THE CHANGING DYNAMICS OF MILITARY ADVANTAGE IN THE
INFORMATION AGE

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
Strategy

by

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2004

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MASTER OF MILITARY ART AND SCIENCE

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ABSTRACT

THE CHANGING DYNAMICS OF MILITARY ADVANTAGE IN THE INFORMATION AGE, by MAJ Sean F. Mulcahey, 110 pages.

The information revolution causes dramatic changes in the geopolitical environment, which result in new challenges to U.S. national security, particularly from a new form of global insurgency. The continued development and proliferation of information technology impacts the very nature of conflict and military competitive advantage. Can the U.S. expect to maintain its current unprecedented degree of military advantage in the information-age? This thesis examines this question using a qualitative research methodology. The research analyzes the impact of information technology on the geopolitical system, the nature of conflict, and the realm of military competition. Within this context, the research examines the changing nature of military advantage. Three elements of advantage are analyzed to determine qualitative changes that result from the changing conditions of the information-age. The elements are power, legitimacy, and effects. The research also includes a comparative analysis that seeks to determine how these changing conditions affect the ability of both the U.S. military and global insurgents to gain advantage. The research concludes that U.S. military advantage will decline relative to a global insurgency. As a result, the U.S. will face significant challenges in its effort to achieve lasting success in the Global War on Terrorism (GWOT).

ACKNOWLEDGMENTS

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ACRONYMS

CFR	Council on Foreign Relations
CIA	Central Intelligence Agency
COG	Center of Gravity
CSIS	Center for Strategic and International Studies
DGDP	Directorate of Graduate Degree Programs
DHS	Department of Homeland Security
DIME	Diplomatic Informational Military Economic
DOD	Department of Defense
DOS	Department of State
GDP	Graduate Degree Programs
GII	Global Information Infrastructure
GPS	Global Positioning System
GWOT	Global War On Terrorism
IO	Information Operations
NGO	Non-Governmental Organization
NIC	National Intelligence Council
NSC	National Security Council
NSS	National Security Strategy
OASD C3I	Office of the Assistant Secretary of Defense for Command, Communications, and Intelligence
OODA	Observe Orient Decide Act
PDA	Personal Digital Assistant
PLA	Peoples Liberation Army

QDR   Quadrennial Defense Review

SSI   Strategic Studies Institute

UN   United Nations

WMD   Weapons of Mass Destruction

ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

> Enemies in the past needed great armies and great industrial capabilities to endanger America. Now, shadowy networks of individuals can bring great chaos and suffering to our shores for less than it costs to purchase a single tank. Terrorists are organized to penetrate open societies and to turn the power of modern technology against us.
>
> President George W. Bush, *National Security Strategy of the USA*

The Changing Nature of Military Advantage

The information-age has dawned. The information technology revolution that brought about this new age continues at breakneck speed. The United States (U.S.) will face serious challenges to its current unprecedented military advantage. America has capitalized on the advancements in information technology, resulting in vast growth in economic might and military prowess. This same information revolution has spawned colossal and fundamental change in the world--economically, politically, socially, and militarily. In fact, an entirely new global system is emerging. There are plenty of uncertainties about the future of this global system, but one thing that seems more and more certain is that the very nature of military conflict and advantage will be different.

Information technology advancements are not only increasing the ambit of traditional instruments of power, but more importantly they are increasing the accessibility of power. The increased value, accessibility, and communication of information characterize the information-age. Knowledge, decisions, and behavior are all impacted significantly by these new information dynamics. Knowledge, decisions, and behavior are key elements in creating the effects that produce advantage--"Superiority of

position or condition" (*Webster's Third New International Dictionary* 1981). Effects are central to the nature of advantage. "Effects determine the creation or seizure of advantage; they determine who wins and who loses" (Hall 2003, 44). Information technology provides new means to generate effects.

The terrorist attacks in the U.S. in 2001 served as a confirmation that a new era had begun. What had been a concern at the tactical and, to some extent the operational level, the forces of insurgency have now been elevated to the strategic level with global reach. Information technologies in the hands of even just a few radicals have given rise to an extremely potent new style of warfare--global insurgency. While insurgency has been a method of warfare for centuries, information technology has removed the barriers of time and distance giving insurgents global reach. This new style of war has significant implications that may serve to erode or perhaps even negate current U.S. advantages in conventional warfare and technological superiority. The Chinese People's Liberation Army (PLA) had presupposed even before the terrorist attacks in 2001 that a national (conventional) force would face challenges. "The advent of bin Laden style terrorism has deepened the impression that a national force, no matter how powerful, will find it difficult to gain the upper hand in a game that has no rules" (Liang and Xiangsui 1999, 35). This assertion by the PLA has only gained credence since 11 September 2001. Just how the U.S. positions itself in its approach to this new style of warfare is key to gaining and maintaining military advantage. A staggering challenge to be sure.

This thesis will examine the effects of the information revolution on the comparative military advantage of the U.S. relative to the rising threats of global insurgency. This will include a discussion of the characteristics and implications of the

emerging global system to establish the context for the subsequent analysis. Information technology will be discussed in terms of how it gives rise to a new style of warfare. Within the context of this new kind of war, both the threat and the U.S. strategy will be analyzed to determine the effect on military advantage. The extraordinarily dynamic nature of this research topic, particularly the effects of current global events, will likely cause fluctuations and permutations in some elements of research.

Research Questions

The primary research question this paper seeks to answer is: In the face of emerging information-age threats from globally networked insurgents, will the comparative advantage of the U.S. military decline? To effectively answer this question, three secondary questions will be addressed:

1. How is information technology changing the conditions of the global system?

2. What is the changing nature of military advantage in the information-age?

3. How is information technology impacting the ability of both global insurgents and the U.S. military to gain and maintain competitive advantage comparatively?

Significance of Study

The military instrument of national power has been and continues to be crucial for the protection of U.S. national security and advancement of national interests. As the information revolution continues and a new global system emerges, new challenges to this instrument of power are coming into play. Most of the challenges have to do with the new conditions under which national power (especially military power) is developed and used. Some elements of traditional theories on warfare by the likes of Clausewitz and others are being put to the test by the new conditions of the Information-age. Of course,

this study goes far beyond mere theoretical speculations. The implications of new

conditions are becomi ng more apparent as they are played out on the global stage in the

ongoing global insurgency (aka Global War on Terrorism or GWOT). Given the

importance of military power to the security and, some would argue, to the very survival

of the U.S., understanding the nature of military advantage and how to gain and maintain

that advantage under the conditions of the Information-age is of paramount concern. The

U.S. military and indeed all of the federal agencies involved in national security are in the

midst of a transformation to be better prepared for threats emerging in the Information-

age. The drive to gain and maintain advantage is at the heart of these transformation

efforts. With little question, this is one of the most defining contemporary strategic

issues.

<div align="center">The Changing International System</div>

> I believe that if you want to understand the post-cold war
> world you have to start by understanding that a new international
> system has succeeded it--globalization. That is "The One Big
> Thing" people should focus on. Globalization is not the only thing
> influencing events in the world today, but to the extent that there is
> a North Star and a worldwide shaping force, it is this system. What
> is new is the system; what is old is power politics, chaos, clashing
> civilizations and liberalism. And what is the drama of the post-
> Cold War world is the interaction between this new system and all
> these old passions and aspirations. (1999, xxi)

<div align="right">Thomas L. Friedman, *The Lexus and the Olive Tree*</div>

Understanding the new global system, spawned predominantly by the revolution

in information technology, is essential to the analysis offered by this thesis. Theories

about the future of this new global system range from the rosy to the down right

frightening. Is the world headed toward global anarchy? Some, like Robert D. Kaplan,

speculate so. Others prophesize a hegemonic U.S. enjoying the spoils of sole super power

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status for years to come. For the purposes of this thesis, it is less important to have absolute confidence in one specific conjecture about the future or another. What is important, however, is that the world power structure is changing and some of the central elements of the new global system have emerged and have manifested themselves in certain trends that provide clear indications of things to come. Two important elements are the nature of conflict and the sources of power. Both of these are directly related to the proposition of why people fight and how people fight and are changing as a result of globalization.

The predominant engine driving globalization is the pursuit of wealth. From individuals to whole societies to international conglomerations, knowledge generated and disseminated by information technology is being used to fuel the cultivation of wealth. In the thrust towards wealth generation, the U.S. has exploited the developments in information technology, particularly in commercial industry (e.g., supply chain management and distribution) and in military systems. These developments have served to further advance the information revolution. The information revolution has some similarities with past global revolutions, such as the industrial revolution. For instance, global revolutions tend to spur conflicts, alter sources of power, and cause change in economies and other social institutions within a society. In this regard, history can be a valuable resource for analyzing the current revolution. There are, however, some aspects of the information revolution that are quite unique, at the very least in the scope of change. In the Information-age, advances in information technology are producing dramatic changes in *what* is known--information turned into knowledge, *when* it is known--the speed at which information is turned into knowledge, and *how* the knowledge

is acted upon--the decision cycle. The connection between knowledge and wealth is fueling the transformation of the global system and is relevant to the nature of conflict and sources of power.

Alvin and Heidi Toffler proclaim that "the way we make wealth and the way we make war are inextricably connected" (Toffler and Toffler 1993, 73). As the world shifts to a new global system, the ways of generating wealth are changing and so too is the ways of making war. The information technology spurring the globalization of the world economy is also used to wage a new kind of war.

While the conditions for this new kind of war have been developing for many years (albeit increasingly accelerated in recent years), the opening acts have really just begun. Al Qaeda emerged onto the world stage in a manner that demonstrated their ability to strike serious blows to the world's only super power. The most significant being the psychological blow to the American people following the terrorist strikes in 2001. This was a clear indication that this new kind of war has transgressed from the hypothetical realm of theory into the practical world of reality. It is not difficult to surmise that, with the pace of information technology advancements and proliferation, the Al Qaeda network is likely just an embryonic form of what is to come.

Some elaboration is required to better understand what is meant by a new kind of war in the context of this thesis. There are certainly some aspects of a global insurgency conflict that are not altogether new. Unconventional warfare, such as guerilla war and insurgency, has been executed for millennia. What is new, however, is the combination and scope of the ways, means, and ends. Information technology has changed the dynamics of power causing significant alterations to the global strategic landscape. So the

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new kind of war discussed here involves more than just the methods of conflict. It includes the actors involved, the time-distance factor, and the goals and objectives among other things. The information revolution is at the root of these changes that result in a new kind of war, referred to in this thesis as global insurgency. For the purposes of analysis, stealthy networked nonstate actors with global reach execute the global insurgency discussed in this thesis.

<div align="center">Assumptions</div>

Certain key assumptions are necessary. The trends towards globalization will continue, which will result in a significant increase in interdependence between nations. This interdependence will be built on the economic necessities of nations pursuing the generation of wealth. The interdependence will not be limited to economic necessities alone and will include political, social, informational, and military necessities as well. Another key assumption involves the pace of development, direction/capabilities, and proliferation of information technologies. Given the current state of the art and the promise of information technologies under development, it is fair to assume that the process of digitization and miniaturization will continue to accelerate. This in turn will open up even more new possibilities to exploit information technologies. The continued integration of functions into Internet web-based activity will also continue to accelerate. Technological development will continue in the direction of creating more and more capabilities that will generate and exploit knowledge. The proliferation of information technology and the worldwide development of information infrastructures will continue to widen the band of accessibility. Bringing more and more of the world's population into the information domain will have compounding effects at increasing aggregate world

knowledge. The virtual world of cyberspace will continue to expand, increasing the span

of this new frontier--not just for friends, but for adversaries as well. Virtual societies of

today will continue to mature and expand in membership. The U.S. will attempt to

dominate cyberspace as a matter of national strategy, but not without others gaining the

capabilities to exploit it for its own purposes. And there are likely to be "others" who will

operate with malicious intent against the U.S. for generations to come.

Limitations

This thesis will focus on the comparative U.S. military advantage in the

Information-age. It will consider the nature of advantage within the context of a new kind

of warfare--a sort of strategic guerilla war embodied in the current GWOT. It will

evaluate the research question within the context of theoretical underpinnings of the

emerging global system. The research will particularly focus on the changing realm of

military competition in information-age conflict. It will consider advantages specifically

related to and derived from information technology. In this context, information

technology does not refer to information operations (IO) exclusively. The type of conflict

evaluated in this thesis is not one of so-called information warfare. Further, the focus will

be limited to the global-strategic implications of U.S. military dominance.

The study will intentionally *not* involve the rising threats from weapons of mass

destruction (WMD) themselves; however, increased access to power that information

technology engenders includes access to WMD. Including WMD in the focus of the

analysis would render this thesis infeasible. Threats from adversarial nation-states,

whether conventional or unconventional, will not be addressed, with some exceptions.

First, the study may consider the cooperation and support a nation state may provide to

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global insurgents engaged in unconventional warfare against the U.S. Secondly, some tactics or doctrine, like the Unrestricted Warfare theory developed by some members of the Chinese People's Liberation Army (PLA), will be discussed in terms of how that theory could be applied by global insurgents. Specific information technology developments/capabilities or detailed military operational concepts, plans, or doctrine will not be discussed at any length. The research will be conducted using publicly available information.

The period of time used for the analysis extends out to the year 2015. Conducting research on a dynamic topic, such as this, that extends much beyond a ten-year horizon is difficult. Looking beyond 2015 would involve a much higher degree of uncertainty, causing reasonable conclusions to be elusive. There is expected to be sufficient evidence in published U.S. national security strategy and threat assessments, inclusive of the year 2015, to support the analysis of this thesis.

<u>Defining Terms</u>

Understanding the definitions of key terms and concepts is essential. This is especially true for the subject of this thesis because it involves emerging theories and concepts. Not all of the terms and concepts are widely understood, and some frequently used terms have lost their original significance. Only the most consequential terms and concepts will be defined or described here. Related terms and concepts are covered in the glossary.

Information technology refers to all applied computing systems including hardware, software, networking, and telecommunications involved in processing and transmitting information. Examples include, but are not limited to the Internet, personal

computers, personal digital assistants (PDA), global-positioning system (GPS), mobile telephones, satellite systems, digital cameras, and satellite-cable television. An important aspect of information technology is the ongoing digitization (turning information into computer code) and miniaturization (especially nanotechnology). The term information revolution alludes to the revolutionary impact of information technology on civilization. The information revolution begets the information-age, or era in which information technology and the use of information are the fundamental characteristics that define civilization. The term global system is used to describe the geopolitical system in which civilizations interact and behave. The definition of global system includes more than simply the international community and encompasses nonstate groups and individuals. The emerging global system is commonly referred to as globalization. In the context of this thesis, the term global insurgents delineate nonstate networked terrorist organizations with global reach. Global insurgents are trans-national groups that have the ability to create effects across the globe.

Summary

The information revolution and globalization cause transformational change to the strategic environment. The breadth and depth of the change affects nearly all aspects of civilization, including and especially the nature of conflict and advantage. The development, proliferation, and application of information technology offers entirely new combinations and scope of ways, means, and ends in approaches to military competition. How will the U.S. military fare in its ability to gain and maintain competitive advantage in the information-age? The number of scholars, government officials, journalists, and the

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like who have asked this question and related ones is quite vast. The literature review in

chapter two investigates the vast evidence related to this issue.

CHAPTER 2

LITERATURE REVIEW

The fundamental issue that defines this research is the nature of advantage. Of course the scope of the primary question lies within the context of advantage as it relates to the competition of the U.S. Military and a global insurgency in the information-age. The on-set of the information-age impacts all aspects of society. This is true about how humans function and interact as individuals, organizations, societies, and the entire global community. Given the immense scope and impact, it should be no surprise that the published material relating to this subject is extremely vast. The fact that the future remains largely uncertain, there are considerable divergent views about the likely outcomes of the continuing transition to the information-age. Furthermore, the subject of this research is highly dynamic with events unfolding on the global stage constantly and rapidly.

To achieve the necessary fidelity in research, sound navigation through the facts and analysis requires an intellectual framework. This framework begins with clear understanding of fundamental concepts that establish a theoretical foundation. These are based on emerging theories impacting power and advantage in the global strategic environment and will provide the basis for analysis. The second component of the framework involves a strategic threat assessment to determine the nature of the ways, mean, and ends that compose the threat from global insurgents in the information-age. And finally, the current direction of U.S. defense transformation strategy with information dominance being a central theme will round out the framework.

Theoretical Underpinnings

Understanding how the information revolution impacts power, competition, conflict, and advantage necessitates establishing theoretical underpinnings. The range of things within the realm of the possible continues to grow. This is predominantly a result of the development and proliferation of information technology and has caused considerable upheaval in theories on the new global system. A review of the emerging theories by prominent futurists and theorists is helpful in grasping the big ideas. The big ideas involve the most significant forces that are shaping the "conditions" of the future geopolitical environment. The nature of advantage will be analyzed under these changed conditions.

Alvin and Heidi Toffler have been among the most distinguished theorists and authors in the field of the changing global environment. As early as 1965, Alvin Toffler coined the term "future shock" "to describe the shattering stress and disorientation induced in individuals by subjecting them to too much change in too short a time" (Toffler 1970, 2). Toffler then spent five years researching the implications of change on both individuals and institutions before writing *Future Shock* in 1970. *Future Shock* offers insights into the forces of change, how people and organizations adapt to change, and implications for the emerging global environment.

In 1980 Alvin Toffler published *The Third Wave*, in which he presents a method of identifying and analyzing revolutionary change on a grand scale. He proposes that "One powerful new approach might be called social 'wave-front analysis.' It looks at history as a succession of rolling waves of change and asks where the leading edge of each wave is carrying us" (Toffler 1980, 13). His "wave-front" analysis focuses on the

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"innovations and breakpoints" in history to gain a better understanding of the changes. In *The Third Wave*, he essentially labels the agrarian age as the "First Wave" and the industrial age as the "Second Wave." Toffler characterizes the "Third Wave" civilization as an information society. He writes "For Third Wave civilization, the most basic raw material of all--and one that can never be exhausted--is information" (Toffler 1980, 351). His Third Wave analysis provides useful insights for the current shift in the global environment and is quite relevant to this thesis.

Alvin and Heidi Toffler expanded the theory of "wave-front analysis" in their book *War and Anti-War*, published in 1993. This book is important because it analyzes global conflict in the context of the emerging Third Wave civilization. *War and Anti-War* investigates the implications of information and knowledge on conflict in the Third Wave civilization. One of the major implications they describe is the transition from "brute force to brain force" (Toffler and Toffler 1993, 8). The Tofflers profess that there is a linkage between how a society makes wealth and how it makes war. This linkage is an essential component of the Toffler's theory and is valuable to the framework for the analysis of this thesis. Generating wealth and making war are two aspects of society significantly impacted by globalization.

Thomas L. Friedman examines the post-Cold War era of globalization in his book *The Lexus and The Olive Tree*. Understanding the emerging international system and the implications of globalization is critical to this thesis. It is the most important and wide-ranging concept or theory that forms the foundation and context for further analysis. Friedman offers a theory by describing the affects of information technology on how the world inter-relates with itself. In doing this, he makes an important distinction between

what is new (changing as a result of globalization) and what is old (that which endures). "What is new is the system; what is old is power politics, chaos, clashing civilizations, and liberalism. And what is the drama of the post-cold war world is the interaction between this new system and these old passions and aspirations" (Friedman 1999, xxi). Friedman spells out in detail his idea about the new power structure that is being formed by the influences of globalization. One of the more important points Friedman makes with relevance to this thesis is the growing power and influence possible for individuals and other nonstate actors.

The new global system creates an environment of more and more extreme complexity. This is due principally to the fact that change is occurring at greater and greater speeds. It becomes difficult for humans to keep pace with all of the transactions of change, especially when many occur simultaneously. A new science of complexity has arisen over the past decade or so that aims to make sense of an increasingly chaotic world.

Within a complex system, changes occur rapidly, often in unpredictable ways, and to some extent in an uncontrollable manner. Based on the shifting structure of power and the ever-changing conditions of the global environment, just what does the future hold for humanity? No one can be entirely certain, but there are many that have posited theories for the future that range from total anarchy to the outright end of armed conflict. Robert D. Kaplan, in his book *The Coming Anarchy*, speaks of a drift towards chaos and anarchy and the demise of the power of nation states. The future decline of nation states points to the equal decline of large heavy metal armies. While it remains to be seen that states will become less relevant as a fixture in global power structure, there are many who believe

that states will even gain in relevance. Noteworthy from Kaplan's theory, is that the "rules' are changing based on the changing conditions of the global environment. While *The Coming Anarchy* is largely focused on social and cultural aspects, he also devotes attention to what he refers to as a "new kind of war." A warfare in which the value of electronic and human intelligence will exceed that of an industrial age force replete with tanks and jets (Kaplan 2000, 106-107). Kaplan also discusses the work of Martin van Creveld in describing how warfare is changing.

Martin van Creveld has developed a prestigious reputation for his important theoretical analysis of military history, strategy, and the future of warfare. In his book *The Transformation of War*, van Creveld delves into an exploration of the very nature of war. That is, who fights, why they fight, what they fight for, how they fight, and so on. *The Transformation of War* challenges the traditional Clauswitzian theory of war with claims that the post-World War II era is increasingly less rational. Whereas Carl von Clausewitz, in his classic *On War*, held that war was basically a rational instrument or extension of national political policy. Van Creveld offers evidence that calls into question the relevancy of portions of Clausewitzian theory on warfare. He describes several conflicts throughout the world (circa 1991) in an attempt to demonstrate that war is not quite as rational as prescribed in Clausewitz's trinitarian war theory. He asserts that "present-day armed violence does not distinguish between governments, armies, and people" (Van Creveld 1991, 58). Further, he claims that terrorist and insurgent groups are more irrational than rational in terms of both their ends and their means.

Samuel P. Huntington published another important and defining work, *The Clash of Civilizations and the Remaking of World Order*, in 1996. In this book, Huntington

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attempts to provide an interpretation of how global politics and power are changing in the contemporary era. He focuses predominantly on the cultural and social elements of societies and how these elements impact power and conflict. He asserts that "clashes of civilizations are the greatest threat to world peace, and an international order based on civilizations is the surest safeguard against world war" (Huntington 1996, 13). Of more specific consequence to this thesis is Huntington's views on the shifting of global power. He cites analyses that point to a decline in U.S. power as other civilizations both surge economically, and present challenges to U.S. power and domination. Regarding military power, Huntington describes several trends in global military capabilities in the years following the Cold War that he offers as evidence that the power of the West (specifically the U.S.) is in decline. One of these trends involves the diffusion of military capabilities broadly across the world, that is, as countries develop economically they have greater means of producing military capabilities (Huntington 1996, 90). Huntington draws from Richard A. Bitzinger's assessment that, "The 1990s have seen a major trend toward the globalization of the defense industry, which is likely to further erode Western military advantages" (Bitzinger 1993, 13).

Wrapping up the major works in this literature review on general theory about the emerging global system and distribution of power, is *Understanding International Conflicts: An Introduction to Theory and History* by Joseph S. Nye Jr. This book provides a contribution to establishing a foundation in theory that incorporates in-depth historical perspectives in the analysis. Nye explores the logic of conflict in world politics and attempts to define and explain many of the related fundamental principles. He explains that the world has not always been divided into a system of separate states,

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rather there have been three basic forms of world politics. One is the "world imperial system" with one dominant government exerting influence (e.g., Roman Empire). The second is the "feudal system" where human loyalties and political obligations are not necessarily tied to geographic boundaries. And the third is the "anarchic system of states" with relatively cohesive states, but no higher government above them (Nye 2003, 3). Nye holds that the anarchic system of states is the most relevant to contemporary politics, but that there is a growing speculation that a new feudalism may evolve in the twenty-first century. His book includes useful discussion and analysis of power, effects of globalization and interdependence, and the impact of the information revolution on conflict and world politics. Especially relevant to this thesis is his observation that the information revolution (especially the Internet and low cost global communication) is causing diffusion of power. He notes that "Both individuals and private organizations, ranging from corporations to NGOs to terrorists, will be empowered to play direct roles in world politics. This view is consistent with Friedman's observations about globalization. The spread of information will mean that power will be more widely distributed and informal networks will undercut the monopoly of traditional bureaucracy" (Nye 2003, 217). Another notable view held by Nye, with significant relevance to this thesis, is the nature of power. He defines power as the "ability to achieve one's purposes or goals" (Nye 2003, 58). He aptly asserts that power is extremely difficult to define or measure. According to Nye, if power is measured in terms of influencing the behavior of others, their preferences must be known. If the preferences of others were not understood in advance, judging how they would act in absence of the influence of power would be impossible. The resulting effect would be a misunderstanding of one's power. This point

that Nye makes about the nature of power is important for this thesis because of the close correlation between power and advantage. Advantage is derived from power to create effects favorable to one's position or interests. Like power, advantage is also difficult to define and measure. This research focuses on the changing nature of advantage and the ability for the Untied States to gain and maintain that advantage relative to rising threats of insurgents with global reach.

<div align="center">Strategic Threat Assessment</div>

As discussed above, the changing global environment is, among other things, creating conditions for the diffusion of power. Of the more challenging threats emerging within these conditions is the power that is migrating to nonstate actors--power with global implications. There is considerable published literature on this relatively new type of threat to U.S. national security. This section of the literature review will highlight publications related to this threat.

John Arquilla and David Ronfeldt have teamed up at RAND to research the impact of information technology on war and conflict. They have subsequently written and edited a number of books and articles on what they have termed "cyberwar" and "netwar." *In Athena's Camp: Preparing for the Information Age*, Arquilla and Ronfeldt compiled a thorough collection of works on the implications of the information revolution on military operations and more generally societal conflicts. This book was published in 1997 and was supported by the Office of the Assistant Secretary of Defense for Command, Communications, and Intelligence (OASD C3I). Alvin and Heidi Toffler set the stage in this book in their contribution in the Foreword section where they lay out their notion of the "new intangibles" which constitute new-found information "assets."

Arquilla and Ronfeldt profess four themes, around which, the compiled essays are oriented. Further, they assert that there is an emerging consensus on these themes, though not yet widely accepted. The first is that conflicts will increasingly revolve around information and communication. The second is that the information revolution is not primarily about technology. It has an organizational element as well. The third theme, related to the second, is that the information revolution tends to favor network forms of organization. The fourth theme they describe is that the complete spectrum of conflict is being remolded. In other words, major changes will occur in the very nature of adversaries and the threat they pose (Arquuilla and Ronfeldt 1997, 4-5). They offer insights and recommendations based on the analysis in four areas: conceptual, organizational, doctrine, and strategy.

Another important and useful book put together by Arquilla and Ronfeldt is *Networks and Netwars*. This compilation was published in 2001 and was also sponsored by OASD C3I. This book contains detailed analysis of the continuing impacts of the information revolution on conflict. It continues the basic themes introduced in *In Athena's Camp*, though it expands on their concept of "netwar." Arquilla and Ronfeldt hold that information technology increases the relevancy and effectiveness of network forms of organization, doctrine, strategy, and technology (Arquilla and Ronfeldt 2001, 7). They do point out that networks can be used for good purposes just as well and effective as they can for bad.

In 1999, RAND produced a research report for the U.S. Air Force entitled *Strategic Appraisal: The Changing Role of Information in Warfare*. This report, edited by Zalmay M. Khalilzad and John P. White, is a comprehensive research product that draws

on a range of experts, an approach similar to that of Arquilla and Ronfeldt. The Foreword section of the book, written by Andrew W. Marshall, describes just how important information technologies are becoming to the way societies wage war. He offers several poignant observations to set up the rest of the book. Among his observations, he points out that information technology advances will affect more than just how wars are fought, but the nature of war itself. He also discusses how information technology can "cut both ways" in terms of its effect on national security. This double-edged sword nature of information technology is central to this thesis. Another essential issue he raises is that the "information dimension" is becoming "central" to the outcome of battles and campaigns (Khalilzad and White 1999, 5). This is yet another issue consistent with the views of many of the experts, and indeed the defense transformation strategy of the U.S. government. The research is presented in the book in three sections. The first analyzes the effects of information technology on society and the international system. The second focuses on the U.S. and examines opportunities and vulnerabilities of information technology. The third section focuses on current issues and lessons decision-makers will need to understand if they are to function in the world to come (Khalilzad and White 1999, 11). The information, analysis, and insights from this research offer considerable evidence that is directly relevant to this thesis.

In a slightly more contemporary book *Stray Voltage: War in the Information Age*, Wayne Michael Hall, a retired brigadier general from the U.S. Army, delves into military theory for the information-age. He attempts to demonstrate that America's adversaries will seize upon strategies, tactics, and tools of asymmetric warfare. This book is particularly noteworthy in that it was written against the backdrop of the on-going global

war on terrorism, which provides a more concrete and direct relationship between theory and current global events. Current global events continue to shape the operating environment for the U.S. military.

The military philosopher Sun Tsu talked about the value of knowing one's enemy to the success of battle in his book *The Art of War*. Sun Tsu's ideas on the enemy are often quoted, perhaps because they are so profound. The challenge of knowing one's enemy, unfortunately, remains a difficult task even today. This thesis demands, at a minimum, a general understanding of the nature and characteristics of the emerging threats from global insurgents. In the period since the terrorist attacks of September, 2001, there has been a virtual frenzy of intelligence analysis and academic research focused on gaining a better understanding of these types of threats.

There are a number of "think tanks" that have conducted research and analysis to develop greater insights into the threats from global insurgents. Both private and governmental organizations, such as the Center for Strategic and International Studies (CSIS), the Strategic Studies Institute (SSI), GlobalSecurity.org, and the Council on Foreign Relations (CFR), have contributed to the research to better understand emerging threats. These organizations, among others, have produced articles, reports, data, and papers that contain useful and relevant evidence for the research of this thesis. These organizations also offer Internet web sites that host a broad range of research resources. All resources accessed on the Internet for use in this research have been scrutinized for legitimacy and academic soundness.

Other sources for threat information include official threat assessments from the U.S. Central Intelligence Agency (CIA), the National Intelligence Council (NIC), the

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Department of Defense (DOD), the Department of State (DOS), the Department of Homeland Security (DHS), and the National Security Council (NSC). Information from these government sources is available in the public domain on the Internet from official U.S. Government web sites such as FirstGov.gov. Documents such as *Global Trends 2015: A Dialogue About the Future With Nongovernment Experts*, produced by the National Intelligence Council and *National Security Challenges for the 21st Century* published by the Strategic Studies Institute of the U.S.Army's War College provide pertinent assessments. Both of these documents contain evidence and analysis related to emerging threats resulting from global diffusion of power and use of information technology by global insurgents to enhance their capabilities and global reach.

In addition to private and governmental sources, there is growing evidence from actual current world events that highlight the nature, capabilities, and impact of the emerging threats from global insurgents. The Al Qaeda terrorist network serves as a particularly useful example of a global insurgent. The use of information technology by Al Qaeda to communicate, plan, finance and conduct global operations illustrates the growing dangers of this type of threat. In the Spring 2003 edition of *Parameters*, Timothy L. Thomas published an article entitled "Al Qaeda and the Internet: The Danger of 'Cyberplanning'." This article offers tremendous insight into the ways in which global insurgents like al Qaeda make use of the Internet to operate with global reach. The article documents some of the actual events and activities surrounding al Qaeda's use of the Internet, which helps define the nature of this new type of threat.

Grant R. Highland published an essay entitled "New Century, Old Problems: The Global Insurgency within Islam and the Nature of the War on Terror" which provides

timely and relevant observations and analysis on global insurgency. In this essay, Highland points out the nature of global insurgency and the danger it poses to U.S. national security. He goes on to offer recommendations for defeating this threat by striking the centers of gravity, which are on the level of whole cultures, religions, and indeed civilizations (in particular disaffected Muslims across the globe). The relevance to this thesis is the nature of the threat with regards to its impact on U.S. competitive military advantage.

U.S. Defense Transformation Strategy

Of all the sources of information for this thesis, official U.S. Government documents on strategy and doctrine regarding national security and use of military power to combat threats are the most definitive. The sources reviewed include capstone U.S. national security and military strategy documents, military transformation planning and guidance documents, joint warfighting concepts and doctrine, and theses and papers that offer some critical analysis of U.S. strategy. The purpose of this part of the literature review is to establish the relevant elements of U.S. defense transformation strategy regarding the impact of information technology causing increasing threats from global insurgents.

The *National Security Strategy of the United States of America*, published in 2002 sets the strategic compass for national security. This document fully recognizes the threats from nonstate actors. Clearly pertinent to this thesis, it declares that the greatest threat to the U.S. lies at the crossroads of radicalism and technology. It also lays out a monumental shift in national strategy from containment to preemption. That is, to strike

gathering threats before they result in catastrophic consequences. The military superiority of the U.S. is clearly an essential and indispensable component of the strategy.

In February of 2003, the Bush Administration published the *National Strategy for Combating Terrorism*, elaborating on the *National Security Strategy*. While the strategy calls for the use of all instruments of national power, the application of military power is critical. The strategy is oriented on "taking the battle to the enemy" and reducing the scope and capabilities of global insurgents like Al Qaeda. The three principal military strategy documents are the *Quadrennial Defense Review 2001, Joint Vision 2020,* and *2003 Transformation Planning Guidance*. These documents emphasize the use of information technology as central components of maintaining superiority or advantage over adversaries. "Information technology will provide a key foundation for the effort to transform U.S. armed forces for the 21st century" (Department of Defense 2001, 45). Likewise, *Joint Vision 2020* establishes similar fundamental focus on information and identifies "information superiority" as a key enabler. "These changes in the information environment make information superiority a key enabler of the transformation of the operational capabilities of the joint force and the evolution of joint command and control" (Chairman, Joint Chiefs of Staff 2000b, 3).

The use of information technologies to gain and maintain information superiority is further delineated in joint warfighting doctrine. Two clear examples are Joint Pub 1, *Joint Warfare of the Armed Forces of the United States*, and Joint Pub 3-13, *Joint Doctrine for Information Operations*. Both documents spell out the role of information technologies and information superiority in the warfighting strategy of the U.S. Another important source for information on U.S. joint warfighting concepts and doctrine is the

U.S. Joint Forces Command web site at www.jfcom.mil. Joint Forces Command is responsible for Joint Force transformation efforts and for concept development and experimentation for the Department of Defense. Beyond the focus on information technologies, the concept of "Effects-Based Operations" is particularly relevant to this thesis research. Once again, creating effects favorable to one's position or interests produces advantage.

CHAPTER 3

RESEARCH METHODOLOGY

Understanding the impact of information technology on the comparative advantage of the U.S. military over the course of the next several years will require a qualitative research methodology. The topic of this thesis is directly connected to an ongoing process of revolutionary global change that has substantial impact on the distribution of power and advantage across the globe. There is a vast array of research, analysis, and postulating on the issues surrounding this topic. The research for this thesis will draw heavily upon the research already conducted in related fields in order to produce relevant evidence to support the thesis. Due to the dynamic nature of the subject, however, evidence will also be gathered to some extent from facts related to actual events occurring around the globe. The research is structured around the primary and secondary research questions.

The subject of this research inherently involves an exploration of basic human behavior. Additionally, the global system, the nature of conflict and advantage, and the subsequent interrelationship between the U.S. military and global insurgents embody dynamic patterns of social interaction. The research areas are largely conceptual and therefore not conducive to scientific or statistical analysis. The research will investigate the more abstract impact of information technology. Based on these factors, a qualitative research design is the most appropriate. Qualitative research provides a more complete picture through descriptive analysis. Quantitative analysis, though more scientifically exact, is not appropriate or even feasible for the topic areas of this research at this point in

time. There may reach a point in the future when research on this topic can be done using quantitative methods.

The research will first investigate the major implications of the information revolution on the geopolitical environment to determine how the conditions are changing for military competition. Secondly, the nature of advantage will be examined to determine how it is affected by information technology. To do this, the concept of advantage will be broken down into elements for detailed analysis in an effort to demonstrate qualitative change related to the impact of information technology. Finally, the effect of information technology on the ability of global insurgents and the U.S. military to gain and maintain competitive military advantage will be determined through a comparative analysis.

<div align="center">The Changing Conditions</div>

Before reaching conclusions on the research questions, it is necessary to establish the fundamental "conditions" against which to analyze the evidence. To do this, the author will conduct an analysis to determine the basic truisms about the changing geopolitical environment. The analysis will endeavor to reach some conclusions regarding the basic concepts of power and advantage, and how they are affected by the information revolution. Evidence for this analysis will be gathered from leading theorists, futurists, and historians in the fields of military strategy, global change, and information technology revolution. The evidence gathered will then be synthesized into generally accepted conclusions that serve to establish rational conditions under which the nature of comparative military advantage can be assessed.

The Nature of Advantage

It is critical to this thesis to determine the nature of advantage within the parameters of the changing conditions as described above, yet it is quite difficult to quantify. This research will gather evidence in an attempt to first characterize the nature of military advantage and how advantage is impacted by the information revolution. Using a basic model that identifies the elements that produce advantage will do this. The elements in the model consist of power, legitimacy, and effects. Each of the elements will then be analyzed individually for qualitative changes as a result of the information revolution. Other aspects and characteristics of advantage will also be explored to gain a good understanding of how it is changing. Again, the process of measuring advantage itself is virtually impossible due to the fact that it is dependent on a given set of circumstances that constantly change from one situation to another. To effectively deal with the difficulty of measuring advantage, this research will focus on evidence to determine the qualitative impact of information technology on the nature of competitive military advantage. The qualitative change can be illustrated through analysis.

Comparative Analysis

A comparative analysis is required to answer the primary question. This thesis is intended to draw conclusions about the impact of the changing conditions and changing nature of advantage on the ability of the U.S. military to gain and maintain competitive advantage relative to global insurgency. This obviously demands a comparison between the two. The comparison will consider six criteria as the basis for analysis. The first criterion is access to power. This involves the tools available that constitute sources of power capable of producing global effects. The second criterion is adaptation. This is

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defined as the ability to change methods of operation (to produce effects) to keep pace with the fast-moving, highly complex environment of the information-age. The next criterion is funding. This is defined as the impact of money--both the need for it and the means to generate it. Legitimacy is the next criterion and is defined as the influence of constraints involved in conformance to some generally accepted standard, a standard that is fundamentally based on the cultural perceptions of relevant individual constituencies. The fifth criterion is time-distance. This criterion is defined as the impact of the information revolution on the reduction or elimination of time-distance barriers in the pursuit of competitive advantage. The final criterion is precision effects. It is defined as the ability to generate the right effect (violent or otherwise) at the right time with precision. Together these six criteria offer a representation of key factors involved in gaining and maintaining competitive advantage from the source of power through application of power to create precision effects. Using these criteria as the basis for the comparative analysis will lead to conclusions to answer the primary thesis question.

Global Insurgents

The rising threat from global insurgents was chosen for the comparative analysis in this thesis for two principle reasons. First, because it appears that organizations posing this type of threat have the most to gain from the impact of the information revolution on military competition. Secondly, this type of threat has been identified as the most dangerous to U.S. national security. To determine the impact of information technology on the ability for global insurgency organizations to gain advantage against the U.S., this research focuses on evidence that shows how changing conditions alter the realm of competition. Evidence will be gathered from strategic net assessments and from a variety

of official U.S. government and private organization sources. Information will also be collected from contemporary research on the subject documented in papers, articles, theses, and monographs. Additionally, since security related events relevant to this thesis are currently occurring across the globe, evidence will be drawn from these events. Once evidence is gathered, the author will synthesize the facts to determine whether the conditions and tools produced by the information revolution lead to increased sources of advantage for global insurgent organizations.

U.S. Military

The information revolution is certainly having an effect on how the U.S. approaches protection of its national security. An analysis will be used to determine how information technology affects U.S. military capabilities and strategy. The analysis will consider how U.S. military strategy accounts for the changes in the realm of competition. There is ample publicly available information in national security strategy documents and joint war-fighting doctrine from which to gather evidence for this thesis. Determining how the U.S. is/plans to leverage information technology to gain and maintain military advantage should be rather straightforward. Once evidence is gathered, the author will synthesize the facts relevant to this thesis for use in evaluation and analysis in chapter 4.

Summary

A qualitative research methodology is deemed the most effective based on the nature of this thesis topic. Evidence to support the thesis can be found in books on history, theory, and future speculation, as well as articles and facts surrounding current events. It is a dynamic topic that is in the midst of unfolding on the world stage. Using a

qualitative research methodology to establish a conceptual framework to conduct an

analysis of comparative military advantage will adequately support this thesis.

CHAPTER 4

ANALYSIS

Introduction

Technological developments have been a force of change in human civilizations since the beginning of time. The powers of the human mind, coupled with a source of motivation, lie at the heart of technology development. Periodically throughout history technological developments, resulting in revolutionary change in civilizations, were spawned by the amazing capacity of the human mind. This was true of the development of technologies such as the printing press, the combustible engine, the airplane, the radio, the computer, and the Internet. Revolutionary change is nothing new for human civilizations. With each revolution, however, the conditions under which human civilizations interact are changed. The latest and ongoing revolution in information technology is certainly no different in this regard. In fact, the global scale, the speed, and indeed the very nature of the information revolution is causing changes to the conditions of human civilization interaction in unprecedented ways. "The locomotive of change in the new era of world politics is information technology. It propels reform and globalization and is increasingly crucial to national power" (Khalilzad and White 1999, 45).

The changing conditions of the information-age are increasingly complex and impact nearly all aspects of human life. The changing conditions present significant challenges to U.S. national security. The changing conditions of the global strategic environment cause fundamental shifts in the equation of power and nature of advantage. Can the U.S. maintain its current supremacy in military advantage in the information-

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age? The analysis in this chapter will examine the nature of advantage in the context of the information-age competitive environment.

The analytical framework for this chapter consists of three major parts. The first is an examination and analysis of the changing global conditions and the resulting implications. This will set the context of further analysis. The second part involves an analysis of the very nature of power and advantage. In this analysis the author offers a basic analytical model that breaks down essential elements that produce advantage. The model is a useful tool in demonstrating the impact of the information-age on the nature of advantage. The third part of the framework is a comparative analysis between the U.S. military transformation strategy and the pursuit of advantage against the U.S. by global insurgency. The first two parts of the analytical framework establish the foundation for the comparative analysis. The analysis will show that the dynamics of military advantage are changing. The analysis also demonstrates that the supremacy of U.S. military advantage is by no means assured, despite efforts to implement a transformation strategy as the information-age continues to unfold.

PART ONE: CHANGING CONDITIONS

A New Global System

By most accounts there seem to be two watershed events that significantly altered the contemporary geo-strategic landscape. The first is the demise of the Soviet Union, highlighted by the fall of the Berlin Wall, bringing a fifty-year ideological struggle to a close. The Cold War ended and so too did the global structure of power that defined the international system. The second is the advent and commercialization of the Internet and associated information technologies. The development and proliferation of computing

and communications technology represented a powerful force for global change. Information technology has impacted human civilization in ways ranging from the basic interaction of individuals to the interrelationships of societies in the global system. Certainly the advent of technology, such as air travel and wire telecommunications, have drawn the world closer over the past century. The power structure of the Cold War and the expense and limited access to information and communications technology circumscribed the impact of these developments on the global system. The rapid development, commercialization, and reduced cost of information technology, in an environment absent competing superpowers, produced the conditions for a new global system to emerge--"globalization."

The new global system that emerged in the post-Cold War period has become known as globalization. Understanding some key elements of the emerging global system is paramount to all subsequent analysis in this thesis. It is the very context in which power and advantage are examined. This thesis does not argue that the new global system is a direct result of the end of the Cold War. However, the change in post-Cold War global power structure certainly contributed to the changing conditions. The emergence of the new global system is more directly related to the increased "connectivity" of the world in terms of information technology. In fact, some have argued that information technology actually facilitated the end of the Cold War. "Changes in information technology have already affected the global balance of power. The collapse of the Soviet Union, which transformed the international system, was facilitated by these changes" (Khalilzad and White 1999, 8). The increased "connectivity" is achieved through digitization, the Internet, satellite communications, global financial systems, regional and

global media outlets, and so on. Instantaneous global communication and rapid information processing have reduced or eliminated global time and distance barriers.

The real significance of the end of the Cold War, from the author's point of view, is that it provided the right conditions for global economic conditions to flourish. The removal of restraints and impediments associated with the Cold War power structure permitted greater global integration. The world was no longer divided between east and west spheres of influence where any incursion by one side into the other typically constituted antagonistic confrontation between super powers. Thomas L. Friedman described the differences between the Cold War system and the new globalization system in terms of what characterizes each, "division" for the Cold War and "integration" for globalization (Friedman, 1999, 8). Friedman goes on to offer his definition of globalization:

> It is the inexorable integration of markets, nation-states and technologies to a degree never witnessed before--in a way that is enabling individuals, corporations and nation-states to reach around the world farther, faster, deeper and cheaper than ever before, and in a way that is enabling the world to reach into individuals, corporations and nation-states farther, faster, deeper, cheaper than ever before. (1999, 9)

Globalization has many facets and is described in a number of ways, particularly with a special emphasis on the economic aspects of the global system. This is because economics and the pursuit of wealth serve as an engine for growth. The integration of people, corporations, governments, and markets across the globe by the power of information technology has, and will continue to draw the world together. An analysis for the U.S. National Intelligence Council on future global trends offers this definition of globalization, "The networked global economy will be driven by rapid and largely unrestricted flows of information, ideas, cultural values, capital goods and services, and

people: That is, globalization" (National Intelligence Council 2000, 18). This and

Friedman's definition provide a good basis for understanding the context of the emerging

global system--that is: global integration and expanding access to information

technology. The speed and scope of information transactions across the globe are causing

an extraordinary acceleration in the pace of change. The cultural impacts of this global

integration are a particularly noteworthy implication of this change. Cultural values and

perceptions form the basis of acceptable standards and norms, and thus directly influence

the concept of legitimacy.

<div align="center">Complexity, Adaptation, and Interdependence</div>

This section will address some of the relevant characteristics--or conditions--of

the globalization system. Humans have a finite capacity for understanding and dealing

with change. Within some societies it is perhaps more finite than others. Many cultures

actually reject change, while others like the U.S. thrive on it. The rapid pace of change in

the globalization system pushes these limits of understanding and dealing with it. With

the world increasingly "connected," billions of information transactions can occur

simultaneously around the globe. Many of these transactions are unregulated and simply

impossible to control, everything from email traffic, Internet web browsing, electronic

financial transactions, cell phone calls, and much, much more. The result is a complex

system of transactions that produce changes, which are inter-related to changes in

different parts of the system. This complex system of interrelated change is, by its very

nature, unpredictable. The time it takes to communicate an idea in the human brain

anywhere in the world to produce potential global effects has been reduced literally to

seconds. The resulting rapid, interrelated change requires adaptation for humans and

organizations to succeed in making progress within the complex system. Adaptations of civilizations must overcome cultural perceptions and traditions.

These circumstances resemble a complexity similar to that of complex systems within the discipline of applied sciences, such as meteorological systems. Complexity Theory, first developed from applied sciences, has gained in relevance and now has increasing applications to organizational theory. Complexity within organizational theory essentially deals with how organizations deal with the accelerated pace of change in a complex system. Centralized control within a hierarchical organization structure is not the most efficient method of operation with so many information transactions occurring simultaneously and independently, yet often interrelated. Mitchell Waldrop describes to the nature of control in a complex system this way:

> The control of a complex adaptive system tends to be highly dispersed. There is no master neuron in the brain for example, nor is there any master cell within a developing embryo. If there is to be any coherent behavior in the system, it has to arise from competition and cooperation among the agents themselves. (1992, 145)

In addition, Edwin E. Olson and Glenda H. Eoyang discuss the nature of how change occurs in a complex system.

> Rather than focusing at the macro 'strategic' level of the organizational system, complexity theory suggests that the most powerful processes of change occur at the micro level, where relationships, interactions, small experiments, and simple rules shape emerging patterns. Everything in an organization is interconnected, so large-scale change occurs through an integration of changes that affect the smallest parts. Organization change emerges from evolution of individuals and small groups. (2001, xxxiii)

These descriptions attempt to define the conditions of a system of rapid interrelated change. The new global system is just such a system in which organizations (i.e., states, military, corporations, organized crime, global insurgents, etc.) operate and interact.

Interdependence is another characteristic of the new global system. Different parts of the system have become dependent on other parts with the increasingly "connected" world. Wayne Michael Hall puts it this way:

> As interrelationships and connectivity continue to expand in size and grow in importance, problems occurring in one part of the world (social, ecological, political, economic, financial, military, and so forth) will increasingly influence events taking place in other parts of the world--causing tremendous frustration and consternation to people who experience difficulty in perceiving the "shroud" of interrelationships cloaking to world and the second- and third-order effects that influence the interaction of these systems. (Hall, 2003, 8)

<u>Wealth and War</u>

Competition is at the root of all conflict. When two or more entities compete for the same interest or resource, conflict results. This is a fairly simple notion, yet deserves some consideration. Gaining advantage is really irrelevant in the absence of competition or conflict. Exploring the nature of competition and conflict can help to illustrate the conditions for pursuing advantage. Of course, the nature of competition and conflict need to be considered in the context of the new global system, which is increasingly connected. As described earlier, globalization, with economics as the engine, is shaping the international system. The same information technology that is fueling the global economy also provides new means for gaining military advantage. In this regard, the pursuit of wealth and the pursuit of military advantage are related. The relationship between how societies make wealth and how they make war is useful in analyzing the changing global conditions. This relationship is a major element in the Toffler's theory on waves of change in which civilizations have historically undergone periodic revolutions. They have organized history into three waves. First Wave civilizations (8000 B.C. to 1650-1750) were essentially agrarian, Second Wave (1750 to 1955) industrial,

and Third Wave (1955 to present) are high technology information civilizations (Toffler, 1980, 13-14).

In describing the Gulf War in 1991, the Tofflers declare that, "Once again, we find that the way we make wealth and the way we make war are inextricably connected" (1993, 73). The Tofflers expand on this contention in *War and Anti-War* by offering observations in a number of realms from work, to innovations, and to organizations in an attempt to clearly demonstrate their assertion. One realm they discuss is that of "intangible values." This area deserves further investigation because of its impact on the pursuit of advantage. Their analysis includes how these so-called "intangible values" have increased in value and importance from second wave industrial civilizations to third wave information civilizations in both an economic sense and in terms of making war. Both economic power and military power were derived predominantly from physical assets in second wave societies, whereas in Third Wave societies, power is derived increasingly from intangibles. Economically, the Tofflers describe it this way, "While the value of a Second Wave company might be measured in terms of hard assets like buildings, machines, stocks, and inventory, the value of successful Third Wave firms increasingly lies in their capacity for acquiring, generating, distributing, and applying knowledge strategically and operationally" (1993, 67). Cultural perceptions form the foundation and shape knowledge and influence the way it is used. Comparatively, in terms of military power, the industrial approach to measuring value rests in quantitative formulas intended to determine the greater military power. Intangibles such as, knowledge and the management of knowledge are of much greater significance in Third Wave information societies and represent an increasing source of military power. The

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conditions are indeed changing. The power of information technology continues to alter the nature of conflict.

<center>What's Happening to Conflict?</center>

As globalization continues to connect the world, the nature and characteristics of conflict are changing. A whole range of influences from the emerging global system causes conflict to change in terms of not just how it is fought, but also why it is fought, and what the aims and goals are within the conflict. Information technology provides new tools for new methods of creating effects against an adversary. At the same time, the changes in the global system (i.e., globalization) brought about by information technology, are creating altogether new sources of conflict. Namely economic, political, and social-cultural conflicts rising between, and as a direct result of, industrial-age societies and emerging information-age societies. The new means of generating effects offered by information technology provides the ability for nonstate actors to engage in conflict in ways never imagined in the past. John Arquilla and David Ronfeldt assert that there is a "new epoch" of conflict. They describe it this way. "This epoch will be defined not so much by whether there is more or less conflict than before, but by new dynamics and attributes of conflict. Qualitative changes will be as strong, if not stronger, than quantitative changes" (1997, 3). The qualitative changes represent the principle factors that impact the ability of one side to gain and maintain advantage against their adversary. Qualitative changes include fundamentally different cultural perceptions of each side, which form the basis for the rules they play by.

One of the most important qualitative changes in the nature of conflict is that it is less identifiable as either war or peace. It is rather a continuum of conflict, which is really

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only distinguishable by the effects--both military and nonmilitary--generated by one entity against a competing entity. The differences between the purely military and nonmilitary also become less distinguishable. Additionally, the opening of the virtual realm of cyberspace results in the demise of past constraints of time-distance, and of traditional legal constructs. The broadening access to information technology that permits users to generate effects with a certain degree of anonymity also changes the dynamics of conflict in a very significant way. These rather dramatic changes to the nature and dynamics of conflict have fueled theories and speculations about the future of conflict and warfare. In fact, Qiao Liang and Wang Xiangsui of the Chinese PLA have developed a theory on what they term "unrestricted warfare." Their theory capitalizes on the new dynamics of conflict, some of which are briefly described above.

The essence of Liang and Xiangsui's theory is that principles of war are changing from the use of armed force to impose will to that of, "using all means, including armed force or non-armed force, military and nonmilitary, and lethal and non-lethal means to compel the enemy to accept one's interests" (2000, 5). What is most intriguing about their theory on new principles of war is that it recognizes and accounts for the changes in the nature of conflict as a result of the information technology revolution. It offers a new look at conflict in a strategic environment where traditional barriers and constraints are either reduced or gone altogether. Their theory is not the same as the so-called Unrestricted Warfare of the First and Second World Wars, which essentially involved attacking commerce and population centers as a means to break the enemy's will. Liang and Xiangsui's theory of unrestricted warfare, on the other hand, capitalizes on information technology and is predominantly oriented on the means and methods rather

than on the targets or objectives. Their theory is well suited for the increasingly complex

nature of the global system. They identify the following as the principles of their idea of a

new kind of warfare:

Omnidirectionality: 360-degree observation and design, combined use of all

related factors.

Synchrony: Conducting actions in different spaces within the same period of time.

Limited objectives: Set a compass to guide action within an acceptable range for

the measures (available).

Unlimited measures: The trend is toward unrestricted employment of measures,

but restricted to the accomplishment of limited objectives.

Asymmetry: Seek nodes of action in the opposite direction from the contours of

the balance of symmetry.

Minimal consumption: Use the least amount of combat resources sufficient to

accomplish the objective.

Multidirectional coordination: Coordinating and allocating all the forces which

can be mobilized in the military and nonmilitary spheres covering an objective.

Adjustment and control of the entire process: During the entire course of a war,

from its start, through its process, to its conclusion, continually acquire information,

adjust action, and control the situation (Liang and Xiangsui 2000, 141).

The principles of unrestricted warfare described above are raised to highlight a

new theory of warfare for the information-age that represents a departure from more

traditional principles of the industrial age. The unrestricted warfare principles fit well

with the global insurgency mode of operation, especially since they are typically applied

using rules different than those adhered to by the U.S. Most importantly, however, the principles and theory represent meaningful perspectives on the impact of information technology on the nature of conflict.

The trends described above about the changing nature of conflict boil down to a few central issues relevant to this thesis. The first is that developments in information technology have created new and greater means of producing effects against an adversary. Secondly, information technology has broadened the scope of the battlespace, resulting in significant qualitative changes in the nature of conflict. Some of the more notable qualitative changes include; the blurring of boundaries (between war and peace, military and nonmilitary, legitimate and illegitimate, etc.), an increased ability to conduct operations anonymously, the ability of individuals and nonstate groups to operate with global reach, and the ability to communicate to widely dispersed masses extremely rapidly. Additionally, the expanded access to the tools capable of generating effects serves as a multiplier of these conditions. One can see that the changing conditions of the global environment have caused the dynamics of conflict to shift considerably.

The U.S. government has, in fact, made efforts to address the changing global conditions and the changing nature of conflict. The resulting military transformation plans are included in this analysis. The threat used for the qualitative analysis of military advantage is that of global insurgency. The U.S. government views global insurgency as the greatest threat to U.S. national security. This is because the conditions of the global environment are most suitable for transnational insurgents with global reach. This is the principle reason the question of gaining and maintaining military advantage between these two is the subject of this analysis. In addition, the conflict between the U.S. and

global insurgents involves a fundamental strategic choice. Being that global insurgents are not nation states, the state of "victory" can not be defined in the traditional sense. Instead, a conflict like this is more likely to involve a perpetual struggle, one in which the U.S. may find the best possible end-state is merely keeping the threat at bay. The choice for the U.S. would be to pursue a path towards traditional victory or a path towards a newly defined acceptable end-state. The difficulty in defining this new end-state underscores the real challenge facing the U.S.

PART TWO: MILITARY ADVANTAGE IN THE INFORMATION AGE

Introduction

This section sets out the structure for evaluating the impact of information technology on military advantage. The theorem here is to identify the basic elements involved in gaining advantage, then discuss the qualitative changes to those elements caused by information technology. The author uses a basic model to help identify the elements, describe them, and demonstrate the relationships between them. Then the changes to each element are discussed to show how information technology is changing the equation for gaining and maintaining advantage. This section also contains a discussion on other aspects of the nature of advantage. Here the author will show how advantage is not a zero-sum game. This point is crucial to the comparative analysis between the U.S. military and global insurgents.

Elements of Advantage

Advantage in the current global environment is extremely difficult, if not outright impossible, to quantify and measure. Yet, in a competition or conflict, the side that can gain, maintain, and then exploit their advantage over their opponent has the greater

chance for success. Therefore, a qualitative assessment of advantage requires a framework or construct. The model illustrated in figure 1 provides the basis for cogent analysis.

Elements of Advantage:

Developed and crafted together to gain superiority of position to impose will upon opponent

POWER

Application of Power

STANDARD OF LEGITIMACY

EFFECTS

Complex, Interdependent, Interrelated Environment

MEANS: POWER
WAYS: LEGITIMACY (Legitimate Methods)
ENDS: EFFECTS
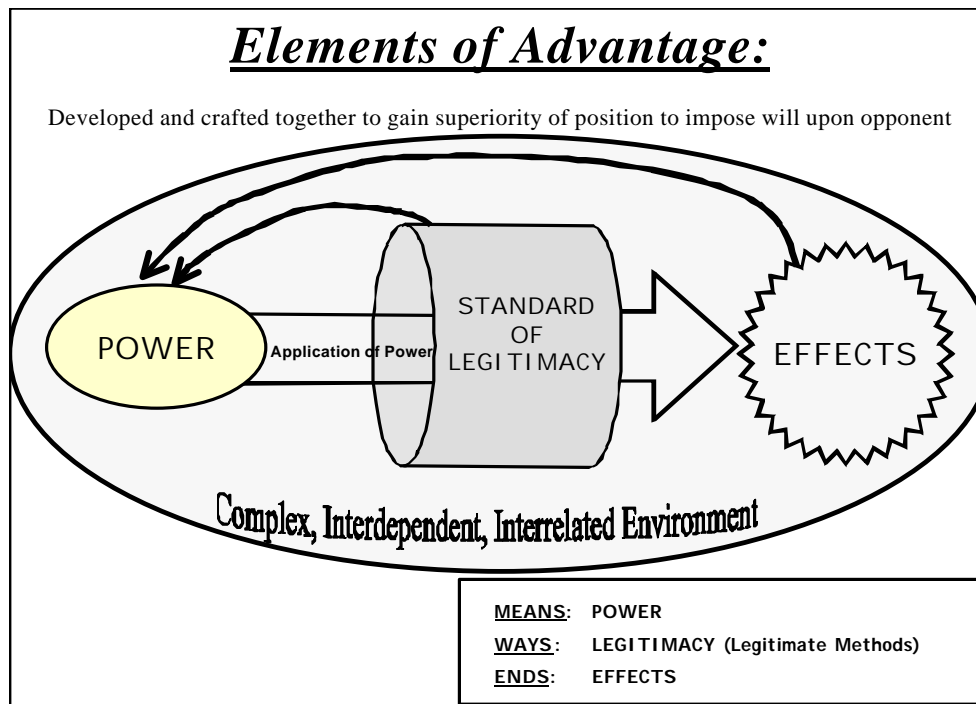
Figure 1.   Elements of Advantage Model

Power is tantamount to the "means" to take some action. Power of course takes many forms, but it essentially represents some ability by its possessor to do something. Power is only of use if it can be applied to create some outcome. Particular constituencies judge the application of power to create an outcome by some standard of legitimacy. The basis of legitimacy rests in the generally accepted standards and norms of each particular constituency. The legitimate application of power is not, however, dependent on universal acceptance. Different constituencies may use different standards of legitimacy, based on their distinct cultural perceptions, social order, and traditions. In the model

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legitimate methods are the "ways" of the equation. Effects are the outcomes and are direct precursors to advantage. Effects are the "ends" and result in some change in condition, which can be either tangible or intangible (e.g., physical or psychological). Both legitimacy and effects can result in increased power if the action is deemed legitimate and/or the effects achieve competitive advantage. Similarly, they can result in a diminishing of power if the action is not deemed legitimate and/or the effects are unfavorable to advantage. There are feedback loops represented in the model that depict this process. The feedback loops can increase, diminish, or have no net impact on power. These impacts predominantly result from the application of power. In addition, efficiency and effectiveness of the application of power contribute to the degree of advantage achieved. Each of the elements is inter-related with the others. The elements also exist within the context of a complex, interdependent, and inter-related environment. This is critical because power depends on greater interdependence of variables rather than on some predictable mechanical process. A balance between the elements is essential. A viable power source applied efficiently, effectively, and legitimately to produce the desired outcome or effect optimizes the means, ways, and ends to achieve maximum advantage. Subsequent analysis of this basic equation will show that information technology impacts each of these elements and their interrelationships, thereby changing the basic nature of military advantage in the information-age.

Power

In a broad sense, power is generally characterized as a means to influence someone or something toward a desired end. Merriam-Webster defines power as the, "ability to act or produce an effect" (*Webster's Third New International Dictionary*

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1981). When it comes to competition or conflict in the global system, power has traditionally been considered in the context of national power. In modern terms, national power is associated with the concept of the sovereign nation-state that emerged from the Treaty of Westphalia in 1648. National power has some defining characteristics that are outlined to add clarity. The following analysis establishes a base-line characterization of power. It subsequently evaluates the effects of information technology on power to show how it is changing.

Like advantage, power itself is difficult to quantify. For the purpose of this analysis, however, the most important point is from where power is derived. In other words, what factors generally constitute sources of power. David Joblonsky offers a useful explanation of the elements of national power by grouping them into two categories, natural and social determinants of power. He describes it this way:

> The natural determinants (geography, resources, and population) are concerned with the number of people in a nation and with their physical environment. Social determinants (economic, political, military, psychological, and, more recently, informational) concern the ways in which the people of a nation organize themselves and the manner in which they alter their environment. (1997, 34)

Each of these elements of national power is interrelated with others, which makes it even more difficult to evaluate and quantify. They are not separate and distinct elements, rather elements that are combined in a way that produces some degree of power. Once again, of significance here is not the quantification of power, but rather the origins of these elements and how they are developed and managed. All of the natural and social determinants of power described above are most often associated with the nation-state.

The determinants of power are largely resource oriented. Military power, for instance, has typically been derived from resources such as population, natural resources, industrial base capacity, technology, and weapon system hardware. As such, nation-states have had considerable ability to control those elements of power. The broad theme for national power in the twentieth century was the centralized control of power by states. Access to power resources in the industrial age was, for the most part, limited to nation-states, mostly because of the vast expense and capacity required to bring those power resources to bear. Further, under the Cold War bipolar balance of power, boundaries divided states into camps where power was more tightly controlled as a result of the east-west global power struggle. So in addition to raw power resources, the way those resources are developed and managed to produce effects is also a major factor in the power equation.

The concept of power is even more dynamic than simply identifying elements and categorizing them. There are other important characteristics of national power. One such characteristic, and most important from the author's point of view, is the relative nature of power. David Jablonsky describes the relative nature of power this way, "national power is relative, not absolute. Simply put, a nation does not have abstract power in and of itself, but only power in relation to another actor or actors in the international arena" (1997, 34). Joseph Nye also asserts that when power is measured by how behavior of others is changed, the preferences and intentions of those others must be known (2003, 58). In other words, power of one side is relative to the preferences and intentions of the other side. These characteristics described by Jablonsky and Nye are important because they add some definition to the rather abstract concept of national power and they

underscore the relative nature of power. As the base line then, sources of power in the industrial age were predominantly associated with nation-states, which in turn exercised centralized control with some confidence in understanding the motivations and intentions of adversary states. This allowed states to limit access to power resources. In the international system, states governed power to serve their own interests through international law, treaties, alliances, and other agreements.

The information revolution has dramatically changed the global power equation. Several key factors contributed to this change, which consequently produced equally dramatic change to the nature of military advantage. The dominating feature of the change is the vastly expanding access to information technologies. This amplifies the notion of relativity with respect to power discussed earlier, in that there are many more actors involved. Another factor is that human knowledge, generated from information proliferation through information technology, itself represents a new power resource. The speed of information proliferation creates a complex system of interaction and inter-relationships that produce rapid and often unpredictable change. The process of bringing a power resource to bear to generate an effect is itself a potential source of power. That is, the key factor in using knowledge as a power resource in a complex system requires organizational agility with a capacity for adaptation.

Access to information technology has expanded. The illustration in figure 2 demonstrates the increasing access to information technology from a U.S. military perspective. The globalization of the economy is the main force behind the rapid development and distribution of information technologies. The very same information technology (i.e., computing, communication, and especially the Internet) that fuel the

globalization of the economy, can be used for illicit purposes just as effectively. Herein

lies the importance of the connection between the making of wealth and the making of

war described earlier. The same tools that provide computing power and instantaneous

mass global communications that enable the success of global international corporations,

also provide the means to generate effects in a conflict. Using Friedman's definition of

globalization, one can see that this conflict could occur among any combination of

individuals, corporations, sub-national organizations, and nation-states, including those

with vastly different cultural perspectives and motivations. Moreover, the cost of access

to information technology continues to diminish. Consider the ability to access the

Internet in a public library in the U.S. for virtually no cost at all. The power of the

Internet in terms of accessing information and communicating is simply staggering. The

information itself that traverses the Internet is recognized now as a new power resource,

one that is widely accessible and not controlled by the state. Joseph Nye describes the

impact of increased access to the Internet, at reduced cost, with power to communicate

widely with very limited state control this way: "What this means is that world politics

will not be the sole province of governments. Both individuals and private organizations,

ranging from corporations to NGOs to terrorists, will be empowered to play direct roles

in world politics. The spread of information will mean that power will be more widely

distributed and informal networks will undercut the monopoly of traditional bureaucracy"

(Nye 2003, 217). Importantly, these distributed informal networks often have no

compunction about following a different set of rules to govern their actions, rules based

on their own distinctive cultural perceptions, rather than the western notion of standards
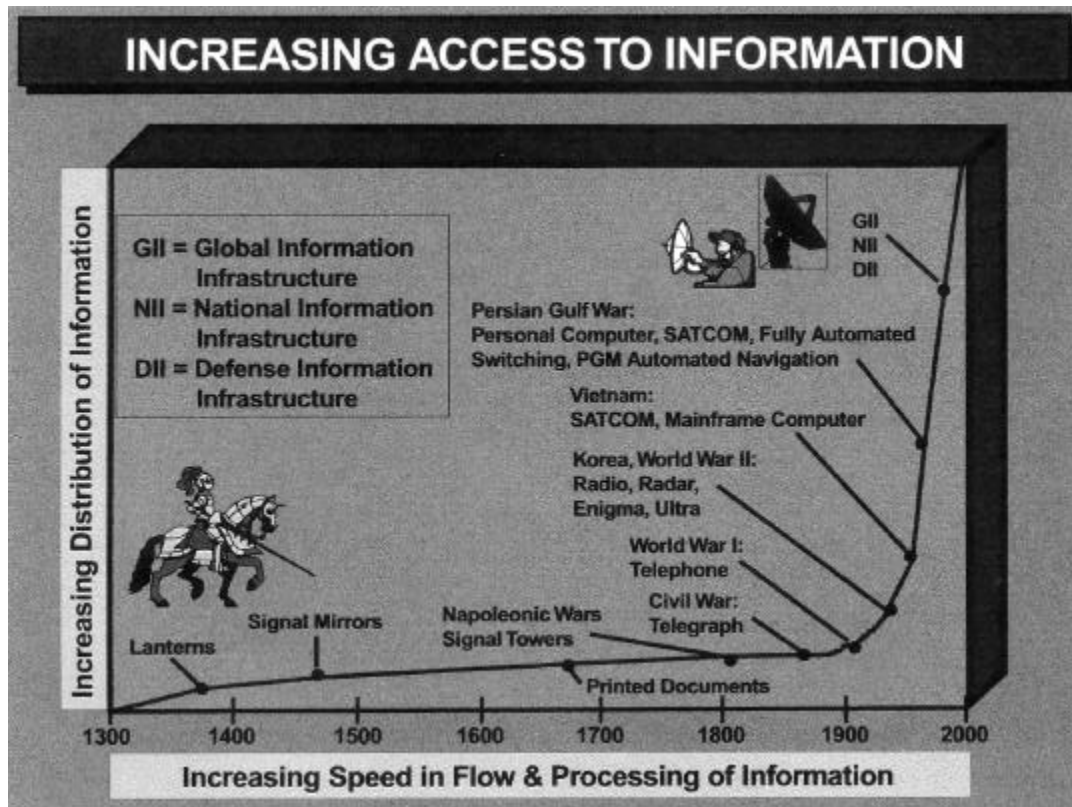
and norms.

Figure 2.   Increasing Access to Information
Source: JP 3-13 1998, I-12.

Information as a power resource is the defining intellection of this thesis.

Information technology represents the means to draw on this new form of power

resource. Information as a resource has unique characteristics. It is dynamic, perishable, unpredictable, literally infinite, and extremely difficult to control.

> For Third Wave civilization, the most basic raw material of all--and one that can never be exhausted--is information, including imagination. Through imagination and information, substitutes will be found for many of today's exhaustible resources--although this substitution, once more, will also too frequently be accompanied by drastic economic swings and lurches. (Toffler 1980, 351)

This characterization of information as a resource by Alvin Toffler illustrates some of its unique attributes. In terms of the Diplomatic, Information, Military, and Economic (DIME) instruments of national power, information permeates and links all of the instruments. Moreover, information actually transforms the other instruments in a manner that changes its very content. As a result, the instruments are often described in terms like information warfare, information diplomacy (public), and information economy and society. So, information does not merely constitute a single distinct instrument of power, but a resource that changes the nature of power in more general terms across all instruments. Furthermore, the conflict between the U.S. and global insurgents (i.e., GWOT) appears inherently protracted and complex with information playing a much more dynamic role relating to all the systems of national and nonstate power. In fact, these dynamics provide evidence that information is taking on a greater level of importance in the DIME than the military instrument in terms of U.S. ability to effect change in the world consistent with its national interests. At the same time, information leavens power and gives nonstate actors the ability to react on par with some states. This characterization is not lost on U.S. military planners who acknowledge that, "Information itself is a strategic resource vital to national security" (Chairman, Joint Chiefs of Staff 1998b, I-18). It is important to note that the effective use of information resources to

generate desired effects in a complex system demands organizational agility and continuous adaptation.

Rapid change characterizes the complex environment of the information-age. Information must be converted into knowledge that can be used to generate some effect for it to have value as a resource. The process of turning information into effects constitutes a source of power in itself, one that would fit into Jablonsky's social determinant category of power. Therefore, an organization's ability to execute this process efficiently and effectively can increase their power. "The information revolution sets in motion forces that challenge the design of many institutions. It disrupts and erodes hierarchies around which institutions are normally designed. It diffuses and redistributes power, often to the benefit of the weaker, smaller actors" (Arquilla and Ronfeldt 1993, 1). This observation about the effect of the diffusion of power in a complex system relates to the ability of institutions to adapt quickly. It illustrates that slow bureaucratic processes hinder traditional large hierarchical organizations, while smaller networked organizations obtain increased power through adaptation and agility. The point here is that institutions best organized to use information to create effects in a complex system will increase their power.

<div align="center">Legitimacy</div>

The concept of right and wrong serves to motivate individuals and groups to act in certain ways. Human nature and how societies and civilizations behave and interact are inherent in this notion. The basic concept of right and wrong, in terms of the application of power, is the primary feature of legitimacy. The notion of right and wrong is inherently based on human values, which in turn are shaped culture. Merriam-Webster

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defines Legitimacy as, "conforming to recognized principles or accepted rules and standards" (*Webster's Third New International Dictionary* 1981). Legitimacy, therefore, represents a constraint on the application of power in the sense that it involves "conformance". This, of course, is nothing new. It is an issue critical to the examination of power and advantage. The information revolution and the new global system impact the traditional paradigm of legitimacy in the use of power to create effects. Understanding the qualitative changes in the nature of advantage, then, requires a description of how information technology changes the way legitimacy impacts conflict. Here the author will show how legitimacy is changing from the Clausewitzian paradigm based on a standard of rational nation-state politics to a paradigm that is more loosely interpreted with varying standards and irrational tendencies. This distinction is important in the analysis of advantage because it marks a consequential change in conditions that result in fundamental change in military competition. This discussion on legitimacy and how it is changing relative to gaining and maintaining military advantage supports subsequent comparative analysis.

The U.S. has enough destructive power in its nuclear arsenal to obliterate the entire planet many times over. What prevents the U.S. from using this vast arsenal when national interests are threatened? The answer in a word is legitimacy. Legitimacy serves as a self-restraint, certainly for rational state actors. Legitimacy in the traditional nation-state international system was founded on the western notion of standards, rules, and principles of international law. Clausewitz appropriately characterizes legitimate use of military power in the international system of nation-states in his description of serious means for a serious object. He declares that war (military competition or duel), though it

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can be exercised in the extreme, remains "…subject to the will of a guiding intelligence" (Clausewitz 1832, 119). That is, even war in the extreme can be considered legitimate as a rational instrument of national political policy.

Nation-states of today remain largely bound by the principles of legitimacy, based on the western model of international politics, however, there are increasing pressures of the new global security environment to deviate from this international norm. The Abu Ghraib Iraqi prison abuse photos underscores this pressure. Nation-states continue to seek legitimacy in their use of military power as illustrated by UN resolutions. "A [UN] Security Council resolution in September 2001 which obligated all 189 member states to deny terrorists safe harbor helped to legitimate American actions in Afghanistan" (Nye 2003, 226). Legitimacy remains a significant constraint on the use of power by rational states. The new conditions of the information-age, however, create dilemmas for nation-states in using national power to combat information-age threats, especially from nonstate global insurgents.

The first dilemma is that since legitimacy is founded on the cultural perceptions of a given constituency, different constituencies are likely to follow distinctly different sets of rules, with each seeing their rules as legitimate. As a result, a particular action is observed and judged by different constituencies using perhaps completely different sets of rules. Complicating matters is the fact that the different rules can be incompatible and irreconcilable. Information-age conflict, exemplified in the current conflict between the U.S. and global insurgents in GWOT, can involve a clash among more and different constituencies because of increased access to global power. Consequently, acting in a universal or even widely accepted legitimate manner is more challenging, particularly for

the U.S. who is much more dependent on legitimacy to be successful in the conflict. Thus, the need for legitimacy will likely hamper the success rate for the U.S.

The second dilemma is the increasing need to preempt the threat of a catastrophic attack. The initiator of conflict is typically viewed as the aggressor, thus leaving the legitimacy of the action open to serious challenge within the international community. While engaging in preventive action against another state has legitimate basis in international law in Article 51 of the U.N. Charter, the initiation of action must be supported by facts at some point to gain bonafide legitimacy. In the case of information-age threats, the hard proof of the threat can be elusive. Information technology allows threats to gather in relative ambiguity and anonymity. Legitimacy of preemptive military action becomes questionable in the absence of hard proof of the threat.

The next dilemma relates to the effects created using information technology in a conflict. Globalization renders the world more connected, complex, and interdependent. The lines between military and nonmilitary targets become blurred. Elements of power become increasingly interconnected. Military power, for example, uses commercial information technology for communications. "Approximately 95 percent of all military communications are routed through commercial lines. . . . The United States buys most of the microchips used in military systems from commercial vendors" (Arquilla and Ronfeldt 1997, 178). These conditions increase the potential for effects having impacts that extend beyond just military targets. A similar blurring of lines occurs along a slightly different dimension. The lines that categorize effects as an act of war or an action short of war. The distinction between these two is essential to the question of legitimacy in the context of international law. John Arquilla describes this inherent blurriness related to

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defining "combatants" and "acts of war" this way. Unlike strategic aerial bombardment, where enemy combatants are known, and to a lesser degree, guerilla warfare, in information warfare almost anyone can engage in the fighting.

> Thus, it is important, from an ethical perspective, to make a distinction between those with access to advanced information technology and those using it for purposes of waging information warfare. Further, the nature of cyberspace-based attacks is such that there may often be an observable equivalence between criminal, terrorist, and military actions. (Khalilzad and White 1999, 386)

For nation-states bound by international law for the legitimate use of military power, the dilemmas described above serve to illustrate that the information revolution is causing qualitative changes to the concept of legitimacy. Thus far, the legitimacy dilemmas of the information-age seem to be limited to those beholden to the standards and principles of international law. Clearly this presents challenges for nation-states as they employ national power to generate effects. The challenge is exacerbated when the nation confronts threats from a nonstate actor with no allegiance to international norms and standards, and judges their behavior by a completely different standard. A conflict of this type, the subject of this thesis, seems to depart from the rational nature of Clausewitz's theory on war and poses dangers of absolute war and disconnect from politics. It should be noted that nonstate actors, including global insurgents, are not free from the restraints of legitimacy. Their actions, especially hostile acts, must be perceived as legitimate in the eyes of their constituents for them to be successful. The legitimacy of their hostile acts, however is not measured by the same standards as nation-states in the international system. In the case of Islamic terrorists, the standard of legitimacy is measured by their interpretation of Islamic law from the Koran. The different standards of legitimacy and the fact that global insurgents do not subscribe to the same international

institutions as nation-states means that there is no political mechanism to resolve conflict in a rational manner. In fact, they do not even have an interest in being party to a "resolved" conflict.

There is yet another important aspect of legitimacy that deserves some discussion. That is, legitimacy is relative to strategic imperative. This idea is closely related to the notion of proportionality. However, the tit-for-tat characteristic of proportionality becomes skewed when considered in the context of preemption and blurring of lines relating to conflict as described above. The relative nature of legitimacy is clearly illustrated by the use of unrestricted submarine warfare in World Wars I and II and by the use of strategic bombing of civilian population centers in World War II. The strategic imperative involved was the need to destroy the enemy's capacity to wage war and their will to fight. This imperative is related to the Just Warfighting concept of, "more good than harm." John Arquilla describes this concept this way, "This notion implies, of warfighting, that ethical conduct requires calculation of the net good to be achieved by a particular use of force. An example of such a calculation, though clouded by violations of notions of noncombatant immunity, is Truman's decision to drop the atomic bomb on Hiroshima to avoid a more costly conventional invasion of Japan" (Khalilzad and White 1999, 383). The use of these tactics, though morally questionable, nevertheless did conform to the rational process put forth by Clausewitz. If the same relativity were applied by a nonstate actor, using their own standards of legitimacy, it is conceivable that any use of violence against any target could be construed as legitimate in their eyes. Herein lies a great danger in the information-age where information technology and globalization extend power down to the individual level.

The qualitative changes to the concept of legitimacy, brought about in large measure by the information revolution, most certainly impact the power equation for gaining and maintaining advantage. The constraints of legitimacy for rational actors on the use of violence or other harmful effects in a conflict are related to the principles of international law, but the dilemmas created by the information-age environment complicate the whole concept. The result is marked changes to the conditions under which states and nonstate actors alike apply power to generate effects to gain advantage. These conditions also tend to force state actors down the amoral slippery slope. Subsequently, the concept of legitimacy becomes more important, and now increasingly more blurry than physical destruction.

<div align="center">Effects</div>

An effect, in essence, is the result of the application of power. The Joint Forces Command Glossary defines effect as, "The physical, functional, or psychological outcome, event, or consequence that results from specific military or nonmilitary actions" (JFCOM Glossary). An effect is the direct precursor to either gaining or maintaining advantage in a competition or conflict. Much like power and legitimacy, the information revolution causes qualitative changes in effects. Creating effects has always been critical to success in warfare. Effects are those outcomes that shape the conditions of the competition. Effects vary in type, scope, and impact. They all are, however, the result of applied power with the intent to gain or maintain advantage over an adversary. This analysis will show the impact of information technology on effects. The points made here include the shifting of importance from tangible brute force effects to more intangible knowledge-oriented effects. Knowledge, in turn, is shaped and influenced by cultural

perception. Discussion will also include an examination of how centers of gravity, the ultimate target of effects, are changing as a result of globalization and the information revolution. Other qualitative changes illustrated here are increased precision of effects, expansion of second and third orders of effect in an interdependent international system, and the rapidly expanding number of actors across the globe capable of producing significant effects.

Twentieth century conflict could be characterized by industrial warfare with large-scale physical destruction at its center. There are arguably some exceptions to this to be sure, but there is little question that physical destruction of enemy military and industrial power was central. The two World Wars saw whole nations ravaged with countless millions killed. The Cold War was essentially a contest of mass destructive power that ended with enough to annihilate the world many times over. Some argue that destructive power has in fact reached its outer limits. The Toffler's take this position.

> The development of modern war--the war of the industrial age--had reached its ultimate contradiction. A true revolution in military thinking was needed, a revolution that reflected the new economic and technological forces released by the Third Wave of Change. (1993, 47)

The driver of this Third Wave of change is, of course, information technology. The most direct impact here is a shifting from attrition-based destruction to information or knowledge-based effects. With the diffusion of power and the reduction of time-distance barriers, gaining advantage in a complex information-age environment will necessarily require knowledge-based effects intended to influence adversary perceptions and decisions. "Indeed, information-age modes of conflict (and crime) will be largely about 'knowledge'--about who knows what, when, where, and why…" (Arquilla and Ronfeldt

1997, 5). Therefore, using knowledge to achieve a more precise effect in time and space is key. To achieve the desired effect, adversary perceptions must be understood.

Information technology has certainly led to an increase in "knowledge" and knowledge management, which reduces some degree of uncertainty and enhances situational awareness. It has also, however, led to an immense surge in readily available information, which negatively impacts the ability to use that information effectively. This allows for more precise targeting for effect. Moreover, it has also led to enhanced tools to deliver precision effects against specific enemy targets such as global positioning, satellite guided munitions, targeted media outlets, and even email accounts and cell phone numbers of decision-makers. The pursuit of precision effects to gain advantage is a significant departure from the days of strategic bombing industrial population centers in World War II. Additionally, the target of effects in information-age conflict is considerably different than the targets of attrition in the industrial age. The distinction is between physical destruction and producing a desired outcome, however limited.

The centers of gravity for industrial age attrition warfare were typically a nation's military forces and industrial capacity. Information-age centers of gravity are much more fluid and to some degree more difficult to protect and find. Rather than physical assets, more often legitimacy, knowledge, will, and possibly anonymity in the case of insurgents, are becoming centers of gravity in information-age conflict. Physical and technological assets will continue to represent considerable and important power, even centers of gravity under some circumstances. The point here is that in the information-age, effects successfully targeted at knowledge systems, legitimacy, or public support can render

physical power less relevant or even defunct. This is one of the defining qualitative changes to effects and is fundamental to understanding the changing nature of advantage.

Another important qualitative change in effects relates to the diffusion of power. The information revolution and globalization result in an expanding number of actors capable of producing significant effects. In addition, as Friedman notes in his definition of globalization, these effects can be produced faster, cheaper, farther, and deeper than ever before. Under these conditions, control by nation-states is reduced and states are increasingly challenged to protect growing vulnerabilities, especially if they approach conflict from a western orientation without accounting for different cultural perceptions of the adversary.

Interdependence within the new global system can lead to a compounding impact of effects. An effect created in one part of the system can, through the interdependence of other parts, result in second and third order effects in greater magnitude. Just as globalization has connected the world and brought it closer together, effects in one part of the system are likely to affect other parts through this connectivity. Wayne Michael Hall describes this impact in terms of what he calls the "world tapestry of systems."

> Finally, as interrelationships and connectivity continue to expand in size and grow in importance, problems occurring in one part of the world (social, ecological, political, economic, financial, military, and so forth) will increasingly influence events taking place in other parts of the world – causing tremendous frustration and consternation to people who experience difficulty in perceiving the 'shroud' of interrelationships cloaking the world and second- and third-order effects that influence the interrelationships of these systems. Indeed, as we progress in the new millennium the catalysts energizing events and relationships that lead to effects (out-comes) will become more abstract, less observable, and in many cases, completely invisible. (Hall 2003, 8)

Hall's characterization captures much of the essence of the qualitative change in producing effects to gain and maintain advantage in the new globalization system. The

abstract and invisible impact of effects in future conflict will go unnoticed by the general public, making a definitive declaration of victory all but impossible. This helps bring into focus the increasing challenges for nation-states and increasing opportunities for nonstate actors.

<div align="center">Additional Points on the Nature of Advantage</div>

There are some additional points that are relevant to the nature of competitive advantage in the information-age. One can see from the changing dynamics and conditions described in the discussion on the elements of advantage, the basic competitive environment is changing significantly. It is true that some things remain the same--human nature, competing interests, determination of will, and so on. There are some things, however, which represent very fundamental change with respect to the competitive environment and how actors interact in that environment. Many aspects of these fundamental changes have been discussed throughout this chapter and some have not. A brief discussion of these is warranted to gain a more complete understanding of the changing conditions and the impact they have on competition for advantage.

Advantage is becoming much more temporary and transient in nature. A position of advantage can change very quickly and without notice. This is essentially the result of the basic shifting of power resources from physical assets to information and knowledge. Thomas Friedman describes this using a sports analogy.

> If globalization were a sport, it would be the 100-meter dash, over and over and over. And no matter how many times you win, you have to race again the next day. And if you lose by just one-100th of a second it can be as if you lost by an hour. (Friedman 1999, 12)

This analogy illustrates a critical point about the nature of advantage in the information-age. The whole notion of information as a power resource, and thus a source of

advantage, has a profound leveling effect in the new competitive environment. The immense physical resources of a nation-state can be negated by a clever nonstate actor armed with information and information technologies that can produce significant effects. Moreover, the fluid and transient nature of information and knowledge means that advantage that relies on information will also be fluid and transient, thus the need for constant pursuit of that advantage. This does not mean that the advantage is dependent on information technology or even anything physical in nature at all. It does suggest, however, that the intangible value of information on advantage is significant.

Any discussion of advantage without the concept of asymmetry would be incomplete. Asymmetry in competition is a rather simple concept whereby one side matches their advantage against a disadvantage for the opposite side, typically in such a way that reduces or negates an existing advantage of the opposing side. Of course, asymmetric warfare is as old as warfare itself. The disadvantaged side always seeks to reduce their opponent's advantage and to seek their own advantages. The information-age environment seems to intensify the ability for all actors to engage in the pursuit of asymmetrical advantage.

> What is new lies in the increasing capabilities the information revolution represents for asymmetric adversaries to help create the offsets they desire. Examples that come to mind include the Internet, cellular phones, personal computers, personal digital assistants, powerful kinetic bombs, and individually placed weapons of mass destruction. (Hall 2003, 50)

Additionally, a particular issue may affect each side in different ways. Take the issue of time for instance. Consider the ongoing war on terrorism. Time is not on the side of the U.S. A conflict resolved in the shortest time possible favors the U.S. On the other hand, extended and drawn out conflicts favor global insurgents. They can afford to hide and

wait until the conditions favor them. When the U.S. commits armed forces in a conflict, it is most often a resource intensive commitment and depends on public support, which is subject to change over time. Then there are those issues that conflict between a collective desire and the necessity to protect against a threat. The example here would be the desire of the American people to live in a free and open society. Living in a free and open society represents a disadvantage when confronted with threats that seek to take advantage of the vulnerabilities of that open society. Advantage then, is complex and multi-dimensional.

Lastly, it is worthwhile to note that access to power is not a zero-sum game. This is important because it illustrates that the use of a particular information technology (e.g., the Internet) does not represent an advantage for only one side. Both sides in a competition can benefit from a technological development, although they may benefit in different ways. Likewise, technological limitations can represent disadvantages for both sides.

Summary

The preceding discussion and analysis demonstrates a qualitative change in the nature of competitive military advantage in the information-age. The framework used for this demonstration involved specific analysis of three elements that together produce a competitive advantage. The elements of power, legitimacy, and effects represent those forces necessary to achieve advantage. Sources of power applied toward an objective in an efficient and legitimate manner produce the effects that lead to a position of advantage. Information technology has caused rather dramatic qualitative changes to these elements.

Power in the industrial age was predominantly related to physical assets that were centrally controlled by nation-states and generally governed by the principles of international law based on western values and cultural perceptions. Information technology and globalization result in vastly expanded access to information and knowledge, which itself is becoming a significant power resource. Organizational ability to bring the power of knowledge to bear efficiently and effectively is also a key feature of information-age military competition.

Legitimacy represents an important restraint in the application of military power. The impact of information technology on military competition includes new dilemmas in legitimacy, especially for nation-states. The increased number of actors with global power has rendered some traditional characteristics of the concept of legitimacy more pronounced. The first is that there are different standards of legitimacy. Then there is the notion that legitimacy is relative to the strategic imperative of one's interests. All of these issues create marked changes in the conditions for gaining and maintaining advantage.

Destruction of physical power resources in attrition-oriented warfare has given way to effects-based warfare. The power of information technology increases the ability to generate information-based and precision effects. The number of actors producing effects also increases with expanded access to information technology. As a result, centers of gravity (COG) are changing, thus shifting strategic objectives and aims. A COG in this case represents a source of significant power. Once again, these qualitative changes represent significant alterations in the conditions for gaining and maintaining advantage.

The changes in the elements taken with the additional characteristics of advantage (complex, asymmetrical, and multi-dimensional) result in fundamental changes in conditions. This affects sources of power, the way power is applied, perceived legitimacy of the use of power, the number of actors engaged in applying power, the speed at which power is applied, the global reach of the effects of that power, the complexity of the impact of the effects of power, and so on. The comparative analysis between the U.S. defense transformation efforts and the threat of global insurgency will be done using these conditions.

PART THREE: COMPARATIVE ANALYSIS.

Introduction

> Those engaged in military foresight are in a perpetual struggle with the challenge of change, assessing whether change in armed struggle is evolutionary or revolutionary and whether it will affect military art. The process is usually a critical investigation, implying that a determined potential opponent's clever mind is seeking to gain a military advantage in a future conflict. (Kipp and Grau 2001, 95)

Indeed, the assessment of how information technology impacts the pursuit of competitive military advantage is a challenge. The information revolution has rendered a true revolution in that the power of information and knowledge now have the capacity to outright negate the power of physical might. The revolution has affected the global conditions of power and advantage. It has also affected the very nature of military advantage. Under these new conditions, further analysis is required to determine the impact on the ability of both the U.S. military and the rising threat of global insurgents to gain and maintain competitive advantage. This analysis transcends information technology itself. Of more consequence is the broader context of the environment created

by information technology and the factors involved in producing advantage in this new environment. The playing field for military competition has changed. The comparison of two players will illustrate how information technology has impacted achieving competitive military advantage.

In the comparison the author will show that despite vast resources, immense industrial capacity, and massive destructive power, U.S. military competitive advantage in the information-age will be marginal and under perpetual challenge. The comparison will examine the general strategy or approach to gaining advantage for both the U.S. and global insurgents. Secondly, some relevant characteristics of each will be discussed to further define some of the central issues in the competition. Then, the comparison will evaluate selected criteria and considerations that are key to determining the success of gaining competitive military advantage in the information-age. The criteria considered in the analysis are; access to power/capabilities, adaptation, funding, legitimacy, time/distance, and precision effects. Because of the complexity of advantage, the situational dependency of advantage, and the difficulty of quantifying advantage, this comparison cannot be all-inclusive. Rather, it attempts to serve as an illustrative example for better understanding how the nature of advantage itself is impacted and changed as a result of information technology.

<u>Global Insurgents</u>

> Utilizing and exploiting a potent blend of high-technology and low-technology means of communication and warfare, as well as a sophisticated and complex organizational structure, al Qaeda represents the new wave of insurgent actors; transnational, or super-empowered, individuals no longer bound by traditional nation-state borders, and capable of organizing insurgency on a global scale. (Highland 2003, 25)

This observation by Grant Highland captures the essence of the threat posed by this new global insurgency and its capabilities to gain advantage. The stark description alludes to means made possible only by information technology, which in fact are what gives rise to this new type of global threat. Without information technology, this discussion would not be taking place. Reality has shown however, that information technology has created conditions whereby nonstate actors and individuals are empowered to influence global power politics. This fact in itself is prodigious and the consequences are severe. Consider the possibility of an embittered individual sitting at the table of global power. The very worst intentions of an individual can be brought to bear on the rest of the world's populations. This is not the subject of a science fiction novel or even the worst case prediction of a futurist. It is real and it is here today.

The new form of global insurgency essentially employs guerilla tactics using both low tech and high tech tools as their means to create effects. This combination of unconventional tactics with new and old tools together to generate effects to impose their will embodies their approach to military competition with other global powers, principally the U.S. This approach not only relies on the power of information and knowledge, it is absolutely dependent on information technology for strength and survival. Unconventional tactics and old tools of violence have existed arguably since the beginning of human interaction. Those insurgents in the past who employed these old tools and methods were largely confined to local or at best, regional areas of influence. A menace to global powers for sure, but certainly not a serious threat to the military advantages of a major industrial power. Information technology, especially the Internet, changed that. Seeking advantage in military competition involves not solely the

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enhancement of one's own strengths, but also offsetting the strengths of one's opponent. Efforts by global insurgents to offset the immense military power of the U.S. are a major part of their approach. Once again, information technology is at the heart of these efforts. "Having an information advantage is one of the few ways a terrorist group can change the balance of power that normally favors the enemy" (Department of the Army 2002, 4-27).

Power and advantage only have value insofar as they lead to achievement of objectives. That is, they are relative to the power and advantage of the adversary. The key to achieving victory in military competition is attacking or otherwise defeating the enemy's center of gravity, their source of strength. What the opponent's center of gravity is and how one defines victory are essential underlying questions when trying to understand advantage. These are most relevant from the standpoint of the relative nature of advantage. Global insurgents need not destroy U.S. military forces to achieve their aim. Global insurgents can be successful by maintaining their capability to create global effects while surviving U.S. efforts to isolate and destroy them. Moreover, global insurgents don't have the need to be successful in every engagement. Just a few successful violent precision strikes accompanied by a widespread psychological operations campaign can have huge reverberating effects, both in favor of their cause and against the U.S. A devastated U.S. economic base and a collapse of public support could very well lead to strategic success for global insurgents. The formidable U.S. military might could be rendered incapable of effectively responding against a shadowy network of terrorists dispersed across the globe. This is not to say that global insurgents do not have their own vulnerabilities. They do. For instance, they are dependent upon secrecy, yet at times are forced into the open to pursue their objectives.

Evaluation of Criteria

The first criterion for examination is access to power. This criterion involves the accessibility of tools that produce power and the ability to negate the power of opponents. It is quite clear from previous discussion on globalization and the diffusion of power, that global insurgents are gaining increased access to the tools that harness information technologies and information as a source of power to produce effects. This is the single most important criterion that cause the greatest change to the global power equation. Information represents a power source that is becoming central to competition in the information-age. Access to information will likely continue to expand. "It is safe to assume that over the next ten years the specificity, accuracy, timeliness, and relevancy of information and knowledge our adversaries will either produce or purchase will rival the best our military can find or create" (Hall 2003, 64). The increase in access and availability is a direct result of the tremendous benefits information technology produces for wealth generation. The technology explosion feeding the expanding global economy drives costs down through market forces. As a result, the demand for even the most basic information technology such as a personal digital assistant with Internet access, global positioning system, and cell phones has driven the cost of these tools down. At the same time the availability of these tools is widespread and certainly not controlled by states. The impact of low cost, readily available information technology puts incredible power in the hands of groups and individuals.

Access to information technology and the seemingly infinite pool of information gives global insurgents incredible power. The Internet for example, provides insurgents the ability to organize, plan, communicate, finance activities, conduct information

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operations activities, command and control operations, manipulate information, and so on. The Internet is a tool that global insurgents use to generate power with global reach. This power is demonstrated by evidence that the terrorists of September 11th used the power of the Internet to conduct what Tim Thomas of the Foreign Military Studies Office calls "cyberplanning." "Evidence strongly suggests that terrorists used the Internet to plan their operations for 9/11. Computers seized in Afghanistan reportedly revealed that al Qaeda was collecting intelligence on targets and sending encrypted messaged via the Internet" (Thomas 2003, 112). The new capabilities of low cost, readily available information technology tools are embodied in Cyberplanning. This access to power is significant, but it is not the only factor impacting global insurgent's ability to gain advantage. The process of bringing this power to bear to create effects is also important.

The second criterion deals with the ability of global insurgents to use this source of power effectively to gain advantage. The ability to adapt in a complex environment and capitalize on the power of information and information technologies is essential. Both the networked organization and the lack of western-style legal constraints to their operations give global insurgents an adaptive quality to take advantage of information technology. This is an area where global insurgents have a marked advantage over bureaucratic, law-abiding nation-states. John Arquilla and others believe that the implications of information technology will shift power to networked, adaptive forms of organization. "These changes [in information technology] will shift the locus of power away from the nation-state altogether and toward nonstate actors whose non-hierarchical, networked form of organization will allow them to take best advantage of new information technology" (Khalilzad and White 1999, 12). Without the constraints and

restrictions of bureaucratic hierarchical organizational structure, the global insurgents are in a better position to capitalize on the power of information technology.

The issue of cost and funding is an important criterion impacting advantage. Especially when taken together with the first two criteria of power and adaptation. The availability of low cost technology combined with adaptive non-conventional tactics to achieve important effects means that global insurgents can develop significant advantages at considerably low cost. Additionally, because of the way global insurgents operate through evasion and blending into civilian populations, they do not incur the high cost of defensive measures that nation-states have.

> It is exceedingly expensive – perhaps impossibly so – to defend against every conceivable form of attack. Accordingly, a determined opponent now has more opportunities to seize the initiative and to achieve surprise, particularly if he is a relatively invisible nonstate actor. (Echevarria 2003, 20)

So from the standpoint of funding required for both offensive attacks and for defending their operations, global insurgents have an advantage because they can achieve both at relatively low cost.

Consistent with the Toffler's theory that ways of making war are linked with ways of making wealth, global insurgents are no different. Their funding is derived predominantly from criminal activity. "They pay their way with funds raised through front businesses, drug trafficking, credit card fraud, extortion, and money from covert supporters" (National Strategy for Combating Terrorism 2003, 7). Once again, here the global insurgents have an advantage in that they are not dependent on a government regulated economic system that has significant competing priorities (i.e., social welfare, public health, infrastructure, etc.) for the resources generated by a nation-state.

Regarding the criterion of legitimacy, again global insurgents seek advantage by both increasing their own legitimacy and by diminishing their opponent's. Information technology provides valuable means for global insurgents to achieve both. Previous discussion has shown that standards of legitimacy are different for all global insurgents, other nonstate actors, and for most nation-states. The means to influence legitimacy for both sides, however, is essentially the same. Information technology offers powerful tools for conducting psychological operations. New mass media communication (i.e., Internet, satellite television, etc.) in which groups and individuals can use to carry out an information campaign targeted at specific populations. The "standards" of legitimacy are those that are generally "accepted" by the society or affected constituents. Therefore, they are subject to influence and subsequent change. In a conflict that involves violence, incites fear, and threatens the security of a society, strategic imperatives cause the threshold of the standards of legitimacy to shift. There is purpose behind the global insurgent's use of violence in combination with an information campaign, that is legitimacy.

There is another aspect of legitimacy that tends to benefit global insurgents. The blurring of lines between war and crime and military and nonmilitary actions in information-age conflicts create particular dilemmas for nation-states since global insurgents follow a different set of rules. There is an added burden on nation-states in their application of power that global insurgents simply do not have. Global insurgents are not beholden to a specific constituent population in a fixed geographic area. Their constituents are trans-national populations dispersed in pockets across the globe. Information technology provides means to communicate and influence the standards of

legitimacy within these dispersed constituency populations. The ability to communicate and influence dispersed groups lessens the importance of national borders and territory.

The next criterion has to do with the impact information technology has on reducing time and distance barriers. In some case, in fact, the barriers are completely eliminated. Global information networks--telecommunications and the Internet--give global insurgents the capability to organize, plan, and conduct operations in a synchronized manner across the globe. The information network transcends geographic, political, demographic, and other barriers that in the past served to keep civilizations separated. These barriers also represented control mechanisms for state governments. With the barriers reduced or eliminated, global insurgents have the freedom of action no longer subjugated by these obstacles. Robert Kaplan observes that these conditions will lead to a reduction in the relevancy of borders. "Instead of borders, there would be moving 'centers' of power, as in the Middle Ages" (Kaplan 2000, 50). This concept of moving centers of power allows global insurgents the opportunity to expand their sphere of influence merely by communicating with them and apply continued pressure on the legitimacy of actions taken by the U.S. to counter them. Similarly, the issue of time tends to favor global insurgents.

Evidence suggests that, for a number of reasons, time is on the side of the insurgents. Time has considerable impact on other factors of advantage as well, such as cost and legitimacy. For instance, the longer U.S. forces are employed, the more costly it is in resources. This is especially true because U.S. forces operating globally must be sustained over time, a costly adventure to be sure. Time also impacts legitimacy. Here again, if U.S. forces are engaged for an extended period of time, the global insurgents

have more opportunity to diminish their legitimacy while building their own legitimacy. "In most cases, potential opponents of the United States view time as being in their advantage" (U.S. Army Command and General Staff College 2003, 1-16). Additionally, the power of global communication has reduced the barrier of time to the speed of an email transmission. This is true for both communication and for information gathering. With cyberplanning, global insurgents can plan and carry out operations in very short order--across the globe. Moreover, cyberplanning has produced the capability for global insurgents to achieve a much higher degree of precision effects.

Precision effects are the last criterion considered in this comparative analysis. Precision effects are extremely powerful and effective tools made possible by information technology that global insurgents can use to gain competitive advantage. Precision strike employed by insurgents is somewhat different from the concept of precision strike employed by the U.S. military. While both share the same intent of striking the right target at the right time to create the right effect, and they are both made possible by information technology, they differ somewhat in their methods. Global insurgents achieve precision effects through the combination of information technology (e.g., Internet, cell phones, etc.), low technology (e.g., explosives), and unconventional tactics (e.g., terror strikes against civilian targets). Additionally, it is common for global insurgents to synchronize simultaneous strikes for effect.

> Because of globalization and the shrouds of relationships encompassing the world's tapestry of systems, terrorists will seek to orchestrate and synchronize in many locations, at the right time, to create the right effects that lead to acceptance of their will. (Hall 2003, 49)

The multiple, simultaneous train bombings in Madrid Spain in March 2004 serve as a clear example of the use of precision effects by global insurgents. The fact that the

bombings appear to have changed the outcome of national elections in Spain

demonstrates the power of precision effects by global insurgents. With the bombs

detonated by cell phones, there is no question that the capabilities provided by

information technology serve to enhance the competitive advantage of the insurgents.

<u>U.S. Military</u>

> Transformation is a process that shapes the changing nature of
> military competition and cooperation through new combinations of
> concepts, capabilities, people, and organizations that exploit our
> nation's advantages and protect against our asymmetric
> vulnerabilities to sustain our strategic position, which helps
> underpin peace and stability in the world. (2003, 3)

2003 Transformation Planning Guidance

This Defense Department definition of transformation shows that the U.S. has

taken stock of the changing nature of the new global environment and recognizes that

military competition is changing as a result. The dynamics of gaining and maintaining

military advantage in this new environment are changing. Efforts to transform the U.S.

military attempt to account for these changes. The overriding feature of U.S. defense

transformation strategy is that of Information Superiority, heavily underwritten by

information technology solutions. It is the dominant aspect of all of the military service

transformation strategies and is a major component of *Joint Vision 2020*--the Joint Chiefs

of Staff vision for how the U.S. will fight future conflicts. Once again, following the

Toffler's theory on wealth and war, the belief is that the benefits and advantages gained

by corporations like Wal-Mart through the application of information technology can be

replicated for warfighting. There is disagreement by some that, however diligent the U.S.

military is in attempting to achieve information superiority, uncertainty will remain

inherent in the nature of war and cannot entirely be eliminated by technology. Despite

these differences, there is really no way to dispense with the fact that the information-age has significantly altered the competitive environment for achieving military advantage. Central to that competitive environment is information and information technology. This is the power resource that will define future military competition. How well suited for this competition, relative to global insurgents, is the U.S. military? That is the subject of this comparative analysis. The basis for evaluating the U.S. military is the current defense transformation strategy of the Department of Defense. The basis for the defense transformation strategy is, in fact, the changing global conditions of the information-age that generate new threats. "America is now threatened less by conquering states than we are by failing ones. We are menaced less by fleets and armies than by catastrophic technologies in the hands of an embittered few" (U.S. National Security Council 2002, 1). The embittered few, for the sake of this analysis, are the global insurgents.

For the U.S. to achieve victory in the conflict with global insurgents, and therefore maintain the freedom and stability that is sought, the power of the insurgents to create global effects must be eliminated. The U.S. National Strategy for Combating Terrorism defines victory in terms of compressing the scope and capability of terrorist organizations, isolate them regionally, and destroy them within state borders. Furthermore, victory will not occur as a single defining moment, rather it requires a sustained effort (U.S. National Security Council 2003, 12). This standard of victory is quite different than that of the insurgents, who do not need to eliminate U.S. military power. Global insurgents need only create effects that result in regional or global destabilization, economic devastation, or significant restrictions on U.S. freedoms, and so

on to be successful over the U.S. These two divergent standards of victory are not equal.

They require different strategies and tactics to achieve advantage.

<div align="center">Evaluation of Criteria</div>

> The Difficulty with the Status Quo: Some argue that the United
> States should not change what are demonstrably the world's best
> military forces. History and current trends suggest that merely
> attempting to hold on to existing advantages is a shortsighted
> approach and may prove disastrous. (2003, 4)
>
> *2003 Transformation Planning Guidance*

Once more, access to power in the information-age is the most important criterion

for evaluation because it forms the basis for gaining and maintaining advantage. The U.S.

has developed information technology for war fighting that has produced unprecedented

competitive military advantage. Examples include enhanced situational awareness via

sensors and the networking of weapons systems for responsiveness, accuracy, and

synergy. In areas where the application of information technology is costly and state of

the art (e.g., space-based capabilities), the U.S. is likely to sustain a competitive edge.

Regarding access to power, the more important implication of information technology is

the diffusion of power to virtually any adversary with hostile intent against the U.S.

"Increased availability of commercial satellites, digital communications, and the public

Internet all give adversaries new capabilities at relatively low cost" (Chairman, Joint

Chiefs of Staff 2000b, 4). Further, it is not merely the access to information technology

that is meaningful. Equally important is the centrality of information technology to future

military competition and conflict. Information has always been an essential element for

success in war. The increasing power of information as a resource and its expanding

accessibility through proliferation of technology results in a reduced margin of advantage

for the U.S. military. Not only will the margin of advantage decrease, it will be harder to maintain. JV2020 notes that, "as potential adversaries reap the benefits of the information revolution, the comparative advantage for the U.S. and its partners will become more difficult to maintain" (Chairman, Joint Chiefs of Staff 2000b, 30). In this regard, the net effect of expanding access to power is a reduction in the margin of advantage for the U.S. military.

It is important to note here that military advantage in the information-age is not simply a function of access to information technology. How that technology is developed and exploited is essential. As the global insurgents gain ground in narrowing the gap with the U.S. by combining low cost information technology, older technology, unconventional tactics, and behavior that abides by a different rule book, the U.S. military must rely on its ability to adapt and innovate to stay ahead. When evaluating the U.S. military's ability to adapt, there are both favorable and unfavorable aspects. Attributes such as intellectual power and the freedom to create in an open society are certainly beneficial for the U.S. The free society in the U.S. entails conditions to exploit the human creative potential. In an era of tightening margins of advantage, this is an important benefit not enjoyed by closed or highly regimented organizations or societies. Free-market democracies dominate the realm of human knowledge "arising from the freedom to create, profit, adapt, and challenge the status quo" (Khalilzad and White 1999, 65). This characteristic of U.S. society helps, but is certainly no guarantee to secure a lasting military advantage, particularly if different rules are used. In addition, there are some crucial drawbacks in the ability of the U.S. military to adapt quickly. The hierarchical bureaucratic nature of the military organization structure and political and

legal constraints are good examples. The bureaucracy of the hierarchical organizational form tends to prevent quick adaptability, unlike flattened decentralized networked forms. Political and legal constraints, based on military accountability to civilian politicians and a democratic public, also serve to limit rapid adaptability. These limitations on U.S. adaptability, to some degree are inherent, but not to the extent that they cannot be mitigated. Information technology in itself cannot overcome these limitations, but combined with the positive aspects of a free society the odds of success are enhanced. "It is only through a combination of technologies and intellectual power that the United States can hope to sustain an edge in the upcoming struggle for finding, achieving, and sustaining information superiority" (Hall 2003, 64).

There are both favorable and unfavorable aspects as well when examining the funding criterion for the U.S. Currently at least, the U.S. has a massive capacity for generating wealth. Arguably this is the result of the positive forces of a free-market, democratic open society with significant natural resources, but also global dependence on resources. Nevertheless, this capacity for wealth represents a considerable advantage in military competition. On the one hand, the robust U.S. economy generates vast resources, while on the other hand however, the U.S. military demands vast resources to operate globally. The high cost of maintaining the technological advantage and the high cost of employing military forces for positional advantage around the globe (especially for extended periods) keep the U.S. dependent on a robust economy and global access to resources to sustain these advantages. Further, the high-end technological advantages enjoyed by the U.S. can be offset to some extent by lesser technology, non-conventional tactics, and successful manipulation of anti-U.S. sentiment around the globe. The U.S.

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economy is certainly susceptible to threats from global insurgents, most notably demonstrated by the terrorist attacks on the U.S. in 2001. The evaluation of the funding criterion demonstrates that, while the U.S. currently enjoys massive wealth generation, it is utterly dependent on those resources to sustain the high cost of technological advantage and the expense of employing military forces. So in terms of cost and funding, the U.S. is dependent on vast resources to sustain its military competitive advantage, yet the source of those resources (robust economy) are becoming more susceptible to threats from global insurgents.

The diffusion of power that results in rising threats from nonstate global insurgents has enormous impact on the issue of legitimacy as discussed earlier. The consequence of this impact is more significant for nation states like the U.S. than for global insurgents. The U.S. is both beholden to and dependent on international law, treaties, and agreements for legitimacy of actions, whereas global insurgents are not. The U.S. is therefore challenged by threats that do not comply by the same conventions. Furthermore, those conventions don't easily lend themselves to an environment in which threats from global insurgents transcend the geographic and political boundaries associated with the international system of nation states. As a result, U.S. efforts to combat global insurgents who operate outside the traditional international community are challenged with respect to legitimacy. This is especially true if the U.S. follows a policy of preemption to strike first against a perceived gathering threat. Global insurgents can, and often do, use the constraints of legitimacy on the U.S. against them. The differences described here amount to essentially two entirely different wars being fought by each side.

In the current struggle between the U.S. and global insurgents, the U.S. and its allies are striving for stability in the international system in support of the existing but rapidly changing global economy and society. The global insurgents are seeking to overthrow that order in the name of a fundamentalist utopia. One war is about limited means to achieve limited objectives, while the other is a religious crusade. One side can not find anyone to negotiate with and the other has no interest in negotiations, only the achievement of absolute ends, even if it means protracted conflict and destruction. Both sides are on paths that are fundamentally irreconcilable, which raises the prospect that a predominantly military approach, information superiority or not, for the U.S. to achieve its objectives in the conflict is insufficient. The implications of these two different wars result in significant difficulties for U.S. efforts to defeat global insurgents.

Both time and distance factors certainly affect the ability of the U.S. military to gain and maintain advantage. Despite the fact that information technology reduces time-distance barriers, employment of U.S. military power remains constrained by both time and distance. Time is critical and is tied to both money and public support. Objectively, the U.S. is better off if conflicts can be resolved rapidly. This is not always possible against a dispersed, stealthy global insurgent network. In fact, it may very well be that it can not be resolved completely. The longer the conflict persists, the more expensive and the greater the chances for public support to wane. Additionally, the U.S. must deploy and sustain military forces to employ them against global insurgents. Employing forces globally across vast distances and across geographic and political borders represents challenges for U.S. information technology, however, it does provide important capabilities for U.S. forces in overcoming some of these challenges. Both time and

distance remain important factors for the U.S. in terms of gaining positional advantage of military forces against global insurgents.

The concept of information superiority is linked to time and distance in the operational concept of dominant maneuver described in *Joint Vision 2020*.

> Information superiority will support the conduct of dominant maneuver by enabling adaptive and concurrent planning; coordination of widely dispersed units; gathering of timely feedback on the status, location, and activities of subordinate units; and anticipation of the course of events leading to mission accomplishment. (2000, 20)

Information superiority then, provides the capability for the U.S. to plan, synchronize, and execute highly complex and distributed military operations. This capability represents a critical advantage, but is somewhat limited when confronted with the highly dispersed and concealed disposition combined with the unconventional tactics of global insurgents. On the other hand, when the insurgents surface to carry out operations, they can be subjected to these capabilities. In terms of time and distance, information technology has given the U.S. new capabilities for integrating highly complex dispersed military operations rapidly, but has not decreased the significance of reduced time-distance barriers to the same extent as for global insurgents.

The last criterion for evaluation is that of precision effects or precision engagement. Information technology contributed significantly to the ability for the U.S. military to enhance the precision of effects. This capability was put on display during the Gulf War of 1991 when video was shown of munitions hitting not only the right building, but the right place on the right building. The capabilities of U.S. munitions and delivery systems have increased tremendously since then. Considering further the full range of effects now possible through the application of information technology, the advantages

the U.S. enjoys, particularly in a conventional force on force conflict, are truly

unprecedented. Exploiting these advantages is part of the vision for the future U.S.

military force and is represented by one of the principle operational concepts in *Joint

Vision 2020*.

> The concept of precision engageme nt extends beyond precisely striking a target
> with explosive ordnance. Information superiority will enhance the capability of
> the joint force commander to understand the situation, determine the effects
> desired, select a course of action and forces to execute it, accurately assess the
> effects of that action, and reengage as necessary while minimizing collateral
> damage. (Chairman, Joint Chiefs of Staff 2000b, 22)

This characterization of precision engagement demonstrates the essential nature of

information technology and information superiority in making the concept possible.

Applied to known targets, it is fairly easy to see and appreciate the power of this

capability. It becomes much more nebulous and suspect when attempted against a threat

like global insurgents who don't make it a habit of offering the U.S. targets to strike or

acting predictably from a western perspective. This capability is dependent, for the most

part, on expensive high technology such as space assets and high-end delivery systems.

In addition, through the increased commercial availability of high-tech equipment and

products, other actors are able to achieve a much higher degree of precision effects

themselves. This creates new vulnerabilities for the U.S. So while information technology

creates increased precision effects capabilities for the U.S., the utility of this capability is

directly related to the existence of known targets for effect. Global insurgents can

mitigate the effects of this U.S. capability by not offering targets and by using their own

form of precision strike against it.

Summary

The foregoing analysis demonstrates that the impact of the information revolution

on geopolitical conditions, conflict, and military advantage is quite profound. It shows

that strategic planners in the defense and national security establishment in the U.S. have

good cause for concern about the need to transform military capabilities. Evidence

suggests that under the changing geopolitical conditions and the subsequent impact on the

nature of conflict, the U.S. will be seriously challenged to maintain an expansive military

advantage, especially vis-a-vis global insurgents.

With regards to the changing conditions of the emerging global system, the

fundamental and defining issue is the diffusion of power through increased access to

information and information technology. Most importantly, the diffusion of power is not

limited to nation states. The access to power that can generate global effects extends to

groups and even individuals, whose actions are both shaped and judged by their cultural

perceptions. Moreover, the complex and inter-dependent nature of the new global system

magnifies the potential effects of power in the hands of individuals. As the world

becomes more and more connected through the application of information technology

(especially the Internet) in the globalization process, there are immense implications on

the nature of conflict. The incredible power of information technology in the

transformation of the global economy also transforms military conflict.

The nature of conflict determines how one achieves competitive advantage.

Globalization in the information-age has tremendous implications on conflict. This new

global system entails some fundamental conceptual changes to the nature of conflict. The

analysis pointed out the relevance of the Toffler's theory on the inextricable linkage

between wealth and war. This theory provides a useful perspective on the impact of information technology on conflict. Industrial style mass destruction characterized warfare in the industrialized economy of the twentieth century. Similarly, the use of information technology and knowledge to create precision effects characterize conflict in the globalization economy of the twenty-first century. The shift from industrial-based warfare to knowledge-based warfare transforms the nature of conflict. In information-age conflict, power is diffused far beyond the control of states to nonstate groups and individuals. Entirely new means of creating global effects means that groups and even individuals can challenge great national powers. Information technology provides greater means for groups and individuals to communicate, plan, and execute operations with increased degree of anonymity. Additionally, blurring boundaries between acts of war and actions short of war cause serious dilemmas for nations beholden to international law and standards for legitimacy.

Traditional conventions for governing the use of military power in conflict can lose their relevance in many circumstances, especially when the conflict involves global insurgents. Nation states are faced with new challenges in determining how to govern their use of power and maintain legitimacy in a conflict with global insurgents. Global insurgents on the other hand, are not faced with the same challenges and are somewhat free to take advantage of new tactics and principles to exploit information technology in conflict. The principles of unrestricted warfare presented by the Chinese PLA offers a good example of how best to capitalize on information-age conflict when not constrained by legitimacy standards of the international community, a path the U.S. can not afford to pursue as a society. Lastly, decisive conclusions are much more evasive in an

information-age conflict. Conflict in the new global system can be characterized as a continuum of effects where the impact of each is likely to achieve only transient and temporal benefits. This type of conflict demands a relentless pursuit of advantage, much like Thomas Friedman's 100-yard dash sports analogy.

The changes in conflict result in subsequent changes in the nature of advantage-- how advantage is gained and maintained. Use of a model to describe qualitative changes to elements of advantage illustrates how information technology changes the dynamics of gaining and maintaining competitive advantage in an information-age conflict. The implications of information technology on the concepts of power, legitimacy, and effects are significant and demand that parties involved in conflict deal with them in their approach. These implications include a shifting of power resource from predominantly physical assets controlled by states to information and knowledge that can permeate throughout the global system uncontrolled by any authority. Legitimacy dilemmas are another implication on competitive advantage. In terms of effects, precision knowledge-based effects, both kinetic and non-kinetic in nature, become much more relevant than industrial age destruction. Gaining and maintaining competitive advantage in information-age conflict absolutely demands addressing these implications.

In the comparative analysis the author uses a set of six representative criteria to evaluate the ability of both the U.S. military and global insurgents to gain and maintain advantage in information-age conflict. The evaluation of the specific criteria demonstrates that the qualitative impact of information technology on competitive advantage results in a narrowing margin between U.S. military and global insurgents. This is due principally to the fact that information technology and knowledge are now

becoming central to military competition in information-age conflict. Further, information technology and knowledge are increasingly accessible and not controlled by a single authority. Much the same way information technology has provided the means to achieve an efficient, adaptable, and precise global economy, it has also provided the means for an equally efficient, adaptable, and precise warfare.

The U.S. military and global insurgents have approached these new means in different ways giving both some advantages. Whereas in the industrial age, states had much greater control of power resources, today the accessibility of information technology gives global insurgents new abilities to create effects with global reach in ways in which the U.S. is not able to counter effectively. The U.S. military is more constrained by issues of legitimacy than are global insurgents, making it more difficult for the U.S. to exploit the full range of information technology capabilities in the same way that global insurgents can. The evaluation of criteria shows that while the U.S. can gain and maintain some competitive advantage, the rising threats from global insurgents are encroaching and narrowing the margin.

The conclusions from this analysis are compelling and have profound implications. The global system, the global economy, and nature of conflict and advantage are all undergoing a dramatic transformation. The defining feature of all these transformations is information technology. The conclusions, implications, and recommendations are discussed in the next chapter.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The analysis in chapter four demonstrates that the information revolution continues to cause rather dramatic qualitative changes in the global conditions and the nature of conflict and advantage. The implications of these changes on the current global war on terrorism, and for future warfare in general, are quite significant. They alter the competitive environment within which the U.S. military pursues advantage against adversaries who threaten U.S. interests. The current conflict with global insurgents illustrates the changes in the competitive environment that the U.S. must contend with. The analysis shows that the competitive environment is highly complex, with a sort of "multi-dimensional asymmetry" that poses serious challenges for the U.S. One of the difficulties of this new environment is that advantage can not be quantifiably measured. There are simply too many variables, many of which are directly related to human behavior. However, a qualitative assessment of the global strategic conditions and the resulting changes to the nature of conflict and advantage produces insights and conclusions about their impact. A further comparison of the U.S. military and global insurgents regarding their ability to gain and maintain an advantage in the new competitive environment helps define the changing nature of conflict and advantage.

The author recognizes that the topic of this thesis is extremely dynamic and is currently playing out around the globe. Consequently, this research has been an extraordinary process where the learning and discovery have evolved since the beginning based upon a continually changing reality. The changing reality has only increased the

significance of this study. Many of the theories, concepts, and issues discussed in the analysis are coming into a clearer focus. The research and analysis produced several conclusions, recommendations, and areas for further research. The qualitative research methodology serves as the basis for answering the research question and drawing conclusions.

Research Questions

The research question posed in this thesis is: In the face of emerging information-age threats from globally networked insurgents, will the comparative advantage of the U.S. military decline? Secondary research questions were required to support this primary question. They are:

1. How is information technology changing the conditions of the global system?

2. What is the changing nature of military advantage in the information-age?

3. How is information technology impacting the ability of both global insurgents and the U.S. military to gain and maintain competitive advantage comparatively?

Conclusions

> Information advances will affect more than just how we fight wars. The nature and purpose of war itself may change. How wars start, how they end, their length, and the nature of the participants may change as shifts in the relative power of states and nonstate entities occur.

> Andrew W. Marshall, *The Changing Role of Information in Warfare*

Analysis of the evidence demonstrates that the impact of the information revolution will decrease the comparative advantage of the U.S. military relative to the new and dangerous threats from global insurgents. The centrality of information in the

new global system and to the nature of conflict is the principle factor driving this conclusion. There are four major conclusions drawn from the research and analysis. First, information technology vastly expands and changes the realm of military competition, resulting in a reshaping of the competitive environment. Next, a multi-dimensional asymmetry characterizes conflict within this new competitive environment. Third is the primacy of legitimacy, that is, the building of one's own and targeting the adversary's takes on greater importance than traditional physical destruction that characterized industrial age conflict. The fourth conclusion is that the concept of information superiority is not an effective approach to combating global insurgents. These conclusions support the answer to the primary research question and are described in more detail below.

Changes in the global conditions, caused by the dynamics of the information revolution, have altered the realm of military competition. Information as a power resource creates many new capabilities for the U.S. military. The new capabilities, however, are not only limited to the U.S. military. The proliferation of powerful low-cost information technologies provides the means for global insurgents to compete with the U.S. This increased access to power, which is capable of producing global effects, means that many more participants can compete. This includes criminal groups and even individuals. No longer do participants need great armies and industrial capacity to compete, even with a world superpower. The new competitive environment is such that the battlespace is greatly expanded and the time-distance barriers are reduced or eliminated altogether. Moreover, adversaries can compete anonymously using completely new principles of war. The resulting effect is a much more complex competitive

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environment where global insurgents can effectively compete with the great military power of the U.S. This in turn causes a shift in what constitutes a military advantage. A dynamic combination of power, legitimacy, and effects determines advantage in this new complex competitive environment. Additionally, advantage is temporal, can change very quickly, and therefore is not likely to lead to a decisive conclusion of the conflict. Information technology has altered the nature of conflict and subsequently the realm of military competition to the extent that traditional U.S. military advantage faces real challenges. The new competitive environment involves asymmetrical relationships in a number of different dimensions that tend to offset the strengths of the U.S. military.

Information-age conflict is characterized by a "multi-dimensional" asymmetry. On a number of levels, the conflict between the U.S. and global insurgents involves facets that are simply not symmetrical. In other words, each side is waging a very different kind of war. They have two different definitions of victory and different criteria to measure success. Global insurgents seek to establish a fundamentalist utopia, even if it means vast destruction and global instability. They don't have a need to "win" every engagement, only to cause instability and instill fear in the American public to impose their will. The U.S. on the other hand, must defeat their capacity to cause instability and fear. Another dimension of asymmetry is the strategy pursued by each side to achieve their definition of victory. The U.S. defense transformation strategy seeks to shape the nature of military competition in a way that exploits advantages and protects against asymmetric vulnerabilities. Heavily reliant on the concept of Information Superiority, the U.S. strategy aims to actively roll back the insurgent threat across the globe. Whereas, global insurgents seek to capitalize on information technology to support their global

stealthy network and strike precision targets and conduct information operations. These different approaches also use information technology in asymmetrical ways. Finally, a dimension of asymmetry critical to military advantage in the new competitive environment is that of motivation and cultural perceptions. The U.S. strategic aim of global stability is based on western values and the international system. Conversely, global insurgent's strategic aim of fundamentalist utopia is based on fanatical religious interpretation. Multi-dimensional asymmetry, or the two distinctly different kinds of war being waged by the U.S. and global insurgents, represents quite significant challenges to U.S. ability to maintain military advantage. One particular area impacted by this multi-dimensional asymmetry is legitimacy.

One of the defining characteristics of the new competitive environment is the primacy of legitimacy. Legitimacy is fundamentally based on the distinctive cultural perceptions of the particular constituency involved. The analysis of the elements of advantage shows that legitimacy has a direct and potentially significant impact on power. For instance, reduced legitimacy of U.S. military action can reduce U.S. power. At the same time, enhanced legitimacy of global insurgent's cause can increase their power. Information technology and information as a power resource can effectively be used to target an adversary's legitimacy, while at the same time build one's own legitimacy. This represents a significant dilemma for the U.S. whose advantage lies in traditional "hard" military power. Hard military power can do very little to either target global insurgent's legitimacy, or enhance the legitimacy of the U.S. military. However, that hard military power can be severely impacted by reduced legitimacy. Herein lies the basis for concluding that the new competitive environment features the primacy of legitimacy. The

implications of this are quite profound when considered with the multi-dimensional asymmetry. Dr. Jacob Kipp of the U.S. Army Foreign Military Studies Office at Fort Leavenworth describes the implications this way:

> The issue of acceptable standards [i.e., legitimacy] is a matter of cultural perceptions and social relations. Within the modern nation-state system of international relations, one can speak of certain recognized, if not always honored, criteria of behavior that are seen as legitimate. With global insurgents, religious fanaticism or ideological fervor may supercede such criteria and make for a profoundly asymmetric relationship between the criteria applied to assess U.S. behavior and those applied by the insurgents or by other fellow-travelers in assessing their behavior. (Kipp 2004)

The primacy of legitimacy in the new competitive environment means that it has a much greater influence on power, and thus advantage, than it did in the past. The influence of legitimacy on advantage can be such that it can negate hard military power, a source of significant advantage for the U.S. in the past. The U.S. strategy of Information Superiority is not likely to overcome the influence of legitimacy on advantage.

The fourth conclusion is that the concept of Information Superiority can not assure advantage in a conflict characterized by multi-dimensional asymmetry and primacy of legitimacy. The vision for U.S. future military capabilities includes the concept of Information Superiority as a defining characteristic, described in *JV2020* this way:

> Information superiority provides the joint force a competitive advantage only when it is effectively translated into superior knowledge and decisions. The joint force must be able to take advantage of superior information converted to superior knowledge to achieve "decision superiority" – better decisions arrived at and implemented faster than an opponent can react, or in a non-combat situation, at a tempo that allows the force to shape the situation or react to changes and accomplish its mission. (Chairman, Joint Chiefs of Staff 2000b, 8)

Within the context of the new competitive environment described in the conclusions above, the objective of "decision superiority" is somewhat problematic in that it does not

necessarily achieve advantage. Reaching a decision faster than the enemy achieves

nothing if the enemy is not dependent upon acting before reaching that decision in order

to avoid the effects of the decision. For example, global insurgents operate in stealthy

transnational networks that can create global effects against U.S. interests, where their

activities can elude the U.S. military, and where the speed of the decision by the U.S.

commander is irrelevant. Furthermore, the increased access to power afforded to global

insurgents by the information revolution makes the prospect of achieving and

maintaining information superiority questionable. Consequently, one of the predominant

concepts for future U.S. military capabilities is likely to fall short of its intended purpose

of gaining advantage over the adversary. It is quite possible that in the conflict between

the U.S. military and global insurgents in the new competitive environment, information

superiority may not provide any decisive advantage at all.

The four conclusions described above support the answer to the research question

that U.S. military comparative advantage is in decline in the face of rising threats from

global insurgents in the new competitive environment. The changing conditions of the

global system and the changing nature of conflict result in a new competitive

environment that reduces the military advantage enjoyed by the U.S. for the last several

decades. It is uncertain at this point just how dramatic this decline will be in the coming

years, or whether the U.S. can find new ways to stop or even reverse the decline.

<u>Recommendations</u>

The author recommends that the dynamics of gaining and maintaining military

advantage in the new competitive environment be included in U.S. defense

transformation strategic planning as a critical focus area. The characteristics of the new

competitive environment should be explored and used as input into the U.S. defense transformation strategy. The U.S. should avoid placing too much emphasis on the promises of information technology and the decision superiority that that technology is presumed to deliver. Placing too much emphasis on technology is a misguided approach when global insurgents capitalize on their advantages within the new competitive environment. To be successful, the U.S. defense transformation strategy must focus on developing capabilities to gain and maintain advantage within the context of the new competitive environment. The U.S. can not afford to rely on traditional military advantages. The rules are changing. New means of gaining and maintaining advantage, that take into account the changing competitive conditions and the new threat, may be the only way to assure U.S. military superiority in the future. Then again, the whole notion of military superiority may very well be replaced in relevance by superiority of some other form of power, one that is more suited for the new competitive environment.

<u>Areas for Future Research</u>

The subject of this thesis is associated with an extremely vast and growing body of knowledge. The research and analysis in this paper is an effort to continue to expand that body of knowledge. Gaining a better understanding of who the global insurgents are is a critical area for future research. Research in this area could include how they use information technology for planning and communicating (especially disseminating lessons learned to their network), then find ways to disrupt these efforts. Further research on the impact of cultural perceptions and social behavior on legitimacy is another area that would be beneficial. Another area for potential future study could be finding new ways to use information technology to build the legitimacy of U.S. actions to ensure

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global stability. This could perhaps include strategies to synchronize all elements of

national power to achieve desired objectives while relying less on military power.

GLOSSARY

Advantage. Superiority of position or condition (*Webster's Third New International Dictionary*, 1981)

Center of Gravity. Those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight. (JP 1-02, 2003)

Decision Superiority. The ability of the commander, based upon information superiority and situational understanding, to make effective decisions more rapidly than the adversary, thereby allowing one to dramatically increase the pace, coherence, and effectiveness of operations. (JFCOM Glossary, 2004)

Diplomatic, Information, Military, and Economic (DIME). Areas of national power that are leveraged in "effects-based" operations against an adversary's vulnerabilities identified by operational net assessment, and targeted against his will and capability to conduct war. (JFCOM Glossary, 2004)

Effect. The physical, functional, or psychological outcome, event, or consequence that results from specific military or nonmilitary actions. (JFCOM Glossary, 2004)

Effects-Based Operations. A process for obtaining a desired strategic outcome or "effect" on the enemy, through the synergistic, multiplicative, and cumulative application of the full range of military and nonmilitary capabilities at the tactical, operational, and strategic levels. (JFCOM Glossary, 2004)

Global Information Grid (GIG). The globally interconnected, end-to-end set of information capabilities, associated processes and personnel for collecting, processing, storing, disseminating and managing information on demand to warfighters, policy makers, and support personnel. The Global Information Grid (GIG) includes all owned and leased communications and computing systems and services, software (including applications), data, security services and other associated services necessary to achieve information superiority. It also includes National Security Systems as defined in section 5142 of the Clinger-Cohen Act of 1996. The GIG supports all Department of Defense (DOD), National Security, and related intelligence community missions and functions (strategic, operational, tactical and business), in war and in peace. The GIG provides capabilities from all operating locations (bases, posts, camps, stations, facilities, mobile platforms and deployed sites). The GIG provides interfaces to coalition, allied, and non-DOD users and systems. Also called GIG. (JP 1-02, 2003)

Global Information Infrastructure (GII). The worldwide interconnection of communications networks, computers, databases, and consumer electronics that

make vast amounts of information available to users. The global information infrastructure encompasses a wide range of equipment, including cameras, scanners, keyboards, facsimile machines, computers, switches, compact disks, video and audio tape, cable, wire satellites, fiber-optic transmission lines, networks of all types, televisions, monitors, printers, and much more. The friendly and adversary personnel who make decisions and handle the transmitted information constitute a critical component of the global information infrastructure. Also called GII. (JP 1-02, 2003)

Guerilla Warfare. Military and paramilitary operations conducted in enemy-held or hostile territory by irregular, predominantly indigenous forces. Also called GW. (JP 1-02, 2003)

Information. 1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation. (JP 1-02, 2003)

Information Differential. The superior access to and ability to effectively employ information on the strategic, operational, and tactical situation which advanced US technologies provide our forces. (*Joint Doctrine Encyclopedia,* 1997)

Information Operations. Actions taken to affect adversary information and information systems while defending one's own information and information systems. Also called IO. (JP 1-02, 2003)

Information Superiority. That degree of dominance in the information domain which permits the conduct of operations without effective opposition. See also information operations. (JP 1-02, 2003)

Information Warfare. Information operations conducted during time of crisis or conflict to achieve or promote specific objectives over a specific adversary or adversaries. Also called IW. (JP1-02, 2003)

Insurgency. An organized movement aimed at the overthrow of a constituted government through use of subversion and armed conflict. (JP 1-02, 2003)

Knowledge. 1. Familiarity, awareness, or understanding gained through experience or study. 2. The sum or range of what has been perceived, discovered, or learned. (JFCOM Glossary, 2004)

Legitimacy. Conforming to recognized principles or accepted rules and standards. (*Webster's Third New International Dictionary,* 1981)

Political, Military, Economic, Social, Infrastructure, and Information (PMESII). Vulnerabilities identified by the ONA. These are researched as "systems of

systems" networks that can be exploited by effects-based operations to affect and adversary's war-making/warfighting will and capability. (JFCOM Glossary, 2004)

Power. Ability to act or produce and effect. (*Webster's Third New International Dictionary*, 1981)

Unconventional Warfare. A broad spectrum of military and paramilitary operations, normally of long duration, predominantly conducted through, with, or by indigenous or surrogate forces who are organized, trained, equipped, supported, and directed in varying degrees by an external source. It includes, but is not limited to, guerrilla warfare, subversion, sabotage, intelligence activities, and unconventional assisted recovery. Also called UW. (JP 1-02, 2003)

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     5. <u>Contractor Performance Evaluation</u>. Protection of information involving contractor performance evaluation.

     6. <u>Premature Dissemination</u>. Protection of information involving systems or hardware from premature dissemination.

     7. <u>Administrative/Operational Use</u>. Protection of information restricted to official use or for administrative or operational purposes.

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     9. <u>Specific Authority</u>. Protection of information required by a specific authority.

     10. <u>Direct Military Support</u>. To protect export-controlled technical data of such military significance that release for purposes other than direct support of DoD-approved activities may jeopardize a U.S. military advantage.

<u>STATEMENT C</u>: Distribution authorized to U.S. Government agencies and their contractors: (REASON AND DATE). Currently most used reasons are 1, 3, 7, 8, and 9 above.

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