

KNOWLEDGE MANAGEMENT OFFICERS: NECESSARY OR REDUNDANT  
WITHIN ARMY TACTIAL UNITS

A thesis presented to the Faculty of the U.S. Army  
Command and General Staff College in partial  
fulfillment of the requirements for the  
degree

MASTER OF MILITARY ART AND SCIENCE  
General Studies

by

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Fort Leavenworth, Kansas  
2008

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<b>REPORT DOCUMENTATION PAGE</b>				<i>Form Approved</i> OMB No. 0704-0188	
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<b>1. REPORT DATE (DD-MM-YYYY)</b> 13-06-2008		<b>2. REPORT TYPE</b> Master's Thesis		<b>3. DATES COVERED (From - To)</b> AUG 2007 – JUN 2008	
<b>4. TITLE AND SUBTITLE</b> KNOWLEDGE MANAGEMENT OFFICERS: NECESSARY OR REDUNDANT WITHIN ARMY TACTIAL UNITS				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Christopher Hartline, MAJ				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301				<b>8. PERFORMING ORG REPORT NUMBER</b>	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for Public Release; Distribution is Unlimited					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> The project examined the necessity, and value in assigning knowledge management officers to Army tactical units. Ancillary, supporting research, focused on decision-making, battle command and Army knowledge management. A qualitative methodology, with quantitative aspects was used to analyze, combine and reconcile data obtained through interviews. There were three sample groups with the senior Army officer group acting as a quasi-control. This study is intended to assist contemporary Army knowledge management initiatives. The research gave rise to four general conclusions, a single conclusion did have primacy – knowledge (management) is people, not a person. Similarly, knowledge mediators, have a crucial role in knowledge organizations. Knowledge management is processes, the knowledge sharing process in particular. Counter-intuitively, enterprise solutions and artificial intelligence have a role in knowledge management, as a decision support tool, creating mental models. Simulations, statistics and decision support tools inform decision making, not confirm it. This research neither validated, nor did it attempt to rescind knowledge management as a discipline, or as an Army core competency. Recommendations from chapter five include possible KM roll-out initiatives, the need to institutionalize and teach KM practices in lieu of assigning knowledge managers. Finally, it recommends further research into enterprise decision support tools.					
<b>15. SUBJECT TERMS</b> Knowledge Management, Battle Command Officer, Battle Command System					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
<b>a. REPORT</b> (U)	<b>b. ABSTRACT</b> (U)	<b>c. THIS PAGE</b> (U)			(U)

Standard Form 298 (Rev. 8-98)  
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE  
THESIS APPROVAL PAGE

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

## ABSTRACT

KNOWLEDGE MANAGEMENT OFFICERS: NECESSARY OR REDUNDANT WITHIN ARMY TACTIAL UNITS, by MAJ Christopher W. Hartline, 163 pages

The project examined the necessity, and value in assigning knowledge management officers to Army tactical units. Ancillary, supporting research, focused on decision-making, battle command and Army knowledge management. A qualitative methodology, with quantitative aspects was used to analyze, combine and reconcile data obtained through interviews. There were three sample groups with the senior Army officer group acting as a quasi-control. This study is intended to assist contemporary Army knowledge management initiatives. The research gave rise to four general conclusions, a single conclusion did have primacy – knowledge (management) is people, not a person. Similarly, knowledge mediators, have a crucial role in knowledge organizations. Knowledge management is processes, the knowledge sharing process in particular. Counter-intuitively, enterprise solutions and artificial intelligence have a role in knowledge management, as a decision support tool, creating mental models. Simulations, statistics and decision support tools inform decision making, not confirm it. This research neither validated, nor did it attempt to rescind knowledge management as a discipline, or as an Army core competency. Recommendations from chapter five include possible KM roll-out initiatives, the need to institutionalize and teach KM practices in lieu of assigning knowledge managers. Finally, it recommends further research into enterprise decision support tools.

## ACKNOWLEDGMENTS

I would first like to acknowledge the contribution of my thesis committee. Mr. Bruce Stanley, Mr. Stephen McComb and Dr. Thomas Ward provided invaluable insight, motivation and hours of monotonous editing. The end product, the completed thesis, without doubt would have ended up an incomprehensible collection of facts, opinions and logical conclusion dispersed among paragraphs and pages of disassociated thoughts. They took on this effort, my professional development, without reservation, hesitation or subsequent protest. For their assistance, guidance and commitment, I offer a final and lasting, “thank you.”

Next I would like to acknowledge the contributions of the members of my thesis seminar, Dr. Rhoda Risner and MAJ Gregory Mittman. Dr. Risner and Greg saw me through the difficult and confusing beginnings of the research project. In reality, Greg’s candid comments and Dr. Risner’s rigorous methods’ kept me moving towards completion. As with my thesis committee, so with my seminar, I am not certain I would have completed the project, or at least not to my liking if it had not been for their contributions.

I would also like to acknowledge the contributions and guidance of Dr. Mike Prevou and indirectly the folks from BCKS, their thoughts gave me the intellectual springboard to begin this study.

Finally, I would like to thank my wife and children, who allowed me to write yet, “one more paper.”

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## ACRONYMS

ABCS	Army Battle Command System
AFATDS	Advanced Field Artillery Tactical Data System
AMDWS	Air and Missile Defense Warning System
BCO	Battle Command Officer
BCS	Battle Command System
BCKS	Battle Command Knowledge System
BFT	BLUFORCE Tracker
C2PC	Command and Control PC (personal computer)
CGSC	Command and General Staff College
CGSS	Command and General Staff School
FBCB2	Force XXI Battle Command Brigade and Below
GCCS-A	Global Command and Control System Army
GCCS-J	Global Command and Control System Joint
SECI	Socialization, Externalization, Combination and Internalization

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## CHAPTER 1

### INTRODUCTION AND BACKGROUND

“At the bottom of the chain of command, we have the Nintendo generation. When it comes to handling the technological complexity of warfighting, it is the younger generation that is most comfortable.”

Robert R. Leonhard, *The Principles of War for the Information Age*

#### The Problem, Background Information and Army Battle Command Suite Version 6.4

The purpose of the research is to examine the relevance and appropriateness of Knowledge Management Officers (KMO) in Army tactical units. For the purposes of this investigation the division (DIV) level is established as the “tactical” ceiling. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. These questions are:

1. How is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?
5. What impacts have BCS had on information management and battle command?

The advent of the Information Age led to the development and deployment of Battle Command Systems (BCS), or digital command and control (C2) systems. Within

the Army they are collectively referred to as Army Battle Command Systems (ABCS). ABCS allows network enabled, collaborative planning and battle command through a suite of eleven computer systems and a series of computer networks<sup>1</sup>. The digital network and use of satellites allows for the rapid transit and global reach of information. The ABCS 6.4 suite contains eleven component systems, they are: GCCS (Ground Command & Control Station); MCS (Maneuver Control Station); BCS3 (Battle Command Service and Support Suite); FBCB2/BFT (Force XXI Battle Command Brigade and Below/Blue Force Tracker); ASAS (All Source Analysis System); AMDWS (Air-Missile Defense Work Station); AFATDS (Advanced Field Artillery Tactical Data System); TAIS (Tactical Airspace Integration Station); CTIS (Combat Terrain Information System); IMETS (Integrated Meteorological Systems); ISYSCON (Integrated System Control). Each ABCS component supports the larger system, has specific functionality and is responsible for providing a portion of the common operating picture (COP).

#### Ground Command and Control Station (GCCS)

GCCS is the above-brigade component of the ABCS suite. GCCS has an Army, GCCS-A, and a Joint variant GCCS-J. GCCS provides a common picture for Joint and senior tactical level commanders. GCCS is rarely found below division level. Information from GCCS is shared to brigades via the battle command server (BCS).

#### Maneuver Control Station (MCS)

Maneuver Control Station, MCS, provides the friendly COP. MCS also contains specialized planning tools. MCS provides a Military Decision Making Process (MDMP)

assistant, a Task Organization tool and the ability to develop and digitally post overlays. MCS also contains a built in operations order (OPORD) format with common Army annexes and appendices. MCS systems connect to supported Brigades through the MCS Gateway, an MCS designated as a server, along Joint Nodal Network (JNN) / Command Post Node (CPN).

### Battle Command Service Support Suite (BCS3)

BCS3 is the logistician's component of ABCS. It replaced Combat Service Support Control System (CSSCS). BCS3 provides the logistics COP to MCS. BCS3 can develop and disseminate near-real time Combat Service Support (CSS) reports. BCS3 can track an item from manufacture to use across the globe, assuming the item is tagged. It provides asset visibility to all users. BCS3 also has the ability to receive FBCB2 logistics roll up reports, which allows for tailored, logistics reporting.

### Force XXI Battle Command Brigade and Below (FBCB2)

FBCB2, Force XXI Battle Command Brigade and Below provides horizontal and vertical digital command and control. FBCB2 has two unique variants. Blue Force Tracker (BFT) and FBCB2(t) terrestrial. BFT uses satellites to send and receive messages and annotate unit locations while the terrestrial version uses encrypted radio traffic through EPLRS (Enhanced Position Recognition Location Radio System) to pass information. This is a major difference. FBCB2 reports locations up the chain of command by echelon, while BFT broadcasts to a satellite which in turn pushes the message down to division and below. The FBCB2 COP provides the user his location

overlaid on a digital map in relation to other friendly units as well as templated or reported enemy activity of significant events.

#### All-Source Analysis System (ASAS)

All-Source Analysis System maintains the correlated enemy COP. ASAS provides limited intelligence and collection planning support.

#### Advanced Field Artillery Tactical Data System (AFATDS)

Advanced Field Artillery Tactical Data System, provides fire support planning and execution. AFATDS provides counter-battery radar coverage fans to the COP as necessary. AFATDS supports a joint operating environment and has recently been incorporated onto Navy vessels. In the past AFATDS had been an Army and Marine Corp system. AFATDS is compatible with all NATO fire support computers (FSC). Technically, AFATDS in coordination with FBCB2, can process a fire mission from a single vehicle Call For Fire mission (CFF) and pass the data straight to firing batteries. While the capability exists, it is almost never used for practical reasons, namely clearance of fires, and limited resources.

#### Tactical Airspace Integration System (TAIS)

Tactical Airspace Integration System provides Army aviators a planning system as well as battlefield visualization system. It provides three-dimensional depiction for command and control of air assets.

#### Supporting Systems

IMETS, Integrated Meteorological Systems, provides weather data and information. CTIS and ISYSCON are support systems. CTIS provides the terrain

database and ISYSCON is the initialization software.

### Difficulties with ABCS (Historical and Contemporary)

Problems with earlier versions of ABCS centered around a collection of five unrelated problems. While three of these problems have been solved, the last two addressed in this thesis have not been solved. These five problems are: interoperability, the requirement for specialized training, band-width and network reliability challenges, information overload and digital filing protocols.

### Interoperability Among the Individual Components/Systems

Each component ABCS system was developed along legacy Battlefield Operating Systems (BOS), initially for very mission specific functions within parochial Army organizations<sup>2</sup>. Generally BOS functions were aligned along Army officer basic branches. These Battlefield Operating Systems (BOS) were functional capabilities rather than generated effects. For example, Armor and Aviation were separate BOS elements. Now they are in the same warfighting function, movement and maneuver. Chemical Corps and Military Police are another example of two legacy BOS components that are now in the same warfighting function. Essentially BOS provided a framework to categorize capabilities. BOS was functionally aligned while warfighting functions are more akin to communities of practice (CoP). Over time, component BOS organization, even separate branches for that matter, developed equipment and training specifically for their community. The artillery community developed AFATDS; and MI branch developed ASAS. These disparate programs were pulled together during modernization,

as an initiative within the Objective Force concept<sup>3</sup>. The Stryker Brigade Combat Teams (SBCT) and the 4<sup>th</sup> Infantry Division were both test beds for digitally enabled battle command.<sup>4</sup> With the development and fielding of ABCS 6.4 all ABC systems are interoperable to a large extent<sup>5</sup>. For example, the K505 message thread, a free text message, will parse between any collection of ABCS systems and more importantly it will be understood on the receiving side. Certain specialty messages such as a TMD (Theater Missile Defense) warning from AMDWS will not properly parse on other systems. The interoperability of all subordinate systems was a major goal of the 6.4 architecture, thus making this collection of computers, servers, and networks a system of systems. While operator training is still required, training requirements – what absolutely must be trained, has changed drastically in the last six years. Six years ago the nature of the core software required more time and effort from students and instructors.

#### Specialized Training on Systems and “Common Look and Feel”

From the researcher’s experience, it took a week of instruction at Fort Knox in July 2001 to teach the same computer functions taught in a day at Fort Lewis in July, 2007. Similarly individuals receiving digital new equipment training (NET) are quicker to learn new software as it is made available to them by the item manager. Consider that junior officers are maturing in the profession with these systems, with ABCS 6.4. The more common, less functionally specific systems, such as MCS, FBCB2 and Command Post of the Future (CPOF) are ubiquitous at battalion and brigade level. Second lieutenants know no difference; MCS is the Global Positioning System (GPS) of the OPERATION: Iraqi Freedom generation of young officers.<sup>6</sup> As part of the Battle Command as a Weapon System (BCAWS) initiative Training and Doctrine Command

(TRADOC) was required to incorporate digital C2 training into all their lessons.

Therefore, it is reasonable to expect that the future battalion commanders, and senior staff officers, will be significantly more comfortable with these systems than their contemporary counterparts. They will be the generation that uses these systems in staff positions prior to command, used them in command, used them again in Command and General Staff College (CGSC), and used them yet again as a field grade staff officer prior to battalion command. When deployed in an operational environment these systems are used daily, all day, every day, for a year. Finally, these systems and their associated procedures take time to develop and spread throughout the organization much like it took time for companies to begin to reap profits from globalization.<sup>7</sup> These are significant point to consider.

#### Band-Width and Networks

The Joint Nodal Network (JNN) was fielded with ABCS 6.4. JNN is a premature, very early, Future Combat System (FCS) spin-out. Program Executive Office Command Control Communication and Technology (PEO C3T) asserts that JNN is the bridge to Warrior Information Network – Tactical (WIN-T), the network associated with the Future Combat System (FCS). JNN has replaced Multi-Subscriber Equipment (MSE), the legacy communications transport system. As part of JNN, battalions were provided Command Post Nodes (CPN). JNN provides an 8 megabit bandwidth capability with the ability to send bursts of 4 megabits to smaller command posts such as battalions. Likewise JNN uses internet protocols which allow dynamic bandwidth on-demand. This precludes the requirement to piece out bandwidth to different units within the division<sup>8</sup>.

Finally, with MSE the pipes were too small and the system took too long to establish connectivity, the concept of digital command and control on-the-move was impossible<sup>9</sup>.

Before continuing I would like to point out that while interoperability, specialized training and band-width/networking problems have not been solved, they are not the formidable hurdles that existed five years ago. This is important to recognize because it shows steady progress towards the vision outlined by GEN Shinseki<sup>10</sup>. The following two points may never go away. These problems are human in nature. These two problems, and associated issues, are problems that the “good” staff officer, battle command officer, or knowledge management officer must effectively address. I offer the following passage from *On War* as an illustration of information overload – “We know more, but this makes us more, not less uncertain.”<sup>11</sup>

#### Information Overload

Information overload is a very obvious problem to anyone who has spent time in a digital tactical operation center (TOC). When all things are considered and all problems listed this issue will likely appear on the top of everyone’s list. Information overload is essentially an information management problem. Frappaolo refers to it as info-glut.<sup>12</sup> Information management will be discussed in detail later. The Army is not the only organization that suffers from this phenomenon. This too will be discussed in detail later.

#### Digital Filing Protocols and the Flattening of Networks

These systems bring amazing functionality and herald a new age in maneuver warfare; however, with great change many problems abide. Orders, plans and text messages travel at the speed of light along digital networks. Products created on

computers, or later digitized are often maintained in a data base, or within a repository.

Without understood, and followed, filing protocols databases quickly become unmanageable. While this has been my experience; I certainly can not claim this as original. GEN Shinseki, the former Chief of Staff of the Army (CSA) identified information management and filing protocols as a problem as early as 2001.<sup>13</sup> Filing protocols are established procedures that govern where a piece of information resides on a computer or server. Filing protocols also include naming conventions. For example, an OPORD may be named –

OP: Thesisreview\_draft\_031300OCT07\_OPORD\_RECONPLAN.doc. This lengthy title would mean nothing, and really would look quit ridiculous to anyone not within the unit that produced it. Additionally, the title may be too long. Certain software code limits document titles. It is very likely that every staff officer in a battalion preparing a staff product in support of operation “Thesis review” would have a document labeled “Thesis review” on their system. If only two individuals had documents with the same name, they could continually overwrite one another as they saved their respective unique documents to a networked server. Imagine if “Thesis review” were a division level operation, an operation with hundreds of staff personnel. Another exercise in digitally enabled frustration can be simply trying to find a document.<sup>14</sup> This almost has to be experienced to be understood. Suffice to say on a webpage, Sharepoint portal, or series of networked computers, someone, or everyone has content management abilities. One manager is too restrictive but everyone managing is dangerous. Content managers can add or remove content at will, hence the title. Their activities usually go unnoticed until an event draws attention to them. For example, a missed suspense placed within a

directive that was posted on the webpage a day before. The directive was hiding in plain sight. Or maybe the content is removed because it is believed, by the content manager, that it is no longer useful. It is unlikely that no one was using the information; nor is it reasonable to infer that content should not be removed. Rather, it illustrates an issue. Content managers control how, when and where information is stored. These individuals can be operations officers, signal officers, Department of the Army (DA) civilians, any Soldier with access to a networked computer, or all of the aforementioned individuals. Content managers will have a natural, and understandable, tendency to arrange content as it makes sense to them. A schema that makes sense to them, one that is not codified in a standard operating procedure (SOP), may be difficult to navigate for others. In the end there is trade off and an agreement is made as to who will expend more time. Will the individual filing the information, the publisher, adhere to a very detailed, methodical filing process, in which case the searching individual quickly navigates to the document he wants because the publisher takes the time to maintain and design his network. Or, the publisher simply dumps his product somewhere in the database leaving the searcher to quest for the information. Imagine five people posting one product per day on a web page, in one month that will equate to 150 products. One hundred and fifty documents, presentations, spreadsheets, all with equally common and pithy titles.

#### Where are We in 2007? Where the Army Might Go?

We believed this “system” was a gift from Mars. It was a head piece that would bless its host with wisdom, clarity of thought and certainty of action. We found that this novelty was a dunce cap, an expensive circlet of confusion, indecision and frustration<sup>15</sup>.

The Army Battle Command System has added complexity where it was supposed to bring clarity to the execution of battle command and decision making. Solutions to this problem abound and as expected they are resource intensive. One solution is for the Army to pursue the development of truly automated computer systems that operate as decision support products. Indeed, some in the field of knowledge management believe that this is the next revolution, the creation of a device that can autonomously receive information and produce decision tools, or at least produce knowledge.<sup>16</sup> A second option might be to dramatically increase the amount of staff training officers receive in a particular experience, in a collaborative process, a collaborative process that not only includes traditional training on the roles and responsibilities of a staff officer, but also adds in the utilization of battle command systems. To that end, instinctively we all understand the synergistic effect that an efficient and experienced staff can have. The staff as a united whole, working towards a common goal is greater than the sum of its personnel parts. A third option, which speaks most directly to this thesis, is the creation of a cadre of staff officers, knowledge management officers who are functionally proficient in staff processes, battle command systems and knowledge management.

#### Information Management and Knowledge Management: Concepts, Doctrine, Definitions and Practices from 2001 to 2007

For a period of time this problem, acquisition of relevant information, existed in the realm of Information Management. The concept of information management within the Army has existed since the publishing of the 2001 revision of *FM 100-5*, the renamed *FM 3-0*. The desire to get the right information to the right person at the right time continues to grow. It is impossible to know if information management as envisioned in

*FM 100-5* was really knowledge management in its infancy. In 2001, then Chief of Staff of the Army GEN Shinseki directed the establishment of a knowledge management organization within the Army and, that the Army should become a knowledge based organization. Army Knowledge On-line (AKO) represents an early knowledge deployment. Conceptually, logically, knowledge management is a spin-off of information management. The cognitive hierarchy displayed these conceptual and logical linkages when *FM 6-0, Mission Command* was published in August 2003<sup>17</sup>.

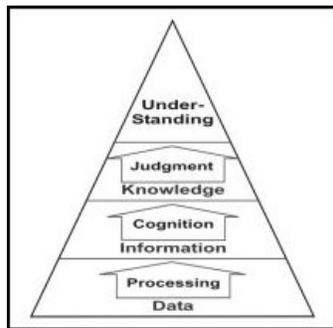


Figure 1. Cognitive Hierarchy  
*FM 6-0: Mission Command*, Appendix B-3

The desire to get the right information to the right person at the right time continued to evolve from being within the information management realm to being within the knowledge management realm. As stated previously, within the hierarchy there is a definite and distinct separation between information and knowledge. Prior to 2003, knowledge was what the individual knew and it was taken for granted that knowledge management, or what we recognize as knowledge management, was not required, not because it was believed unnecessary, but likely because it was seen as an aspect of training.<sup>18</sup> Historically, training, transfer of training and knowledge sharing were

recognized as a human resource development responsibility, as a training task, by the Army and business community and eventually a few major corporations established executive level learning and knowledge positions.<sup>19</sup> British Petroleum is one of these organizations. In the Army, After Actions Reviews (AAR) are encouraged, as are the execution of tactical vignettes and case studies, all of which support KM principles.

*FM 3-0, Operations: Full Spectrum Operations* and *FM 1-02, Operational Terms and Graphics* define battle command as, “The exercise of command in operations against a hostile, thinking enemy”.<sup>20</sup> *FM 1-02* defines information management as, “The provision of relevant information to the right person at the right time in a usable form to facilitate situational understanding and decision-making. It uses procedures and information systems to collect, process, store, display, and disseminate information.”<sup>21</sup> *FM 6-0* defines knowledge as “*information analyzed to provide meaning and value, or evaluated as to implications for the operation.*”<sup>22</sup> *FM 3-0* recognizes knowledge management as a process that supports collaboration while improving organizational performance by the generation of knowledge products.<sup>23</sup> Processes and procedures within information management support knowledge management by distributing information and knowledge products. Information management is the science of moving data, information, and knowledge and knowledge management is the art of sharing, transferring, displaying and collecting relevant, analyzed and important information for the purpose of making a decision or producing new knowledge.<sup>24</sup> In a very basic sense, a Commander receives the right information at the right time through an information management system, likely a staff procedure, or possibly from a computer display. His staff provides him with knowledge; really, the Commander’s Guidance and Course of

Action Approval portions of the Military Decision Making Process are examples of knowledge management in operation. In these instances, the commander is using his relevant information and experiences, his knowledge, to make decisions and to express his battlefield visualization. Similarly, the staff provides analyzed-information, their knowledge, to the commander.

Emerging doctrine identifies both battle command officers and knowledge management officers. It is important to note that the battle command officer referenced in this doctrine, and the battle command officer being provided to brigades and divisions is not the same individual<sup>25</sup> Simulation operations personnel are taught that while the roles and duties of BCOs have not been articulated in doctrine, it is generally accepted that

Battle Command Officers:

- a.) Facilitate/coordinate staff training
- b.) Be the Commanders technical expert on Battle Command Systems (BCS)
- c.) Manage the Commanders Common Operation Picture (COP)
- d.) Plan and integrate BCS into live-virtual-constructive (LVC) training.

Knowledge management officers are expected to:

- a.) Coordinate and integrate the COP
- b.) Develop and execute KM policies
- c.) Train staffs on KM and collaboration / collaborative planning

d.) Facilitate communication and knowledge creation.<sup>26</sup>

In general all staff officers are expected to “...provide commanders with correct and timely relevant information (RI) and well-analyzed recommendations.”<sup>27</sup> Likewise, staff officers are expected to collaborate and exchange information (knowledge), conduct training based on identified weaknesses and manage the COP as appropriate to their staff section/function.<sup>28</sup> I have included select roles and duties of the Chief of Staff / XO to illustrate additional overlap of responsibility, this information is also from *FM 6-0*.

<p><b>Battle Command Officer</b> Facilitate/coordinate staff training</p> <p>Be the Commanders technical expert on Battle Command Systems</p> <p>Manage the Commanders Common Operation Picture</p> <p>Plan and integrate BCS into live-virtual-constructive (LVC) training.</p>	<p><b>Knowledge Management Officer/FMI 6-0.1 BCO</b> Coordinate and integrate the COP</p> <p>Execute KM policies and procedures</p> <p>Supervise content management</p> <p>Develop KM training / train staffs on collaboration</p> <p>Facilitates greater communication and knowledge creation</p>
<p><b>Staff Officer</b> Provide commanders with correct and timely relevant information (RI) and well-analyzed recommendations.</p> <p>Staff officers are competent in all aspects of their functional responsibilities and know their duties</p> <p>Are creative in researching solutions to difficult and unfamiliar situations ... they find a solution</p> <p>Manage Information / Maintain the COP</p> <p>Conducts Training</p>	
<p><b>Chief of Staff / XO</b> Supervising all tasks assigned to the staff.</p> <p>Conducting staff training.</p> <p>Ensuring the staff integrates and coordinates its activities internally and with higher, subordinate, supporting, supported, and adjacent commands.</p> <p>Ensuring all staff sections participate in and provide functional expertise to IPB, managed by the G-2 (S-2) in coordination with the G-3 (S-3).</p> <p>Directing and supervising staff planning.</p>	

Figure 2. Comparison Between BCO, KMO and Chief of Staff/XO

After a cursory review of Army Operational Knowledge Management doctrine, it appears that KMOs and BCOs, in theory, perform many of the same functions, to the point that they could be synonymous. While KM remains an emergent concept in the military, knowledge management (KM) has matured in the business sector. The Army Operational Knowledge Management proponent office appears to recommend the development of KM teams and personnel in every Army organization above BDE level. The business sector does not necessarily embrace the role of the KMO, or an individual titled as a Knowledge Manager or Knowledge Management Professional.<sup>29</sup> With an eye towards the divergence within the business and academic institutions over the requirement and necessity of a KMO or CKO, the Army must understand the ramifications of creating KMOs.

#### Modeling and Simulations Officers as Battle Command Officers – the Contemporary Reality, Perceived Solutions and Resourcing Risks

Battle Command Systems and Battle Command Officers provide unique capabilities and skills, and function as valuable members of any staff. Modeling and Simulations Officers currently serve as Battle Command Officers within separate Brigade Combat Teams (BCT) and Regiments (RGT), Fires Brigades (BDE), Aviation (AVN) BDEs and Sustainment (SUST) BDEs. Currently there are four BCO positions within Heavy Brigade Combat Teams (HBCT), with the anticipation of adding six more positions in FY08. The expectation is that every BCT (combat or otherwise) will be authorized a Battle Command Officer, likely a FA57 officer, with the rank of CPT or MAJ. At current authorized strength the FA57 functional area will not be able to meet all of these new requirements while providing officers for other authorized positions. These

BCO requirements are emerging and are not on the MTOE. A BCO in every BDE/BCT (Maneuver BCTs, Multifunctional SPT BDEs, RGTs and Fires BDEs would require approximately two-thirds of the FA57 Majors sample. This does not include authorizations or assignments to: The National Simulation Center, the Combat Training Centers, the Battle Command Training Centers, any Division, Corps or Army staff, any representation within BCTP, any assignments to professional system, or anyone serving outside of a FA57 billet, or performing in a KMO role. Similarly, Operational Knowledge Management (OKM), the Army's proponent office for KM has recommended the creation of KM cells within every organization above BDE level. These cells would include at least four individuals. At the BDE level this would include one FA57 KMO and associated personnel such as a branch immaterial Captain and Sergeant First Class. At the division level these would equal three FA 57 officers, one each as the Simulations Officer (SIMO), BCO and KMO. If every active duty division was allotted eleven FA57s for BCO/KMO/SIMO duties the proponent office would be short by approximately 4%. As in the above example, this assumes that every FA57 MAJ is always assigned to one of the ten division HQs, or within one of the subordinate maneuver BDEs. Others could fill the role, military intelligence officers are taught to manage information and to establish information collection plans. FA53, network specialists are computer savvy are required to have a working knowledge of battle command systems. Finally, the Army CKO is the Army G6, the senior signal officer in the Army, thus signal officers could also fill this position. However, the primary purpose of this research identifying if KMOs are relevant, not which organization should fill this position. Chapter two includes considerably more information on business concepts and

academic notions about KM, but as stated earlier there does not appear to be a preponderance of individuals recommending the creation of designated KMOs. Rather they seem to recommend that KM should be a process, a part of an organizational culture that recognizes the unique, tacit knowledge of every individual. An organization that recognizes that the large imaginative group truly is superior to the numerically inferior elite, will also recognize that the best instructor may be the individual in the next cubical and the best academy is the office.<sup>30</sup> It is reasonable to assert, given the above concepts, that the ability to learn from, and reinvent, ourselves is the power of the staff as a KM community of practice and that it exceeds the ability of a single KMO. More clearly, a staff of competent officers trained in knowledge management practices, practices embraced and understood at all staff levels and ingrained as an aspect of the organizational culture, is superior to an individual who receives eight weeks of specialized training.

### Chapter One: Summation

Chapter one identifies Army wide problems associated with the fielding of digital battle command, those being: 1.) interoperability of systems; 2.) the requirement for specialized training; 3.) limited band-width; and 4.) information overload, or info-glut; and 5.) digital filing protocols. These problems, the forces driving the need for change, will themselves change slightly in chapter two, some of the problems, historical in nature, identified in chapter one have now been solved. For example, interoperability is no longer considered a problem. The primary research question and secondary research questions were also provided in chapter one. These questions examine different initiatives and concepts that might interact with the problem. For example, what impacts

have battle command systems had on the battle command? Chapter one examines Army initiatives that directly address the research questions, initiatives designed to ease transformation into the Information Age. These initiatives include the early establishment of Information Management Officers (IMOs), though not discussed in detail a greater investment in technology solutions, and the contemporary development of KMOs and Army knowledge management. Finally, the feasibility and suitability of a “person solution”, a dedicated KMO, to a perceived procedural problem, is briefly addressed in chapter one.

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<sup>1</sup> Department of the Army, *FMI 6-0.1, Battle Command Knowledge Management* (Washington, D.C.: Government Printing Office, 2006), Appendix – ABCS Overview. ABCS 6.4 is referred to as a system of systems (SoS). Within this context the system is composed of servers, networking protocol and core systems.

<sup>2</sup> Timothy Rider. "Digital' Army Dawns as System Undergoes Tests at Fort Hood." PEO C3T. Available from [http://peoc3t.monmouth.army.mil/articles%5Cabcs\\_may4.html](http://peoc3t.monmouth.army.mil/articles%5Cabcs_may4.html). (Internet; accessed 2 October 2007), 2

<sup>3</sup> Eric Shinseki, GEN. "Concepts for the Objective Force." *United States Army White Paper*, (2001), 6. "...units linked by web-centric C4ISR (replaced by C2 in contemporary doctrine) capabilities for common situational dominance."

<sup>4</sup> Ibid, "...networked situational awareness within Legacy and Interim Force formations." The Legacy force cited is the 4<sup>th</sup> Infantry Division. As the test bed unit 4ID conducted a "proof in principle" rotation, Division Capstone Exercise or DCX, at the National Training Center (NTC) in February, 2001. SBCT and Interim Force are synonymous. SBCTs are interim forces, precluding the objective force.

<sup>5</sup> Timothy Rider. "Digital Army Dawns as System Undergoes Tests at Fort Hood." PEO C3T. Available from [http://peoc3t.monmouth.army.mil/articles%5Cabcs\\_may4.html](http://peoc3t.monmouth.army.mil/articles%5Cabcs_may4.html). (Internet; accessed 2 October 2007),2

<sup>6</sup> During OPERATION: Desert Shield/Desert Storm, Global Positioning System (GPS) was a new item. Many units used a map and compass to navigate. Units that had

GPS rarely had more than a few per company. At the conclusion of the war GPS technology began to proliferate. Now GPS is very common, with numerous commercial and military applications. Similarly, the MCS system was not wide spread prior to OIF. In contemporary battalion (BN) / Task Force (TF) command posts their might be as many as ten systems, while brigade command posts (BDE) may have more than thirty.

<sup>7</sup> Thomas Friedman, *The World is Flat*, (New York, N.Y.: Farrar, Strauss and Giroux, 2005), 206

<sup>8</sup> MSE(s) were organic to Signal Battalions which were organized to Divisions. Therefore, signalers with MSE had to split out, or dedicated bandwidth, and MSE was line-of-site. The converse is true about JNN. JNN, through subordinate CPNs, are organic to BNs and connect via satellite.

<sup>9</sup> Timothy Rider. "New Gear Helps Soldiers Bring Beans, Bullets and Bandwidth to Battle ." PEO C3T. Available from <http://peoc3t.monmouth.army.mil/articles%5CJNN%20Article21.html>. (Internet; accessed 2 October 2007.), 1-2

<sup>10</sup> General Shinseki was the Chief of Staff of the Army (CSA) from 1999 until 2003. Knowledge management and the idea of an Army of knowledge, was developed under his tenure. It is important to note that during his tenure as CSA, knowledge management made massive gains, became a very popular concept, within business and academic communities.

<sup>11</sup> Carl Von Clausewitz, *On War*, Michael Howard and Peter Paret, eds. (Princeton, N.J.: Princeton University Press, 1984), 102

<sup>12</sup> Carl Frappaolo. *Knowledge Management*. (West Sussex: Capstone Publishing, 2006), 60

<sup>13</sup> "Concepts for the Objective Force.", 7

<sup>14</sup> This will be covered in more detail in chapter two. Connecting people, really, sharing knowledge, sharing what people know, is embraced as a knowledge management task. Frappaolo claims that success in this area can bring significant return on investment while Jacobson and Prusak state that this is a nominal problem. People spend 80% of their time analyzing and interpreting knowledge.

<sup>15</sup> The author's opinion, it is easy to become a "digital organization." Becoming digitally proficient and maintaining proficiency, as personnel change and new systems are developed is exceptionally difficult. This assertion is based on personal experience as a staff officer and commander in 4ID (DEC01-JAN04), and later as a maneuver (S3 / S3A) and logistics staff (S1, S4) observer-controller at the National Training Center (FEB04-MAY07).

<sup>16</sup> This concept appears in the Army's Objective Force white paper. It also appears in other places in academic articles. This concept will be covered in more detail in chapter two; individuals interviewed also had divergent opinions. Opinions on mechanical knowledge creation, knowledge creation devoid of direct human analysis or interaction, are divergent.

<sup>17</sup> Department of the Army, *FM 6-0: Mission Command; Command and Control of Army Forces* (Washington, D.C.: Government Printing Office, 2003), Appendix B

<sup>18</sup> While the Army did not begin including KM in doctrine, KM practices were recognized as beneficial processes as early as 2001. Within the business community KM began to grow substantially in the late 1990s. Many authors place the operational, functional development of KM at 1996.

<sup>19</sup> Raymond A. Noe, *Employee Training and Development*, 3<sup>rd</sup> ed. (New York, N.Y.: McGraw-Hill, 2005), 146-166. In his book Mr. Noe describes four conceptual ways of sharing knowledge. Chief Learning Officers and Chief Knowledge Officers have been used to develop and nurture knowledge and learning organizations.

<sup>20</sup> Department of the Army, *FM 1-02: Operational Terms and Graphics* (Washington, D.C.: Government Printing Office, 2004), 1-1

<sup>21</sup> *Ibid.*, 1-1

<sup>22</sup> *FM 6-0: Mission Command; Command and Control of Army Forces*, Appendix B-5

<sup>23</sup> Department of the Army, *FM 3-0: Operations; Full Spectrum Operations* (Washington, D.C.: Government Printing Office, 2007), 7-2

<sup>24</sup> Dr. Michael Prevou, during a discussion, Schofield Hall Ft Leavenworth, KS, October 9, 2007

<sup>25</sup> The battle command officer initiative (BCO) being pursued by the FA57 (modeling and simulations) proponent office has battle command officers focusing on the integration of battle command systems, staff training, and live-virtual-constructive training (LVC) integration. Modeling and Simulations officers are expected to maintain M&S proficiencies and responsibilities, while performing additional duties, facilitating battle command and knowledge management. The BCO within FM 6-0.1 is a subordinate to the chief of staff and the superior to the KMO. This BCO is a KM supervisor, of the 16 duties listed all but 4 explicitly reference "knowledge". An organization that has a FM 6-0.1 BCO, KMO may have as many as three FA57 officers, One each as BCO, KMO and M&S, all which we presumably be majors. See October, 2007 edition of *FMI 6-0.1: Knowledge Management Cell*, 2-2 to 2-4. *FMI 6-0.1 can is available at <https://www.us.army.mil/suite/portal/index.jsp>*

<sup>26</sup> *FMI 6-0.1: Knowledge Management Cell* (Washington, D.C.: Government Printing Office, 2007), 2-2 to 2-3 available at <https://www.us.army.mil/suite/portal/index.jsp>

<sup>27</sup> *FM 6-0: Mission Command, Appendix C-6*

<sup>28</sup> *FM 6-0: Mission Command, Appendix C-6*

<sup>29</sup> Gregory Bellinger, (2004). "Knowledge Management - Emerging Perspectives", retrieved September 14, 2007, Web site: <http://www.systems-thinking.org/kmgmt/kmgmt.htm> - Other individuals have expressed a similar opinion during the original research. Notably, one concept expressed, was the belief that KM, is a process that should produce additional knowledge (knowledge creation) and compress learning time. The analogy of a BN CDR was used, how can a battalion commander be developed in twelve years as opposed to eighteen?

<sup>30</sup> Eric Sauve, "Informal knowledge transfer." *T+D 61*, no. 3: 22-24. Business Source Premier, EBSCOhost (accessed October 9, 2007). Of the three solutions that I offered earlier (technology, staff training and KMO) this obviously supports the concept of learning staffs, staffs that train one another.

## CHAPTER 2

### REVIEW OF THE LITERATURE

“Information age armies will differ from those of the industrial age. First, they will be more flexible and versatile. They will also tend to be smaller, yet more...”

GEN Gordon Sullivan, (RET), *Envisioning Future Warfare*

#### What is the Problem?

The purpose of the research is to examine the relevance and appropriateness of Knowledge Management Officers (KMO) in Army tactical units. For the purposes of this investigation the division (DIV) level is established as the “tactical” ceiling. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. These questions are:

1. How is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?
5. What impacts have BCS had on information management and battle command?

The need for knowledge management is instinctual. Globalization and the ascendance of asymmetric threats and non-state actors are requiring the United States

military to become more agile and able while maintaining a smaller force resourced at historically low levels.<sup>1</sup>

The U.S. Army must do more with less. The tactical and operational reality is that units are expected to do more and be more proficient, efficient and lethal. This new paradigm is transposed on an environment defined by deadly consequences for failure; military leaders can ill afford to squander resources, even when those resources are as ephemeral as knowledge.

Historically, the Army's expectation was that dominant land systems would provide decisive victory. The field Army would achieve a decisive victory through the dominance afforded by super weapons.<sup>2</sup> A key aspect of dominance is information superiority.<sup>3</sup> GEN Sullivan (RET) echoes this point by stating that domination of an enemy force and domination of the information environment are linked.<sup>4</sup> A component part of information superiority is the ability to establish and manage a collective knowledge base.<sup>5</sup> The 2008 version of *FM 3-0* recognizes KM as an aspect of Information superiority.<sup>6</sup> Business best-practices such as Six Sigma and Knowledge Management facilitate continual improvement, increased effectiveness and can improve mission efficiency.

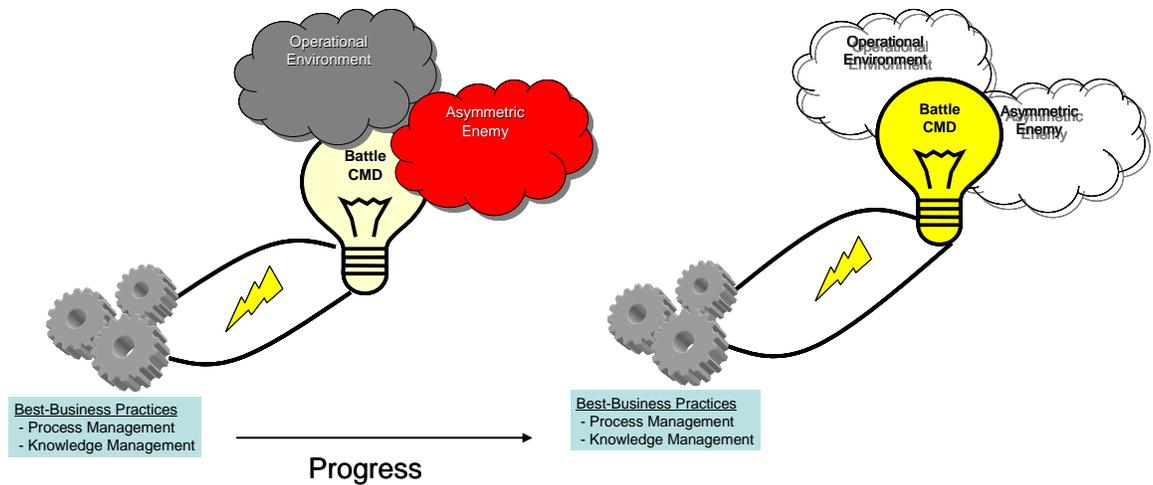


Figure 3. Battle Command and the Commander's Visualization, by the author

The rapid flow of information requires leaders to make decisions under conditions of intense ambiguity and uncertainty, increasingly the ability to observe and affect enemy forces in a larger area of responsibility demands immediate action like never before.<sup>7</sup> While nothing will ever remove uncertainty from war, knowledge management can provide the collective “brain” power to the battle command process in order to illuminate both the enemy and the operational environment (fig. 3).<sup>8</sup> The left portion of the illustration depicts confusion and uncertainty, Clausewitz's “fog”. The right portion graphically portrays processes, the machinations of, best-practices and knowledge management powering the light bulb of battle command, leading to innovation, providing coup d’oeil, allowing for informed decision making in an unfamiliar situation.<sup>9</sup>

### What is Knowledge Management?

“Knowledge Management is a buzzword that carries more skepticism than enthusiasm.”

Carl Frappaolo, *Knowledge Management*<sup>10</sup>

“Knowledge management is the discipline, or act, of decision support, that enables knowledge creation, facilitates innovation and (knowledge) distribution to the Whole through knowledge sharing practices.”

attributed to the author

Knowledge Management is the practice of making available to the organization, as a whole, the knowledge of its individuals within the organization. The maxim goes, “If HP only knew what HP knows.”<sup>11</sup> This short sentence has come to define knowledge management.

Knowledge Management is a divisive discipline. Academic and business organizations continue to disagree on the relevance, need for, and uniqueness of knowledge management practices. Semantics aside knowledge management principles and processes are, in practice, a collection of practices, processes and products from other disciplines. These disciplines, fields, include information technology, management, library science and business process management.<sup>12</sup> The single, universal, KM truth is that KM intends to solve problems and increase organizational efficiency.

In Knowledge Management, Carl Frappaolo asserts that knowledge management must facilitate informed action in an unfamiliar situation. Therefore, information and knowledge sharing allow for informed action in unfamiliar situations.<sup>13</sup> This is the luster, the strength, of organizational collective intelligence. Individuals in either working groups (WG) or communities of practice (CoP) can conceivably harness that which is known by others.<sup>14</sup> CompanyCommand.com is a CoP that is recognized not only by Battle Command Knowledge System (BCKS) but also by Mr. Sauve, CEO and Co-Founder Tomoye Corporation, as an exceptional example of knowledge management gone right.

Communities of practice are an example of a KM best-practice. KM practices range from applications such as computer software/hardware based solutions, databases, servers, and repositories, to concepts for face-to-face knowledge sharing. Search engines are another form of a KM application solution. Face-to-face events draw out knowledge from one individual for the purpose of making that knowledge available to the remainder of the organization commonly through a process like the knowledge spiral, SECI model, or the 4C model offered by BCKS.<sup>15</sup> This process is referred to as externalization or explication. An example of knowledge sharing, of externalization, is the interviews conducted by the Center for Army Lessons Learned (CALL) and the subsequent production of *The First 100 Days*.<sup>16</sup> Within the book combat experienced Soldiers provide Tactics, Techniques and Procedures (TTPs), the military equivalence of Best-Practices, to the remainder of the Force.<sup>17</sup> For example, what is the prevalent Improvised Explosive Device (IED) emplacement TTP and how it can be defeated. This is an example of a KM process taking one individual's tacit knowledge and subsequently capturing and cataloguing it, making it explicit knowledge. This is referred to as a tacit to explicit intermediation, or more commonly as knowledge sharing, the sharing of relevant information. Frappaolo recognizes four types of KM applications (processes) the author sees no difference from Frappaolo's KM applications and Nonaka's knowledge spiral.<sup>18</sup> Nonaka's corresponding concepts have been added to provide clarity to those that may be more familiar with the SECI model.

1. Intermediation (broker for knowledge) - Socialization
2. Externalization (organizing and storing knowledge) - Externalization
3. Internalization: (query and search) - Combination

#### 4. Cognition: (applications/software) - Internalization

KM applications are ways, or processes to share, store, or convert knowledge. Creating knowledge, knowledge sharing, has traditionally been expressed in terms of transmitter-receiver. Nonaka identifies four methods within his concept of the Knowledge Spiral, SECI Model.<sup>19</sup> The differences in the two models (Nonaka v. Frappaola) is based on the continuity, progressive nature, of Nonaka's SECI model, a knowledge transfer must go through every step. Frappaola suggests that knowledge sharing can occur from point-to-point (tacit to tacit) without having to hit every preceding step. Raymond Noe, asserts that rather than being a "spiral", or funnel, a tool that scopes and focuses knowledge transfer through a series of steps, each part is actually a tool that facilitates a particular form of knowledge.<sup>20</sup> Noe's "modes" and Frappaola's "applications", are both adapted, or misinterpreted, from Nonaka's SECI model. Nonaka's SECI model includes the following four steps.

1. Tacit to tacit (observation and imitation) referred to as Socialization
2. Explicit to explicit (reports, synthesis) referred to as Combination
3. Tacit to explicit (direction, personal knowledge sharing) referred to as Externalization
4. Explicit to tacit (internalization, organizational culture) referred to as Internalization

A KM "application" or "mode" is a tool, or mental model, used to transfer knowledge from an individual to the group. Certain tools, applications, work better with certain problems. After all you can drive a screw with a hammer if enough force is applied. Practically, internalization, the tool, would not work well for a tacit to tacit

knowledge transfer. This presupposes that you accept point-to-point knowledge transfers.

Other concepts that exist in knowledge management are knowledge trees, knowledge audits, knowledge blueprints, and knowledge chains. Knowledge Architects may use any of the mentioned knowledge transfer models from above, paring them with knowledge portals and communities of practice, as part of a knowledge blueprint following a knowledge audit. Knowledge trees are a representation of who-knows-what, or where information may be located. They are useful when determining how to solve, or address, a perceived problem, by identifying who may have the information necessary to solve the problem. This concept is, coincidentally and not by name, incorporated into the “M” in the Six Sigma DMAIC methodology.<sup>21</sup> This is only relevant since it shows a process improvement methodology, Six Sigma, which requires managers to identify those individuals who might be best able to fix the problem, a concept beloved by KM. Incidentally, an organization called Seventh Sense software is in the process of developing a repository that will evolve and change over time based on a novel biological-like taxonomy. Knowledge chains are similar to knowledge trees in the sense that they generally are introspective in nature. While examining knowledge chains it is interesting to consider the “see first, understand first, act first and finish decisively” paradigm as outlined by General Shinseki.<sup>22</sup> Knowledge chains include:

1. Internal awareness
2. Internal responsiveness
3. External responsiveness
4. External awareness

## Why Knowledge Management?

### Why Knowledge Management - Faster, More Lethal, Less Force

In 2001, the former Secretary of the Army (SECARMY) produced *Knowledge Management Guidance Memorandum Number 1*. The memorandum directed that the Army become a “net-centric, knowledge-based force”.<sup>23</sup> The memorandum outlined five milestones.

1. The Army is a knowledge based organization
2. KM and Best Business practices would be integrated into Army Processes
3. Army would manage it’s Infostructure
4. Army will scale Army Knowledge On-line (AKO) as the Enterprise Portal
5. Harness human capital for the knowledge organization.

The SECARMY withheld the ability to deviate from assigned suspense’s associated with the above milestones. There is a reason why the Army has become a knowledge based organization beyond, “because we were told to”. A dire and compelling reason to become a knowledge based organization – combat. The concept behind transformation is that information technologies can count for, be in lieu of, combat forces.<sup>24</sup> A digitally enabled tank company within a digitally enabled armor battalion is more lethal, more capable than its equivalent legacy, non-digital counterpart. This is because information sharing and network enabled C2, two concepts that allow American forces to find, and engage enemy forces faster; shortening the decision cycle. Department level White Papers as well as independent studies and surveys conclude that future-leaders will be required to make decisions rapidly. Information age armies will move faster and be more lethal than contemporary units.<sup>25</sup> In the contemporary business

community, it is expected that managers will be required to make twice as many unfamiliar, uninformed decisions, doubling the number of decisions that are made purely on tacit knowledge and “gut instinct” (heuristics).<sup>26</sup> Information technologies provide unparalleled situational understanding. This, in combination with a smaller force structure with which to fight a conflict, is moving the Army towards distributed operations in a non-contiguous environment.<sup>27</sup> Digital Command and Control allows commanders the ability to achieve a temporal advantage over enemy forces.<sup>28</sup> To exploit this temporal advantage commanders must act immediately. This adds stress in the system. Historically intelligence collection plans confirmed or denied enemy activity, based on an expected enemy course of action (ECO). Current enemy activities when compared to historical events helped to shape future friendly force decisions. Knowing the enemy’s actions now allowed for a “best guess” as to what he would do in the future. This methodical, calculated approach was appropriate on a compressed, contiguous battlefield. Now, conversely, commanders must strike in order to maintain temporal advantage and decisive overmatch based on extended sensor and weapon ranges inherent to a smaller, network centric force operating within a large, non-contiguous operational area.

Traditionally, military units would maneuver and fight shoulder-to-shoulder. This ensured that vulnerable flanks and supply lines were not exposed to enemy attack. Likewise operations in a contiguous environment facilitate synchronization and unity of effort. As expected, decisions in the contiguous environment are generally sequential. Conversely, Operations within a noncontiguous environment provide less combat power along a single axis, or within a single area.<sup>29</sup> This new paradigm in turn requires

decisions to be more simultaneous than sequential.<sup>30</sup> This is a marked change from legacy military juggernauts lumbering on-line towards an objective, towards a single point of decision. In the contemporary noncontiguous environment distributed campaigns have replaced the single point of decision.<sup>31</sup> A campaign, or series of objectives, is built to provide for a rapid outcome based on the application of dominant military capability against an enemy's weakness.<sup>32</sup> Besides more mission for less force, competency is becoming more important than ever before.<sup>33</sup> For one reason, commanders have to plan to mass effects. The military principle of mass still applies; however, the massing of effects is substantially more different and difficult in the noncontiguous environment. Leaders need to be trained on how to coordinate action in a more complex and loosely organized environment, have the ability to fight an asymmetric threat. Mr. Gertein implies that we are not doing enough to prepare our information age leaders, develop them in-light of the new, yet significant challenges, asymmetric threats.<sup>34</sup> Presuming that the Army does make great improvements in leadership training for information age leaders, which by itself may not be enough.

Workers, Soldiers and leaders are not interchangeable; they do not have an equality quality.<sup>35</sup> In the information age, the value of an employee depends more on what he knows and less on where he is within the organizational hierarchy.<sup>36</sup> Knowledgeable employees, the experts that every organization depends on, and in some cases could not survive without; can leave at almost any time, taking their "Deep Smarts" with them as they walk through the door.<sup>37</sup> Deep smarts (tacit knowledge) is experience based. Expert ability (deep smarts) requires a long time, as much as ten years, to develop and is generally personal in nature.<sup>38</sup> The expectation is that KM practices will:

1. provide commanders the right information at the right time to allow them to make an informed decision
2. create a “collective genius”<sup>39</sup> by exploiting and sharing the tacit knowledge within the Force
3. Create more capable leaders in less-time, increase instinctual decision-making capability (heuristic decision-making).<sup>40</sup>

### Decision Making at Lower Levels

Tempo and the distributed nature of contemporary and future operations will flatten the decision tree. Shortened decision cycle’s resultant from the free, rapid flow of information will restrict time available for analysis and encourages Soldiers to make immediate decisions.<sup>41</sup> Fortunately, or not, Soldiers not historically trained to ask questions, or analyze problems are now becoming knowledge consumers. A consequence of this is that high-quality Soldiers, leaders, staffs and organizations will be a requirement, not a luxury.<sup>42</sup> To that end instinctual decision-making, enabled by experientially based mental models, created through high-fidelity, high-resolution simulations, will be necessary at the lowest levels. Squad level tactical, virtual simulations will become increasingly necessary, to hone the skills required of junior Soldiers.

### Info-Glut and Analysis Requirements

The Army is grappling with the problem of information overload, the incessant flow of information, lots of which may not be accurate, meaningful, or relevant. Daniel Gerstein illustrates this last point in his book by explaining that hours after the attacks on

the World Trade Center Towers in 2001, he received no less than six emails espousing various conspiracy theories regarding the attack.<sup>43</sup> Right or wrong, in a real sense, leaders and knowledge/information consumers must sort through more information than before. Information technologies are providing limitless amount of information cheaply.<sup>44</sup> In *Knowledge Management*, Carl Frappaolo refers to this as info-glut. This is not a novel problem, nor is it a good problem to have. In 2003 US military commanders in Kuwait and Qatar had to turn off sensors and “stop accepting feeds” they were crippled by information.<sup>45</sup> It is important to note that information technologies (IT) were not designed to directly reduce the amount of analysis.<sup>46</sup> Rather, information technologies allow for the sharing of information and collaborative planning.<sup>47</sup> The overabundance of information is changing how analysis is conducted, more specifically, the deliverable and what is done, directly with analysis. This concept was mentioned earlier, but requires more elaboration to put it in the proper context, as it relates to contemporary decision-making and thus IM and KM.

In the not so distant past decisions were made based on dated information.<sup>48</sup> If the enemy force was in Area: BLUE five hours ago he should be near Area: RED, preparing to attack. We must destroy the enemy in Area: RED before he attacks. Dated information was an indicator of future events. We had a longer decision cycle; we had not actually seen the enemy in Area RED which allowed for a more leisurely, sequential planning process and decision cycle.

In the contemporary environment near-real time information is just that – near real time. In the information age decisions are made in the belief that the information is

correct and the opportunity is fleeting. In terms of the analogy above, the enemy is in Area: RED, preparing to attack. He is there now. Thus, the decision must be made now.

### Why Knowledge Management - Are We There Yet?

We are already feeling the effects of knowledge management. Hugh McKellar tells a dreary story of contemporary managers at their wits end due to competing intellectual requirements. Managers complain that they:

- 1.) "...have insufficient time to focus on important issues"
- 2.) "...spend too much time collecting and synthesizing information"
- 3.) "...feel inefficient"
- 4.) Managers believe they spend too much time massaging information into a usable form and exerting too much effort finding complete and relevant information
- 5.) "...can not anticipate and manage critical events."<sup>49</sup>

While the symptom is apparent, frustration, the problem is deceptive. In very general terms the managers within the article complain that they lack focus because of an inundation of information and requirements. Carl Von Clausewitz offers an interesting counterpoint.

"We know more, but this makes us more, not less uncertain. The latest reports do not arrive all at once: they merely trickle in. They continually impinge on our decisions, and our mind must be permanently armed, so to speak, to deal with them."<sup>50</sup>

Carl Von Clausewitz, *On War*

Based on McKellar's report and Clausewitz's narrative, it is reasonable to assume that more information begets more analysis. This leads to "knowledge" that may require yet more analysis, or to knowledge that may be useful to the creator, but of limited use to anyone else.<sup>51</sup>

Daniel Gertein and Hugh McKellar seem to imply that we are not in need of knowledge management personnel; we need better knowledge management processes. Organizations are provided information by the gigabyte from IT. The current challenge is making knowledge out of information, knowledge being relevant information that can be acted on to achieve a goal. Many authors believe that knowledge on-demand will be the next boom in KM and IT; this will be covered in more detail later.

#### Knowledge Management as a "Process"?

In, *The Knowledge Creating Company*, Nonaka established the metaphor to model process for knowledge creation. Converting tacit knowledge to explicit knowledge was termed articulation. Explicit knowledge used to expand an individual's tacit knowledge was termed internalization.<sup>52</sup> Nonaka's mental model described a process where, conceptually, tacit knowledge passes through a series of mental processes to become new knowledge, "...imagination to logic...evocative, must express the inexpressible".<sup>53</sup> Explicated knowledge, tacit knowledge made explicit (presumably through articulation), was coined implicit knowledge by Polanyi.<sup>54</sup> In practice knowledge transfers take innumerable forms and is a complicated endeavor; rarely are they completed in a short period of time.

Knowledge Coaches are introduced in *Deep Smarts*. Knowledge coaches are not KM professionals per se; rather they are experts that impart their tacit knowledge to

others through a series of knowledge coaching techniques and processes. These processes include:<sup>55</sup>

1. Guided Practice
2. Guided Observation
3. Guided Problem Solving
4. Guided Experimentation

Knowledge Management as a “Person”, Who’s Who in the Knowledge Zoo?

Raymond Noe identified that business organizations do establish Knowledge Management Officers, or KM professionals. Oftentimes organizations employ executive level Chief Knowledge Officers (CKOs) and Chief Learning Officers (CLOs).<sup>56</sup>

Knowledge professionals focus on identifying, capturing and disbursing knowledge.<sup>57</sup> Or, knowledge management professionals serve as authoritative figures that reinforce the importance of knowledge and learning.<sup>58</sup> In *Knowledge Management*, Carl Frappaolo offers a professional KM taxonomy. Mr. Frappaolo introduces Knowledge Engineers, Knowledge Analysts, Knowledge Markets and Knowledge Stewards.<sup>59</sup> The CEO of British Petroleum advances even more unusual titles such as Knowledge Harvesters, Knowledge Guardians and Knowledge Coordinator.<sup>60</sup> In instances of more unusual titles, they appear to be professional “handles”. They are evocative, illustrative, ephemeral titles that are meant to communicate unusual responsibility, or confusing notions. However, Mr. Frappaolo admits that Chief Knowledge Officer (CKO), a more common title, is rare.<sup>61</sup> The reason for this may be summed up by Thomas Brailsford, the CEO for Hallmark,

“Knowledge exists with the workers; knowledge is inseparable from people. Knowledge Management is an oxymoron. You can’t manage it...rather than having a person who can bring all of that together you need to have a culture...”<sup>62</sup>

*Knowledge Management*, as a whole, seems to encourage organizations to create KM professionals. This book mentally nudges the reader to this conclusion through three case studies, none of which expressly mention CKOs or KMOs, and by espousing that, “...there must be an internal champion to lead the knowledge cause.”<sup>63</sup> KM professionals gather knowledge for the betterment of the organization. As mentioned earlier, Dorothy Leonard and Walter Swap offer a wholly different technique. They suggest that organizations make their most valuable employees, their experts, into knowledge coaches, knowledge professionals who share their expertise. These individuals, knowledge coaches, use numerous techniques to impart their “Deep Smarts” to others.<sup>64</sup>

Nonaka and Fullman (basing a lot of their work on Nonaka, Duguid and Polyani) have a different view. If KM is a person, it is all of us. Stated another way, knowledge management is an inherent quality within a good employee. Knowledge management enables continuous renewal, it is a decisive edge, and every employee is an air-breathing knowledge repository. Knowledge management must be a cultural concept born of shared responsibility and universal appreciation for all employees, not “knowing” can not be grounds for retribution, nor can knowledge sharing be mandated.<sup>65</sup> If knowledge management is important then learning organizations, or more directly, developing an organization that teaches itself is critical.<sup>66</sup>

While learning organizations are important, it is reasonable to assume that nobody will ever know everything. Therefore, KM professionals and best practices can help

direct those that need to know to those that do. As stated earlier Frappaolo offers knowledge intermediation as a way to facilitate knowledge sharing. Communities of practice (CoP) remove the need for an intermediary. CoPs work because they have an inherent level of trust and to a certain extent a measure of anonymity, or at least they remove the fear of reprisal. Likewise these informal organizations are free from the bureaucratic bonds of the organization, mainly for reasons mentioned earlier.<sup>67</sup> British Petroleum has long used a similar KM method called a peer-assist, where one team calls another and through face-to-face dialogue over one to three days (knowledge transfer) the peer-assist team helps their counterpart in solving a problem.<sup>68</sup>

#### Knowledge Management as a “Thing”?

Polanyi has suggested that knowledge is humanistic. It is created in the mind and operates, interacts with information and other knowledge, within the mind. He argues that knowledge can only be created by people, that knowledge exists, conceptual, solely within people.<sup>69</sup> Michael Fullman echoes Polanyi’s sentiment when he declares, “Information is machines. Knowledge is people.”<sup>70</sup>

#### Chapter Two: Summation

Chapter two, in a very broad sense, asks “what is KM” and why now? The Army was directed to become a knowledge organization in 2001. But, more compelling than that, the problems identified in chapter one have changed, and for a nation at war they have become more meaningful. Interoperability issues during training are an annoyance, however; interoperability issues during combat can cost lives. The problems are now

identified as: 1.) increased lethality; 2.) decision making at lower levels; 3.) info-glut. If ABCS 6.4 is a system of systems; KM is a process of procedures.

KM endeavors to create innovative and imaginative solutions. KM processes also focus on allowing for informed decision making in an unfamiliar environment. KM processes spread the knowledge of the individual around to every corner of the organization, with the expectation that this process of knowledge sharing creates new knowledge. KM processes can also include protocols for harvesting, collecting, and storing knowledge so that it may be retrieved by someone else. KM schemes can even facilitate personnel hook-ups; linking people with a knowledge deficit to people that may possess the needed knowledge. Chapter two also examines knowledge professionals and their relevance in the corporate sector. Many knowledge professionals like the KMO, manage the procedures that push the KM processes as described above. Some authors and executives support the concept of a Knowledge Management executive, while others deem it a hoax and a farce. This section introduces the Knowledge Coach, Knowledge Engineer and the Knowledge Architect, naming a few of the evocative, sometimes self-anointed titles. These individuals, knowledge professionals, are responsible for creating, or directing the sharing of knowledge. A Knowledge Engineer combines knowledge to create new knowledge, while a Knowledge Architect develops a holistic plan, technological, sociological and psychological to facilitate the sharing of knowledge. Chapter two, and the literature, do not support the notion that there is an agreed upon solution to the question of assigning knowledge professionals, nor does the literature contain a single, or common, definition for KM. In fact, the progenitor of contemporary KM, Ikujiro Nonaka, bluntly states that managing knowledge is impossible. His two

books express the need for innovation, a need for knowledge creation. Organizations should manage knowledge creation, rather than attempting to manage knowledge, a point that he adamantly stresses.<sup>71</sup>

Henceforth, the researcher defines knowledge management as: the discipline / act of decision support that enables knowledge creation, facilitates innovation and (knowledge) distribution to the Whole through knowledge sharing practices.

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<sup>1</sup> Defense spending accounts for approximately 3.8% of the national budget, this is the lowest rate since World War II. Until recently the Army was pursuing a gradual force structure decrease. The Army maintained 13 active duty ground combat divisions during the 1991 Gulf War as opposed to the 10 divisions now. These operational and campaign concepts are outlined by: Eric Shinseki, General (Ret). "Concepts for the Objective Force." *United States Army White Paper*, (2001): ii-iv. Daniel Gertein echoes this sentiment in *Leading at the Speed of Light: New Strategies for U.S. Security in the Information Age*, 40

<sup>2</sup> Robert R. Leonhard, *The Principles of War for the Information Age*, (New York, N.Y.: Ballantine Books, 1998), 73. Quote the author – “Super weapons plague warfare. They are the enemy of clear thinking and good tactics. What is a Super Weapon? It has two components: a technologically advanced weapon system, and an overly zealous proponent.”

<sup>3</sup> David Talbot, “How Technology Failed in Iraq”, *Technology Review*, Available from [http://technologyreview.com/printer\\_friendly\\_article.aspx?id=13893](http://technologyreview.com/printer_friendly_article.aspx?id=13893) (accessed 26 October 2007)

<sup>4</sup> Gordon Sullivan, GEN (RET) and James Dubik (COL), *Envisioning Future Warfare*. (US Army Command and General Staff College, Fort Leavenworth, K.S.: Government Printing Office, 1995), 53

<sup>5</sup> Department of the Army, *FM 6-0: Mission Command; Command and Control of Army Forces*. (Washington, D.C.: Government Printing Office, 2003), 7-6

<sup>6</sup> Department of the Army, *FMI 3-0: Operations; Full Spectrum Operations*. (Washington, D.C.: Government Printing Office, 2008), 7-2

<sup>7</sup> Daniel Gertein, *Leading at the Speed of Light: New Strategies for U.S. Security in the Information Age*, (Dulles, V.A: Potomac Books, 2006), 48

<sup>8</sup> MacGregor Knox and Williamson Murray, *The Dynamics of Military Revolution: 1300-2050*, (New York, N.Y.: Cambridge University Press, 2001), 178-179. Nothing will remove uncertainty or passion from warfare. Accepting this as truth, it is reasonable to assume that process improvements and communications technologies can however reduce friction and inform decision makers.

<sup>9</sup> The concept of coup' de oile describes an instinctual ability to make the right decision, similar to heuristics. Frappaolo contends that without innovation there is no knowledge. See Carl Frappaolo, *Knowledge Management*, (West Sussex: Capstone Publishing, 2006), 3

<sup>10</sup> Carl Frappaolo, *Knowledge Management*, (West Sussex: Capstone Publishing, 2006), 1

<sup>11</sup> Thomas Davenport, "If Only HP Knew What HP Knows", Available from [http://www.providersedge.com/docs/km\\_articles/If\\_Only\\_HP\\_Knew\\_What\\_HP\\_Knows.pdf](http://www.providersedge.com/docs/km_articles/If_Only_HP_Knew_What_HP_Knows.pdf). Internet; accessed 27NOV 2007, 1

<sup>12</sup> Michael E.D. Koenig and T. Kaniti Sri Kantariah, *American Society of Information Science and Technology: Knowledge Management Lessons Learned; What Works and What Doesn't*. (Medford, N.J.: Information Today Inc., 2004), 5

<sup>13</sup> *Knowledge Management*, 3

<sup>14</sup> For the purposes of this thesis I will define work groups and CoPs as follows. Work groups are formal organizations created for a specific purpose. They may be functionally aligned, or an organized group of varying specialists created to solve a problem. Communities of practice are analogous to unions. They are an informal collection of people of with similar specialties. CoPs are informal groups that contain functional specialists, content managers. Within these communities ideas are shared, problems are solved and informal support networks are established. Generally, these communities are devoid of authority figures; rather they act as peer organizations.

<sup>15</sup> See *The Knowledge – Creating Company* for Knowledge Spiral (SECI Model), and *FMI 6-0.1: Knowledge Management Cell* for the 4C Model, both are available in Appendix E of this thesis.

<sup>16</sup> Center For Army Lessons Learned (CALL), 2006 "*The First 100 Days*", Ft. Leavenworth, KS: Government Printing Office

<sup>17</sup> Referring to the Army as an operational whole.

<sup>18</sup> *Knowledge Management*, 19. The existence of cognition as a knowledge management application, in combination with Nonaka's Metaphor to Model concept seems to beg the question, "why can a machine not create knowledge." Certainly, there are better reasons than semantics. Additionally, Frappaolo's applications are recognized

by others, and commonly understood to be processes. References to applications by the author will refer to software unless specifically stated otherwise.

<sup>19</sup> Ikujiro Nonaka 2007. "The Knowledge - Creating Company." *Harvard Business Review* 85, no. 7/8: 162-171. Business Source Premier, EBSCOhost (accessed October 9, 2007), 4

<sup>20</sup> Raymond Noe. *Employee Training and Development*. 3<sup>rd</sup> Ed. Boston, MA: McGraw-Hill, 2005, 161

<sup>21</sup> From Six Sigma Black Belt courseware, associated with U.S. Army Skillssoft Six Sigma distance learning on-line course material.

<sup>22</sup> Eric Shinseki, GEN (RET). "Concepts for the Objective Force." United States Army White Paper, (2001), 6

<sup>23</sup> Thomas White (SECARMY) and Eric Shinseki, GEN (RET). "Army Knowledge Management Guidance Memorandum Number 1". Department of the Army (2001): 1

<sup>24</sup> David Talbot, "How Technology Failed in Iraq." *Technology Review* Published by M.I.T.. Available from [http://www.technologyreview.com/printer\\_friendly\\_article.aspx?id=12759](http://www.technologyreview.com/printer_friendly_article.aspx?id=12759). Internet; accessed 26 November 2007: 4

<sup>25</sup> *Envisioning Future Warfare*, 54

<sup>26</sup> Eric Sauve, "Informal Knowledge Transfer". *T+D* 61, no. 3: 22-24. Business Source Premier EBSCOhost (accessed October 9, 2007), 1

<sup>27</sup> "Concepts for the Objective Force", 3

<sup>28</sup> *The Principles of War for the Information Age*, 65

<sup>29</sup> Department of the Army, *FM 3-90, Tactics*. (Washington, D.C.: Government Printing Office, 2001), 2-17

<sup>30</sup> *Envisioning Future Warfare*, 55

<sup>31</sup> Ibid: 43

<sup>32</sup> Department of the Army, *FM 1-02, Operational Terms and Graphics*, (Washington, D.C.: Government Printing Office, 2001), 1-27

<sup>33</sup> *Envisioning Future Warfare*, 48

<sup>34</sup> Ibid: 48

<sup>35</sup> *Leading at the Speed of Light: New Strategies for US Security in the Information Age*, 40

<sup>36</sup> Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge-Creating Company*, (New York, N.Y.: Oxford University Press, 1995), 7

<sup>37</sup> Dorothy Leonard and Walter Swap, “Deep Smarts”. *Harvard Business Review*, Harvard Business Review Publishing Corporation, 2004: 1-3

<sup>38</sup> *Ibid*: 5

<sup>39</sup> “Concepts for the Objective Force”, 7

<sup>40</sup> Decisions are being made at lower and lower levels. In counterinsurgency operations the tactical planning paradigm is turned on its head. Lower level leaders that routinely interact with the local samples, as such they not only collect information for their higher headquarters, they also plan many, if not most operations. This is in sharp contrast to more conventional operations where orders start on-high and trickle to subordinate commands. The challenge then becomes, how do you imbue junior leaders, Soldiers that may be very likely be less than thirty years old and with less than four years in the Army, how do you train them to make the decisions that were once held by a commander with in excess of twenty years in the Army, an individual that used an exceptional amount of tactic knowledge to both frame a problem and make a subsequent decision.

<sup>41</sup> *Ibid*: 9; “As of 2006, the United States spends over half a trillion dollars on defense...examination of the DoD budget certainly does not indicate large expenditures in the development of leaders.”

<sup>42</sup> *Envisioning Future Warfare*, 53

<sup>43</sup> *Leading at the Speed of Light*, 55

<sup>44</sup> *Ibid*: 38

<sup>45</sup> “How Technology Failed in Iraq”, 5. The article explains that not only were commanders and staffs overcome by the amount of information coming in, “the pipe was too big” – referring to the transport layer and mechanisms from the upper-tactical internet (TI), they also could not get information back out to field commanders because the MSE “pipe was too small” – referring to the lower-TI.

<sup>46</sup> “Concepts for the Objective Force”, 7

<sup>47</sup> *Ibid*: 7

<sup>48</sup> *Leading at the Speed of Light*, 46

<sup>49</sup> Hugh McKellar. "KM: Still a long road ahead." *KM World*. Available from <http://www.kmworld.com/Articles/PrintArticle.aspx?ArticleID=36002>. Internet; accessed August 1, 2007. 2

<sup>50</sup> Carl Von Clausewitz, *On War*, Michael Howard and Peter Paret, eds. (Princeton, N.J.: Princeton University Press, 1984),

<sup>51</sup> Starting with the premise that knowledge is information placed in context. It facilitates a decision, helps to solve a problem. Knowledge may provide for, or describe a solution, but it may not remove the problem. The Military Decision Making Process (MDMP) is an Army staff drill that contains knowledge management processes. For example, Mission Analysis the first step within MDMP should deduce, describe, conceptualize a military problem. However, Mission Analysis does not develop the solution to the problem; Courses of Action are developed to solve the problem. Course of Action Development, the second step in MDMP, generates solutions to the problem.

<sup>52</sup> Ikujiro Nonaka. 2007. "The Knowledge – Creating Company." *Harvard Business Review* 85, no. 7/8: 162-171. Business Source Premier, EBSCOhost (accessed October 9, 2007): 5

<sup>53</sup> "The Knowledge – Creating Company", *Harvard Business Review*, 4

<sup>54</sup> Ibid: 7

<sup>55</sup> "Deep Smarts" 1

<sup>56</sup> *Employee Training and Development*, 163

<sup>57</sup> *Leading in a Culture of Change*, 79

<sup>58</sup> *Employee Training and Development*, 164

<sup>59</sup> *Knowledge Management*, 58

<sup>60</sup> Ibid: 61

<sup>61</sup> Ibid: 58

<sup>62</sup> Ibid: 60

<sup>63</sup> Ibid: 60

<sup>64</sup> "Deep Smarts", 7-9

<sup>65</sup> Sharing of responsibility fosters the proliferation of knowledge – *Knowledge-Creating Company*, The notion that employees need to not only be comfortable sharing

knowledge and asking for assistance can be found in *Deep Smarts*, *Leading in a Culture of Change*, and *If We only Knew What we Know*.

<sup>66</sup> “Informal Knowledge Transfer”, 1

<sup>67</sup> Ibid: 1

<sup>68</sup> *Leading in a Culture of Change*, 88

<sup>69</sup> *Leading in a Culture of Change*, 80-81

<sup>70</sup> *Leading in a Culture of Change*, 71

<sup>71</sup> Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge – Creating Company*, (New York, N.Y.: Oxford University Press, 1995), 154 and Georg Von Krogh, Kazuo Ichilo and Ikujiro Nonaka, *Enabling Knowledge Creation*, (Oxford, N.Y.: Oxford University Press, 2001), 26-29

## CHAPTER 3

### METHODOLOGIES

The primary purpose of this research is to examine the relevance and appropriateness of Knowledge Management Officers (KMO) in Army tactical units. For the purposes of this investigation the division (DIV) level is established as the “tactical” ceiling. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. These questions are:

1. How is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?
5. What impacts have BCS had on information management and battle command?

#### The Methodology

The research conducted can be best described as a qualitative, descriptive methodology. While certain data provided a quantitative aspect to this research, it is noted, and stressed by the author, that this research is based on a qualitative methodology

and an associated convenience sample. Individuals within the research sample were all local and were readily available for questioning. The qualitative nature, small research area and research sampling implies that this research is neither fully complete, nor is it authoritative. Thus the research provides the reader with implications and possibilities as opposed to facts and truths.

The researcher conducted a comparative analysis of the data retrieved from the semi-structured interviews. Very simple quantitative analysis and associated methods were applied. For example, if concrete data, numerical information is retrieved in meaningful amounts a quantitative analysis will be conducted. Conceivably, an interviewee may be aware of KM measures (cost savings, increased efficiencies) that impact the study that the researcher is currently unaware of. An example might be that X BDE from Y DIV saved a certain amount of money as a result of a KM initiative. A more appropriate measure might be tied to a training organization, such as a basic training unit, reporting increased transfer of training as a result of a KM initiative. Again, it is unlikely that quantitative data will be gleaned from the semi-structured interviews. An initial research assumption, which the researcher is now certain is factual, states that recorded, measurable, data associated with a repeatable KM initiative does not exist within Army tactical organizations. Second, as determined by Dr. Ward, quantitative analysis of KM processes in a much broader business and academic study is still elusive.<sup>1</sup> Thus, attempting to force a solely quantitative method would be inappropriate.

Return on investment and quantifiable measures directly associated to KM implementation are near nonexistent. In *Knowledge Management*, Frappaolo illustrates two cases of measurable effect, in both instances fiscal, financial returns, were assumed

based on increases in efficiency.<sup>2</sup> An additional example was provided in *Knowledge Management: Lessons Learned*. This example also dealt with a presumed increase in efficiency based on a decrease in the amount of time employees spent reading and responding to email.

A review of literature and, a series of semi-structured interviews provide a lens through which to observe the problem statement and secondary research questions. This aspect of the research compared and contrasted the views, and professional opinions, of parties associated with battle command, battle command systems and KM. To a certain extent, the structured interviews provide a counterpoint to the academic influence from the literature review. The interviewees will talk to uniquely Army problems. These individuals are immersed in the Army culture and understand the effect of Army cultural values on KM implementation.

It is important to highlight the role that literature has on addressing the problem. Three general categories of literature were chosen to scope the problem; all three categories are listed below. The first two categories were viewed as literary hind-sight that foreshadows future events. That is to say, the literature can explain, in a literal sense, where KM has been. To an extent, the literature can forecast what is plausible. Conversely, the third literary source, Army doctrine, describes the context, culture and expectations of Army KM. KM is impacted just as it impacts the organization within which it is employed. Asserted conclusions, and unreasonable demands can not alter reality and certain physical limitations.

The literature reviewed was a combination of:

- 1.) Business and academic publications including both books and articles

- 2.) On-line publications, or professional journals, and
- 3.) Military doctrine

Each type of literature provides a unique lens through which the problem is observed. Business and academic publications represent current, accepted theory and best practice. While journals and on-line publications represent cutting-edge, innovative, and sometimes novel approaches to KM, military doctrine establishes the framework in which KM processes and procedures will be used within the Army. An additional discussion about military doctrine, KM literature, and its impact on the research is continued below.

#### Military Doctrine as the Foundation

Military doctrine provides a base line understanding of knowledge management (KM), or at least how KM is perceived and employed by the U.S. Army. Viewing KM from the Army's perspective is uniquely important in this investigation because it speaks most directly to the problem statement and research questions. The Army's understanding of KM, and KM's ability to address numerous problems, is generating requirements, changing force structure, consuming resources and committing funds.

#### KM as a Continuum – Literature's Role in Providing Reflection Points, Establishing Conceptual Limits and Illustrating Future Possibilities

Academic articles and texts illustrate both cutting-edge concepts as well as useful hindsight.

- 1.) *The Knowledge Creating Company*, in combination with military doctrine provided the foundation for the investigation.

2.) *Leading in a Culture of Change, Knowledge Management, and Knowledge Management: Lessons Learned* highlighted where KM has been as a practice.

3.) *Knowledge Management: Lessons Learned, If We Only Knew What We Know* and *Deep Smarts* revealed contemporary KM theory and provide current KM best practices.

4.) *How Technology Failed in Iraq, Concepts for the Objective Force, The Principles of War for the Information Age, and Leading at the Speed of Light* identified and expounded on military information technology, knowledge management challenges, and the desperate need for information superiority in contemporary and future conflicts.

5.) *Blink, The Tipping Point, The Fifth Discipline* and other books and articles, provided supporting material to add context and depth to the investigation of knowledge, decisions and highly-effective organizations.

6.) And finally, *AI Re-Boots* along with many of the aforementioned publications, and more that have not been mentioned provided a hint to where KM may proceed in the future.

### Study Design

The research was designed, and the research sample chosen, because each group provides a unique insight into KM and the Army's challenge in implementing KM, and conducting information management. Similarly, they all have a part to play within any data, information or knowledge management schema. Their unique talents, and experience, combined with their understanding of the research problem, provided useful insight into how they, as a group, an aspect of the institution, view the problem and anticipate the solution. Portions of the overall research sample acted as a control,

balancing disparate opinions within the sample. The researcher expected that KM professionals and FA57s would hold differing opinions based on unique experiences.

Finally, results of the research may be a type of rehearsal for the Army's KM implementation. Significant disagreement among the different sample groups, in particular in regards to questions one, three and four, will certainly herald the coming of significant challenges.

### Sample

The sample is exclusively from the Command and General Staff College (CGSC), or associated organizations such as the Battle Command Knowledge System (BCKS). This sample group was chosen because they were readily accessible, also because BCKS is the Army proponent for KM implementation as a subordinate organization within the U.S. Army Combined Arms Center (USACAC).<sup>3</sup> Additionally, most of the interviewees are stakeholders in the Army's KM initiative.

The independent research is composed of fourteen semi-structured interviews and three reliability interviews were conducted, for a total of seventeen interviews. Responses in the interview equate to data for analysis. The interviewees were:

- 1.) Senior officers (COL) within CGSC
- 2.) FA57 (Modeling and Simulations ) officers
- 3.) Knowledge management professionals.<sup>4</sup>

Table 1. Research Sample	
Senior Officers	2
FA 57s	6
KM Professionals	6

### Instrumentation

Reliability and validity was established prior to the first interview. As mentioned earlier, three reliability interviews were conducted; their data was included in the research. Reliability interviews, sometimes referred to as pilot interviews, ensure that responses to the interview questions fall into a realm of reasonable variance, thus the interview, the data, should be considered reliable. They ensure that the interview questions are valid, the answers to the interview questions, “got to the problem?” All semi-structured interviews were conducted face-to-face. The interview script includes seven questions. The ordering and actual verbiage changed slightly in chapter four the final research instrument with script is included as Appendix B. The “Approved Instrument” is the initial version (Appendix D, depicted below) that was approved by the Command and General Staff College, Quality Assurance / Quality Control section.

1. Is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?

5. What impacts have BCS had on information management and battle command?
6. Is there a question that the researcher did not ask that he should have, why?
7. Is there someone else that the researcher should interview?

### Data Collection

The interviews were conducted between 22 January and 15 April, 2008 on Ft. Leavenworth. The interviews were recorded on a digital recording device. The recordings were downloaded to the researcher's personal computer. The information, data, obtained from the interviews will be maintained for five years, and will be secured behind two fire-walls and is password protected.

The data was sorted by type; however, transcription was not required.

### Data Analysis

Each interview was checked for any quantitative data, or a quantitative feel. Yes/no answers were manipulated to become zeros and ones, while this was not expected to be the case; a process was in place none the same. Next, statements were generalized by both opinion and category. A Likert scale was used for questions with a quantifiable response. Body language, the individual's response and the enthusiasm for their answer was used to provide the Likert measure. An individual that replied in an absolute and passionate way rated a "5"; likewise someone that replied equally passionately in the negative was assigned a "1". This hybrid methodology was used on questions one, three and five. An example is illustrated below.

Table 2. Responses to Research Questions 1, 4 and 5			
Sample	Question 1	Question 3	Question 5
Senior Officers	2	3	5
FA 57s	2	3	5
KM Professionals	4	2	5

Analysis of this table would tend to show that in general, everyone highly agreed that battle command systems have had an impact on information management. Again, as previously stated, subsequent to this more quantitative analysis, the context, the verbiage, would be examined qualitatively for additional insights. Again, table 2 is only an example meant to illustrate the methodology; it is not data compiled from the research.

### Conclusion

The research was designed to compare categories of the research sample off of one another. The nature of the topic precludes a methodical, detailed quantitative analysis. However, where appropriate, quantitative expressions were used to clarify the results of the research, and enhance the meaning of the qualitative results. The research addressed the problem statement by identifying 1.) if the intended solution was being addressed by Army KM and; 2.) if the solution was addressing the root cause of the larger problem.

### Chapter Three: Summation

Earlier chapters discuss the relevance of KM by answering the question, “what is KM?” Chapters one and two, describe the development of a KM program to capitalize on enterprise wide knowledge, as well as providing a way to address numerous other

problems associated with digitization and transformation. The problems are now identified as: 1.) increased lethality; 2.) decision making at lower levels; 3.) info-glut. With all of these pressures in mind, Army senior leaders understand that making the right decision at the right time is no longer a fanciful concept; it is now a real hazard. In chapter two, it is determined that KM promises to enable these types of near-perfect decisions.

The interview questions within this qualitative study will: 1.) examine the perceived impact of battle command systems on decision-making; 2.) examine the role KM plays in staff work and decision-making; 3.) examine if KM is a unique process? An analysis of the data collected from the interviews in combination with the review of the literature will provide a reasonable answer to the research question, are “KMOs necessary in Army tactical organizations?” For if KM is not a unique process, rather it is inherent in good staff work, and the role of battle command systems in generating the problem is great, then it would be reasonable to assert that an individual, as a solution, would not be feasible or acceptable. Rather an educational, institutional solution is preferable.

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<sup>1</sup> Thomas E. Ward, II, *Implementing Knowledge Management to Support Executive Decision-Making In a Joint Military Environment: Key Enablers and Obstacles*, (Ann Arbor, M.I.: UMI Dissertation Services – Proquest, 2006), 144

<sup>2</sup> Carl Frappaola, *Knowledge Management*, (West Sussex: Capstone Publishing, 2006), 54-56

<sup>3</sup> Department of the Army (G-3/5/7), “Assignment of Army Operational Knowledge Management Proponent”, (Memorandum for Commanding General USACAC, thru Commanding General TRADOC, dated August 14, 2007), 1. The

memorandum identifies the Army G6/CIO as the Chief Knowledge Management Officer (CKO).

<sup>4</sup> FA57 officers interviewed were experienced staff officers with above average functional ability on ABCS. All of the officers came from a maneuver and effects background; some of them are competent computer programmers, and half have experience as a battle command officer. All of them are familiar with the Army's KM initiative. The KM professionals interviewed were associated with Battle Command Knowledge Site (BCKS) and the Command and General Staff College (CGSC). These individuals were chosen for the expertise on knowledge management practices.

## CHAPTER 4

### DATA PRESENTATION, ANALYSIS AND CONCLUSIONS

“The acme of skill in the Information Age is to manage what we know and what we don’t know, and to balance our knowledge with activity.”

Robert R. Leonhard, *The Principles of War for the Information Age*

#### Review of the Problem Statement

The primary purpose of the research is to examine the relevance and appropriateness of Knowledge Management Officers (KMO) in Army tactical units. For the purposes of this investigation, the division (DIV) level is established as the “tactical” ceiling. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. The questions below are offered as secondary research questions, having a direct impact on the problem statement as expressed at the conclusion of chapter one.

1. How is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?
5. What impacts have BCS had on information management and battle command?

Before continuing it is stressed the questions on the research instrument were re-ordered during the conduct of the research. It was discovered that the original ordering of

the questions caused the interviewees to mentally shift gears between questions. This accounts for the similarity in tables 3 and 4, but there dissimilarity to table 2. The same three questions are reflected in tables 2 and 4.

It quickly became clear that there was consensus, that staff processes were important and that knowledge management could play a large role in staff process improvement. Conversely, a consensus was never reached, as to the roles and responsibilities of Battle Command Officers and Knowledge Management Officers. Finally, while counter intuitive, but not contrary to the first point, people are important, experts are required, the Army, any organization must have a ready pool of talented individuals and a culture, that supports, and is the foundation for knowledge creation.

### Structured Interview Discussion

#### People interviewed and the research process

The independent research was composed of fourteen separate interviews. All of the interviews were conducted within the Command and General Staff College, Ft. Leavenworth, Kansas. Three pilot interviews were conducted prior to the structured interviews. The interview script went through three rewrites based on discoveries made during the pilot interviews. The script was submitted and approved by the college, quality assurance, and quality control staff. The final version of the script, the research device, is slightly different than the initial draft, and the instrument mentioned in chapter three of this thesis. Specifically, it was determined that rearranging the question seemed to facilitate a more logical, sequential response to the questions. The logical flow improved the dialogue between the researcher and the interviewee.

The dialogue during the interviews was initially guided, by the interview questions, from the script. Leading questions, questions of clarification, or additional questions were asked as the situation warranted.<sup>1</sup> The interviews were recorded and notes were taken. Later, the researcher's notes and the recordings were used to create executive summaries. The executive summaries assisted in the creation of the data tables and functioned as a member check instrument. The executive summaries are included as Appendix C to this thesis. Six KM professionals, six FA57s and two senior officers comprised the body of independent research. The KM professionals are a collection of individuals who have experience working with knowledge management. The original research design unconsciously limited this sample to individuals who worked in BCKS, or were involved with BCKS. This was due to an assumption that KM would be foreign to everyone except BCKS personnel. The assumption turned out to be false. Once the research was begun, the researcher realized that there were many more people with KM experience than previously expected. Three of the individuals within this sample group worked with KM personnel, or within KM cells. Two of these individuals are KM champions within their organizations; they are actively working to spread KM processes and ideas within their organizations.

#### “Lead-in” Questions / Statements of Clarification

Lead-in questions were developed to facilitate the flow of dialogue. The interviewees had a diverse background; as such there was not a uniform knowledge base. The lead-in questions leveled the information gap, in theory, between all individuals. For example, one of the interviewees was familiar with ABCs, very familiar with C2PC, and

had experience with KM practices in Joint operations. However, he was an Air Force officer, and was unfamiliar with specific Army KM procedures, and operational concepts.

Statements of clarification were used to confirm or clarify, what was said and the message that was communicated. This was generally a recitation of what the interviewee said, and what that meant to the researcher.

### What Was Said – Discussion of the Results

Table 3 compiles the results from the semi-structured interviews. While the results for specific sample group, KM professionals and FA57 officers, is presented graphically in figures four through seven, the compiled results are presented here to provide a quick look into the collective responses of the individuals interviewed. The interview questions, secondary research questions, are listed across the x-axis, with question one being, “What is KM?”. The respondents are listed along the y-axis, beginning with Modeling and Simulation officers, (M0005 to A0001) continuing to KM professionals, (O0001 to F0001), and concluding with two senior officers (SM001 and SM002). Responses denoted by “\*” indicate that there was no quantitative data obtained, reflecting the wholly qualitative and subjective nature of the question, such as, “What is KM?” The ability to establish a quantitative feel to the responses was not anticipated; rather it was borne out of the actual conduct of the interview. A cursory analysis of Table 3 reveals congruence in all three sample groups on two questions. KM does support decision-making and, Battle Command Systems (BCS) have had an impact on information flow. It also illustrates divergence, a lack of consensus, on the concept of KM being unique from effective and efficient staff work.

Table 3. Compiled Research Results (interview questions)

	<b>Interview Questions</b>				
	<b>What is KM?</b>	<b>Is KM unique?</b>	<b>Does KM SPT decision</b>	<b>Role of BCO and KMO</b>	<b>Impact of BCS</b>
<b>M0005</b>	*	1	5	*	5
<b>M0007</b>	*	3	4	*	5
<b>M0003</b>	*	1	4	*	4
<b>F0002</b>	*	1	5	*	4
<b>M006</b>	*	3	5	*	5
<b>A0001</b>	*	1	5	*	5
<b>O0001</b>	*	5	5	*	5
<b>M0002</b>	*	3	5	*	4
<b>M0001</b>	*	1	3	*	4
<b>JF0002</b>	*	2	4	*	5
<b>JF0001</b>	*	1	5	*	5
<b>F0001</b>	*	3	5	*	4
<b>SM001</b>	*	3	5	*	5
<b>SM002</b>	*	2	5	*	5

As chapter three discusses, and touched on briefly above, 3 questions quickly appear to have a quantitative-like characteristic. This was determined after the pilot interviews; this feeling was justified after the first three interviews. Responses to questions two (“Is KM unique”), three (“Does KM support decision making”) and five (“What impacts have battle command systems had on information management”) were uniformly yes, or no. The values fall along the Likert scale of 1 to 5, where a one is a disagreement with the question, or put another way, a negative response, such as one response of “...not at all.” A five was given for an affirmative response that was generally accompanied by a passionate clarification, forceful body language, or even a firm, confident assertion, such as one response of, “...absolutely.” A three indicates a failure to commit to a yes or no response, or equivocation. A response of two, by itself is not significant; they indicate a lack of passion. Twos were rarely assigned. On table three (below) fractional numbers above 0.5 were rounded up to the nearest whole number. For example, the mathematical average to question five, by both FA 57 officers and KM Professionals was 4.5 and was therefore rounded to 5.

### Analysis and Trends

Table 4 presents the average of all responses by sample group against questions two, three and five. Viewing the data in this form, the averages, as opposed to the uncorrelated data from table 3, makes the congruence between KM professionals (O0001 through F0001) and senior military officers (SM001 and SM002) much more apparent, in particular in how they view KM in respect to staff work. This could be attributed to a general unfamiliarity with staff work by KM professionals and KM by senior military officers. Or M&S officers may have responded in the negative, believing that they will have responsibility for implementing a program that is neither feasible nor suitable. The data indicates that M&S officers simply do not believe that KM is unique from efficient and effective staff work. More will be discussed on this later in this chapter.

Sample	Is KM unique? (QSTN 2)	Does KM support decision-making? (QSTN 3)	Impact of BCS (QSTN 5)
Senior Officers	2.5	5	5
FA 57s	1.6	4.6	4.6
KM Professionals	2.5	4.5	4.5

Table four shows that questions three and five, reveal an agreement between KM professionals and Modeling and Simulations (M&S) officers agree that: 1.) knowledge management supports decision making and; 2.) information management systems have had a major impact on battle command, the practice of leading forces in operations against a hostile, thinking, and adaptive enemy. The table also indicates that there is a

conflict between KM professionals and M&S officers. Modeling and Simulations officers do not believe that KM is unique from efficient and effective staff processes as prescribed by *FM 5-0*. On this point, it is beneficial to ignore the averages provided in table 4, and return to table 3 in order to see that the law of averages skews the correlated data, as presented in table 4. Two of six respondents were rated as a “3”, while the remainders were rated as a “1”.

KM professionals tend to agree that KM was unique, different, from efficient and effective staff processes. It also reveals a dichotomy among that sample group. Responses to questions two ranged from one (really disagree) to five (really agree). Figure 5 portrays the responses of KM professionals to questions two (“Is KM unique from efficient and effective staff work?”), three (“Does KM support decision-making?”), and five (“What impacts have battle command systems had on information management?”). The x-axis corresponds to responses made by the six individuals in this sample group. The y-axis indicates the degree, the actual response quantified 1 through 5 and displayed on a chart.

## Knowledge Management Professionals

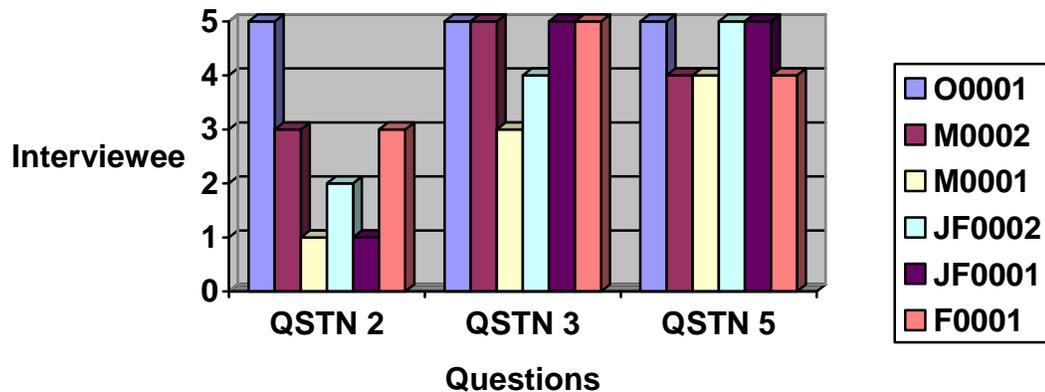


Figure 4. KM Professionals Responses to Questions Two, Three and Five, by the author

As mentioned above, KM professionals diverge on question two. The chart above (figure 5) illustrates the separate beliefs held by KM professionals. Responses range from one to five, these are whole number. Mathematical operations were not used in association with figure 4. Though this group was described as a collection of professionals, it should be noted that every one of these individuals has experience in knowledge management. They, as a group, have more KM experience than their FA 57 contemporaries. Two individuals examined knowledge management as part of their doctoral dissertation. Two of these individuals are knowledge champions within their organizations; all of them have experience working with, within, or through knowledge management. Though, more experienced working with KM than the FA 57 sample, they still “neither agree, not disagree” with the theory that KM is unique from efficient staff work. In fact, experience seems to jumble their opinions about. However, as a group

they agree that information management systems, battle command systems, have had an impact on military processes, and that, battle command does facilitate decision making.

Figure 6 portrays the responses of M&S officers to questions two (“Is KM unique from efficient and effective staff work?”), three (“Does KM support decision-making?”), and five (“What impacts have battle command systems had on information management?”). The x-axis corresponds to responses made by the six individuals in this sample group. The y-axis indicates the degree, the actual response quantified 1 through 5 and displayed on a chart.

### Modeling and Simulations Officers

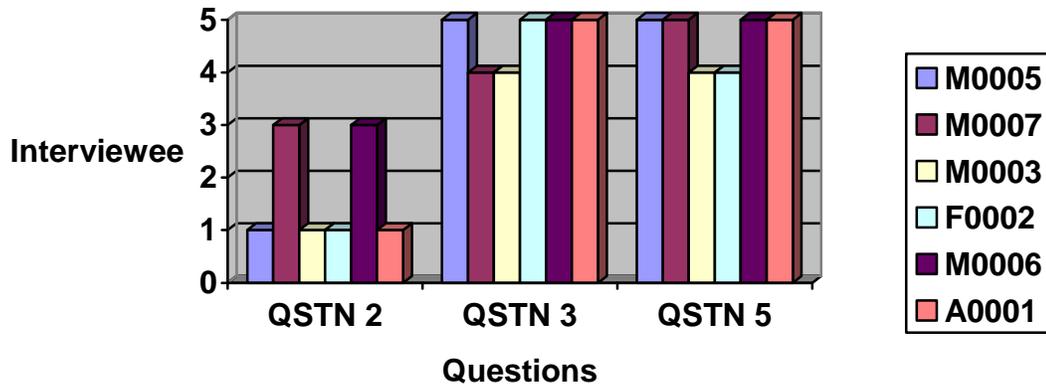


Figure 5. Modeling And Simulations Officer Responses to Questions Two, Three and Five, by the author

The FA 57 sample includes all but two of the FA 57 officers attending the FY08-01 CGSC class. They are generally combat arms officers, with at least ten years of experience as an officer in the United States Army. A significant minority, are prior service non-commissioned officers, and as such have in excess of sixteen years in the Army. Two officers received an advanced degree in Modeling and Simulations. One

individual felt conflicted as to whether or not KM is unique to efficient and effective staff work. His concern is that conceptually, KM practices explicate knowledge and store it for future use. In his opinion, this is unique from staff work because staff actions focus on current operations, or future planning as opposed to storing information away for historical purposes. His belief is that staff officers do not store information, and knowledge, specifically for future and collaborative work. During subsequent dialogue his opinion was reversed, or at least he expressed that he wasn't certain that KM was unique.

Figure 7 examines the feasibility and acceptability of KMOs by graphically depicting the linkages between the three quantitative-like questions with some qualitative data provided by the senior officer, control group. Senior officers want KMOs, BCOs, or anyone that can: 1.) facilitate collaborative staff work; 2.) assist staff officers in providing timely analysis to the commander; 3.) solve their info-glut problem. They generally concurred with the researcher that more information begets more analysis. Continuing on that path, more information coming quicker to a staff with greater responsibility causes significant friction. Staff officers need to have a collaborative planning capability without being overwhelmed by information.

It was universally agreed that information management systems have had a significant impact on information management (QSTN 5) and military processes, it is agreed that a “thing”, not a person – or lack of, is contributing to the problem. It is agreed that knowledge management facilitates decision-making (QSTN 3), the art and science of directing forces against a free-thinking enemy in a combat situation, is a process. KM is a process.

There is significant disagreement on the feasibility and acceptability of KMOs and BCOs as a solution to the problem (QSTN 2), and whether a process (presumably KM), not a person (KMO / BCO) will solve the problem. The senior military officer sample expressed the need for analysis from their staff, a staff that is able to use the digital systems to leverage rapid decision-making and visualization. Likewise, they recognize info-glut as a problem.<sup>2</sup> These needs seem to be educational and procedural. For this reason, is not suitable to expect a person to solve a unit's education and procedural needs. In chapter one, background, it was determined that the KMO initiatives were not feasible, nor acceptable because of insufficient personnel numbers, and a lack of knowledge management training being provided to the to-be espoused knowledge managers. Senior officers are communicating a training and procedural deficiency, while the force generating Army is resourcing a personnel need.

Put again, in a slightly different way, the data indicates that: 1.) question five ("What impacts have battle command systems had on information management") is the manifestation of a "KM problem" in the Army – info-glut and the need for relevant information; 2.) responses to question three ("Does KM support decision-making") represent the belief, and confidence, in the abilities of KM. KM has the capability to illuminate problems, and assist decision-making by getting knowledge to decision-makers and sharing it within the organization, cutting through info-glut; 3.) responses to question two ("Is KM unique from efficient and effective staff work") then becomes a de facto vote of confidence in current KM initiatives. This implies an information/knowledge problem, this problem (question five) and these issues are affecting decision-making (support to decision-making); staff's have a role to play in this

conundrum (Is KM unique). Currently, the data (in particular interviews with SM001 and SM 002) indicate that staffs are not managing knowledge, and by being perpetual-product generating machines, they are only making things worse. They are generating more unsynthesized, incomplete information for their subordinate staff officers to analyze. The data further (qualitative data from the interviews) implies that addressing staff problems must have primacy over other managerial tasks; no amount of KM will overcome a staffs inability to conduct adequate analysis. The Army has KM problems; KM is not unique from staff work. Therefore, staffs are the KM problem.

#### “Conclusion” – Generalizations and Discoveries

##### First Sweeping Generalization: It’s People, Not a Person

“ ... all WFF’s create effects, no single staff officer is designated as the ‘effects coordinator’ and no single staff section or command post (CP) cell is assigned responsibility for ‘effects’”<sup>3</sup>.

*FMI 5-0.1: The Operations Process*

Knowledge management is not about a person; knowledge management is people. Accepting that a majority of any organization’s knowledge capital is sealed within the skulls of its workers and likewise; accepting that even in the best circumstances, tacit knowledge transfer is difficult, then some thought should be given to answering the “what now” question. An example, if it takes eighteen years to make a “good” battalion commander, “making” them in ten years, starting two weeks from Tuesday will not likely produce pleasing results. Rather, some thought should go into what makes this person (a lieutenant colonel) qualified for the position (battalion command), and how can that training, later knowledge and experience, be given to others. The researcher offers the following, less heady, less conceptual example. There is a “go-to” guy in every

organization. This individual can be replaced, without loss of effectiveness to the unit if his knowledge is transferred to others. Is it any wonder that this individual is never the new arrival to the team; he is almost always the individual who has been in the organization the longest. In simplistic terms, this is what *Deep Thoughts* is all about, the power of the individual with - “deep smarts” or exceptional organizational knowledge, maybe a knowledge mediator, or gatekeeper.<sup>4</sup> If you doubt this ask the following two questions, “Who was not allowed to PCS in my organization?”; and “who has not been allowed leave in my organization?”

#### Experts Make Knowledge Go ‘Round

For knowledge management to work you must have useful knowledge. Useful knowledge, in the context of a brigade level staff, is only created by a professional who is an expert in his profession. If the knowledge is “bad” or corrupt, a result of poor analysis, inappropriate assumptions, or a failure to perform to standard, then the KMO is spreading an intellectual contagion. When the magic happens, the goblet of wisdom conjured by the battle command officer (or KMO) becomes a fools brew. More appropriately, it becomes an intellectual contagion that spreads like pestilence from one section of the cramped tactical operating center (TOC) to all the grimy corners, and within every section. Frilly words and literary exaggeration aside, staff products and knowledge management absolutely require the sharing, and indeed encourage the collaboration and shared creation of knowledge. Therefore, one bad product influences all that follow in a cascading, generational effect. Knowledge management will not work if there is not at least a perception of expertise. Communities of practices are rendered irrelevant if there is no recognition by the participants as well as the subsequent

knowledge users, of expertise. Likewise, if individuals are not identified as experts, by everyone, then what they “know” will likely remain in their heads. Maybe this is OK, or possibly bias and culture unfairly paint individuals as less than adequate. “Deeply Smart” people must be able to communicate their knowledge. The idea of, the “curse of knowledge” as revealed in *Make it Stick*, became a real, no-kidding issue during the research. An individual that fails to communicate their knowledge to someone has failed to share their knowledge.<sup>5</sup> Abstract ideas, expert knowledge and, professional instincts do not transfer well to novices.<sup>6</sup> A mechanized officer with thirty years experience would be just as unsuccessful in explaining to a stockbroker, with equal time in his profession, why he committed his reserve when he did, as the later would be in clarifying why he shorted a stock. These points would have been addressed in the literature review, but they only were recognized as relevant when the research sample repeatedly, identified the issue, that being the issue of expert knowledge.

### If Not You Then Who

Modeling and Simulations officers, as part of the BCO initiative, have been included in the bric-a-brac of functional and operational areas slated to fill KMO positions. This collection includes Functional Area (FA) 53 Information Management Specialists, FA30 Information Operations Officers and Signal CORPS officers. In fact the Army Chief Knowledge Officer (CKO) is the Army G6, the senior Army communications and signals officer. All things considered, Military Intelligence (MI) Officers should also be considered as KMO potential should the Army decide to produce KMOs.

Military Intelligence Officers are taught to ask meaningful questions which will in-turn drive decision by the commander. Chapter one examines the feasibility and suitability of the KMO initiative; it also identifies people that could fill this role. A commander describes his battlefield visualization in three steps, one of which is the issuance of Commanders Critical Information Requirement. Commanders Critical Information Requirements are an externalization of missing tacit knowledge. These bits of information, when combined through cognition complete the commander's battlefield visualization, and link directly to decisions (decision points) that he will be required to make in the future. This Commanders Critical Information Requirement (CCIR) and decision point (DP) linkage is taught to new military intelligence lieutenants in their basic preparatory school. If knowledge is information in context that supports a decision, it would seem that MI officers are well suited for the task. Military Intelligence officers are taught to dissect problems; they are expected to form the right, relevant and meaningful, questions in order to reach a solution. Military Intelligence officers manage information collection operations and have (information) "collection manager" as a title.

FA57, Modeling and Simulation (M&S) officers are being considered because they generally come from combat arms backgrounds; and they have a solid foundation of training on the battle command processes, and on battle command systems. Battle command system integration is/was an aspect of the M&S duty description as modeling and simulations officers. However, these individuals have limited information management, or knowledge management training. Battle Command Knowledge System (BCKS) does provide four hours of KM specific training to officers who will serve as BCOs. In the larger military scheme that is inconsequential. Additional skill identifiers

(ASI) require at least thirty-two hours of training, even then those Soldiers who have an ASI are not considered a professional in that area.<sup>7</sup>

The Army offers Six Sigma courses through Skill Port; I am unaware of any type of KM training offered through Skill Port. And if the Army did offer KM training as part of a distance learning initiative, how effective would it be? Explicit knowledge is, at best, half of the equation. Can concepts for tacit knowledge transfer be explicated and pasted into a presentation? Not likely.

Establishing a cell of four individuals within a brigade or division will not, by itself, solve information flow or knowledge problems. The researcher is unaware of any additional training that will be provided to these Soldiers. With little additional training, limited authority, and without prior practice this group of individuals is expected to shoe-horn knowledge out of the staff, explicate and stack it in repositories for the use of the collective group. A person is not the solution, even a trained person, or a few dozen trained people; the solution is the inculcation of knowledge management into the institution. One common feature throughout the literature was the requirement for the organizational culture to support knowledge management initiatives. Army culture does support knowledge management and knowledge transfer in general. However, the Army is taking a bolt-on solution to KM and the associated issues of digitization, and the management of info-glut as shown by the following examples

Battle command officers have been provided to numerous brigade level organizations. These individuals are essentially filling positions that do not exist on their unit's MTOE, Modified Table of Organization and Equipment. "BCOs provide the science to the CDR's art." This analogy was encountered twice during the research and

once prior to, during the authors professional military education. This analogy is not only absolutely unrealistic, it is also completely counter to what *FMI 6-0.1, Knowledge Management Cell*, and most KM publications describe.<sup>8</sup> Emerging doctrine tells the reader that, “Battle command officers direct the knowledge management cell. They ensure KM processes and procedures are understood within the command.”

Battle command is, “the art and science of understanding, visualizing, describing, directing and leading forces in operations against a hostile, thinking, and adaptive enemy.”<sup>9</sup> It would be reasonable to then assume that the BCOs roles and duty descriptions would align with the, understand, visualize, describe, direct battle command paradigm. As stated earlier, others have said that BCOs apply science, technology solutions, to explain and presumably illustrate the CDR’s visualization; his thoughts and information needs. However, this issue is already addressed in doctrine.<sup>10</sup> Commanders use their battle command system, their knowledge, the battle command process, the Staff, and associated equipment to conduct battle command. The illustration below shows how a commander uses his tacit knowledge, and applies the battle command process, a socialization and externalization mechanism, for knowledge creation and knowledge sharing.

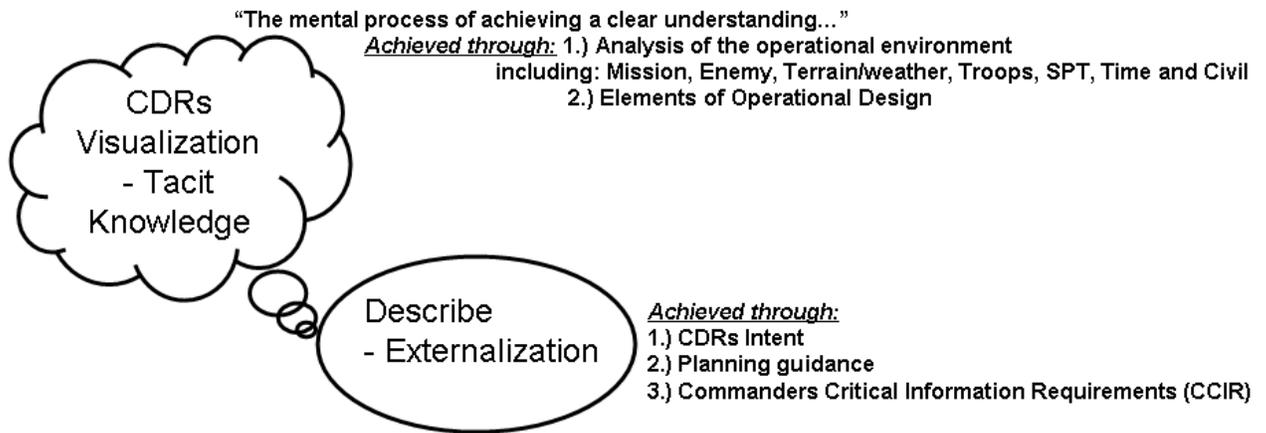


Figure 6. The Battle Command and Process, adapted from *FM 5-0*

Not only are there significant differences in opinion over what a BCO should do; reality has yet to take a swing. In practice BCOs do something different. The research sample included two FA57 officers that functioned as BCOs during their most recent assignment in support of OPERATION: Iraqi Freedom. Both of them did something different than the BCO functions described above. They worked for the brigade operations and training officer, the S3, or with brigade information management/communication officer, the S6 Emerging doctrine expects Army BCOs to establish and execute a KM plan and as such function as the head knowledge worker, possibly responsible for the actions of a Knowledge Management Officer (KMO). However, intuitively this job title and duty description is a mismatch that creates visions of an extraordinary staff officer (or simply an extra officer), but contemporary reality says that they are both wrong. A BCO is a staff officer that holds the rank of MAJ, and performs, “...what the boss needs done.”, at least that is what has been occurring.

Again, the research is not arguing that all knowledge management practices or individuals are worthless. Nor, has the researcher found any reason to believe that KM and the Army are incompatible, or that KM is a collection of unfounded fads and commonsensical practices. Some of what is passed off as KM is indeed ridiculous and painfully obvious. For example, the need for a common and understood vision has been offered as a KM solution, an imperative for successful KM. This is true for any organization, vision, like culture is not uniquely to KM. Rather, the research has found that KM is very valuable, useful and worth more time and research – KM is more than a person. KM is especially more than a person, if that person is an untrained, bolt-on solution to an ill defined, not commonly understood problem.

Terms like, “war stories”, or “office talk” have been with the Army at least as long as the researcher can remember. Both phrases refer to dialogue of business related activities during other-than business conditions. Really, this dialogue is storytelling. Analogies and metaphors within the narrative of a story transfer knowledge from the storyteller to the listener. Stories act as a universal translator that allows our minds to make otherwise abstract ideas, concrete.<sup>11</sup> Storytelling is a successful knowledge sharing process because the stories are generally compelling and more importantly, the stories keep their context, stories express information in context. Similarly, the emotive nature of stories and visions provides a rally point for the organization. One reoccurring theme in almost every piece of literature was the importance of vision and culture in knowledge management. Interestingly enough, during the independent research, one individual specifically identified “war stories”, “beer calls” and storytelling as a tacit knowledge transfer best-practice.

## Second Sweeping Generalization: Learning From Others, Storytelling and Gatekeepers

The concept of stories as a knowledge management practice was identified, by the researcher, during the interviews. Little effort was later required to find literature on storytelling. The section on storytelling, in chapter two, was added after chapter three was completed.

Stories and vignettes play an important role in the lives of many military leaders. Vignettes are like stories; they contain the context of the moment, generally the small mental cues that support decision-making. Vignettes, tactical decision games, have been used in professional publications for a long time. Their inclusion is hit-or-miss, *FM 3-90: Tactics* includes many vignettes, other manuals do not. Many branch specific publications such as *Infantry* and *Armor* magazine included vignettes on a monthly basis. Vignettes are useful since they facilitate the creation of mental models. Unfortunately, vignettes are not compelling, nor are they generally a socializing, learning tool. Participants are likely to work through an event by themselves, limited by their experience and biases. Stories, on the other hand are inclusive events; events that require buy-in from the audience as well as the use of their imagination.

Storytelling and vignettes were mentioned in the literature, but it was a surprise when they began to appear in the original research. Roughly a quarter of the total research sample mentioned stories, or used a story, to explain an event. One individual specifically identified story telling as a KM best-practice. A second individual lamented that unit social hour, or “officers call / beer call” has become a thing of the past. This individual identified these events as important professional development events. The informal atmosphere in combination with a very real physical and psychological link to

“work”, made for very interesting, informative and resonating events in his early military career. Stories became the socializing and externalization event, while personal introspection, the “oh, I may need to know this...” feeling, became the internalizing mechanism and finally, discussion facilitated combination. The give and take, the feeling of belonging, along with personal recognition that, “...that could be me next time”, in the story quickly transported one person’s tacit knowledge to another, all done fairly effortlessly with no overhead.

### Third Sweeping Generalization: KM is About (Process) Improvement

If the evolution of KM is viewed as a continuum, a straight line, we can safely say that the starting point for “KM” is around 1966<sup>12</sup> and that 1996 is generally accepted as the year that KM became a discipline.<sup>13</sup> If the terminus of the continuum were a point representing 2007, various organizations could be plotted on the line based on where they were in executing KM practices or principles. First generation KM organizations, those closer to 1996, have developed knowledge repositories and are using basic knowledge sharing applications and practices to share the collective knowledge of the organization. Third generation KM organizations, those closer to 2007, are developing complex taxonomies. Organizations like Seventh Sense are creating software that will store information in a hierarchy reminiscent of the natural taxonomy.<sup>14</sup> This linear reference is used to illustrate that like most things, human endeavors in particular, KM is constantly evolving. This Darwinian Theory supposes that there are KM applications and processes that were not useful and did not provide progress in the field. Conversely, there are modern applications that have an ancestor. The notion of a highly organized, organizing hierarchy of knowledge is certainly a descendant of repositories, a first-generation KM

application.<sup>15</sup> The Army, depicted by the arrow “You are Here” should heed the lessons provided by others, indicated by “Others are Here”.<sup>16</sup> The dawn of the millennium produced numerous extraordinary business and human resource concepts; and while KM should not be compared to the foosball tables in Enron, maybe some of its practices should.<sup>17</sup> Similarly, Carl Frappaola, in *Knowledge Management*, cautions the “buyer beware” whilst shopping in the “knowledge market”.<sup>18</sup>

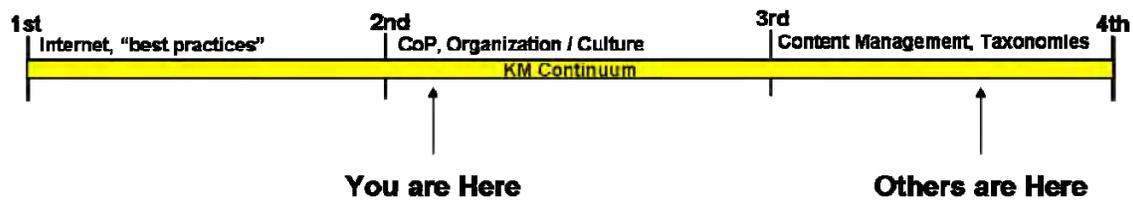


Figure 7. The KM Continuum: adapted from *Knowledge Management and Knowledge Management Lessons Learned*

Fourth sweeping generalization: Enterprise solutions and AI have a role in KM

The technological context should be examined, what capabilities did computers have in the late 1960s through early 1990s? The desktop computer that the author is using to complete this thesis has more computational power, and is quicker than the computer used during the United States Apollo program.<sup>19</sup> The researcher then concludes that while opinions will diverge initially, the consensus in the end will be that very capable computers with very capable operators are able to create implicit knowledge, or metaknowledge, artificial knowledge used to create meaningful knowledge.<sup>20</sup>

A common argument asserts that a machine will never create knowledge because knowledge is inherently human and can only exist in the human mind. This Turing-ton notion is unreasonable.<sup>21</sup> Turing's notion does not allow for the mimicking of capabilities, seeming intelligent rather than being intelligent.<sup>22</sup> Consider computers. They have the ability to process in excess of 20 billion instructions (decisions) a second, allowing them to make statistic best-guesses.<sup>23</sup> This can allow them to appear intelligent. Asserted conclusions aside the research indicates that AI is no-longer science fiction. Programmers are making headway in heuristics, the study of informal and instinctual decision-making. Artificial Intelligence and studies in heuristics could produce a superb decision support tool. Research into stories and mental models, discussed earlier, revealed that decision makers place mental models, simulations, vignettes, and stories onto a block, as one big mental lump, the entirety of their experience. They then "chunk", the familiar experiences, cutting away ones that are not somehow like the new, unexpected experience. Finally, once the big "chunks" are removed they can switch to a more precise instrument, a razor, Occam's razor, discarding inappropriate solutions based on unnecessary assumptions and contrary facts. This idea expounds, adds to Frappaola's conceptual mechanism for knowledge creation.<sup>24</sup>

Low-overhead, simple programs that can depict tactical problems quickly would be an excellent tool, a mental aerobic device for decision makers. Two individuals interviewed expressed the following. The first individual stated that commanders that conducted decision support training in the form of tactical war-games, vignettes, or tactical decision games (TDG), not only made better decisions than a control group, they also made these decisions in half the time. A second individual interviewed shared a

story of an interview that he conducted with a Lieutenant General (LTG), this LTG told him that it was, “absolutely critical that commanders rehearse their decision-making.” A simulation that could provide this would probably be welcomed. A simulation with contemporary AI, that could provide a tactically reasonable, free-thinking-like, enemy situation would be even better. KM can help in this area.

The research and literature support the concept of using Nonaka’s Metaphor – Analogy model as the basis for a KM application, software solution. This process would translate imaginative, abstract ideas into tangible, concrete ones. The author believes that through this process machines, computer programs, could produce knowledge.<sup>25</sup>

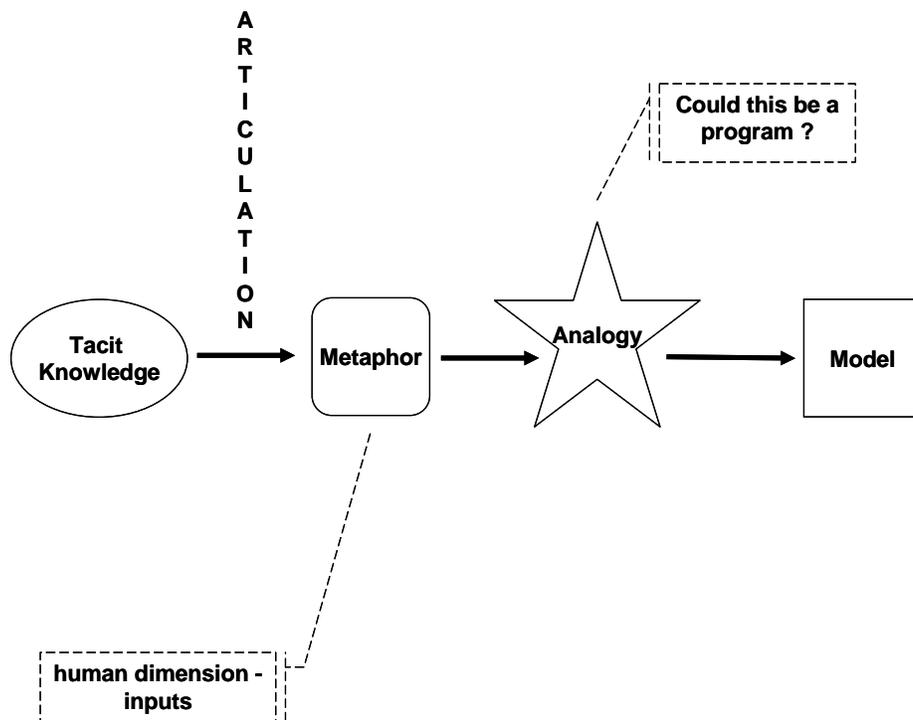


Figure 8. Nonaka’s Metaphor – Model Process, by the author

In the illustration below the author provides two problems and a conceptual process to follow. In the first example, the individual is attempting to improve his

writing ability. In the second example, the individual is attempting to discover how to defeat the 125<sup>th</sup> Guards Tank Division (GTD). By dissecting the problem computer capabilities could provide solutions to the problem. In particular, on the second problem, all three of the boxes could be inputs, built into the computer's database. The database could contain the capabilities and vulnerabilities of millions of pieces of military equipment. Doctrine and physical/natural limitations could assist the computer in determining likely locations of the 125<sup>th</sup> GTD, and particular vulnerabilities to be targeted, such as artillery or radars. Likewise, the database could search within itself and use reported information, ASAS correlated, or uncorrelated data, to determine where the vulnerability is located. Icons populated in the database become information available to and searchable by everyone in the network. After the data is located in the data-base, the larger program might send a call-for-fire message thread (CFF) to AFATDS.

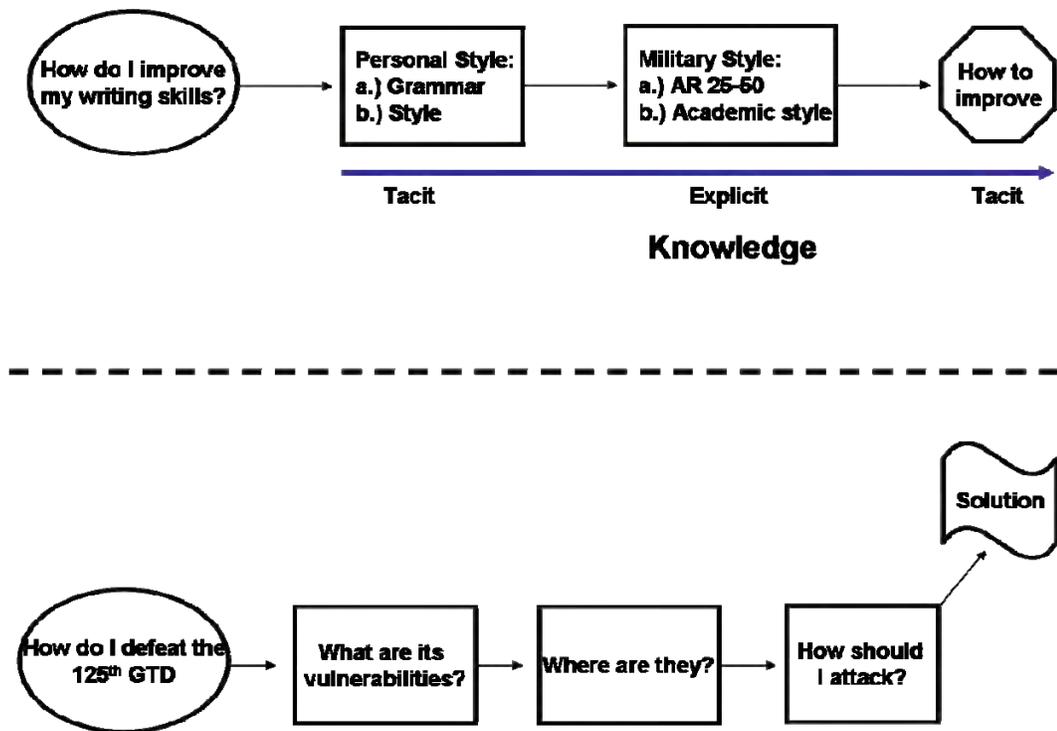


Figure 9. Dissecting the Problem, by the author

Another, of many, surprises occurred during the interviews. Two individuals interviewed were familiar with AI; one conducted post graduate work at the University of Central Florida, on a similar type program, a program that received drawn tactical mission graphics as inputs, to develop a course of action development and rehearsal tool. He was assisting in the development of an enterprise solution, a series of programs and systems, that would translate tactical mission graphics off of a smart board, code the graphics for execution, execute a series of actions, and result in a tactical engagement against a computerized enemy force that would operate to fulfill a specific military purpose. The second individual conducted research into Semi-automated Forces (SAF) during his post-graduate studies.

In conclusion, data emerging from the interviews illuminated the need for an institutional, educational solution to knowledge management needs. The establishment of BCOs and KMOs, or any type of singular knowledge management professional, had mixed reviews. Those that believed that BCOs and KMOs were necessary justified their position with an “ends, justifies the means” argument - if this (BCO/KMO positions) is what it will take to improve digitally enabled battle command in the information age, then we need to make it work. However, the research did not find this to be an adequate solution by itself.<sup>26</sup>

The research also discovered the importance of expertise within a knowledge organization. This wasn't self-evident; it was mentioned by one individual, but the scope of which was only appreciated after analysis and reflection subsequent to the research. To that extent, knowledge management is about people, lots of people with expert

knowledge, experts that share knowledge through a deliberately planned knowledge management process.<sup>27</sup>

#### Chapter Four: Summation

The original research supports the finding presented in chapter two. That being, chapter two, and the literature, do not support the notion of an agreed upon solution to the problems of creating KMOs, and assigning knowledge professionals. Chapter one identifies why the KMO initiative, as prescribed in *FMI: 6-0.1, Knowledge Management Cell*, may be neither feasible nor suitable. Chapter four highlighted the unfeasible nature of the Army KM initiative, through a description of needs analysis mismatch. Senior officers are communicating a training and procedural deficiency, while the force generating Army is resourcing a personnel need.

Chapter four also highlights the need for expert knowledge, in particular in an organization practicing aggressive knowledge management. Bad knowledge spreads like a contagion through high-efficiency organizations, turning otherwise masterful decisions into feeble guess-work. Mental models, stories and social interaction are important factors in communicating, knowledge sharing and hence, decision support. Artificial intelligence and decision-support tools have a place in Army KM initiatives, in that they produce mental models to enable expert decision-making in an unfamiliar situation.

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<sup>1</sup> Refer to EXECSUM, Annex B, F0002

<sup>2</sup> Refer to EXECSUM, Annex B, SM001 and SM002.

<sup>3</sup> Department of the Army, *FMI 5-0.1: The Operations Process*, (Washington, D.C.: Government Printing Office, 2006), 1-11; 1-58

<sup>4</sup> Knowledge mediators and gatekeepers connect people to knowledge. They facilitate knowledge transfer by helping people identify what knowledge is missing and then enabling the link-up with someone that may possess the aforementioned, missing knowledge.

<sup>5</sup> Chip Heath and Dan Heath, *Made to Stick*, (New York, N.Y.: Random House Publishing, 2007), 20

<sup>6</sup> Malcolm Gladwell, *blink*, (New York, N.Y.: Little, Brown and Company, 2005), 44 and *Made to Stick*, 21

<sup>7</sup> The 5H ASI, Joint Fire Power, provides Soldiers with the skills needed to plan, coordinate and control Air Force attack aircraft. However, this course does not make a Soldier with the 5H ASI a Joint Terminal Air Controller, an air power employment specialist.

<sup>8</sup> *FMI 6-0.1, Knowledge Management Cell*. (Washington, D.C.: Government Printing Office, 2007), 2-2 and 2-3 available at <https://www.us.army.mil/suite/portal/index.jsp>

<sup>9</sup> Department of the Army, *FM 3-0, Operations: Full Spectrum Operations*, (Washington, D.C.: Government Printing Office, 2008)

<sup>10</sup> Ibid: 3-4 to 3-8

<sup>11</sup> Stephen Denning, *The Springboard*, (Woburn, M.A.: Butterworth-Heinemann publishing, 2001), 62-64

<sup>12</sup> Polanyi and Drucker introduced the concepts of tacit knowledge and the knowledge worker in 1964 and 1966 respectively. *Knowledge Management and Knowledge Management: Lessons Learned; What Works and What Doesn't* and *If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practices* generally place the beginning of knowledge management at 1996.

<sup>13</sup> ASIS&T, Edited by Michael Koenig and Kanti Srikantaiah, *Knowledge Management Lessons Learned: What Works and What Doesn't*. (Medford, N.J.: American Society for Information Science and Technology, 2004), 12

<sup>14</sup> Seventh Sense home page, <http://www.seventh-sense-software.com/>. Natural taxonomy, or Linnaean Taxonomy is the ordered arrangement of living creatures based on common features. The common biological/Linnaean Taxonomy includes: Domain, Kingdom, Phylum, Class, Order, Family, Genus and Species.

<sup>15</sup> *Knowledge Management Lessons Learned: What Works and What Doesn't*, 5

<sup>16</sup> Publish and Subscribe Server (PASS) is new to ABCS 6.4. PASS is a mediation technology that allows individuals to “subscribe” to information that is being

“published” by another individual. PASS is also a repository for the storage of information.

<sup>17</sup> John Schwartz, "Dot-Com Is Dot-Gone, And the Dream With It." *The New York Times*, (2001), 1

<sup>18</sup> Carl Frappaola, *Knowledge Management*, (West Sussex, England: Capstone Publishing, 2006), 65

<sup>19</sup> Beyond comparisons of capabilities I believe it is necessary to state that science fiction has a way of becoming science fact. R. Daneel Olivaw, the conscious robot and major character in the *Foundation* and *Robot* series remains much more fiction than fact. However, given the increasing speed, storage capacity and novel programming associated with modern computers, it is certain that computers become more “helpful”, “thoughtful” and useful.

<sup>20</sup> The origin and concept of metaknowledge, and why the researcher believes that metaknowledge should be distinct from implicit knowledge is covered in chapter two.

<sup>21</sup> Michael Hiltzik " A.I. Reboots." Technology Review Published by M.I.T. Available from [http://www.technologyreview.com/printer\\_friendly\\_article.aspx?id=12759](http://www.technologyreview.com/printer_friendly_article.aspx?id=12759). Internet; accessed 26 October 2007. 3 Alan Turing, mathematician and computer pioneer, developed the notion that in order to be judged as intelligent, a machine must appear to be human. Douglas Lenat, creator of Cyc, the world’s preeminent artificial intelligence (AI) counters Turing’s argument with, “There’s no reason a smart machine must mimic a human being by sounding like a person ... any more than an airplane needs to mimic a bird by flapping its wings.”

<sup>23</sup> Thomas Friedman, *The World is Flat*, (New York, N.Y.: Farrar, Strauss and Giroux, 2005), 190

<sup>24</sup> *Knowledge Management*, 19

<sup>25</sup> The most common definition of knowledge is information that fits a pattern, information that has been analyzed, or information that is relevant to the problem at hand and supports decision-making. The analysis, considerations and mental actions that move information to knowledge are referred to as cognition. *FM 6-0: 3-61* has a very helpful analogy that relates data – understanding to reports and staff actions taking place in a tactical operations center.

<sup>26</sup> The three FA57 officers that filed BCO equivalent roles within AVN BDEs over the last two years (two of which were interviewed) stated that: 1.) they were used as assistant staff officers, filled holes in the staff; 2.) there is a huge need for ABCs training the operators are overcome by events and are rarely adequately trained, as one put it,

“...those that are trained are piled in by those that are not. They (those that are capable of using ABC systems) end up doing everyone else’s work”; 3.) staff turbulence and individual competence plays a role in any staff.

<sup>27</sup> *Knowledge Management: What Works and What Doesn’t*, 209. Mr. Bedford examines the role of a Knowledge Architect in creating a KM apparatus.

## CHAPTER 5

### SUMMARY AND RECOMMENDATIONS

#### Summary of the Study

The primary purpose of the research is to examine the relevance and appropriateness of Knowledge Management Officers (KMO) in Army tactical units. For the purposes of this investigation the division (DIV) level is established as the “tactical” ceiling. Secondary research questions focus on the roles and responsibilities of Battle Command Officers (BCO) and KMOs, as well as the creation and sharing of knowledge. The questions below are offered as secondary research questions, having a direct impact on the problem statement as expressed at the conclusion of chapter one.

1. How is the discipline of knowledge management unique from efficient and effective staff work?
2. What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
3. What is KM?
4. How does KM support decision making?
5. What impacts have BCS had on information management and battle command?

#### The Problem

In the simplest terms, the Army, is struggling to adapt, to become a force equipped, organized, and prepared to fight in the Information Age.<sup>1</sup> This research examines whether or not the establishment of KMOs support the Army’s movement into

the Information Age. The problem with KMOs and associated Army knowledge management initiatives associated with them is that they are, by their very nature, dependent on one or possibly two individuals. The Battle Command Officer and the KMO, where assigned, are the engines that must drive unit knowledge management practices. If information (knowledge) has a cost, so too does information (knowledge) management.<sup>2</sup>

Currently, the officer education system does not support the establishment of knowledge management professionals, and military manuals do not mitigate this oversight. *FMI 6-0.1: Knowledge Management Cell*, describes what Army knowledge managers, the BCO and KMO, should do, but there is little practical how-to, within the eighty-eight page manual.

The force structure does not support the creation of dedicated, BCOs and KMOs within every BDE and DIV headquarters.<sup>3</sup> The Army would need to produce, educate, and maintain a population of individuals that are capable of performing these functions. If FA 57s are chosen to fill these billets, then the FA 57 population will have to grow by as much as 50% in order to place two FA 57 officers within every active Army brigade and division headquarters. The BCO and KMO job descriptions and duty titles are counter-intuitive. Consensus on, roles and duties of battle command officers, does not exist. Simply put – who and what is a battle command officer; what does he do? This was discussed in detail in chapter four but will be reviewed again later in this chapter. Finally, the establishment of knowledge management officers is not in keeping with business best practices.<sup>4</sup>

The research, the data, indicates that knowledge management is critical to the Army's future success. Therefore, the early roll-out of an immature knowledge management initiative will poison the proverbial well, ensuring that knowledge management within the Army is never successful – knowledge management will become the Army's next Gama Goat, a project loved by few, which produces remarkable results for fewer. A program of daunting complexity, and abound by misunderstandings related to capabilities and investiture of time and resources. The researcher's recommendations will conclude this chapter.

### Themes From the Literature

#### Information Age Warfare:

The Army must overcome info-glut and determine a way to harness its inherent and holistic knowledge capacity. To that end, information management, and later knowledge management facilitates decision-making on the complex, info-centric battlefield. This is done by cutting away irrelevance and meeting, information (knowledge) requirements. More information makes for more analysis. Leaders within knowledge organizations can make rapid, appropriate decisions in unfamiliar situations as a result of knowledge processes. This concept has promise, but the road to paradise is long and difficult.

#### The Importance of People

Knowledge is people. While authors disagree on terms, knowledge management verses knowledge sharing, or knowledge creation, they all agree that knowledge processes are inseparable from people.<sup>5</sup> Additionally, there seems to be consensus that

knowledge equity is unrealistic. Some people are more knowledgeable than others. The return these individuals bring to the organization is much greater than usually expected, or more than simply what they produce. Deeply smart individuals generally act as knowledge coaches, knowledge mediators, mentors and reflection points for others.<sup>6</sup> Though unspoken, inferred, the literature did not directly speak of the need to have knowledgeable people within a knowledge organization. While this is accepted as a given in the literature, in actual practice this is not always a good assumption to be operating on. Likewise, it is inappropriate to assume that the Army is generating competent staff officers, knowledge workers from which to harvest critically important knowledge.

#### Knowledge Transfer Challenges

The Heath brothers develop and communicate the concept of “the curse of knowledge”, within their book, *Made to Stick*. As people become experts in their field they move from concrete things to abstraction. In practical language, the instincts, and experiences – tacit knowledge, resident in the brain of a nurse with twenty years of practical application in her field, is not easily transferred. This issue is recognized by Nonaka, Denning, Frappaola and O’Dell, but is explained most eloquently in *Made to Stick*. It is impossible to recall, remember, or explain, not knowing something.<sup>7</sup> Likewise, the act of communicating the “how” in knowing something is exceptionally difficult. How many times has the reader heard, “well, I just knew?” This is heuristic decision making, which was discussed in detail in *blink*.

Instinctual decisions depend almost solely on tacit knowledge. Thin-slicing and chunking information supports heuristic decision making. Indirectly, *Blink* and *Made to*

*Stick* explain why transferring tacit knowledge is so difficult. It is impossible to un-learn, and it is exceptionally difficult to explain experiential analysis. This is why efficient and effective staff work is so important. That “what” may mean absolutely nothing to the commander; but is exceptionally important to the intelligence officer.<sup>8</sup> But, unconsciously the intelligence officers “curse of knowledge” fools him into thinking that the commander knows these things – he may not. His knowledge base and experiences are likely very different. Efficient and effective staffs, stuffed with expert knowledge workers, are able to assist the commander in identifying, catalogue and filling, his knowledge gaps. This process is not done by the KMO, or BCO, it is done by the staff. They assist the commander in the identification and capturing of Commanders Critical Information Requirements (CCIR). Likewise, BCOs do not provide the commanders visualization, visualization occurs in the commander’s head.

Others argue that, while not addressing or contradicting the Heath bothers other knowledge barriers exist. Generally these barriers are ingrained in the culture or in organizational design. However, sometimes the barrier “personal bias” is a difficult foe. These barriers can also be related and actually support the concept of a knowledge curse. One such barrier expressed in *Knowledge Management: Lessons Learned and If We Only Knew What We Know*, is the barrier of ignorance. We are oftentimes ignorant of what we do not know, or that we know something that others may not know, but need to. This concept frequently appeared in the original research as well. It is the researcher’s opinion that this is one of the strengths of communities of practice (CoP). Communities of practice freely, in a trusting, co-equal environment, an environment that is also contextually correct, enable the exchange of knowledge. The dialogue that occurs can be

either knowledge sharing, where one gives to another, or knowledge engineering, where two or more create new knowledge. Culture plays a large role in determining, ahead of time, whether an organization will become a knowledge organization, as well as determining if knowledge initiatives will succeed.

### Culture and Processes

Knowledge management is dependant on cultural acceptance and executive support. Without executive support, knowledge initiatives will, obviously, not be resourced. Similarly, knowledge sharing must be part of the culture, to the point that knowledge sharing is included in the “everyday way of doing business.” Knowledge can not be seen as an ancillary activity, nor can managers allow knowledge sharing to conflict with standard job duties. For example, activities that are checked, verified, and where individuals are held accountable will be completed before anything else. It is unreasonable to expect employees to naturally place knowledge activities high on the list of priorities if there is no apparent linkage to their duty description.

### The Methodology

The research can be best described as a qualitative, descriptive methodology. While certain data will provide a quantitative aspect to this research, it should be noted, and is stressed by the author that this research is based on a qualitative methodology. The qualitative nature, small research area and research sample precludes this from being a complete, or authoritative study

### Recommendations for Future Research

This research concludes with four general recommendations for implementation, or future study. First, the Army should focus on teaching knowledge management principles to the staff, officers and enlisted Soldiers, everyone, in order to create a greater “expert knowledge” capacity. To support this concept, the force generating Army needs to serve as a KM engine, in opposition to unit KMOs. The institution pushes, generates and breeds knowledge processes as opposed to individuals pulling, sorting and filing knowledge. Second, the Army, through BCKS, should a.) Continue to develop and use communities of practice (CoP) to share knowledge and experience and to; b.) Develop knowledge champions. These initiatives are not the driving force for knowledge management, or knowledge creation per se, rather they represent a resident capacity to assist in knowledge creation and knowledge sharing. Third, the priority of effort should be on innovation, with the priority of support going to enabling knowledge creation and sharing at the unit level. Fourth, the Army should consider the viability of creating digital decision support tools and incorporating them into the network enabled command and control (NECC) concept. Each of these four points is covered in more detail below.

#### KM as a Process – Start by Teaching “The Staff”

The Army, or any organization, interested in innovation, and extraordinary effectiveness should consider teaching the concepts of knowledge management (KM). Likewise, knowledge management principles should be inculcated into the culture of that organization. Battle Command Knowledge System (BCKS) might consider researching, and constructing, a plan to integrate KM into the officer and non-commissioned officer education system. Additionally, serious consideration should be applied to the issue of

staff training. CAS<sup>3</sup> was closed in 2001; it can not be known if this has had an indirect impact on this study, but the researcher assumes that it has. The senior officer sample in this study is concerned with staff processes and issues, namely information management (info-glut) and a general lack of analysis from staff officers. Further analysis and recommendations should focus on the concept of expert knowledge, deficiencies in Army staff officer training, the force generating Army as a KM capability and KM, “how-to”.

### Communities of Practice and KM champions

Battle Command Knowledge System (BCKS) might consider identifying KM champions within the force. Once identified, they should be brought to a central site, in an Army-wide community of practice (CoP) forum. The focus of this event could be: 1.) What’s new in KM, and Army KM; 2.) Unit best-practices; 3.) Establishing an energetic, passionate group of professionals to carry KM practice from the force generating Army to the operational Army. Focus, informality, shared hopes and professional duty will make this event a success. Consider providing formalized training and an additional skill identifier for these individuals. Knowledge portals and de facto CoPs available through BCKS are a great start. The research mentions this in a few different places, and numerous forms, particularly, [companycommand.com](http://companycommand.com), CAVNET or S3/XO Net. Continued maturity and utilization, probably encouraged through word-of-mouth, will continue to provide substantial bang for the buck.<sup>9</sup>

## Innovation and Creativity vs. Management

The Army should consider how they might identify and reward innovation and creativity. Similarly, a move from the metrics of management might be beneficial in encouraging Leaders to become problem solvers and “knowledge workers”. A historical affinity for statistics, quantifiable data and total quality management-like (TQM) rating schemas has not nurtured, and may continue to reinforce a culture apart from knowledge. Recognized innovation and creative, thoughtful personalities need to be developed. Industrial age management techniques are not applicable in the Information Age and when dealing with knowledge work. How do you calculate the worth and “productivity” of Thomas Edison? The Army might consider a knowledge, or more appropriately a life long learning, stipend or compensation plan similar to language pay. Enlisted personnel do receive promotion points for civilian and military education. This initiative is not uncommon in businesses; in fact many of the contractors that work for the DoD receive some type of advanced degree compensation, possessing a ph.D. equates to seniority and an increase in benefits such as financial compensation. Program like those mentioned above could be greatly expanded in scope, and provided to all ranks with reasonable costs.

## Decision Support Programs

The National Simulations Center (NSC) and Program Executive Office (PEO) C3T might consider researching, or encourage FA57 officers, to research the concept of heuristics, decision making and decision support programs. Universities are conducting this research, as are businesses. Researching these concepts now, before they become

prolific in business might help the Army produce and procure a system that meets its specific needs.

#### Chapter Five: Summation and thesis concluding remarks and recommendations

“...the fact that just one manager is assigned to such an unwieldy task points up the limits of the approach, as does the hierarchical label of “officer”.

Krogh, Ichijo and Nonaka, *Enabling Knowledge Creation*

Consider the question is it better to “do it right”, or “do it right-now”? KM is important to the Army. Neither singular super-empowered intellectuals, nor a vanguard group of, knowledge management officers will solve the Army’s knowledge problem. The research indicates that the Army should consider: 1.) the role of the force generating Army in knowledge creation and the knowledge sharing process, eliminating the need for knowledge officers. Knowledge management practices must be spread throughout the entire Force Generating Army (FGA), initially through NCOES and OES but later through other means; 2.) Reinvigorate CoP and identify knowledge champions, consider that knowledge champions probably are not on the top of the organizational chart. These initiatives are a supporting effort, enabling the distribution of practices and processes from the FGA; 3.) Focus on innovation, knowledge creation and life-long learning. Reward life-long learners; 4.) Develop low-over head decision support software internally, for incorporation on the Networked Enabled Command and Control (NECC) architecture.

Rolling out an initiative that is not supported by the culture, is neither feasible nor suitable, and not entirely in the organizations best interest in the long run, expends precious resources. It is rushing about, hustling through chaos, things that might have been noticed are no longer apparent. In the frenetic center we either struggle and panic,

or admit to the inevitability of the outcome. Everything becomes clear in hindsight, in hindsight the problem is identified and can be considered without emotion. The Army exists on a mountain of knowledge. Coal is mined, removed from the Earth, often times forming a mountain. The Army exists on a mountain of knowledge. The Army must now consider how it will remove, separate, process and share the knowledge of its employees with the whole of the organization.

“Arthur C. Clarke once observed that cave dwellers froze to death on beds of coal.”

Carla O’Dell and C. Jackson Grayson, JR., *If Only We Knew What We Know*



Figure 10. Lascaux Primitive Cave Painting: Lascaux, France (15,000 to 10,000 B.C.)

While the Army will not become extinct, nor will the Nation cease to exist as a result of bad KM decisions. However, competitive military advantages, as well as lives, could be lost. Programs and policies established in 2008 will require years to fund, and longer to develop through the Army Doctrine, Organization, Training and resources, Material, Leadership and education, Personnel and Facilities (DOTMLPF) process. As

an organization implements policies and programs as an aspect of organizational change, it seeks, and finds, a type of equilibrium which resists future change. Therefore, a program to develop and field a person solution, to a process problem, if discovered to be a bad idea, will by its nature within the DOTMLPF process, take tens of years to change. After all, something as insular as performance evaluations, officer evaluations in particular, have been undergoing consistent and constant change since before the researcher was commissioned in 1997.

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<sup>1</sup> Robert R. Leonhard, *The Principles of Warfare for the Information Age*, (New York, N.Y.: Ballantine Publishing, 1995), 6, 18-20. Mr. Leonard asserts that information technology has fundamentally changed military art, the application of force for political means. He contends that the Army is no longer in the era of “sophisticated guess based planning”, but in an information age which allows for “truth-based” planning.

<sup>2</sup> Ibid: 252-253

<sup>3</sup> Chapter one provides greater detail on this subject. Personnel assignments are a zero-sum gain, FA 57, and most operational career fields, do not have the personnel on-hand to fill all of their required billets. Creating additional requirements will make deciding who goes without an authorized FA57 more difficult, and in the long-term will require the accession of more officers into the FA57 career field, drawing officers from established manpower end strength.

<sup>4</sup> I offer Frappaola’s, consumers in the knowledge market - buyer beware, understand what you are looking at, and its appropriateness as a solution, *Knowledge Management*, (West Sussex, England: Capstone Publishing, 2006), 65. Nonaka et al, describe a “pitfall” associated with the creation of a KM officer, indeed the authors encourage enabling knowledge creation, offer that knowledge management as a concept may be counter-productive, *Enabling Knowledge Creation*, (New York, N.Y.: Oxford University Press, 2000), 11-12 and 26-29.

<sup>5</sup> Nonaka – knowledge creation (unpredictable, small group, innovation more important than capture and dissemination), Frappaola – knowledge management (similar to Nonaka , must include innovation, believes that “managers” are appropriate and Denning – knowledge sharing (stories and ownership)

<sup>6</sup> Conceptually from *Deep Smarts*, in particular the term Knowledge Coach. But, the various roles played by the most intelligent within any organization are self-evident.

<sup>7</sup> Chip Heath and Dan Heath, *Made to Stick*, (New York, N.Y.: Random House Publishing, 2007), 20-21

<sup>8</sup> The intellectual standards of: “What, So what, Therefore and Which means”, is a very helpful mental tool that helps ensure that knowledge is conveyed. Staff needs to provide knowledge (enough fuel for five days of continuous operations), as opposed to, information, (we have 300,000 gal. of fuel).

<sup>9</sup> Malcolm Gladwell, *The Tipping Point*, (New York, N.Y.: Back Bay Books, 2002) and *Made to Stick*, 133, 157. Both discuss the importance of legitimacy. Both authors conclude that advice from a trusted source is very often seen as highly legitimate.

## GLOSSARY

**Advanced Field Artillery Targeting and Data System:** Provides targeting, indirect fire control (procedural) as well as the fires and effects portion of the Common Operational Picture (COP).

**Army Battle Command System (ABCS):** a suite of contractor developed, proprietary software programs that facilitate battle command by enabling functional specific planning and execution tools. A system of systems that is interoperable as a result of numerous software patches, and middleware solutions.

**Artificial Intelligence:** A complex computer program that processes intelligent-like capability because of the innate computing power, mathematical, that it has available.

**Battle command:** “The practice of leading forces in operations against a hostile, thinking, and adaptive enemy.” *FM 1-02, Operational Terms and Graphics.*

**Battle command officer:** The Army officer responsible for: 1.) Integrating the COP through ABCS; 2.) Responsible to the commander for simulation training development and execution; 3.) Facilitating staff training in accordance with the training officer and executive officer, or chief of staff.

**Battle command system:** 1.) the commander, his staff, and their tools. 2.) Army Battle Command Systems and their joint counter-parts.

**BLUFORCE Tracker:** An FBCB2 that uses satellites as its communication transport mechanism.

**Cognition:** The process of thinking, conducting personal visualization, analysis, and assessment, draws upon personal experience and tacit knowledge.

**Cognitive hierarchy:** a schema that depicts raw data on the bottom of the model, moving up the model (generally a pyramid) increases the necessary contextual detail and associated complexity of the original data.

**Combination:** From *The Knowledge – Creation Company*, The third step in the knowledge spiral where externalized knowledge is received and combined, in the receiver, with his personal tacit knowledge..

**Common Operational Picture (COP):** 1.) what the commander wants to see; 2.) the visual depiction of important information, or explicated knowledge.

**Data:** a number or thing without any context, for example, 5 is data and \$5 is information.

Decision support: the process of identifying information and knowledge gaps, and the subsequent the filling of the need gaps with useable, personalized information. This concept recognizes that information/knowledge that is found, but unintelligible to the decision maker, is useless. Thus, allowing for variance in individual decision-makers cognitive abilities and styles.

Explicit knowledge: tacit knowledge captured, stored and made available to the group.

Externalization: From, *The Knowledge – Creation Company*, the second step in the spiral of knowledge, in which an individual explicates his knowledge through writing, drawings, models, metaphors or analogy, a knowledge translator.

Force XXI Battle Command Brigade and Below (FBCB2): The individual, platform level, digital command and control device. FBCB2 is interoperable with all ABCS though specific functionalities are limited. FBCB2 comes in either a terrestrial (FBCB2t) or satellite (BFT) enabled versions. FBCB2t uses the EPLRS radio as its communication transport mechanism.

Gatekeeper: a knowledge worker that either controls access to knowledge, or directs people to knowledge. Gatekeepers may develop this characteristic as a result of their role, or history within an organization, or as the result of personal development and personality.

Implicit knowledge: tacit knowledge made explicit

Information: data with limited context, \$5.

Internalization: from *The Knowledge – Creation Company*, the fourth and final step in the spiral of knowledge, where “combined” knowledge and personal explicit form to become new knowledge, that now becomes part of the individuals (the combined-new knowledge) tacit knowledge.

Knowledge management: the discipline / act of decision support that enables knowledge creation, facilitates innovation and (knowledge) distribution to the Whole through knowledge sharing practices.

Knowledge Manager: the knowledge professional, manager, responsible for coordinating the actions of other knowledge professionals (i.e. knowledge engineers, knowledge analysts, or knowledge architects)

Knowledge sharing: providing personal knowledge to others.

Knowledge transfer: a successful sharing of knowledge.

Knowledge: information in a specific context that facilitates a decision.

Knowledge coach: from, “Deep Smarts”, an exceptionally knowledgeable individual that over time, and through various processes transfers his knowledge to another.

Knowledge worker: the term developed by Peter Drucker in *Landmarks of Tomorrow*, (1959), to describe people whose trade is knowledge, and whose tool is their brain.

Socialization: from, *The Knowledge – Creation Company*, the first step in the spiral of knowledge in which knowledge and experience are shared with others, later externalized, to facilitate sharing of knowledge.

Staff officer: any officer not in command, not in a command associated, or equivalent, billet.

Tacit knowledge: personal knowledge that exists in the mind.

Understanding: prescience, the ability to use knowledge to predict future events.

## APPENDIX A

### WHO'S WHO IN THE KNOWLEDGE ZOO

The intent of this appendix is simply to provide a listing of the unusual titles that abound. What follows is a fairly sizable list of the various “knowledge” jobs, roles or concepts that were discovered during the research. The various exotic titles are often a metaphor, describing role necessity and function. For example, knowledge engineer sounds important, and the title alludes to its function, that of building, creating useful knowledge. The evocative nature of the field in general, combined with the hyperbolic growth of the discipline, has created a lexicon, fantastic titles.

Some authors scoff at the elaborate titles, some very notable authors. The progenitor of contemporary KM, Ikujiro Nonaka, bluntly states that managing knowledge is impossible. Indeed his two books express the need for innovation, a need for knowledge creation. Organizations should manage knowledge creation, rather than attempting to manage knowledge.<sup>1</sup>

Others authors suggest that a hierarchy or possibly taxonomy of knowledge workers is necessary and that standardization would be helpful. In fact Nonaka stratifies organizational knowledge workers into knowledge practitioners, knowledge engineers and knowledge officers – his “knowledge – creating crew.”<sup>2</sup> His knowledge professionals’ possess familiar, bland, common titles with expected duties and roles.

Chief Knowledge Officer – found in *Knowledge Management, The Complete Idiot's Guide to Knowledge Management*, and *Employee Training and Development*

Gate Keeper – from *Knowledge Management*

Knowledge Activation – from *Leading in a Culture of Change*

Knowledge Analyst – from *The Complete Idiot's Guide to Knowledge Management*.

Knowledge Architect – from, *Knowledge Management Lessons Learned: What Works and What Does Not*.

Knowledge Audit: – from, *Knowledge Management Lessons Learned: What Works and What Does Not*.

Knowledge Broker – from *The Complete Idiot's Guide to Knowledge Management*, one of three distinct knowledge management roles identified by the IBM Institute for Knowledge Management.

Knowledge Champion – from, *Knowledge Management*

Knowledge Coach – from, “Deep Smarts”

Knowledge Engineer – from, *If We Only Knew What We Know* and *The Complete Idiot's Guide to Knowledge Management*.

Knowledge Guide- from, *Knowledge Management*

Knowledge Harvester – from, *Knowledge Management*

Knowledge Manager – from *The Complete Idiot's Guide to Knowledge Management*

Knowledge Mule – from “Deep Smarts”

Knowledge Nurturing – from *Employee Training and Development*

Knowledge Researchers – from *The Complete Idiot's Guide to Knowledge Management*, one of the three distinct knowledge roles discovered by the IBM Institute for Knowledge Management.

Knowledge Stewards – from *The Complete Idiot's Guide to Knowledge Management*, one the three distinct knowledge roles discovered by the IBM Institute for Knowledge Management.

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<sup>1</sup> Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge – Creating Company*, (New York, N.Y.: Oxford University Press, 1995), 154

<sup>2</sup> Ibid: 151

## APPENDIX B

### STRUCTURED INTERVIEW SCRIPT

05 March, 2008

#### MEMORANDUM FOR RECORD

**SUBJECT:** Informed consent letter (version 2)

1. Purpose: Provide the interview participant with information to facilitate “informed consent.”
2. I am completing a Masters in Military Arts and Sciences. I am investigating the relationship between: knowledge management, knowledge management officers, battle command officers, battle command systems, and staff officers in general.
3. Information obtained from this structured interview may be used in my MMAS thesis. The results of this interview are the property of myself and the Command and General Staff College. **YOUR STATEMENTS MAY BE ATTRIBUTED TO YOU.**
4. Information that I intend to use in my MMAS will be forwarded to the participant for their approval prior to inclusion. The intent is to ensure accuracy in statement and contextual relationship; this provides the participant the ability to clarify, or place in-context, prior statements before these statements are included in my thesis.
5. Participants should consider legal, social or economic risks. Your participation is voluntary; and you need only answer questions as part of the interview. Benefits of this study may include: additional staff/knowledge training to junior officers; better, more efficient use of human capital within the Army; definition and delineation of roles and responsibilities of key staff personnel as it relates to knowledge management. I will at anytime answer ant questions that you may have, as it pertains to this project.
6. At any point prior to the completion of this MMAS thesis you retain the right to withdraw any statement and request whatever material that you provided to me through and interview. This will include notes, recordings, or original documents.
7. The results of the interview will be safeguarded by password and CAC encryption within CGSC and by MS network password while at my personal residence. Recordings and notes will be secured for five years or destroyed in an appropriate means by myself.
6. Thank you for your time and assistance in furthering my education and professional development.

Again, thank you for your participation in this structured survey. As a reminder I would like to inform you that you may decide to end the survey, or remove your statements at any time prior to the publishing of my MMAS thesis.

Your statements may be attributed to you within the thesis. However, I will notify you and provide the statements that I intend to include in the thesis.

These are the seven questions that intend on asking during our interview.

- 1.) What is KM?
- 2.) How is the discipline of knowledge management unique from efficient and effective staff work?
- 3.) Does KM support decision-making?
- 4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?
- 5.) What impacts have BCS had on information management and battle command?
- 6.) Is there a question that I did not ask that I should have; why?
- 7.) Is there someone else that I should interview?

Christopher Hartline  
MAJ, AR  
Modeling/Simulations Officer

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\_\_\_\_\_  
\_\_\_\_\_

## APPENDIX C

### EXECUTIVE SUMMARIES

#### Executive Summary – F0001 / Knowledge Management Professional

##### 1.) What is KM?

My definition: A disciplined approach to applying the processes required to use what we as individuals or an organization know for some competitive advantage. It consists of the processes for: planning, creation, integrating, organizing, , transferring maintaining, and assessing knowledge, relevant information, required to make a decision. .

## Process Based Framework

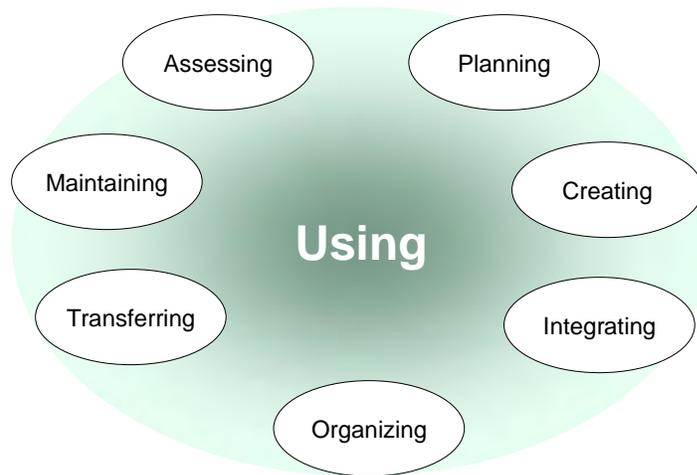
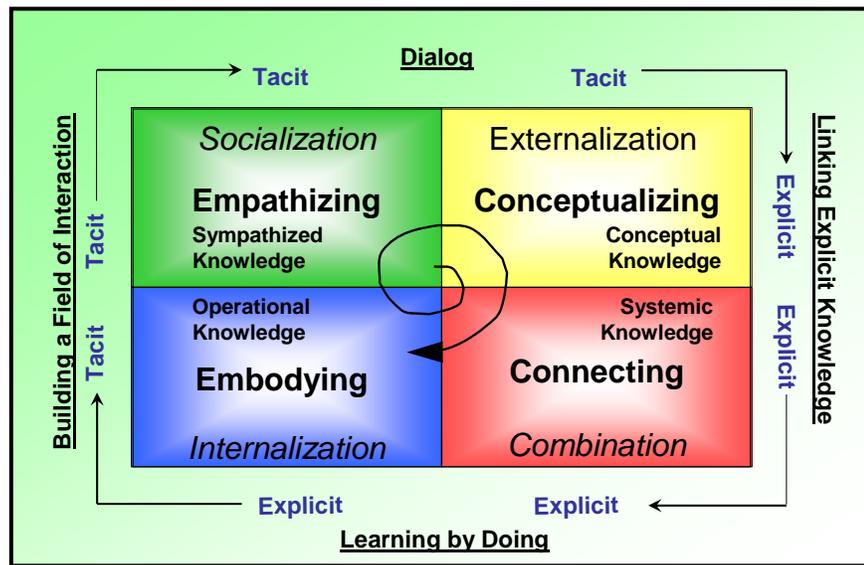


Figure 11. Process Based Framework, provided by Battle Command Knowledge System (BCKS)

Nonaka's SECI model facilitates knowledge transfer. Knowledge transfer must pass through each of the SECI steps, or it will lose context, thus losing effectiveness.

Context is very important.

## Knowledge Spiral: Knowledge Development and Dissemination



Adapted from Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation* (New York and Oxford: Oxford University Press, 1995), 71

Figure 12. Knowledge Spiral, provided to the author, and adapted by BCKS from *The Knowledge – Creation Company*

2.) How is the discipline of knowledge management unique from efficient and effective staff work? Effective staffs should manage knowledge; they should manage it through collaboration and general knowledge sharing as experts in their field. However, "...it is too important to leave knowledge sharing to happenstance", thus BCO and KMO functions. We need someone dedicated to, whose attention is focused on, managing knowledge and knowledge flows. (3)

3.) Does KM support decision-making?

Yes, KM, knowledge provides mental models, mental models allow commanders, decision makers, the ability to quickly evaluate an experience, or situation as “like”, or “not like” their mental models. This process and large amounts of mental models provide for exceptionally rapid and generally correct decisions. (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

The KMO assists the BCO; the KMO works for the BCO. The BCO is the chief of the knowledge management cell. He is part of the commander’s staff. He probably, more directly, works for the XO or the Chief of Operations, but supports the whole staff. The BCO is responsible for: 1.) Maintaining the COP 2.) The unit “digital master gunner” and 3.) Dedicated manager of knowledge.

5.) What impacts have BCS had on information management and battle command?

They have greatly increased the amount of information available, the complexity of the reporting system and the depth of understanding required to function operate information systems. (4)

Additional Comments:

We are in third-generation KM, characterized by collaboration which requires knowledge engineering. Second generation KM was characterized by tacit to explicit transfers. War-gaming builds mental models, which enable rapid/heuristic decision-making. War games and simulations build mental models and the receptors required for broad visualization, understanding and eventually decision making. What makes us “adaptable” leaders is having lots of courses of action available to us in any given situation. Mental models improve our options this improve both speed and accuracy of decisions. Vignettes (short stories) are Army best practice for communicating a situation which can put a learner “in the moment”– storytelling, simulations can produce “stories”. SECI model must be completed for there to be a meaningful, complete, appropriate knowledge transfer.<sup>1</sup> Mental models and knowledge sharing reduce uncertainty and reduce decision time because the analogy process reduces the number of options; it eliminates inadequate decisions, Occam’s razor.<sup>2</sup>

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<sup>1</sup> SECI - Socialization, externalization, combination and internalization, from Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge Creating Company*, (New York, NY: Oxford University Press, 1995), 82-84

<sup>2</sup> Occam’s razor refers to logician technique of determining a solution by eliminating, shaving away, assumptions and generally accepting that the simplest explanation is the best explanation. Interestingly, probabilistic equations modeled after Occam’s razor are being used to produce artificial intelligence, see [http://en.wikipedia.org/wiki/Occam's\\_Razor](http://en.wikipedia.org/wiki/Occam's_Razor).

Executive Summary – M0001 / Knowledge Management Professional

1.) What is KM?

KM passes knowledge, relevant information with a context. The presentation of the information is important, the presentation should facilitate learning. People learn differently. The important thing, the question that needs to be asked, is “what do you want to pass, what is the goal”. This question should determine the presentation method.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

Not really. (4)

3.) Does KM support decision-making?

Yes, I think it does, but from my experience, the USFK KM cell was still developing. There was significant disagreement between KMO and IMO folks, the who was responsible for what argument. The IMO is responsible for the maintenance of the network, but who is responsible for managing the content and layout? (3)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

That was never well defined for me.

5.) What impacts have BCS had on information management and battle command?

Battle command systems provide the COP. The COP is really whatever the Commander wants it to be. Generally, this is 1.) location of troops; 2.) control measures; 3.) location of enemy forces. Battle command systems, information management systems, have resulted in information overload with large amounts of information in many different places. The staff is very important in analyzing information and making sure that the commander gets the right information, at the right time, in a usable format.

(4)

## Executive Summary – M0002 / Knowledge Management Professional

### 1.) What is KM?

Getting the right information, to the right person, at the right time

### 2.) How is the discipline of knowledge management unique from efficient and effective staff work?

There is very little difference in performance. However, KM, aspects of KM, are designed to capture knowledge and experiences so that it can be shared – knowledge sharing. Like wise, knowledge management also provides for, has created knowledge brokers or gatekeepers, individuals that either pass lots of knowledge, or have access to knowledge. These two individuals facilitate knowledge sharing / transfer. KMOs are important because they are identifiable and have command support. Also, staffs do not stay together. KMOs can bridge the experience of different staff groups. (2)

### 3.) Does KM support decision-making?

Yes, knowledge management gathers, processes and displays relevant knowledge to facilitate decision making. Commanders make decision based on their experiences, instincts, gut-feelings; their tacit knowledge enables their decision making. (5)

### 4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

The battle command officer assists in the operational plan, while the KMO moves across the organization to enable, and encourage knowledge sharing.

5.) What impacts have BCS had on information management and battle command?

Battle commands, information systems, have allowed a better common operational picture. The systems are beneficial. They have; however, led to information overload. (5)

Executive Summary – O0001 / Knowledge Management Professional

1.) What is KM?

KM improves the ability of an organization by enabling knowledge sharing across the entirety of the organization.<sup>1</sup> Unfortunately, the largest obstacle of knowledge sharing exists in the human dimension, people don't talk or collaborate. The larger and more distributed the organization the larger this obstacle becomes. As mentioned, it goes beyond collaboration, people simply do not interact.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

KM is different; KM is a focused effort to encourage, enable knowledge sharing. KM is an indirect activity. By that, you can't say, "manage knowledge and expect results." (4)

3.) Does KM support decision-making?

Yes, KM supports decision-making, everyone is a decision maker. (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

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<sup>1</sup> Carl Frappaolo, *Knowledge Management*,

I think the term BCO is confusing. I think a better term is BCI (integrator) or BCS (supervisor). The battle command officer should be ensuring that the commander is “fed the information” that he needs to make a decision. The KMO should develop information management protocols, and acts as the commander’s representative for KM processes.

5.) What impacts have BCS had on information management and battle command? Big difference! Battle command systems have not only kept the stove-pipes, they have made the pipes narrower and more rigid. They (BCS) has created the need for new disciplines, like information management and networking. BCS has also created the tendency to concentrate on the COP, thus staff work and battle command has become more about watching a system and less about processes and people. (5)

Additional Comments:

Q: “Can KMO fix poor staff officers?”

R: The volume of knowledge needing to impart, share, store or “manage” is overwhelming. Dr. Gil Ariely, and I tend to believe as well, that the knowledge manager within an organization is that organizations commander, or executive.

People can only handle 5 to 7 variables (+/- 2). Chunking allows small parts to be squeezed into larger parts.<sup>2</sup> These larger parts can be managed. Either way, large parts, or smaller pieces, need to be analyzed.

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<sup>2</sup> Malcom Gladwell, *blink*,

Commanders, with their staff, must execute decision making battle drills.

See first doesn't mean good decision. Historical information provides context, the ability to express future events in terms of past experiences.

Community of Practice vice Community of Purpose

KM requires trust. The three anti-obstacles are: 1.) Initiative; 2.) Culture/value of knowledge; 3.) experts in their area / "smart".

Q: "What training should battle command officers and knowledge management officers receive?"

R: Battle command officers must absolutely be experts on how information systems work. They must understand their commanders, and how the commander process information.

Executive Summary – JF0001 / Knowledge Management Professional

1.) What is KM?

Timely and relevant information to support decision making.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

KM is not unique to effective staff work. I've been using KM practices throughout my career. We are all responsible, to each other, as knowledge managers. (1)

3.) Does KM support decision-making?

Yes (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

They could be additional duties. If they are specific billets, they should report to the XO, or maybe they are special staff. They are two separate individuals. The BCO should be senior to the KMO. The BCO integrates the staff and battle command systems. The KMO facilitates the display of information.

The BCO facilitates the commander's visualization. The battle command officer is lens that moves art to science, and transfers science to art.

5.) What impacts have BCS had on information management and battle command?

BCS has promulgated mistrust in automation and information systems. A unit's ability to utilize battle command systems depends on the influence and priorities of the commander. But, the commanders don't understand what they have. This is an institutional issue. These systems support staff actions and the commander's decision making, but the boxes (particular ABCs system) are operated by junior enlisted men. (5)

In contemporary times modern information systems also provide, what was an amazing capability ten years ago, reach-back. Brigades, battalions even, have the ability, through classified networking, to assist each other with analysis and staff functions from the continental United States.

Additional Comments:

The decline in after hours social events, storytelling, has hampered knowledge sharing. These events were important socialization, externalization events, in which knowledge was explicated from one individual to another.

Executive Summary – JF0002 / Knowledge Management Professional

1.) What is KM?

The sharing of information.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

I don't believe it is necessarily different. Knowledge management, and efficient staff work, are not exclusive. It's like Lean Six Sigma; this process can be applied to any organization in order to increase efficiency. (2)

3.) Does KM support decision-making?

Yes, KM processes provide the Commander with the information that he needs in order to make a decision. (4)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

The KMO runs SharePoint, the web portals, to facilitate the sharing of information.

5.) What impacts have BCS had on information management and battle command?

Information flow, you're drinking from a fire hydrant. It isn't so much that the information isn't out there, rather, it is so difficult to find the right information and then manipulate it to a useable fashion. (5)

Executive Summary – F0002 / Functional Area 57, Modeling and Simulations Officer

What is KM?

KM is taking information, conducting analysis and putting it into a database, providing it for further recall and decision making.

How is the discipline of knowledge management unique from efficient and effective staff work?

Knowledge management is like staff work. Staffs work in the “now”, KM is sharing and saving information for future use and decision making. Knowledge is information with analysis; staffs analyze information, hence share knowledge. (1)

3.) Does KM support decision-making?

It is the basis for decision-making as opposed to gut reactions. (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

BCO is responsible for ABCs and the Army Digital Training Strategy. The KMO is responsible for data-basing knowledge and knowledge management SOPs. Both of these individuals work for the S3.

5.) What impacts have BCS had on information management and battle command?

Accessibility of information, information is easier to attain, it travels faster than ever before. The garbage in – garbage out maxim applies; inaccurate information produces bad knowledge, which equates to poor decisions. Analysis should be constant. Staffs must maintain running estimates. (4)

Additional Comments:

The individual interviewed received a graduate degree and has investigated decision support tools (computer programs) that would take free-hand drawn mission-task graphics, combine them with unit capabilities and provide a visualization of the unit conducting a tactical task against an enemy force.

Officer

1.) What is KM?

Streamlines information and harnesses the knowledge of the group.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

Not unique, KM does provide historical information and enable collaboration. (1)

3.) Does KM support decision-making?

Yes, brings relevant information. KM focuses the commander's decision making.

(5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

The BCO facilitates visualization and information flow (processes). The KMO deals with people (chat and protocols). The duties might be performed by one individual.

5.) What impacts have BCS had on information management and battle command?

They have provided a false sense of information superiority, and possibly enabled micromanagement. Digital C2 makes the location of individuals less important. (5)

Additional Comments:

SAF and JSAF could be used as rehearsal / war-gaming tools. However, there are too many inputs to get things going. It becomes a drill in managing icons. What would be helpful would be a print-out of decisions that the program made. That would help commanders, and staffs, produces decision support tools.

Artificial intelligence is still a program that makes a decision based on an algorithm; a series of variables produces a number which causes an action that is displayed on a computer screen. The difficulty is determining which “variables” to include, and how these variables are filled. If a crowd is going to riot, that causes it to do so (variable), how do you express anger, to the point of violent confrontation, as a number?

Executive Summary – M0005 / Functional Area 57, Modeling and Simulations Officer

1.) What is KM?

Knowledge management is the act of managing information, applying analysis or collaboration to make better decisions.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

No difference. Good staffs should collaborate; a lot of problems are attributable to an inexperienced and disorganized staff. They may be experts in their field, but they are unfamiliar working together as a whole. The group is important. Finally, a lot of staff officers, Military Intelligence officers in general, do not want to share information, or share “knowledge”. A fair amount of staff information is technical in nature, so the assumption is that other staff members will not understand, something ... a staff product, but in reality this is usually untrue since many officers have a good grasp of combat and combat support capabilities and their associated doctrine. (1)

3.) Does KM support decision-making?

Absolutely (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

Both individuals work for the commander, possibly within the S3 (operations) shop. They have to have some coordinating relationship with the S6 (network/communication) shop. The KMO, both actually, should really be someone that makes people get up and talk to people. In my last job it was amazing how often people would email a sentence, to the guy that was just down the hall, but in the same building.

5.) What impacts have BCS had on information management and battle command?

They have added complexity in numerous ways; one in particular is accuracy and fidelity of reporting. The saying goes, “the first report is always wrong.” Now-a-days, the “first report” can reach division headquarters before the “correct report” is created. Likewise, there is a need for analysis, in the past we produced EVENTEMPs to illustrate where the enemy might be in order to craft and conduct an intelligence plan, now we know where he is, but since we haven’t done the precursory analysis we don’t know what to do with the report. The additional analysis is not occurring. Similarly, with the three IED scenario. If the TOC (tactical operations center) receives three reports, over a period of time, by three separate individuals, of an IED at grid NV350128, is that three separate IEDs, three IEDs in one place, or the same single IED being reported three times by three different people? This was a real problem for us. (5)

Additional Comments:

Commanders and staff still aren't using all the systems. They develop an affinity for one and use it at the exclusion of all others. In my last BDE, no one used the MCS; everything was done on the CPOF.

Few people know how to use the ABCs systems, those that do are buried in work because they are doing the collective work (digital) of the staff. It is somehow easier, and preferable to wait, for one individual to input all of the information on the system as opposed to having lots of trained operators.

Although I was a BCO, I was in actuality the Asst. S3, the training officer. In Iraq, I was the "FRAGO dude."

Our division did have some success with KM initiatives. Our division web page had a KM folder, in which people could post their TTPs and so-on. The division staff then, supposedly, briefed the division Commander.

Executive Summary – M0007 / Functional Area 57, Modeling and Simulations Officer

1.) What is KM?

Sorting, cataloging and providing information and the context. Knowledge is information and experience.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

Staffs should understand KM practices; these processes should be integrated into staff practices. An individual can be appointed to develop a database, or sorting mechanism. He shouldn't have sole responsibility for maintaining the "system". (2)

3.) Does KM support decision-making?

Yes, if the products on-hand are useable. There is a significant trust factor. Trust and usability are important. You don't want to spend time re-working and analyzing someone else's product. Trust in the information, knowledge, is crucial ... trust, accuracy and recent and relevant. (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff? Who do they work for? What are their specific roles?

BCO should work training and training support issues, ABCs integration is important too. KMO should manage data, and information, on servers (PASS), MCS and web-portal content. BCO and KMO function, in total, are too much for one guy.

5.) What impacts have BCS had on information management and battle command?

A big difference. We are definitely moving towards information dominance ... in particular, the spreading of information. Lots of folks have stories about the relevance and importance of FBCB2 and BFT. (5)

Additional Comments:

Bad information can act like a virus, and contaminate the organization.

Specialty training and indexing training are required. Our portals are flat and they are rarely intuitive. (Knowledge architect).

Junior (officers, NCOs and Soldiers) are confident/competent on digital systems.

Executive Summary – M0006 / Functional Area 57, Modeling and Simulations Officer

1.) What is KM?

Controlling of information to support collaboration and decision making. KM practices should be constrained by conventions and an reasonable architecture.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

They are very similar effective and efficient staff work should facilitate knowledge management. The fact that few staffs are efficient and effective is an obstacle to knowledge management. (3)

3.) Does KM support decision-making?

Yes – The right information at the right time. (5)

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff?

I'm not certain I know. BDEs sure don't. A was assigned to a BDE as a 57, supposedly as a BCO, or BDE M&S officer. In reality I was another staff officer. No one seems to really know how we should be integrated, so much depends on the organization that you find yourself in.

5.) What impacts have BCS had on information management and battle command?

Huge! More information – but people don't seem to understand that more information equals better decisions. The two are not directly related. More information equals more information, and usually confusion. Tools, so many tools, and lots of folks don't know how to use more than a few. And, everyone wants something different, their little mark. One of my tasks was managing the seven different BDE calendars. After all the CDRs calendar is done one way, while the training calendar is done another ... the XO has to have a third calendar for himself, and so-on. (5)

Additional Comments:

The more the Army tries to standardize things, the less standardized they become.

Executive Summary – A0001 / Functional Area 57, Modeling and Simulations Officer

1.) What is KM?

KM is the process of sharing information and knowledge within an organization for everyone's benefit.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

No, staffs should be managing their own data, information and knowledge. The IMO established filing protocol, maybe the S3; someone establishes the standard by which things will be filed. The staff then executes appropriately.

3.) Does KM support decision-making?

Absolutely, the staff and the commander must be able to harness the collective knowledge to come up with a decision, or to recommend a decision.

4.) What is the relationship of the BCO and BCKMO within a division or BDE staff?

The BCO integrates ABCs machines and networks; maybe helps the staff do general staff things, depending on his background. The BCO is also the simulation and maybe the assistant training officer. The KMO probably focuses more of moving information and knowledge.

5.) What impacts have BCS had on information management and battle command?

Huge, things are changing rapidly as older staff officers become more aware of the systems, and new staff officers come in. Junior captains are completely comfortable with the systems; it's all that they know. That and they are generally more tech. savvy.

Executive Summary – SM001 / Senior Military Officer, CGSC

1.) What is KM?

Information management that allows for collaborative planning, it (KM) allows for on-the-fly coordination. It assists in planning by facilitating a Car's visualization and providing a means for assessment and immediate course correction.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

KM is an intellectual free-for-all, a collegial planning environment that leverages the experience of all the participants. KM initiatives develop an intuitive staff, one that know what they are about, and what the CDR is about. (3)

3.) Does KM support decision-making?

Yes, but only if it is good knowledge. If not, that's a bad thing. (5)

4.) OMITTED

5.) What impacts have BCS had on information management and battle command?

It revolutionized the Army. It has caused us to fight differently, for the first time in history, I can know exactly where I am, exactly where the enemy is ... and can engage him, through lethal means with pin-point precision and exceptional accuracy. In three

words is has revolutionized warfare by increasing certainty, lethality and sustainability.

(5)

Additional Comments:

The need for another individual is an indication that there is a “problem in the machine”, the systems are good but they are not entirely intuitive, like my iPod. That (iPod) is intuitive. Likewise, some of the systems come with a lot of baggage.

Executive Summary – SM002 / Senior Military Officer, CGSC

1.) What is KM?

Knowledge Management is the day to day management, sharing of information, to facilitate informed responses.

2.) How is the discipline of knowledge management unique from efficient and effective staff work?

Processes are similar, but purposes are different. The purpose is different, separate, because KM is a daily affair. KM is “full spectrum”; it is the specific process of filtering data and information to enable analysis, and ultimately decision. KM is about understood processes and organizational culture. KM is different because staffs use knowledge, presumably achieved through a knowledge management process, to conduct their daily business.

3.) Does KM support decision-making?

Absolutely, but not by itself.

4.) OMITTED

5.) What impacts have BCS had on information management and battle command?

BCS have provided the ability for greater, richer collaboration. However, they have also flooded our organizations with information. The large amount of information makes it difficult to establish priorities, which in, and of itself is a time consuming process.

Additional Comments:

KM, BCS integration and simulations training, that's too much for one individual.

Staffs are too inundated with information to adequately analyze the information that they have. In theory, "There is no such thing as too much information", but in practical application that is not true.

The three problems facing any organization are: 1.) establishing (and sticking to) priorities; 2.) time management; 3.) personalities and personal capabilities matter

Analysis is an uncommon art, "draw me a picture", analysis and decision occurs in the head. The process, the road to developing a decision, should be: 1.) I.D. the problem; 2.) conduct analysis; 3.) develop options

APPENDIX D

THE APPROVED RESEARCH INSTRUMENT

ATZL-SWD-QAO

15 NOV 07

MEMORANDUM FOR: MAJ Christopher Hartline

SUBJECT: Request for Research: Knowledge Management

1. Your request to conduct interviews of individuals at Fort Leavenworth per your application for research is:

- Approved
- Approved with Conditions (see below)
- Denied (see below)

2. Your Research Control Number is **07-038**.

3. You are required to submit an *End of Project Data Collection Report* to the CGSC Quality Assurance Office when data collection for your project is complete. This report can be found at:

[http://cgsc.leavenworth.army.mil/QAO/download/End\\_Of\\_Data\\_Collection\\_Report.doc](http://cgsc.leavenworth.army.mil/QAO/download/End_Of_Data_Collection_Report.doc).

4. The decision was coordinated with the following:

GDP Director    Agree With Decision    Disagree With Decision    Date

5. If you have questions, contact the undersigned at (913) 684-7331.

**// Original Signed//**

Ricky Steele  
CGSC QAO  
Survey Control

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