THE BARRIERS TO MILITARY TRANSFORMATION

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Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.

— Guilio Douhet

History is full of examples of the strongest states failing to take advantage of significant changes of the time and transformations in military affairs. The Mongols missed the gun-powder revolution, the Chinese and the Indians failed to embrace the industrial revolution, while the Russians let the information revolution go by. It is difficult to comprehend why these societies that were among the most advanced and influential in their time, failed to grasp the importance of these major revolutions. Certainly, they were not ignorant of the sweeping changes taking place. Was it that they were too confident of their position and the structures that had led them to this position? Did they get too complacent?

It is not just militaries that suffer from a lack of will to transform. Large business corporations fare no better. Not a single maker of sailing ships made a successful transition to steam power. Sony, a leader in the transistor era and inventor of the famous Walkman, is struggling to compete with Apple's iPod in the digital era. None of the manufacturers of mini-computers

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— not Digital Equipment Corporation or Data General or Prime, invincible giants as recently as the 1980s — made a successful transition to personal computers.[1]

Perhaps after an especially successful streak of being a leader, it is unimaginable that an upstart can displace you. The longer you are on top, the more convinced you get of your invincibility. On the other hand, the vanquished, the upstart or the aspirant has no option but to innovate and find new ways of reaching the top. This perhaps best explains why defeat in war has often been a spur to innovation, from the Prussians' humiliation in the Napoleonic Wars to the Germans' humiliation in World War I, to the Americans' humiliation in the Vietnam War. Out of all these setbacks were born new ways of fighting that led once vanquished forces to victory in future battlefields.[2] Military transformation has been critical to the success of various countries throughout history and any government that regards it merely as an academic study does so at its own peril.

This paper will look at the reasons why militaries do not readily transform or the barriers to military transformation, and attempts to find ways and means to overcome these. This is not to say that militaries do not transform at all — indeed, they do. However, history reveals that at every cusp of change, there have been militaries that chose to embrace the change and militaries that chose to continue with the legacy.

TRANSFORMATION OF THE MIND

Transformation starts from the mind. For, unless the mind is willing, nothing will change. While talking to the military and civil leadership on the challenges to the leadership in the coming decades Air Mshl N. A. K. Browne had said that transforming a force is easy but transforming people

1. Max Boot, *War Made New* (New York: Gothan Books, 2007), p. 456.
2. Ibid.

and attitudes is much more difficult.[3] A similar sentiment was echoed by Gen Peter Pace, the first Marine officer to be appointed Chairman, Joint Chiefs of Staff in the US, while speaking on "21st Century Transformation of US Armed Forces." He said, "If I could only pick one thing (to change), I would pick mindset. I will tell you categorically that if we change none of our toys and simply change the way we think about how to apply them, we will have transformation on a very, very fast path."[4]

VAdm Arthur K. Cebrowski, the Director of Force Transformation for the US military, had once stated, "Historically, victors don't learn nearly as well as losers." A study of the successful French expedition to Naples in 1494, illustrates the point. The French under Charles VIII overran Naples in an unprecedented *blitzkrieg*. The key ingredient of the campaign had been extensive use of mobile artillery. The French had made their cannons lighter with use of better metallurgy and tied them to swift horses rather than oxen as had been the practice hitherto. So static had been the tactics in that era that this one change transformed the way wars were fought. By many accounts, the French invasion of Italy brought in the modern era of warfare. War strategy and tactics which had been relatively static for 1,000 years, changed with bewildering rapidity over the next century or so until the mighty naval armadas of sea-faring colonial powers became the standard war-fighting instruments. It also brought in the end of city-states that had been flourishing so far and heralded the rise of nation-states. Modern warfare would bring in an increasingly greater role for the weapons and weapon systems that could only be maintained and afforded by larger and richer entities.

However, just a quarter of a century later, in 1521, the French suffered a crushing defeat at the hands of the King Charles of Spain whose army had mastered the use of firearms. King Charles reorganised the Spanish Army into formations of tactically unique combinations of combined arms centred

3. Air Mshl N. A. K. Browne, Vice Chief of the Air Staff, Valedictory Address, 3rd 'Jumbo' Majumdar Seminar on "Aerospace Leadership in the Coming Decades," New Delhi, February 4, 2011.
4. Gen Peter Pace, Address to members of the National Defense University, Fort Nair, Washington DC, January 31, 2002, accessed at http://www.nlgmltf.org/pdfs/2nd_Art.pdf.

The Italians were aware of the existence of the cannon in 1494 and the French possessed firearms in 1521 but it was the opposition that chose to employ these weapons in a transformational way.

on armoured infantry. By virtue of this combined arms approach, the formation simultaneously enjoyed both the staying power of its pike-armed infantry, as well as the ranged firepower of its firearms. The French lost because they continued relying on cannon-based artillery and did not adopt infantry firearms. While that had been a good tactic to win over fortified positions in Italy, it could never compete with cavalry and infantrymen in the open fields.

Surprisingly, the Italians were aware of the existence of the cannon in 1494 and the French possessed firearms in 1521 but it was the opposition that chose to employ these weapons in a transformational way. Napoleon had much later stated that "one must change one's tactics every ten years if one wishes to maintain one's superiority." Militaries must guard against the danger of idolising a weapon, a tactic or an institution which they have created as a response to an earlier challenge as it can become a cultural barrier to further progress.

Minds stuck to mindsets and learning (only) the lessons of the last war have been the bane of many militaries. One of the best examples to illustrate the point is the French defence based on the Maginot Line where, based on the experience of the German invasion and the static trench warfare of World War I, the French constructed continuous fortifications along the eastern border to stop any attack from that direction and give them time to mobilise. The fortifications extended over 87 miles from the Swiss frontier to Montmedy and were constructed at an enormous cost of 7,000 million francs.[5] The fortifications were particularly strong on the French-German border while the Luxembourg and Belgian borders were relatively weak. Military experts extolled the Maginot Line as a work of genius, believing it would prevent any further invasions from the east notably, from Germany. In 1940, the Germans attacked France through the Low Countries where the

5. Brig J. Nazareth, *Creative Thinking in Warfare* (New Delhi: Lancer International, 1987), Ch 4, "The Military Environment for Creative Thinking," p. 60.

defences were thinnest and simply bypassed the defences. The adage that "generals always fight the last war" best describes the French military mindset of the time.

Even a lead in transformational thought can be lost due to organisational myopia.

A lead in technology is also no guarantee for leadership and can be very easily squandered away if there is no focus and vision. In the late Thirties, the Germans had discovered the power of nuclear fission. The Army War Office of the Army Ordnance Department had as early as 1939 been made aware of the potential use of power of nuclear fission for a weapons programme. After an enthusiastic pursuit of the weapons programme for three years, the War Office ceded control of the programme to the academics because it wanted all resources to be available for the war effort which had started suffering setbacks at this point in time.[6] The Americans meanwhile successfully pursued a similar programme and three years later, used the atomic weapons to end the World War in favour of the Allies.

Even a lead in transformational thought can be lost due to organisational myopia. During World War II, the German Army made brilliant use of tanks in a *blitzkrieg* to run over large parts of Europe. Interestingly, it was the British and the French who had first planned to field thousands of tanks in a massive *blitz* in 1919, that would have anticipated many of the innovations employed by the Germans twenty years later.[7]

A British infantry officer, Col J. F. C. Fuller had, during World War I itself, suggested using mobility and the firepower of tanks to avoid the appalling stalemate of trench warfare. In 1920s, the British Army did more than any other to make this a reality. In 1927, at a time when the Germans did not have even a single tank, Britain set up the Experimental Mechanised Force, the prototype of the armoured division, equipped with medium and light tanks, self-propelled guns and motorised infantry. This force carried out large scale exercises and manoeuvres which were followed with greater interest in Germany and Russia than in Britain itself. Meanwhile, the French

6. Jeffrey T. Richelson, *Spying on the Bomb* (New York: W. W. Norton & Company, 2006), pp. 25-26.
7. Boot, n. 1, p. 216.

also had some very good tanks. The Char B1 was the best heavy tank design in the 1920s and the armour was so impenetrable that German shells would simply bounce off it. Similarly, the Somua S35 medium tank was also world class, with speed, hitting power and protection as good as any rival's. Yet, the French military leaders did not capitalise on the potential of tanks.

As on September 1939, the Germans had fewer infantry divisions, fewer artillery guns, smaller number of fighters and bombers, and, significantly, just 2,439 tanks pitted against more than 4,200 tanks that the Allies had.[8] Another account pegs 2,600 German tanks against 4,450 of the Allies during the German invasion of France and the Low Countries.[9] While the exact numbers may be difficult to establish, there is no doubt that the Allies enjoyed both qualitative as well as quantitative superiority.

Why, then, did the Germans win in France? The prevalent impression of the time that the Germans had superior numbers or, for that matter, superior equipment, is certainly false. The general mindset in Britain, perhaps due to its unique geography and the requirements to safeguard the colonial possessions, was to invest more in air and naval forces than in land forces. Or may be the British were just not willing to change; after all, they were ruling almost half the world at that time and were justified in sticking to the old ways. Interestingly, the British War Office did assign Basil H. Liddell Hart, then a young career officer and another early proponent of armoured warfare, to rewrite its tactical manual; however, his manoeuvre warfare concepts were deleted from the completed manual.[10] In another example of military myopia, Maj Gen Percy Hobart, associated with tank development and armoured tactics from its infancy, who had earlier, as a Brigadier commanded the 1st Tank Brigade (the first ever tank formation) and then trained the armoured units in Egypt (later 7th Armoured Division) was eased into retirement, based on hostile War Office information regarding his "unconventional" ideas about armoured warfare.

8. Prof Ernest R. May, *Strange Victory: Hitler's Conquest of France* (New York: Hill and Wang, 2000), pp. 476 -477.
9. John J. Garstka, *Patterns in Innovation*, in Transforming *Defense Capabilities: New Approaches for International Security, ed. Scott Jasper* (Boulder,Colorado, USA: Lynne Rienner Pub Inc, 2009) p. 69.
10. Ibid., p. 67.

The British and French thinking was still looking at winning trench warfare while the Germans mastered the art of manoeuvre and speed — they reduced distances with mobility and, above all, were able to coordinate all their forces into a combined-arms approach. The Germans were victorious because they had a decisive edge in doctrine, training, planning, coordination and leadership. What was revolutionary and unprecedented about the *blitzkrieg* was not the new technology the Germans employed, but rather the unprecedented way in which they mixed new and existing capabilities.

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Noted French historian and intellectual Marc Bloch, in his first-hand account of the French defeat, blasted the military leadership for failing to realise that an entirely new way of fighting wars had been evolved. He said, "What drove our armies to disaster was the cumulative effect of a great number of different mistakes. One glaring characteristic is, however, common to all of them. Our leaders, or those who acted for them, were incapable of thinking in terms of a new war. In other words, the German triumph was, essentially, a triumph of intellect — and it is that which makes it so peculiarly serious."[11]

TRANSFORMING MINDS AS A SYSTEM

Transformation historically constitutes one of two forms: it is in response to a revolution in military affairs, or it will prove to be the catalyst for such a revolution itself. Moreover, in contrast to prevailing military beliefs, transformation remains primarily the product of intellectual energy, and is

11. Marc Bloch, *Strange Defeat: A Statement of Evidence Written in 1940,* translated by Gerard Hopkins (Oxford: Oxford University Press, 1949), Reprinted in James M. Brophy ed., *Perspectives from the Past: Primary Sources in Western Civilizations* (New York: W. W. Norton, 2002), Vol. 2, pp. 727-29, accessed at http://dev.prenhall.com/divisions/hss/app/BW_TEST/Western_History/documents/Marc_Bloch_from_Strange_Defeat.htm on June 11, 2011.

There exists a historic bias against intellectuals (thinkers) in favour of individuals of action (doers).

rarely a result of technology alone.[12]

Throughout history, we come across Generals and leaders who won battles despite being handicapped in terms of the quantity and quality of the forces they commanded, by employing superior strategy, tactics and innovativeness. Surely, military wisdom and scholarly learning play an important part in winning wars. While academicians and military professionals have debated the value of intellectual pursuits to the art of war since ages, nobody has attempted to address an important issue: the notion of institutional intellectualism versus individual intellect and its catalytic role as a driving force for military transformation.

Many thinkers from the military and outside have endeavoured — with varying success — to convince the leadership that there exists a historic bias against intellectuals (thinkers) in favour of individuals of action (doers).[13] It is a commonly held opinion that intellectuals in the military offer little of practical value and fail to function effectively as combat leaders. While it is possible for exceptional combat leaders like Joshua Chamberlain and George Patton to employ their intellect in solving battlefield challenges, this is very different from the individual who uses his intellect to drive institutional change that results in transformation throughout the organisation as a whole.[14] A lot of transformational thought has indeed been evolved by military officers who did not participate extensively in combat or rise very high in the military system. In fact, many officers espousing change have been ridiculed, passed over for promotions and even court-martialled while in service.

12. The authors have argued that while technology is unarguably vital to progress, military revolutions usually happen as a result of new operational concepts, changes in organisational structures and evolution of doctrinal thought. Williamson Murray and MacGregor Knox, ed., *The Dynamics of Military Revolution, 1300-2050* (Cambridge, England: Cambridge University Press, 2001).
13. Col Lloyd J. Matthews, "The Uniformed Intellectual and His Place in American Arms," *Army Magazine*, July-August 2002, accessed at http://www.freerepublic.com/focus/news/735611/posts, on June 07, 2011.
14. Commander Steven W. Knott, *Knowledge Must Become Capability: Institutional Intellectualism as an Agent for Military Transformation* (Carlisle Barracks, PA: US Army War College, 2004), accessed at http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA424406, on June 03, 2011.

In the past, military leaders enjoyed immense power and authority. On most occasions, they were also the sovereigns. Therefore, success or failure in the battlefield was usually attributed to individual leaders. However, in the last couple of centuries, there has been a progressive march of democracy and militaries have become an organ of the larger nation-state, answerable to the people through the elected political leadership. While the senior military leadership still enjoys immense power in most countries, political and civilian control of the military is increasingly becoming the norm. Moreover, within the military, there has been a large amount of horizontal expansion. The number of General Officers and their equivalents in all militaries has increased without an actual increase in the overall cadre strength or the functions of the military. AVSC II resulted in an increase in additional 30 three-star posts in the Indian armed forces.[15] As a result of these changes, the authority and independent decision taking ability that an individual officer enjoys is progressively waning. Another significant change is the tremendous impact of technology on military affairs. It is no longer possible for a single officer to have in-depth knowledge of all the domains. As a result of the above changes, Staff Officers have become indispensable links in the military machinery. Major changes in policy, doctrine, organisational structure and new procurements are more staff driven than ever before and therein lies the argument for building up institutional intellect.

Institutional intellectualism can be defined as system-sponsored critical thinking that focusses on continual evolution and forward thinking within the organisation. An institutional mechanism is essential because modern militaries operate simultaneously over various separated domains in terms of geography, technology, functions and equipment. If all of them were to evolve individually, they would all be moving at a different pace, direction and level. Institutional intellectualism achieves a synergistic effect that can effect transformation in a highly disciplined, organised and coordinated

15. "Cabinet Approves About 1,900 New, Senior Posts in Armed Forces," *The Times of India*, October 03, 2008.

fashion. Collective ideas tend to be more effectively transformed into reality and resulting military capability.

It is imperative that institutional intellectualism be embedded within the organisation's structure (formal or informal) so that it is capable of influencing mainstream thought and processes. Individual thinkers working within the system will always encounter opposition to change from entrenched traditional elements. However, an institutional push for transformation can build greater momentum. Finally, institutional intellectualism can only succeed in an organisational climate that promotes free-thinking and an honest exchange of ideas. The transformational reforms of the Prussian military best illustrate the case for institutional intellectualism for an entire military organisation in response to an adversary's military revolution.

Following the destruction of the Prussian Army at Jena-Auerstädt in 1806, Carl von Clausewitz sardonically observed that "it was not just a case of a style (of warfare) that had outlived its usefulness but the most extreme poverty of imagination to which routine has ever led."[16] The Prussians never realised that the character of war had fundamentally changed until they were overwhelmed so swiftly and decisively by Napoleon's Army.

Indeed, the Prussian Army had arrived on the battlefield woefully ill-prepared for battle against Napoleon. Despite a self-confidence firmly rooted in the military achievements of Frederick the Great, the Prussian Army of 1806 was institutionally flawed. The officers, more concerned with social status than professional matters, were of inconsistent talent and inadequately trained. The soldiers too were poorly trained and lacked a patriotic spirit because their interests were not one with the King. Moreover, the Prussian Army also suffered from poor administration and equipment; specifically, the troops lacked proper uniforms, weapons, field gear and rations. The military organisation and tactical doctrine employed by the Prussians were obsolete as well.

Acknowledging the need for change, Prussian King Frederick William III convened a military reorganisation commission in 1807 to investigate

16. Günter R. Roth, "Operational Thought from Schlieffen to Manstein", accessed at http://www.history.army.mil/books/OpArt/germany2.htm, on June 03, 2011.

the debacle at Jena-Auerstädt and propose reforms to the existing military structure. The principal members were Prime Minister Baron Carl von Stein, Gen Gerhard von Scharnhorst, Col August von Gneisenau, Maj Carl von Grolman, and Maj Hermann von Boyen; Clausewitz, as a young Captain and administrative assistant to Gen Scharnhorst, also became a *de facto* participant of some influence. Scharnhorst was selected to the commission because he was one of few senior military leaders who had performed well on the field against Napoleon; besides he had gained universal respect as a military scholar and thinker while serving as Director of the highly regarded Militärische Gesellschaft (Military Society), the first institution of its kind devoted exclusively to the academic study of war. Scharnhorst chose the remaining members of the commission based on their intellectual contributions and their recent performance in combat; in short, they were the "best and brightest" the Prussian Army had to offer.[17]

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In its first set of reforms, the commission corrected straightforward organisational discrepancies. The army received improved uniforms and equipment, modern weapons and new tactical procedures. In the next phase, the commission focussed its attention on more difficult challenges: the socio-political flaws. Hitherto, commission in the Prussian officer corps was the sole prerogative of the aristocracy and was granted on the basis of political influence and family lineage rather than merit or military potential. The reformers transformed the officer corps, first, by persuading the King to grant eligibility to all elements of society. New officers would receive appointment through a universal examination process blind to station or

17. Charles E. White, *The Enlightened Soldier: Scharnhorst and the Militärische Gesellschaft in Berlin, 1801-1805* (New York, 1989), pp. 128-131.

influence. This measure alone served to expand significantly the talent pool from which candidates came, and it proved to be the principal foundation upon which the new Prussian officer corps would rest. Military academies and staff colleges were set up to train officers.[18]

In tandem with reforms to the officer corps, the commission also pursued significant transformational objectives in recasting the Prussian soldier. At Jena-Auerstädt, the soldiers did not constitute a national army; in fact, most viewed war as solely the concern of the King and the aristocracy. Consequently, the average soldier was bereft of *esprit de corps* or patriotic spirit. The commission instituted a system of egalitarian universal conscription which denied exemption to any element of society and mandated a shorter period of obligation. Recruitment of foreign mercenaries was stopped and the rich could not buy an exemption.

However, the most noteworthy and long lasting reform was the creation of the General Staff system to administer, train, and lead this new army. This measure proved the most unprecedented and intellectually revolutionary of all the reforms in the commission's efforts. The Prussian Army meticulously selected, organised, and empowered the best officers — intellectually and professionally — to function collectively 'as a single' brain responsible for strategic and operational planning, as well as for the direction of operations once hostilities commenced.

Creation of the General Staff system was indeed one of the greatest military transformations of modern times. Its success lies in the fact that even today, almost all the modern militaries follow a similar staff system. The achievements of the reorganisation commission provide a persuasive example of institutional intellectualism as an agent for military transformation. Working under a mandate from King Frederick, the commission operated within, and as a function of, the military system. Moreover, it enjoyed a degree of intellectual freedom and engaged in a critical exchange of ideas that were remarkable for the time. Eventually, the General Staff system itself became an epitome of institutionalised intellectualism.

18. Boot, n. 1, p. 121.

OVERCOMING ASYMMETRY

Modern warfare has a unique dimension, not seen in earlier periods: that of asymmetry. In the era of hand to hand combat or even in the age of edged weapons, it was not possible for a hugely inferior adversary to consider combat with an overwhelmingly superior enemy. Of course, there were instances when smaller forces defeated much larger forces but the difference between the two forces was not greater than a factor of two or three. In the age of firearms, the difference went up to as much as a factor of ten or twenty, as was the case during most of the colonial conquests, but in the last two decades or so, certain groups have challenged militaries that have a hundred times more personnel in their ranks, budgets that are thousands of times greater, and technology that is many generations ahead. Conflicts in Afghanistan and Chechnya reflect this trend.

The difference in technology between some of the modern militaries and others, including non-state groups, is ever increasing. But technology has its limitations too. Today, so great is the stranglehold of technology and so prohibitive the cost that it has become virtually impossible for militaries to deviate from planned trajectories even when the environment itself changes. The dependence on technology has increased more than on any other resource, in fact, on many occasions at the expense of other capabilities. It is routinely lamented in Western literature that so much money was spent on spy planes and so much faith attached to them that Human Intelligence (HUMINT) as a resource was neglected to the detriment of accurate intelligence.

Just as the militaries became fixated with technology, the technologically impoverished adversaries transformed themselves to blunt the technological edge of the militaries. Realising that it was not possible for a technologically challenged adversary to fight and win in a conventional war, the adversary chose to fight in an unconventional manner. The established militaries were caught off guard. In Vietnam, Chechnya, Iraq and Afghanistan, the most powerful militaries of the time were hard pressed to counter the transformed enemy. The more astute (adversaries) came to understand that the Information Age offered new opportunities for "asymmetric

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warfare" – the ability to inflict great damage on a powerful adversary by using unconventional weapons.[19] Nimble, flexible and networked groups like Al Qaeda are far more willing to experiment and change than large militaries that are happier to follow established procedures and Standard Operating Procedures (SOPs). Money, an important resource to effect any change, is made available to modern militaries after an inordinately long vetting process, but can be spent without any accountability by groups like Al Qaeda.

As the world painfully learned on September 11, 2001, the challenges of the new century are not as predictable as they were during the Cold War. No one could have imagined that terrorists would hijack commercial airliners, turn them into missiles and use them to strike the World Trade Centre, killing thousands of innocent civilians. It can be correctly assumed that we could be surprised again in the time to come by new adversaries who may also strike in unexpected ways. The US today has unparalleled land, sea and air power and it makes little sense for potential adversaries to compete with these strengths. So rather than building competing armies, navies and air forces, they will likely seek to challenge the US asymmetrically. Similarly, other groups all over the world will be looking to exploit the vulnerabilities of the established powers and building capabilities with which they can exploit them.

So what can the militaries do to counter the new threat? Quicker reorientation, faster equipment acquisition process and flexibility to effect rapid changes based on circumstances could be some of the issues worth examining. This too is a facet of transformation. In Afghanistan, fighting the first war of the 21st century, the horse cavalry was back and being used in previously unimaginable ways. Coalition forces employed existing military capabilities, from the most advanced laser-guided weapons to the

19. Ibid., p. 351.

most elementary, a man on horseback. Technology and legacy were used together in unprecedented ways, with devastating effect on the adversary's physical assets as well its morale. Of course, as militaries transform, they must not make the mistake of assuming that the experience in past wars or for that matter even current wars presents them with a model for the next war. Preparing to fight the last war is a mistake repeated throughout much of military history.

An ability to adapt will be critical in a world where surprise and uncertainty are the defining characteristics. Preparing for the future requires thinking differently and developing the kinds of forces and capabilities that can adapt quickly to new challenges and to unexpected circumstances. To achieve this, militaries have to put aside the established ways of thinking and planning, take risks and try new concepts.

OVERCOMING TANGIBLE BARRIERS

A range of very practical hurdles challenges transformation. Limitations of available technology, shortfall in quantity and quality of human resource, limitations of budgetary and material support, different demands and trajectories of each Service, civil-military relationship of the society, reluctance to change and fear of losing turf are some of the issues that could slow down the momentum for change.

Technology is usually credited as being the main driver of transformation. It has universal applicability, is easily understood and easy to sell. Technology in the military sphere is developing as rapidly (and sometimes even faster) as the changes reshaping the civilian sector. The 20th century witnessed the greatest and fastest exploitation of technology ever, resulting in an increasingly bigger chasm between societies that were in the forefront of technology and those that got left behind. It has been persuasively argued by Alvin Toffler and many others that the rate of change is ever increasing and the gap between generations of technology is reducing. In less than a hundred years, tanks, submarines, aircraft, radio, nuclear weapons, ballistic missiles and precision weapons amongst many other inventions transformed the way wars were fought. Never before in the history of

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warfare had military hardware changed so fast. Swords and spears were in vogue for thousands of years, longbows and firearms for hundreds of years, sailing ships and cavalry for as long but in the last one hundred years, the changes have been fast and furious. By the time the Cold War ended, computers and information technology were seen as the next big change, to be followed by lasers, robotics and artificial intelligence. In the 20th century, transformation in modern militaries had become synonymous with technology. The last hundred years have perhaps seen more change than the previous two thousand put together.

Paradoxically, all this changed with the advent of the information age. James Blaker in his book *Transforming Military Force,* said that in the Information Age, technology is available, not just to the relatively wealthy, industrialised, educated or endowed nations but to anyone who has the incentive to innovate.[20]

How does this affect military transformation? In fact, it has been argued earlier in the paper that transformation is usually the result of intellect rather than technology. Indeed, but that was true when two adversaries enjoyed contemporary and similar technological capability as was the case with the French and Spaniards in 1521 or the Germans and British in 1939.

While technology alone may not bring transformation, lack of technology can certainly hold back transformation or at least make it prohibitively expensive. The Russians were the first to articulate the need for a military transformation but could not achieve it as they failed to exploit the emerging technologies. It can be argued that lack of technology can be overcome by buying it. Of course, but this has huge limitations and comes with a price either in terms of prohibitive costs or losing a certain amount of sovereignty at least in so far as independent policies and decision-making are concerned or in terms of granting concessions to the seller. Even then, the technology

20. James R. Blaker, *Transforming Military Force* (Westport: Praeger Security International, 2007), p. 36.

on offer may not be the best that is available. It would be naïve to assume that technological lead can be created by buying it.

Not only is it important to gain mastery of the current technologies, it is even more important for military leaders to visualise the potential of futuristic technologies and invest both human and material resources. It is vital for a military and society to work together to take full advantage of what technology has to offer. The lack of the Indian armed forces' involvement, especially the Army and Air Force, in pursuing high technology projects along with scientific and industrial complexes, is baffling. The military must have the agility to explore technologies that do not address an immediate threat, but could itself pose a threat in the future if it was aggressively pursued by an adversary or a potential adversary. In this context, it would be prudent for a military to identify future technologies and assign some bright officers to pursue their progress. This has to be a continuous process.

There is, of course, the counter argument that information technology has flattened the technology dispersal. Few, if any technologies, much less scientific concepts, will remain the property of one country for long in the Information Age. While this is true to a great extent, it cannot hope to eradicate the large amount of differential between various countries in the exploitation of Industrial Age technologies. Mere availability of theoretical knowledge on the internet cannot ensure that a nation can produce jet fighters or tanks or battleships.

A change is perceived as a transformation when plotted against time. The notion of "transformation" itself is problematic, primarily because the term has come to mean almost anything pertaining to change, but also because there are no defined time-frames. It is germane to highlight the immutable factor of time. Transformational changes take years, even decades to take effect. The Prussian reformers put sweeping socio-political-military changes in place between 1807 and 1812. As a result, the Prussian Army performed significantly better in the campaigns of 1814 and 1815 against Napoleon; yet the full return on their intellectual labour was not fully realised until the wars of 1866 and 1870, in which the Prussian Army defeated Austria and France and established the Prusso-German nation as the greatest

Organisations that have successfully transformed have usually had a few senior leaders who understood the new environment and brought about change in complex organisations serving for a long period of time.

power in Europe. When seen through the prism of history, it presents the dilemma of elasticity of time; changes spread over say 50 years, as was the case with Prussian military reforms and their subsequent effect on the battlefield, look almost as a point in time now, whereas changes spread over ten years today appear to be taking inordinately long to fructify, leading to finding of faults with the system.

We have seen that even the most dramatic change in large military organisations usually spans a decade or more. Whenever, such changes have taken place in the past, there has been a leader, an officer or a team of officers that has been involved with it for a fairly long time. This ensures continuity of vision and commitment to the cause. On the other hand, frequent changes in leadership are likely to leave the ship rudderless. The levels of commitment of different officers will be dissimilar and it is quite possible that some of the later incumbents may actually reverse the change. This is a typical phenomenon in modern militaries where nobody has a sufficiently long tenure.

The personnel policies of the militaries today typically rotate officers out of assignments every two to four years. This posting cycle may be adequate and even appropriate for officers whose responsibilities are direct and continuous and deal with the day-to-day running of units such as operations officers, commanding officers and flight commanders. It is, however, less desirable where they are tasked with effecting military transformation. Here the officers are dealing with long-term projects that have huge costs and a large number of variables. A frequent change in officers handling such projects is likely to disturb the planning and execution of the project. Besides, an officer not connected with the vision is far more likely to succumb to the lobby, resisting the change, than one who visualised the project. Organisations that have successfully transformed have usually had a few senior leaders, who understood the new environment and brought

about change in complex organisations, serving for a long period of time compared to typical officers' tenures. While it may be naïve to ask for long tenures at the highest levels in modern militaries, it may be far more practical to assign middle and junior level officers to projects for longer durations.

Intellectual efforts to drive transformation will always have to contend with traditional conservative elements supporting the status quo and resisting change.

Human resource transformation is often the most difficult to accomplish yet can be most critical to successful transformation. Uniformity and creativity are two ends of military thinking. Uniformity is required to fulfill the basic functions of the military; and creativity is required for the military to move forward. Military organisations exert strong pressures on the individual to conform. These pressures are cultural blocks to creativity which tend to reduce the potential leaders to mediocrity. An existing system creates its own vested interests which in turn fosters barriers to change.[21] Any organisation whose culture inhibits critical self-assessment, learning and rigorous experimentation, is unlikely to succeed in covering new ground. It is essential for leaders to recognise when new career paths need to be supported to fully realise the potential of an emerging war-fighting capability.

Donald Rumsfield, the American Secretary of Defence, had said, "The roadblocks to military transformation are enormous, and overcoming them requires leaders who believe in, and advocate, the changes being introduced."[22] Most people have an inherent tendency to want to stick with what they know and are comfortable with rather than change. Instituting change, particularly in a large organisation like the military, requires far more than issuing a directive or barking an order. People can be commanded to implement a change but they need to be persuaded if the change is to become permanent.

21. Nazareth, n. 5, pp. 38-39.
22. Donna Miles, "Rumsfeld Shares Transformation Philosophy with Chinese Military", American Forces Information Service News Articles, accessed at http://osd.dtic.mil/news/Oct2005/20051020_3102.html, on June 04, 2011.

Intellectual efforts to drive transformation will always have to contend with traditional conservative elements supporting the status quo and resisting change. More importantly, transformation requires changing culture and attitude besides changes in weapons and systems and consequent budgetary and manpower allocations. With every change, there will be sections within the military that will lose importance and others that will gain. Those who expect to lose turf are most likely to resist.

A significant obstacle is a military brass wedded to existing weapon systems, strategy and organisational structure. In the US, the military brass was content to let Defence Secretary Rumsfeld talk about transformation as long as his plans didn't interfere with their own priorities. He wanted additional spending on missile defence, satellites and intelligence while they had their own shopping lists: new ships, airplanes and armoured vehicles, as well as more people to operate them. Everything changed when Congress passed the $1.35 trillion tax cut and the Administration signalled a limit on defence budget increases, making it clear that there probably was not enough money to fund the differing desires of Rumsfeld and the Joint Chiefs.[23]

Just as there is acute competition between the different organs of the state for resources and money, there is even greater competition within the different Services of the military. The air, land and naval forces compete with each other for a greater share in all aspects of existence; from a greater doctrinal role to increase in defence allocation to buy more weapons and equipment to pitching in for additional manpower. At an even lower level, there is competition within the elements of each Service; tanks vs artillery or manned vs unmanned aircraft or submarines vs aircraft carriers. Different departments and directorates try to sell their idea of operations. Under such conditions, a coherent transformation programme is extremely difficult to implement. It is not unusual for a commander to shelve a programme in favour of another, just because he happens to be from that stream of the military.

23. Thomas E. Ricks, "For Rumsfeld, Many Roadblocks, Miscues and Resistance Mean Defense Review May Produce Less Than Promised," *The Washington Post*, August 07, 2001, accessed at http://www.washingtonpost.com/ac2/wp-dyn/A28526-2001, on June 03, 2011.

There is also the issue of synergising transformation efforts. Unless this happens, various elements will transform independent of each other. This will not result in the whole being greater than the sum of the parts. New capabilities, specially weapon systems, are very expensive and must be integrated with existing systems and capabilities. There is an inescapable requirement to streamline the whole process of transformation. Somebody has to be in charge of the whole process. It is too expensive to be frittered away in penny packets.

Modern military transformation is not confined to the military sphere but requires considerable civil-military interaction.

Modern military transformation is not confined to the military sphere but requires considerable civil-military interaction. These interactions may concern tangible elements such as commitment of budgetary support and manpower to transformation efforts. On the other hand, transformation may be stymied if deemed inconsistent with a society's history, norms, and collective memory. Balancing the "societal imperatives" emanating from the civilian realm and the "functional imperatives" from the military realm can be the source of considerable tension.[24] Interaction between the military and civilian leadership, thinkers and elites is necessary to ameliorate these stresses. This interaction often involves an exchange of information concerning the costs and benefits of a particular transformation programme. In certain cases, the rationale and benefits of a particular transformation initiative are fairly obvious, and this communication can occur smoothly.[25]

Changes do not stop with changing just the uniformed personnel but must extend to the elected representatives who must stay updated with

24. Samuel Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Harvard University Press, 1957), p. 2.
25. For example, at the end of the Cold War, it was fairly obvious to European civilian and military leaders that their militaries could downsize given the dramatically reduced likelihood of a conventional war in central Europe. These force reductions had the readily apparent benefit of freeing up resources (i.e. a "peace dividend") for other purposes. Jolyon Howorth, "The Transformation of European Military Capability," in Curtis Gilroy, ed., *Service to Country: Personnel Policy and the Transformation of Western Militaries* (Cambridge, MA: MIT Press, 2007), pp. 37-40.

Transformation is born of intellectual energy, but it can succeed only within an institutional framework wedded to the system.

the security scenario, civilian officials who must become more agile and flexible in their approach and to defence industries which must respond by changing their operations to produce the new or different equipment needed.

ANALYSIS

Military transformation has been the greatest driver of history. If one were to reflect on history for a moment, the most notable events that come to mind are the great military conquests by Alexander, Genghis Khan, Hannibal, Babur, Napoleon and many others, depending on the history books that one has read. However, what is common in all these is that each one of these victories was won not by overwhelming force but by sheer genius, innovativeness, employment of new weapons and sometimes of older weapons but in a novel way, and bold experimentation. The record for the vanquished is equally unvarying; failure to learn the new ways of war-fighting.

Just as visionary minds have changed the world, stagnant minds have been the roadblocks to progress. We live in a world where the system runs because most people conform to the laid down norms and nowhere is this truer than in the military. However, a deeper study of military history reveals that conformity, while vital to success at the tactical level, has usually lost to creativity at the higher levels. It is not easy for a military to discard the known for the unknown as the price of failure could be survival itself. On the other hand, not staying ahead of change could be equally self-destructive. Therefore, the only option available with militaries is to encourage radical thinking and innovative ideas but implementation after rigorous experimentation. A culture of creativity and intelligent risk taking is essential to foster transformation.

Transformation is born of intellectual energy, but it can succeed only within an institutional framework wedded to the system. Organisational endorsement as granted by King Frederick provided indispensable legitimacy to the Prussian military transformation. In the United States, the creation of

the Office of Force Transformation under the direct purview of the Secretary of Defence was a similar exercise that carried out transformational activities during the better part of the last decade. Transformational changes need institutional backing.

We have seen earlier that military establishments are averse to encouraging radical thinking and, yet, unless there is new thought, there is no progress. With the higher standards of education and the democratisation process in the society, better results can be attained by fostering the individual soldier's intellect and innovativeness. The Israeli Army is an excellent example of a military that evolved into one of the best fighting forces without the restrictions of conformity and entrenched mindsets. However, for militaries with glorious histories and long standing traditions such an approach, though desirable, may be impractical. Establishment of think-tanks is one of the ways by which leadership at all levels can benefit from the creative thinking of those inclined towards it without disturbing the conformity required in the rank and file of the military. However, this can only succeed if the organisation provides active encouragement and wholehearted support. It is unfortunate that militaries reserve their best officers to carry out tasks that are mundane and need no greater intellect than following the drills rather than freeing them up for higher level thinking.

Modern militaries operate over many domains simultaneously. Air, land, sea and space, besides cyber forces, must cooperate and coordinate their operations to achieve success. However, when it comes to effecting change, each of these forces, led by different leaders, tends to follow its own culture and trajectories. Surprisingly, even the acquisition and procurement procedures could be different. The combined arms approach has been in vogue for the last five hundred years or so and is only getting stronger. Therefore, it is essential that all the three Services synergise their transformation effort so that the doctrines, organisation structures and equipment are in sync with each other. The Indian armed forces are hurtling towards transformation at breakneck speed and will be spending colossal amounts of money on new equipment. They must ensure that there is coherence and coordination between different elements of the military, and that the money is well spent.

Transformation takes time to achieve. Therefore, officers involved in transformational activities need to be given longer tenures and encouraged to undergo rigorous academic study. Effecting transformation requires a flatter and nimble bureaucracy that is forward looking rather than precedent based.

Besides building new capabilities, transformation also requires rebalancing existing forces and existing capabilities. For example, the experience in Afghanistan showed the effectiveness of the unmanned aircraft. But serious students of warfare knew of its seminal role in action by Israel *two* decades earlier. However, the Afghanistan experience also revealed how few of these aircraft were available even with the US military and what their weaknesses were.

CONCLUSION

Transformational changes in warfare occur when new technologies and tactics combine to reshape the face of battle. Although many transformations are rooted in technological innovations, a successful transformation requires adaptations in mindsets, military organisation, training and doctrine. And if there is a single dominant factor to explain why some militaries have managed changes better than others, it is not technical genius but rather forward thinking and visionary mindsets.

Visionary leadership, foresight, innovative thinking and organisational encouragement are as important as technology. As far as intellectual and doctrinal innovation is concerned, it seldom evolves in response to top-down guidance. Breakthroughs in theory usually come from operational practitioners and academic researchers with deep insight. Assignments dealing with transformational activities must be staffed with the "best and brightest" to ensure that the highest calibre of intellectual power, energy, and vigour is applied to transformation activities.

When militaries do manage change properly, the rewards are impressive. The importance of not missing out on the next big change in warfare should be on the mind of every military leader.