TRANSFORMING THE NAVY

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with
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CENTER FOR NAVAL WARFARE STUDIES
DECISION STRATEGIES DEPARTMENT

Report 00-3

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INTRODUCTION

The Secretary of the Navy requested the Naval War College's assistance in constructing a blueprint for transforming the Navy. Three complementary approaches were taken to address these questions — research, interviews, and a workshop. This report provides insights into what was learned.

WHY TRANSFORM?

Arguments abound for transforming the Navy. Some supporters of change insist that the spread of technology to potential adversaries will make the current Navy ill-equipped to deal with emerging challenges. Others argue that technological opportunities are sufficiently compelling to warrant change regardless of the global security environment. Still others point out that change is the natural order of things and in spite of anyone's desire to maintain the status quo, nothing remains the same. In large measure, the inevitability of change makes up a part of the American psyche. As a recent *Economist* editorial noted, the "real American way" involves "adapting quickly, adapting constantly."[1] The question is not why the Navy should transform, but how.

Nevertheless, the Navy is divided over the question of transformation.[2] On one extreme are those who believe the global security environment is changing so quickly and dramatically that if the Navy doesn't change with it the service will become increasingly irrelevant. At the other extreme are those who ask, "If it ain't broke, why fix it?" The conundrum is that many who believe themselves to be in the camp that embraces change place themselves — by their actions — squarely in the "If it ain't broke, don't fix it" camp. Overcoming this self-delusion will prove to be a significant challenge for naval leadership. The change in participants' attitudes from Global '99 to Global 2000 was dramatic. The former struggled with new command arrangements while the latter embraced them.

Although some trends are widely accepted — such as globalization, technology proliferation, and networking — not everyone agrees how (or how fast) the Navy should change in response. Those favoring slow change point to the rising costs of military systems during a period of falling budgets. They are countered by

[1] "The revolutionary spirit," *The Economist*, 18 September 1999, p. 17.
[2] The following positions were expressed during a transformation workshop conducted in the Naval War College's Decision Support Center on 08 October 1999.

those who argue that in the most critical area (information technology), costs are declining relative to capabilities. As recently as late 1999, the case for change still needed telling. At that time, Thomas Mahnken, a strategy professor at the Naval War College, wrote, "A vision of the 'Navy after next' must be the starting point for a transformation. Historically, those states that have innovated most profoundly have done so because they faced a current or anticipated strategic or operational problem that they could not meet with current forces. While the United States — and the Navy — face a number of threats that demand innovative responses (e.g., area denial, weapons of mass destruction), the Navy has yet to make the case publicly and forcefully that these strategic problems demand change. Current arguments for network-centric warfare are driven by opportunity rather than need, and are likely to prove unpersuasive to the majority who find the status quo not only acceptable but comforting."[3] Since then, Joint Vision 2020 has embraced the concept of network centric warfare and made it a touchstone for joint transformation. That does not mean that the need for a clear articulation of the Navy's current course has gone away. There is still a requirement to answer questions such as: Where is the Navy headed in the right direction? Where does it need correction and why? What are the alternatives or solutions?

The Navy's vision must be shared and articulated by both the Secretary of the Navy and the Chief of Naval Operations (CNO). At a Transformation Workshop conducted at the Naval War College, there was general acceptance that the challenge for naval leadership is to establish the direction and rate of change. Even though participants grasped the general direction in which the Navy is headed, they were unsure, what the consequences of failing to move rapidly ahead really were. Since all of the participants were actively engaged either in the military or with national security affairs, it remains clear that the benefits and challenges of transformation require further examination and dissemination.

This paper discusses transformation using a framework devised by Andrew Hargadon and Robert Sutton.[4] Its aim is to institutionalize a process that fosters innovation and over time results in both structural and cultural change. Although it provides a number of specific recommendations for the Navy to follow, the

[3] Email received by author on 28 September 1999.
[4] Andrew Hargadon and Robert Sutton, "Building an Innovation Factory," *Harvard Business Review*, May-June 2000, pp. 157-66.

strategy is really the skeleton upon which the meat of transformation must be hung.

A Brief Overview of the Navy's Vision

It should come as no surprise that a transformation strategy cannot be crafted unless those asked to do the crafting have an idea about what the Navy is supposed to transform into. This vision of the future Navy need only be painted with the broadest strokes. Only the metaphorical mountain that needs climbing requires drawing, not specific routes to the top. The strategies proposed in this report will guide and encourage those developing innovative ideas to fill in the details. For purposes of the report, three facets of the Navy's vision are presented as an overview — its focus, its method, and its means.

The Focus: Influencing Events Ashore

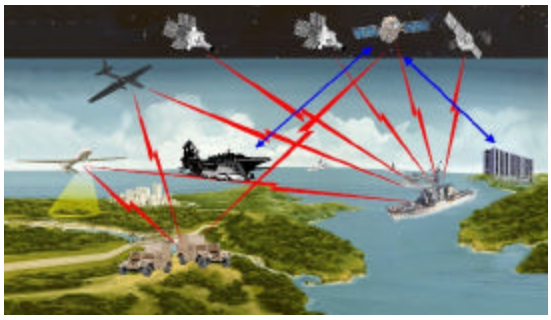
During Admiral Jay Johnson's tenure as the Chief of Naval Operations (CNO), he established the focus of the Navy's vision by declaring that in conflict the Navy must decisively influence events ashore.[5] This clarion call was the natural follow-on to concepts presented in the Navy's white paper entitled *… From the Sea*.[6] It helped bound the challenge of transforming the Navy by affirming that the Navy will fight in the littoral, as well as in the open ocean, and will reach as far inland as technology permits. Implicit in this vision is that the Navy will be within range to support the forces of sister services whenever they are ashore. This focus complements the Marine Corps' operational maneuver from the sea concept, ensuring that America's maritime services move along convergent rather than divergent paths. The vision also advances concepts found in *Joint Vision 2020*, the Department of Defense's guiding document.

The Method: Unconstrained Combined Arms Support

Continued evolution and improvement of naval surface fire support is implicit in the CNO's vision. A decade of land attack experience using Tomahawk cruise missiles has demonstrated that the Navy's reach can be long. The information era will allow the United States to field weapons with even longer ranges and greater speeds and to combine them with weapons from other services in order

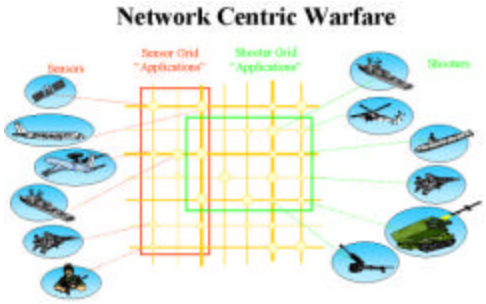
[5] Admiral Jay Johnson, "Anytime, Anywhere: A Navy for the 21st Century," *Proceedings*, November 1997, pp. 48–50.
[6] *… From the Sea*, Department of the Navy, 1992.

to mass effects in new and more effective ways. Even more important than improving weapon systems, however, is improving sensors. New sensor technology promises exponential increases in weapon effectiveness without having to invest in marginal weapon improvements. This expanded understanding of combined arms embraces everything from sensors and communications to platforms and weapons. It covers mission areas that extend from the heights of space to the depths of the sea. The vision embraces new ways of conducting and sustaining expeditionary operations using information to help reduce the military footprint ashore while at the same time increasing the effectiveness of all forces.



THE MEANS: NETWORK CENTRIC WARFARE

The connectivity required to achieve this vision of decisively influencing events ashore using combined arms lies at the heart of network centric warfare. All services are moving towards this concept. It is warfare for the information age and its emergence cannot be stopped. Network centric warfare does not change the underlying tenets of warfare; rather it expands them into a new battlefield (cyberspace) and assists commanders in better applying old rules on more familiar battlegrounds. Tomorrow's conflict may well be characterized as a battle of bandwidth.[7]

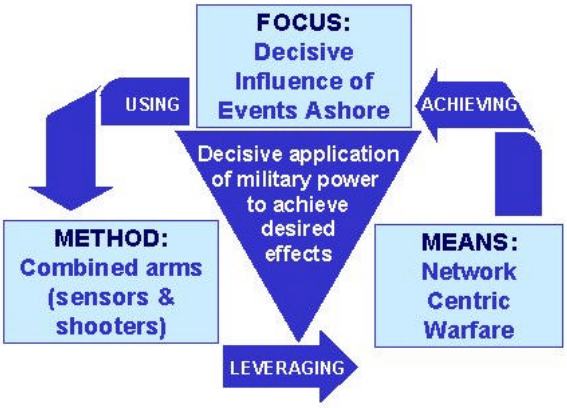


IDENTIFYING THE NAVY'S COMPETITIVE SPACE

To move acceptance of this vision forward as well as to put some bounds on it, agreement needs to be reached as to what competitive space the Navy is best suited to fill. There are two complementary sets of questions that could be asked to frame the debate. The first set deals with priorities for investment. In what areas should the Navy take the lead? Conversely, in what areas should it follow the lead of others? In areas where it decides neither to lead nor follow, where should it reserve the right to play later? Finally, which of the areas that the Navy is now involved in should it divest itself of?

[7] For a fuller discussion of Network Centric Warfare, see Vice Admiral Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origins and Future," *Proceedings*, January 1998, pp. 28–35.

Assuming that the Navy will continue to conduct all maritime missions, the second set of questions asks more geographical and mission-related questions. A few examples include: Are there limits to land attack? What air power missions of the other services are uniquely theirs? Does the Navy have a space mission or should it cede space to the Air Force? Workshop participants suggested that defining the Navy's competitive space is a top down responsibility. If the Secretary and Chief of Naval Operations (CNO) are hesitant to define it themselves, participants recommended they host a meeting involving as many 3- and 4-star flag officers as possible to consider these sets of questions as well as to address other concerns about the Navy's future. They noted that the Marine Corps conducted a similar meeting prior to the current Commandant's (CMC) selection. By getting agreement on the Corps' future before the new Commandant was selected, a degree of support for the new CMC was assured even before anyone knew who he was. A similar Navy workshop could generate enthusiasm and support for transformation and allow the Secretary to assess who among the current crop of leaders should be assembled to form a team whose goal would be to press transformation forward. If agreement were reached, it would give the CNO some measure of confidence that he could lead the service towards transformation without having to counter significant opposition concerning the direction he needs to go.



TRANSFORMATION STRATEGIES

Simply stated, the vision is to field a Navy that can exploit technological opportunities to improve: battlespace knowledge, command decisions, target acquisition, weapon allocation, and combat effects. Of course, the devil is in the details and the debate concerning the vision has been about those details. In general, however, the foundations of the Navy's vision are sound and follow a course dictated in equal parts by past traditions & missions and future challenges & opportunities. As noted above, transformation strategies recommended in this study for achieving a more interconnected force are aimed at changing both structure and culture. These strategies build upon and support one another. Taken as a package, they have the potential of transforming the Navy in the way the vision suggests.

When making decisions about which technologies and programs to pursue, naval leadership should have an underlying philosophy. One promising philosophy comes from Eric D. Beinhocker and is drawn from his work on evolutionary

biology.[8] Beinhocker recommends adopting a family of strategies that incorporate many small evolutionary steps that are complemented by several bigger leaps that hedge against the unexpected. He notes that, “a robust population of strategies will produce positive results under a wide variety of circumstances, even though it may not be optimal in some circumstances. … Such an adaptive population of strategies keeps an array of options over time minimizing long-term and irreversible commitments.” Evolutionary biologists often use an imaginary grid called a fitness landscape to visualize patterns of evolution in nature. Fitness landscapes provide a useful model for thinking about strategies that ensure survival in a complex and unpredictable future. Beinhocker suggests there are three elements vital for success on a fitness landscape: keep moving, conduct parallel searches, and mix long and short jumps across the landscape. He reasons that the more you explore the greater your chances of finding new peaks. Even if you are fortunate enough to be on a high peak you can’t afford complacency — at some point your dominant peak will collapse as the environment changes or competitors’ actions deform the landscape.

For the Navy, conducting robust analyses, modeling, simulation, gaming, and experimentation can mitigate the risks associated with pursuing big leaps in technology. Every area discussed in this paper can benefit from an up-front investment in such activities.

ORGANIZATIONAL CHARACTERISTICS THAT FOSTER INNOVATION

Matthew Evangelista identified five characteristics common to organizations that have demonstrated successful innovation and implementation. Successfully implementing innovations is no mean feat because the characteristics required for innovation are often at odds with those necessary for successful implementation. Evangelista's characteristics are:[9]

- *Centralization* of power and control. Absolutely critical for successful implementation, centralization of power nevertheless puts a damper on the innovation process.

- *Complexity* of the knowledge and expertise possessed by an organization's members. New ideas flourish when an organization is filled with bright and informed people, but sorting out ideas and prioritizing them becomes problematic.

- *Formalization* of rules and procedures the organization imposes for its members to follow. Just as with centralization of power, getting an

[8] Eric D. Beinhocker, "Robust Adaptive Strategies," *Sloan Management Review*, Massachusetts Institute of Technology Press, Vol. 40, No. 3, Spring 1999, pp. 95–106.
[9] Matthew Evangelista, *Innovation and the Arms Race: How the United States and the Soviet Union Develop New Military Technologies* (Ithaca, NY: Cornell University Press, 1988), pp. 28-49.

organization to follow a single set of rules is great for implementation, but it can stifle creativity.

- *Interconnectiveness* refers to the degree to which an organization can disseminate new ideas through interpersonal networks. The upside of connectivity is being demonstrated everyday on the internet. The downside is that connectivity can (and will) create influential back-channels for those opposed to the direction an organization has selected.

- *Organizational slack* refers to the degree to which uncommitted resources are available. An organization can generate the world's greatest ideas, but if resources are not freed to implement the ideas, they will remain fallow.

	Effect on Idea	
Characteristic	Generation	Implementation
Centralization	Inhibits	Encourages
Complexity	Encourages	Inhibits
Formalization	Inhibits	Encourages
Interconnectedness	Encourages	Encourages
Organizational slack	Encourages	Encourages

Jeffrey Sands compared a community known for its creativity — the U.S. weapons development community — with the Navy in general and demonstrated why innovation is difficult in a large bureaucratic organization.[10]

	INNOVATION ENVIRONMENT	
Characteristic	Weapons R&D Community	NAVY
Centralization	Low	High
Complexity	High	High
Formalization	Low	High
Interconnectedness	High	Varies
Organizational slack	High	Varies

If the Navy is going to successfully transform, it must blend these characteristics in a way that encourages innovation without hampering implementation. This means that selective organizations must be structured, to use Hargadon and Sutton's term, as innovation factories. How to do this will be discussed later.

TRANSFORMATION APPROACHES

Even if one gets the organizational structure sorted out properly, an organization's leadership still needs to determine how fast, how broad, and how

[10] Jeffrey I. Sands, *Sea Changes: Institutionalizing Innovation in Post-WWII U.S. Naval Strategy* (Unpublished paper, 1994).

affordable transformation is going to be. There are basically four approaches that can be pursued (as shown on the accompanying chart).

Squeezed transformation. When fiscal constraints are great, the temptation is to pursue a focused and measured strategy because it can react to the vagaries of the budget process. This strategy is well suited for maintaining current budget lines, but has difficulty freeing assets for transformation. The slow pace of this strategy means that culture shock, that can increase opposition to change, is generally not a problem. In fact, criticism of this strategy is more likely to reflect its resistance to change.

Unconstrained Transformation can be followed when asset availability is not a significant consideration. This strategy encourages innovation because money will be available to explore most ideas, but it could present a problem as to how to prioritize among them. Although it ensures that an organization remains technologically advanced, it changes so fast that it pays little attention to its competition (or friends). The downside of this strategy can be severe. It costs an enormous amount to change an organization completely over a short amount of time. The rapidity of change also results in culture shock, increasing opposition to change and impeding implementation of ideas. It also runs the risk of creating a force structure/strategy mismatch as unanticipated challenges emerge.

Targeted Transformation permits an organization to focus on particularly critical challenges and overcome them quickly. It also permits the organization to make a few "big bets" with promising technologies without risking the overall health of the organization. The downside of this strategy is that transformation is selective and generally affects programs more than people. Force capabilities, rather than strategy, are its main drivers, again risking a structure/strategy mismatch.

Evolutionary Transformation permits an organization to pursue a comprehensive strategy that affects both structure and culture while minimizing culture shock. It reduces risk because of its measured pace, but could delay transformations that are useful in the short-term. This strategy requires commitment by successive administrations, but has a good chance of achieving its objectives because its pace makes it affordable.

Dual Path Strategy. The Naval War College Transformation Task Force recommended simultaneously pursuing targeted and evolutionary transformation strategies — they are not mutually exclusive. The first objective should be overcoming the challenges of connectivity that form the basis of network centric

warfare. A horizontal network that forms the operational backbone of the Navy and vertical tactical networks should both be pursued. This strategy should also be used to prioritize among "big leaps" that hold great promise if they can be brought to fruition. The evolutionary strategy should be institutionalized in a process that permits the Navy to change continuously and constantly as new challenges and opportunities emerge. The simultaneous pursuit of these two strategies can achieve the greatest effect in the shortest period of time and ensures that the process will continue with the least risk and greatest affordability. Since the evolutionary strategy is the most comprehensive and difficult (because it aims to change both structure and culture), it will be the focus of the remainder of this study.

FINDING AND CARING FOR INNOVATORS

No process can turn a pedestrian thinker into a genius. Identifying personnel with creative minds thus becomes the first order of business for any organization seeking to improve its capacity for innovation. Two methods for identifying innovators were proposed.

Fitness Reports. Although the task force hesitated recommending an additional block on fitness reports, alternatives to that option appeared limited — especially for junior officers. The task force recommended that commanders only mark the "innovation" block when an officer demonstrates unique and substantive creativity. To minimize abuse, a separate, full-page justification would have to be submitted whenever the block was checked. Additionally, the block should not be briefed to promotion or command screening boards, but used only by boards selecting officers for special programs that will be discussed below.

Nominations. Officers could also be nominated for special programs by flag officers or other designated individuals (such as, college professors or senior DoD civilians). These nominations would also have to be accompanied by written justification.

OPPORTUNITIES TO EXCEL

Creative people must be placed in situations that foster innovation. Hence, the Navy needs to place more emphasis on special educational opportunities, such as fellowships and, especially, doctorate programs. Many of those involved in this study pointed out that the Navy is sadly lacking in doctorates in comparison to the Army and Air Force. The Navy does support a reasonably strong fellowship program that includes Federal Executive Fellowships (FEF) and the CNO's Strategic Studies Group (SSG). Members of the SSG have enjoyed remarkable promotion success to flag rank, but the same cannot be said for those who have been involved in doctoral or FEF programs. All of these avenues should provide paths to flag rank if naval leadership intends to promote

innovative thinking among its officers. One new opportunity recommended by the task force was the establishment of an "operational" strategic studies group whose focus would be on experimenting with cutting-edge concepts and hardware. This group will be discussed in more detail later.

In order to ensure that those involved in these programs achieve proper promotion consideration, the Secretary of the Navy should require board presidents to report on how these individuals fared. For example, the board president should have to justify why an unselected "special program" officer was passed over when compared to the last officer that was selected. Such a procedure would have an immediate impact on the desirability of participating in such programs and have a long-term impact on naval leadership.

EXPLORE NEW CAREER PATHS TO FLAG RANK.

Steve Rosen writes that a real transformation has taken place when "a new distribution of power within the service … [emerges] as well as new paths to power (Flag rank)."[11] This successfully occurred during the infancy of both the air and submarine communities. There is an ongoing debate, however, about whether information age warfare requires a new cadre of warfighters or simply adds new qualifications for successful officers in existing communities. Based on interview and workshop results, the latter course appears to be winning the day. The "operational SSG" could provide officers who have pursued non-traditional careers an opportunity for command that might otherwise be unavailable.

GET OVER THE RICKOVER SYNDROME.

Research concluded and workshop participants agreed that the Navy needs to get over its "Rickover Syndrome" and keep selected officers in critical billets for extended periods.[12] Workshop participants recommended selectively exempting senior flag officers from DOPMA requirements when they are in command of organizations charged with developing and implementing innovations. This strategy would require constant review of programs and billets in order to identify those that are critical to transformation. When a billet has been identified, its incumbent should receive special instruction on how to foster personal relationships with key decision-makers to improve chances for program success. A cadre of former flag

[11] Stephen Peter Rosen, "New Ways of War: Understanding Military Innovation," *International Security*, Summer 1988, p. 142.

[12] The Rickover Syndrome is the Navy's concern about allowing an officer to build a personal influence base outside of the Service. Participants agreed, however, that those left in place over extended periods of time need to remain subject to service control and removal. See Bradd C. Hayes et al., *The Politics of Naval Innovation* (Newport, RI: Strategic Research Department Report 4-94), p. 95.

officers who were able to build such relationships during their careers could provide this training.

INCREASE EDUCATIONAL OPPORTUNITIES FOR ALL OFFICERS

The old adage that "all boats lift with the tide" can be applied to the remainder officer corps. Innovative ideas will have a better chance of being implemented with minimum opposition when those challenged to implement them have been exposed to postgraduate education. Andrew Marshall recommends that the officers of all services' "spend more time at war colleges … in wargaming and in research programs" and that they be given "credit for this in their careers; it has to be a way to the top for them."[13] To meet this challenge some workshop participants recommended revising the Naval War College curriculum to differentiate more distinctly between junior and senior students and involving students more closely in research programs. Others recommended extending careers to allow officers more time for education and experimentation, without sacrificing fleet operational experience. Others recommended that the Secretary require at least a master's degree for those promoted to captain and above.

UPDATE PERSONNEL POLICIES

Strategies for dealing with personnel must change with the time. Commanding officers should be judged on their ability to identify and nurture both command-capable officers and innovative thinkers — and the Navy must know how to shape careers for both.[14] "Up or out" policies will have to be eliminated in areas not leading to command. In knowledge-based warfighting, as much of the Navy's value will be tied up in what its people know as in its infrastructure.

A recent study by McKinsey & Company noted that key personnel in the business world "gravitate toward one of four basic brand positions. 'Go with a winner' employees are most interested in growth and advancement; 'big risk, big reward' players value advancement and compensation. Those out to 'save the world' need an inspiring mission, while 'lifestyle' employees seek flexibility and a good fit with the

[13] Andrew Marshall, "Some Thoughts on Military Revolutions—second draft," memorandum for the record, 23 August 1993, p. 6.
[14] See "Job Sculpting: The Art of Retaining Your Best People," *Harvard Business Review*, September-October 1999, pp. 144–52.

boss."[15] The Navy's primary recruitment pools will be among the 'big risk, big reward' players and those 'out to save the world.' Adventure and patriotism still hold their allure for many. A few people may be attracted among the 'go with a winner' crowd, but few, if any, 'lifestyle' people are going to find that the military way of life suits their personalities. All this indicates that a new breed of officer needs to be trained today for dealing with tomorrow's personnel challenges.

Transforming the Navy will impact almost every personnel policy from recruitment to retirement. The Navy will have to become a "brain-rich" organization. As Arie de Geus notes, the "modern brain-rich company is in the first place a community of people that, to succeed, must maximize its available brain capacity." He goes on to say that "managers cannot run these brain-rich companies in the old capital-oriented style. They have to change their priorities. … They must find a way to optimize people."[16]

Information age pundits caution that we don't know enough about interconnectivity to make wholesale changes to current organizations. They recommend starting slowly by applying the lessons learned from the commercial sector to those portions of the Navy's organization that function more like businesses. Military critics of network centric warfare believe the restructuring of the fighting forces should be tackled last. They are particularly concerned about establishing virtual warfighting organizations. Even video teleconferences, they insist, cannot offer the "human moment" that is essential for success in battle. According to one expert, the "human moment has two prerequisites: people's physical presence and their emotional and intellectual attention."[17] "As the tide of electronic hyperconnection rises," he insists, "the landscape of work is in some ways changing for the worse. … [Eventually,] an organization's culture turns unfriendly and unforgiving. Good people leave. Those who remain are unhappy."[18] He goes on to note that the "remedy is not to get rid of electronics but to restore the human moment where it is needed."[19] It would thus appear that the strategy to pursue with respect to organization is to learn the best that business has to offer and apply it in similar business-like environments in the Navy. Be careful with combatant command reorganizations and ensure that the human moment is preserved — even fostered.

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[15] Sarah Cliffe, "Human Resources: Winning the War for Talent," *Harvard Business Review*, September-October 1998, p. 19.
[16] Arie de Geus, "The Living Company: A Recipe for Success in the New Economy," *The Washington Quarterly*, Winter 1998, pp. 200–01.
[17] Edward M. Hallowell, "The Human Moment at Work," *Harvard Business Review*, January-February 1999, p. 59.
[18] Ibid., p. 60.
[19] Ibid.

INSTITUTIONALIZING THE TRANSFORMATION PROCESS

There is a strong desire on the part of some to know *exactly* where they are headed in the transformation process. They seem to assume there will come a time in the future when transformation can be declared complete and the process stopped. Identifying an "end state," however, should be anathema to any organization that must remain ahead of its competition. Garrison Keillor got it about right when he declared, "Some luck lies in not getting what you thought you wanted but getting what you have, which once you have got it you may be smart enough to see is what you would have wanted had you known."[20] Establishing a process for transformation (one that includes technology, concepts, and doctrine) is more important than worrying about where the process might lead. The process must be perpetual and supported by top leadership or it will be stillborn.

THE KNOWLEDGE-BROKERING CYCLE

The Naval War College Transformation Task Force developed a series of independent recommendations, but struggled to identify a useful framework in which to discuss them. Hargadon's and Sutton's work provides such a framework. Hargadon and Sutton studied a number of "innovation factories" whose business requires them to conceive then develop ideas into useful products. They call the process used by these companies "the knowledge-brokering cycle." This 4-step process involves capturing good ideas, keeping ideas alive, imagining new uses for old ideas, and putting promising concepts to the test.

Capturing Good Ideas

Research has demonstrated that the best way to foster innovation in a large bureaucracy is to create enclaves that can operate as small organizations.[21] Earlier we discussed organizational characteristics that impact on the generation and implementation of innovative ideas. The Navy must create a variety of organizations that use a combination of characteristics in order to create an overall bureaucracy that can do well at both innovation and implementation. The following chart depicts the mix of organizational characteristics that the Navy must achieve if transformation is going to take hold. Achieving this mix will prove more art than science.

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[20] Robert Byrne, "The Third – and Possibly the Best – 637 Best Things Anybody Ever Said," #533, *The 2,548 Best Things Anybody Ever Said* (New York: Galahad Books, 1996)
[21] Hayes et al., op. cit., p. 95.

Small innovative organizations, such as the CNO's Strategic Studies Group, require little centralization of power and control and few formalized rules; whereas, operational commands require firm chains-of-command and formalized doctrine and tactics. The task force recommended establishing three new organizations. The first has been mentioned several times — an operational strategic studies group. The second — an experimental squadron — would serve as the overarching venue for the first. The final organization recommended was a new requirements organization whose primary mission was to build the future Navy. These organizations will be discussed later in greater detail.

Characteristic	REQUIRED INNOVATION ENVIRONMENT
Centralization	Varied
Complexity	High
Formalization	Varied
Interconnectedness	High
Organizational slack	High

"The proponents of innovation," observed Harvey Sapolsky, "tend to exaggerate the benefits of innovation and … underestimate the costs." To help mitigate this truism, as well as provide another venue for capturing good ideas, the task force recommended establishing an Innovation Capital Group. Its objective would be to judge innovative proposals and provide seed money for the most promising. This recommendation tackles one of the hardest problems transformation presents, prioritizing among ideas that advance the transformation process. Resources would come from money set aside for program elements identified as critical to the transformation process, each of which would carry its own funding line. The Innovation Capital Group could support both targeted and evolutionary transformation strategies.

A great deal of fiscal flexibility would be required to make this concept work. The group's board of directors would need the authority to move funds across program elements as well as the ability to change research and development resources into acquisition funding should an idea prove immediately successful. Such a system would enhance other aspects of the transformation strategy because innovators would see that money was available to advance their ideas and that submitting them offered new career opportunities. Most importantly, people will see money flowing into these program elements and not away from them, encouraging the generation of even more ideas. The board of directors for this group could be a handpicked group of retired officers & industrial magnates, scientists, technologists, and others deemed appropriate by the Secretary of the Navy or, alternatively, the CNO's Executive Panel.

Exploit All Current Opportunities

The transformation process needs to take advantage of every organization currently recognized as a home for innovative thought as well as establishing those mentioned above. Established organizations include the CNO's Strategic Studies Group, Federal Executive Fellowships, postgraduate schools, laboratories, the Center for Naval Analyses (and other think tanks), operational centers of excellence, the Navy Warfare Development Command, and the fleets.

KEEPING IDEAS ALIVE

"Ideas can't be used," note Hargadon and Sutton, "if they are forgotten." One of the primary purposes of the proposed experimental squadron is to preserve corporate knowledge. This will be achieved in two ways. First, the experimental squadron will employ a permanent (mostly civilian) core staff. This staff will become the repository of information on past experiments and research. The core staff is one opportunity that may open for innovative naval officers to serve in a long-term assignment. The second way that the experimental squadron will keep ideas alive is by maintaining a stock of experimental hardware. Hargadon and Sutton noted, "Much of each company's stockpile of ideas [that they studied] is embedded in objects … an actual junk pile." The experimental squadron's "junk pile" will allow fellows from the operational strategic studies group to grasp ideas much more quickly than would otherwise be possible. In order to ensure that the "junk pile" continues to grow, the task force strongly supported a robust program of prototyping, modeling, and concept demonstrations.[22] A successful demonstration of a developing, cutting-edge technology has almost always been the difference between continued funding and program termination. Because of this, the experimental squadron is the key to establishing a successful transformation process.

An acquisition strategy (dubbed "spiral acquisition") has also been suggested as a complementary process to prototyping. Spiral acquisition begins with a promising high-risk, high-payoff concept. Because the concept is "out there" so far, it has little likelihood of achieving its full potential as a short-term program. Therefore, the concept is taken to industry and opened for bids. Contractors are asked to prepare an estimate of what they think they can produce in one or two years and the best proposal is funded. At the end of that time, the Navy takes whatever the contractor has come up with and acquires an appropriate number of them. Then the Navy refines the concept, adapts it, or remains with the original and once again opens the process up for bids using the last contractor's product as the starting point. The process continues until the objective is achieved or the program terminated.

[22] See Hayes, op. cit., p. 100.

The value of such an approach is that it speeds research and development (much of the cost of which is borne by contractors), it preserves competition by keeping all contractors in the game, and it supports the proposed prototyping strategy recommended. The issue of proprietary information would have to be addressed, as would the challenge of contractors who want to join only when the endgame nears and the acquisition pot-of-gold is in sight. These problems, however, are not insurmountable. Most important, while technical knowledge is building toward the objective, the fleet is growing in knowledge, experience, doctrine, and confidence in the new capability. This strategy moves transformation forward and avoids the dilemma of deciding when to stop researching and start applying new technologies to fleet challenges.

IMAGINING NEW USES FOR OLD IDEAS

"If you want a new idea," suggests Robert S. Wood, "read an old book." Many, if not most, new ideas are the result of someone imagining a new use for an old product. Supplementing the permanent civilian staff of the experimental squadron with rotating military personnel (including fellows assigned to the operational strategic studies group) should provide a catalyzing mixture for new ideas — but it probably is not enough. In the past, the reluctance to involve non-defense personnel in decisions affecting national security has impeded military innovation. The task force recommended that a rotating group of visiting scholars and business people also be included in order to insure a constant infusion of new perspectives.

Navy Staff Reorganization

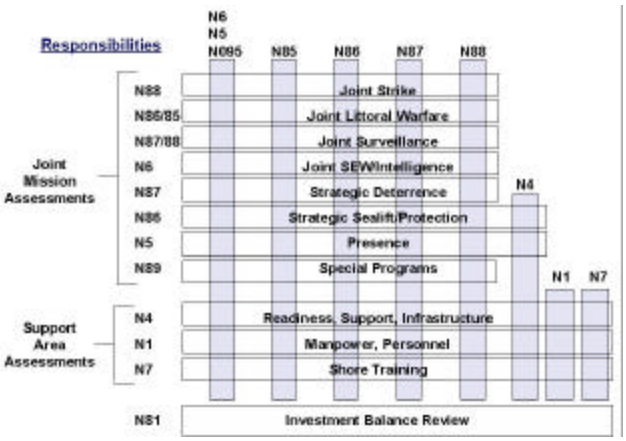
The Task Force also recommended a reorganization of the Navy Staff so that separate organizations deal with building the budget and building the future Navy. When Admiral Vern Clark was named Chief of Naval Operations, one of his first decisions was to create just such an organization. The reorganization was necessary because the former structural arrangement demanded the impossible. No one tasked with promoting a particular

program, on the one hand, can be expected to set aside self-interest and look for program shortcomings or recommend its termination on the other. Neither can they be expected to prioritize their program objectively in relationship to others.

What is left to be determined is the type of "hook" into the funding allocation process that will be put in place so that the process is properly institutionalized and not personality dependent. The new resource organization will need two things, the time to concentrate on building a navy, not worrying about a budget, and some kind of fiscal authority so that its recommendations result in proper allocation of resources.

Continue stressing the Integrated Warfare Area Requirements process.

Another way to imagine new uses for old ideas (or programs) is change one's perspective on it. In order to accomplish this, one oft repeated recommendation was to align resource sponsors along warfare areas instead of along platform lines. In other words, the Navy Staff needs to figure out a way to flow (at least some) funds horizontally rather than vertically in the accompanying chart. Some participants did not favor such a drastic reorganization, believing that desired results could be achieved by tasking the platform barons to overcome specific challenges. Admiral Clark's reorganization removed responsibility for warfare specialties from the Pentagon and gave it to one of the two type commanders in each community. How these type commanders will interact to meet cross-community challenges is still unknown. In all likelihood, N-8 will remain the Navy's integrator, although the new N-7 may also play a role. In either case, the IWAR process is a step in the right direction and should be encouraged and strengthened.



PUTTING PROMISING CONCEPTS TO THE TEST

Historically, both inter- and intra-service competition have been a source of innovation.[23] The experimental squadron and Innovation Capital Group are two organizations that can help generate internal creative tension. They should be chartered to run intra-service competitions. Ideas should be the winners or losers during these competitions, not the individuals whose ideas are tested. For

[23] See Hayes, op. cit., pp. 97-98.

innovators, the process should be a constructive, rather than a destructive, one. If those who promote losing ideas are tarred with the brush of failure, the Navy will have set back innovation for a generation. More will be said about this later.

Head-to-head competition is one of the best ways to prioritize among ideas, which is especially important when pursuing a targeted transformation strategy. Head-to-head competition also helps cultivate the proper attitude about ideas. Successful innovators, according to Hargadon and Sutton, have an "easy come, easy go" attitude. They "rarely keep trying to make something work in the face of evidence that it won't. They focus on finding the best ideas for solving the problem, not on solutions they can claim glory for." Hargadon and Sutton call that the "nothing-is-invented-here" attitude. By contrast, they note that the best innovators view a "not-invented-here" attitude "as inefficient, arrogant, and ultimately fatal to innovation."

Current methods of competing ideas, such as war games, models, and Fleet Battle Experiments, should be continued and strengthened. New fora for competition are required, however, if the Navy is to look beyond today's challenges and into the future. The task force recommended a new experimental squadron as the centerpiece for this activity.

Commissioning an Experimental Squadron.

Experimentation appears to be a key to moving the transformation program forward. A group of Institute for Defense Analyses researchers highlighted the importance of experimentation, especially in peacetime, by summarizing thousands of pages of scholarly work on military innovation into one short paragraph.

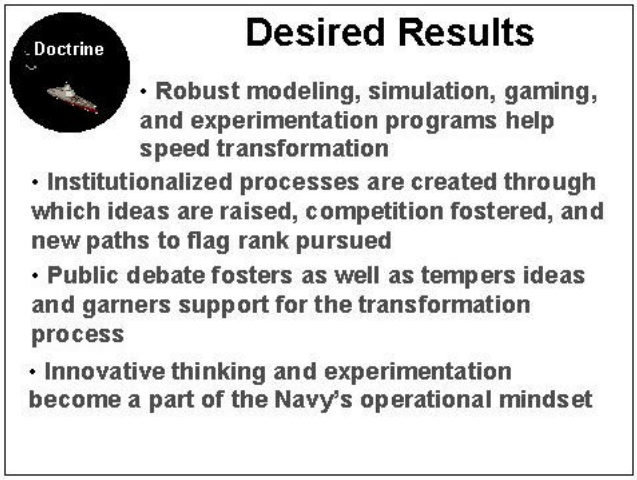
> History shows that in peace technology and doctrine develop somewhat separately. First battle experiences expose at high cost the lack of alignment. Experimentation should provide that first battle experience and ensure that doctrine is capable of fully exploiting available technology. Furthermore, first battle experiences expose fallacies in thinking and mismatches between available and needed capability. Experimentation must confront conventional wisdom. Lacking a specific threat, we lack a unifying focus for doctrinal and technological development. Instead, we must plan for a wide array of threats. Experimentation should

provide the *breadth* of experience needed to deal with the unexpected.[24]

It is because experimentation is so critical to the transformation process that participants recommended the complementary approaches of establishing an experimental squadron and continuing with fleet battle experiments.

This squadron — a multi-platform group dedicated to innovation and experimentation — would be the natural home of prototypes and Advanced Technology Concept Demonstrations (ACTDs). Leased platforms should be strongly considered since tying the squadron to a particular complement of ships would prove counterproductive. As mentioned earlier, the squadron should have a permanent civilian support staff to provide direction & training and to maintain corporate knowledge. It should be the foundation of the operational strategic studies group recommended earlier. Promising officers and enlisted personnel should be handpicked to command and man the ships. Proof of the concept would be in attaining the same level of flag promotion enjoyed by the current CNO's SSG. All those who cycle through the squadron should be expected to take with them into the fleet what they learned while there. Since the operational readiness of the squadron would be very high, it should expect occasional special mission assignments and it could occasionally serve as a Red Force during fleet exercises.

The experimental squadron would complement current experimentation efforts, such as Fleet Battle Experiments (FBEs). The difference would be in the kinds of experiments undertaken. FBEs and other current fleet experiments are excellent for testing innovative approaches to near-term problems, but they will never be transformation catalysts. The focus of the new squadron's experiments would be transformation.



There was some concern that creating a separate experimental squadron would inhibit rather than foster transformation by isolating exciting experimentation from the majority of the Navy's personnel. Although this concern was noted, there were numerous other benefits and considerations that were overriding. Most participants believed that moving personnel

[24] "What Does 'Military Experiment' Really Mean?" briefing by D. Robert Worley, Dennis Gleeson, and John Kreis, IDA, 30 September 1999, from work sponsored by the Joint Staff J-8 (emphasis in original).

directly from the experimental squadron into the operating fleet would ensure that innovative ideas were quickly introduced and appreciated. Few believed the fleet capable of doing the types of experiments necessary to enhance transformation. Many participants believed that in order to provide fleet commanders the opportunity to focus on innovation and experimentation, the current operational tempo would have to be reduced. They believed the chances of this happening are slim. Some participants were concerned that increased experimentation would adversely affect readiness, while others felt that the current security environment provides a unique opportunity to experiment with platforms and systems without creating undue risks to the country.

One of the most persuasive arguments in favor of the experimental squadron came from work completed by Clayton Christensen and his colleagues at the Harvard School of Business. Christensen noted, "Every company [in the sector they studied] that has tried to manage mainstream and disruptive businesses within a single organization failed."[25] Failure in the fleet is not an option. Another reason companies lost out to competitors, Christensen notes, is that they listened to their customers, who weren't interested in the types of products that new technologies supported, and paid no attention to developing products utilizing the new technology until they could use them. When the new technologies became the dominant technologies, it was too late for companies who had been listening to their customers to jump into the new game. The Navy's customers — combatant CINCs — are too involved in today's challenges to worry about what they really need in the future. According to Christensen and his colleague, Joseph Bower, well-managed companies generally do well, even with new technologies, when they are addressing "the next-generation performance needs of their customers."[26] They don't do well thinking about how disruptive technologies might affect the company, since those technologies usually get a foothold among a different customer base. If naval leadership is to avoid this trap, they must not be content with the way things are simply because the CINCs are happy in the near term. An experimental squadron will be able to operate as a separate organization using a distant horizon, and will not be bound by current operational tasking.

[25] Joseph L. Bower and Clayton M. Christensen, "Disruptive Technologies: Catching the Wave," *Harvard Business Review*, January-February 1995, pp. 52-53.
[26] Ibid., p. 44.

PROTECTING INNOVATORS

Innovation cannot flourish in an environment that is intolerant to failure. It requires risk. Both those who come up with innovative ideas and those who implement them need to be protected during the transformation process. The Navy needs to come to grips with the idea that sometimes failure is success. At Southwest Airlines in the early 1990s, a manager by the name of Matt Buckley recommended that the company get into the shipping business. It did and it lost money. Instead of firing Buckley, Southwest Airlines management praised him for his initiative and "to this day, whenever a Southwest employee offers a daring new idea — good or bad — it's called a 'Matt Buckley.'"[27]

In learning to judge when an individual should be protected rather than punished for failing, the Navy needs to parse out the problem. If those who approve moving forward on a project that ultimately fails should have realized the idea was stillborn, then the failure cannot be laid at the feet of those who tried to implement it. If the reasons for failure were not foreseeable, then again those who pursued it should be protected — even praised. Only when it can be determined that a good idea was implemented poorly should those responsible be held to full account. The problem with the Navy's culture today is that there are sticks but no carrots for those who want to stretch their necks. Risk aversion is so ingrained in the psyche of those writing fitness reports and members of selection boards that failure is simply not tolerated — and certainly seldom rewarded.

Risk aversion in the military is certainly understandable — failure on the battlefield is not an option — but there must be some safe havens where risk is not only tolerated but rewarded. Failure is not always bad. In fact, keeping bad ideas out of the fleet is as important as introducing new ones to it. Under the right circumstances, you can learn as much from failure as from success.

BUILDING SUPPORT

Although the proposed strategies in this study complement one another and form a comprehensive transformation package, no package, regardless of how well formulated, can succeed without widespread support. Building the necessary support for transformation requires a four-part process. First, a winning sales approach needs to be adopted. Second, internal support needs to be garnered. Third, external support needs to be strengthened. Finally, key positions need to be filled by officers groomed to take the transformation process forward.

[27] Edward Iwata, "Corporate climate brewing brainstorms," *The Providence Journal*, 17 April 1995, pp. A10–11.

ADOPT A WINNING SALES APPROACH.

Workshop participants confirmed what research and interviews had revealed: the best chance of achieving revolutionary results is by stressing the evolutionary nature of the changes involved. Change is difficult to achieve. Machiavelli wrote centuries ago that "there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in success, than to take in hand the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new."[28] There have been a number of studies that have examined how innovations find their ways into the military in general and the Navy in particular. One of the clear lessons of those studies is that innovations seldom, if ever, receive support based on the argument that they will revolutionize a service's fundamental character.

Most innovations are adopted because their proponents have convinced others that their innovations offer a better way of doing something the service is already doing.[29] In other words, rhetoric that stresses revolutionary aspects of change is unlikely to be as effective in fostering change as arguments that demonstrate how current capabilities can be enhanced through the adoption of new technologies and procedures. Even though revolutionary results are desired and will emerge from the acceptance of certain innovative ideas, they are best promoted as evolutionary concepts. A concomitant lesson is that trying to sell innovative ideas using an entirely new lexicon can also inhibit the transformation process. Finally, even strong supporters of military transformation note that revolutions in military affairs do not occur overnight; they can take up to 20 years to achieve. Proponents of change will remain frustrated if they fail to take a long view of the process.

GARNERING INTERNAL SUPPORT.

Derailing the transformation process in favor of maintaining the status quo is easier than supporting change. Destructive activities always take less energy, thought, and time than productive ones. Proponents of change should, therefore, anticipate activities aimed at undermining transformation. Such attacks can be mitigated if personnel in critical organizations and commands (that is, individuals who could use their positions to undermine transformation if their support is not given) can be co-opted into the process. Personal one-on-one intervention by the Secretary and CNO is one way to gain supporters. When someone in a particularly crucial billet is an outspoken critic, intervention will only work if his or her concerns are adequately addressed or the opponent is removed. Critical players within the Navy include individuals assigned to the system commands, the research and development community, advanced service schools, resource sponsors, the geographical commanders-in-chief, and the numbered fleet

[28] Niccolò Machiavelli, *The Prince*, trans. W.K. Marriott (London: J.M. Dent & Sons, 1968), p. 29.
[29] See Hayes, op. cit., pp. 93–94.

commanders. Co-opting bureaucrats is extremely critical since they believe they can outlast any short-term military innovator.

GARNERING EXTERNAL SUPPORT.

Internal support for transformation is a necessary but insufficient condition for it to succeed. Research and common sense confirm that external support is also essential for any new concept to succeed. The critical external players include the Joint Staff, the Office of the Secretary of Defense, congressional leaders, industry leaders, opinion leaders, the media, and the attentive public. The fact that the list is so eclectic indicates that the support of some players is more important than the support of others. In a category by itself is Congress. One need only recall that in the early 1990s the Department of the Navy, the Joint Staff, and the Secretary of Defense all tried to kill the Marines' V-22 tiltrotor program. The Corps felt so strongly about the program that it successfully circumvented the Department of Defense by going straight to Congress to win support. The downside of this silver bullet strategy is that institutional memory is long and those previously bypassed can later undermine support for other important programs.

FIELDING A WINNING TEAM.

Although organizations and commands may be successfully co-opted into the transformation process, key billets must be staffed with talented "believers." Building a cadre of transformation supporters is one of the main objectives of the strategies recommended in this report, including the establishment of an experimental squadron with its associated operational SSG. Other recommendations, such as continuing the CNO's SSG and Federal Executive Fellowship programs, creating more opportunities for naval officers to attain doctoral degrees, and allowing individuals who propose innovative ideas to assume control of follow-on implementation programs, also contribute to this aim.

CONCLUDING THOUGHTS

How the Navy trains and fights in the future will largely be determined by the kinds of precursor activities it participates in today. Those offering opinions for this study concurred that the Navy needs to invest in vigorous analyses, modeling, simulation, gaming and experimentation. The purpose of these precursor activities is not to validate the vision or demonstrate that it is achievable; rather the purpose is to provide traction for the process and to enrich the detail and scope of promising, but untried, concepts. As part of the transformation process, innovative concepts, such as those proposed by past CNO's Strategic Studies Groups deserve a more open airing and debate than they have recently received. Past suppression has resulted from a number of factors, but fear has been foremost among them — fear from program sponsors

that innovative concepts will kill their programs and fear from naval leadership that new concepts will expose unanticipated maritime vulnerabilities to the other services during budgetary and Quadrennial Defense Review processes. Those are risks to be sure, but risks that naval leadership must take and can mitigate with a strong public relations campaign that explains what the Navy is about.

As the Navy moves into the next millennium, its budgets must reflect a proper balance between sensors, communications, and shooters (platforms and weapons). For years the Navy stressed platforms, now it stresses networks. The next area it must concentrate on is sensors. Naval leadership cannot simply look to see if new technologies outperform the old — if they do, they will miss the point of information age transformation. Bower and Christensen wrote, "Many of the disruptive technologies we studied *never* surpassed the capability of the old technology."[30] For example, personal computers never surpassed the capability of mainframe computers, but that wasn't necessary to produce a transforming effect. Personal computers became powerful enough that they satisfied customer requirements for a fraction of the cost. Fielding an array of *expeditionary sensors* can have the same transforming effect on the Navy, even though individual sensors never surpass the capabilities of some of our current, high-priced organic and national sensor systems.[31]

Naval leadership should also adopt a set of "touchstone questions" that must be answered before programs receive (further) funding. The questions should be crafted so that satisfactory answers point all programs in the direction of transformation. For example, how does this system communicate or connect with others? Does connectivity rely on maintaining legacy systems or is it flexible enough to connect with emerging systems? Establishing joint standards for programs will ensure that broad connectivity can be achieved and that Navy programs adhering to those standards will receive support as they move out of the service budgeting and acquisition process into the joint arena.

When the Maritime Strategy was introduced in the 1980s, it provided people with a new framework for thinking about how to fight the Navy. As a result, people started experimenting, exercising, and operating in ways that had not occurred to them during the pre-Maritime Strategy years. Innovation breeds more innovation. Taken together the strategies presented in this study provide a way for the Navy to transform both its structure and culture. The strategies pave the road to the future and empower a Maritime Strategy for the 21st Century that can have an even greater impact on the Navy than its Cold War predecessor.

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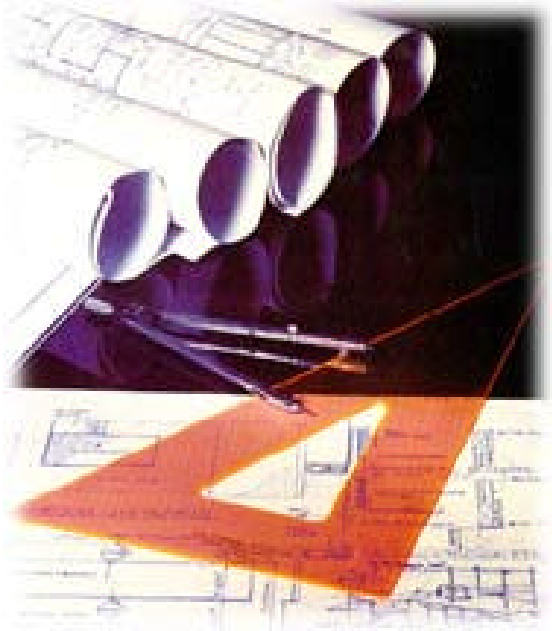
[30] Ibid., p. 50.

[31] In some areas, the military will remain a high-end user. In those areas, lots of cheaper, but less effective, systems won't be able to replace more expensive systems; but the strategy should be pursued whenever it makes sense.

The blueprint for transformation that has been presented in this report

- Supports creative people
- Provides opportunities for them to excel
- Ensures adequate resources are available for transformation
- Promotes changes in both structure and culture
- Grooms follow-on generations of leaders
- Institutionalizes the process