

Military affairs have undergone radical and incredibly overwhelming changes in doctrine, philosophies, and interpretations of what it takes to master the [art of war](#). These changes are not only radical in nature but have increased in frequency and speed of implementation. Some of these changes have been merely shifts in how we think of [military operations](#) but some have been true [revolutions](#) in military affairs (RMA) and, as such, have fundamentally changed how warfare affects the world.

History has proven that the sad truth of the fluid and more rapidly changing philosophies and tools of [war](#) is that they are usually only noticed after the fact, typically catching military (and political) leaders martially flat-footed. The true nature of RMA becomes readily apparent to militaries, which fall victim to the evolutionary principles of survival of the fittest and serve to demonstrate how those unaware of changing times are destined to be represented in textbooks as historical failures. Furthermore, for inexplicable reasons, both military and political leaders seemingly ignore the winds of change until they are consumed by the firestorm that usually accompanies revolutions of any nature. This "head-in-the sand" philosophy only further serves to make RMA more sudden and far reaching in impact.

We serve in our military today at a watershed event in the history of modern warfare. Technology is fundamentally altering the doctrines we study and practice and, for the first time, the changes are not occurring for technology's sake but rather as a consequence of [science](#) fiction-like capabilities only dreamed of just 10 years ago. That, in and of itself, could be argued as an RMA; that the 21st century in contrast to the 20th century serves as an example where technology is driven by change instead of the other way around. This article highlights only one small aspect of the science fiction-like capabilities facing senior leaders of today--the information revolution.

Revolutions in military affairs are defined as. "Major discontinuities in military affairs. They are brought about by changes in military relevant technologies, concepts of the operation, methods of organization, and/or resources available, and are often associated with broader political, social, economic, and scientific revolutions." (1) RMAs can also be defined to include the characteristics of strategic/ operational offensive operations, changes in international affairs, the abruptness of change (from practically instantaneous to more than a 2- to 3-decade period, which is quite rapid given [military history](#)), and typically render obsolete subordinate existing means for conducting war.

The information revolution occurring in the world today has greatly impacted the U.S. Department of Defense (DoD) in truly breathtaking and eye-opening ways, and in truth, takes its impetus from another RMA--the [telegraph](#). The telegraph revolutionized strategic command and control of military forces by facilitating speed of mobilization,

large-scale movement of [armies](#), and, most importantly, provided strategic leaders and statesmen a greater understanding of the military situation. Almost immediately, the floodgates were opened, and the demands of strategic leadership to be routinely apprised of military successes and failures have steadily increased as each new information capability is discovered. Largely though, the strategic impact of the capabilities of the telegraph (even with the advent of the telephone) changed little until the computer revolution, but despite the fact the world's first computers were built for military applications (ENIAC was built to compute field artillery ballistic firing tables), strategic information operations had changed little since the telegraph. Only when the personal computer evolved from the computer revolution did the emerging demands of information dominance have a tool that could maximize information acquisition and denial, information strikes, information-based protection, and information-based movement.

At this point, it is critical to understand that with regards to the information revolution the underlying change is not a result of the computer revolution or the advent of the internet or any other esoteric technological advances, but rather a change in Army thinking that "emphasizes the importance of information, and especially of information dominance over an opponent." (2)

Therein lies the revolution, information and gathering it fundamentally changes how [wars](#) are fought. No longer is it simply enough to have more tanks with thicker armor than the enemy or more planes that carry more bombs than the enemy, but now military forces must have information dominance, complete battlefield awareness, and the ability to see and know the enemy's intentions well in advance of his ability to see us and learn ours.

But how do we know the worldwide information revolution is also a true RMA? First and foremost, information operations represent a major discontinuity in military affairs. General John M. Keane, Vice Chief of Staff, U.S. Army said, "We believe we can move away from the paradigm upon which the M1 tank is built. Which is, survive first-round hit and continue to overmatch an adversary. To, avoid being hit ... because we're going to fight at a time and place of our choosing, our situational awareness is going to be considerably better." (3)

This paradigm shift from surviving direct fire and overmatching your opponent to avoiding being hit altogether through situational awareness is fundamentally and radically different to prior military theory. Much in the same vein as the introduction of the machine gun during the Crimean War (1854-56), the [Civil War](#) (1861-65), and its first true widespread use in World War I served to destabilize military theory in favor of the defense over the offense, the information RMA serves to destabilize our 20th-century reliance on mass formations to achieve tactical and strategic victory by instead forcing us to rely on situational awareness to achieve mass in fires and effects.

The second criterion of identifying RMA is: they are brought about by changes in military-relevant technologies, which is the most recognizable aspect of the information revolution as RMA. Information-gathering systems have proliferated worldwide and have unheard-of accessibility. As changes in Army doctrine call for the ability of [soldiers](#) and [weapons](#) systems to avoid detection or direct fire, technologies, such as the internet, email, video-teleconferences, total asset and in-transit visibility, and other such commercially developed business solutions, become immediately applicable to military applications. Satellites that ordinarily track cargo on trucks, ships, or other cargo transports can now capture every aspect of the battlefield and distribute that information to anyone requiring it virtually instantaneously. This total asset battlefield visibility, if you will, can be distributed on secure internets, via email, or many other data distribution methods. Once again, technological innovation highlights the trend away from mass formations massing fires to dispersed formations massing fires and effects.

Introducing the submarine in World War II as an RMA is similar to the information RMA. With the submarine, the longstanding naval strategy of close blockades of enemy ports had to be abandoned. Even more important, the "hierarchy of power" in [naval warfare](#), which had been established with the advent of the capital ship more than three centuries earlier, had been severely undermined? In as much as the submarine practically negated the naval juggernaut based on capitol and dreadnought-type battleships, information technology is bringing the heavy, ponderous, steel juggernaut of armored formations to a grinding halt.

The technologies that have been introduced into [combat](#) zones, as leaders demand more and more situational awareness and control of assets, have forced an evolutionary change in how [battles](#) are fought. Quantity is not enough; complete control of the battlefield requires complete control of the information on the battlefield. Though how we control, distribute, and mass the effects of combat systems has evolved since the telegraph, the revolution in information operations is a reflection of the speed by which information systems are introduced to the military, the speed by which these systems capabilities are capitalized on, and how they continue to influence the changing doctrine on how to fight wars.

Lastly, we can perceive we are in the middle of an RMA by comparing the broader political, social, and economic impacts of information technologies in today's society with similar impacts within the military. Ten years ago, company commanders did not need email to command or control their organizations, nor did their battalion commanders need email to command and control their company commanders; however, email is a standard information-gathering system used by most military

leaders. Battle hardened [generals](#) and even the most cynical senior noncommissioned officers practically expire if the email server is down for more than a few hours. The fact that government supplies, repair parts, and almost anything else military organizations might need, can be found, priced, and purchased via the internet, is truly astounding. The days of a battalion support operations officer spending hours on the telephone trying to scrounge much needed wheeled-vehicle parts are fast disappearing now that any conceivable part can be found online and delivered next day by express mail services. Truly, every aspect of how we did business within DoD has changed as a result of information technologies, or is approaching change.

Not one of us can escape the presence and impact of information systems in the hallowed halls of military establishments, so why be concerned with one more RMA or transformation of military affairs? Our predecessors survived similar events and clearly we will as well. Just as RMA of the nuclear revolution fundamentally changed the world and how we interact with allies and adversaries, so will the information RMA.

Our changing doctrine reflects our dependence on recently emerging capabilities, and, as such, presents hidden vulnerabilities of which our adversaries can take advantage. For every advantage of information gathering as a combat tool, information weapons exist that could effectively destroy our military. Computer viruses that attack our dependence on off-the-shelf products, computer hackers that target our resources through the computerized systems that control their distribution, and information [terrorism](#) are but a few examples of how our adversaries will take advantage of our dependence on these systems. Civil and military leaders must be fully cognizant of how dependent we are on information systems and what can be done to mitigate the impact of a systems failure. Failure to grasp, move with, and take advantage of this revolution, without fully exploring or understanding where these trends lead, may assure America's place in the history books as the latest victim of the changing face of warfare.

Notes

(1) Center for Strategic and Budgetary Assessments, 2000, http://www_csbaonline.org/2Strategic_Studies/Revolution_hi_Military_Affairs/Revolution_Military_Affairs.htm, accessed 3/10/03

(2) Paul Bracken and Raoul Henri Alcala, *Whither the RMA: Two Perspectives on Tomorrow's Army*, U.S. Army War College, Carlisle Barracks, PA, 1994, p. 4

(3) 33d IFPA-Fletcher Conference, 2002, online at <http://www.ifpafletcherconference.com/marines2002/keane.htm>, accessed 3/10/03.

(4) Center for Strategic and Budgetary Assessments

MAJ Jason Y. Craft is serving as an assistant program manager for personnel airdrop systems, PEO Soldier, Fort Belvoir, VA. He received a B.A. from Longwood University and an M.S. from Florida Institute of Technology. His military education includes the Infantry Officer Basic Course, Quartermaster Advanced School, Rigger School, Jumpmaster School, and U.S. Army Command and General Staff College. He has served in various command and staff positions, to include program manager, Defense Message Service, Headquarters, U.S. Army Europe, Germany; commander, 612th Parachute Rigger Company, Fort Bragg, NC; S3 Air, 530th Battalion, Fort Bragg; and platoon leader, 1st Battalion, 6th Infantry Regiment, 3d Infantry Division, Vilseck, Germany.

Craft, Jason T.

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