DIGITIZATION, LEARNING ORGANIZATIONS AND LEADERSHIP

A Monograph
by
Major Jack L. Gumbert II
Armor

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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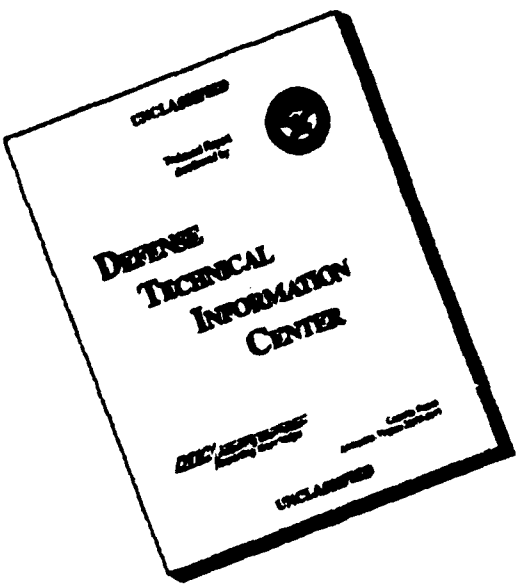

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ABSTRACT

Digitization, Learning Organizations and Leadership by MAJ Jack L. Gumbert II, USA, 54 pages.

This monograph discusses the implications of digitization and learning organization theory on leadership primarily at the tactical level. Digitization is a term widely used to describe the various technological efforts to improve battlefield operating systems. Learning organization theory is a popular methodology for enhancing the operations of complex organizations. Of particular importance is the positive effect learning organizations have upon the members of the organization.

This monograph first examines the capabilities of the tactical digital unit. Next, the monograph depicts the tactics, techniques and procedures of digital units. The Army current doctrinal leadership model is introduced to complete a presentation of what is presently known and available to Army leaders.

In response to the rapid and far reaching advances in technology, Army leadership is theorizing a new leadership model. This evolving leadership model has systems thinking, learning organization theory and the effects of digital technology as basic theoretical concepts. Systems thinking is a intellectual paradigm which involves holistic, dynamic processes. Some of the implications of these changes are new, many are not. A discussion of the leadership of Sitting Bull at the battle of the Little Bighorn illustrates how many learning organization concepts were used long before digitization existed.

The monograph analyzes leadership in digitized learning organizations. Army learning organizations will have the following theoretical constructs; personal mastery, mental models, team learning, shared vision and heroic leadership. Systems thinking provides the intellectual energy to bring these concepts to fruition.

Finally, this monograph discusses the implications these ideas have for leader development and training. Included are ideas for future digitized learning organization leader training.

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Major Jack L. Gumbert II

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Approved by:

James J. Schneider, Ph.D. — Monograph Director

COL Danny M. Davis, MA, MMAS — Director, School of Advanced Military Studies

Philip J. Brookes, Ph.D. — Director, Graduate Degree Program

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I Introduction

Throughout history, military leaders have wrestled with the question of how to lead their organizations.[1] Sun Tzu offered the military leaders of his day insights for effective leadership. He compiled sets of readings that have been studied for centuries by diligent students of military leadership. Likewise, the great Prussian theorist Carl von Clausewitz wrote at length about the necessity of good leadership and provided a glimpse of which leadership qualities were necessary to excel in combat. The writings of some leadership theorists posit principles to be followed to ensure effective leadership. Other theorists fill volumes with offerings designed to answer age old military leadership questions without enumerating specific maxims. Recently, the rapidly changing international security environment has led to a reassessment of all things including military leadership. The end of the cold war produced a dramatic change in the balance of world power. US Army leaders were accustomed to think in terms of the east-west challenge. Now, the global threat of the past 50 years is gone, replaced by unknown threats and different missions from that which our cold war army was trained to accomplish.[2] The Army understands that change will be a constant theme far into the future. Army leaders must recognize, understand and adapt to the changing environment within which they are called to serve.

Army military doctrine provides guidance to leaders in a series of field manuals designed to assist and support the military leader in the development of his art. Due to the changing nature of the security environment, many of these manuals are presently in the process of rewrite or revision. Concurrent with the revision of Army doctrine, there is an ongoing evolution of Army leadership theory and organizational theory. This progression can be

seen in the writing of many leading Army thinkers and writers. The basic theme of these authors is that the Army must change. Changes will occur in how the Army operates and how the Army understands itself as an organization.

One trend in the evolution of Army thought concerns the concept of the learning organization. This concept is borrowed from civilian management theory. One of the leading disciples of learning organization theory is Peter Senge. If the Army adopts some or all of learning organization concepts, it is likely that Senge's writings will have a significant influence.

Another trend within the changing American Army is modernization through digitization. Many of the signal and command and control processes will be "digitized" in the near future. Some modernization through digitization is already underway in the Army. Digitization promises to provide great benefits for Army leaders in many areas, not all of which are understood. The Army is presently conducting experiments to better understand the exact benefits of digitization and how to make best use of these benefits.

This paper will analyze the current Army effort into learning organizations and digitization. The analysis will focus on the effect of these trends upon leadership. Specifically, how will digitization impact a leader's ability to provide purpose, motivation and direction in Army learning organizations.

As mentioned previously, the U.S. Army is experiencing dramatic changes in the nature of war, in the environment of warfare and especially in the capabilities available to wage war. Together, these changes dictate a change in the nature of the relationship between the leader and the led. Like any organization, the U.S. Army must understand change in order

to prepare for the future. This provides the opportunity to keep abreast of new developments and prevents simply "reacting" to change. The Army Digitization Master Plan (ADMP) states, "Interoperable digitization of the battlefield has the potential to provide the means for the next renaissance of military art and science, in the same manner that the infusion of digital technology into the American society is providing the bridge from the Industrial Age to the Information Age."[3] In short, the Army must help shape the future by preparing leaders to maximize their personal leadership effectiveness in the Force XXI army of the future. Leadership will remain a key to success in future warfare. TRADOC[4] pamphlet 525-5, Force XXI Operations, recognizes the influence of future conflict on leaders when it states, "characteristics of recent operations reinforce the notion that the ambiguities and complexities of future combat require even greater leadership skills".[5] The Army must identify what these changing and ambiguous circumstances are, and what impact they have on future leaders. Additionally, the Army must determine what leadership skills are required for leaders to operate effectively in future combat. Understanding and anticipating change will prepare Army leaders to be effective in whatever mission they are called upon to perform. Training these skills and abilities must enter the leader training programs now, if we are to have viable leaders prepared for tomorrow.

ASSUMPTIONS:

The author makes several assumptions in the preparation of this paper. First, the technological advances and specific improvements in Force XXI army equipment and organization will occur. The Army has a concept of what it wants in terms of high-

technology digitization. The improvements in modernization through digitization are contained in the ADMP.[1] Second, there is the underlying assumption that leadership and command changes in relationship to changes in the technological state of the army. This might seem obvious to most serious students of history, but it is relevant to this study. Third, the Army will adopt the philosophies of learning organizations. Many of the ideas central to learning organization theory are already in practice by Army leadership or are congruent to current Army leadership theory. Further, tactical units at company, battalion and brigade level are organizations amendable to this process. The Army will continue to explore, experiment and adopt learning organization concepts.

PURPOSE.

This monograph will research the issue of leadership in digitized tactical units which operate as learning organizations.

METHODOLOGY

There are endless theories about how technology, specifically the advances known as digitization, will change the nature of leadership. This paper will examine some of the theories, concepts and ideas central to digitization and learning organizations. Initially, a definition of digitization is in order. Digitization is defined as the application of information technologies to acquire, exchange, and employ timely digital information throughout the battlespace. Digitization will be tailored to the needs of each decision maker (commander/leader), thus allowing each to maintain a clear and accurate vision of his battlespace which is necessary to support both planning and execution.[2]

Initially this paper will examine the current requirements and capabilities of the digitized

force. This will be followed by an examination of the written formal doctrinal leadership model found in field manuals. This framework is required in order to establish a foundation upon which to explore how leadership concepts are changing. Next the paper will explore what is determined to be the evolving popular leadership model mentioned in draft manuals and mentioned in respected military publications. There is no specific name that is normally associated with the new leadership concepts. This will provide a baseline for understanding the army leadership model currently in vogue, if not in doctrine. The model will include a determination of what direction the army appears to be headed with reference to leadership in the future. The perspective will be taken from a systems thinking paradigm, with an emphasis on learning organization philosophies. Determining the capabilities and requirements for digitized unit leadership will help ascertain if our leadership requirements are met by the leadership model. An understanding of the leadership model and the leadership requirements of the digitized force will provide the basis for understanding what changes in army leadership will be necessary in the 21st C. Additionally, the analysis will provide a view of how personal leadership could change in a digitized force. The implications of the analysis will be to provide ideas for the direction for leader training today, in order to have prepared and capable leaders for the digitized army of tomorrow.

II. Capabilities of the Tactical Digital Unit

The digital unit of the U.S. Army will have capabilities far advanced from non-digital (conventional) units. What exactly the changes in digital capabilities will be are not fully

known due to advances in hardware and software which continue at an unabated pace. Therefore, in order to discern what capabilities the digital tactical unit will possess, it is useful to examine the Army requirements for these systems. This will provide an understanding of what capabilities the Army has determined are necessary for future digitized units.

The Army Digitization Master Plan contains baseline requirements for digitization of the battlefield and future command systems. The operational baseline provides for the:

- Capability to react on information faster than the enemy.
- Enhanced situational awareness at all levels.
- Rapid processing and transfer of information.
- Faster and more comprehensive access to intelligence data.
- Increased ability to synchronize direct and indirect fires.
- Means to establish and maintain an overwhelming operational tempo.

The Army Global Command and Control System (AGCCS) will seamlessly interface with the Force XXI Battle Command, Brigade and Below (FBCB2) through the Joint Common Operating Environment (JCOE) as part of the Army Battle Command System (ABCS). The Army Tactical Command and Control System (ATCCS) will interface with FBCB2 into and under the umbrella of ABCS. This linkage will provide a complete holistic, seamless integration of the tactical battle. The Force XXI Battle Command Brigade and Below system provides digital connectivity from brigade to the weapon systems platform level, and is currently comprised of three general areas. Add-on packages known as "applique", which are processing devices connected to navigation

devices and radios to provide processing and display capabilities to platforms without the need for an embedded processor. Common software, hosted both on applique and embedded processors, that is interoperable with the C2 systems at brigade and above. The "Tactical Internet", battlefield communication systems are internetted using commercially based Internet protocols currently available "off the shelf".

The FBCB2 acquisition strategy will support Force XXI through the experimental process.[9] The process is geared toward experimentation, with some concurrent acquisition, in order to quickly move the Army toward tactical digitization. The Force XXI Battle Command Brigade and Below Operational Requirements Document (FBCB2 ORD) looks beyond current interim efforts, such as IVIS and B2C2, toward an objective C2 system for the 21st century. The emphasis is on developing situational awareness at all echelons.[10] This concept is designed to answer leader battlefield questions pertaining to his force, the enemy, and the situation.[11]

In order to answer these basic questions the FBCB2 ORD establishes functional requirements for each echelon from squad through brigade. These functional requirements include the platforms for each unit. It is important to describe the requirements for the systems so as to understand the nature of the capabilities of the Force XXI digital unit and their implications for leadership. Highlights of the functional requirements for each echelon are summarized in the following tables

Squad Section and Platform requirements
- Automatic position location and reporting. - Digital map with graphics and hasty mapping products. - Graphical display of radio net members and adjacent friendly units. - Display enemy locations. - Line-of-sight battlefield combat identification system. - Automated logistics and operational reports.

Table 1. Squad/Section Platform requirements.

Platoon Leader/Sergeant functional requirements include the above, plus.
- Synchronize and control sub-elements. - Create, send, and receive text and graphics. - Receive and consolidate status reports. - Calculate and display platoon center-of-mass (COM). - Display COMs across the battlefield, including adjacent units.

Table 2. Platoon Leader/Sergeant functional requirements.

Company Commander functional requirements include the above, plus.
- Automatically receive, consolidate, and transmit platoon reports. - Provide automated logistics roll-up. - Display COMs of CO TMs, adjacent BN TFs, COMs of all elements in battalion task force.

Table 3. Company Commander functional requirements.

Battalion Commander functional requirements include the above, plus.
- Provide access to ABCS. - Provide access to ATCCS to coordinate operations and support. - Provide a local area network for: 1. C2 vehicle (C2V) 2. Tactical Operations Center (TOC) 3. Combat and field trains

Table 4. Battalion Commander functional requirements.

Brigade Commander functional requirements include all of the above, plus.
- Provide access to all databases. - Link directly to both B2C2 (or its equivalent) and ATCCS.[12]

Table 5. Brigade Commander functional requirements.

There are other general functional requirements that FBCB2 users can anticipate. These functional requirements are summarized in Table 6.

General FBCB2 Functional Requirements.
- Transmit voice and data from the same platform without interference. - Automatically access multiple communications paths. - Operate systems that are user friendly. - Operate while on the move. - Access on line, embedded, or off-line training support packages. - Fuse digital terrain data and intelligence data into a graphic portrayal of the battlespace and situational awareness.[13]

Table 6. General FBCB2 Functional Requirements.

The development of systems that have the capabilities described above, will bring about a vast change in the way armies go about the business of war fighting. What is not so obvious is what these changes mean to the war fighter as leader. The predominant amount of conceptual work concerns heavy mechanized or armor forces. These units have a higher reliance on technology and therefore will receive an inordinate degree of the benefits of digitization at the tactical level.

Of particular importance is the work being done in conjunction with a number of institutions located at Fort Knox. The Armor School has instituted the Advanced Warfighting Working Group (AWWG) to explore the meaning of digitization on the battlefield. This ad hoc committee of subject matter experts, doctrine writers and interested others is chaired by the Commandant of the Armor School.[14] The Mounted Battlespace Battle Laboratory has sponsored a number of Advanced Warfighting

Experiments (AWE) in order to demonstrate new digital technologies and gain valuable "hands on" experience with digitized capabilities. A number of special text (ST) manuals prepared the doctrinal ground for the AWEs. The purpose of these STs is to provide tactics, techniques and procedures, and a common terminology basis from which the digitized force could operate. These special texts also provide insight as to how the Army envisions utilizing digital capabilities within Force XXI. A brief review of these texts will advance a practical understanding of current digital systems capabilities.

TACTICS, TECHNIQUES AND PROCEDURES FOR THE DIGITIZED TACTICAL UNIT.

A review of current special text material will provide a basis for completing a determination of what capabilities the leader of tomorrow will have available at the tactical level of war. This review will mesh tactics, techniques and procedures, (TTP) for leaders found in brigade and battalion level special texts which are currently available for mechanized units. The capabilities discussed are in addition to the capabilities normally found in non-digital units. The digitized tactical unit leader must be able to exploit the following enhanced capabilities.[4]

1. Enhanced Command, Control and Communications.
2. Fights decisive tactical engagements, transitions to other missions at an accelerated rate.
3. Increased lethality due to technological superiority.
4. Conduct deep, independent maneuver to achieve operational objectives
5. Influence a greater volume of physical space.
6. Provide force modularity by tailoring its organizational structure.

7. Enhanced precision movement and maneuver.

8. Enhanced force protection

9. Versatile employment.

When developed, these requirements point to a vast change in the execution of war. Leaders will be far more informed about the environment and situation of their units and the enemy. Therefore, the process of digitization will lead to a dramatic increase in the battlefield situational awareness of all leaders.[6] Currently, Army leadership doctrine is contained in a series of manuals, the capstone of which is FM 22-100. The current doctrinal Army leadership model will provide the ground work for exploring future leadership concepts.

III. Army Doctrinal Leadership Model.

Any model of leadership must begin by defining leadership. FM 22-100 defines leadership as,

> the process of influencing others to accomplish the mission by providing purpose, direction, and motivation.[7]

Field Manual series 22 contains the army leadership model. Of the five manuals in the series, FM 22-100 provides the doctrinal "how to lead" in a direct, face-to-face method.[8] This manual concentrates on an understanding of leadership at tactical levels. Using history as a guide, the FM identifies certain factors, principles, and competencies that effective leaders have mastered in the past.[9] There are four leadership factors: the led, the leader, the situation, and communications. The 11 principles of army leadership are

developed from this appreciation and study of history. Taken together within the framework of factors identified by the army, these provide a doctrinal structure for army leadership education and training. Within this framework, the Army addresses leadership competencies and styles which establish broad categories of acceptable leader behavior.[2]

Appendix A of FM 22-100 specifies nine leadership competencies which provide a basis for leader development and assessment.

1. Communications
2. Supervision
3. Teaching and Counseling
4. Soldier Team Development
5. Technical and Tactical Proficiency
6. Decision Making
7. Planning
8. Use of Available Systems
9. Professional Ethics

Every leader exercises the competencies in different ways and in accordance to their style and position. As with the principles of leadership, the competencies can be taught through the three pillars of leader development: institutional, operational, and self-development. The application of leadership to specific personalities is addressed in FM 22-100, appendix B, leadership styles. Historically, leadership theory identified two distinct leadership styles which operated on a continuum as either autocratic or democratic leaders. This conceptualization tended to be static, assuming that leaders adopted a style that fit

their personality and therefore used the same leadership style no matter what the situation The fixed predetermination of leadership style is no longer accepted. The Army now considers a range of acceptable leadership styles. FM 22-100, appendix B, addresses three basic styles of military leadership.

1. Directing - leaders tell subordinates what, who, where, how and when he wants something done, then closely supervises the accomplishment.

2. Participative - leaders involve the subordinates in determining what to do and how to do it. Leaders still make the decisions.

3. Delegating - leaders delegate problem-solving and decision making to subordinates.[41]

The basic concept underlying these military leadership styles is an understanding that leadership can be situational and that military leaders must be able to apply the appropriate leadership style to each situation. This demands an assessment of factors of leadership mentioned earlier, coupled with the personal self-understanding necessary to fit the style with the particular situation. Much of the emphasis for this situational leadership generated from social - behavioral science. The army adopted much of the work of Kenneth H. Blanchard whose situational approach to managing people was very successful in civilian applications.[42] Subsequently, the army refined the situational leadership techniques into doctrinal applications of a flexible nature, allowing military leaders the ability to match personality to situational leadership styles. The FM specifies that in order to apply the techniques of situational leadership the leader must understand the factors of leadership which include himself, the soldiers in his command, and the situation.[43] This monograph does not explore the issue of whether these factors and principles will change. Rather, the

present research will address the issue of what leadership concepts and skills must be added to the basic leadership model to keep it viable through the present period of vast change.

This model of leadership has served the Army well for many years. Currently, there are new ideas in leadership and organizational theory which must be allowed to rise to the awareness of the Army and its leadership. The Army states that it is a learning organization. What does this mean to leaders operating within the organization? What will it mean to leaders who will operate digitally in a rapidly changing environment? When these ideas are fully adopted what new concepts will replace or modify the traditional model of leadership?

What is vital to any change in the nature of leadership is an understanding of the impact upon the leader's ability to provide purpose, direction and motivation. These three aspects of leadership define the essence of good leadership. Leaders who cannot provide these three fundamentals will not effectively accomplish their assigned mission.

IV. The Evolving Army Leadership Model.

TRADOC pamphlet 525-5, Force XXI Operations states:

> Our Army also has recently changed itself to become a learning organization better suited to the wide variety of requirements for service to nation in a much different strategic environment.[4]

An evolution of army leadership is occurring in conjunction with the technological advances of recent years. In many ways the changing environment, as well as the pace of change, has altered the way the Army thinks about leadership. This seems evident in new leadership practices such as the situational leadership model mentioned earlier. Furthering the development and evolution of army leadership philosophies are the pronouncements by

senior army leaders that indicate the Army is adopting a new way of analyzing the environment. This new paradigm closely follows scientific advancements through an inter-disciplinary methodology known as systems thinking. Together, systems thinking and learning organization models are helping shape how the army leadership views the world, and the relationship of the army in the ever changing world security environment. Significantly, these concepts are creating new ideas of leadership and developing new relationships between leaders and subordinates.

SYSTEMS THINKING, LEARNING ORGANIZATIONS and DIGITIZATION.

The first concept relevant to modern leadership is systems thinking. This idea is not new, however it represents a true revolution in how individuals view cause and effect relationships. Further, it represents a unique method of understanding and analyzing the environment. Systems thinking involves establishing a new paradigm, a new world view. The over-arching importance of becoming a systems thinker is critical to being a successful leader in the future.

Systems thinking was popularized in the 1960s by Ludwig von Bertalanffy with the publication of General Systems Theory.[4] Systems thinking involves looking at the complete picture of events when determining cause and effect. The theory understands that there exists no true reductionism of cause and effect, apart from the scientific laboratory. There are many types of systems: open systems, closed systems, social systems, etc. The key point to understand is that systems exist within systems, and to realize that each action taken by a leader has an effect on some part of a system, often in an unintended way. This in turn may effect another part of a related system. Systems

thinking focuses on the relationships between the arrangements of the various systems and sub-systems that operate in the environment under analysis.[26]

Learning organizations are organizations that are designed, equipped and structured to learn at a rapid pace. They adapt, survive and grow within their environment by maximizing the capabilities of all members. Learning organizations are growth and success oriented. Peter Senge developed the phrase "learning organization" to describe those attributes he believed were necessary for an organization to become a truly emergent, adaptable organization. Senge wrote of five disciplines needed to be a learning organization: 1. personal mastery, 2. mental models, 3. team learning, 4. shared vision, 5. systems thinking.[27] Learning organizations can only be understood within the context of systems thinking. Senge described the relationship of the core disciplines to systems thinking in the following way,

"Systems thinking also needs the disciplines of building shared vision, mental models, team learning, and personal mastery to realize its potential."[28] Further he states, "I call systems thinking the fifth discipline because it is the conceptual cornerstone that underlies all of the learning disciplines."[29]

The five disciplines of a learning organization are defined by Senge as,

1. Personal Mastery - learning to expand our personal capacity to create the results we most desire, and creating an organizational environment which encourages all its members to develop themselves toward the goals and the purposes they choose.

2. Mental Models - reflecting upon, continually clarifying, and improving our internal pictures of the world, and seeing how they shape our actions and decisions.

3. Shared Vision - building a sense of commitment in a group, by developing shared

images of the future we seek to create, and the principles and guiding practices by which we hope to get there.

4. Team Learning - transforming conversational and collective thinking skills, so that groups of people can reliably develop intelligence and ability greater than the sum of individual members' talents.[30]

5. Systems Thinking - learning organizations cannot effectively operate unless the organization understands and adheres to systems thinking. Systems thinking is the ability to understand all the inter-related components and systems that is involved in creating the current situation. Further, it is an awareness of how these systems may dynamically change over time. This change does not occur in isolation, but happens in relation to each of the systems in operation. Systems thinking integrates the four other disciplines into a coherent body of theory and practice.[31]

To be effective in a learning organization the leader must adopt a new conception of leadership. Leaders must move beyond traditional roles and create learning organizations where they are designers, stewards and teachers who impart direction, purpose and motivation.[32]

In a learning organization the leader designs the organizational structure to take advantage of the inherent capabilities of the entire organization. This process involves integrating the five disciplines in order to gain a synergistic effect within the organization. The leader designs the organization in accordance with its vision, values and purpose. Thus, the organization develops direction and can accomplish any mission within a learning context.[33]

The leaders of learning organization must be stewards. They perceive the purpose of the organization and guide it toward goal accomplishment. These leaders understand the deeper meaning of why the organization exists and toward what ends the organization should move.[34]

Lastly, the leader of a learning organization should be a teacher. Teaching concerns helping individuals to learn how to learn, and empowering them to understand and cope with reality. Leaders must teach systems thinking coupled with an understanding of the purpose of the organization or mission. The ability to impart the "how" and the "why" of the organization motivates soldiers to learn and do while unleashing the creative tension needed to energize the organization.[35]

These disciplines, and the learning organizations they underlie, are bound in an environment more complex than ever known in the history of mankind. Indeed, mankind continues to create information that overwhelms the ability of any one man to manage. In creating such a complex environment man must develop a means to make sense out of the environment and each particular situation that arises. Complexity can easily undermine confidence and responsibility.[36] Systems thinking is an antidote to the complexity that engulfs army leaders. It provides a methodology to see and understand the environment and the relationships that exist between the complex systems operating in dynamic fashion throughout the battlespace. Learning organizations allow leaders to overcome complexity by giving leaders a method to adapt and grow within the dynamic, complex environment of combat. Learning organization theory is one of the key ingredients for battlefield success.

The digitized hardware of Force XXI will equip the leader with capabilities that will

facilitate learning organization processes. Digitization will help create the conditions for successful learning organizations by creating viable systems. These systems will enable the leader to share and process information thereby giving leaders a valuable tool to use in dealing with the complex environment. This in turn will reduce ambiguity and confusion through enhanced situational awareness. An example of how these systems may operate to maintain system viability follows.

Before a unit engages in a mission in combat, most if not all of the unit leadership has a common understanding of the situation. After the start of the mission the number of individual leaders with a common understanding of the situation is reduced over time and degraded by tempo and casualties. The effect of this process is that longer operations conducted at higher tempos result in fewer leaders with a common situational awareness. This process is represented in figure 1.[7]

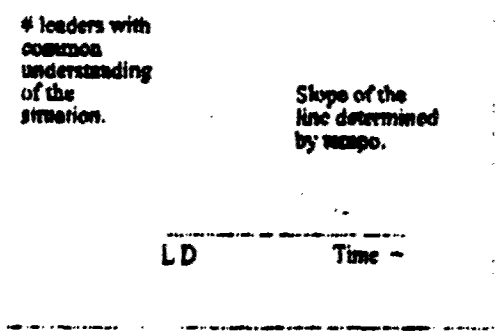

Figure 1.

Digitization will prevent the degradation of leader common situational understanding by allowing leaders at all levels to continuously share information. Therefore, digitization should work to reduce the slope

of the line induced by tempo, casualties and time. Further, if unusual circumstances prevent leaders from maintaining a relevant common picture of the battlefield, digitization provides a methodology to quickly recomprehend the unit situation. This type of information sharing has the capability to provide for the generative and adaptive components which are a requirement of growth oriented learning organizations. Together, digitization and learning organization theory will meld to provide a winning framework for leadership in Force XXI. There are other concepts which are relevant to the development of an evolving leadership model.

ADDITIONAL THEORETICAL CONCEPTS.

A recently published article placed the army within the context of a learning organization. Colonel Herbert Harback and Colonel Ulrich Keller identified four components of the new environment within which army learning organizations will operate. The components are: 1. ambiguity, 2. complexity, 3. speed, 4.organizational change.[8] These inter-related components will require army leaders to acquire skills that will allow him to operate effectively within this dynamic environment. The authors develop four elements required of a successful learning leader:

1. a learning philosophy which includes how to learn continuously.

2. group dynamics, which includes understanding and utilizing the group for generative growth and learning.

3. professional development which recognizes multiple developmental paths

4. synthetic theater of learning (STOL) which captures greater meaning than the three traditional pillars of leader development. (institutional, operational, self) to expand the

definition and concentrate on the intellectual development of the leader.[5]

Army leaders of the future will operate in dynamic, complex environments where the ability to learn will be as important as the actual individual lessons. Force XXI leaders will face situations where their ability to impart purpose, motivation and direction will be challenged in unique ways, due to the nature of this changing environment. The future leadership model must contain all the elements of systems thinking and learning organizations to obtain the utmost from the organization. These concepts will allow the army to reap the benefits of quality soldiers operating enhanced combat systems in unique, highly adaptive, flexible, organizations.

The Battle Command Battle Laboratory recently provided a glimpse of future changes in leadership in a briefing titled, "The Evolution of Army Leadership". This interesting document discusses how a future leaders stock of tacit knowledge may be more important than his stock of explicit knowledge.[6] Moreover, leaders skills and abilities will be more conceptual or cognitive than mechanical.[7] The briefing compares the old to new army leadership paradigm using the nine leadership competencies as a guide, while describing the specific differences in a digitized unit apart from a conventionally equipped unit. Some of the data considers the effect of digitization upon leadership. The following table highlights a few key considerations by leadership competency.

EVOLUTION OF ARMY LEADERSHIP FROM OLD TO NEW PARADIGM

COMPETENCY	OLD	NEW
Communications	Push to talk FM Send and receive information Linear, stovepipe, hierarchical	Watch and listen digital Assimilate information Multi-directional, echelon
Technical and Tactical Proficiency	Specialist Mechanical skills Knowledge and comprehension level	Generalist Cognitive skills Synthesis and evaluation level
Use of Available Systems	Apply known techniques	Develop and apply techniques
Decision Making	Static frame of reference Reactive, adaptive Minimize risk Analytical decision making	Dynamic frame of reference Proactive, innovative Maximize opportunity Recognition primed decision making

While the assumption is that basic leadership will not change, the table illustrates the specific differences in a few of the many leadership competencies. The briefing contained many other specific examples of change in leader skills. The summary slide proposed a concept called the learning leader. The learning leader would be flexible, versatile, adaptable and innovative.[12] Great leaders have always incorporated many of these talents into their leadership philosophies. The emerging doctrinal writings merely posit a change in influence or substance between the various qualities of effective leadership.

Throughout emerging doctrinal publications there exists a trend toward maintaining a human dimension to leadership. A decidedly main topic of FM 22-102, Command (initial draft) is the consideration of the human dimension on the ability to get soldiers into the fight.[13] The manual asserts that moral authority is the most effective means to exercise command and leadership.[14] Further, leadership is determined to be a projection of personality, character and

essentially creative in nature.[4] This draft manual also provides a more refined and detailed definition of leadership.

> Leadership is the process, through direct or indirect means, of influencing others to accomplish the mission by providing resources, purpose, direction and motivation and of creating the conditions for sustained organizational success. It involves the commander's ability to impart his vision of success...[5]

The direction and impetus of these new sources of thought is clear. The Army is moving the nexus or balance of leadership and command away from a strict scientific application of knowledge towards a more creative, intuitive process which emphasizes the human dimension of battle. Clausewitz called the development of genius, "*a harmonious combination of all elements*".[6] The combination of elements he would have called genius, the Army normally associates with intuition. The Army tries to instill these elements through a combination of training and education. Leaders must operate on many levels of thought and action combining various skills and methods to ensure mission success.

Future Army leaders must apply science through the window of human interaction and cognition. The development of sound leaders and decision makers will rest on the understanding of the full range of military possibilities in any situation. Intuition may hold the key to unlocking many of these possibilities. TRADOC pamphlet 525-200-1 defines intuition as, "the ability to demonstrate immediate cognition without evident rational thought and inference. It is in fact born from the range of experiences and reflections upon similar occurrences by the commander in the course of his development as a leader"[7]. This emphasis on dynamic, intuitive leadership seems counter-intuitive in an era of advancing technology and robust communications.

Yet, it is in the midst of such rapid and far reaching change that challenges to traditional

definitions of leadership principles abound. America has long enjoyed a love affair with high technology in warfare, and this relationship influences how Americans approach war making. This materialistic focus occasionally works to over-emphasize technological scientific advances over the human aspect and its improvement.[49] A new philosophy is called for, one that reestablishes the art form of leadership, not in contravention to scientific and technological advance, but in harmony with progress.[50]

Emerging Army doctrine appears to recognize the danger of emphasizing technology over people. Not only is the Army determined not to fall prey to a de-emphasis of its greatest asset (people), it would appear the Army is trying to re-establish a balance between science and the human dimension of warfare. TRADOC pamphlet 525-200-1 continues a discussion of the importance of good leadership by stating, "Leaders are the main source of will.... leaders are first soldiers; they must know and understand their subordinates. They must share their soldiers concerns, feel their pain, understand their pride... Leaders build trust and teamwork... Leaders inspire and direct forces and resources toward a purposeful end... providing the vision that both focuses and anticipates future courses of action."[51] Competent leadership is a absolute, necessary, precondition for success on the battlefield of tomorrow. No one knows exactly what the future may hold for Army leadership. However, a close examination of history or specific events in the past may provide clues into the future. An examination of the life of a great leader in American history may help guide the process of developing concepts for future leadership in the digitized learning organization.

SITTING BULL

Sitting Bull is a legendary figure in American folklore. For many years the popular press

pilloried the Sioux chief as a heathen bent on killing white settlers and preventing the western expansion of the country. Only recently have historians come to know more of the complete picture that surrounds the battle of Little Bighorn and the events that led up to that fateful day Emmett C. Murphy has analyzed Sitting Bull and the events leading up to the Little Bighorn.[50]

In his analysis Murphy describes features common to great leaders, which he calls heroic leadership. Murphy understands that many principles of leadership are timeless. Further, the analysis is conducted within a systems thinking framework, considering the environmental and situational context in which the participants operated. The theory of heroic leadership is set in the realm and conditions of a learning organization.

Sitting Bull united the tribes of the Southwest in a common effort against a powerful and cunning foe. Like any unit in battle the tribes were by nature, individualistic and prone to disagreement in their changing and ambiguous environment. The effect of Sitting Bull's leadership of the various tribes was to create a dynamic team with many of the same characteristics of a learning organization. Sitting Bull used concepts similar to the techniques of learning organizations to unite the tribes of the southwest. Murphy uses these concepts to describe heroic leadership. In developing the theory of heroic leadership Murphy finds thirteen traits common to heroic leaders which proceed through three phases of action.[51]

In phase one the leader assembles and integrate forces. During this phase leaders create commitment, build trust, increase power, live the experience of their people, are healers and communicate on many levels.[51] Leaders can accomplish these tasks by incorporating the traits of a learning leader. Developing personal mastery and sharing a common vision is key to creating commitment and building trust. Team learning is facilitated through living the

experience of the people and communicating on many levels. Developing rich, robust mental models increase personal power and assist in team and personal healing.

In phase two, heroic leaders project and apply the power of their assembled forces by thinking strategically, respecting the competition, redefining the rules of battle, knowing the terrain and "rightsizing" their forces.[55] These dynamics are central to learning organizations. The concepts relating to understanding the situation, the enemy and yourself are timeless leadership principles. Anyone familiar with military history will recognize Sun Tzu in this advice.

Finally, leaders must adjust their strategy through crisis management and evaluation by welcoming crisis and measuring results.[56] This allows leaders to anticipate problems, take charge of crisis situations and learn from the process. Additionally, leaders learn by measuring results and using the feedback process to share results with the team. The process is one of growth and accomplishment. The concept of heroic leadership is consistent with traditional Army concepts of leadership and with the development of learning organizations.

V. Leadership in Digitized Learning Organizations.

FM 100-5 states,

> The most essential dynamic of combat power is competent officer and noncommissioned officer leadership. Leaders inspire soldiers with the will to win. They provide purpose, direction, and motivation in combat.[57]

Given the digital environment and the evolutionary leadership model presented, what changes in leadership result from these influences. How will these changes impact the commanders ability to provide purpose, direction and motivation to the digitized learning organization in combat?

First, the development of systems thinking is paramount if leaders are to master the techniques of either theory. Leaders must be able to see their environment in its totality and just as reductionist pieces and parts. Digital hardware will assist the leader to accomplish this. Second, leaders must have extensive personal mastery of tactical and technical methods in order to effect their decisions. Third, there must exist a development process of rich, elaborate, mental, models capable of providing the background of knowledge needed to understand the situation. Fourth, leaders must develop combat teams which grow through team learning. Fifth, leaders must develop a shared digitized vision with their subordinates and allow them the latitude and authority to execute the plan within their intent. Lastly, Army leaders must accomplish the above within the context of heroic leadership.

Before a leader is able to take advantage of the changes in future warfare that digitization and learning organization theory present, the leader must become a systems thinker. Systems thinking is the framework upon which a new paradigm of leadership is built. Digitization is the hardware that will provide the capability to fully integrate systems thinking. The ability to see the whole situation and understand its relationship over time is of paramount importance to leaders. Without systems thinking the other disciplines of a learning organization become lost in unimaginative reductionism.

Leaders must be systems thinkers in order to understand the effect digitization will have on their organization, its people and their missions. Systems thinking provides the basis for integrating digitization into the organization and will facilitate the evolution of leadership by providing the intellectual acumen necessary to provide purpose, direction and motivation.

PERSONAL MASTERY.

The digitized leader will have to master many new skills in order to be effective on the battlefield of tomorrow. It is axiomatic that leaders must continue to be tactically and technically proficient. However, in the digitized units of Force XXI leaders need to take the competency of technical mastery to new levels. Of critical importance is developing a complete mastery of computers and an understanding of the processes by which they work. Such mastery will set a firm example for the troops to follow. Just like any other system the army has employed in the past, leaders must understand the system in order to make intelligent decisions concerning its use.

Mastery of computers and the related command and control processes provides freedom for the leader to visit subordinates. Not being tied down to the computer gives leaders the advantage of face-to-face communication with key subordinates, and the ability to provide the critical element of combat power-leadership at the critical time and place.[45] Further, a commander on the scene understands the human dimension of battle. The soldier's spirit and will to win are lost in the computer processed displays.[46] The commander's personal presence on the battlefield is essential for inspiring and motivating soldiers especially during combat.[47] Personal mastery allows leaders to be with their subordinates in time of crisis and success. Sharing personal experiences with subordinates helps leaders develop a heightened awareness level of the realities of combat. This provides an important, additional perspective from which to understand the effect of battle upon their soldiers. S.L.A. Marshall expressed this concept best when he offered the idea that the front is only understood through the eyes and minds of the men who fight there. Further, soldiers at the front know that a leader who is physically

present will understand their tactical problems and do all he can to help solve them."[61]

The aspect of computer personal mastery must permeate the leaders training program. The skills of computerized digital command and control may be relatively perishable, requiring constant practice.[62] Therefore, the effective future leader will have to master the computer processes he uses, and will have to continue to practicing his skills in order to remain "current". Beyond technical competence and skills, personal mastery means understanding what is important and includes learning to understand current realities.[63] Personal mastery is a type of baseline capability of knowledge and thought which must exist in order to experience further leader growth and cultivate an organizational climate conducive to expansive learning."[64]

Leaders must develop personal mastery of computers in order to have the time to exercise reflective thought. Reflective thought and introspection are mental processes the leader uses to develop expertise. Synthesis and integration of information are the underlying processes the leader uses to learn and increase their level of expertise."[65] In order to "see the big picture" leaders must have the time to remove themselves from the detailed complexity of running the organization. Detailed complexity is all the information available on a given subject at a given time."[66] This period of reflective thought allows the leader time to analyze the environment and place available information in terms of dynamic complexity which has time and space as ingredients. Cause and effect are not easily recognized and the effect of a leader's actions over time are not obvious."[67] Understanding in an environment of dynamic complexity requires a leader to take the time to think about the situation. Without personal mastery leaders will be forever lost in the detailed complexity of the situation.

MENTAL MODELS.

Much has been written concerning the need for leaders to exercise their intuitive sense on the battlefield.[6] What is intuition and how does it work to make leaders more effective in combat? How is it that some leaders just "know" the right answers or the proper thing to do, or the right question to ask? Much of these answers rest in a concept centered around how expertise is developed and the knowledge that some exceptional leaders seem to possess.

Leaders must develop elaborate mental models (some research refer to frames of reference), in order to equip themselves with the mental tools necessary to cope with complex, dynamic, ambiguous situations.[7] Leaders must formulate these elaborate mental models as part of developing the expertise needed to become effective as commanders.[8] As leaders experience and learn within a particular knowledge domain they develop rich, complex, elaborate mental models to organize, store and use large amounts of data.[9] The leader on future battlefields will have tremendous information gathering capabilities. This will improve his ability to visualize the learning organization in combat. However, this increase in information will not eliminate ambiguity or uncertainty.[10] The elaborate mental models provide the leader the mental tools which help them deal with multiple interpretations of data and conflicting reports. Therefore, expert leaders are more adaptable to new and uncertain circumstances than individuals without these capabilities.[11] Leaders with rich mental models may be able to quickly discern patterns in seemingly unrelated information that are unrecognizable to other individuals. The mental model process is part of the cognitive development of intuition in the effective learning leader. There are other factors which work with the development of elaborate mental models.

Leaders must understand how they think about a problem in order to understand if they are "on track" in problem solving. Expert leaders possess a quality known as metacognition. This quality is the ability to monitor one's own thinking, choose the appropriate problem solving approach or adapt an existing approach to the unique situation."[74] These metacognition skills are valuable to leaders when deciding to trust their intuition."[75]

A related concept to the development of intuition is "tacit knowledge". Tacit knowledge has three characteristic features: it is procedural, taking the form of "knowing how", it is instrumental to goal attainment, and it is acquired with little help from other people. Tacit knowledge often is unknown to the user, or poorly understood relative to its importance. This trait is important because it helps leaders adapt to, select and shape behavior to the environment."[76]

Mental models, metacognition and tacit knowledge are all part of the intellectual development necessary for Force XXI leaders. The ability to apply the "art" of leadership on the uncertain battlefield of the future demands leaders who can creatively use their forces and soldiers to meet the enemy in the most intelligent and purposeful method available. They must understand the holistic systems approach to apply complete and seamless creative leadership. Only leaders who develop these skills to a high degree of refinement will be able to impart the proper purpose and direction for their force and thereby dominate the future fight.

Whatever the underlying cognitive process, what will leaders use these skills to accomplish? A concept related to the development of mental models, is the cognitive process leaders utilize when exercising their reasoning skills or intuition to address a problem, situation or decision. Specifically, how do leaders use their cognitive skills to adjust to and make sense of their

individuals and their environment.[7] A simple model of how leaders make use of the cognitive processes can be visualized as:

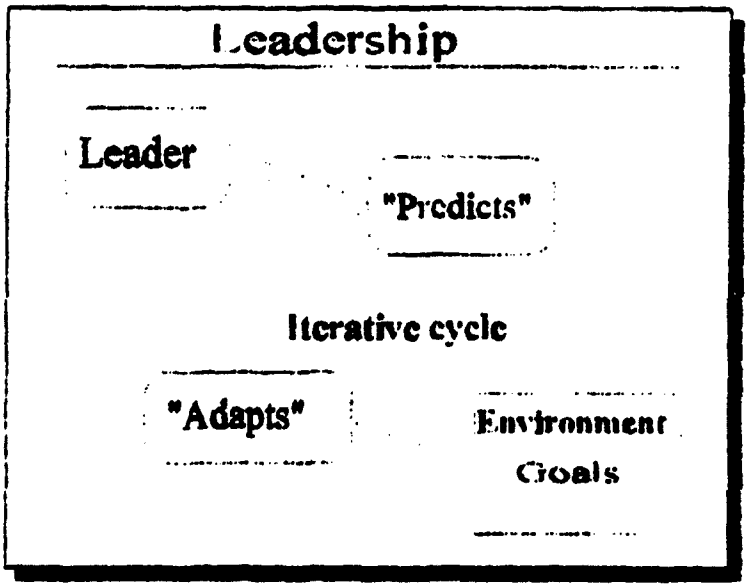

Figure 2.

The model demonstrates the ability of leaders to predict the conditions of their environment in the context of goal setting, within their understanding of the environment. In ambiguous and complex combat environments forecasting may be a more accurate description of the ability of leaders to anticipate future requirements. The leader then adapts himself and the organization to his forecast. In this way the leader can understand and provide purpose for the organization. Visualizing the future fight is a critical requirement often mentioned in doctrinal literature.[8] The process occurs concurrently with feedback from the environment and analysis of the situation. This process is an iterative, dynamic, predictive adaptive cycle which continues indefinitely throughout the term of the event, or until goals are reached.[9] For information age leaders, the model provides an ability to dominate a battlefield situation

because it promotes quicker adaption and prediction times. This capability is facilitated by faster information via digital processes. When coupled with leaders who can make use of the information, this will allow leaders at all levels to operate within the decision cycles of their opponents. This process will assist leaders in providing direction for their organization.

TEAM LEARNING.

Leaders must set the conditions for the generative growth of individuals and ideas within a learning organization by exercising team learning. Team learning allows the very best talents and abilities within individuals to come to the surface.[80] The Army is made up of a variety of organizations. Each individual unit can be thought of as a team. Together, the army consists of a system of teams, bound together by organization, mission or situation. Leaders must understand how to create conditions which exact the most from these teams. Providing the conditions for successful team learning helps accomplish this goal. How does a leader then set the conditions for creative team learning and the generative growth of the soldiers in the team, which in turn provide purpose, direction and motivation?

1. Instill trust and confidence. This facet of good leadership has been a requirement of successful leaders for eons. The leader as commander must permeate his will throughout the organization.[81] The leader accomplishes this through the development of trust and confidence. However, in the digitized era the concept of trust and confidence will take on a different dimension. Dr. James Schneider postulated the theory of the empty battlefield to demonstrate how the effects of technology and doctrine were dispersing troops on the battlefield.[82] This led to a decrease in moral cohesion. Digitized units will be able to become even more dispersed due the C3 capability of these units.[83] Trust must span the distance between soldiers in order

for the individuals to operate as an effective team. Therefore, soldiers must trust the digital systems as well as the leaders using them.[82] Trust and confidence is initially built through inter-personal contact between leaders and subordinates.[83] The training a unit receives prior to combat provides the base upon which trust and confidence are built.[84] After combat is joined, trust is maintained or elevated through mutually shared experiences.

The key to integration of replacements and the maintenance of established relationships may lie in the effectiveness of the leaders inter-personal skills. Leaders will rely on implicit and explicit communications to convey their message. Implicit information is faster and more effective than explicit information.[85] However, in order to be effective with implicit communications the communication must be based in a shared understanding of the context and content of the message. This is not always possible with new soldiers. Therefore, the leader must demonstrate effective inter-personal skills to integrate the new soldier within the flow of implicit communications.

The process of information flow and effective communications includes more than the ability to simply pass data. Leaders must be able to judge the emotional and psychological state of their soldiers. Presently, tactical digital systems do not provide a methodology for transferring this important aspect of communication. Therefore, voice FM or face to face communication remains the only way to pass non-verbal information. Leaders must look in the eyes, or hear the voice, of subordinates in critical situations.[86] The ability to transmit various forms of communication, (including voice and inter-personal) was a important piece of the communications plan during Advanced Warfighting Experiment (AWE) "Focused Dispatch". The communications plan provided the specific times when messages would be sent digital or

voice. Any time a subordinate came into contact with the enemy or a critical situation developed the message traffic was via voice. The reason was two-fold. First, voice traffic via FM is currently faster than digital. Second, the commander wanted to hear the voice of his subordinate to listen for non-verbal clues.[9] Further, the immediate response of FM voice allows the leader to maintain trust and confidence. TRADOC Pam 525-200-1 states the matter succinctly: "A soldier's spirit and will to win are lost in the computer processed displays".[10] Trust and confidence are key components of motivation in soldiers.

2. Allow for generative development by empowering subordinates. Subordinates and leaders must be able to share ideas and concepts in a way mutually beneficial. Senge in his book, The Fifth Discipline, discusses the use of two types of communication, discussion and dialog. Discussion is occurring when the subject to be analyzed is dissected from different points of view with one or more positions determined to be correct or superior. Dialog occurs when the participants collectively work to access a larger meaning, providing a free flow of ideas and move to a greater capacity to learn.[11] Soldiers understand there are many occasions when discussion must place. Soldiers also know that sometimes purely one way conversations will occur. However, there is a time and place for dialog within the army. When analyzing a problem or confronted with a situation the leader must trust in his subordinate to help devise a solution. Soldiers who believe they are an integral part of the organization will participate fully in the execution of the mission.

Digital systems must be designed that allow for the empowerment of subordinates. Systems that mesh audio with video capability offer the most promise. Current digital systems, such as those utilized during AWEs Dessert Hammer and Focused Dispatch, may work to deny

important information from the leader in terms of non-verbal information and psychological indicators.[92] Current digital systems require a high proportion of interface conducting "house keeping" tasks. The systems are very complex, but are not necessarily easy to use. The result is leaders and soldiers to spend precious time and energy managing the computer. In the future, computer systems must become sophisticated versus complex. Sophisticated computer systems will be easy to use, easy to manage and will incorporate pull type data. This development will free the leader to spend time using his creative processes in other ways.[93] Further, sophisticated computers will empower subordinates to think by expanding and assisting the creative process. Eventually, computers will promote generative idea sharing through inter intra active use.

3. Leaders at all levels should allow maximum freedom of action for subordinates to accomplish their missions. Digital systems offer tremendous opportunities for leaders to generate an accurate situational picture of the battlefield.[94] Leaders should not use these systems to pre-empt the command or leadership prerogatives of subordinates.[95] Over-supervision can damage command climate. Further, leaders who misuse digitized equipment could lose the necessary interpersonal contact mentioned earlier.[96] This development could have a negative impact upon motivation. There may be important information available to the subordinate, not accessible to the higher leader, which impacts future decisions. Increased situational awareness does not equal perfect situational awareness. Until it does, mission-oriented subordinate execution of centrally planned orders will remain central to army ethos.

The army believes in the concept of mission-oriented orders. Mission-oriented orders were generally adopted from the German concept of Auftragstaktik. The basic concept being to

empower subordinates to accomplish missions within their capability, by means of their own choosing, within the intent of the commander.[97] The process of mission-oriented orders works to develop subordinate responsibility. Empowerment of subordinates is a key concept behind developing team learning. Empowering subordinates increases their desire and capability to learn. Team players must understand that they make a difference in the organization and are not simply easily discarded spokes in the wheel. Truly dynamic team learning is not just "groupthink", but a genuine learning advance for every individual in the group.[98] Further, team learning is a necessary element in the development of purpose and direction for the organization.

SHARED VISION.

Shared vision is a creative process which seeks to answer the question "what does the organization want to create"?[99] At the tactical level this concept has utility in an organizational sense and in a tactical mission sense. Shared vision means allowing leaders to work together to develop a vision for the organization that every member believes in. Allowing for the contribution of all members in developing the shared vision will promote a vested interest on the part of each in the accomplishment of the organizational goals. This provides focus, energy and purpose for the organization.[100] This process also supports the development of organizational direction. Vision is the glue that binds individuals to each other, to the organization, and to the personal and organizational goals that each are trying to achieve. Digitization is the catalyst that helps solidify the gluing process. Further, digitization will provide leaders the ability to keep the soldiers in their organization with a common understanding of the situation. (see figure 1). A common understanding will

provide a sharp focus toward organizational vision.

Vision for the tactical leader as commander means developing a proper end state, understanding the nature of the operation, and the purpose of the operation as a whole. These are the elements which comprise the commander's intent. The commander's intent is time or event specific, but operates to guide the unit toward mission accomplishment in much the same way as shared vision does for the organization. The result is a sense of purpose for the organization and a sense of direction for its members. In a learning organization, Army leaders must be proficient at developing both types of vision.

HEROIC LEADERSHIP.

The US Army is an organization that exists to fight in combat and win wars. Because of this requirement the Army as an organization will be similar, but never identical to civilian organizations in the standards it has for leadership. The Army leader must maintain the highest levels of professional competence and personal commitment. In business, people do not normally die because of the decisions of its leadership. In the Army, death, sacrifice and loyalty are components of the environment the Army leader must understand. The Army leader face situations where they order subordinates into harms way. It is essential that the leader understand the dynamics and the personal nature of this problem. Army leaders must make it clear that there exists a sense of purpose and meaning to the decision. Soldiers want to hear their commanders voice or sense his presence before committing to battle. The advances in digital communications do not always allow for the complete communication needed by leaders. The following passage by the commander of the battalion that conducted AWE "Focus Dispatch" demonstrates this aspect of heroic

leadership.

"Orders to units that require people to go kill other people must be made by voice...Platoon leaders want to hear their commanders voice...critical information must still be face to face, or by voice in order to feel the situation."[101]

It is because of the unique environment within which Army leaders operate that heroic leadership is essential. The heroic leader understands the effect of battle upon his soldiers and the systems they operate. Further, the heroic leader knows that battle influences every system that comes into its domain. Intuition and experience bring insight which the Army leader must use to the advantage of the organization and particularly the soldiers fighting to survive as a part of the organization. The Army leader must go beyond the designer, steward, teacher components of the learning organization leader. The Army leader must imbue the traits of heroic leadership that propelled Sitting Bull to greatness. The heroic leader will provide purpose, direction and most important during the fight, motivation for the soldiers and the organization.

VI. Implications for Leader Development and Training

Today and in the future leadership will depend on its educational and intellectual foundation more than ever before. For the leader failure to think becomes a failure to lead.[102] In order to prepare Army leaders to be effective as a leader in the digitized Force XXI of tomorrow the Army must start training these leaders today. The future battalion and brigade commanders for the Army in the year 2010 are currently first lieutenants and captains.[103] These future leaders are learning how to lead and command via the experience and education they are receiving now. This paper points to a number of implications for

the training of future leaders who will lead digital learning organizations in combat

1. Leaders at all levels must receive superior instruction on the use of computers. While the youngest people in our society have had the most exposure to computers, that does not automatically mean that they will have the proficiency required to master computer processes. Much of these future training requirements could reside in the self-development pillar of leader training

2. Leaders must become systems thinkers. The development of systems thinking needs to start with an understanding that this process is not automatically the providence of the most educated or the most intuitively gifted. Currently, our system of military education does not develop systems thinking.[64] Developing systems thinking is imperative for providing the leaders that can creatively leverage the dynamic learning organizations of the future. The process of teaching systems thinking must begin early in the development of leaders. Education which stresses systems concepts should start at the entry level. Systems thinking should permeate all subsequent educational and operational experiences.

3. Leaders must develop mental agility, exercising adaptive understanding and predictive perception. These thought processes can be developed and exercised through mentally stimulating training that challenges leaders to quickly, yet comprehensively provide answers to battlefield problems. A simple example may serve to illustrate this concept

Current field training exercises and computer simulated exercises normally have the following basic format The unit leader receives a mission, conducts decision making, issues an order, and executes the mission. During this process there may be a situation change significant enough for the issuance of a FRAGO. To stimulate mental flexibility

and agility. future training events may be designed so that the basic mission changes sometime prior to execution. This will require the leadership to quickly redesign the operation. Further, during execution, three or more situation changes requiring FRAGOs will stress the flexibility of the initial order and the mental agility of the leadership. The answers do not always have to be "right", it is the thought process which is important. Errors in solution must be tolerated if the development of thought process is the goal. Further, working with senior officers on a regular basis will assist the young leader in broadening his view. The senior officer component of teaching is important to developing leaders in learning organizations. Computer simulations which allow leaders to experience a wide range of situations will provide insight into the leaders cognitive process. Adding a variety of levels of difficulty and ambiguity will help teach leaders how to deal with complexity.

4. Leaders must thoroughly understand mission type orders, and the effect of superseding subordinates by micro-managing. The learning organizations of the future Army will take full advantage of decentralized execution of centrally planned operations. The five disciplines of a learning organization are predicated on senior leadership allowing the learning process to take place. This requires leaders who understand that decentralized execution is not just a mission orientation, but a learning methodology. Further, mission type orders are a engine of generative growth for soldiers and the organization to which they belong.

5. Leaders must have realistic and varied training experiences. This is an often declared goal of training managers, the question is, why this is important? Realistic and varied

training experiences work to develop elaborate mental models in leaders. This in turn assists the incorporation of tacit knowledge and intuition. Together, these abilities facilitate the leaders decision making process. This development will enable leaders to operate in familiar circumstances or, in vague, ambiguous or new situations.

VII. Conclusion

The international and domestic security environment is replete with signs of rapid and continuous change. Gone are the"good old days" when Army leaders could apply doctrinal solutions to the predicted mass warfare of Central Europe. Today the Army has no clear enemies, has seen an expansion of its traditional roles, and can expect to fight as power projection force with little warning, anywhere in the world. Coupled with modernization of equipment, changes in doctrine, and changes in structure, these development all point to a new Army far different from that which executed the Gulf War only four short years ago. These immense changes demand that Army leadership make the absolute best out of available systems. Further, new concepts and evolutions of old ideas will combine to offer a multitude of options for channelizing and promoting the benefits of new technology. Digitization and learning organization concepts are two ideas that can fundamentally assist Army leaders now, and in the century ahead. These concepts must be melded together for combat through new leadership.

Digitization will offer many advantages to leaders at all levels. Of particular importance will be the increase in acuity of situational awareness. The ability to rapidly communicate and share information will be a natural consequence of digital development. The leader

task becomes in learning how to use this technology to exact every possible benefit, while remembering its limitations.

Many core Army beliefs are inherent in a learning organization. The principles of Army leadership and the competencies required of leaders will not fundamentally change. The twin concepts of decentralized execution of centralized plans and mission oriented orders are clearly compatible with learning organization theory. The learning organization leader as designer, steward and teacher is also understood in Army leader ethos. However, the Army leader must also be a heroic leader if he or she is to provide the purpose, direction and motivation vital to success in the Army of the future.

With the advent of digitization it is a good time to incorporate the concepts of learning organizations. The combination of digitization and learning organizations will furnish the Army a decisive advantage over future enemies. This combination will also provide the framework for the growth and maturation of a whole new generation of leaders prepared and capable of leading the American Army into the 21st century.

ENDNOTES

1.Numerous books and articles discuss the dynamic of leaders attempting to understand leadership. Some authors develop theories of how once effective leadership is understood, it can be applied to the situation at hand, while other authors attempt to demonstrate the existence of universal leadership principles which transcend time. A few of the more contemporary authors relevant in this discussion include. John Keegan. The Mask of Command. (New York, NY: Penguin Books. 1987) Introduction. Martin Van Creveld. Command in War. (Cambridge, MA: Harvard University Press, 1985) Various sections with reference to leadership in command.

2.The changing environment and capabilities to wage war are discussed by General Gordon R. Sullivan and Colonel James M. Dubik in. Envisioning Future Warfare. US Army Command and General Staff College Press. Fort Leavenworth, Kansas, 1995.

3. Army Digitization Office. The Army Digitization Master Plan. Headquarters, Department of the Army. Washington, DC. Jan. 1995. p. 2-1.

4. TRADOC pamphlet 525-5. Force XXI Operations. United States Training and Doctrine Command. Fort Monroe, VA. December 1994.

5. The Army Digitization Master Plan.

6. Louisiana Maneuvers briefing slides, provided September 1995 by BG Ohle.

7. The Army Digitization Master Plan. Horizontal Integration of Battle Command Mission Needs Statement, Army Digitization Office. Headquarters, Department of the Army, Washington, DC. Jan 1995. p. 2-5.

8. The Army Digitization Master Plan. P. 2-9. p. 2-10.

9. Ibid. p. 2-10.

10. Ibid. p. 2-12.

11. Ibid. p. 2-13.

12. Ibid. p. 2-13, 2-14

13. Ibid. p. 2-14.

14. Interview with Major Robert Valdivia and Major Chris Mitchell conducted at various times between August and October 1995. As doctrine writers at The Armor Center these individuals, along with many others, contributed to the conceptual work on digitization initiated by BG Lon Maggart in the Advanced Warfighting Working Group. This committee was initially an ad hoc group of thinkers, theorists and warfighting practitioners whose intellectual capital BG Maggart relied on to test, evaluate and formulate ideas and concepts relating to future battle doctrine.

digitization and Force XXI.

15. ST 71-3. p. 3-3 through 3-6. In addition see. Special Text 71-2-2 (Revised Draft). Tactics and Techniques for the Battalion Task Force. US Army Armor School. Fort Knox. KY. Jan 1995. The Battalion level manual is predominately TTP. the Brigade manual contains some theoretical and conceptual work which adds body to its discussion of capabilities. employment and doctrinal usage of the digital force.

16. Discussion of the advantages of enhanced situational awareness through digitization is found in various sources. There exists some disagreement as to just what advantages will actually occur. However. the end result is also a function of what systems are fielded. Therefore. the jury is out on what to expect from digitization and modernization in general. See ST 71-3. ST 71-2-2.

17. United States Field Manual 22-100. Military Leadership. Washington DC: Headquarters. Department of the Army. July 1990

18. Ibid p. ix.

19. Ibid p. viii.

20. Ibid p. 66.

21. Ibid p. 69-70.

22. Blanchard. Kenneth H. Situational Leadership II. The Article. Blanchard Training and Development. Inc. Escondido. CA. 1985.

23. FM 22-100. p. 3.

24. TRADOC pamphlet 525-5. p.4-1. p.4-11.

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47. Clausewitz. Carl von. On War. edited by Michael Howard and Peter Paret. Princeton University Press. Princeton. NJ. 1976. p. 100.

48. TRADOC Pamphlet 525-200-1. Battle Command. U.S. Army Battle Command Dynamic. Headquarters. U.S Army Training and Doctrine Command. Fort Monroe. VA. 1 Dec. 1994. p. 4

49. Many efforts exist which chronicle the high technological reliance of US soldiers and doctrine. Worthwhile is Martin Van Creveld. Command in War, chapter 7. Further, An American View of War. Corps and Division Doctrine Directorate. US Command and General Staff College. Fort Leavenworth, KS.

50. Special Text 71-3, Tactics, Techniques, and Procedures for the Digitized Brigade. US Army Armor Center. Fort Knox, KY. Feb 1995. p. 4-2.

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52. Murphy, Emmett C. The Genius of Sitting Bull. Prentice Hall. Englewood Cliffs, NJ. 1993.

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61. Marshall. pp. 102-105.

62. Major C. F. Edwards III. U.S.A. "Digital Battlefield Training and Tactical Insights of a User." Armor. (May-June 1995). p. 13-14.

63. Senge. The Fifth Discipline. p. 141.

64. Senge. ch. 9.

65. Army Research Institute. The Human Dimensions of Battle Command: A Behavioral Sciences Perspective on the Art of Battle Command. ARI Battle Command Research Unit. Fort Leavenworth, KS. p.16. The discussion of reflective thought is found within the broader examination of the development of expertise. The emerging expert is thought to utilize consistently developing mental models upon which to draw perceptions of the world and reach understanding of complicated events. The topic of developing mental models is topic of the next section of the monograph.

66. Being unable to find a succinct enough definition I developed this definition of detailed complexity with reference to the theory of complexity and systems thinking.

67. Senge. The Fifth Discipline. p. 71.

68. A discussion of intuition invariably starts with Clausewitz in chapter 3. "On Military Genius" Clausewitz was describing what he considered military genius. today we hold many of these same qualities as attributes present when a leader is said to possess a highly developed sense of military intuition. Other. more modern discussions of intuition are in. The Human Dimension of Battle Command and Madigan and Dodge. "Battle Command: A Force XXI Imperative". Military Review. November 1994. p.34.

69. Howard T. Prince II. "Developing Leaders for Force XXI Battle Command". AUSA Symposium. San Jose. CA. p. 3.

70. The Human Dimension of Battle Command. pp. 14-15.

70. Ibid. p. 16.

72. Many publications speak to the future environment of combat. Most indicate that combat will be full of ambiguous. complex situations. Certainly. Clausewitz would have recognized the idea that the fog of war still exists no matter how good our information systems become. In this regard see Van Creteld. Command in War ch.7. Concerning the environment of future war see TRADOC Pam 525-5. p.3-4. also see Harback and Keller. "Learning Leader XXI" p. 33. for a discussion of ambiguity.

73. The Human Dimension of Battle Command. p. 16.

74. Ibid. p.17.

75. Ibid. p.18.

76. Ibid. p. 27.

77. To discuss all or even some of the various models of leadership. analytical decision making or cognitive process is well beyond the scope of this paper. A good discussion of some of the relevant studies and background material can be found in ARI study 95-01.

78. Nearly every published doctrinal statement in the last four years talks to commanders visualization of the battlefield. A recent document which provides a succinct definition of battlefield visualization is TRADOC Pam 525-XX. Battlefield Visualization Concept. Department of the Army Washington DC. 1 August 1995. This document describes visualization as a three step process. p. 3.

1. Understand the current state of friendly and enemy forces.
2. Clearly discern a desired end state
3. Ability to see and understand the dynamic relationship and sequence of activity between the

current situation and the end state.

79. The predictive/adaptive leadership model was presented to me in an interview with BG Ohle, Deputy Commandant, Command and General Staff College, Fort Leavenworth, KS, 29 August 1995.

80. Senge, The Fifth Discipline, p. 236.

81. Battle Command, (draft 2.1), BCBL, Fort Leavenworth, KS, 22 April 1994, p. 11.

82. James J. Schneider, "The Theory of the Empty Battlefield," JRUSI, September, 1987, pp. 1-52.

83. TRADOC Pam 525-5, p. 2-8.

84. Interview with LTC Joe Orr, Commander 2-33 Ar, 5 October 1995. LTC Orr indicated that trust in the digital communications system was of paramount importance in gaining and maintaining organization effectiveness.

85. Many articles and books discuss this important point at length. See Marshall, Men Against Fire, Van Crefeld, Command in War, FM 100-5, FM 22-100, among many others.

86. Ibid.

87. ST 71-3, p. 4-4.

88. Slides from, "AWE Focused Dispatch", observations provided to the ADPA 1995 Combat Vehicle Conference, MBBL Update, 19 September 1995.

89. Interview with LTC Orr, Commander 2-33 Ar, 5 October 1995.

90. TRADOC Pam 525-200-1, p. 12.

91. Senge, The Fifth Discipline, pp. 238-248.

92. The concept that some types of non-verbal communication is lost over radio messages is not new. Further, the concept that some communication is lost through digital message traffic is not new. What is interesting is the need for leaders, and all soldiers, to feel connected with their fellow soldiers. S.L.A. Marshall wrote extensively about the phenomena of part of combat cohesiveness as a function of proximity. During interviews with LTC Joe Orr (Commander), MAJ Andy Dreby (S-3) and CPT Tom Deakins (S-3A) of 2-33 Armor all stated a desire to keep close contact with significant members of the organization. Digital message traffic left out key components of communication that were important for these soldiers in the execution of AWE, "Focus Dispatch". Therefore frequently the key members of the command would use FM or personal visits to reinforce the communication flow between system users.

93. Interview with BG(P) Lon Maggart. Commander General. Fort Knox and Commandant U.S. Army Armor School. conducted 5 October. 1995.

94. Greater situational awareness is a main topic in many areas of digital development. Most observers believe that situational awareness will be greatly increased via digitization. Further. nearly every publication dealing with digitization discusses the advantages of the increase in situational awareness. See TRADOC Pam 525-5 ch. 3. BCBL's Battle Command. draft 2.1 along with any of the newer publications dealing with command or leadership.

95. TRADOC Pam 525-5. p. 4-4.

96. TRADOC Analysis Center. Leader Competencies: Implications for Force XXI. FY 95 Mobile Strike Force Experiment. Fort Leavenworth. KS. June 1995.

97. For a general discussion of Auftragstaktik and how these concepts are relevant for the information age see. Thomas Barth. Auftragstaktik-A Leadership Philosophy for the Information Age. School of Advanced Military Studies. Fort Leavenworth. KS. 94-95.

98. Senge. The Fifth Discipline. p. 238.

99. Ibid. p. 206.

100. Ibid. pp. 206-210.

101. Interview with LTC Joe Orr. Commander 2-33 Armor. Fort Knox. KY. conducted 4 October 1995.

102. Schneider. James J. How War Works: The Origins. Nature. and Purpose of Military Theory. unpublished paper. School of Advanced Military Studies. USAC/GSC. Fort Leavenworth. KS. 16 June 1995. p. 2.

103. Battle Command Battle Laboratory. The Evolution of Army Leadership. Briefing slides. Fort Leavenworth. KS. 30 December 1994.

104. Interview with Dr. Kathy Quinkert. Army Research Institute. Fort Knox. KY. conducted 4 October 1995.

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