Approach to Revolution in Military Affairs (RMA) and Information Warfare (IW) : A Perspective

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Revolution in Military Affairs (RMA) is not only important to military but is also a political and strategic tool for global and regional security policies of the future. It is a metaphor for the politico-military establishments of the countries to prepare in advance for likely wars and conflicts of the future. The term had acquired a certain salience of its own in the 1990s based on the use of high technology exhibited by the US Armed Forces and concepts, practices and doctrines propounded by them leading to their victory in Operation Desert Storm of 1991 in Iraq and successes thereafter in Serbia and Kosovo. Admiral William Owens of the US Navy had visualised a 'system of systems' concept based on linking all the relevant entities of command, control, communications, computers intelligence, interoperability, surveillance and reconnaissance (C412 SR) and bringing them on one unified grid to achieve synergies in effects.

Once the Bush government took over, this term in the US military parlance has increasingly been replaced by 'defence transformation' which according to some viewers is less unsettling while another view is that it is a more broad based, comprehensive and versatile concept covering the entire gamut of defence and security concerns of a nation. Even though the US military is dictating the dominant discourse in military literature and military affairs yet the other militaries are largely using the erstwhile term of RMA considering 'defence transformation' to be more of a rhetoric. However, the fundamental objectives of the RMA and defence transformation revolve around evolving military capabilities to protect national interests increasingly being impacted upon by forces of globalisation and ever changing geo-political and geo-strategic contexts.

Both Chinese and Indian militaries have embarked upon the path of ushering in the RMA into their respective Armed Forces

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after having witnessed the impact of tools of technology on conduct of warfare in recent US campaigns. There have been many studies and analyses which have forecast that 21st Century would be an Asian century dominated by two major growing economies of Asia, i.e., China and India. According to one forecast their rates of growth are such that China is likely to become the second pole of the bipolar world by the end of first quarter of this century and India would be the third pole, albeit weakest of the poles, of a tri-polar world by the end of second quarter of this century. It is expected that their economies would release enough resources for the modernisation of their militaries without neglecting development in other areas of national endeavours. It is quite evident that a strong economy growing at a steady clip would sustain the momentum of the RMA.

Acquisition of strategic and niche technologies, evolving innovative concepts to use new technologies, managing people and organisations to get the best value and worth from the resources would always be a challenge in moving towards the RMA in both Indian and Chinese militaries.

Factors Influencing India's RMA

Political, economic, technological and strategic factors influence to a very large extent the quality and speed of occurrence of RMA. Indian approach to RMA is, therefore, shaped by:-

(a) Geo-political and geo-strategic contexts and security concerns arising from these.

(b) Fiscal pressures.

(c) Technology imperatives.

(d) Social and cultural context.

Political purpose or policy in Clausewitizian parlance dictates the objectives to be achieved at the national level. Military strategy would only be a sub set of the over all national strategy to achieve national goals. The security challenge facing India is diverse, complex and evolving. Instability in our neighbourhood and extended neighbourhood sharpens the threat to our security. Our strategic thinking is influenced by what happens in the Indian Ocean, West Asia, Central Asia and South-East Asia.

Prime Minister Manmohan Singh, during his address to Combined Commanders' Conference in October 2005, observed "To meet national security challenge, our strategy has to be based on three broad pillars. First is to strengthen ourselves economically and technologically; second, to acquire adequate defence capability to counter and rebut threats to our security, and third, to seek partnerships both on the strategic front and on the economic and technological front to widen our policy and developmental options"[1]. Thus introduction of cutting edge technologies both in the field of defence and civil becomes equally important. Even though preference to economic development over military development is given, it is possible to proceed simultaneously in both the areas once a certain level in economic development and capabilities has been reached. RMA which is a priority for the armed forces need not be a priority at the national level because of competing needs of other more important civil sectors which need funds for development.

India's core defence policy goals as outlined by our Defence Minister recently are protecting and safeguarding India's territorial integrity and sovereignty. Ensuring the security of sea lanes and other means of securing energy supplies becomes vital for our national security energy. Our defence and security policy is, therefore, dovetailed with the larger national mission of rapid economic and social development and to ensure a peaceful internal and external environment, in which such development can be pursued. As for social and cultural context, India has generally emphasised on soft power and non-military means to pursue conflict resolution because non-military measures are invariably needed to evolve durable solutions. Further, development of human resource in terms of education, improved health also contributes to improved quality of manpower available for both civil and military purposes.

Yet, at the military level, India's situation is unique in that it faces threats along the entire spectrum of war and conflict ranging from sub conventional warfare at the lower end to a high end threat of a nuclear conflagration. Therefore, Indian Armed Forces have to be prepared to meet challenges along the entire range of war and conflict. This adds to the complexity of moving towards building a RMA enabled military.

The drivers or motivators for RMA in China and India can generally be perceived to have some common denominators like

keeping up with the peer competitors, reducing the technological gaps with modern militaries besides national security and strategic concerns. A National Intelligence Council (NIC) Report of the US (in 1999) had observed that among the countries considered, India, China, Russia and Australia have the greatest potential to achieve RMA[2].

Characteristics of Indian RMA

One of the major benefits of the RMA is perceived to be the reduction in manpower because technology enabled forces can achieve the same or better combat value with new tools and weapons of technology but with reduced manning levels, Further, the reduction in manpower generates additional resources which can be again used to spur the RMA. Therefore, in 1998, India had commenced reduction of its armed forces strength, particularly of the Army by 50,000 troops. However, in view of Kargil War in 1999 and intensification of low intensity conflict this process had to be discontinued. Irregular warfare, proxy war and LICO by their nature, need large number of troops to counter and manage the threat. Our forces remain heavily committed in counter insurgency (CI) operations and, therefore, this restrains us from moving towards our goal of right-sized Army. Although, increasingly paramilitary forces are being trained and being handed over CI missions, yet this process is expected to take some time.

Though the current phase of the RMA is said to have begun in early 1990s, Indian Armed Forces were not in a position to emulate some of the lessons learnt from the Gulf War because of economic constraints. Prior to 1990s. Indian military was in a consolidation phase with little or a few incremental steps towards modernisation. In mid and late eighties the emphasis was towards increased mechanisation and acquisition of air borne and missile capabilities. However, budgetary support for such modernisation programmes was not forthcoming at desired levels. A stage at the beginning of 1990s had been reached when percentage of capital budget available for modernisation was just enough to meet the past contractual obligations and no resources were available for fresh programmes and even the revenue budget was getting impacted upon adversely. The new economic policy introduced in 1991, revolutionised the Indian economy and since then rate of economic growth has been following an upward trajectory.

Fortunately, by the time the Kargil conflict took place the Indian economy had turned a corner which enabled release of additional funds for defence effort in the aftermath of Kargil. Thus revolution in economic affairs preceded revolution in military affairs.

Added to the above were the defence reforms carried out in 2001 to evolve integrated and joint structures for higher defence organisation in order to face the emerging threats and consequently achieve the goals of the RMA. These reforms have achieved some degree of maturity. Formation of Headquarters Integrated Defence Staff has been instrumental in adopting an integrated and joint approach towards the RMA. Streamlining defence procurement procedures, involving private sector in defence production, spurning research and development taking long term perspective in defence planning and budgeting, up-gradation of quality of personnel in the armed forces and rationalisation of manpower were among many of the key defence reforms recommended by a Group of Ministers Report of 2001.

At the present juncture our armed forces are in transition from industrial age forces to knowledge age forces with a portion of forces being RMA enabled. While the Army has a larger element of industrial age forces, the Navy and the Air Force which are more technology intensive forces and less manpower intensive, are much better on the RMA scale. Transition from industrial age force to knowledge age force is not an easy task and takes considerable time and resources. Therefore, Indian approach to RMA can be termed as one of 'incremental gradualism' where general direction of advance of RMA has been recognised and set in motion but the same gets impacted by a number of impeding factors unique to Indian conditions. Essentially, the aim of home-spun RMA is to evolve capabilities that meet our needs and give us an edge over potential adversaries.

Components of RMA

According to the Indian Army Doctrine of October 2004 'RMA is termed as a major change in the nature of warfare brought about by innovative application of new technologies which combined with dramatic changes in military doctrine, operational concepts and operations, fundamentally alters the character and conduct of military operations. Therefore, major constituents of RMA are doctrine,

technology, training and evolving suitable organisations to meet the challenges of new nature of warfare. Thus, components of RMA which have been focus of attention in the Indian Armed Forces are:-

(a) Innovative doctrine and operational concepts.

(b) Strengthening C4I2SR systems.

(c) Improving information warfare capabilities.

(d) Adopting a Network Centric Warfare and Effect Based Operations approach.

(e) Achieving capabilities in long range precision strikes, sensors, Unmanned Aerial Vehicles (UAVs) and space support for force multiplication of air and surface forces.

(f) Evolving joint and integrated structures and organisations and enhancing jointness.

(g) Attracting knowledgeable personnel, and training them for knowledge age wars.

(h) Spurring research and development and strengthening self-reliance in defence industry.

Doctrine and RMA

A common military doctrine is a must to prosecute war and conflicts in all their complexities. Joint doctrine not only gives a common perspective but also provides an authoritative guidance for the Armed Forces. Joint doctrine is essential for success because organisational synergies to be gained from joint efforts of our armed forces are as important as new military technologies which we may use for future operations. Towards achieving the goals of RMA a **Joint Military Doctrine** has been formulated and released in April 2006. Purpose of the doctrine is to achieve inter-service synergies, augment operational efficiencies, and foreclose duplication of assets in areas like communications and network centric warfare. The joint doctrine complements the recently revised single service doctrines that have already been promulgated.

In October 2004, a formal Indian Army Doctrine was promulgated which highlights the influence of RMA on armed forces

thinking and, therefore, the need to evolve new force structures, induct new weapon systems, and formulate new operational level doctrines and concepts as a consequence of impact of RMA. The Doctrine states that Indian Army has to maintain a high level of readiness in varied terrain conditions and it should have the capability to operate in complete spectrum of conflict. Thus, the doctrine has been evolved based on experience in wars as well as the experience of the US Armed Forces and coalition partners in recent campaigns.

The doctrinal changes in the Army Doctrine were as a response to changing environment and experience after Operation Parakram of 2002 and Kargil conflict. The doctrine was conceptualised to overcome delay in mobilisation of heavy strike elements which were largely industrial age formations. The new doctrine envisages a number of task oriented Integrated Battle Groups penetrating into adversary's territory from a cold start and executing their assigned tasks quickly within a period of a week to ten days before any international pressure can be brought to bear. The new doctrine involves exploitation of all the elements of the RMA in an integrated and joint fashion to become effective. It can be compared at certain levels to the Chinese concept of War Zone Campaign and their emphasis on Rapid Reaction Forces, use of elite forces to achieve political objectives, and force a quick resolution of dispute.

The Air Force and the Naval doctrines both emphasise strategic reach of their respective Services and the need to operate in joint Services environment in order to achieve synergies of defence effort.

Information Technology (IT) Based RMA

Information technologies are the DNA* of the current RMA and C4I2SR systems form the backbone. India is witnessing a boom in IT sector and its strengths are being leveraged to impart momentum to enhancing our capabilities in C412SR sphere. Overall approach is to create an integrated Defence Communication Network (DCN) at the strategic level that will bring relevant entities on one common high speed network to respond to

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*Denyribonucleic Acid - Contains the genetic instructions for the biological development of cellular form of life. It is in this sense, but in a generalised manner, the term has been used with reference to RMA.

national emergencies and crises where inter agency and joint Services response is envisaged. Adequate bandwidth to cover real time voice, data and imagery is being ensured. This is in addition to the individual service networks. Currently, the Indian military is placing emphasis on IT, information warfare and Network Centric Warfare (NCW) in its attempts to move towards a knowledge age military and C4I2SR systems are essential components of this endeavour. Finally, the objective is to have seamless integrated network architecture at the operational levels with increased levels of interoperability to maximise combat power.

The importance given to IT by the Army can be gauged by the fact that two three star Generals, that is, Director General of Information Systems and the Deputy Chief of the Army Staff (Information Systems and Training) are looking into this new dimension of warfare. Further, one of the Corps' has been experimenting with information systems and has been nominated as test bed for new information technologies. The aim is to bring up a portion of the Army quickly to desired levels of expertise and then pass it on to the rest of the Army.

Meanwhile, the Air Force is in the process of completing a state-of-the art wide area network (WAN) with adequate bandwidth and redundancies that would give high speed connectivity to all the entities. An imagery dissemination system is also being set up that would use the WAN system to ensure that latest UAV imagery and satellite pictures are available to the pilots and to other Services through DCN in real time. This network would also enable merging of information available with different operational areas to present a unified view of operational data. This would improve shared situational awareness and synchronisation, which are the pillars of NCW.

The Navy was first in achieving high speed connectivity between shore establishments, ships, other naval platforms, and logistics installations. The Navy has identified two key thrust areas in the field of IT - networking and e-enabled solutions. The objective is to obtain a common operational picture and have capabilities to ensure total asset visibility.

Salience of Information Warfare

The more we rely on information networks more is the likelihood

of these being disrupted by the adversary and its resultant impact on conduct of operations, In fact, in the knowledge age warfare the main goal to be achieved is the destruction or neutralisation of C4I2SR systems leading to psychological paralysis of the decision making apparatus of the adversary thus reducing effectiveness. Indian Army doctrine defines IW as actions taken to achieve *'information superiority by adversely affecting the adversary's information, information based processes, information systems and computer-based networks whilst simultaneously protecting one's own information, information based processes and computer-based networks'.*

There are seven forms of IW. These are Command and Control Warfare (C2W), Intelligence Based Warfare, Electronic Warfare, Psychological Warfare, Cyber Warfare, Economic IW and NCW. While the dimensions of some of these forms like psychological warfare, Cyber Warfare and Economic IW may extend beyond the military realm others may largely be confined to the military arena. At a larger level the aim is to alter the perceptions of the opponent to influence his plans, actions and objectives by using IW techniques.

Indian approach to IW is again one of a joint and integrated effort. A joint IW doctrine has been formulated to synergise the efforts of the three Services. Our defence forces having recognised the benefits of jointness and IW had established a Defence Information Warfare Agency (DIWA) under the tri-Services Headquarters Integrated Defence Staff. DIWA is the nodal agency and the apex policy-making body to coordinate the IW activity of the Services. It also has linkages with National Information Board and provides it with military inputs. At the national level the threats to information systems are responded to by National Computer Emergency Response Team (NCERT) which consists of a number of experts in the required domains. Even the Army has organisation for responding to cyber attacks, which has been termed as Army Computer Emergency Response Team (ACERT).

Moving Towards a Network Centric (NCN) Approach

NCW focuses on combat power that can be generated by effective linking of war-fighting machinery and the organisations. Indian Armed Forces are in the initial stages of moving from a

platform centric approach (a characteristic of the industrial age type of warfare) to a network centric approach which in effect defines information era wars. Fundamental aim of being NCW - enabled is to connect sensors, decision makers and shooters in one common grid in order to achieve improved mission effectiveness, improved speed of command and matching response and self synchronisation. It provides a shared common operational picture. NCW generates higher levels of operational efficiencies and both traditional and new capabilities can be used with speed and precision.

A jointly networked force generates increased combat power and enhances the ability of the force to transform into a seamless and well oiled military machine. It is increasingly being recognised that smaller joint force packages suitably networked can possess more flexibility and agility and are able to yield greater combat power at the points of decision. The three Services recognize the benefits of a networked force and NCW and have introduced a number of systems and architectures to improve connectivity with sensors, decision makers and shooters.

Long Range Precision Strikes and Surveillance Assets

Precision engagement is considered as one of the most important aspects of the ongoing RMA. The benefits of Percision Guided Munitions (PGMs) are well known. The precision weapons substitute mass for effects. They enable concentration of effects from geographically widely dispersed forces, contribute to reduced logistics tail and help in reducing collateral damage. Therefore, increasing the accuracy and range of missiles and developing and acquisition of a family of PGMs is receiving greater attention in our armed forces.

Long range of weapon platforms are of no use unless they are complemented by matching surveillance, target acquisition, battle damage assessment and weapon guidance capabilities. Therefore, besides ground based and air borne early warning systems, the space based assets assume importance for imparting force multiplication effects to air and surface forces. Thus, space is another area which is being used basically for communications and navigation and we are in the process of increasing our ISR capabilities. Another area which has been focus of attention is both

development of indigenous UAV and import of UAV's to add to our ISR capabilities.

RMA and Jointness

Jointness is recognised as an essential ingredient for a meaningful RMA to occur. Defence reforms to move towards jointness have achieved some degree of maturity but more needs to be done in this field. Meanwhile we have a joint tri-Service Command in the shape of Andaman and Nicobar Command. We regularly hold joint Air-Land training exercises and tri-Service amphibious exercises to hone our joint skills. However, we are yet to evolve Joint Logistics Units like the one fielded by the Chinese People Liberation Army (PLA) in July 2004 in Jinan Theatre even though some of the logistics functions of the three Services like provision of supplies are performed by one common agency.

Upgrading Quality of Personnel

Knowledge age wars require knowledgeable personnel and thus Indian military has been emphasising on inducting personnel with higher educational qualifications with technical bent of mind. The qualification for a soldier at intake has been increased to at least tenth standard pass. With increase in general levels of education standards a large number of well qualified soldiers are joining the forces.

All the officers have graduate level qualifications and are encouraged to acquire post graduate level qualifications either through in service long courses or through grant of two year study leave. Even the non-technical Arms and services have increasing numbers of officers with technical degrees. A large number of non-technical officers go for acquiring degrees in computers and IT related fields during their study leave. However, problems of attracting and retaining talented people remain because of the booming civil economy and better prospects offered in the civil arena. Further, the aim at lower levels is to make the soldier multi skilled in order to meet the objectives of downsizing, achieving flexibility in employment and improving their career prospects.

At the higher levels of leadership, officers are put through training capsules and courses at higher institutions of learning to make them aware of the new doctrines, security related aspect

and impact of new technologies on RMA. A National Defence University is also established to coordinate such efforts.

RMA, Research and Development (R&D) and Defence Industry

For RMA to occur in a substantial manner a world class defence manufacturing industry that would be self reliant and sufficient, is a necessary pre condition. Our defence procurement procedures have been streamlined and policies changed to encourage private and foreign participation in defence industrial sector. The objectives are to achieve synergies of both civil and government sectors by integrating their capabilities. Technological and science skills, management capabilities and ability of civil sectors, to raise resources would be combined with the Research and Development (R&D) capabilities of government laboratories and institutions to produce state-of-the art defence equipment. Further, direct offsets against procurement from foreign sources have been introduced for the first time to encourage transfer of technology and investments from abroad.

Future Direction of RMA

The future direction and pace of RMA would largely be dictated by the budgetary constraints. Presently, the budget is at a very modest level of 2.3 per cent of the GDP. Even in next five years defence plan (2007-2012) the defence budget is expected to be around 2.5 per cent of the GDP. If there is a sustained growth of eight per cent and above in the economy then it may be possible to allot additional budget for the defence[3]. Currently and in the next five year plan there would be added emphasis on technologies, equipment and strategies to counter terrorism. Surveillance, communication equipment and sensors would be major areas for development and acquisition. Cyber security and achieving synergies in the field of information technology would continue to be focus of modernisation.

A long term perspective plan for 15 years (2007-2022) has been visualised to induct elements of RMA in the Armed Forces. It is expected that by the end of this period a larger portion of the armed forces would be RMA enabled though industrial age elements would still co-exist.

Notes

1. Prime Minister Manmohan Singh's speech at Combined Commanders Conference held on 25 October 2005. Same remarks were emphasized in IDSA Foundation Lecture by the Prime Minister on 11 November 2005. See www.idsa_india.org

2. National Intelligence Council Report, 14 October 1999, Global Trends 2015, available at http://www.dni.gov/nic/confreports_buckrogers.html.

3. For instance in 11th Five Year Defence Plan (2007-2012) the defence expenditure is expected to increase by 8 percent every year and is expected to be 2.5 percent of the GDP instead of 3 percent as asked for by the defence forces.