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A case analysis to increase awareness of current USMC Knowledge Management (KM) practices

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THESIS

A CASE ANALYSIS TO INCREASE AWARENESS OF CURRENT USMC KNOWLEDGE MANAGEMENT (KM) PRACTICES

by

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September 2013

Thesis Advisor: Mark E. Nissen
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A CASE ANALYSIS TO INCREASE AWARENESS OF CURRENT USMC KNOWLEDGE MANAGEMENT (KM) PRACTICES

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ABSTRACT

The practice of knowledge management (KM) continues to grow within the Department of Defense; however, while the other services have substantially matured in KM, the United States Marine Corps (USMC) has not. Most organizations today leverage information systems and technology to their advantage for increasing information and knowledge flow, and overall KM. The problem is that USMC units do not appear to be leveraging knowledge as effectively as they could, and as other services do, to address the national knowledge issue and dilemma. The purpose of this research is to identify current courses of action that the USMC is taking to mature its KM, to diagnose pathologies preventing USMC units from capitalizing on the power of KM, and to identify a framework for small-unit level implementation.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFKN	Air Force Knowledge Now
AFMC	Army Knowledge Online
BCKS	Battle Command Knowledge System
BPR	Business Process Reengineering
C-3PO	Create, Craft, Choose, Promote and Organize Framework
C4	Command, Control, Computers and Communication
CA	Chief Architect
CAC	Combined Arms Center
CALL	Center for Army Lessons Learned
CBR	Case Base Reasoning
CCIR	Commander's Critical Information Requirements
CIO	Chief Information Officer
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CMC	Commandant of the Marine Corps
COI	Community of Interest
CONOPS	Concept of Operations
COP	Common Operation Picture
CoP	Community of Practice
DoD	Department of Defense
DON	Department of the Navy
DSM	Decision Support Matrix
DST	Decision Support Template
DTIC	Defense Technical Information Center
FMF	Fleet Marine Force
HADR	Humanitarian Assistance and Disaster Relief
HQ	Headquarters
HQMC	Headquarters Marine Corps
I&I	Inspector Instructor
IM	Information Management
IMO	Information Management Officer

IMP	Information Management Plan
IT	Information Technology
ITS	Individual Training Standards
KM	Knowledge Management
KF	Knowledge Flow
KMO	Knowledge Management Officer
KMS	Knowledge Management System
KPI	Key Performance Indicator
KS	Knowledge Superiority
KVA	Knowledge Value Added
MAGTF	Marine Air Ground Task Force
MCCDC	Marine Corps Combat Development Command
MCCS	Marine Corps Common Skills
MCEITS	Marine Corps Enterprise Information Technology Services
MCES	Marine Corps Enterprise Services
MCSC	Marine Corps Systems Command
MCWP	Marine Corps Warfighting Publication
MDKFV	Multidimensional Knowledge Flow Visualization
METL	Mission Essential Task List
MET	Mission Essential Task
MFR	Marine Corps Forces Reserve
MOS	Military Occupational Specialty
NDS	National Defense Strategy
NETC	Naval Education and Training Command
NKO	Navy Knowledge Online
NMS	National Military Strategy
NPDC	Navy Personnel Development Command
POTUS	President of the United States
PP&O	Personnel, Policies and Orders
NSS	National Security Strategy
R&D	Research and Development
ROI	Return on Investment

SATE	Systems Approach to Training and Education
SECNAVINST	Secretary of the Navy Instruction
SMCR	Selected Marine Corps Reserve
SNMP	Simple Network Management Protocol
SWOT	Strength-Weakness-Opportunity-Threat Analysis
TECOM	Training and Education Command
T&R	Training and Readiness
TTP	Tactics, Techniques and Procedures
USMC	United States Marine Corps
U.S.	United States of America
UTM	Unit Training Management
W3	World Wide Web
WF	Workflow

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I. INTRODUCTION

The practice of knowledge management (KM) continues to grow within the Department of Defense (DoD); however, while the other services have substantially matured in KM, the United States Marine Corps (USMC) has progressed rather slowly.

Most organizations today leverage information systems and technology (IST) to their advantage for increasing information and knowledge flow and overall KM. This thesis topic stems from the larger issue of our nation's decreasing knowledge and the negative effects of the cultural characteristics of Generation Y—birth dates from 1980s to 2000s. The president of the United States (POTUS) acknowledged in *National Security Strategy 2010* (NSS) that social progress has accelerated to the extent that Americans must pursue a strategy of increasing knowledge. The POTUS continues,

> We must educate our children to compete in an age where knowledge is capital (NSS, 2010, Introduction, para. 4) …., and our own prosperity and leadership depends increasingly on our ability to provide our citizens with the education that they need to succeed. …. The United States has lost ground in education, even as our competitiveness depends on educating our children to succeed in a global economy based on knowledge and innovation. America's long-term leadership depends on educating and producing future scientists and innovators. (NSS, 2010, p. 29)

Further, as the POTUS said in his State of the Union Address in 2011, "revolutions in technology have transformed the way we live, work, and do business" (Obama, 2011, p. 2). Other nations are educating their children with greater emphasis on math and science and investing in research and new technology to improve their knowledge and leadership; however, America's technological education follows behind many other nations, which have greater Internet and World Wide Web (W3) access and invest more in educating young people to earn a college degree (Obama, 2011).

American leadership acknowledges the importance and necessity of investing in education and research in technology, but not every organization/unit is prepared to leverage IST towards increasing knowledge and improving leadership. In the struggle to keep a competitive edge, leaders, teachers, and parents have to dictate, direct, and force-

feed knowledge to the millennials (i.e., Generation Y) through legacy methods. This is only one battle in the war to gain knowledge superiority (KS). When an organization achieves superb knowledge flow, it will be able to create a niche of competitiveness and survive in the long term. In order to respond to opportunities and threats across the globe, the millennial generation needs to take the initiative to learn and research the knowledge necessary to make them better leaders—which, internalized, will give them and their organizations efficiency and overall effectiveness.

Since it is clear that America needs to get back the competitive advantage, it is every citizen's responsibility to connect every part of America to the technological age of information and knowledge flow, thus enhancing the leadership of our country (Obama, 2011). To inspire millennials to achieve the vision and dedication necessary for knowledge superiority is the first step in ensuring we have the warriors necessary to be effective and efficient within our elite military organizations, for our nation's security.

Finally, the national military strategy (NMS) of the United States recognizes that, globally, we are a knowledge-based society and have the ability to share, process, analyze, and disseminate information to be efficient and effective (Mullen, 2011). The DoD sees information as a strategic asset and wants to ensure that innovative information capabilities are available to the warfighter (DoD CIO *Vision and Mission*, 2013). The DoD has taken many steps towards tackling the issue of KM through the use of IST. The DoD Research and Engineering Enterprise (DoD R&EE) supports the mission of "depend[ing] on science, technology and innovative engineering to not only protect the American people but to advance our national interests and to prepare us to meet the challenges of an uncertain future" (DoD R&EE, 2013, Mission, para. 1). The Defense Technical Information Center (DTIC) mission repeats this theme: "to provide essential, technical research, development, testing and evaluation information rapidly, accurately and reliably to support DoD customers' needs" (DTIC, 2013, DTIC's Mission Statement). These organizations are implementing the precept stated in the 2011 State of the Union Address, that "maintaining our leadership in research and technology is crucial to America's success" (p. 4).

Johnson (2010), in his thesis, *Developing a Knowledge Management Framework to Assist With Current USMC Information Management Practices*, identifies U.S. Army, Navy, and Air Force KM practices and their maturation. Another military organization that responds immediately to threats across the globe is the USMC, and this elite military organization has yet to mature any KM program or introduce KM programs throughout its smaller units. The last piece to fulfilling the direction of the POTUS and the national military strategy of the U.S. is for the USMC to leverage and mature the practice of KM and implement a framework at the small-unit level. The USMC "understands well the value of KM, but has a difficult time integrating its practice into daily operations" (Johnson, 2010, p. 1). A community of practice (CoP) is thus desirable, but initiating any KM programs, especially at the small-unit level, remains a low priority for the USMC. Knowledge needs to be a priority because it is "the preeminent economic resource, more important than both raw material and money" (Stewart, 1997, p. 6). Grant (1996) emphasizes that a firm's priority should be to focus upon knowledge as its most important strategic asset.

The purpose of this research is to identify current courses of action (COAs) the USMC is taking to mature its KM, diagnose any pathologies preventing USMC units from capitalizing on the power of KM, and identify a framework for small-unit-level implementation. This thesis commences with existing literature in Chapter II. Chapter III focuses on research methodology. Chapter IV diagnoses any pathologies and summarizes findings. Chapter V proposes recommendations and key interventions for the USMC to adopt and to advance KM.

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II. LITERATURE REVIEW

Johnson's (2010) thesis, *Developing a Knowledge Management Framework to Assist With Current USMC Information Management Practices*, recognizes and addresses the problem that the USMC lacks a mature KM framework and rigorous practice. Any mention of knowledge is through current doctrine identifying information-management (IM) standard operating procedures (SOP). For example, the Marine Corps Warfighting Publication (MCWP) 3–40.2 places heavy emphasis on IM, but not KM. Johnson begins his thesis by explaining how knowledge is one of the most important factors in an organization's competitive advantage and, citing Tom Stewart (1997), asserts "knowledge has become the single most important factor of production, managing intellectual assets has become the single most important task of business" (p. 6) in the modern economy. Other resources cited by Johnson (2010) include Grant (1996), to demonstrate that knowledge is the "critical input in production and primary source of value" (p. 112). Johnson (2010) explains the various definitions of knowledge and KM visions, while piecing together and articulating numerous principles and theories of KM. For example, an important concept in understanding KM is knowledge-flow principles and Nissen's (2006) multidimensional knowledge-flow visualization. Understanding the common language of KM is an important success factor for any KM initiative (Davenport & Prusak, 1998). Johnson's thesis discusses each service's perspective and definitions of KM through their own publications and analyzes each service through six developed propositions. Ultimately, Johnson finds that the USMC has no strong KM initiatives, but does consider KM an important concept. Using Minonne and Turner's (2009) *Evaluating Knowledge Management Performance* Johnson rates the USMC at maturity level two out of five. The conclusion to Johnson's 2010 thesis recommends a "create, craft, choose, promote and organize" (p. 62) (C-3PO) framework with KM "best practices and activities most likely to bring maturity to current USMC KM practices" (p. 62).

In order to grasp the extent of the following research and extend Johnson's 2010 research, the following outline frames this literature review. First, an analysis of the current maturity level of the USMC KM is conducted, with a diagnosis of pathologies

that may suggest a different framework or methodology for practicing KM at the unit level. A new theory is that the USMC has not substantially matured in any KM practice or initiative, and there is no push for KM practice at the unit level. Targeting, evaluating, and placing strong emphasis upon current DoD KM best practices and principles will add to the strategy of Johnson's methodology using Yin's (2009) five components for case-study research. Additionally, the principles outlined in Nissen's (2006) *Harnessing Knowledge Dynamics* will also be leveraged to determine any improvement of KM practice in the USMC and referred to for possible establishment of a basic unit KM SOP doctrine. Finally, IST will be analyzed through the framework provided by Alavi and Leidner (2001). As Johnson mentions, Alavi and Leidner introduce "a framework for the analysis of the role of an information system in organizational KM processes" (p. 15). The following literature review summarizes a variety of materials to avoid redundancy with previous research.

A. EPISTEMOLOGY

Scientia potentia est (knowledge is power) has been a cliché for centuries. Descartes' *cogito ergo sum* (I think, therefore I am) is also a cliché, and also a phrase for traditional epistemology. Knowledge itself is an extremely influential tool and arguably the most important practice (business or not) for any individual or organization hoping to achieve a competitive advantage. Although the intuitive and notional practice of obtaining more useful knowledge than the adversary (i.e., the competition) is a human instinct, the physical practice or study of knowledge (i.e., epistemology) was not introduced into organizations, and organizational research as a capital asset until the information revolution took off and knowledge became a necessity for success. Johnson (2010) acknowledges this importance for the USMC by reference and assertion that "knowledge is the key to achieving competitive advantage" (p. 5).

Many scholars have elaborated on the intellectual history of the study of knowledge from the era of Socrates and Plato (300–400 BC), and through their recent contributions in the field of epistemology. Other scholars attribute the beginnings of the study of knowledge *per se* to Sir Francis Bacon in the seventeenth century or John Locke

in the eighteenth, due to their pioneering work and impact on epistemology. Epistemology is the philosophical aspect of the theory of knowledge and can be dated as far back as the Paleolithic age (2.6 million years ago), with the prehistory of human technology. The study of knowledge started with the beginning of humankind, communicated through drawings (40,000 years ago) and developed into proto-languages, petroglyphs, pictograms, ideograms, cuneiform script (c. 3000 BC), the Rosetta stone, Sanskrit (1500–1200 BC), woodblock printing, hydraulic semaphore systems (fourth century BC), the printing press (1000–1500 AD), modern linguistics, telephony (nineteenth century AD), and all the advanced technology developed over the last century.

Epistemology and its historical sources have created a dynamic field of study centered on the specific techniques practiced by individuals, groups, and organizations to gain a competitive advantage. As seen below, and much like the development of communications, the study and theory of knowledge continues to evolve. Cook and Brown (1999) are just one example among many authors who have studied epistemology and the difference between knowledge and knowing, distinguishing between the epistemology of possession (i.e., knowledge) and epistemology of practice (i.e., knowing), which will be covered below. Today, another dynamic field of knowledge has emerged, that of knowledge management (KM), which encompasses the whole realm of advanced sociology and technology. To drill down into the core capabilities of KM, one must understand the definition and scope of knowledge.

B. KNOWLEDGE

There are many different categories of knowledge in academia, business economies, and modern militaries. They include (but are not limited to) communicated knowledge, situated knowledge, partial knowledge, scientific knowledge, and organizational knowledge. Johnson (2010) cites many authors and delivers a thorough definition. He quotes Stewart (1997) that knowledge is "the preeminent economic resource, more important than both raw material and money" (p. 7). He also refers to Alavi and Leidner's (2001) statement that "knowledge is information possessed in the

mind of individuals: it is personalized information (which may or may not be new, unique, useful, or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgments" (p. 3). Again, Grant (1996) adds that knowledge is the "critical input in production and primary source of value," (p. 112) and Davenport and Holsapple (2006) assert that knowledge is the capacity to take action. Plato defines knowledge as "justified, true belief" (Morey, Maybury & Thuraisingham, 2002). Stewart (1997) adds that knowledge is often more important than money, and "considered as an economic output, information and knowledge are more important than automobiles, oil, steel, or any of the products of the Industrial Age" (p. 7).

Overall, there are many variations and ideologies about what knowledge is or is not. The general consensus is that knowledge supports and enables a competitive advantage among individuals, groups, and organizations. Many academic and business professionals have their own knowledge taxonomies, but within the KM culture the fundamental definition of knowledge remains distinct. Jennex and Croasdell (2005) assert that the most commonly used taxonomy is from Polanyi's (1964, 1967) and Nonaka's (1994) definitions of explicit and tacit knowledge. Schwartz's (2006) *Encyclopedia of Knowledge Management* states the two categories of knowledge are tacit and explicit, which have a dynamic interaction, like analog-to-digital synthesizing. Figure 1 illustrates the interaction between these knowledge types.

1. Explicit Knowledge

"Explicit knowledge" is data and information codified and put into context as "symbolic representations such as words and numbers that can be readily transferred among persons in formal, systematic ways" to enable action (Davenport & Hosapple, 2006, p. 811). Additionally, explicit "knowledge is more actionable than information or data is, but actionability does not imply a separate judgment such as better; … and knowledge often requires data to enable action" (Nissen, 2006, p. 20).

2. Tacit Knowledge

"Tacit knowledge" is simply understood as that which is commonly experienced; however, "it is deeply rooted in an individual's actions and experience as well as in the

ideals, values, or emotions he/she embraces," (Nonaka & Takeuchi, 1995, p. 8) forcing it to be "highly personal and hard to formalize, making it difficult to communicate or share with others" (Nonaka & Konno, 1998, p. 42). Two dimensions of tacit knowledge Nonaka and Konno (1998) refer to are:

- Technical dimension of tacit knowledge: "The informal personal skills or crafts often referred to as 'know-how.'" (Schwartz & IGI Global, 2006, p. 811)
- Cognitive dimension of tacit knowledge: "Beliefs, ideals, values, schemata, and mental models which are deeply ingrained in us and which we often take for granted. It shapes the way we view the world." (Schwartz & IGI Global, 2006, p. 811)

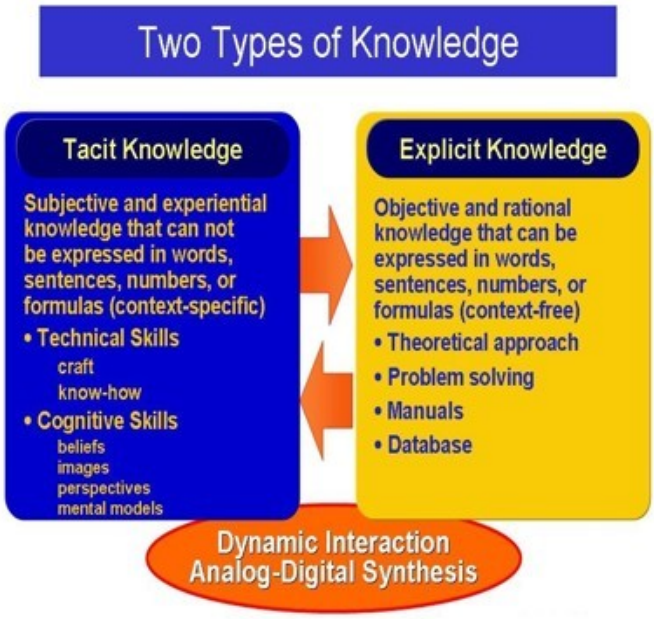

Figure 1. Dynamic Knowledge Interaction (From APO, 2013)

C. KNOWLEDGE HIERARCHY

In order to thoroughly grasp and understand the importance of knowledge and why it lies at the top of most valued organizational capital, a knowledge distinction needs to be presented through a hierarchy of data, information, and knowledge. The knowledge hierarchy in Figure 2 explains a broadly accepted view.

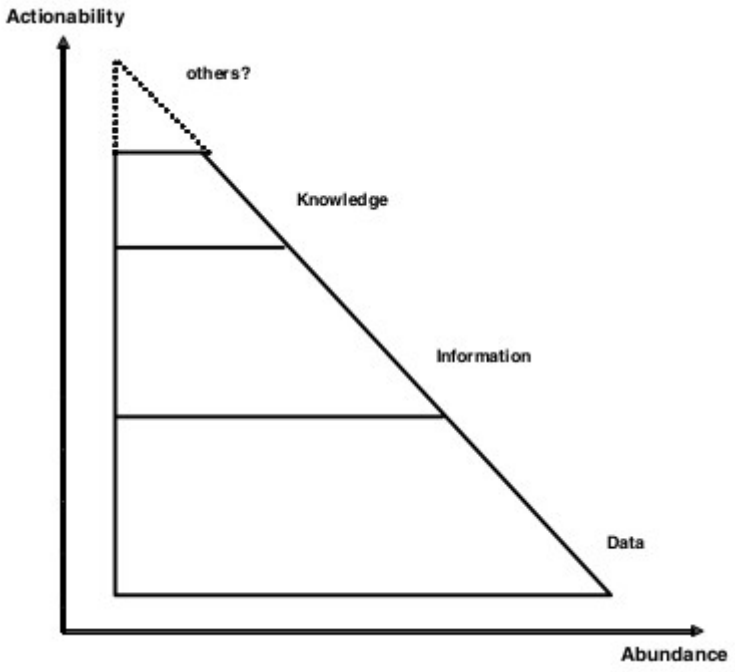

Figure 2. Knowledge Hierarchy (From Nissen, Kamel, & Sengupta, 2000)

Johnson (2010) explains that Tuomi's (1999) view of the knowledge hierarchy suggests that knowledge is superior to data and information; however, Nissen (2006) points out that directionality can occur both ways, as illustrated in Figure 3, keeping in mind that the "interrelationships between knowledge, information, and data are more complex than implied by a simple three-layer diagram" (Nissen, 2006, p. 20).

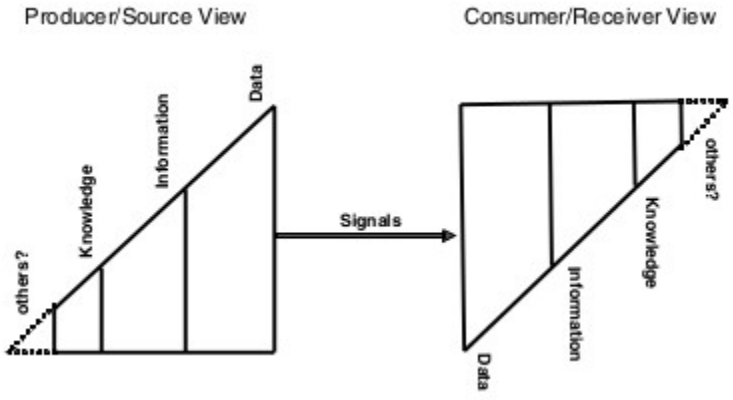

Figure 3. Knowledge Flow Directionality (From Nissen, 2002a)

Nissen's (2002a) inverted view of the hierarchy of knowledge reasons that many professions call upon knowledge to produce information, which information is necessary for data conveyed through signals. Nissen (2006) describes the producer/source view with an analogy of how an attorney uses knowledge to persuade jurors, using experienced-based knowledge to ascribe meaning to the information presented (e.g., evidence and witness testimony). This information is presented through signals (analogical and/or digital), which are symbols through script, words spoken, or visual appearances (Nissen, 2006). An opposing view that supports Tuomi (1999) flips this hierarchal analogy of the attorney. A juror hears and sees signals from attorney arguments, which are placed into contextual information. The information presented forces the juror to act by way of rendering a verdict, and the verdict is a result of juror knowledge (Nissen, 2006).

Applying the knowledge hierarchy to a military viewpoint, raw datum is constantly being collected for processing into information for critical (i.e., life threatening) decision-making capabilities. Only after the correct information is analyzed and acted upon is knowledge introduced into leadership decision-making capabilities and the development of situational awareness. The consistent hierarchal view of knowledge among civilian and military professionals adds to the importance of knowledge and of obtaining a competitive advantage. Figure 4 illustrates the USMC's information-flow concept of how data is processed into information for commander critical-information requirements (CCIR), and then stored as knowledge for critical decision-making capabilities. The important point is that "knowledge involves more than just information: It enables direct action (e.g., good decisions, appropriate behaviors, useful work—judgment and norms determine what constitutes good, appropriate, and useful)" (Nissen, 2006, p. 16). The directionality of the knowledge hierarchy relates to how "different kinds of knowledge (e.g., language, contextual) are required for different kinds of action (e.g., interpretation, informing)" (Nissen, 2006, p. 18). Understanding the knowledge hierarchy and its directionality precedes a fundamental discussion of knowledge flow.

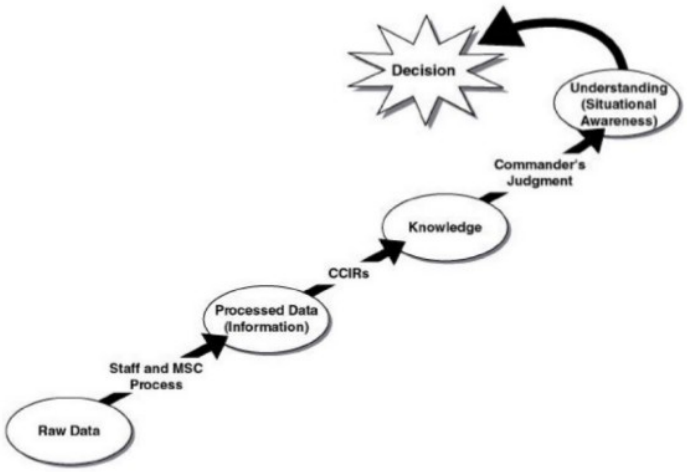

Figure 4. USMC Information Flow (From MCWP 3–40.2, 2002)

D. KNOWLEDGE FLOW

The flow of knowledge in any organization is arguably the most important and fundamental requirement for achieving a competitive advantage. Using Newton's law of physics, Nissen (2006) emphasizes that "knowledge at rest tends to stay at rest" (p. 32). The reason KF is so critical is that it "depends upon the people, not the technologies," (Nissen, 2006, p. 24) and people can be difficult to persuade to share their experience for fear they will lose their individual competitive advantage within an organization. In order to successfully obtain knowledge flow within any organization, four processes—socialization, externalization, combination, and internalization (SECI)—must occur. Johnson (2010) refers to Nonaka's (1991) model in *The Spiral of Knowledge* depicting these four KF processes and their related dimensions, as illustrated in Figure 5.

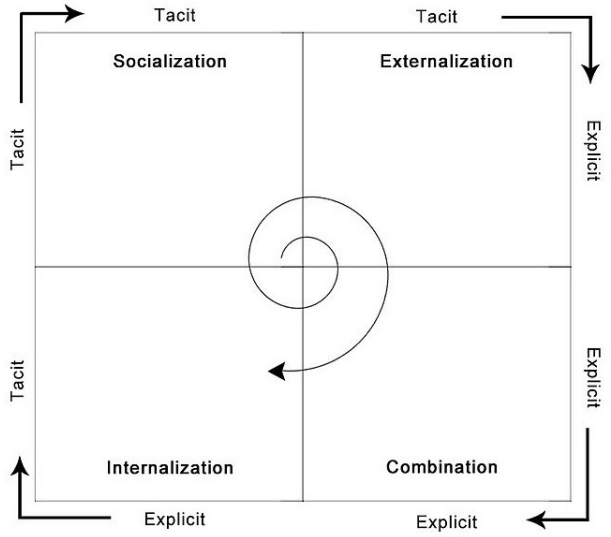

Figure 5. SECI Model (From Nonaka, 1991)

The tacit-to-tacit dimension modeled in Figure 5 relates to socialization through social interaction and face-to-face sharing of knowledge through experiences. Since tacit knowledge is difficult to codify, it usually requires socialization in the form of meetings, brainstorming, and group training. Traditional on-the-job training (OJT) leverages tacit KF through hands-on experience instead of learning through explicit knowledge. The tacit-to-explicit dimension relates to externalization, where tacit knowledge is captured and codified, allowing more knowledge to flow through a medium (e.g., books, manuals, publications, images, documentaries). Where knowledge tends to increase in complexity and creativity is through explicit-to-explicit KF. This dimension is referred to as *combination*, and the technology to support such combinations of explicit knowledge is more prevalent. Finally, *internalization* refers to explicit-to-tacit KF. This is learning by doing, where the individual or group collectively analyzes patterns, ideas, and principles for reflection and builds on individual or group tacit knowledge. Familiar KF processes that can be related through the SECI model are learning and doing through training exercises, education, trial and error, etc. "Learning refers to knowledge in motion," while "doing refers to knowledge-based work" (Nissen, 2006, pp. 73-78).

Knowledge-based action is different than knowledge that enables action, and the term "*Knowing* refers to knowledge in action" (Nissen, 2006, p. 70). Simply put, you may

know how to do something versus just knowing something (see Cook & Brown's epistemology of practice vs. epistemology of possession). The SECI model evolves in a spiral where new knowledge is created, existing knowledge is expanded upon, and explicit and tacit knowledge flows. Knowing and knowledge are complementary. "The action of knowing cannot obtain without the enabling knowledge; and the enabling knowledge cannot be put to use except through the action of knowing" (Nissen, 2006, p. 71).

Another important aspect that correlates to knowledge-based action is workflow (WF) interactions. The activity of research clearly describes the interaction between the flow of knowledge and of work. As Nissen (2006) points out, "there is learning as well as doing taking place" (p. 39) as new knowledge is developed through this learning and doing activity. Keep in mind that there are several WF processes that concentrate only on doing and not learning (e.g., flipping hamburgers), and "people must know what do to and how to do it before they can effectively accomplish a knowledge-based activity" (i.e., task or mission) (Nissen, 2006, p. 45). Understanding KF and WF processes and related knowledge-based activities in the SECI model presents a multidimensional knowledge-flow visualization (MDKFV) developed by (Nissen, 2005). Figure 6 incorporates life cycle and flow time to add to the complexities of KF, and providing a thorough visual aid in KF analysis.

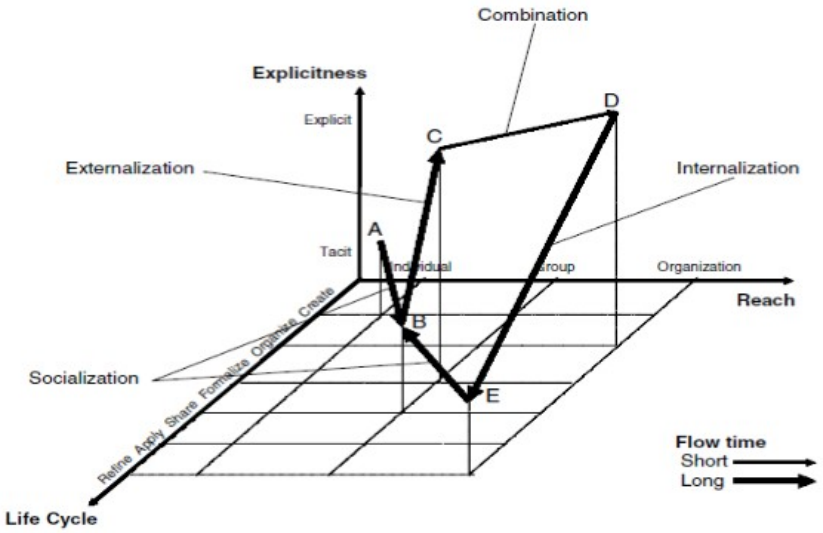

Figure 6. Multidimensional Knowledge-Flow Visualization (From Nissen, 2005)

The MDKFV serves many purposes for analyzing KF and covers the whole spectrum of KF. A more thorough discussion and description on the MDKFV can be found in Nissen (2006) and Johnson (2010). The big takeaway is that the MDKFV is a visual aid after breaking down KF patterns within an organization to identify critical capabilities and diagnose any pathologies in regard to knowledge flows. This diagram will be used to analyze USMC components and capabilities within its current KM maturity level.

As Nissen (2006) points out, organizational leadership has many obstacles and diversions restricting knowledge flows. Ultimately, "a person [or organization] must be competent at learning before knowledge creation can take place, … a person [or organization] must have internalized knowledge before it can be applied," (Nissen, 2006, p. 43) and where knowledge does flow, learning will finally take place.

E. KNOWLEDGE TECHNOLOGY

Today, almost all business processes involve IT and rely upon an IT infrastructure and architecture to bring a competitive response or advantage to an organization or enterprise. Not only is knowledge a critical capability and considered the most important form of capital or asset any organization can have; technology is also a strong core capability to create effectiveness and efficiencies through a synergy of technologies. Long gone are the days of "snail mail," typewriters, and pads of paper for storing knowledge. Although these were once important for the transfer and flow of knowledge, innovation continuously evolves as faster and faster hardware, software, systems, and networks are invented to deliver and share data, information, and knowledge, slashing life cycle and flow time. Within the knowledge life cycle are two roles that clarify the supporting nature of IT. Adapted from Nissen (2006), Figure 7 illustrates two roles (i.e., classes) to distinguish among extant technologies and show the importance of reliance on persons for knowledge to flow.

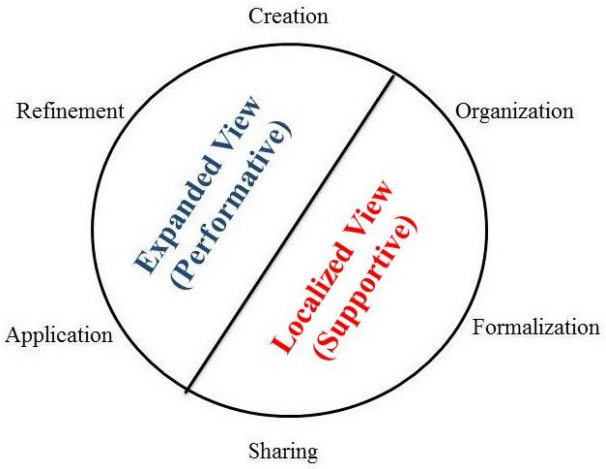

Figure 7. Knowledge Life Cycle (After Nissen et al., 2000)

Nissen (2006) points out that the two classes of knowledge are of a localized and expanded view. The localized view is supportive in nature, meaning that legacy technologies organize, formalize, and share knowledge—indicating support for KF. The expanded view is performative in nature, meaning that technologies effect the creation, refinement, and application of KF activities. Again, knowledge flows depend upon people, not technologies, and there are not many performative technologies (Nissen, 2006). Simulation or expert-systems technologies are probably the only argument to a legacy technology that performs through "facilitating learning as well as doing through virtual practice" (Nissen, 2006, p. 68). Furthermore, these systems have proven over time that they can perform better than people (in some, relatively narrow circumstances) by taking explicit knowledge and turning it into action. This demonstrates that the capacity to increase novice performance levels to that of experts, with an understanding of this knowledge technology, is a powerful contributor to competitive advantage (Nissen, 2006).

Understanding and adapting new technologies to sustain a competitive response or to gain a competitive advantage is not as easy as it seems. Organizations study their environment, formulate strategies, and create structure under an operating model just to obtain a sense of what specific business processes can be leveraged to facilitate KM. According to Alavi and Leidner (2001), "in order to formulate a knowledge-management strategy, organizations need to assess and understand their knowledge position and existing intellectual resources before they can assess the role of information technology

in facilitating knowledge management" (Johnson, 2010, p. 17). A class of information systems that can manage organizational knowledge is referred to as a knowledge-management system (KMS). KMSs are "IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application" (Alavi & Leidner, 2001, p. 7). Alavi and Leidner (2001) propose there is a sociology of knowledge within an organization that is considered to be a "knowledge system," and this organizational process is a framework for information technologies in organizational management. Table 1 summarizes this framework to further explain categories of KMSs.

KM Processes	Knowledge Creation	Knowledge Storage/Retrieval	Knowledge Transfer	Knowledge Application
Supporting IT	Data mining Learning tools	E-bulletin boards Knowledge repositories Databases	E-bulletin boards Discussion forums Knowledge directories	Expert systems Workflow systems
IT Enables	Combining new sources of knowledge Just in time learning	Support of individual and organizational memory Inter-group knowledge access	More extensive internal network More communication channels available Faster access to knowledge resources	Knowledge can be applied in many locations More rapid application of new knowledge through workflow automation

Table 1. Knowledge Management Processes and the Potential Role of IT (After Alavi and Leidner, 2001; Johnson, 2010)

Johnson (2010) provides a thorough explanation of Alavi and Leidner's (2001) framework. Essentially, knowledge creation is exactly that: the creation of new knowledge or the replacement of existing explicit or tacit knowledge. Knowledge storage/retrieval is knowledge that resides in many codified forms. Knowledge transfer simply is KF, and knowledge application stems from the individual or organizational use of knowledge. Examples of each are provided in Johnson (2010). The point illustrated is

that Alavi and Leidner's (2001) framework correlates to Nissen's (2006) knowledge life cycle, and knowledge technology is another important component of KM.

F. KNOWLEDGE MANAGEMENT

Understanding the definition and types of knowledge that exist, where knowledge lies in the hierarchy of data and information, how knowledge flows among individuals and organizations, and what technologies support knowledge flows, all contribute to the best business practice of KM. So what exactly is KM? Jennex (2007) established a working definition of KM as:

> KM is the practice of selectively applying knowledge from previous experiences of decision making to current and future decision-making activities with the express purpose of improving the organization's effectiveness.

Jennex (2007) clarifies that this definition does not include the aspect that once KM is implemented, organizational effectiveness and efficiencies will immediately improve by putting knowledge into action. Reinhardt (2000) emphasizes there is no single perspective that clearly defines KM, since there are both theoretical and practical perspectives (Morey, Maybury & Thuraisingham, 2000, p. 192). The theoretical perspective of KM is based on the following framework:

- Four different system levels of learning: individual, team, organizational, and interorganizational (Reinhardt, 2000, p. 192).
- Three different learning modes: cognitive, cultural and action perspective (Reinhardt, 2000, p. 192).
- Three different learning types: single-loop, double-loop and deuteron-learning (Reinhardt, 2000, p. 192).
- Four different learning phases: identification/creation, diffusion, integration/modification, and action (Reinhardt, 2000, p. 192).

Figure 8 illustrates this framework.

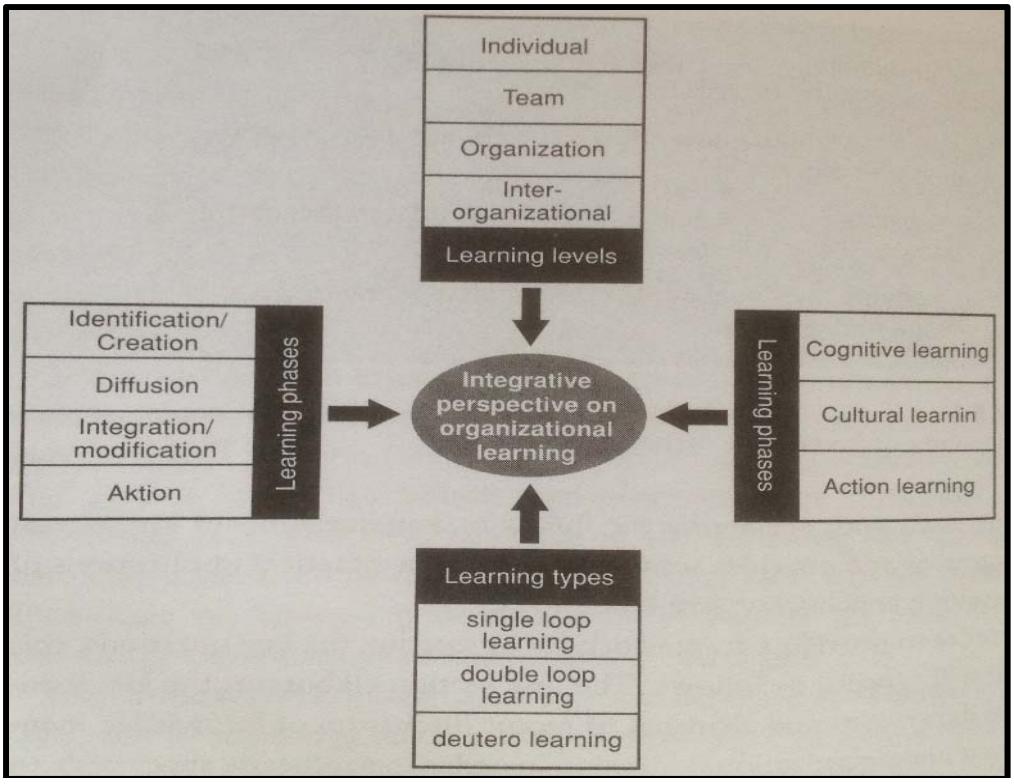

Figure 8. Integrative Perspective on Organizational Learning Concepts (From Reinhardt, 2000, p.190)

The figure and framework in Figure 8 are the product of findings from extensive literary research. These are four fundamental core perspectives on organizational learning and KM (Reinhardt, 2000, p. 190), and are considered a major theoretical development. The other major development from this integrative framework is that KM is understood to be a goal-oriented process (Pawlowsky, 2001; Reinhardt, 2000, p. 192). Additionally, this integrative perspective/framework supports an "understanding of the complexity of organizational learning and knowledge management processes," (Reinhardt, 2000, p. 192) but is also necessary for successful organizational KM implementation. Building upon a theoretical framework, the more practical perspective of KM adds the managerial perspective to the process of organizational learning (Reinhardt, 2000, p. 193). Figure 9 illustrates the core elements of KM previously mentioned and the integration of theory and practice. A more in-depth description can be found in Morey et al., (2000), *Knowledge Management: Classic and Contemporary Works*.

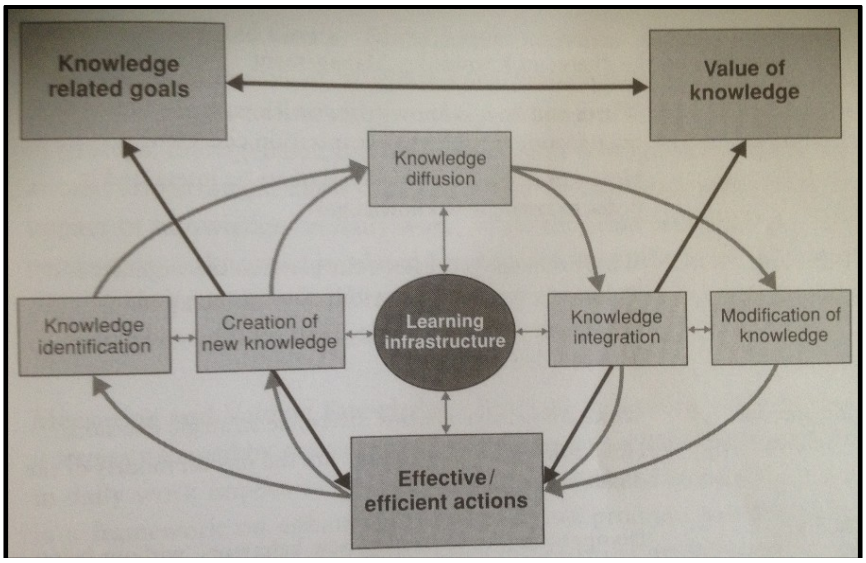

Figure 9. The Practical Perspective of Knowledge Management (From Reinhardt, 2000, p. 193)

The practical perspective of KM includes a gamut of fundamental managerial skills not limited to creating a vision and mission, setting goals, performance measurements, and cost analyses. Another large piece of KM rests within research and development (R&D) departments. Not every organization has an R&D department; however, groups of individuals working on any task can be organized to retrieve valuable explicit knowledge for decision making or improving business processes. KM can occur at the smallest entity in global organizations. Take the DoD for example: most KM occurs at headquarters level or higher, and only among certain services or specific units. But KM not only can be adopted and practiced at a smaller-unit level (e.g., in a regiment or battalion), knowledge can be managed at the fire team or squad level to also achieve a competitive advantage—in this case, against an adversary.

The discussion of KM theory and practical application is endless. Researching hundreds (among thousands) of papers reveals the same authors referenced over and over by other well-known KM theorists and practitioners. The *Electronic Journal of Knowledge Management, Volume 11*, Issue 2, 2013, addresses this very subject. Maasdorp (2007) and Stacey (2001) clarify that Nonaka and Takeuchi's (1995) original

theory has dominated as the basis for KM theory (Virtanen, 2013). To exaggerate this point, take the following definitions of KM:

- Alavi and Leidner (1999) define KM as a "systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge" (p. 6; Virtanen, 2013, p. 119)
- Snowden (2002) defines KM as "The identification, optimization, and active management of intellectual assets, either in the form of explicit knowledge held in artifacts or as tacit knowledge possessed by individuals or communities" (p. 63; Virtanen, 2013, p. 119)
- Capeda-Carrion (2006) states KM to be "the formalized, integrated approach of managing an enterprise's articulated and tacit knowledge assets" (p. 34; Virtanen, 2013, p. 119)

From the above definitions and frameworks described, there are hundreds of "distinct perspectives or models of organizational learning and knowledge management, … and managers [leaders] cannot expect the universal blueprint of implementing knowledge management with regard to improving the performance of a firm [unit]" (Reinhardt, 2000, p. 192). KM continues to evolve with improved or newly developed frameworks, due to the spread, trend, and advantages organizations obtain or adapt. Keeping in mind that every organization is tailored differently depending upon its goals and implementation of KM, the more KM is implemented and practiced, the more practitioners and scholars are able to analyze overall organizational performance to assess and understand the true benefits KM as to offer. Currently, this is the case for all armed services within the DoD, except the USMC.

G. KM WITHIN THE DEPARTMENT OF DEFENSE

The *National Defense Strategy* of 2008 acknowledges that the DoD must "break down barriers and transform industrial-era organizational structures into an information and knowledge-based enterprise" (p. 20). Johnson (2008) points out that a "transformation to a net-centric force requires 'fundamental changes in processes, policy, and culture,' all of which KM boasts significant abilities to achieve" (p. 33). The quest to implement KM CoPs throughout the DoD began around 2008, when the DoD CIO defined KM in the DoD IM/IT *Strategic Plan of 2008–2009* as "the systematic process of discovering, selecting, organizing, distilling, sharing, developing and using information, … providing the basis from which decisions are made and actions are

taken" (Johnson, 2010, p. 35). The *Department of Defense Information Enterprise: Strategic Plan 2010–2012* emphasizes that KM is a necessity and discusses the growing "premise that rapidly sharing knowledge of people and organizations at all levels provides a vital augmentation to traditional, rigid, centrally-approved knowledge sharing approaches" (DoD CIO, 2012, Forward, p. IV).

The Department of the Navy (DoN) defines KM "as the integration of people and processes, enabled by technology, to facilitate the exchange of operationally relevant information and expertise to increase organizational performance" (Wennergren, 2005, p. 1). The U.S. Army defines KM in *Army Regulation 25–1* (2013) as an:

> Armywide strategy to transform the Army into a network-centric and knowledge-based force to improve information dominance by our Warfighters and business stewards. It includes, but is not limited to, improving processes, technology, and work culture to collaborate, catalog, store, find, and retrieve information; and share this information with Joint, coalition, and international partners as mission needs dictate. (Odierno & O'Keefe, 2013, p. 74)

Additionally, the U.S. Air Force defines KM in *Air Force Policy Directive 33–3*, 28 March 2006, as:

> The handling, directing, governing, or controlling of natural knowledge processes (acquire/validate, produce, transfer/integrate knowledge) within an organization in order to achieve the goals and objectives of the organization (JP 6–0). KM seeks to make the best use of the knowledge that is available to an organization, creating new knowledge, and increasing awareness and understanding in the process. KM can also be defined as the capturing, organizing, and storing of knowledge and experiences of individual workers and groups within an organization and making this information available to others in the organization. (Peterson & Shade, 2006, p. 9)

While the USMC has no official publication or doctrine that specifically defines KM, this thesis will highlight the most current initiatives, as representing current doctrine. Since the USMC partners with DoN's information-management initiatives and regulations, it is logical that they share the same definition and understanding of KM. All services acknowledge that they understand KM, and most have initiatives and CoPs in place. The U.S. Coast Guard's Office of the Chief Information Officer (CIO) vision is:

> To provide quality information services to meet the total information needs of our customers. Support the goals of the Coast Guard through continuing improvement, innovation, and technological growth using knowledge management principles. (CG-61, 2013, Vision)

Other organizations within the DoD have CoPs; for example, the Defense Acquisition University (DAU's) *Knowledge Management and Information Technology: Know-IT Encyclopedia* states knowledge is "The ideas, understanding, and lessons that an organization has learned over time … knowledge is condensed information with context that has value for decision and action" (Pollock, 2002, p. 220).

We clearly see that the DoD and services understand the importance of KM, and for the most part are starting to talk the talk; however, depending on operational commitments, the maturity level of KM within the services differs drastically. In 2010, Johnson summarized examples of KM initiatives throughout the DoD, as shown in Table 2 below. Table 3 illustrates a timeline of on how the Air Force and Army have evolved in KM, and Table 4 provides maturity levels.

	Air Force	Army	Marine	Navy
Service Level Programs	Air Force Portal Air Force Knowledge Now (AFKN)	Army Knowledge Online (AKO) Portal Defense Knowledge Online (DKO) Portal Battle Command Knowledge System (BCKS)	MarineNet (Learning Portal) Marine Ammunition Knowledge Enterprise (MAKE) Marine Corps Combat Development Command (MCCDC) KM Center	Navy Knowledge Online (NKO) Portal Enterprise Knowledge Management (eKM)
Unit Level Programs	Air Force Materiel Command 77 Weapons Squadron > 15K Virtual CoPs	1st Cav Division 4th Infantry Division US Army Reserve Affairs Center for Army Lessons Learned (CALL)	Marine Corps Center for Lessons Learned (MCCLL) Ammunition Knowledge Management Portal MCCDC KM CoP	Naval Education Training Command Naval Personnel Development Command US Pacific Fleet Naval Postgraduate School (NPS)
KM Education Offered	AFKN Workshops AFKM 101 Intro to KM AFKN FM KM Overview AFKN CoP Training AFKN Wiki Training	Basic KM Course Battle Command Officer Integration Course Army Knowledge Management Qualification Course MS Sharepoint Adobe Connect	Under Development	CoP Courses (7) IPTR: Knowledge Distribution, Knowledge Flow, and Organizational Performance (KM) Navy Afloat Knowledge Managers Course NPS: IS3210 KM in Defense NPS: IS4210 Knowledge Superiority
KM Methodology	Community of Practice Knowledge Centric Operations	Community of Practice AKM Knowledge Advisors	Community of Practice	Community of Practice

Table 2. DoD KM Initiatives (From Johnson, 2010)

	Air Force	Army
KM Evolution	1999 - Air Force Materiel Command (AFMC) launches KM initiative 2001 – AFMC KM becomes AFKM 2001 – AFKM adopts CoP methodology 2002 – AFKM has 200 CoPs and 1500 users 2002 – AFKM becomes Air Force Knowledge Now (AFKN) 2004 – AFKN has 700 CoPs and 14K users 2006 – AKFN adopts Knowledge Centric Operations (KCO) concept 2006 – AFKN has > 7K CoPs and > 160K users	1990s- Old Soldiers Bulletin Boards 2000 - companycommand.com 2002 - early CoP (S3-XO Net) 2003 - AKO 2004 – BCKS 2004 – 2006 BCKS grows to over 80K participants 2006 FM 6-01.1 first KM doctrine 2006 – BCKS develops KM training 2007 – present BCKS assists Army units with KM initiatives 2009 – BCKS receives Authority to Operate (ATO) for NIPR/SIPR networks 2009 – 5th Annual AKM Conference

Table 3. DoD KM Evolution (From Johnson, 2010)

Level of implementation	Maturity Stage	Level of Control
The basics of KM and the difference between it and information management are understood by some within the organisation. The potential benefits and the use of KM have been discussed in some functional areas.	1	No KPIs other than perhaps some qualitative assessment of efficiency in managing knowledge assets.
An intermediate level of *cultural* integration has been achieved. *Organisational* integration remains at a low level and no meaningful *methodical* and *procedural* integration are yet established.	2	A few qualitative metrics developed to control efficiency in guiding the implementation of KM strategy towards the future.
An advanced level of *cultural* integration and an intermediate level of *organisational* integration have been achieved. Only a low level of *methodical* integration is in place and no meaningful *procedural* integration is yet established.	3	Mainly qualitative, but some quantitative KPIs developed to monitor efficiency and some qualitative KPIs to assess effectiveness in the implementation of KM strategy.
An advanced level of *cultural* and *organisational* integration as well as an intermediate level of *methodical* and *procedural* integration has been achieved.	4	Qualitative and quantitative KPIs in place to monitor the implementation of an effective and efficient KM strategy to take the organisation in the direction of its perceived future image.
An advanced level of all forms, *cultural*, *organisational*, *methodical* and *procedural*, integration has been achieved. The organisation has reached world class status.	5	KPIs, both quantitative and qualitative, in place to measure changes in the image of the future and frequent reassessment of KM strategy to reflect changes in that image

Table 4. Stages of Implementation and Control Maturity
(From Minonne & Turner, 2009)

Using the Minonne and Turner (2009) maturity model, Johnson (2010) rated the Air Force, Army, and Navy at five, while the USMC was rated at two. These ratings are quite significant. The priority and implementation of KM within the USMC may be high, but there clearly are other significant factors preventing a higher maturity rating (e.g., the war in Afghanistan). Overall, KM within the DoD is strong among most services, and continues to evolve. Before a more thorough evaluation is conducted within each service, KM initiatives need to expand to test new ground. The DoD KM findings from Johnson (2010) are listed in Table 5.

	Air Force	Army	Marine Corps	Navy
KM Defined	Yes -AFPD33.3 28 Mar 2006	Yes - Army Regulation (AR) 25–1 15 Jul 2005	Yes – MCO 5400.52 5 Jan 2010	Yes – DoN Memo 20 Oct 2005
KM Perceived Important	Yes – KM goals outlined	Yes – KM goals/benefits outlined	Yes – KM benefits outlined	Yes – KM goals outlined
Indicators and Factors of KM Success	Resource growth Content growth Technical infrastructure Clear purpose Knowledge friendly culture Senior management support Standard, flexible knowledge structure	Resource growth Content growth Technical infrastructure Clear purpose Knowledge friendly culture Senior management support Link to industry value	Resource growth	Resource growth Content growth Technical infrastructure Clear purpose Knowledge friendly culture Senior management support Multiple channels for knowledge transfer
KM Maturity Level	Mature	Mature	Novice	Mature
KM Strategy	**Yes**	**Yes**	**No**	**Yes**
KM Framework For Implementation	**Yes**	**Yes**	**No**	**Yes**

Table 5. DoD KM Findings (From Johnson, 2010)

Among all the services and findings, Johnson's thesis research at the Naval Postgraduate School (NPS) found that "KM has the capability to make the USMC business and decision-making processes better;" however, USMC KM initiatives may "appear to remain unit specific, as opposed to organizationally formalized" (Johnson, 2010, p. 26). In his conclusion, he recommended that a create, craft, choose, promote, and organize (C-3PO) framework (Figure 10) be implemented for the USMC to mature in KM practices, and a strength–weakness–opportunity–threat (SWOT) analysis be performed to tailor KM efforts to operational commitments within the Marine Air Ground Task Force (MAGTF) (Johnson, 2010). Finally, he recommends creating a strong vision, promoting knowledge sharing, and organizing KM processes around strategy, all of which should have been implemented or tested to bring all the USMC's headquarters- and unit-level programs, KM-offered education, and KM methodology to a maturity level of five. The next section will cover a methodology to diagnose any pathologies and factors of success or failure to evaluate and analyze the current state of KM in the USMC.

Figure 10. C-3PO KM Framework (From Johnson, 2010)

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III. METHODOLOGY

The methodology of this research is modeled after Johnson's thesis, *Developing a Knowledge Management Framework to Assist With Current USMC Information Management Practices* (2010). As with a controlled variable in an experiment, retention of the previous case study's methodology allows further and secondary research to be conducted more accurately and conclusively. Secondary research is widely used for adding to data collections. The secondary research in this thesis applies Yin's (2009) case-study methodology and Johnson's (2010) research on KM in the USMC.

A case-study methodology is an appropriate choice because KM is contemporary in nature and currently practiced in the USMC; this empirical inquiry, however, will tend toward a more theoretical perspective. As Yin (2009) points out, "a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 634). While Johnson's (2010) case-study method was intended to contribute to the knowledge of organizational KM at the service and unit levels of the DoD, the case study in this thesis is focused solely on the USMC and possible KM at its small-unit levels. Throughout the analysis, any identified KM best business practice from any CoP (e.g., DoD or academia) will be thoroughly evaluated as a candidate for possible additional research. The case study presented is also "exploratory, developing hypotheses and propositions" (Johnson, 2010, p. 29) similar to Johnson's (2010) thesis, but changing the questions to reflect KM in the USMC only. Areas of analysis are critiqued for the possible addition of leadership mandates, which serve to add a best business practice the USMC excels in: developing leaders and leading Marines.

A. COMPONENTS OF CASE-STUDY RESEARCH

Yin's (2009) case-study research employs five necessary components, as Johnson (2010) points out: "1) a study's questions; 2) its propositions, if any; 3) its unit(s) of analysis; 4) the logic linking the data to the propositions [a general strategy]; and 5) the criteria for interpreting the findings [analytic technique]" (p. 29).

Two questions were formulated for the research in this thesis:

- What are the USMC's current efforts and COAs for maturing in a KM CoP at a headquarters level?
- What pathologies are impeding KM programs or projects at the headquarters or small-unit level?

The exploratory nature of the first question is focused on extant research of KM throughout the USMC, while the second question tailors this case study by analyzing past and current USMC KM initiatives. Both these questions add to theoretical observations and findings on the current maturity level of KM in the USMC and on factors in success or failure. Additionally, they support the possible identification of a framework for small-unit-level implementation.

Following component two of Yin's *Case Study Research: Design and Methods*, Johnson's (2010) investigative questions led to the development of six specific propositions tailored to KM in the DoD. Yin (2009) states, "the first and most preferred strategy is to follow the theoretical propositions that led to your case study" (p. 2657). The development of the propositions in this case study stems from the original objectives and design of Johnson's (2010) study and, based on these propositions, presents a set of research questions, literature reviews, and new hypotheses or propositions (Yin, 2009). The propositions in this research are focused specifically towards the USMC.

- Proposition 1: KM in the USMC is a critical capital asset for a competitive advantage.
- Proposition 2: KM can support any strategic, operational, or tactical discipline.
- Proposition 3: KM can mature in the USMC through the acceptance and direction of an SOP and CoPs at both headquarters and small-unit levels.

The research builds upon these propositions (Johnson, 2010) and shapes data collection accordingly, yielding a relevant analytical strategy (Yin, 2009). Additionally, these propositions are of a "theoretical orientation guiding the case study analysis," and "focus attention on certain data" (Yin, 2009, p. 2668).

The third component [described by Yin,] units of analysis, is, for the purposes of this research, USMC headquarters and small-unit-level KM initiatives. Yin's fourth component, linkage of logic to data, is conducted by using Yin's embedded single-case

study design. This is different from Johnson's (2010) embedded multiple-case design because Johnson utilized pattern matching from across the DoD, whereas this single-case design is focused on one service.

The fifth component is the actual analytical technique employed. This study will methodically use explanation building and organizational-level logic modeling to analyze theoretically significant propositions. Johnson (2010) used logic modeling and pattern matching, which was valuable in comparing and contrasting KM among all the services in the DoD. Explanation building in this thesis compares the findings of Johnson's initial USMC case evaluation against revised propositions, a technique Yin (2009) identifies as iterative explanation building. Logic models, which are also employed in this research, are defined by Yin as "an analytic technique… [that] consists of matching empirically observed events to theoretically predicted events" (Yin, 2009, p. 3053). The strength of this study lies in comparing KM in the USMC from 2010 to the present and identifying room for improvement and future iterative research.

B. QUALITY AND RELIABILITY METRICS

To keep the integrity of secondary research on Johnson's (2010) thesis, quality and reliability metrics need to be similar. These metrics are four tests "common to any empirical social research along with the associated tactics necessary at each phase of research to ensure success" (Johnson, 2010, p. 31). Ideally, a validity test is first constructed [check] to "identify correct operational measures for the concepts being studied" (Yin, 2009, p. 1060). The research will have validity based upon multiple sources of evidence through an established chain of events of data collection. Internal validity testing seeks "to establish a causal relationship, whereby, certain conditions are believed to lead to other conditions, as distinguished from spurious relationships" (Yin, 2009, p. 1062). This is accomplished through explanation building and logic modeling during the data-analysis phase. The same concern applies to internal validity. Johnson's (2010) research cautions against "incorrect inferences being made from events not directly observed;" (p. 31) however, this caveat may not apply to the nonexistent or novice KM at the USMC small-unit level. Using this single-case study as a research design, the external validity test defines "the domain to which a study's findings can be

generalized" (Yin, 2009, p. 1064). The single-case study, combined with iterative explanation building, will ensure that findings are generalized. Finally, a reliability test demonstrates that "the operations of a study—such as the data collection procedures—can be repeated, with the same results" (Yin, 2009, p. 1065), and a collection database minimizes errors and prevents bias.

Tests	Case Study Tactic	Phase of Research in Which Tactic Occurs
Construct Validity	➢ Use multiple sources of evidence ➢ Establish chain of evidence ➢ Have key informants review draft case study report	➢ Data Collection ➢ Data Collection ➢ Data Collection
Internal Validity	➢ Do explanation building ➢ Use organizational-level logic models	➢ Data Analysis ➢ Data Analysis
External Validity	➢ Use theory in single-case studies ➢ Use iterative explanation building in single-case studies	➢ Research Design ➢ Research Design
Reliability	➢ Use case study protocol ➢ Develop case-study database	➢ Data collection ➢ Data collection

Table 6. Case Study Tactics for Four Design Tests (After Johnson, 2010)

C. RESEARCH BIASES AND LIMITATIONS

As Johnson (2010) points out regarding his own study, "the major bias is that the investigator is a member of the United States Marine Corps" (p. 32). The same holds true for this investigator; however, an advantage is that the investigator already has some knowledge obtained about the organization and its functions in collecting data for a thorough analysis. A significant limitation is the absence of a universally accepted definition of KM (Johnson, 2010). But this limitation is only salient if extending research outside the DoD. As indicated, each service has a universally accepted definition within its ranks, and these are similar. Depending upon a service's mission requirements and capabilities, KM practices will vary; but the fundamental theoretical perspectives still apply. Another limitation is that no survey or interview data is collected from current USMC KM practitioners. The components of USMC KM analyzed are the most current, however, mitigating the necessity of first-hand interaction. Finally, it is assumed that all

of Johnson's (2010) research is accurate as a basis for secondary research. Any information deemed inaccurate will be acknowledged and remedied.

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IV. ANALYSIS

In setting the scene for the diagnosis of pathologies, the author must present the intentions of the Marine Corps' top leader to clarify his direction for the future. Additionally, the author will present key indicators (e.g., information systems and doctrine) to support this analysis. As illustrated in Figure 11, the commandant of the Marine Corps (CMC) has outlined four priorities in the *35th CMC Commandant's Planning Guidance* for the Marine Corps' way forward, all of which align with the capabilities and components of KM.

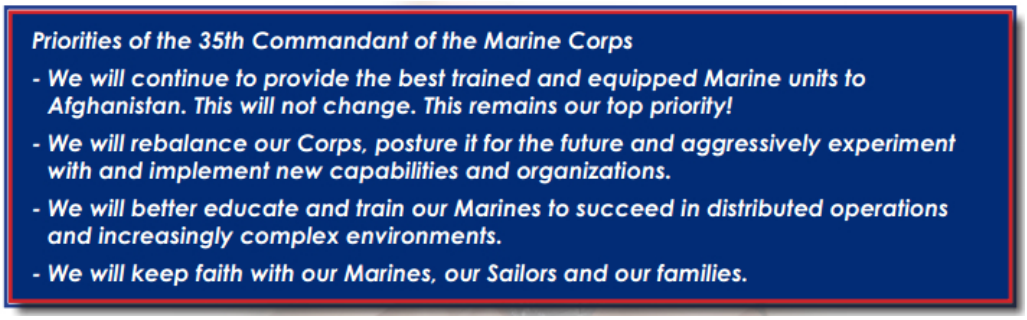

Figure 11. Priorities of the CMC (From Amos, 2010)

The USMC's *Vision and Strategy 2025* (2007) emphasizes that, "To remain the nation's force in readiness, the Marine Corps must continuously innovate. This requires that we look across the entire institution and identify areas that need improvement and effect positive change" (Conway, 2007, p. 19). These priorities and the USMC's *Vision and Strategy for 2025* (2007) illustrate the need for a more mature KM CoP. Each priority identifies an important aspect and element for a KM program. The first priority stresses that every Marine be prepared to succeed in any type of mission, and in any complex or dynamic environment (Amos, 2010, p. 10). Marines must learn and know how to accomplish tasks and missions successfully. The next priority highlights changes in the manpower environment, which forces the need to improve education and training processes within a cohesive unit (Amos, 2010). Knowledge must flow in order to transfer both explicit and tacit knowledge, because "knowledge at rest tends to stay at rest"

(Nissen, 2006, p. 32). The third priority adds to the first and second by emphasizing the dramatic increase in investment in education, which reflects complex information warfare (IW) and hybrid environments (Amos, 2010). Again, Marines must learn and know exactly how to accomplish tasks and missions successfully. Finally, enhancing morale to ensure effectiveness and efficacy in "mentoring and retaining the most talented men and women who bring a diversity of background, culture, and skill in service to our nation" (Amos, 2010, p. 10) is a priority. This priority again emphasizes another area in the quest to retain experience (i.e., knowledge), which could be realized through a solid KM program. Furthermore, each priority is broken down in more detail in the *Commandant's Planning Guidance* to clarify these requirements. The *Commandant's Planning Guidance* is the progenitor of the Marine Corps' vision and strategy, as illustrated in Figure 12 below.

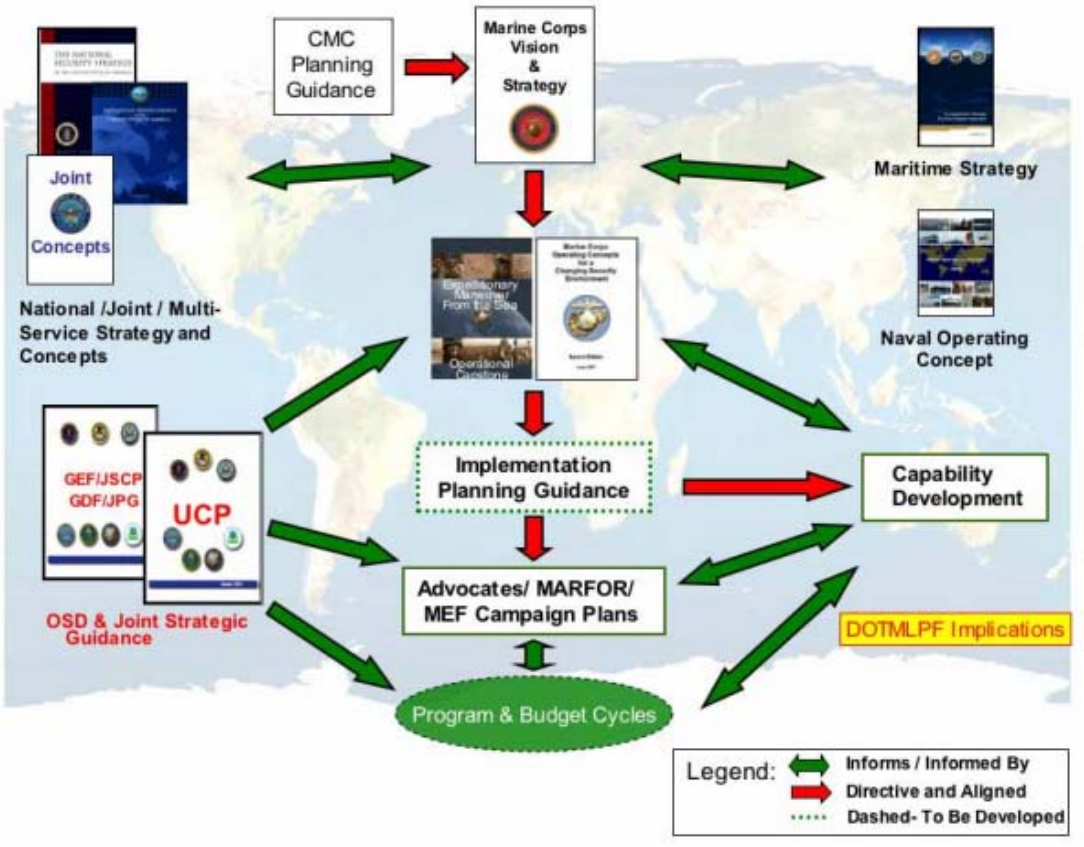

Figure 12. Vision and Strategy: Hierarchy and Connectivity (From Conway, 2007)

The ongoing theme in *USMC Vision and Strategy 2025* (2007) is to constantly train (i.e., learn) and innovate to improve core competencies, increase effectiveness and efficiency, and sustain a competitive advantage against any adversary. Although *USMC Vision and Strategy 2025* (2007) lists many goals, the specific strategy statement and objectives for 2025 align with what a KM program can manage or can contribute to sustaining a competitive advantage. For example, the first objective is to focus on the individual Marine by "recruitment, training, professional education, and retention of high quality, disciplined warriors imbued with" knowledge, which is paramount to the Marine Corps' mission (Conway, 2007, p. 14).

The point of mentioning both the *Commandant's Planning Guidance* (2010) and the *USMC Vision and Strategy 2025* (2007) is to illustrate that the Marine Corps and its leaders have the right mindset and understand the direction of the future, yet still have not fully invested in initiating or understanding the power that KM can provide. This at least answers the first proposition that USMC leadership understands that KM in the USMC is a critical capital asset for a competitive advantage. There are many other documents that illustrate the benefits that a KM program can provide as a capital asset (e.g., *2012 U.S. Marine Corps S&T Strategic Plan: Leading Edge Technology for the Marines of Tomorrow*). Additionally, there are numerous all-Marine (ALMAR) messages, Marine administrative (MARADMIN) messages, doctrines, publications, Marine Corps orders (MCO), bulletins, etc., that allude to promising benefits that the Marine Corps can expect from a KM enterprise. There are also official programs that are still ongoing. For example, *MCO 1553.3B Unit Training Management Program* (2011) specifically provides a policy for the implementation of the Marine Corps Unit Readiness Planning (URP) policy. Additionally, unit training management (UTM) directs standard-based training focused on mission-essential tasks (METs) (MCO 1553.3B, 2011).

Most importantly, *MCWP 3–40.2 Information Management* (2002) supports the current information age. It states,

> Effective information management delivers critically important information in a timely manner to those who need it in a form that they can quickly understand, … and includes all activities involved in the

identification, collection, filtering, fusing, processing, focusing, dissemination, and usage of information. (MCWP 3–40.2, 2002, p. 1–1)

Not only is IM for command and control (C2) purposes, *MCWP 3–40.2* (2002) stresses all types of information to support decision making. Figure 13 illustrates information flow through the new information hierarchy figure in draft MCWP 3-40.2 (2013).

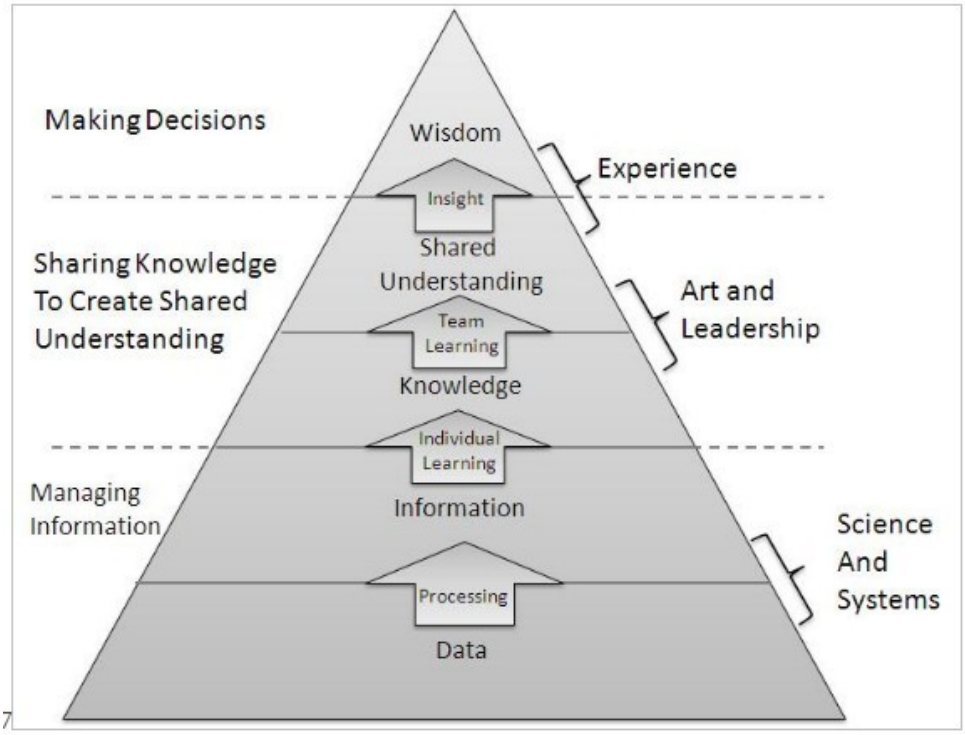

Figure 13. Creating Shared Understanding (From MCWP 3–40.2, 2013)

The information hierarchy acknowledges that knowledge is a necessity in supporting situational awareness and decision making. MCWP 3–40.2 (2013) defines knowledge as "the result of analyzing, integrating, and interpreting processed data; it brings meaning and value to a situation or event. Simply put, knowledge is a representation of what is happening" (p. 1–4). In an effort to manage information, an information-management officer (IMO) has the responsibility to ensure personnel of all ranks are receiving and distributing quality information throughout the unit (MCWP 3–40.2, 2002, p. 2–2). The IMO is further tasked with promoting KF as mentioned in

MCWP 3–40.2 (2013). This emphasizes that data, information, and knowledge are all manageable processes within data management, IM, and KM.

One of the major units that support these priorities and the direction of the CMC is the Headquarters Marine Corps (HQMC), Marine Corps Combat Development Command (MCCDC), Combat Development and Integration (CD&I), G3/G5 unit. Their mission is to develop the conceptual and operational view of how the Marine Corps contributes to the joint forces. This division develops Marine Corps concepts of operations (CONOPS) to guide force development (CD&I, 2013). The CD&I's latest initiative was a USMC KM CoP kickoff meeting held on 20 May 2013. The USMC KM CoP consists of "representation from each of the HQMC agencies, operating force commands, and supporting establishments" (CD&I Slides, 2013, Slide 14), to include participants in meetings and discussion forums from other unit KM leads such as commanders, leaders, and decision makers. The agenda included strategic drivers, KM principles, the USMC KM vision, definition, goals, and value proposition, USMC KM CoP objectives, and the integration of both IM and KM (CD&I Slides, 2013). Again, the Marine Corps understands the direction of the future, but has not yet initiated a solid KM program; however, much ground has been covered in building up a USMC KM CoP over the last few years. CD&I also employs a knowledge-management support section with a chief knowledge manager (CKM). During the USMC KM CoP kickoff meeting, the CKM stressed two important MCIENT objectives that state "the need to institutionalize information management and knowledge management practices across the Marine Corps," (Nally, 2010, p. 14) and to evolve the "Corps into a knowledge-based force that achieves decision and execution superiority, leverages seamless communications for decisive advantage, and extends our Corps' warfighting preeminence into cyberspace" (Nally, 2010, p. 15). The most important and prominent aspect for the Marine Corps' initiation of KM is the adoption of KM principles from the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) in *Charter of the Knowledge Management Cross-Functional Team* (CJCSI 5124.01) (2013). These principles are listed in Table 7.

Knowledge Management Principles		
People	1	Train and educate KM leaders, managers, and champions.
	2	Reward knowledge sharing and make knowledge-management career rewarding.
	3	Establish a doctrine of collaboration.
	4	Use every interaction, whether face-to-face or virtual, as an opportunity to acquire and share knowledge.
	5	Prevent knowledge loss.
Process	6	Protect and secure information and knowledge assets.
	7	Embed knowledge assets (links, podcasts, videos, documents, simulations, wikis…) in standard business processes and provide access to those who need to know.
	8	Use legal and standard business rules and processes across the enterprise.
Technology	9	Use standardized collaborative tool sets.
	10	Use open architecture to permit access and searching across boundaries.
	11	Use a robust search capability to access contextual knowledge and store content for discovery.
	12	Use portals that permit single sign-on and authentication across the global enterprise, including partners.

Table 7. Knowledge Management Principles (After CJCSI 5124.01, 2013)

The CJCSI released the *Charter of the Knowledge Management Cross-Functional Team* in April 2013. This charter established:

> A governing entity responsible for improving knowledge management across the Joint Staff (JS), as well as mentoring and promulgating knowledge management best practices across the Services, combatant commands, and combat support agencies. In short, it ensures lessons learned and best practices filter up and across while strategic guidance from the JS guides priority of effort. (CJCSI, 2013, p. 1)

Two important points are derived from this charters' purpose: 1) that KM best practices should spread across the services, and 2) the priority of effort—an ongoing theme. Johnson's (2010) thesis, *Developing a Knowledge Management Framework to Assist With Current USMC Information Management Practices*, states that, "the Marine Corps, as well as DoD, understands well the value of KM, but has a difficult time integrating its practices into daily operation" (p. 1). While the DoD and the Marine Corps' KM CoPs have only recently been developed, the other services (i.e., Air Force, Army, and Navy) have put KM

into practice within the last few years. Presented again, Table 8 is a summary of each service's KM initiatives, as of a few years ago. This table not only illustrates what the USMC had in the past, it also sets the scene for how far it has gone to create a KM CoP, definition, vision, strategy, and principles. This table emphasizes past programs to reveal any pathologies, and to identify in later analysis more recent programs and activities.

	Air Force	Army	Marine Corps	Navy
Service Level Programs	Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory	Army Knowledge Online (DKO) Portal Battle Command Knowledge System (BCKS)	MarineNet (Learning Portal) Marine Ammunition Knowledge Enterprise (MAKE) Mairne Corps Combat Development Command (MCCDC) KM Center	Navy Knowledge Online (NKO) Portal Enterprise Knowledge Management (eKM)
Unit Level Programs	Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory	1st Cav Division 4th Infantry Division U.S. Army Reserve Affairs Center for Army Lessons Learned (CALL)	Marine Corps Center for Lessons Learned (MCCLL) Ammunition Knowledge Management Portal MCCDC KM CoP	Naval Education Training Command Naval Personnel Development Command U.S. Pacific Fleet Naval Postgraduate School (NPS)
KM Education Offered	Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory	Basic KM Course Battle Command Officer Integration Course Army Knowledge Management Qualification Course MS Sharepoint Adobe Connect	Under Development	CoP Courses (7) IPTR: Knowledge Distribution, Knowledge Flow, and Organizational Performance (KM) Navy Afloat Knowledge Managers Course NPS: IS3210 KM in Defense NPS: IS4210 Knowledge Superiority
KM Methodology	Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory	Community of Practice AKM Knowledge Advisors	Community of Practice	Community of Practice

Table 8. DoD KM Initiatives (From Johnson, 2010)

A. USMC KM COP DEFINITION, VISION, STRATEGY, AND PRINCIPLES

The USMC KM CoP definition of KM is "the integration of people and processes, enabled by technology, to facilitate the exchange of operationally relevant information and expertise to increase organizational performance" (CD&I Slides, 2013, Slide 10). They add that this definition will be included in the forthcoming MCWP 3.40.2 (2013) revision (CD&I Slides, 2013).

The USMC KM CoP vision is "to develop a Marine Corps enterprise environment that promotes leveraging information and knowledge assets, along with a continuous learning organization that takes advantage of technology, to effectively share, communicate, and collaborate in order to maintain mission readiness" (CD&I Slides, 2013, Slide 10). The strategic drivers are adopted from the *MCIENT Strategy (2010),* as mentioned previously. The USMC KM CoP has aligned vision and strategy to support the CMC's *Planning Guidance* (2010) and the USMC's *Vision and Strategy 2025* (2007). Currently, organization-wide KM in the Marine Corps has made little advancement by creating the fundamentals of any program (i.e., definition, vision, and strategy), and emphasizing the priorities of the commandant. The next big piece in the USMC's KM CoP goals is to practice the adopted principles and further develop a mature KM enterprise. Table 9 summarizes the USMC's KM principles and adds an element of analysis and support to each. Every USMC KM principle is related to a corresponding principle from Nissen (2006) to either augment or provide clarity. It is important to understand that Nissen's (2006) principles are derived from years of research, connecting the theories of many KM practitioners to establish concise, relevant, and the most up-to-date principles for application. The USMC KM principles themselves are being critiqued, not the application or practice of the principles, because the USMC has yet to establish a coordinated KM initiative throughout its major and subordinate units. When revised MCWP 3–40.2 (2013) is released and the KM CoP expands throughout the USMC, then a knowledge assessment could commence and an updated maturity analysis be conducted.

Analysis of USMC KM Principles		
People	1	Train and educate KM leaders, managers, and champions.
		"15. Managerial efficacy through intervention can be increased by learning the principles of dynamic knowledge."
	2	Reward knowledge sharing and make knowledge-management career rewarding.
		"23. The impact of KM increases in direct proportion to the reach of knowledge flows through an organization."
	3	Establish a doctrine of collaboration.
		"5. The four organizational elements of personnel, work processes, structure, and technology operate as a cohesive system and should be addressed as an integrated design problem."
	4	Use every interaction, whether face-to-face or virtual, as an opportunity to acquire and share knowledge.
		"11. Knowledge-flow processes represent direct focuses of leadership and managerial action."
	5	Prevent knowledge loss.
		"21. Knowledge must be put to use through action in order to be useful."
Process	6	Protect and secure information and knowledge assets.
		"18. Most IT plays a supportive role in the organization, whereas people play most of the performative roles."
	7	Embed knowledge assets (links, podcasts, videos, documents, simulations, wikis…) in standard business processes and provide access to those who need to know.
		"1. Shuttling information around via computers, networks, reports, and communications does not address the flow of knowledge, at least not directly or on the same time scale."
	8	Use legal and standard business rules and processes across the enterprise.
		"13. Knowledge-flows should be planned and managed like workflows."
Technology	9	Use standardized collaborative tool sets.
		"16. The manager needs to employ non-technical interventions to enhance knowledge flows."
	10	Use Open Architecture to permit access and searching across boundaries.
		"12. Changes to workflows demand changes to knowledge flows, and vice versa."
	11	Use a robust search capability to access contextual knowledge and store content for discovery.
		"10. The nature of knowledge represents a critical factor for determining where IT can be expected to enhance knowledge flows."
	12	Use portals that permit single sign-on and authentication across the global enterprise including partners.
		"19. 'Intelligent' applications can play a performative role in the organization."

Table 9. Analysis of USMC KM Principles

Most doctrine in the USMC serves as a standard operating procedure or addresses what must be known to take action. Nissen's (2006) research supporting the KM principles above serves as a valuable SOP—especially in the USMC's initiative to get KM off the ground and implemented throughout all subordinate units. The doctrine currently in use is *MCWP 3–40.2* (2002); however, the update to include KM has not been approved for release. Plans, Policies, and Operations (PP&O) "is responsible for coordinating the development and execution of service plans and policies related to the structure, deployment, and employment of Marine Corps forces in general" (PP&O, 2013, Mission), and they do not perceive knowledge as manageable. In this case, it would be better for USMC units to understand how to harness knowledge rather than manage it. This is an extremely important concept to understand. Much like the wind, organizational success is obtained through harnessing knowledge where managing it is impossible. In answering the second proposition, harnessing the dynamics of knowledge can prove to support any strategic, operational, or tactical discipline. Harnessing knowledge should be evident and the updated doctrine should not be stalled, because knowledge is power. It has not been determined exactly what PP&O's opinions and justification are for not releasing the new MCWP 3–40.2 (2013); nevertheless, the USMC KM CoP is still continuing to pursue and follow the guidance set forth by the CMC's *Planning Guidance* (2010*)* and the USMC's *Vision and Strategy 2025* (2007). "Knowledge is more actionable (i.e., can be better managed) than information or data is, but actionability does not imply a separate judgment such as better" (Nissen, 2006, p. 20). This issue brings to light a leadership problem, thereby formulating our first mandate:

- **Leadership Mandate 1: USMC KM must have a centralized vision across the whole organization, with decentralized execution.**

As evidenced in the other armed services, KM is manageable. The Air Force, Army, and Navy all have matured over the last few years in KM, while the USMC's KM has not made it explicitly into daily operations. An important principle has been derived from this problem, which includes people and processes:

- **Organizations must be willing to adopt business process re-engineering and change-management processes to increase or sustain a competitive advantage.**

In any business process re-engineering (BPR) and change-management process, there will always be preconditions for success and failure. This is because there may be "(1) lack or sustained management commitment and leadership; (2) unrealistic scope and expectations; and (3) resistance to change" (Nissen, 2006, p. 94). Again, these three obstacles seem to keep the USMC from attempting to initiate KM through BPR and change-management processes; however, (presented in Table 10) the *USMC Knowledge Management Community of Practice Charter* (2013) has identified six specific goals to achieve, and to further expand a USMC KM enterprise.

USMC KM CoP Goals	
1	Enable, sustain, and institutionalize information and knowledge sharing across the Marine Corps.
2	Develop open communities where people may question, learn, and collaborate in a manner that builds organizational expertise and fosters individual growth.
3	Advocate and support information and knowledge sharing to increase operational efficiency and effectiveness, and enhance planning and decision-making processes across the tactical, operational, and strategic levels of command.
4	Develop processes, procedures, and standards that best enable the capture, sharing, and maintenance of relevant and timely information and knowledge assets.
5	Create, capture, store, and share information and knowledge assets in a manner that provides accurate and actionable information for commanders, planners, and decision makers, on demand.
6	Identify and leverage standard, interoperable internet-based capabilities that best enable secure collaboration and information and knowledge sharing across USMC and DoD information enterprises.

Table 10. USMC KM CoP Goals (After USMC KM CoP Charter, 2013)

B. CURRENT USMC KM INITIATIVES

Johnson's (2010) research and analysis identified that, three years ago, the USMC was at a maturity level two in their quest towards implementing KM initiatives. Today, the USMC can be seen at a maturity level of three from Minonne and Turner's (2009) *Evaluation of Knowledge Management Performance*. This maturity level indicates the USMC has progressed, but still trails the other services towards an organization-wide KM CoP. Again, the driving force for the successful maturation of the USMC's KM CoP and program(s) is the MCCDC, G3-G5, CD&I, Office of Knowledge Management.

Minonne and Turner's (2009) stages of implementation and control maturity level three states, "An advance level of cultural integration and an intermediate level of organizational integration have been achieved. Only a low level of methodical integration is in place and no meaningful procedural integration is yet established" (p. 587). The level of organizational control is "mainly qualitative, but some quantitative KPIs [key performance indicators] developed to monitor efficiency and some qualitative KPIs to assess effectiveness in the implementation of KM strategy" (Minonne and Turner, 2009, p. 587). Basically, Minonne and Turner's (2009) maturity/stage level three signifies:

> Appropriate personnel and monetary resources are made available for current activities and firmly committed for future developments in KM. Knowledge innovation ("I" of EIDA, see Minonne 2007) is supported and actively promoted. This fosters increasing effectiveness by leading to new ideas, combinations or new applications and thus puts in place a foundation for the development of new products or services. (p. 587)

The products and services that are currently supporting the USMC's KM CoP and initiatives are plentiful; however, they are not currently labeled as specific KM capabilities. Additionally, many commands are at a high KM maturity level with strong CoPs in place (e.g., IMEF, TECOM, MARSOC, MARFORRES, just to name a few), but lack coordination for an overall effective KM enterprise. This signifies that the USMC's KM program is progressively gaining strength, and KM is becoming the norm among many units; however, the latest KM tasks and initiatives tracker (see Figure 14, below) was last updated on 5 December 2012, indicating the last event was the third USMC KM CoP Quarterly Meeting in July 2013. Additionally, the USMC's KM way ahead in 2010 is indicated in Figure 15. Compared to its current 2013 way ahead in there is no current or updated project tracker; however, as a result of the USMC's KM maturity, CD&I, Office of Knowledge Management Support verified the following are the most recent enterprise-facing KM actions and milestones to date:

- Development and release of the USMC KM CoP Charter
- Subsequent conduct of quarterly meetings and webinars
- Release of the Joint KM Charter and USMC's strategic alignment

- Development and inclusion of the USMC's official KM definition and terminology in the USMC doctrine
- Final stages of publishing and release of USMC KM doctrine
- Strategic partnership with Training and Education Command (TECOM) and enterprise stakeholders to develop USMC KM leadership staff tasks, activities, and knowledge, skills and abilities (KSAs)

These actions and milestones are significant in proving the slow progression but higher level of maturity for the USMC's KM program. The units/services identified below are only the most readily identified contributors toward increasing the USMC's KM maturity level. Once a thorough operating model and campaign plan are established, then only can organizational wide integration and/or standardization be accomplished.

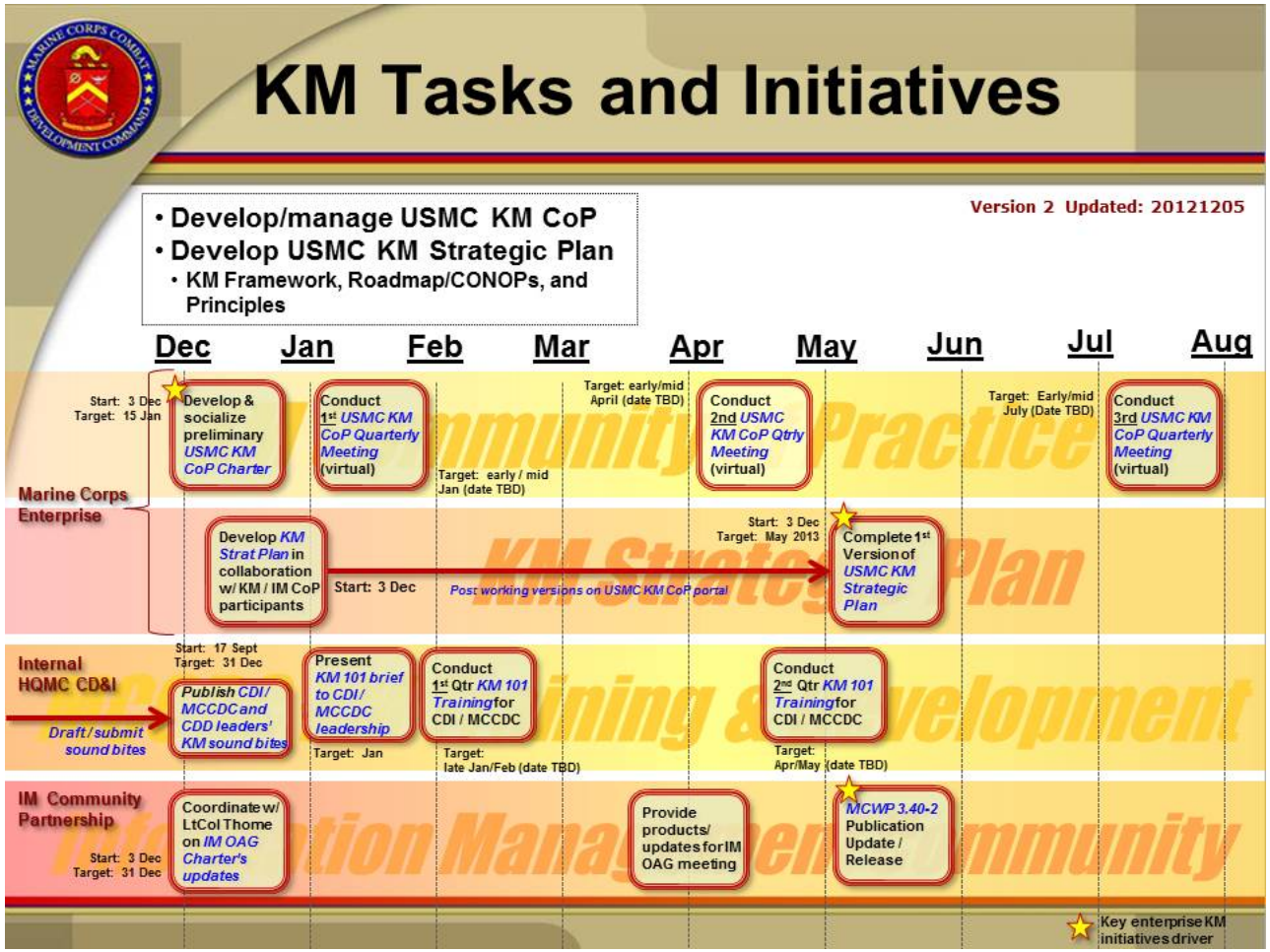

Figure 14. USMC KM Tasks and Initiatives (From USMC KM, 2013, Tracker)

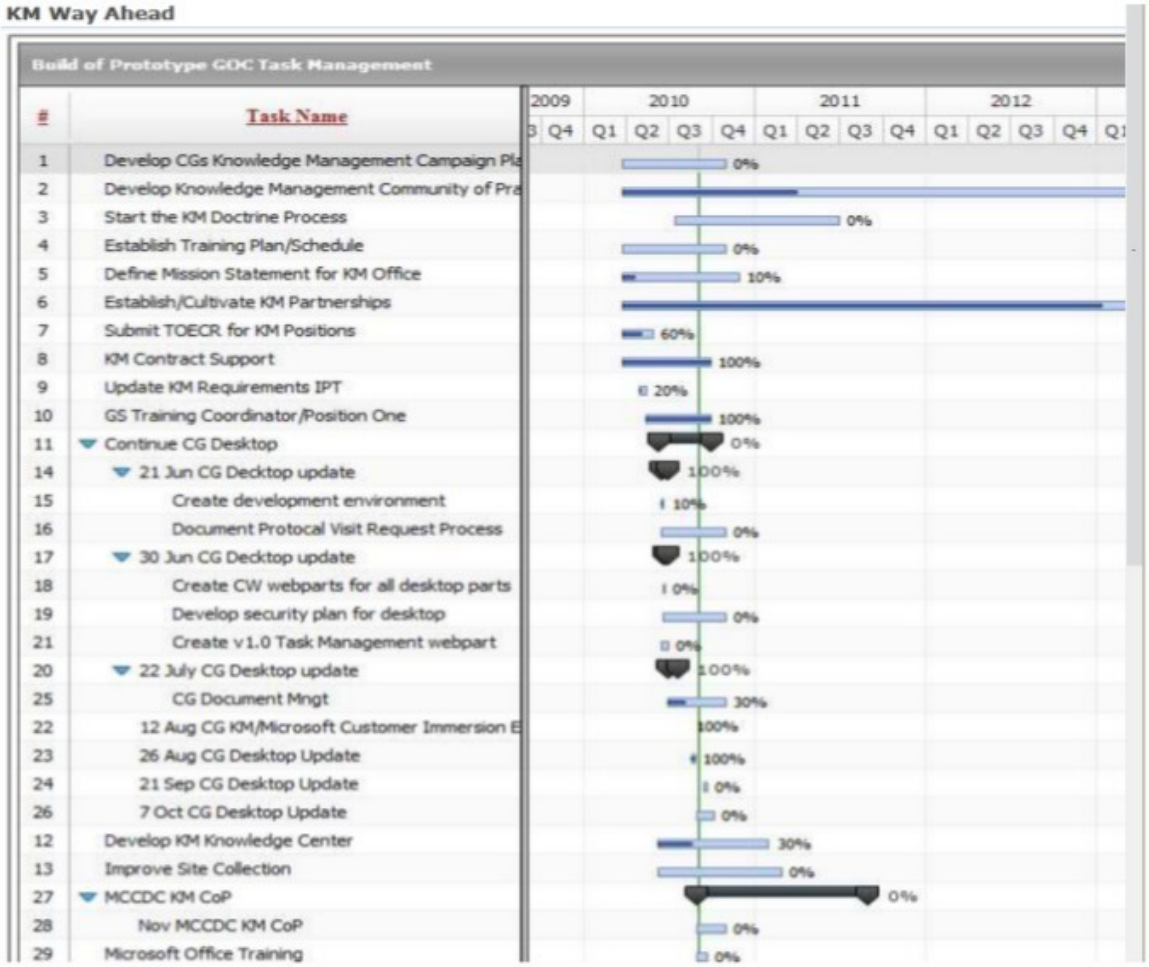

Figure 15. USMC's KM Way Ahead 2010 (From Johnson, 2010)

1. Marine Corps Enterprise Services

A large part of fulfilling the USMC KM CoP definition of KM is currently being accomplished through the Marine Corps Enterprise Services (MCES), previously named Marine Corps Enterprise Information Technology Services (MCEITS) subpart of Marine Corps Systems Command (MCSC). The latest initiatives by MCSC have shown a dramatic increase in KM practices by serving the "Department of the Navy's systems command for Marine Corps ground weapon and information technology system programs in order to equip and sustain Marine forces with full-spectrum, current and future expeditionary and crisis response capabilities" (MCSC, 2013, Command Mission). Under the command overview and history, MCSC further states that they implement the

most effective and efficient business processes, while both civilian and active duty Marines learn, research, and test any system or piece of equipment that contributes to the warfighter's mission accomplishment (MCSC, 2013). Through their framework (Figure 14 and 15) MCEITS is the main "provider of enterprise IT services, service support, and the infrastructure necessary to enable a secure collaborative, interoperable" information and knowledge sharing environment (MCES, 2013, Support). MCES is a perfect example of a supporting unit/system that has aligned its mission to meet the priorities, vision, and strategy of the CMC, DoD, and POTUS in enabling a knowledge-based organization and culture. Not only does MCEITS help accomplish the goals of the USMC's KM CoP Charter, their end-user services of MCEITS Marine Corps Portal (i.e., eUSMC portal), asynchronous collaboration, and workflow services provide capabilities to support day-to-day operations, aligning with USMC KM principles 4 (people), 6 & 7 (process), and 12 (technology) as seen below and in figures 16 and 17:

> The eUSMC portal will provide the opportunity to customize and personalize an online environment with information from different systems and services most critical to a user's role. This interface will be similar to the iGoogle and myYahoo portal concept. It will serve as an integrated information workplace. (MCES, 2013, MCEITS Portal and Web Services)

> The Asynchronous Collaboration Services will provide a central storage and workspace allowing teams and organizations to exchange information non-simultaneously under the MCEITS enterprise portal umbrella. This will seamlessly integrate with the single sign-on services within the MCEITS environment. (MCES, 2013, MCEITS Portal and Web Services)

> The Workflow Services will provide a mechanism to automate tasks and will incorporate human tasks as well as information service tasks. This will include a management interface that allows for the administration of the designed workflow processes. The Text-Based Chat Services will provide an enterprise wide chat capability that seamlessly integrates with the eUSMC portal environment, and will incorporate the same interface look and feel. (MCES, 2013, MCEITS Portal and Web Services)

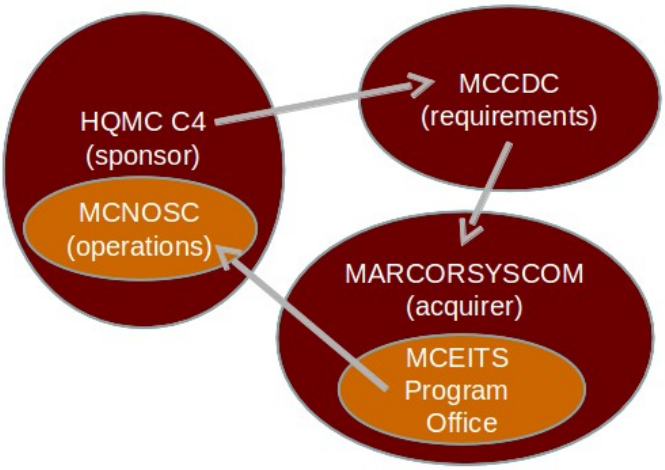

Figure 16. MCEITS Organizational Relationship (From MCES, 2013)

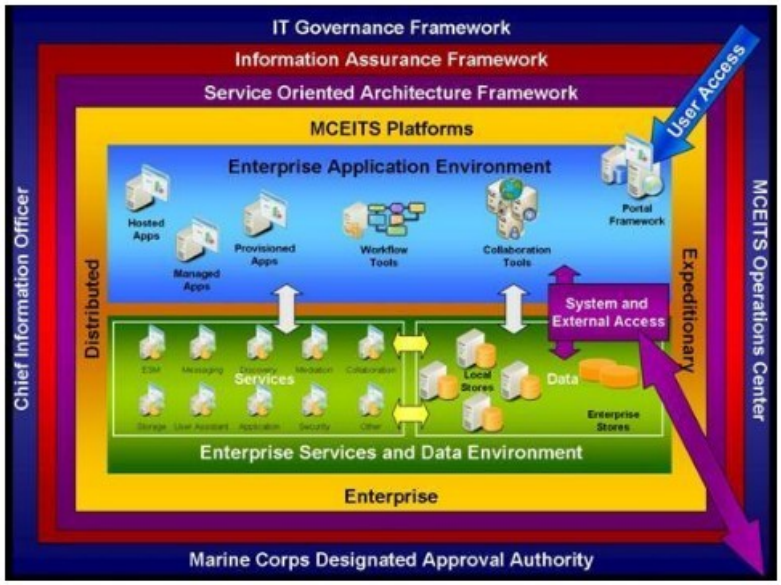

Figure 17. MCEITS Framework (From MCES, 2013)

2. Training and Education Command

Another major advance in the USMC's KM initiatives is through the USMC TECOM's Marine Corps Training Information Management System (MCTIMS). TECOM's mission is "to develop, coordinate, resource, execute, and evaluate training and education concepts, policies, plans, and programs to ensure Marines are prepared to meet the challenges of present and future operational environments" (TECOM, 2013, Mission). TECOM has literally over a hundred subordinate units worldwide

(for an organizational chart see http://www.tecom.marines.mil/LinkClick.aspx?fileticket=AbtBoYIIYqg%3d&tabid=8217&portalid=90), and is another USMC-wide supporting unit that has aligned its mission to meet the priorities, vision, and strategy of the CMC, DoD, and POTUS in enabling a knowledge-based organization and culture. MCTIMS is a training and readiness (T&R) manual module designed to capture individual and collective unit-training standards for an occupational field and military occupational specialty (MOS). These training standards are used by the selected schoolhouse and the Fleet Marine Force (FMF) as the basis for training throughout the USMC. The functional manager for MCTIMS modules is Training Management and Evaluation Branch (TMEB). TMEB basically oversees "T&R manual development, curriculum management and development, student evaluation, individual training management, electronic training jacket, and unit training management" (TECOM, 2013, Ground Training Division). Essentially, the majority of TMEB's responsibilities lie within the realm of KM. What they do not necessary have is a KM program. With TECOM's current efforts, KM CoPs in the USMC can grow and develop thorough KM programs. Currently TECOM's strategy mirrors the same principles as MCEITS: 4 (people), 6 & 7 (process), and 12 (technology). MCTIMS is another great example of a supporting unit/system that has aligned its mission to meet the priorities, vision, and strategy of the CMC, DoD, and POTUS in enabling a knowledge-based organization and culture. Evidence illustrates that TECOM's subordinate units, programs, and systems help support the USMC's KM CoPs in achieving their goals. This also supports the current maturity level of KM in the USMC. When a true USMC-wide KM enterprise matures, it should be the result of TECOM coordinating with MCES and engaging/interacting with every unit in the USMC to enhance KFs. Both are well on their way. For example, TECOM already has a KM Officer (KMO) at G-3, and a KM analyst at Operations Directorate, Marine Corps Communication Electronics School. Table 11 is a consolidation of current USMC KM initiatives (but not limited to).

Service Level Programs	Unit Level Programs	KM Education Offered	KM Methodology
MarineNet (Learning Portal)	Marine Corps Center for Lessons Learned (MCCLL)	Naval Postgraduate School KM Certificate Program	Community of Practice
Marine Ammunition Knowledge Enterprise (MAKE)	Ammunition Knowledge Management Portal MCCDC KM CoP	Community of Practice	
Marine Corps Combat Development Command (MCCDC) KM Center	Major Subordinate Command's (MSC) Individual KM Campaigns	KM Training Coordinator - Office of KM, MCCDC	
Marine Corps Enterprise Information Technology Services (MCEITS)	Unit Training Management (UTM)		
Marine Corps Training Information Management System (MCTIMS)	Systems Approach to Training and Education (SATE)		
	Train the Trainer Schools (T3S)		

Table 11. Current USMC KM Initiatives

C. SMALL UNIT ANALYSIS

For the purpose of this analysis, small units in the USMC are considered any major subordinate command (MSC) and lower (e.g., divisions, regiments, battalions, companies, platoons, and squads). Although most will consider a division to be a large unit, KM at MSCs and lower may be similarly structured from the USMC's hierarchal operational and tactical structure. Many smaller units in the USMC are at a maturity-level four in Minonne and Turner' (2009) stages of implementation and control. The ongoing trends are knowledge-based Sharepoint, portal, and web-service establishments and use among USMC MSCs interacting and integrating with one another on an intermediate level. Additionally, the USMC has a well-established program in place that can contribute greatly towards increasing KM initiatives throughout MSCs and below. The unit-training management (UTM) program and the utilization of the systems approach to training and education (SATE) process in all USMC formal schools and by units within the operating forces can contribute greatly towards an individual unit's KM program and KF in general.

1. Marine Force Reserve KM Program

One major MSC is Marine Corps Forces Reserve (MFR) Headquarters. After a recent visit by the author from the Naval Postgraduate School, but not as an official evaluation, MFR may be seen at a higher maturity stage of four. Minonne and Turner's (2009) *Evaluation of Knowledge Management Performance* states the level of implementation is "an advanced level of cultural and organizational integration as well as an intermediate level of methodical and procedural integration," and the level of control is "qualitative and quantitative KPIs in place to monitor the implementation of an effective and efficient KM strategy to take the organization in the direction of its perceived future image" (p. 587). Maturity in the MFR is evident throughout, especially after their assessment from an experienced KM consulting firm. One major method MFR uses to achieve a higher degree of maturity is their advanced decision-making framework, presented in Figure 18. This framework is an advanced addition to Johnson's framework presented in his 2010 case study; however, the C-3PO KM framework still provides a theoretical methodology to guide the development of a strong KM program within any unit. MFR adds an advanced aspect of social interaction in decision-making processes to their KM framework.

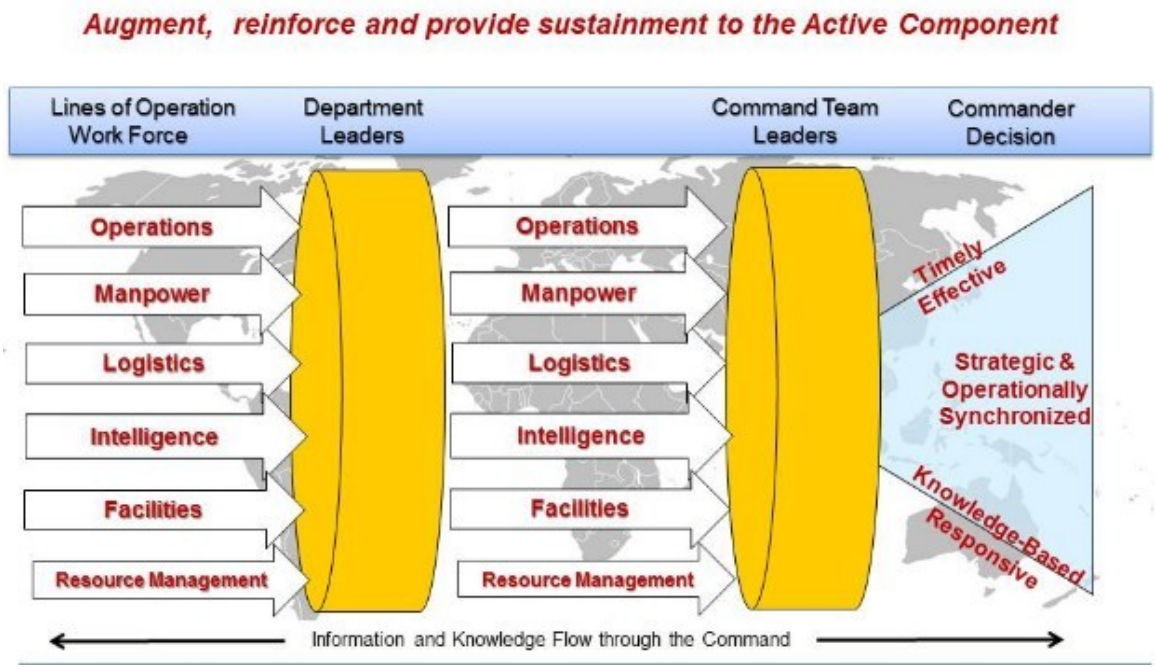

Figure 18. MFR Decision-Making Framework (From McGuiness, 2013a)

MFR's principles (Table 12) and goals (Table 13) are even more advanced than the USMC KM principles. As seen below, MFR's principles are directed more towards the process of their KM program rather than the basics of USMC KM principles. Additionally, their goals present a focus upon specific KM-related tasks to improve in and expand the awareness of IM and KM. All MFR's KM principles and goals are centered on their strategy that,

> Information does not manage itself, and Knowledge is neither created nor transferred by accident. A successful organization develops the culture and processes to ensure that the right information is available for people at all levels to make the best decisions. A coordinated strategy that seeks to reduce the cost, complexity and integration difficulties of sharing and exchanging information and knowledge is essential to developing this culture. Information Management and Knowledge Management are keys to MARFORRES' ability to support the Marine Reserve Component particularly in the impending lean fiscal environment. This first ever, MFR IM/KM Campaign Plan provides the roadmap to adding this critical enabler to support the Force. (McGuiness, 2013b, Situation)

MFR Knowledge Management Principles	
1	KM is a deliberate approach to help organizations effectively use and re-use what they know (tact and explicit) to achieve a sustained competitive advantage.
2	KM is socially driven, linking people across the organizational boundaries to share what they know.
3	KM is about finding experts, connecting people and solving problems more effectively.
4	KM connects the act of leadership and intuition to the science of management and control.
5	KM provides a disciplined approach and a set of tools to what would otherwise be happenstance.
6	KM is a holistic approach that covers everything from creating new knowledge to managing documents and records.
7	KM is connecting people to share what they know.
8	KM is focused on moving actionable knowledge from people to people, not storing information and data in large repositories.
9	KM KM must be aligned with an organization's performance goals and objectives. It helps us do our jobs better, to improve our capacity to act, (i.e., to make decisions).

Table 12. MFR Knowledge Management Principles (After McGuiness, 2013a)

MFR Knowledge Management Goals	
1	Increase KM education, training, awareness, and understanding throughout MFR Headquarters and throughout the Force.
2	Develop a user-participative MFR KM training and assessment program/plan.
3	Develop a CMFR KM Evaluation/Endorsement Component to the MFR KM Strategy.
4	Accomplish the following KM- Based Projects: (1) 'On Boarding' - Assess and enhance the MFR 'On Boarding' Processes at both the Headquarters and at the I&I levels. Integrate all existing on-boarding components and determine/implement improvements. Perform similar assessment for 'Off Boarding.' (2) 'Business Governance' - Develop a KM Business Governance in concert with existing practices and procedures to clearly articulate the purposes and uses of the following: CMFR Landing Page, Battle Rhythm/Staff Management Pages, Command Dashboards, Command Task Management Systems/Tools, Email, Discussion Forums, Chat/Jabber, Wikis, SharePoint, Staff meetings, Business Process Management , Content Management
5	Link the MFR KM effort with the Marine Corps IM/KM effort.

Table 13. MFR Knowledge Management Goals (After McGuiness, 2013a)

The MFR is one of many MSCs that have advanced or developed a KM CoP to maturity levels higher than that of HQMC's organization-wide KM program. Furthermore, during a more broad analysis, many MSCs and subordinate units were

unconsciously practicing the process and technology principles of KM; and at an individual level, a large part of a Marine's daily duties or responsibilities is focusing on training and education. It has always been part of the esprit de corps that a Marine's job is to train when not directly involved in a firefight. Training and educating on a daily basis calls for an extensive program that not only has standards for "brilliance in the basics," but requires sustainment training. Sustainment training contributes directly to the gain of tacit knowledge. The USMC's mature training programs tie directly into the USMC's KM program.

2. Unit-Training Management and Systems Approach to Training and Education

The USMC needs to capitalize on the well-established UTM program and the SATE process to increase its maturity in an organization-wide KM enterprise. All key personnel in all military specialties are responsible for maintaining their own codified knowledge, per many MCOs required for training and learning. UTM programs are directed by MCO 1553.3B, which requires unit commanders to "develop and execute training plans focused on their respectively approved Mission Essential Task List (METL). …. with input and assistance from Training and Education Command and the Marine Forces" (MCO 1553.3B, 2011, p. 2). Basically, a METL includes tasks required for training Marines to accomplish the mission. More emphatically, the Commanding General, MCCDC "advises and guides Marine Corps commanders of the operating forces and supporting establishment in all matters related to training and education" (MCO 1553.3B, 2011, p. 2). This is important because as illustrated in Figure 16, MCCDC is part of MCEITS's organizational relationship.

UTM is responsible for several areas of training, especially in Marine Corps common skills (MCCS) and individual MOS training standards (ITS). A large part of training is accomplished through MarineNet courses. Again, UTM directly ties into KFs of explicit and tacit knowledge within a unit. There are many references and much codified knowledge in regard to a unit's UTM (e.g., MCOs, Publications, T&R manuals, and checklists). Most of the codified knowledge was captured from the tacit knowledge gained by Marines over decades of service, and KF throughout the USMC is directly tied

into the military's organizational group structure (e.g., divisions, regiments, battalions, companies, platoons, squads, fireteams, and special teams/groups). Ideally, the organizational group structure of the USMC supports the framework and principles of UTM programs. A majority of these principles (listed in Table 14) can be tied to the transfer of knowledge from individual to individual or from group to group—even more reason to tie people, processes, and technology together under a USMC KM enterprise architecture of coordination with high integration and flexibility at all MSCs and below.

Marine Corps Training Priciples	
1	Train as you fight.
2	Make commanders responsible for training.
3	Use standards-based training.
4	Use performance-oriented training.
5	Use mission-oriented training.
6	Train the MAGTF to fight as a comined-arms team.
7	Train the MAGTF to fight as part of a Joint Force.
8	Train to sustain proficiency.
9	Train to challenge.
10	Integrate values based training and leadership.

Table 14. Marine Corps Training Principles (After MCO 1553.3B, 2011)

Among the many components of the USMC's UTM program, the SATE process provides commanders with a framework to plan and conduct training. Following the SATE process ensures that "Marines acquire the knowledge and skills essential for successful job performance both as individuals and as a unit in the performance of all [missions]" (MCO 1553.3B, 2011, p. 2-1). The SATE framework comprises five phases: analyze, design, develop, implement, and evaluate. This is similar to Nissen's (2006) knowledge life-cycle to create, organize, formalize, share, apply, and refine. Looking at Nissen's (2006) MDKFV in Figure 19, one can see similarities of concepts along the Z axis (i.e., life-cycle).

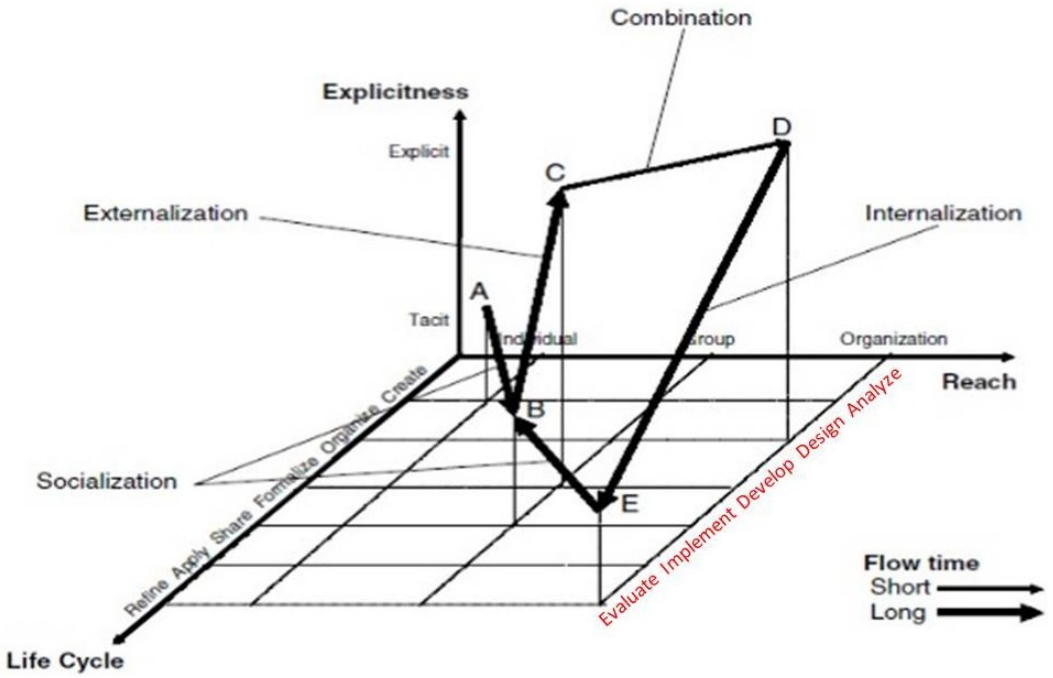

Figure 19. MDKFV and SATE (After Nissen, 2005)

With UTM and SATE, knowledge does flow through a systematic process of Nonaka's (1991) SECI model; however, the problems arise through the transfer of tacit knowledge because it is "sticky, difficult to imitate, and slow to move" (Nissen, 2006, p. 13). Within a unit's training program, knowledge clumps must be identified so KF can occur more fluidly. The USMC's UTM program and SATE process have all the signs that an implementation of a KM program will evolve and drastically improve the flow of knowledge, thus increasing training and education for every Marine; however, there is no real use of knowledge technology throughout the MSCs to increase KF. For example, Polania's (2010) thesis on *Leveraging Social Networking Technologies: an Analysis of the Knowledge Flows Facilitated by Social Media and the Potential Improvements in Situational Awareness, Readiness, and Productivity* indicates that the USMC can adapt and take advantage of social media to increase KFs. By now, there should be a visualization that illustrates the need for a relationship between UTM/SATE, MCEITS, MCTIMS, and social media under the umbrella of KM. Figure 20 provides a simple visualization of a USMC KM enterprise's interactions and integration. Of course, the whole realm of KM components can expand this diagram dramatically.

> Beyond the scope of IM, KM leverages the collective human, intellectual, social and structural capitals to create knowledge-based organizations, aimed at accomplishing organizational goals and missions while sustaining a dynamic strategic advantage, across the Marine Corps (MCWP 3-40.2 Draft, 2013, p. 15).

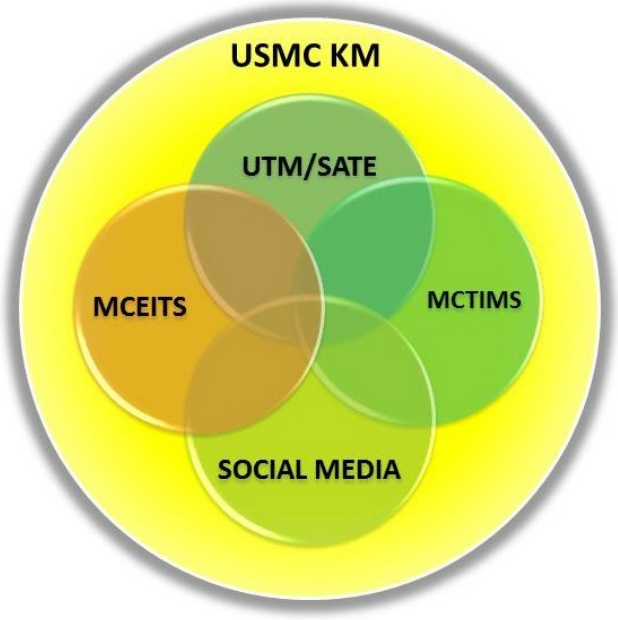

Figure 20. USMC KM Enterprise Interactions and Integration

D. PRECONDITIONS FOR SUCCESS

Many preconditions for success are present throughout the Marine Corps, indicating that the practice of KM will give the organization a competitive advantage. Table 15 summarizes the preconditions for success.

Precondition	KM Implication
1. Senior management commitment	Change of any magnitude requires commitment by senior managers. KM should be considered change of substantial magnitude.
2. Realistic expectations	Expecting too much, too fast, can deflate support for change. Change takes time to implement and refine in KM as in other areas.
3. Empowered and collaborative workers	People doing organizational work are the ones who will make KM effective or not. Knowledge workers need some empowerment for exploration and learning, not just exploitation and doing.
4. Strategic context of growth and expansion	Enthusiasm and optimism can pervade a change project and contribute to toward its success, whereas negativity and pessimism can kill it. Setting goals for growth and expansion, through sustained competitive advantage, can facilitate KM change.
5. Shared vision	A vision of how knowledge flows can be enhanced must be conceived and shared broadly in order for empowered people to understand how to change.
6. Sound management processes	The better organized an enterprise is to begin with, the better its chances for successful change via KM.
7. Appropriate people participating full-time	Successful change requires talented people devoting their attention and effort toward enhancing knowledge flows. Assigning slack, part-time resources is unlikely to produce successful KM change.
8. Sufficient budget	Successful change costs money and requires time. Competitive advantage enabled by knowledge is not free. The KM budget should reflect this reality.

Table 15. Preconditions for Success (From Nissen, 2006 & Bashein et al., 1994)

All preconditions for success are evident within the USMC except one and five. Clearly, not all leaders are onboard for the substantial change involved in adapting KM practices throughout the Corps. It is not that leaders will not follow the KM direction for future success; they are not fully informed about the potential KM offers for competitive advantage. Additionally, the vision of KM needs to be conceived and empowered by all. For example, KM must be incorporated into everyday tasks, senior-management support, and employee training (Nissen, 2006 and Jennex & Olfman, 2004). The implementation of KM throughout the USMC is a realistic expectation, as the current USMC KM CoP has done much to develop the required supporting doctrine and follow a framework for success. With commanders understanding the potential KM has to offer their units towards a competitive advantage, enthusiasm for this potential is inevitable, for it will cause growth and expansion. The USMC's task organization clearly illustrates it obtains

sound management processes to pursue the change needed for KM implementation and maturity. Additionally, the USMC has the motivation and dedication for the successful change, along with the funding necessary to adapt new practices and required technologies.

E. PRECONDITIONS FOR FAILURE

Precondition	KM Implication
9. Wrong sponsor	Some characteristics of a "wrong sponsor" include too low in management ranks, too technically focused, getting ready to retire or change jobs, and lacking credibility and leadership.
10. Reliance upon external expertise	Reliance upon external talent may be necessary to initiate a KM program, but such talent leaves the organization, often before the requisite expertise can be absorbed. This leaves the KM project without sufficient knowledge for sustainment.
11. Cost-cutting focus	People do not react well to change when they feel threatened. A focus on downsizing effectively killed the BPR movement in the 1990s.
12. Narrow technical focus	People, organizations, work processes, and technologies must all change—together—for successful KM. A single-minded focus on technology is hazardous.
13. Consensus management	Collaboration without leadership is problem-prone. Tough decisions about KM alternatives are required but unlikely to be resolved well by consensus.
14. Unsound financial condition	Many organizations attempt KM out of desperation. When management is desperate, realistic expectations, patience, and sufficient budget are unlikely.
15. Too many improvement projects under way	Successful change requires focus. If everyone in an organization simultaneously changes everything they do, then chaos is likely. Organizations are advised to focus on one or perhaps a few KM initiatives at any one time.
16. Fear and lack of optimism	This is the counterpart to the cost-cutting focus. People associated with change need to believe they are working to improve their own work environment in addition to that of others.
17. Animosity toward staff and specialists	Many leaders and line managers view specialists with contempt and perceive change efforts as disrupting their work processes. Middle management is the place in which resistance to change is likely to be greatest on a KM project.

Table 16. Preconditions for Failure (From Nissen, 2006 & Bashein et al., 1994)

Precondition 15 seems to be the most prevalent within the Marine Corps. The operational tempo in the USMC is a speeding locomotive. Many organizations are

reactive vice proactive, which is always considered a recipe for disaster. This could be the aftereffect of too many projects under way. Developing priorities of work and sound time-management practices must always be the fundamentals of managing tasks and change. As mentioned, the adoption of KM is a substantial and significant change that must occur for the Marine Corps to continue excelling in warfighting; however, people are resistant to change and do not want to work harder than they are already to implement a new practice. Attention needs to be drawn to Nissen's (2006) fifth principle—"the four organizational elements of personnel, work processes, structure, and technology operate as a cohesive system and should be addressed as an integrated design problem" (p. 14)—and the new principle derived from leadership mandates. Again, an ongoing theme of successful KM includes an enterprise of people, processes, and technologies. Working together as a cohesive organization will bring together the necessary requirements for successful change. With components of UTM, SATE, MCEITS, MCTIMS, and other KM-supporting technologies, organization-wide KM in the USMC is well on its way to the next maturity level. Seeing MFR's accomplishments and other KM CoPs located at MSCs and below will prove KM's advantages and successes.

Nissen (2006) points out that Jennex and Olfman (2004) have identified other factors for success, such as "incorporation of KM into everyday work tasks, senior management support, and employee training" (p. 98). Both the factors of success and failure from Bashein, Markus and Riley (1994) did not mention the importance of an SOP. While there is an update to MCWP 3-40.2 (2013) waiting to be signed, there is still no official USMC SOP for the practice of KM at MSCs and below. In answering proposition three, KM will mature in the USMC through the acceptance and direction of an SOP and CoPs at both headquarters and small-unit levels. For example, relevant literature such as *Harnessing Knowledge Dynamics: Principled Organizational Knowing and Learning* (Nissen, 2006) can serve as a SOP for units to begin creating "brilliance in the basics." As clichéd as the phrase has become, "brilliance in the basics" still proves to be a strong methodology for commencing and improving any skill set or program. This leads to a second mandate:

- **Leadership Mandate 2: Principles and standard operating procedures serve as a basis for learning and doing and may always be improved upon for refinement.**

So far, this analysis has illustrated that the Marine Corps has made solid groundwork in following a framework (e.g., vision, strategy, principles) for the practice of KM at the HQ level, and senior leaders and managers have shown the fortitude for successful change. Once the Marine Corps' KM program is actually initiated across HQ level units, a more thorough analysis can be conducted to assess more conditions for success and failure, maturity levels, and specific knowledge assessments. For example, Nissen's (2006) knowledge assessments are proven tools for knowledge managers to obtain a more thorough analysis of each KM program. Assessing KF performance can be conducted through the BPR approach, as conducted above through preconditions of success. There are many approaches for assessment, but the most prominent are knowledge audits, knowledge-value added (KVA), learning curves, and KF computational modeling (Nissen, 2006). All these methods add either a theoretical or practical perspective to a KM assessment. There are also well-known firms that exercise experienced KM assessments. One such firm was "instrumental in establishing the first knowledge-management program for the U.S. Army and helped build a network of communities of practice with over 250,000 members" (SKS, 2013, About Us). It is recommended that a consulting firm be brought in for their expertise and to obtain a detailed assessment for substantial KM growth.

Finally, the most substantial goal of the USMC KM CoP will be the release of an updated MCWP 3-40.2 (2013), which is currently still a draft waiting to be processed by PP&O. Draft MCWP 3-40.2 (2013) provides thorough detail as to why KM is important to any organization. Figure 21 illustrates the importance of KM, which is preached and stressed by leaders from the POTUS down to the CMC and unit commanders.

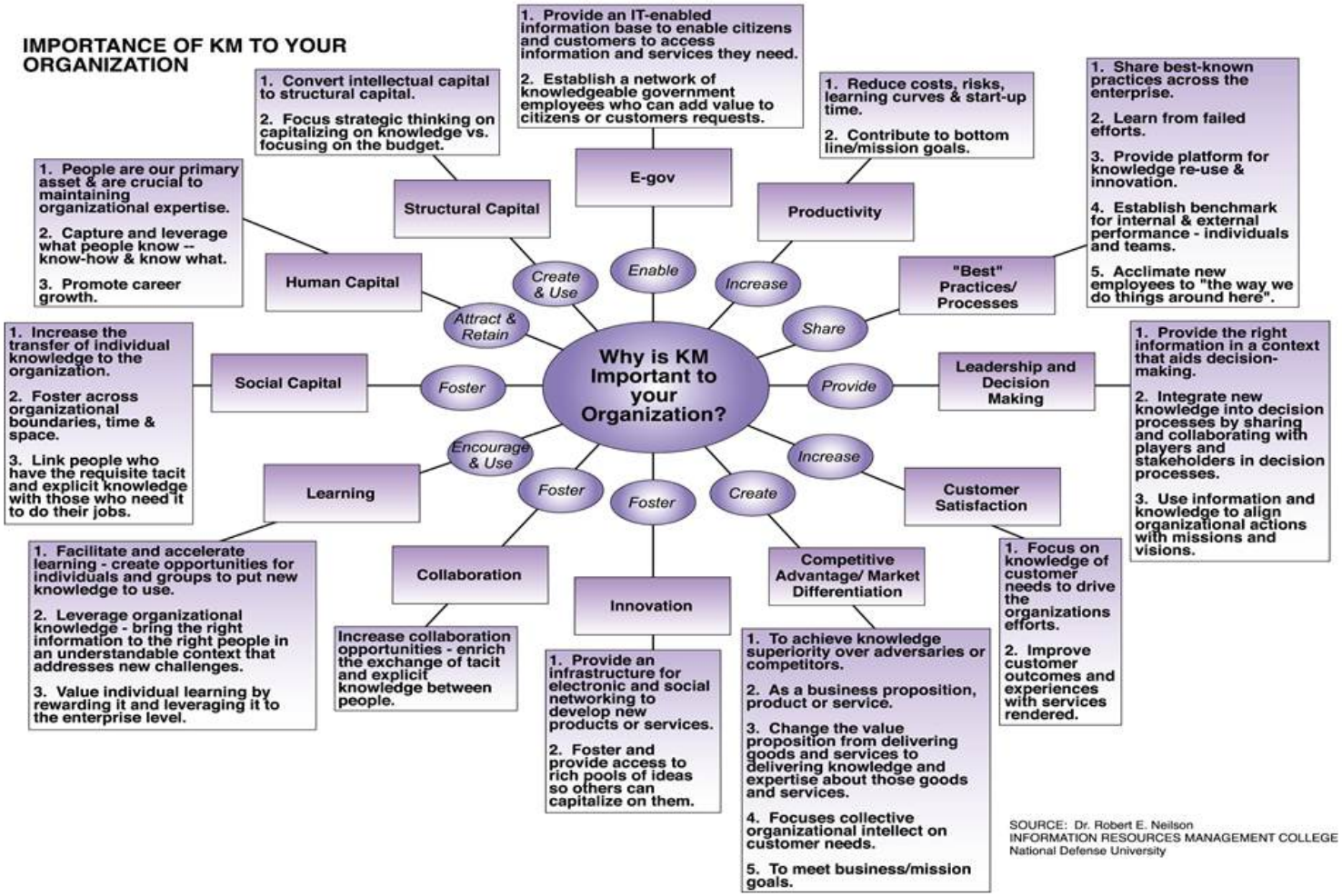

Figure 21. Importance of KM (From MCWP 3-40.2 Draft, 2013

V. CONCLUSION

This research set out to identify current COAs the USMC is taking to mature its KM, diagnose any pathologies preventing USMC units from capitalizing on the power of KM, and identify a framework for small-unit-level implementation. The main finding was that the Marine Corps has no large-scale pathology preventing organization-wide KM initiatives and an increase in CoPs throughout. The main contribution to the increase in USMC KM maturity is the spread and implementation of KM CoPs throughout MSCs and supporting commands. This illustrates that not only does HQMC have a framework already in place, but the practice and maturity of KM in other units demonstrates and proves the existence of a framework similar to Johnson's C-3PO. The only speed bump identified is PP&O's delay in signing off on the new, updated MCWP 3-40.2 (2013). Overall, it is clear that most of the leadership in the USMC is onboard for sustaining a competitive advantage, making every facet of knowledge a priority, and connecting every Marine, Marine Corps affiliate, contracting service, and adjacent agency to information and knowledge flow. This is directly in line with the intentions of the POTUS, CJCS, DoD CIO, DoN CIO, CMC and others. Below are key results and insights from this case study, with recommendations and suggestions for future research.

A. KEY RESULTS AND INSIGHTS

The higher maturity level attained of three is a direct result of the USMC KM CoPs, which are currently the main driving force for the majority of KM initiatives. Referencing Johnson's (2010) C-3PO framework, it is evident that the USMC KM CoP has a clear vision and strategy. Where the initiatives lag is in choosing KM activities in conjunction with remote knowledge sharing and organizing KM processes around a strategy. For example, it is evident from the analysis that there is no strong integration of USMC KM initiatives among HQMC supporting units (e.g., TECOM, MCES, MCCDC, PP&O, and MCSC, to name a few), and all MSCs and below. Each unit maintains its own structure for KF (e.g., Sharepoint). Back in 2010, Johnson noted that the indicators and factors of success "are largely representative of knowledge-flow processes and activities

that, along with the appropriate KM principles, senior leadership as well as KM practitioners, are actively figuring out how to successfully weave [integrate KM] into the cultures and operational practices" of each service (Johnson, 2010, p. 58). The same cannot be truer for the integration of KM processes, people, and technologies within and throughout all units in the USMC. Finally, this research focuses on initiatives to expand the practice of KM in the USMC and not on specific KF processes at the HQ and MSC level. Table 17 is a snapshot that summarizes the USMC KM initiatives and practices revealed by this research.

KM	Marine Corps (2010)	Marine Corps (2013)	MSCs (2013)
Vision	Yes	Yes	Yes
Goals	No	Yes	Yes
Strategy	No	Yes	Yes
Principles	No	Yes	Yes
Framework For Implementation	No	Yes	Adopted
Training	No	Yes	Yes
Billets	-KMO	-KM Analyst -Supervisory Program Analyst -Supervisory Management Analyst -Chief KMO -KMO	-IMO Practicing KM
Most Popular Supporting Technologies	-Sharedrives -Intermittent Unit Sharepoint Services -Email -Teleconferencing -Unit Webpages	-Integrated Sharepoint Services -Email -Video Teleconferencing -Chat Services (XMPP) -Web 2.X Collaboration Groups	-Integrated Sharepoint Services -Email -Video Teleconferencing -Chat Services (XMPP) -Web 2.X Collaboration Groups
Maturity Level	Novice	Maturity Level 3	Maturity Level >3
Assessment	No	No	Yes
Future Campaign	No	No	Yes
Indicators and Factors of Success	-Strategic context of growth and expansion	-Realistic Expectations -Empowered and collaborative workers -Strategic context of growth and expansion -Sound management processes -Appropriate people participating full-time -Sufficient budget	-Realistic Expectations -Empowered and collaborative workers -Strategic context of growth and expansion -Sound management processes -Sufficient budget

Table 17. USMC KM Findings

B. RECOMMENDATIONS

The author's recommendations focus on the three major components of IM and KM: people, processes, and technologies. Affirming that the USMC has and will continue to mature in its KM CoPs and initiatives, the following are simple but significant recommendations based upon case-study findings.

First and foremost, MCWP 3-40.2 (2013) should be approved for release and distributed immediately throughout the USMC. Not only does MCWP 3-40.2 (2013) cover IM capabilities, it includes a major addition on KM capabilities that covers most of the information in the literature review, plus specific capabilities and components for conducting KM. MCWP 3-40.2 serves as the principle doctrine expanding upon MCDP 6, *Command and Control*.

Second, the USMC needs a solid SOP for KM leading participants within a unit. While MCWP 3-40.2 (2013) enhances the reader's knowledge of KM and its relationship to IM, another publication or SOP needs to serve as the cornerstone for thoroughly defined KM principles, understanding of knowledge uniqueness, KFs, knowledge learning, knowledge doing, and knowledge assessment. The product of many years' experience and research, Nissen's (2006) *Harnessing Knowledge Dynamics: Principled Organizational Learning and Doing* would serve as an excellent SOP for commanders, all staff (i.e., operation, intelligence, communication, logistics, and administration officers), section heads, and most emphatically KM billet holders. This text conveys the essentials concerning the power of knowledge. It is required reading for the KM course offered at the Naval Postgraduate School and part of the KM certificate program. Because CD&I and other agencies coordinate KM training and seminars, it would be prudent to add Nissen (2006) to any required KM reading material.

Clearly, the hierarchal structure of the USMC creates an atmosphere for instant obedience to orders. As the practice of KM in the USMC expands, so does all KM within subordinate units. Besides securing an updated MCWP and an essential KM SOP, the next step for most of the USMC is to develop specific campaign plans for following Johnson's (2010) C-3PO framework on choosing KM activities. As evident in the

literature review and analysis, the USMC already has a well-established vision and strategy. A next step in choosing KM activities calls for conducting knowledge audits, SWOT analysis, KM education, KM toolkits, and supportive technologies. Having a detailed campaign plan with specific KM goals will drastically support KM CoPs and expand KM unit awareness, initiatives, and technologies. The interaction and integration of all KM components and capabilities increases KFs.

Following Johnson's (2010) C-3PO framework is also essential, especially if standardized across all USMC units. As discussed in this thesis, the C-3PO framework supports a unit's KM maturity level. For example, after adopting or creating a vision and strategy, units can immediately obtain a thorough KM assessment. This in turn, provides structure for ascertaining the requirements of a solid KM campaign plan and goals to shoot for. Standardization and integration across the USMC appear key to keeping the traditions of unity of command, and for this, keeping a successful KM framework is a must. Within the framework, the value obtained from a KM assessment cannot be overstated, as evidenced by MFR, who use SKS and currently have a solid KM campaign plan and goals.

Another part of the C-3PO framework's KM activities is KM education. Education is another important recommendation of this thesis, and part of the rationale for having MCWP 3-40.2 (2013) approved for distribution. In addition to study of Nissen's (2006) *Harnessing Knowledge Dynamics: Principled Organizational Learning and Doing* and other training and seminars, KM education in the USMC needs to expand to courses offered and implemented through MarineNet.USMC.mil. Creating KFs for KM education will exponentially increase the USMC's KM CoPs overall competitive advantage.

As a final recommendation, KM in the USMC can be presented as an enterprise, which needs a KM operating model for organization-wide standardization and integration. On a very simple scale, a KM enterprise would combine the efforts of all units to support people, processes, and technology. For example, the KM umbrella (i.e., enterprise) would include coordination and collaboration from Marine Corps Network Operations and Security Center (MCNOSC), MCSC, MCES, TECOM initiatives (i.e.,

MCTIMS, UTM, SATE), and external factors such as social media. Of course, such an enterprise would expand to all services, contracting agencies, and other outside agencies.

C. SUGGESTIONS FOR FOLLOW-ON RESEARCH

Promising capabilities are available for enhancing KFs by integrating and harnessing units throughout a KM enterprise framework. Expanding upon Johnson's (2010) C-3PO framework for incentives, collaboration, and strategies that facilitate knowledge transfer and growth will create a KM enterprise that integrates and coordinates all KM-supporting capabilities in the USMC.

An important part of the expansion of USMC KM initiatives comes from KM CoPs expanding to subordinate command. A MSC like MFR is quite mature in its KM initiatives and seeks new innovative capabilities to expanding its KFs. The MFR is unique in its organizational structure, comprising the Selected Marine Corps Reserve (SMCR) national facilities, and Individual Ready Reserve (IRR) Marines located throughout the U.S. In an effort to keep the SMCR Marines ready to augment in time of war, the MFR must take great measures in personnel accountability, including medical readiness and completeness of required training standards. Since reserve Marines and sailors are located essentially everywhere, delivering effective training to transfer both explicit and tacit knowledge is a huge challenge. One method that interests the MFR is distance learning, to include virtual and social media.

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