

## Papers

Opening Session  
Keynote Speech

### *Transformation Lessons from the U.S. Armed Forces Experiences*

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A coherent discussion of Transformation needs to begin with agreement on its purpose and characteristics. The fundamental purpose of transformation is to create more effective ways to operate in relevant physical and political environments. Three aspects of effective transformation provide both a broad perspective and a useful framework for validation from real world experiences. They are:

- the characteristics of transformation,
- enablers of transformation, and
- some powerful transformational operational concepts.

While I will use some examples from U.S. military experience, this discussion is not unique to the United States, or to military forces.

#### **The Characteristics of Transformation**

There are two overarching characteristics of successful transformation:

- First is the clear understanding that transformation is a journey, not a destination. Successful transforming processes produce continuous improvement with few if any revolutionary steps. In fact, experienced military leaders often reject revolutionary steps as too risky. Still, continuous improvement can produce revolutionary changes in capabilities.
- The second overriding characteristic is that transformation is often more about new ways of thinking than about new technologies. The now classic image from Afghanistan of Army Special Forces soldiers on horseback, calling down individual bombs from B-52s high overhead, is a case in point.

Changes in the capabilities of the U.S. Army over two time intervals provide some compelling illustrations of transformation. These illustrations are particularly instructive because transforming ground forces is inherently more complex and difficult than transforming air or naval forces.

The first illustration compares the U.S. Army of the Vietnam War to the Army that played a central role in driving the Iraqi army out of Kuwait in the 1991 Gulf War. The Army that emerged from Vietnam was severely damaged in concept, doctrine, mid-level leadership, and morale. A decade and a half later that same Army provided convincing evidence that it had been transformed into one of the most effective combat forces the world has seen. Yet in examining the Army's development from Vietnam to the Gulf War, it is difficult to identify any

revolutionary step. Instead, continuous improvement in standards and training, together with modernized versions of familiar weapons and equipment, delivered a clearly transformed Army. Though transformed in quality, it was, in concepts and doctrine, still the Army organized, equipped, and trained for a war in Central Europe or Korea.

A decade later, a broader transformation of the U.S. Armed Forces was apparent. The Army had transformed itself again, this time in concepts and doctrine as well as in quality. Again, there were no revolutionary steps but the Army that drove to Baghdad in three weeks was clearly transformed in capability from the Army of the Gulf War.

Air Force and Naval Air forces were also transformed in capability. In Vietnam, it took squadrons worth of combat sorties to produce a significant military effect on a military target. In the 1991 Gulf War, a single aircraft, delivering precision munitions under the right conditions, could produce the desired military effect on more than one target with a single sortie. For the 1991 Gulf War, this capability was resident in only a fraction of the force and was not incorporated into integrated joint operations. A decade later, precision delivery of precision weapons around the clock in any weather had become the standard for U.S. airpower. Further, this capability was now well integrated into joint operations. This second period of observed transformation, from the 1991 Gulf War to Operation Iraqi Freedom, is particularly noteworthy in that rapid change is more often inspired by failure, as was the case after Vietnam. In this case, broad transformation across the military forces followed dominant military success in major combat operations.

## **Enabling Transformation**

From these and other experiences, we can identify a set of key enablers of transformation. While it is possible to compile a long list of relevant enablers, four seem particularly important and nearly universal. They are:

- recognized necessity as the underlying motivator;
- change in enterprise expectations;
- leadership from the top, innovation from the bottom; and
- exploiting technology and leveraging competencies to fill capability gaps.

### ***Necessity as the motivator***

It seems clear that the strongest and most reliable driver of transformation is recognized necessity – identified through experiencing failure, as was the case following the U.S. experience in Vietnam, or identified by recognizing rapid change in the operating environment, as was the case of the U.S. experience in major combat operations in Iraq. As an example of the first, the lethality per combat aircraft in the Vietnam War was so low, the operating envelope so limited by night and weather, and the adversary so resilient that the adversary could repair damage faster than air attacks could inflict it. Hence, airpower could not deliver the promised military effects. Influenced by that experience, generations of airpower leaders focused on ensuring that, in the next conflict, airpower would deliver the promised effects. Air Force and Naval air leaders embarked on a path of continuous improvement to multiply the lethality of combat aircraft, to provide around-the-clock and all-weather capability, and to develop the command and control

concepts and capabilities needed to direct attacks against the right targets at the right time with the right effects. By the time of the 1991 Gulf War, at least a segment of airpower could meet these needs.

For ground forces, it became clear that the months of massive logistics build-up that preceded the ground offensive, and the access through multiple high capacity seaports that allowed the build-up, made the 1991 Gulf War a special case, as those conditions are not likely to be repeated for the range of possible future operations. Hence the need was recognized for new concepts and doctrines providing for more rapid response with agile forces, adaptable concepts, and an expansion of capabilities across a far broader mission space. Some of those concepts are discussed later in this paper.

### ***Change in Enterprise Expectations***

A second key enabler is a fundamental change in the expectations from operations. Before the 1991 Gulf War, the expectation was that major conflict would be long and bloody. There would be battles won and battles lost. In the end, as long as U.S. forces were incrementally superior to the adversary, we could expect military victory. Victory was measured by the military outcome, not by the price paid by either the victor or the vanquished, and also not by the political outcome.

Following the Gulf War, the U.S. Department of Defense published Joint Vision 2010 which codified the expectation that U.S. forces would develop the capability to dominate an adversary from the outset across a wide range of possible conflict scenarios. This change in expectation was accompanied by the realization that the 21st century would be characterized by unpredictable challenges to the security interests of the United States and our allies. This set of perceptions led to the concept of capability-based forces. Capability-based forces are expected to deal with any combination of expected threats and with unexpected threats as well. Capability-based forces are, therefore, designed to meet a much more demanding standard than threat-based forces. The concept of capability-based forces has been and remains a powerful driver of transformation.

### ***Leadership from the Top, Innovation from the Bottom***

A third key motivator and enabler is strong commitment to transformation from leadership at the top that encourages and is receptive to innovation from the bottom. Following the Vietnam War, military and civilian leaders focused intensely on ensuring that in the next conflict, U.S. forces would be able to deliver the expected military effects. The demand for continuous improvement was institutionalized so that successive generations continued a set of programs focused on the ability to achieve the desired effects regardless of operational conditions. This focus continued through multiple changes in leadership and a succession of programs.

Transformation is also strongly enabled by innovation in concepts, doctrine, training, and equipment. Those immersed in the daily business of the forces – in training, exercises, and real-world operations – are a unique and particularly valuable source of innovation. As the pace of change has increased, the demand for more rapid adaptation has increased, and a key engine driving adaptability is innovation from the operating forces, at all levels.

### ***Exploiting Technology and Leveraging Competencies to Fill Capability Gaps***

In the late 1970s, U.S. military leaders quietly set a series of long term goals. For example, an Army goal was first-shot lethality on the move for armored fighting vehicles. At the time this was considered a challenging goal, perhaps unattainable. By the 1991 Gulf War, U.S. armored and mechanized infantry crews were trained and equipped to be highly lethal while maneuvering at speed. First-shot, first-kill on the move had become part of the proven fighting doctrine for armored forces.

Among the objectives set by U.S. airpower leaders were two long term goals for global capability. One was to be capable of striking any target, anywhere in the world, any time of the day or night, in any weather with the precision and power needed to achieve the desired military effect. The other was to be able to locate any target with the precision needed for attack. By the mid 1990s, U.S. Air Force and Naval aviation were well on the way to achieving the first goal, with a few exceptions, but not nearly as far along towards the second goal. It may be that the second goal was much harder than the first. It is more likely that the military departments and their defense contractors were much more competent at attacking targets than at locating them. But, again, fielding the technologies and gaining the competency to achieve the first goal required continuous improvement from the first rudimentary, day only, clear air only, guided air-to-ground weapons to today's highly precise, all-weather, guided weapons.

Bottoms-up innovation can also play a powerful role in matching technology and competencies to capability gaps. When U.S. soldiers and Marines in Iraq discovered their adversaries were using the remote control devices from toy cars to set off roadside bombs, for example, they obtained remote control devices of their own. They taped the "throttle" wide open and mounted the devices on the fronts of their vehicles to cause bombs to go off before they got within the kill radius.

### **Some powerful transformational concepts in the U.S. experience over the past decade**

During the last two decades of the 20th century and moving into the 21st, a rich set of innovative operational concepts and doctrines emerged that enabled and drove transformation of combat capabilities. The intellectual underpinnings for these concepts were rooted in a rapidly changing world, the march of information technology, daily operating experiences, and strong support from the senior civilian and military leadership. Contributors included a wide spectrum of entities in the U.S. Department of Defense, in supporting Defense Contractors, in Non-Governmental Agencies, and in similar institutions among our allies. These concepts were defined, refined, and validated or rejected through the crucible of war games, tests, exercises, and operational experience. They were also strongly driven by the necessity of dealing with a rapidly changing operating environment. Among the expanding set of innovative concepts are five broad areas where new ways to operate are producing near revolutionary results. They are:

- effects-based planning and execution;
- network-enabled information sharing, decision superiority, and command and control;
- distributed operations;
- integrated, interdependent, parallel, joint operations; and
- continuous adaptation.

### ***Effects-based Planning and Execution***

The long-standing practice in evaluating the adequacy of military forces has been input-based; that is, described in terms of numbers of divisions, squadrons, combat ships and their equipment. This practice does not account for the large increase in the capabilities of single platforms and small units. For example, a single heavy bomber orbiting over Afghanistan could quickly meet the need for massive firepower with high precision in support of ground operations. A small number of such bombers could provide timely and effective support virtually anywhere in the battle space. Hence, in Afghanistan, a small team with access to overhead heavy bombers and fighter-attack aircraft could direct rapid response firepower equal to that of a conventional division or more, striking an adversary force with devastating surprise and effect. In Iraq, a Company size unit, kilometers away from supporting ground forces, could call on precision firepower from Air Force, Navy and Marine Corps aircraft around the clock, in any weather, to ensure its security and support its mission success. The limited seaport capacity available necessitated new approaches to achieve large force effects with smaller forces. The concepts and materiel capabilities needed to provide this capability were in hand.

### ***Network-enabled Information Sharing, Decision Superiority, and Command and Control Concepts***

Modern information technology makes it possible to provide leaders at all levels the information they need to make decisions that are better and more timely than those of any adversary. Further, key operational decisions can be delegated to those who have the best feel for the complexities at the tactical level. With the needed information and a clear understanding of the intended outcome of each operation, subordinate commanders can make decisions that are faster and better than those of the adversary, and also faster and better than could be made by their superior officers further removed from the tactical situation. This is decision superiority – a concept that is more credible than information superiority.

Information superiority is an expression of input and is of questionable validity since an adversary may be able to succeed with a fraction of the information needed for the friendly force to succeed. The Bora Bora operation in Afghanistan is a compelling illustration. The friendly force needed detailed information to succeed in trapping the Al Qaeda leadership thought to be in the area, but the Al Qaeda leadership needed only enough information to escape. In contrast, decision superiority measures output, the output being better and more timely decisions.

Network-enabled information sharing and decision superiority at the tactical level together permit a new and powerful approach to command and control. Rather than senior commanders telling subordinate commanders what to do and how to do it, they communicate to subordinate commanders what they want done; that is, what outcome they want. This is distributed to subordinate commanders as the commander's intent. Information sharing also contributes to empowering subordinate commanders by bringing their experience, judgment and current understanding of the situation to bear to achieve mission objectives, thereby providing their superiors with a continuing picture of how their units are doing at achieving the objectives. This frees senior commanders to devote their attention to trouble spots, shifting resources, and adjusting commander's intent as needed.

An important key to network-enabled operations is the move from need-to-know to right-to-know as the criterion for allowing access to classified information. With this concept, the holder of the information can control the classification but access by those with the proper clearance has to be controlled by the individual needing the information, not by the holder of the information.

This is a difficult concept for many to accept but it is imperative for effective network-enabled operations.

### ***Distributed Operations***

The concept of distributed operations uses forces to occupy only as much of the battle space as needed, for only as long as needed, to reach the objective. This has long been a central tenet of air and naval warfare since continuous occupation of air or sea space is not an executable concept. Distributed operations can now be applied to ground warfare as well. In the past, large formations advanced side by side to sweep through and control territory enroute to the objective. In distributed operations, the object is to move rapidly through the battle space, keeping the adversary off balance, providing only enough rear area force to protect supply lines and control key points. This is the concept that allowed coalition forces to reach Baghdad in three weeks of major combat. There is risk attached to this concept in that it assumes that reaching the objective will be militarily conclusive. If that assumption proves not to be the case, as it did with Baghdad, then there may be a need to provide security over a broad area for a prolonged period.

### ***Integrated, Interdependent, Parallel Joint Operations***

Integrated and interdependent operations are very different from coordinated and interoperable operations. The major combat phase of Operation Iraqi Freedom may be the first integrated, interdependent, parallel, joint operation in U.S. military history. In the 1991 Gulf War, the ground forces operated in separated lanes. Air and ground operations were sequential, with a 100-day air campaign followed by a 100-hour ground campaign that was supported by a massive logistics buildup. There was minimum direct reliance on air support during the ground campaign. Tactical air and armed helicopter operations were kept apart by airspace assignment.

In contrast, there was no separate air and land campaign in the major combat phase of Iraqi Freedom. Instead, there was a single joint campaign with integrated land, sea, and air operations from beginning to end. The ground forces were dependent on air and space surveillance for situational awareness and on air-delivered joint firepower for heavy support. This integration and interdependence, along with network-enabled information flow, supported the fast-moving distributed operation that allowed the rapid advance to the objective with a minimum size force – one that was supportable through the limited throughput capacity at the one available seaport.

### ***Continuous Adaptation***

Success in the battle space has always demanded adaptation as conditions change and surprises unfold. There is built-in conflict between the need to coordinate and harmonize operations and the need to adapt to rapidly changing conditions. A key to rapid and continuous adaptation is found in the command and control and network-enabled concepts discussed earlier. The subordinate leader on the scene, immersed in the situation, is in the best position to understand what is going on and what is needed to achieve the commander's intent. However, combat operations at the lowest level can have politically strategic effects. When broadcast on CNN or Al Jazeera, for example, the response of a platoon leader or company commander in Iraq can have far reaching political effects. Hence, there is a need to ensure that more senior, more experienced judgment is available when needed and that senior leaders are instantly aware when there is a need. This is accomplished by multiple levels of networking so commanders are aware

of ongoing distributed operations within their command and can intervene when needed without inhibiting the innovative effectiveness of their subordinate leaders. While these concepts may sound complex, they are being employed regularly and successfully in the stability and reconstruction phase of the conflict in Iraq.

## **Conclusion**

The 21st century environment is characterized by rapid change, diverse and unpredictable threats to the United States and our allies, and unprecedented demand for innovation and adaptability in military forces at all levels. The dividing lines among strategic, operational, and tactical level operations are blurred in that tactical operations at the lowest level can have strategic political effects. Further, technology puts unprecedented military force in the hands of lower level leaders. Transforming concepts and attitudes are essential to meeting these 21st century challenges. There are measurable milestones on the transformation journey but it will have no end until the world environment stops changing. There is no prospect of that happening.