

DEFENCE TRANSFORMATION: AN APPRAISAL

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As we prepare for the future, we must think differently and develop the kinds of forces and capabilities that can adapt quickly to new challenges and to unexpected circumstances. We must transform not only the capabilities at our disposal but also the way we think, the way we train, the way we exercise and the way we fight. We must transform not only our armed forces, but also the Department that serves them by encouraging a culture of creativity and prudent risk-taking. We must promote an entrepreneurial approach to developing military capabilities, one that encourages people to be proactive, not reactive and anticipates threats before they emerge.

**—Donald H. Rumsfeld,
Ex US Secretary of Defence**

“Transformation”, “reform”, “modernisation”—whatever one calls change—is not a new phenomenon in the armed forces. Transformation, “generates increased combat power by networking sensors, decision-makers and shooters to achieve shared awareness, increased speed of command, high tempo of operations, greater lethality, increased survivability and a degree of self-synchronisation.”

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Change is essential, but effecting change is not easy. This has been recognised by senior leaders of armed forces throughout history. Defence transformation has preoccupied the US Defence Department (DoD) for over a decade and holds the promise of a paradigm shift in the character and conduct of warfare. At the same time, it is more than simply overlaying new technologies and new hardware on existing force structures; it requires fundamental changes in military doctrine, operations and organisation.

While several countries including India are closely studying and assessing the implications of the emerging revolution in military affairs (RMA), they have, for a variety of reasons, made little progress so far in actually transforming their armed forces along its lines. In fact, most countries are unlikely, despite their best efforts, to move beyond “modernisation-plus,” at least not in the near future.

The concept, doctrine, organisation, threat perception, leadership, budget, culture and level of technology used by us in India are at wide variance with the USA. However, we must keep ourselves abreast with all transformational activities happening across the globe, draw the correct lessons, and change the Indian armed forces as per our conditions that prevail in the subcontinent, while keeping a close watch on the Global War On Terrorism (GWOT).

In this essay, a detailed analysis of defence transformation presently in progress in the USA will be carried out. The significance of technology, jointmanship, leadership, logistics, training, culture, budget and limitations of transformation and its implications for the Indian armed forces will be carried out

INFORMATION AGE

What we are seeing, in moving from the Industrial Age to the Information Age, is what amounts to a new theory of war: power comes from a different place, it is used in different ways, it achieves different effects than it did before. During the Industrial Age, power came from mass. Now power tends to come

from information, access and speed. We have come to call that new theory of war network-centric warfare. It is not only about networks, but also about how wars are fought—how power is developed.

**—Vice Admiral (Retd) Arthur K. Cebrowski,
Director, Office of Force Transformation,
IEEE Spectrum**

Primary Characteristics of the Emerging Way of War

Although the concept of what the future force will look like and how it will conduct military operations is still evolving, two salient characteristics seem to stand out. It will be a joint, network-centric force and it will be capable of executing effects-based operations (EBO), enabled by network-centric warfare (NCW). Already, the combination of modern technology and new operational concepts has enabled networked units and individual platforms to operate together in ways not considered possible just a few years ago. NCW is characterised by the ability of geographically dispersed forces to attain a high level of shared battlespace awareness that is exploited to achieve strategic, operational and tactical objectives in accordance with the commander's intent. This linking of people, platforms, weapons, sensors and decision aids into a single network creates a whole that is clearly greater than the sum of its parts. The result is networked forces that operate with increased speed and synchronisation and are capable of achieving massed effects, in many situations without the physical massing of forces required in the past.

WHAT IS TRANSFORMATION

It is not the strongest of the species that survives nor the most intelligent that survives. It is the one that is the most adaptable to change.

— Charles Darwin

The US DoD has defined transformation in one document as a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organisations that

exploit the nation's advantages and protect against asymmetric vulnerabilities to sustain the strategic position, which helps underpin peace and stability in the world. Transformation anticipates and creates the future and deals with the co-evolution of concepts, processes, organisations and technology. Profound change in any one of these areas necessitates change in all. Transformation also identifies

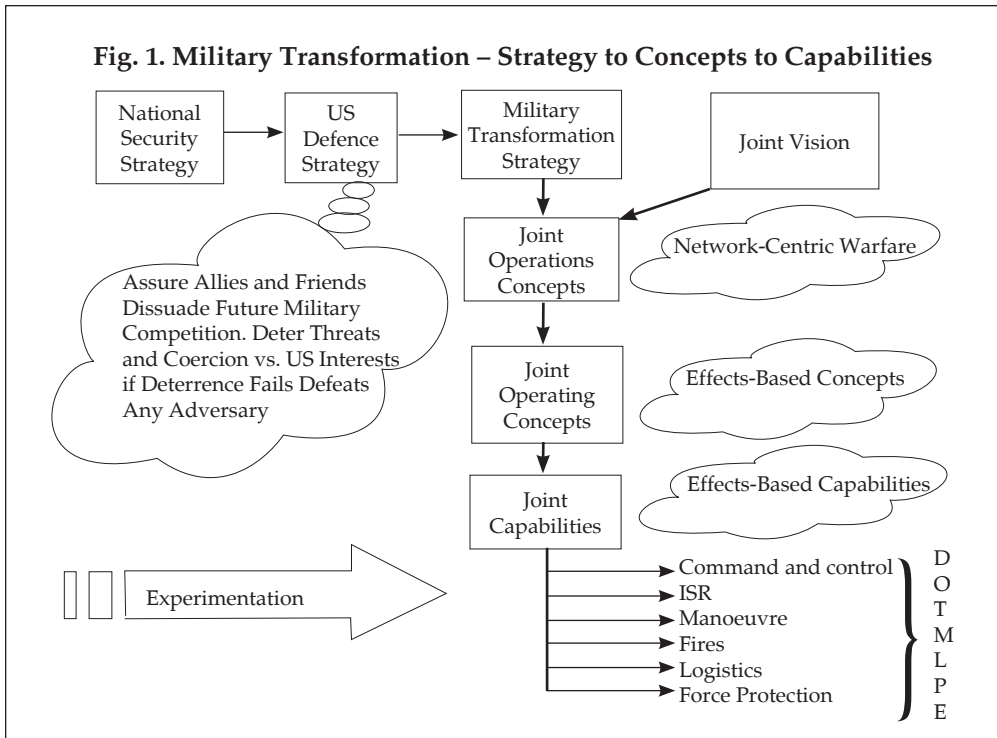
Transformation is a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organisations that exploit the nation's advantages.

and leverages new sources of power. Military transformation is about changing the culture of the armed forces. Therefore, transformational activity must facilitate a culture of change and innovation in order to maintain competitive advantage in the information age. That culture must foster leadership, education, processes, organisations, values and attitudes that encourage and reward meaningful innovation.

Office of Force Transformation

To help implement transformation, the US DoD created the Office of Force Transformation (OFT), which resides within the Office of the Secretary of Defence (OSD). OFT is a small office with a staff of fewer than 30 people and an annual budget of roughly \$30 million. It reports directly to the secretary of defence. Among other things, OFT issues guidance to the rest of DoD on transformation; reviews and approves transformation plans submitted by the military services and DoD agencies; acts as a generator, promoter and clearing house of ideas for transformation; and generally evangelises in support of transformation.

As illustrated in Fig. 1, military transformation begins at the strategic level. Guided by defence strategy, the military transformation strategy and the joint vision, joint war-fighting concepts are developed. The joint war-fighting concepts will focus on the development and acquisition of joint war-fighting capabilities across doctrine, organisation, training, material, leadership and education, personnel and facilities.

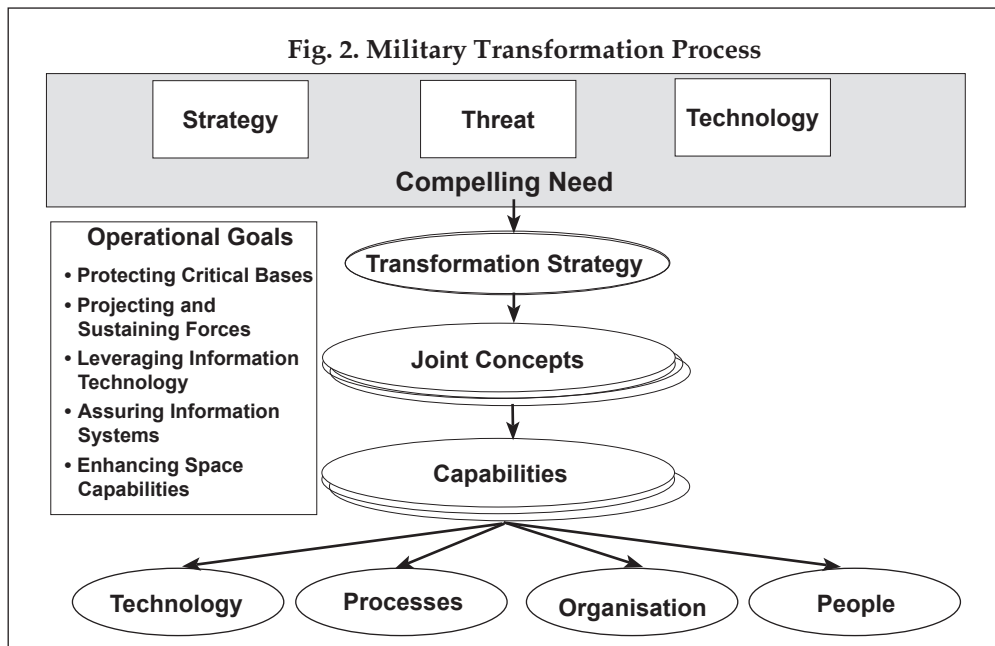


Scope of Defence Transformation

Overall, the scope of defence transformation encompasses three major areas: how business is done inside the department, how work is done with interagency and multinational partners, and how we fight.

Military Transformation Process

The military transformation process depicted in Fig. 2 begins with an analysis of the strategy, threat and technology drivers for transforming the force and the six critical operational goals, which provide the focus for the department's transformation efforts. Transformational capabilities will be attained when the results of concept development and experimentation are implemented in selected elements of the US armed forces.



Military Transformation Strategy

The department's overall strategy for transforming consists of three parts: transforming culture; transforming processes; and transforming capabilities through force or military transformation. The four pillars that constitute essential elements of the department's force transformation strategy are:

- Strengthening joint operations.
- Exploiting intelligence advantages.
- Concept development and experimentation.
- Developing transformational capabilities.

Successful implementation of the department's force transformation strategy will accelerate the ongoing shift from an industrial age to an information age military. This is a matter of developing competency for the new age. Future military operations will be conducted using more network-centric forces. The tactical and operational effectiveness of widely dispersed forces will be enhanced

by increasing information sharing via a secure network that provides actionable information at all levels of command. This in turn will create conditions for increased speed of command and opportunities for self-synchronisation across the battlespace. The first step towards the development of a network-centric joint force is to invest more now in the four military transformation pillars.

JOINT TRANSFORMATION

Separate ground, sea and air warfare is gone forever. If ever again we should be involved in war, we will fight in all elements, with all Services, as one single concentrated effort. Peacetime preparatory and organisational activities must conform to this fact.

— President Dwight D. Eisenhower

At its extreme, jointness means the full integration of the different Service divisions, i.e., where capabilities are “born joint.” Jointness would be far more prevalent and would penetrate further into each Service than it has in the past. This concept of jointness seems consistent with the Services each retaining the responsibility and authority to create and sustain specific defence capabilities but engaging jointly in planning the capabilities needed, allocating the capabilities across the Services, deciding on battle plans and tailoring the modules to be deployed.

Meanwhile, each of the military Services has been developing new operational concepts to implement Joint Vision 2020. The navy has focussed on NCW, using new information technologies to link the forces together digitally. The air force has concentrated on EBOs, which assess how best to destroy the enemy, with minimal collateral damage. The army has focussed on rapid decisive operations (RDOs), that is, reaching the conflict quickly and acting before the enemy can react. Elements of these three strategies are merging together.

TECHNOLOGY

It is not that Generals and Admirals are incompetent, but the task has passed beyond their competence. Their limitations are due not to a congenital

stupidity—as a disillusioned public is so apt to assume—but the growth of science, which has upset the foundations of their technique. The only way of salvation would be to survey the problems in complete detachment and from the widest point of view.

— **B. H. Liddel Hart**
From Thoughts of War

What Weapons and Systems are Transformational?

Although transformation involves changes in organisation and concepts of operations, much of the debate over transformation has centred on which military weapons and systems should be deemed transformational or not. Experts disagree on this question, even when working from a common definition of transformation. As a result, lists of weapons and systems that qualify as transformational differ from one source to the next. Weapons and systems that have frequently been identified as closely associated with the Administration's transformation vision include but are not necessarily limited to the following:

- Command, control, communication, computers, intelligence, surveillance, reconnaissance (C4ISR) systems that link military units into highly integrated networks for conducting NCW.
- Forces for countering terrorists and weapons of mass destruction.
- Space systems.
- Missile defence.
- Unmanned vehicles.
- Special operations forces.
- Precision-guided air-delivered weapons.
- Lighter and more mobile army ground forces.
- Smaller and faster navy surface ships.

A few technologies stand out as especially needed for today's new missions:

- Unmanned aerial vehicles (UAVs) and space-based radar for persistent surveillance.
- Information operations, both offence and defence.
- Storage and retrieval of information—data mining.
- Tagging for tracking, identification and forensics.
- Space control.
- Biochemical defence.

Critics say that transmitting accurate information in real-time to systems and units that can act on it immediately is the challenge. Because battlefield information and intelligence flows through and across multiple organisational boundaries and interfaces, it will inevitably be delayed, altered, or otherwise distorted. Staffs will take time to analyse and interpret new information and propose courses of action rather than immediately pass it unfiltered to subordinate and adjacent formations

Separating the important from the unimportant has always daunted commanders and staffs. Time rushes on as commanders and staffs wrestle with the thorny problems of battle command. What is the best system to engage an emerging target? How can we be sure who is really there? Is this important enough to postpone other engagements? What about collateral damage and innocent civilians? How much information should be pushed down to small units and how much can they digest? Who else needs to know? Who must approve the strike?

These and other factors affect the technical problem of data transmission. They are not trivial concerns, nor are they particularly susceptible to technical solutions. In fact, the explosion of automation and computer systems in headquarters has brought an increase, not a decrease, in the size of headquarters staffs. So long as people make battlefield decisions, they will stop and think. So long as militaries are hierarchical, commanders

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will use their discretion. Whenever information crosses an organisational boundary, it will be altered, however subtly.

Advanced command and control (C2) is a two-edged sword: it can lead to less centralised operations or more micromanagement from far. The reality is that satellite communication has allowed decisions on the battlefield in Iraq or Afghanistan to be made at Headquarters (HQ) Central Command in Tampa, Florida. Sometimes involvement at the highest HQ is necessary as we have seen in the case of the siege of the Hazratbal shrine by terrorists when, in the glare of the media, operations are carried out live and there is no time to go through all the intermediate formations. Of course, intermediate formation HQs will feel left out.

Experience in the streets of Mogadishu, in the air over Kosovo and in Afghanistan and Iraq suggests that severe weather, air defence, complex terrain and urban environments still make combat a very close fight. Critics say that the most critical transformational weapon today is the improvised explosive device (IED) used by insurgents and terrorists. Technology has its limitations in close combat.

CULTURE AND INNOVATION

Transformed Culture and Processes

The strategy for achieving transformation in the Department of Defence must begin with an effort to transform the overall culture into one where innovation and informed risk taking are encouraged and rewarded – a culture that is characterised by the information age. This must be done through leadership development and education, an increased emphasis on concept development and experimentation and changes in the personnel system and incentive structure. Senior leadership must set the example by fostering innovation and adopting information age technologies and concepts.

Innovation = Creativity x Implementation

Innovation, so vital to the transformation process, is dependent upon creativity, the development of new organisational and operational

concepts, processes and technologies. For meaningful innovation to occur, however, creativity alone will not be sufficient; implementation is equally important. Without interested customers to conduct experiments, demonstrations, tests and evaluations and ultimately, adopt new concepts, processes and technologies for the conduct of real-world operations, innovation will not occur.

Together, creativity and implementation will have a multiplying effect in providing own forces with innovative new capabilities. We must encourage innovation and the sharing of knowledge and operational experimentation among the Services. This will enable to discourage and ultimately defeat of the development of new capabilities and effective asymmetrical strategies by adversaries.

LEADERSHIP

If the mind is to emerge unscathed from this relentless struggle with the unforeseen [in war], two qualities are indispensable: first, an intellect that, even in the darkest hour, retains some glimmerings of the inner light which leads to truth; and second, the courage to follow this faint light wherever it may lead.

— Carl von Clausewitz

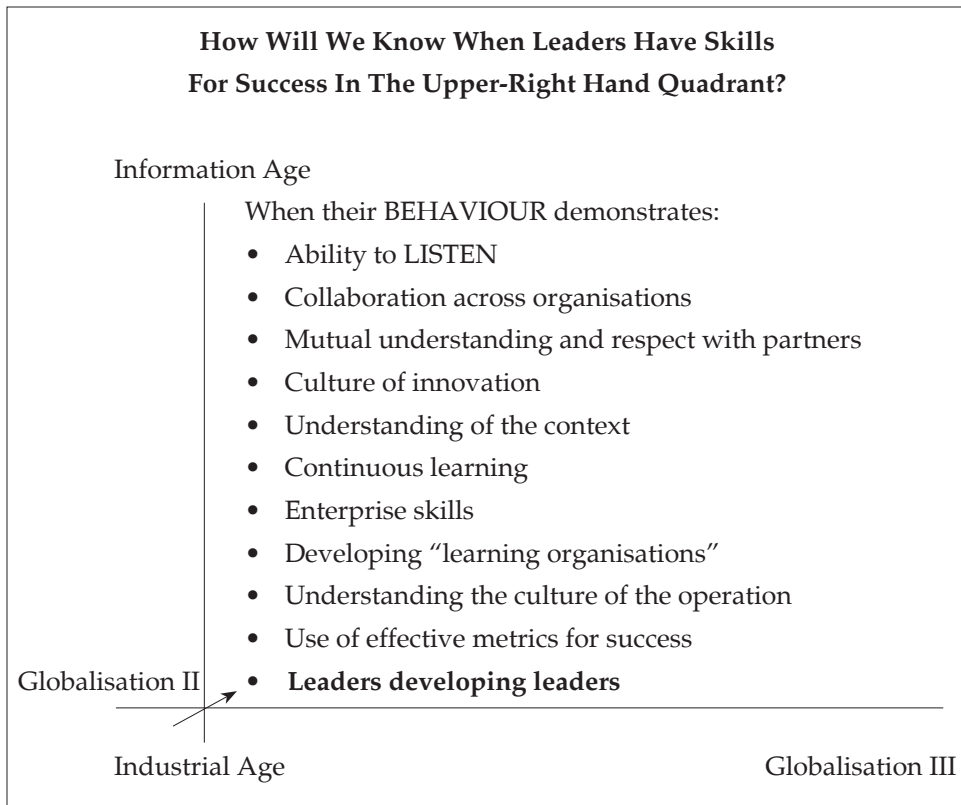
The leadership development process must result in leaders who are competent, have the right education and experience through schooling and assignment processes, are of sound character and integrity, cherish dignity, have the self-discipline to always do what's right and understand human nature and how they can influence human nature at any given point to accomplish the mission. The leader must also be confident in his own abilities to operate independently if

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necessary and on operations with direct visibility to the highest levels of government and army leadership. The leader must have the confidence in the capabilities of subordinates where trust among all is second nature and never questioned.

"I don't need someone who's only good at the killing and breaking, I need somebody who has the breadth of education experience and intellect to take on all the rest of these missions that he or she is going to be saddled with when the shooting stops or when it subsides to some level. They're the ones that are going to count on the ground out there, more than anything else. And I think that's the issue in any discussion as to what happens to our military from here on out." (Source: Gen Anthony Zinni, Address at the Marine Corps Association and Naval Institute: Forum 2003: "How Do We Overhaul the Nation's Defense to Win the Next War?", Crystal Gateway Marriot, Arlington, VA, September 4, 2003).

Retired US Army Chief of Staff Gordon Sullivan warns about this very same point when he cautions, "The old maps, the old ways of doing business will not work in today's new territories. Simply improving an existing process will not solve a problem... Doing the same thing you have always done—no matter how much you improve it—will get you only what you had before" (Sullivan & Harper, *Hope is not a Method*, New York : Times Business 1997, p.152). Military thinker Trevor Dupuy in his book *Understanding War* (1987) advanced an important idea about the actual importance of technology in warfare. In the chapter "Technology and Human Behavior in Combat", he asserted that historical data about war indicates, "No technology, no weapon, however great its actual or potential lethality, has been more important for the winning of battles or wars as the men who controlled the weapons ... the essential nature of war has not changed. Wars are fought by men and there has been no discernible difference in the fundamental nature of man over the past five thousand years of recorded history. Because the nature of man has not changed, neither has his basic objective when he turns to war: the employment of lethal instruments to force his will upon other men with opposing points of view."



Innovative Change Agents Discouraged

One widely recognised ingredient for successful transformation has been a visionary group of visionaries with relatively persistent tenures, that dare to conceive of bold new ways of conducting warfare. Admiral William Owens asked before he retired. “Where is the revolutionary who will lead the RMA?” There was no one he could point to. No Billy Mitchells, no Alfred Mahans, no George Pattons, no George Marshalls. What is different about the army now versus times in the past is that there are currently no rewards for risk taking and even the smallest mistakes are punished. As an officer in the US Army Command and General Staff College Survey stated, “Risk aversion has become a military cultural thing; commanders are not willing to take risks (and subordinates know it).”

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Few incentives exist for commanders to protect their mavericks in today's army. Since one bad or merely neutral officer evaluation report (OER), can ruin a career, a highly risk averse senior rater can derail an innovative change agent easily. Supporting evidence comes from the survey: top-down loyalty does not exist. Senior leaders will throw subordinates under the bus in a heartbeat to protect or advance their careers. This trend is not only found in the US Army. In 1996, terrorists blew up a US apartment building in Saudi Arabia after the commander had argued for increased security consistently for months. He was blamed for the attack despite his efforts to avoid this outcome. The chief of staff of the US Air Force attempted to save this officer's career by preemptively resigning as the responsible commander, but the local commander was forced to retire anyway. This pattern strongly suggests that high levels of risk aversion are being institutionally reinforced in US military organisations.

The US Army has 3,700 colonels but only 33 manoeuvre brigades: the navy has 3,500 captains but only 359 ships. Most wind up on staff duty, whether they are needed or not. Most effective armies throughout history have had only 3 to 8 percent of their numerical strength in the officer corps; the US has 14.3 percent. The bloated headquarters only create unproductive paper work for already hard pressed units who are short of officers. This dichotomy has to be resolved.

LIMITATIONS

When I was a young officer, I was taught that if you have air superiority, land superiority and sea superiority, you win. Well, in Vietnam, we had air superiority, land superiority and sea superiority, but we lost. So I realised there is something more to it.

— Colonel John Boyd

As the US Army's force deployment challenges in Afghanistan and Iraq have demonstrated, the United States military is not organised, trained, or equipped to conduct protracted counter-insurgency and counter-terror operations on a large scale. In particular, the manpower requirements to sustain these counter-insurgency campaigns are considerably greater than those that can be supported by the current force structure. Indeed, recent US history finds US forces conducting a remarkably high number of "regime change" operations (e.g., Panama, Haiti, the Balkans, Afghanistan and Iraq). This greatly increases the demand for forces capable of conducting stability operations until a new government can be formed and indigenous forces trained to assume responsibility for the country's internal security. As the Balkans, Afghanistan and Iraq have shown, these operations can be protracted in nature, especially in cases where a robust insurgent movement develops. The features of insurgency—blending into civil population, superior human intelligence, enlarging its organisation in time, unconstrained in choosing the time, location and type of attacks, being free from legal constraints, use of media to its advantage—make it a force with its own networking and situational awareness.

This trend may well continue, whether or not the US military conducts regime change operations. This is because adversaries confronting states with overwhelming advantages in conventional capabilities (e.g., the United States) have often adopted unconventional methods of waging war to offset these advantages. Although the US military's record in such operations is mixed, institutionally the armed forces have shied away from fielding forces structured for irregular warfare, for several reasons. First, irregular warfare operations are typically manpower intensive, while the US military has become increasingly capital intensive.

Technological sources of intelligence were of little value in Somalia. Commanders relied on human intelligence as the primary source of information. As Gen Anthony Zinni, then director of operations

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at the United Nations Task Force Somalia recalled, he had access to very good technical intelligence, but sensors could not “penetrate the faction leaders and truly understand what they were up to. Or may be understand the culture, the clan association affiliation, the power of the faction leaders and may be understanding some of the infrastructure too.” Because of ambiguities in target selection and identification, many targets were hit unintentionally. Mistakes occurred not because of a lack of information; the sheer volume of data and the difficulty in separating good from bad information presented difficulties. As Secretary of Defence William Cohen attested after the war, “Our vast intelligence system can create such a haystack of data that finding the one needle that will pinpoint a target in the right time-frame is difficult, indeed.” The best-known intelligence failure was the bombing of the Chinese Embassy in Belgrade.

Strategic and operational uncertainties were amplified at the tactical level. Soldiers and marines operated in a populous, congested urban area in which almost everyone was armed; it was difficult to distinguish between friendly forces, neutrals and those opposed to the humanitarian effort. For marines and soldiers, the complex social, political and geographical environment blurred distinctions between peace-keeping operations and combat operations. Maj Gen Tom Montgomery remarked, “If this isn’t combat, then I’m sure having a helluva nightmare.”

Maj Gen (Retd) Robert H. Scales while speaking on “Change During War: Contemplating the Future While Fighting in the Present” at a seminar on “An Army at War: Change in the Midst of Conflict” held at the Combat Studies Institute Frontier Conference Centre, Fort Leavenworth, Kansas, on August 2-4, 2005, made some very interesting observations:

Technologies dictating concepts—find an enemy and a method worthy of our weapons. This is a very serious problem with us. We have the technology

netcentric warfare so let's come up with a military theory that supports it. What's good for IBM has got to be good for the army—build me a network and the enemy will collapse. Build me a net and the enemy will come. Well, we're learning about that, aren't we? The enemy adapts. He says, "You want a net? I'll build a net and I'll build it with tribal affiliations and execute with notes passed in the middle of the night and through backyard deals. And you can build all the nets you want, but I'll beat you at your own game." I think the bill on netcentric warfare is something around a trillion dollars. I've been to the Office of Force Transformation. It's incredible that people are still living in a realm of fantasy. Try to talk to these guys about the enemy and about war being a two-sided affair and they look at you as if you have a tree root growing out of your head. Be careful of the moniker and the bumper sticker—be careful of net this and net that. I wrote a piece a few months ago called, "Culture-Centric Warfare." I told my editor, "Look, if I don't put *centric* on something, you guys won't publish it."

Give me an enemy worthy of my weapons...please. Do you ever notice that we only decide to fight China during the Quadrennial Defense Review? Do you ever notice that? "Give me a peer! Who can make a carrier? China. Okay, they're the enemy." It's this whole idea of technology driving doctrine instead of doctrine driving technology

This problem is made particularly difficult today because of our obsession with jointness. Jointness is, by its very nature, a source of friction in forward thinking, because everybody has to have a piece of the action. Why do we put a "J" in front of all of our headquarters? Well, because we have to be joint. Actually, we don't. There's very little "joint" about IRAQI FREEDOM, it's 95 percent Army and Marine Corps. It's got everything to do with winning the war on the ground. The enemy has ceded us the global commons. We own space, the air and the sea.

You need a catalyst for reform. Normally, it's a person. You need a Donn Starry. You need someone who has the unique skills, not so much as a visionary, Donn Starry will tell you that he was not a visionary; what he was, was an individual

who knew how to move an institution forward. He knew how to manipulate the elements of change in order to get the most from the process.

You've got to experiment. Experiment in minute increments. Experiment over and over and over again. You might have a grand event, but it needs to be cheap, it needs to be repetitive, it needs to be distributed and it needs to be run by captains and majors and may be lieutenant colonels—not by generals and heads-of-state. That's how change occurs.

We must kill with immediacy and discretion. Immediacy—we're still too slow in how we kill and we're still relatively indiscriminate. We need to be able to kill someone on the other side of the wall, rather than dropping a building in Fallujah and we need to do it within seconds and not minutes. The Air Force is very proud of the fact that their reaction time for close air support has gone from an hour and 15 minutes in Korea, down to about 20 to 25 minutes now—that's still too long. It should be two minutes, not 20 to 25 minutes, in this type of war.

What happened after 9/11, I would argue, is that it shifted to the other way—we're now living in a world that's driven by Red. Osama bin Laden doesn't care about joint doctrine. He controls the clock, he's driving change, he's adapted very quickly and he really doesn't care about any of our structures, about mimicking anything that we do whatsoever. So what does that mean—for you? What it means is the onus for adaptation—for increasing the pace of adaptation—is on you, not on him. Until we're able to do that, until we're able to cast forward and get away from the practical present and think of the theoretical future, we'll never be able to close that gap.

IMPEDIMENTS TO DEFENCE TRANSFORMATION IN THIRD WORLD COUNTRIES

Several factors currently inhibit defence transformation. The first comprises costs and resource constraints. Transformation doesn't come cheap, despite assertions made early on by some proponents that the exploitation of

commercial off-the-shelf (COTS) technologies would greatly reduce costs. Rather, even to make a start requires the acquisition of many new and expensive types of military-unique systems. Even many dual-use COTS information and communications technologies are not easily adapted to military use, as they often require substantial modification, such as ruggedisation or additional capabilities

At the same time, funding for transformational systems must generally compete with large and expensive “legacy” programmes—such as fighter aircraft, tanks and large warships, as well as huge manpower costs usually associated with sizeable ground forces. Also, the US economy can only support its military for expensive transformation efforts.

The organisational and institutional cultures found in most militaries impede transformation. Militaries in the Third World are often extremely conservative, risk-averse and highly bureaucratic organisations. Of course, large organisations anywhere, certainly militaries and Defence Ministries, are typically resistant to change, especially disruptive change, since it can threaten the stability of normal day-to-day operations, standard operating procedures, war plans and even career paths. Armed forces are especially hierarchical, with heavily top-down command-and-control structures.

Another implication of the decidedly conservative nature of regional defence establishments is a characteristic preference for traditional systems. Militaries often prize large and conspicuous weapon platforms—such as main battle tanks, modern fighter aircraft and aircraft

carriers—more than less visually striking but transformational systems, such as unmanned aerial vehicles (UAVs), command, control, communication, computers, intelligence (C4I) networks and precision-guided munitions. In addition, high-ranking military officials have tended to prefer immediate, high-profile hardware acquisitions over longer-term software fixes.

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Many militaries also lack any tradition of joint operations and instead possess strong single Service cultures and severe inter-Service rivalries. In such a state of affairs, it is doubly difficult to introduce ideas of jointness, interoperability and combined-arms operations as basic war-fighting concepts, or to create common C4ISR and logistical support systems.

Most defence technology and industrial bases are ill equipped to contribute much to defence transformation. Most regional defence research, development and industrial bases lack the design skills, technological expertise, or links to advanced commercial technology sectors needed to develop and manufacture transformational systems. In particular, the defence industries do not possess sufficiently advanced systems-integration capabilities to link together highly complex systems of systems such as C4ISR networks. In addition, heavy emphasis in most of these countries on self-reliance in arms production means that resources are often wasted on duplicating the development and manufacture of weapon systems already widely available on the global arms market.

Militaries and defence industries have few strong linkages to innovative local industries, such as the information technology sector, limiting the potential for “spin-on”—that is, from commercial to military. Most regional arms industries are state owned and insulated from both market forces and the private sector. This demarcation, however, makes it more difficult for the defence sector to benefit from cross-fertilisation with commercial technologies, as well as making it harder and less attractive for civilian industries to participate in military research, development and manufacturing. At the same time, local militaries in general remain distrustful of commercial off-the-shelf technologies and prefer “mil-spec’ed” equipment. However, if the Tatas can manufacture Humvee vehicles for the US Army, they can surely meet our requirements. The point is: what will happen to white elephants like Ordnance Factory Board (OFB) units like the Vehicle Factory? The armed forces suffer silently.

For the last 50 years, India has been trying to set up a defence industrial base, yet we are not far down the road. In the early 1980s, a big push was given to the process with the expectations that the 2000+ cycle will see the Indian armed forces equipped with India-made tanks, light fighter aircraft and surface-to-air missiles (SAMs). In 1997, the government announced that a 10-year plan had been made to increase the ratio of expenditure on procurement from domestic sources from 30 percent to 70 percent by 2005. We are nowhere near achieving it.

Exploitation of dual-use technologies for defence transformation is unlikely to occur to any large degree.

Consequently, exploitation of dual-use technologies for defence transformation is unlikely to occur to any large degree. While nearly all countries see the great promise of advanced commercial technologies for military uses, particularly information technologies, or space, few have made actual, deliberate and concerted efforts to engage in such spin-on. Most exploitation of dual-use technologies in the region has so far been modular, that is, simply “piggybacking” on existing or emerging commercial systems (such as nationwide fibre-optic telecommunications networks) rather than adapting commercial technologies to military purposes. Great work has been done to put information technology (IT) and communication networks in place at least up to Brigade Headquarters level. But what is the use of these infrastructures if we don’t use them to our advantage. Where are the application softwares for use? Maximum use of this fantastic communication network in our army is to see MS Branch postings and promotions. Our young officers and men are good, smart and technology savvy. It is not possible to stop them using internet, cellphones, SMS, email, blogging. Yet the danger is that the more one uses networked technology, the more is the security vulnerability. Our officers and men will talk to their parents or wives from battlefield, they will use blogs to exchange their views on ongoing operations with people all over the world. What is our response as an institution? As a typical hierarchical and rigid organisation, we always fall behind in the race and are reactive in formulating policies.

The danger is that the more one uses networked technology, the more is the security vulnerability.

Most countries in the Indian subcontinent region, despite their best efforts, are unlikely to transform their militaries to the extent made possible by the information revolution and the emerging revolution in military affairs, at least not in the near future. There are simply too many factors to move beyond modernisation plus. These factors particularly include budgetary constraints; cultural, organisational and bureaucratic resistance; weaknesses in national defence technology and industrial bases; and under-appreciation of the complexity of adapting commercial dual-use technologies to military purposes. Overall, defence transformation may simply be too disruptive and too threatening to military and civilian elites, too expensive and technologically too demanding.

INDIAN SCENARIO

The Indian Ministry of Defence is one of the largest spenders, employers, industrial complexes and scientific experts in the world.Somehow paradoxically, although the number and rank of the people involved have also expanded, there has not been really innovative or even significant change in the way, that problems are analysed or handled and the concept of "tradition" has been used to circumvent the obvious need for change.

**— Arun Singh, Former Minister of
State for Defence**

In India, transformation can be necessity driven, personality driven, backed by the government or media driven. After the 1962 debacle, massive expansion took place, Mountain Divisions were established. The results started showing immediately in the 1965 War, and even more in the 1971 operations. This can be an example of necessity driven transformation. Thereafter, in the 1980s, a major modernisation and reorganisation took place under the guidance of Gen K. Sunderji. The changes were incorporated in the following stages:

- (a) **Speculation.** This was done with the publication of concept papers, journal articles, studies, formation of groups to study lessons of recent wars, etc. Gen K. Sundarji, as commandant, College of Combat, initiated these and himself wrote an influential series of papers laying out theoretical doctrine and deployment plans for Indian nuclear weapons in 1980–81. He had a grand vision of change.
- (b) **Experimentation.** Establishment of experimental organisations and testing grounds, field training exercises to explore new warfare concepts and war-gaming at field formations and Category 'A' establishments were carried out.
- (c) **Implementation.** Establishment of new units, revision of concepts, establishment of new branches and changes in curriculum of professional military educational institutions were carried out. As a result of which we have the Mechanised infantry. Large scale modernisation took place in the Armoured Corps, Artillery, Engineer, Signals and AD Artillery. Army Aviation came into being. Gen Sundarji had the vision and influence both within the army and the ministry, and bureaucracy and leadership to carry out the changes. He had a comparatively long tenure, and he could cultivate the subordinate leadership and followed up the changes.

However, the change process was orchestrated much earlier. Gen K.V. Krishna Rao in his memoir (*In the Service of the Nation, Reminiscences*, Viking, 2001) has articulated how as chairman of the Expert Committee with members like eminent soldiers such as Lt Gen M L Chibber and Gen K. Sunderji, he had started the process earlier and carefully nurtured the programme as deputy chief of Army Staff, vice chief of Army Staff and ultimately as chief of Army Staff. Continuity was maintained. A bunch of sharp, intelligent, progressive officers, not afraid to think out of

Most countries in the Indian subcontinent region despite their best efforts, are unlikely to transform their militaries to the extent made possible by the information revolution and the emerging revolution in military affairs, at least not in near future.

the box, were identified and carefully nurtured under the mentorship of Gen Sunderji to carry forward the change process. Above all, Prime Minister Rajiv Gandhi firmly backed the effort of major changes in the armed forces. This was a case of transformation of the Indian Army, one can argue. This can be an example of personality driven transformation. However, the worst form of transformation may be media driven. If in the next five or six years, we do not change, there will be tremendous pressure from the media to change. Our media is yet to acquire the knowledge and vision on defence related matters to drive such a change. The outcome may be disastrous. Clearly, time is running out. But where are the intellectual leaders with vision to drive the next transformation efforts of the Indian armed forces?

Bureaucracy

India's labyrinthine bureaucracy offers additional barriers to innovation and change. The civilian side has always dominated civil-military relations in India. The Ministry of Defence and Ministry of Finance, composed largely of career bureaucrats, have dominated procurement and budget decisions. The role of the military in determining policy and procurement has been deliberately minimised. Without fundamental changes in the Indian defence bureaucracy, any rapid change in the armed forces is difficult to come through.

The example of non-finalisation of the Tenth Defence Plan yet can be an example of how the bureaucracy works. The plan was for the period 2002-07. We are now in 2008! The Third Report of the Standing Committee on Defence (2004-05) (Fourteenth Lok Sabha) presented to the Lok Sabha on April 25, 2005, has been scathing in its criticism. It states:

The Committee express their serious concern that despite their strong recommendation for an immediate finalisation of the Tenth Defence Plan with committed allocation, there has been little progress, with no firm indication of annual outlays for the remaining 2 years of the Tenth Defence Plan by the Ministry of Finance. The Committee note with serious concern that the Ministry

has itself admitted that some compromises are inevitable in the absence of a formally approved plan.The Committee are not convinced with the sketchy reasons advanced by the Ministry for delays and feel that the Ministry had neither shown any urgency nor followed up with the Ministry of Finance to get the firm commitment of funds to finalise the Plan. The Committee are unhappy to note that instead of approaching the Ministry of Finance for supplementary allocation, the Ministry of Defence has felt content to bank on delays on the part of suppliers or some slippage taking place in already concluded contracts so that the Ministry could progress new projects out of available allocation. This shows a casual approach on the part of the Ministry to pursue for higher allocation with the Ministry of Finance and goes contrary to Government resolve to eliminate all delays in Defence Modernisation. The Committee feel that it tantamounts to compromising the security concerns of the nation. The Committee, therefore, desire that the Government should immediately finalise the Tenth Plan with firm indications of funds for the remaining years of the Tenth Plan without any delay so that the modernisation process can proceed smoothly.

Budgetary Support

“Forget knowledge is power, ...money is real power.” The most important part is the availability of funds to carry out major transformational efforts. Even a country like the USA is finding it tough to carry out modernisation plans. They are unable to acquire costly new weapons and equipment as well as increase the strength of the army or marine corps when any soldier who has fought counter-insurgency operation will vouch for the requirement of more boots on the ground. The same problem would come up if and when the Indian Army tries to transform. During the 1980s, the Reorganised Army Plains Division (RAPID) was created by reducing a brigade from the division structure on the assumption that manpower thus reduced would be replaced by force multipliers and

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surveillance efforts. However, the financial resources were never allotted for the technological wherewithal.

There has been a downward trend in the percentage share of gross domestic product (GDP) spent on defence. The Third Report of the Standing Committee on Defence (2004-05) (Fourteenth Lok Sabha) was forthright in stating:

The Committee are deeply concerned to note that the Ministry of Defence was compelled to surrender funds to the tune of Rs. 5,000 crore, Rs. 9,000 crore and Rs. 5,000 crore at the Revised Estimates stage of 2001-02, 2002-03 and 2003-04 respectively, to meet the deficits. The budgetary ceilings imposed by the Ministry of Finance in the year 2005-06 have led to the downsizing of the total projected capital requirements of the Defence Services from adequately Rs. 44,123.86 crore to Rs. 34,375.14 crore which fails to address the security concerns of the nation. The arbitrary caps on budget utilisation over a period of time have taken a toll of almost all sectors of defence like manpower in the Navy, the ongoing modernisation, infrastructure development, procurement of equipment/ acquisitions, indigenisation and R&D initiatives. The across the board cut applied by the Ministry of Finance on defence expenditure without undertaking any exercise to check the ramifications of their decision on defence preparedness, calls for an immediate review. The Committee feel that there should not be any cut or reduction in the defence budget by the Ministry of Finance at any stage. However, considering the present defence expenditure of some of our neighbours and the present security scenario, the Committee feel that there is a need to fix a minimum percentage of our GDP which should be made available to the defence forces at all costs every year.

Joint, Combined or Integrated Warfare

Even after four wars and innumerable crises, we have failed to evolve joint doctrine and concepts. We are in the process of starting the journey. Transformation of the military must be based on a new joint doctrine which follows a top-down and not a bottom-up approach. Gen Shankar Roychowdhury (Retd) states, "The Indian Army individually as well as

the defence forces, must no longer be allowed to function as independent disconnected entities, without the required inter-Service synergy for fullest exploitation of their respective capabilities. In some senses, provision of an enabling environment of jointmanship and stamping them on the individual ethos and culture of each Service may well be the most challenging task, which should be accorded an overall priority, higher than many other issues."

Future

Probably it is good that no major transformation effort is on the anvil in India. Now is the time for a vigorous, healthy debate to encourage criticality and participation at all levels, modify the concepts and doctrine keeping in view the future as well as lessons learnt in recent operations and sub-conventional warfare, empower people, communicate to all about our vision and transformation plans, identify intellectual leaders in the armed forces, carry out experimentations in theory as well as in training exercises, and institutionalise the change process. Training Commands like ARTRAC and all the Category A establishments have a major role to play in giving the intellectual stimulus. We should have regressive planning which means directions are given from highest strategic body to the lower echelons of command. Our political leadership shies away from giving written directions to the Service chiefs. We must have a National Security Strategy followed by a National Military Strategy, followed by five-year Defence Plans like the 11th or 12th Plan and a Long-Term Perspective Plan. Based on the Joint Vision statement issued by the CISC, the respective Services should issue their individual Service Vision statements. We must think about capability-based planning in place of the existing threat-based planning. No transformation can take place without active support and budget allotment by the government. The armed forces should go back to the government with our present capability and

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ask them what they want us to do. A clear-cut message should be given, if a particular capability needs to be acquired, about what should be the budgetary effect. Hopefully, by the time all these issues are resolved, visionary leaders, both in uniform and outside will emerge to carry the transformation forward. Perhaps Captain Alfred Thayer Mahan's great generalisation that no military Service should or can undertake to reform itself is valid. Change must be directed from outside, the military in order to transform it and achieve true jointness. Perhaps, somebody with knowledge, vision and commanding respect within the strategic community like Arun Singh would meet the requirement.

We have to keep the Service culture always in mind. All the debates, systematic study and analyses have to be carried out now. As Col Douglas Macgregor, testifying before the House Armed Services Committee on July 15, 2004, on "Army Transformation: Implications for the Future," states, "Whenever an Army Chief of Staff makes a pronouncement, regardless of whether the pronouncement is based on sound analysis and accurate data, every officer knows that in order to be promoted, he or she must sign on unconditionally for the 'party line.' In this cultural setting, there is no argument, no debate and no experimentation."

CONCLUSION

Let noble thoughts come to us from every side.

— Rig Veda

The US military transformation is a project mandated by strategy, threat, technology, risk imperatives guided and shaped by operational goals and the military objectives of the US defence authorities. It is unique to the USA. Application of this model is not feasible for any military, let alone India's. However, US military transformation provides important lessons which we can learn.

Achieving transformation is by no means certain. First, the process is complex because it affects many different and fundamental aspects of the joint war-fighting system. Second, change is always resisted in favour of the status quo. Third, transformation competes for both attention and resources with other important, immediate demands on the ministry, notably counter-terrorism, counter-insurgency operations and internal security. Fourth, there is an increasing demand on resources for current operations vis-à-vis investments in the future. Finally, transformation is a journey, not a destination. Decision-making will need to be tailored to this reality, i.e., more emphasis on the management of change versus traditional management of major new programmes.

Of course, it is easy to criticise. Change, especially radical change, inherent in the RMA, is always hard and it is human nature to be suspicious of, and hostile toward, the unknown. It should not be surprising to see so much organisational, institutional and cultural resistance to the idea of transformation. Moreover, transformation as a concept suffers from the fact that it is basically an open-ended, continuous process since there will always arise new technological innovations that can affect the character and conduct of warfare and, therefore, military doctrine and organisation. When does a military decide that it has finally and successfully transformed itself?

At the same time, however, transformation along the lines of the US model may not be necessary to “get the job done.” A modernisation plus strategy that is evolutionary and sustaining innovation alone may be sufficient to meet our defence requirements, particularly with respect to the strategic context (that is, the immediate threat perceptions and defence requirements) and the available resources. We do not need to emulate the American transformation paradigm in order to derive valuable new capabilities and other benefits from their current modernisation efforts. A partial solution could be more than adequate.

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