

Seeing Beyond the War on Terrorism: Military Transformation for the Long Term

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Class 03-1S
09 Mar 2003

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Seminar B

Report Documentation Page

*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 09 MAR 2003	2. REPORT TYPE N/A	3. DATES COVERED -			
4. TITLE AND SUBTITLE Seeing Beyond the War on Terrorism: Military Transformation form the Long Term		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S) Phil Cullom, CAPT, USN Dave Thurlow, LTC, USA John Cottam, Lt Col, USAF		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Joint Forces Staff College 7800 Hampton Blvd Norfolk, VA 23511-1701		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES Taken from the internet.					
14. ABSTRACT See report.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	UU	31	

Seeing Beyond the War on Terrorism: Military Transformation for the Long Term

Every day, we are faced with urgent near-term requirements that create pressure to push the future off the table. But September 11th taught us that the future holds many unknown dangers and that we fail to prepare for them at our peril.

Secretary Donald K. Rumsfeld, January 31, 2002.

Introduction

Rounding a curve near the seaward end of the Yokosuka Naval Base in Japan, a visitor to this Far East naval base will occasionally see the bow of a U.S. aircraft carrier looming large over the roadway from the Yokosuka drydocks. Unnoticed by most visitors to this scene, who normally marvel at the grandeur and size of a modern day carrier, is a small blackened stone marker at the front of several of the largest drydocks. An individual who reads the placards affixed to these markers quickly realizes that the most impressive thing about this place is not the great symbol of U.S. might that casts a shadow over these stones. Instead, it is that Drydocks #4 and 5, 785 and 1,057 feet long respectively, were completed in 1905 and 1916, a full generation before any vessels requiring facilities of such size would even be contemplated. The real significance of this achievement lies in the long-range mindset of a nation and a people that was so visionary as to begin construction of infrastructure in the 19th century that would be capable of accommodating 20th-century aircraft carriers.

At the same time, the United States embarked upon an equally grand project to build the Panama Canal. Although today the largest supertankers and nuclear powered aircraft carriers cannot quite make it through the canal locks, it must be remembered that both it and the drydocks in Yokosuka were conceived in an age when many senior maritime planners worldwide still believed that mast, sail, and wooden decks were essential for a proper man-of-war. In fact, few

ships of that day were over 300 feet long. The instructive lesson from both these examples is that each project took vision and planning transcending the implements of war envisioned at the time. Further, both projects required nations capable of capitalizing on the tumultuous changes occurring in technology at that moment in history and both required sufficiently visionary horizons of investment that a warship as revolutionary as the British battleship HMS *Dreadnought* was in 1906 would still be dwarfed in the confines of either human-made creation.

The first years of the 21st century have brought startling change. A new administration has clarified its vision and imperative for transformation. Several thousand Americans have been lost on their own soil in the first attack on America since Pearl Harbor. And the nation has embarked on a war against nonstate actors who employ asymmetric methods, tactics, and weapons. The decade of limbo that began when the Berlin Wall fell is over and the international landscape has evolved not into a New World Order but rather a new world of disorder. As a nation, the United States knows it wants military transformation and knows it needs new capabilities quickly to defeat potential new adversaries. Yet, it is still uncomfortable with what military transformation will look like or, even more fundamentally, how to define it.

U.S. military leadership has begun to lay down a road map for transformation. On 31 January 2002, at the National Defense University, Secretary of Defense Donald Rumsfeld outlined goals for U.S. defense strategy and force structure in the 21st century in six principles:

- To protect the U.S. Homeland and U.S. bases overseas
- To project and sustain power in distant theaters
- To deny enemies sanctuary
- To protect U.S. information networks from attack
- To use information technology to improve joint warfighting
- To maintain unhindered access to space and protect U.S. space capabilities from enemy attack (1)

In his article “Understanding Transformation,” General Richard Myers, Chairman of the

Joint Chiefs of Staff (CJCS), has also defined the concept of transformation. He states, “Transformation is a process and a mindset - not a product. (2)”

It seems clear that transformation is not meant to be a static event, complete by a certain time or the acquisition of certain specific capabilities. Rather, transformation must be constantly evaluated, updated, and modified to take into account newer concepts and better emerging technologies, including those that have not yet been fully described. That said, there must be an identifiable and agreed upon compass heading to guide the engine of industry to develop the right technologies, produce applicable doctrine for the proper employment of increasingly complex systems, yet also develop leaders trained in innovative means and methods of war.

This vision must include the near-, mid-, and long-term to be effective. Everyone realizes the magnitude of the grave threats the nation now faces in this Global War on Terrorism (GWOT), and there is a natural tendency to devote energies and resources to solving the urgent problems of today. Once given a mission, such as the GWOT, the tendency of the military is to focus on achieving its objectives to the virtual exclusion of all else. Thus, it should be no surprise that there currently seems to be little strategic, policy, or program emphasis on anything other than supporting this campaign. Progress on transformational concepts, as articulated by DOD leadership, has taken a backseat to the imminent threats posed by terrorists. By limiting imagination and development to the proximate threats, however, or setting arbitrary dates such as 2010 or 2020 to define the future, planners will limit their capacity for visionary thought – cultural, intellectual, and technological. To fully realize the tremendous benefits of transformation, DOD must articulate a long-range transformational vision for combatant commanders and Services that is not just a process, but is process guided by identified capabilities for shaping the global security environment 50–100 years into the future. This will capitalize on a critical na-

tional competitive advantage, the spirit of enterprise and creativity that took the United States to the moon.

The Case for an Integrated Investment Plan: A Business Model

Although most U.S. corporations, driven by quarterly profit and loss statements, may not be seen as the most long-range of visionary entities, there are some instructive points to be gleaned from how companies invest. After all, capitalist markets are lean and mean and the associated businesses that survive over the long haul must continuously wrestle with how to wisely invest scarce capital if they are to be the victors in this Darwinian "survival of the fittest."

Today, the most successful and long-lived multinational corporations use a number of strategic planning tools to guide their investment of corporate profits for maximum shareholder wealth and corporate survival. Virtually all begin with some kind of market assessment, identifying enduring trends that dominate their sector's business landscape and to which they must adapt. Similarly, most try to assess their corporate competitive advantage vis-à-vis their competitors and then ration their limited investment resources across a range of possible business areas/products most likely to exploit their competitive advantages and ultimately grow their businesses. Similar logic may be worth using to review military investment processes.

Innovation: A Key Military Competitive Advantage

Futurists cite many different trends when it comes to predicting the nature of future warfare, but two aspects of U.S. society's move from an industrial age to an information age dominate the literature. The first is that the increased sharing of information has resulted in accelerating the pace of technological change, which makes it harder than ever to remain at the leading edge of this wave (3). The second is that the web of interconnectedness brought on by the information age will give the advantage to militaries that can find the most efficient, and survivable,

ways to share information and make their weapons of war work together synergistically in a joint operations environment (4). The net effect for the future is that jointness and technological innovation matter more than ever, and militaries of the future will ignore these inexorable trends at their own peril.

Fortunately, innovation is something that comes naturally to America. Its heritage is one of “Frontierism,” fueled, encouraged and emboldened by the values of freedom and individual human worth. Every generation since the founding of the republic has been obsessed with it – finding a new frontier with opportunities and challenges that will make life better or more interesting. Over the last two centuries, Americans have found those new frontiers, first in westward movement to explore and develop a continent. Later, as new lands to explore grew scarce, they ventured off to new frontiers of the mind, technology, science, and even space. Along the way, they have come to appreciate the journey as much as the waypoints. Thus, Frontierism – that incredible quality of never being satisfied with one’s geographic, cultural, or even intellectual confines – is something almost uniquely American by virtue of, and as a product of, the nation’s adolescent history. It has become a part of the national psyche. It is a source of national strength. And in many ways it represents America’s unique and most important competitive advantage and strategic strength.

Seeking Investment Balance

There will be many transformational tasks that can be achieved now or shortly into the future that will be helpful in the GWOT. These should be vigorously pursued, particularly if they can counter clear and present dangers to U.S. national security. But thinking long-term is equally important and a new analytical framework to help compare the full range of transformational

ideas/technologies that may be possible can be the decision-making tool DOD needs to best prepare for an uncertain future.

Borrowing from the business world its penchant for matrix analysis, there are several ways to compare future investments in transformation. One way is through a two-dimensional analysis that compares risk of development with future return on investment (ROI) and can be evaluated for each Service’s desired capabilities (*Figure 1*). The size of the project, in terms of the fiscal resources allocated to the capability’s R&D and procurement, can be shown by the proportional size of the symbol in the matrix.

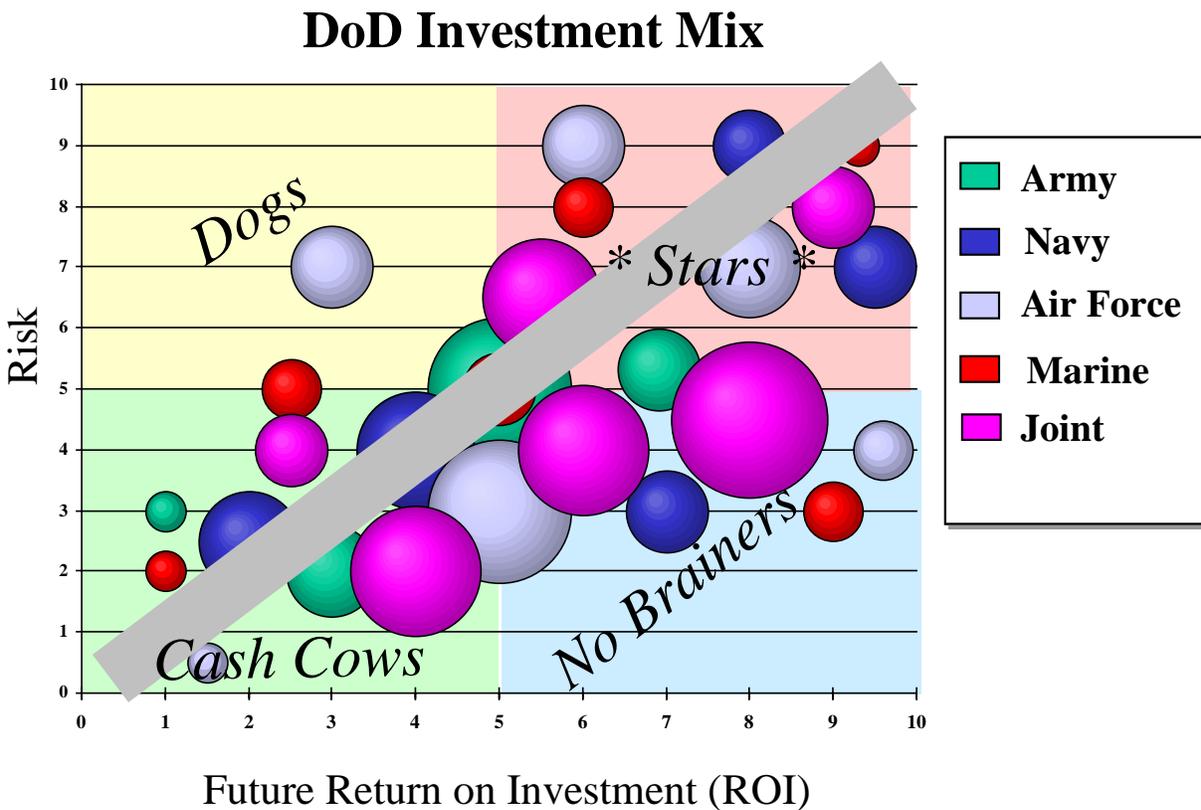


Figure 1

Some proposals for investment may be clear losers – high risk with low to moderate pay-out. In the business world, these are the “dogs” that are not worthy of investment (5). Few emerging capabilities will have high ROI with little risk, but they would certainly be “no brain-

ers” for investment if found. Most reasonable investment decisions will likely fall on the line, evenly balancing return and risk. Further, the vast majority of these potential programs will rate low in risk and cost while offering only modest returns on investment.

These are the “low hanging fruit,” or evolutionary capabilities that in marketing terms are called “cash cows,” which can be easily harvested (6). They typically receive the greatest investment (shown by correspondingly larger symbols). Most are sure bets to reach successful Initial Operating Capability (IOC), will be easy to defend in the budget review process as a result, and can be counted on to deliver enhanced capabilities to warfighters as soon as possible.

Other capabilities will require significant investments in technology, resources, and time before fielding, but can offer quantum leaps in transforming the military – the “stars” in the investment portfolio (7). Just a few of these with successful outcomes will improve the national competitive advantage and thereby maintain the generational lead over potential future adversaries (8). The nation cannot realistically chase every one of these possibilities just because they may have a high future ROI. They have considerably higher risk and may in fact never come to fruition. Judicious investment in a range of these potential long-range capabilities, however, is necessary “seed money” to innovative, revolutionary transformations. As the developments show promise in future years, they can be “watered” with increased funding, growing the investment in size and moving it down the future ROI and risk axes.

Remembering the other inexorable trend of the information age – the tendency toward integrated, joint military operations – it may be even more appropriate to add another dimension to the analysis. Evaluating a capability’s joint strategic fit, in addition to measuring its future return and developmental risk, adds a third axis and additional key metric to help ration investment in future capabilities (*Figure 2*).

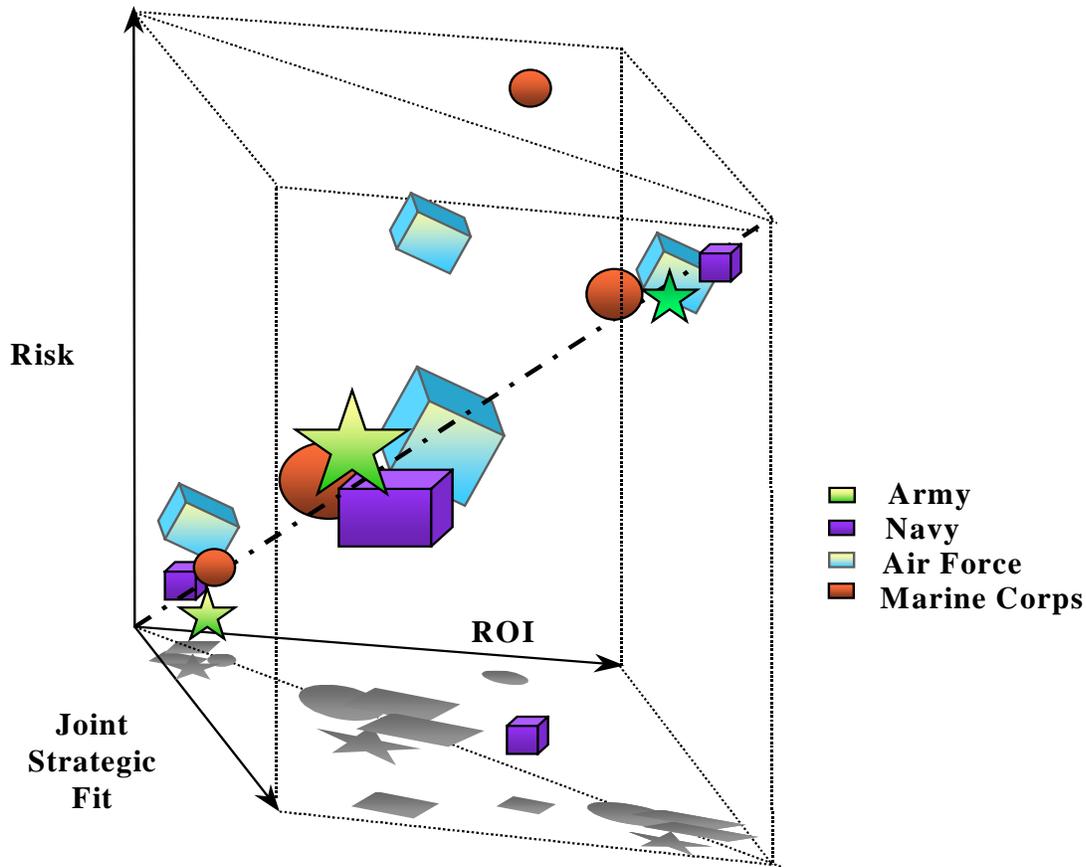


Figure 2

Although this may make the graphics significantly more complex, it could certainly show requirements oversight groups, such as the Joint Requirements Oversight Council (JROC), a metrics-driven fusion plot by which a DOD-wide mix of capability investments that best fits national strategic goals and best exploits national economic competitive advantages may be selected.

In summary, if the nation's competitive advantage really does reside in its ability to exploit its sense of frontier innovation, then an organized, coordinated, and sufficiently visionary direction to development is the best way to convert U.S. strengths into continued long-term military advantage. Admiral Cohen, the Chief of Naval Research, recently framed the risk involved:

“I must tell you there are a couple of things that keep me awake at night. One is the fear of technological surprise (9).” In a world where the rate of technological change is increasing at an exponential rate, investment in the future must look to the long term, support joint warfighting capability, and provide the right strategic mix for the “corporation.”

Transformation does not specify a definitive end state with respect to capabilities, operational concepts, force structure or weapon systems. In pursuit of the transformation process, however, intermediate steps or provisional end states must be identified to guide organizational efforts. A provisional end state is defined as an articulation that the nation expects to need certain capabilities, operational concepts, and force structures not later than a projected point in the future to meet an anticipated security environment, with the understanding that such a provisional end state may be highly transitory.

The identification of periodic provisional end states will facilitate the ability to integrate and synchronize changes across DOD and therefore manage risk. These periodic points or end-states are too important to leave future strategic directions and critical technology choices to the vagaries of funding battles between national labs or corporate investment choices that maximize shareholder ROI, not the U.S. military’s or the nation’s ROI. In the end, DOD must carefully choose those capabilities that will give the country the ability to shape the global strategic landscape in a way that can effectively counter the plans or actions of an adversary (state or nonstate) and actually foreclose its ability to threaten the United States through military force or destructive power. Simply put, by DOD’s developing a set of desired long-range capabilities, the engineers, warfighters, and commanders will have direction for their innovations, a target for their efforts, and an identifiable vector from which to guide the development of future forces.

By pursuing transformational technologies, the U.S. military can counter enemy capabilities and options, thus shaping the security environment of the future to its benefit. If possible aggressors know their plans can be thwarted by effective response and their attack methods countered, the U.S. military can achieve a strong deterrent capability or, if required, dominate the battlefield. This shaping of the security environment before conflict arises could cover much of the upper spectrum of conflict.

Transforming the Resource Process

The crucial direction of transformation within the U.S. military is controlled by three organizations: the Office of the Secretary of Defense (OSD), the Joint Chiefs of Staff (JCS) and Joint Forces Command (JFCOM). Secretary Rumsfeld and Deputy Secretary of Defense Paul Wolfowitz have unequivocally articulated the requirement and charted a path of transformation. Although the Services' imperative to transform has been a stated administration priority since 2001, institutional momentum and the inertia thwarting change in existing allocation processes continue to slow their ability to realign future investment to better support transformation. Even the FY03 DOD budget retained much of its legacy character and was widely criticized for not meeting the Secretary of Defense's challenge for transformational change (10). Top down, DOD has tried to force change in patterns of proposed investment for FY04, but without changes to requirements oversight processes so as to more fully support joint or transformational investment, enduring transformation to maintain America's military leadership position may be unsustainable. To reap the enormous benefits transformation can provide, the Service chiefs and combatant commanders must fully support the process and be required to integrate new proposals for systems into a long-term plan that meets the goals of a transformed force envisioned by the Secretary and CJCS.

The body in the Joint Chiefs of Staff where the Service chiefs and combatant commanders express their requirements is the JROC. When it was established, its goal was to assess requirements and allocate resources from a joint perspective. With varying levels of success, the JROC has worked to integrate the capabilities of the various Services to provide a more joint, synergistic solution to military problems (11). Almost 20 years after its inception, however, the JROC still deals mostly with Service-specific proposals for new weapon systems.

There is little optimism that the situation would be different if Services had to choose between funding programs focused on short-/mid-term needs or supporting the research and development of long-range transformational concepts. The Service chiefs and combatant commanders are focused on the here and now, as they should be, and must support programs to guarantee military supremacy in the present. Long-range focused programs are “nice-to-haves” and may be considered, but only at the expense of immediate Service needs that are frequently judged of greater priority. Truly transformational programs are also inherently joint and, therefore, may not always get tremendous support in the traditional JROC system.

The JROC should be given, as part of a revised charter, the responsibility to formulate and evaluate programs, activities, and capabilities that meet the long-term goals of transformation. If a long-term joint program office were established to champion innovative, promising long-term technologies – perhaps as a new division within the J-8 directorate – these ideas could be submitted directly by JROC through JCS/J-8 to the CJCS for inclusion in the Chairman’s Program Assessments and Recommendations during the budget cycle. This new “Long-range Strategic Resourcing Division” would coordinate with combatant commander and Service staffs to identify programs that fit transformational goals for the long-term and support requirements identified by warfighters. Most important, they would be distinct from, and in addition to, the

normal Service and combatant commander inputs. In this way, such a division would provide direct input for uniquely joint programs without having those ideas blocked or completely reshaped by the natural Service stovepiping inherent in the Planning, Programming, and Budgeting System (PPBS) process. In fact, a charter mission for such a division might be to institutionalize the addition of transformational concepts, less fettered by Service rivalries or priorities, into the budget process. Barriers to such a proposed organization are not insignificant. Ramifications of the language of Title 10 funding, for example, may also need to be addressed, but they are beyond the scope of this paper. Key in any JROC change, though, is that without an avenue to consistent funding and CJCS advocacy, the process of institutionalizing transformation for the long term will be at risk.

Several highly respected persons, including former Vice CJCS Admiral Owens, have suggested expanding or changing the membership of the JROC. One suggestion would be to bring in the deputy combatant commanders, and possibly senior members of OSD, who could provide additional viewpoints and expertise in acquisition, planning, and programming, as well as make the board more fully able to view issues from a joint warfighting perspective than currently offered by Service deputies alone (12). Another suggestion would include expanding JROC membership with retired, former combatant commanders who could act as “trusted agents” and thus be more likely to be neutral toward improving joint force capabilities. With an expanded charter to define the short-, medium-, and long-term goals of the U.S. armed forces, and using resource allocation models like those already presented, this new, redefined JROC could better focus on the task of identifying and justifying joint warfighting requirements and allow Service chiefs to concentrate on the training and equipping of their respective forces (13).

Experimentation: A Proving Ground for the Complete Mix

Experimentation should be a crucial driver of transformation. When properly done, it can become a proving ground for more than new weapon systems. An integrated program for experimentation can help identify new and innovative combinations of technology, capabilities, doctrine, and operational concepts. With the right mindset, it will also help institutionalize an acceptance and cultural bias for flexibility, adaptation, and innovation. It must be remembered, however, particularly with new technologies, that experimentation is inherently messy, expensive and sometimes unsuccessful. Institutionalizing a process of experimentation will mean accepting failures or partial successes as a cost of normal operations.

JFCOM has been charged with leading transformation within the armed forces, and it has already begun the innovative restructuring of standing joint task force organizations to allow future commanders to integrate forces into a joint team rather than just deconflict Service campaigns. JFCOM has also begun an important series of exercises experimenting with transformational ideas in scenarios for the short and medium term. What is not yet mature is a plan for addressing the intellectual, cultural, and technological aspects of transformation across the spectrum of the near, the mid, and, in particular, the long term. A process of experimentation emphasizing all three timelines of required vision will solve today's problems, anticipate tomorrow's challenges, and permit wiser investment in the security challenges of the mid-century.

Experimentation must also address the other inexorable trend brought about by the information age, that of increasing jointness. JFCOM has taken the first steps toward joint experimentation by holding UNIFIED VISION and MILLENNIUM CHALLENGE, an exercise focused specifically on the joint warfare environment. Creation of a Joint National Training Center, whether actual, virtual or some combination thereof, would be a next step in recognizing and

emphasizing the needed focus on joint experimentation. A fenced environment that independently develops and rigorously tests new joint warfighting organizations, operational concepts, and technology will help insulate joint experimentation from merely cobbling together service experimentation while maintaining a focus on operational concepts that are uniquely joint. This latter point is critical, since optimizing joint operational concepts can have significant implications at the tactical, operational, and even strategic levels of war. A training center that focuses on the joint problem will help answer what should be some of the most important questions for future joint warfighters. For example, given new capabilities, how should tactical and operational actions be sequenced in campaigns to maximize friendly effects? What are the potential logistical considerations of new combined arms capabilities? Do new joint capabilities change the way we frame battlespace, in the senses of logistics, time, distance, lethality, and command and control? In the near term, it may well be possible to experiment with prototype or newly fielded interim capabilities. In the longer term, it will be necessary to analyze the implications of projected, but hypothetical, capabilities and their possible impact on operations.

Doctrine Must also Transform

A future can be foreseen where doctrine fails to keep pace with the fielding of technology, leaving a shortage of the operational concepts that tell how to maximize the effects of such innovation, along with the requirements for integration and synchronization with other capabilities, and the implications for rules of engagement. Whether caused by a lack of intellectual effort, lack of sufficient funding, or a lack of focus on the problem, the end result will be similar.

Much as General Henry “Hap” Arnold said in November 1945:

National safety would be endangered by an air force whose doctrines and techniques are tied solely to the equipment and processes of the moment. Present equipment is but a step in progress, and any air force which does not keep its doc-

trines ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security. (14)

Without appropriate doctrine, military success will come only by paying a high price in combat. Operational concepts must be proven and appropriate doctrine solidified long before deployment of new systems. This necessitates a higher emphasis on the operational level of warfare, where insufficient doctrine would be most glaring.

If transformation is a process and not a final end state, and if any transformation plan must capitalize on the rapidity of technological change and the jointness evolving from ever more interconnected webs of information, then the program for transformation must test those future ideas if pragmatic doctrine is to be developed to employ these new capabilities. The goal of such a program of experimentation must be to ensure that at the mid-century there are not only employable options for innovative technology, but also a range of operational concepts and doctrine that will enhance joint functionality and effectiveness.

At the tactical level, experimentation must ensure that new weapon systems or technological innovations are fielded with operational concepts that maximize capability. Experimentation must also ensure that both the technology and the operational concept are good fits against the larger strategic requirements of the United States in the near, mid, and long term.

At the operational level, transformation will pose a number of challenges for operational art, and solutions will require forward-looking and highly innovative experimentation. For example, the execution of U.S. strategy will vary by place, time, and circumstance as the nation faces adversaries who are currently uncertain, unforeseen, or unknown. Transformation, meanwhile, will provide capabilities-based forces not necessarily optimized to those specific threats. Combatant commanders will inevitably craft campaigns tailored to their theaters, a given oppo-

ment, and a particular situation, even as they draw on a common portfolio of U.S. capabilities and forces. Experimentation (and exercises) must build the required level of operational art. Operational art in this context must include the ability to ensure the properly sequenced, decisive application of low-density, high-demand advanced systems within and between theaters of war – an area toward which transformation is increasingly directing future force structures.

Future combatant commanders may face another challenge in operational art – that of simultaneously employing up to four differently capable forces. These will include legacy forces using currently fielded and proven technology, interim forces that embody upgrades or incremental changes to technology, revolutionary combat systems providing substantial or quantum leaps in capabilities but available only in prototype quantities, and allied/coalition partners with their own mixture of forces. (As the U.S. experience in Kosovo made vivid, allied forces are unlikely to match the full spectrum of transformed U.S. capabilities). The integration and synchronization of these four types of units into a synergistic fighting force may be the biggest challenge facing future commanders. By rigorous experimentation and training through repeated exercises, both operational commanders and operational concepts can be validated before reaching the crucible of combat.

Experimentation will also be required to test whether changes in technology may be so significant as to change the basic understanding of warfare. For example, a premise of network-centric warfare is that integration and exploitation of superior information technologies will permit battlefield awareness so complete as to allow the real-time acquisition of targets and their immediate destruction. Only rigorous experimentation will determine whether this nearly seamless sensor-to-shooter link can overcome the fog, friction, and enemy counteraction found on the battlefield.

Further, it is fair to ask whether the improved capabilities called for by transformation (i.e., longer-range precision weapons, information and space warfare, increased integration of joint and combined forces) will change the shared cultural framework of a battlefield with strategic, operational, and tactical levels. The existing literature, including Joint Vision 2020, does not draw this conclusion (although some advocates of particular aspects of transformation may). Strategies will still be needed to achieve national objectives. Tactics will still be required to employ U.S. forces and capabilities against opponents. Most significantly with respect to transformation, an operational level of war and operational art will still translate strategy into campaigns and sequences of actions essential in achieving objectives. Indeed, a close reading of the discussion of transformation by Secretary Rumsfeld, Deputy Secretary Wolfowitz, and General Myers indicates that the essential universe of combat described long ago by Sun Tzu and Clausewitz seems to still be intact. The violent application of physical coercion on opponents will still be a rational instrument of national power and the primary purpose of armed forces. Violence is meant to support the political objectives of the state. Therefore, the challenge will be to find possibilities inherent in the transformation process as illuminated by an evolving understanding of war. The military will strive to conduct operations more flexibly, adaptively, and effectively through better-integrated organizations that maximize appropriate effects for each mission. The process of transformation must ensure as a deliverable that understanding of the application of operational art keeps pace with changes in technology, capabilities, and operational concepts.

Military Education: The Sustainer for Transformation

Transformation is not just about new technology. Technology without trained, educated, and experienced personnel skilled in operating the new systems, or without innovative leaders willing to expand current doctrinal boundaries, will not achieve the purpose. Along with the

push for a long-term vision in building future technologies, there must be a corresponding campaign to expand the intellectual foundation of the military. All levels of the armed forces must be conditioned to accept transformational changes, be encouraged to think “out of the box” and to understand the changes new technologies will have on the planning, conduct, jointness, and speed of warfare. These are critical if there are to be the appropriate, necessary, and lasting changes in doctrine and operation planning process.

JFCOM has proposed a new plan for professional military education (PME) that provides educational opportunities at all rank levels, concentrating on appropriate instruction for each rank. The idea has tremendous merit. For the first time, military education will be truly integrated from lieutenant to lieutenant general. That will help break down intellectual and cultural barriers to transformation by offering an opportunity to educate officers from the entire spectrum on the changes occurring in technology and doctrine. At all levels of this new educational structure, focusing on a long-range vision of the future will promote within the military establishment a mindset (intellectual change) looking forward rather than backward in preparing for future conflicts. Past solutions should be only a starting point, not a prescription, for how to fight future wars.

In addition, PME for officers should be expanded outside of formal schools as well. Transformation requires officers to have highly developed intellects to process and understand the potentials of new technologies, new organizational structures, and faster timelines for all actions. For officers to better understand these new technologies, to better understand joint and combined warfare principles, to build the capability to think unconventionally, to be exposed to innovative ideas and people, they must be exposed to a range of historical works of great leaders

and thinkers, current scientific works, and postulative treatises on subjects that will train their minds to look not just for the probable, but the possible as well.

All Services expect their enlisted personnel, and especially their noncommissioned officers, to attain certain knowledge appropriate for their rank, and they are tested on that knowledge as a prerequisite for promotion. Why should less then be expected from the commissioned officer corps? The Chairman has long had an established reading list to improve the minds of officers and provide continuing education regarding the profession of arms. Those readings should be made mandatory (and regularly updated) for each year of service for officers, from lieutenant to lieutenant general. Performance evaluation forms can be altered to include a block indicating that professional readings have been accomplished. During normal performance counseling sessions, commanders should verify completion of the readings by asking officers to relate what they learned. These counseling sessions will also provide an opportunity for commanders to encourage officers to think out of the box by actively soliciting ideas that could lead to important doctrinal changes.

Much of this discussion emphasizes the need for a strong program of exercises and experimentation to prove transformational concepts and constructs. JFCOM has built a solid foundation in this area, but an expanded program, as advocated here, could overwhelm current capabilities of the command. A solution could be to integrate the senior Service schools at Newport, Carlisle, Maxwell, Quantico, and NDU/ICAF into the actual conduct of JFCOM-led joint experiments. The inclusion of populations of student officers (and senior noncommissioned officers) in actual experimentation might be one method to inculcate change and to develop an enhanced appreciation for the demands of operational art. After all, the senior Service school curriculum emphasizes operational joint warfare principles, teaches military planning processes, and

prepares the best and brightest officers to accept positions of authority in the military profession. JFCOM exercises could be a practical teaching aid where students put into practice the lessons they have learned in the classroom. That would be a valuable opportunity for both the schools and the students. For the students, it would serve as a form of case study or graduation exercise for their year of study. JFCOM would, in turn, gain the benefit of hundreds of new players in their exercise cells – all in all, a win-win solution.

Another benefit of using students in exercises would be to reinforce the lessons of accepting the cultural change to the military profession brought about by transformation. It might also mitigate a drop in creativity frequently observed among those reaching middle age. An exhaustive study of 1,300 R&D scientists and engineers, completed in 1976, found a biphasic curve in creativity, where a peak in innovation frequently occurs in an individual's 30s followed by a decline in average creativity into the late 40s, and ultimately a final spurt after 50 (15). What better tool to reinforce and buoy the concepts of innovation, creativity, and acceptance of the failure of some ideas than through experimentation – particularly at an age and leadership point in an officer's career when it is needed the most? Officers brought together at the war colleges are encouraged to think freely, are released from the daily pressures of their jobs (a likely cause of the study's observed decline between the ages of 35 and 50) to pursue more intellectual thoughts, are exposed to the joint culture, and have the time and opportunity to exchange ideas with others of varying backgrounds. For all of these reasons, these senior war college students are the perfect candidates to lead experiments in new organizational structures and new technologies, and to develop new doctrine. If accomplished as part of the curriculum, that would also help institutionalize the process and probably ensure one does not fall into a trap identified by a forthright British general, who observed 80 years ago that “any military service which tries to

separate its fighters from its thinkers is likely to finish up with cowards doing the thinking and the fools doing the fighting” (16).

Critics of the need for transformation still abound, and it is unlikely their objections will lessen given proposals for thinking further out and more jointly. Some will say the landscape is so uncertain that it is hard enough thinking out to 2010. To expend effort beyond that is pointless and will not solve today’s problem of global terrorism and protecting the homeland. Further, the culture will not support that kind of innovation; Service parochialism and resistance to change are too strong, and organizational resources are stretched too thin to permit focusing 50 years out in any meaningful fashion. All of these objections may seem reasonable on a first pass, and all have certainly been voiced in one fashion or another in editorials and articles since September 2001. The underlying fallacy in these views, however, is best found in the pages of history in a parallel situation encountered by another great power less than a century ago.

In August 1919, Great Britain’s War Cabinet formulated a strategic dictum called the Ten Year rule that guided much of its defense planning for the next 20 years. In short, it stated that Britain was not expected to be involved in a major war over the next decade, and thus no expeditionary force would be needed to fight abroad (17). The direct implications of that were profound, affecting the funding, manning, and training of Britain’s forces during the critical interwar years. Although Britain was at the leading edge of many military technological developments during that time (e.g., tanks, radar, sonar, long-range bombers, aircraft carriers, and fighters), few were actually fielded or exercised in numbers that gave them militarily significant transformational capability.

With a narrowed horizon of ten years, aircraft carriers were an interesting experimental capability, but not a weapon envisioned to be useful against enemy battleships. Thus, the Royal

Navy did not realize the true potential of carrier aviation before 1940. The Ten Year Rule placed similar blinders on Army development, with Army strategy focused on protecting the Empire. Given the geographic extent of the lands controlled, London expected most of the Army's mission to occur in tropical climates as low-intensity conflict, for which tanks were ill suited. Again, remarkable technological developments in mobile armored systems were not translated into their most potentially useful military capability. Finally, the ten-year strategy so limited the resourcing of equipment and personnel as to make its military incapable of winning a major land war in Europe. As late as 1937, Prime Minister Chamberlain was still pursuing a policy of limited liability, in which the country would provide air and naval forces, but rely on allies to furnish large armies. After World War II began, London had to focus anew on building a modern army to fight in Europe. The delay, however, put Britain significantly behind Germany, which had more consistently developed the equipment and doctrine for mobile armored formations, integrated with other arms (18).

These lessons should be instructive for the U.S. military. A limited and arbitrary horizon for strategic planning stifled Great Britain's ability to adequately field the military forces needed for the future. Worse, it let golden opportunities to develop doctrine for new weapons of war slip by and allowed Britain's potentially tremendous competitive advantage in innovative thought go unrealized in terms of fielded, war-winning military capability.

The United States must not let this happen to it. Although September 11, 2001, was a seminal event, Americans must guard against focusing so closely on the resultant GWOT that they have it limit their horizon of danger and in effect their strategic vision – blinding them to the opportunity they have to take advantage of a wave of technological change, information connec-

tivity, and their unique faculty for innovation. Failure to lead now in transformation may require the United States to follow others by the mid-century.

Conclusion

Per Secretary Rumsfeld's oft-cited example of Special Forces soldiers in Afghanistan combining the effects of precision-guided munitions and a horse-borne cavalry charge, transformation includes the individual and organizational flexibility to use existing technologies and capabilities in new and more effective ways. Transformation clearly also includes new technologies and capabilities, but they must arrive in the field in a coherent plan with the appropriate operational concepts with which to employ them. Even more important, they must be sufficiently visionary. The military organizations that receive new technologies and capabilities must be structured to maximize the effects of new capabilities and operational concepts in a joint and combined environment. These organizations must be manned by well-trained and educated personnel, capable of applying new doctrine in a military culture that encourages and rewards flexibility, adaptation, and experimentation. The integration of intellectual, cultural, and technological transformational efforts is intended to produce a military that expects to be routinely joint and combined. It develops a future force that thinks in a larger framework than traditional Service core competencies and doctrine – a force that seizes the possibilities of unusual, tailored combinations of forces, ideas, and capabilities to achieve required effects at the decisive time and place.

Joint Vision 2010 and *Joint Vision 2020* were excellent constructs for the medium term and have provided conceptual frameworks for operational requirements within the realm of what is currently possible. What is missing is the goal for sustained progress. The military needs to augment *Joint Vision 2020* with a much farther-reaching document, one that looks out at least 50

years. It cannot be expected to accurately predict what the world will be like; that would fall under the old “threat-based” concept of describing the most probable enemies to be faced. It should push the boundaries of the possible and try to visualize capabilities the United States can develop or exploit to shape the security environment in the future. Resources, of course, will be always be constrained, and how the nation invests for the future across DOD must inevitably be a balance of near-, mid-, and long-term proposals. America must exploit its national competitive advantage in innovativeness, but must develop new resource assessment tools that can give new fidelity to project risk, potential future return, and joint strategic fit, yet provide warfighting decision makers a global view of the battlefield of resource allocation.

JROC must be changed to institutionalize transformation in the short, medium, and long term. JFCOM should continue to improve its exercises by experimenting with all aspects of transformation and including long-range analysis as well. The use of students would increase its capabilities to match the expanded requirements. PME must be improved to inculcate within the minds of all ranks the ideas of change and the desirability of innovation (with its possibility for failure as an essential part). Courses of instruction should be expanded to reach all ranks with the appropriate educational concepts at the appropriate time within a career. Bringing mid-career thinkers into the process of experimentation and innovation is a critical part of the plan.

There is often a brief window of opportunity during wartime to push transformation. War energizes thought and accelerates innovation. It also breaks resistance to change, engenders a willingness to think of “the team” over organizational loyalties, and leads to larger budgets rather than guarding or dividing resources. DOD can make great strides transforming the military now because Congress, the military, and the nation see the benefits and the imperative in view of the GWOT. If the GWOT dwindles to a steady state operation, the military may lose the emphasis

for transformation. DOD must take advantage of this window of opportunity now to institutionalize transformation. And though the GWOT may provide the catalyst and imperative for transformation, care must be taken to ensure that it does not obscure the need to focus on the longer strategic horizon. If the United States is to have the necessary capabilities to ensure a favorable security environment 50 or even 100 years in the future, and not go the way of other great powers in recorded history, the time to start laying an integrated intellectual, cultural, and technological groundwork for transformation with vision is now.

ENDNOTES

- 1 “21st Century Transformation,” Secretary of Defense Donald Rumsfeld, remarks delivered at National Defense University, 3 January, 2002
- 2 “Understanding Transformation,” Chairman of the Joint Chiefs of Staff General Richard Myers, December, 2002, p. 5.
- 3 *New World Coming: American Security in the 21st Century*, The Phase I Report on the Emerging Global Security Environment for the First Quarter of the 21st Century, the United States Commission on National Security/21st Century, 15 September, 1999, p.10.
- 4 Gary Hamal and C.K. Prahalad, “Do You Really Have A Global Strategy?” *Harvard Business Review*, No. 85409. Volume 63, Number 4. July-August 1985, p.147.
- 5 “Note on Industry/Market Strategy,” *Harvard Business School*, 9-585-107, Rev. 6/85, 1985, p. 5.
- 6 Ibid, p.5.
- 7 Ibid, p.5.
- 8 Ibid, p.5.
- 9 Congress, Senate, Committee on Armed Services, Subcommittee on Emerging Threats and Capabilities, “*Leap Ahead*” *Technologies and Transformation Initiatives Within the Defense Science and Technology Program*, 107th Congress, First Session, June 5, 2001,” p.55.
- 10 “The Defense Budget: Is It Transformational,” David L. Norquist, *Joint Force Quarterly*, Summer, 1994, p.95.
- 11 “JROC: Harnessing the Revolution in Military Affairs,” Admiral William Owens, *Joint Force Quarterly*, Summer, 1994, p.55.
- 12 “The Once and Future Revolution in Military Affairs,” Admiral William Owens, *Joint Force Quarterly*, Summer, 2002, p. 61.
- 13 Ibid.
- 14 Air Vice-Marshal R.A. Mason, “Innovation and the Military Mind,” Prepared for Air University “Concepts for Air Force Leadership,” Online Internet. www.au.af.mil/au/awc/awcgate/au-24/au24-401.htm, p.6.

- 15 Dr. William R. Klemm, "Leadership: Creativity and Innovation," Prepared for Air University "Concepts for Air Force Leadership," Online Internet. www.au.af.mil/au/awc/awcgate/au-24/au24-401.htm, p.17.
- 16 Mason, p.4.
- 17 *JFQ*, Summer 2002, p.96.
- 18 *Ibid*, p.96.

BIBLIOGRAPHY

Alberts, David S., John J. Garstka, and Frederick P. Stein. *Network Centric Warfare: Developing and Leveraging Information Superiority*. Washington, D.C.: C4ISR Cooperative Research Program (CCRP), 1999.

Armstrong, Robert E. "From Petro to Agro: Seeds of a New Economy." *Defense Horizons* Center for Technology and National Security Policy, National Defense University, October 2002.

"An Evolving Joint Perspective: U.S. Joint Warfare and Crisis Resolution," by the Directorate for Operational Plans and Joint Force Development. The Pentagon. 28 January 2003.

Barber, Arthur H., III, and Delwyn L. Gilmore. "Maritime Access: Do Defenders Hold All the Cards?" *Defense Horizons* Center for Technology and National Security Policy, National Defense University, October 2001.

Barry, Charles L., and Elihu Zimet. "UCAVs-Technological, Policy, and Operational Challenges." *Defense Horizons* October 2001.

Binnendijk, Hans, ed. *Transforming America's Military*. Washington, D.C.: National Defense University Press, 2002.

Chairman of the Joint Chiefs of Staff. *Joint Vision 2020*. Washington, D.C.: U.S. Government Printing Office, June 2000.

Coffey, Timothy, and John A. Montgomery. "The Emergence of Mini UAVs for Military Applications." *Defense Horizons* December 2002.

Cohen, Elliot A. "A Tale of Two Secretaries." *Foreign Affairs*, May/June 2002.

Costa, Keith J. "Joint National Training Capability: The Next Wave in Transformation." *Inside the Pentagon*, February 20, 2003, p. 1.

Department of Defense. *Quadrennial Defense Review Report*. Washington, D.C.: U.S. Government Printing Office, September 30, 2001.

Greenwald, Bryon E. "The Anatomy of Change: Why Armies Succeed or Fail at Transformation." *The Land Warfare Papers*, No. 35, September 2000.

Hamel, Gary, and C.K. Prahalad. "Do You Really Have A Global Strategy?" *Harvard Business Review*, No. 85409. Volume 63, Number 4. July-August 1985.

Handel, Michael I. *Masters Of War: Classical Strategic Thought*. Portland, OR: Frank Cass, 2001.

Howard, Michael, and Peter Peret, ed. *Carl Von Clausewitz: On War*. Princeton: Princeton University Press, 1976.

Klemm, Dr. William R. "Leadership: Creativity and Innovation." Prepared for Air University "Concepts for Air Force Leadership." On line internet. www.au.af.mil/au/awc/awcgate/au-24/au24-401.htm.

Krepinevich, Andrew F. "Lighting the Path Ahead: Field Exercises and Transformation." Center for Strategic and Budgetary Assessment. Washington DC. 2002.

Logue, Dennis E. "Counter Evidence on Management's Investment Myopia." *California Management Review*, Volume XXVIII, Number 1, Fall 1985.

Mait, Joseph N., and Jon G. Grossman. "Relevancy and Risk: The U.S. Army and Future Combat Systems." *Defense Horizons*, Center for Technology and National Security Policy, National Defense University, May 2002.

Mark, Hans. "The Airborne Laser from Theory to Reality: An Insider's Account." *Defense Horizons* Center for Technology and National Security Policy, National Defense University, April 2002.

Mason, Air Vice-Marshal R.A. "Innovation and the Military Mind." Prepared for Air University "Concepts for Air Force Leadership." Online Internet. www.au.af.mil/au/awc/awcgate/au-24/au24-401.htm.

Myers, General Richard. "Understanding Transformation." December 2002.

New World Coming: American Security in the 21st Century. The Phase I Report on the Emerging Global Security Environment for the First Quarter of the 21st Century. The United States Commission on National Security/21st Century. 15 September, 1999.

Norquist, David L. "The Defense Budget, Is It Transformational?" *Joint Force Quarterly*, Summer, 2002.

"Note on Industry/Market Strategy." *Harvard Business School*. 9-585-107, Rev. 6/85. Boston: Harvard Business School. 1985.

Oliver, David R., Jr. "Current Export Policies: Trick or Treat?" *Defense Horizons* December 2001.

Owens, William. "JROC: Harnessing the Revolution in Military Affairs." *Joint Force Quarterly*, Summer, 1994.

Owens, William. "The Once and Future Revolution in Military Affairs." *Joint Force Quarterly*, Summer, 2002.

Rumsfeld, Donald. "Transforming the Military." *Foreign Affairs*, May/June 2002.

Rumsfeld, Donald. "21st Century Transformation." Online Internet, www.defenselink.mil/speeches/2002/s20020131-secdef.html.

Sanders-Newton, Desmond, and Aaron B. Frank. "Effects-Based Operations: Building the Analytic Tools." *Defense Horizons*, October 2002.

Scales, Major General Robert H., Jr. *Future Warfare Anthology*. Carlisle Barracks: U.S. Army War College. 2000.

Sun Tzu. *The Art of War*. New York: Oxford University Press, 1963.

Tilford, Earl H., Jr., PhD. "Asymmetry and the American Way of War." *The Officer*, January/February 2003.

"Transforming Defense." Briefing by Vice Admiral Cebrowski, USN (Ret) at the Pentagon. 4 February, 2003.

U.S. Congress. Senate. Committee on Armed Services. "Military Transformation." Testimony by Andrew F. Krepinevich, Executive Director, Center for Strategic and Budgetary Assessments. 9 April, 2002.

U.S. Congress. Senate. Committee on Armed Services. "Military Transformation." Testimony by Deputy Secretary of Defense Paul Wolfowitz; Vice Chairman of the Joint Chiefs of Staff General Peter Pace; Commander in Chief, U.S. Joint Forces Command General William Kernan; and Director, Office of Force Transformation Vice Admiral Arthur Cebrowski, USN (Ret). 9 April, 2002.

U.S. Congress. Senate. Committee on Armed Services. Subcommittee on Emerging Threats and Capabilities. "*Leap Ahead*" *Technologies and Transformation Initiatives Within the Defense Science and Technology Program*. 107th Congress, First Session, June 5, 2001. GPO. 2002.