Secretary Robert McNamara (head of table) and private industry officials discuss ways to avert nationwide strike during Vietnam War

DOD (Frank Hall)

Is the Conduct of War a Business?

By MILAN VEGO

The U.S. military has long used various business models in managing its bureaucracy and budget and planning its force. During the 1960s, however, the Pentagon used a business model extensively in its conduct of the war in Vietnam, ultimately leading to disaster. Despite this, since the late 1990s, the U.S. military has increasingly embraced the notion that business models can and should be applied to the conduct of war.

But business models cannot be applied to war; their basic purposes are so hugely different that they cannot be reconciled. Instead of focusing on leadership, the U.S. military increasingly puts emphasis on *management*, military *efficiency* instead of *effectiveness*, and the application of various quantifiable methods called *metrics* based on business models in order to assess the performance of military forces in combat. Another problem in the U.S. military is the increasing use of business terms to describe purely military activities. This, in turn, further weakens the emphasis on leadership and warfighting.

Use of Business Models

During World War II, both the United States and United Kingdom used business statistical methods extensively to analyze the effects of strategic bombing. They also used various operations research techniques for the analysis of antisubmarine warfare in the Atlantic and offensive mining in European waters and the Pacific. In the late 1950s, the U.S. Navy developed a network model called the Program Evaluation and Review Technique (PERT) for managing the work of thousands of contractors in its highly successful Polaris missile program. PERT provided managers a graphical display of employees' various activities, estimates of how long each activity and the entire program would take to complete, and which activities were the most important to ensure timely completion of the program. PERT offered a successful tool for planning, coordinating, and controlling large, complex military programs.

A major effort to introduce business models into the U.S. military came during

Dr. Milan Vego is Professor of Operations in the Joint Military Operations Department at the Naval War College.

the tenure of Secretary of Defense Robert S. McNamara (1961–1968), whose main reason for adopting business practices was his almost exclusive focus on improving the efficiency of the U.S. military. Among other things, he introduced a "game theory" approach to the war in Vietnam at the political-strategic level. The United States would send messages to the enemy, whose responses could then be predicted. He also used various metrics such as body counts to measure the progress of war in Vietnam. This approach had predictable and catastrophic consequences for the U.S. military.[1] McNamara also extensively applied systems analysis run by civilian "whiz kids" as a basis for making key decisions on force requirements and designing weapons systems.

DOD (Helene C. Stikkel)

Secretary William Cohen emphasized worldwide threat of nuclear, biological, and chemical weapons during press briefing, 1997

In the late 1990s, Secretary of Defense William Cohen directed the Pentagon to take advantage of the "revolution in business affairs" to improve efficiency and cut waste. The military adopted business fads such as total quality management and velocity management in logistics. These changes coincided with the increased influence of information warfare enthusiasts who argued that the practices of the so-called new economy could be applied to waging war.[2] Some prominent military officials apparently were influenced by Alvin and Heidi Toffler's 1993 book *War and Anti-War: Survival at the Dawn of the 21st Century*. The central theme of the Tofflers' work was that "the way we make war reflects the way we make wealth; and the way we make anti-war must reflect the way we make war."[3] They claimed that a revolutionary "new economy" was arising based on knowledge rather than on conventional raw materials and physical labor. This remarkable change in the world economy supposedly was bringing with it a parallel revolution in the nature of warfare.[4] Several themes in the book were later accepted by leading proponents of so-called network-centric warfare (NCW).

Yet the nature of war as explained by Carl von Clausewitz is not subject to change regardless of the changes in military technology, not to say the world's economy. This was one of the major errors in the Tofflers' book. The authors also asserted that in the new economy, time becomes a critical variable as reflected in "just-in-time" delivery and pressure to reduce "decisions in process." They were apparently critical of those who argued against overreliance on technology in the U.S. military. The Tofflers expressed a clear technological bias by arguing in favor of a smaller number of highly sophisticated weapons, using as an example the U.S./coalition victory against Iraq in the Gulf War of 1990–1991.

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They wrote that in the new economies, the pace of operations and transactions is accelerated. Economies of speed are replacing economies of scale. Competition is so great, and the speed required so high, that the old "time is money" rule is increasingly updated to "every interval of time is worth more than the one before it."[5] The Tofflers also introduced the concept of "demassification" by arguing that the defining characteristics of the "second wave" economy become increasingly obsolete as firms install information-intensive, often automated manufacturing systems capable of endless and inexpensive variation and even customization. The revolutionary result is, in effect, the demassification of mass production.[6]

By the late 1990s, leading proponents of the emerging NCW concept embraced the Tofflers' idea that power flows from society and its methods of creating prosperity and wealth. Hence, in their view, the U.S. military should not read the works of Clausewitz and other classical military thinkers but rather books about how nations create wealth and prosperity.[7]

A major effort to adopt various business models in the military was undertaken by Defense Secretary Donald H. Rumsfeld (2001–2006). His aim was to streamline the Pentagon by applying maximum business practices. The logical outcome of Rumsfeld's approach would have been almost complete homogenization of all the Services, which would have essentially the same capabilities. This redundancy in capabilities would in turn be used as justification for canceling additional weapons systems. The end result of this single-minded quest for military efficiency would be a much smaller but supposedly more mobile and lethal U.S. military force. The Pentagon also became enamored of outsourcing and just-in-time logistics that eliminated supply depots and warehouses for spare parts.[8]

NCW became the heart of Rumsfeld's force transformation of the U.S. military. The leading advocates of transformation repeatedly asserted that the information revolution had fundamentally altered the ways of both business practices and the conduct of war. They explained that in business, success increasingly relied on the ability to move material objects around. Businesses that could produce items rapidly and ship them quickly and inexpensively were more successful than those that could not. The businesses that could rapidly acquire, disseminate, and analyze information would be more successful than the others. Likewise, armies succeed by moving their forces to

decisive places in order to defeat a similarly concentrated enemy army.[9]

NCW proponents argued that a fundamental shift in the sources of power—from industry to information—has already occurred and that it is comparable to the earlier shift from the agrarian to the industrial age. Although industrial power remains influential, information has become the most important source of power.[10] Yet the truth is that the new economy has not turned the law of supply and demand on its head. It did not represent more than the special features characterizing one of the periods of fundamental innovation that routinely occur in the economy.[11]

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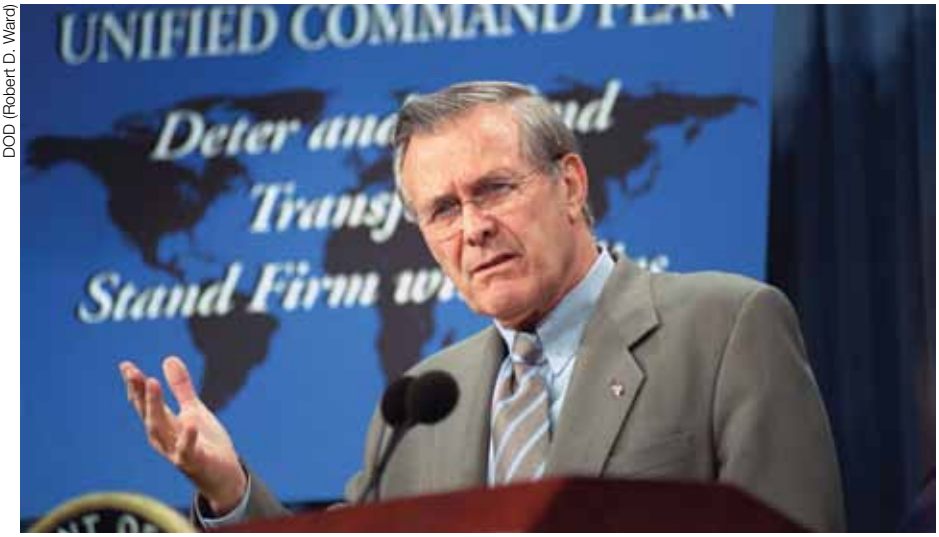
Purposes

The single most important differences between the conduct of war and business activity are their ultimate purposes and the ways of accomplishing them. First, the main purpose of any business is to create customers and to make profit.[12] In general, business activity should be conducted by following certain rules and regulations. It has to conform to the existing social and legal order. In contrast, the ultimate purpose of warfare is not to create, but—and this cannot be emphasized too strongly—to *destroy* the enemy's wealth and seize his territory while protecting and preserving one's own. War is full of violence and bloodshed. As Clausewitz aptly stated, war is an act of force, and emotions cannot fail to be involved.[13] Whatever rules exist for its conduct are often violated by all sides. A wrong decision in business does not usually result in a loss of life. A bad decision in war, especially one made by the top political leadership, is likely to result in huge losses in human life and destruction of property. It might even have such catastrophic consequences as losing control of one's own territory, succumbing to foreign occupation, and ultimately threatening the nation's very existence. Warfare, in contrast to business, is not about making profits or avoiding losses, and it is not about preventing the waste of one's resources. A war involves the nation's vital interests—such as its very survival and future well-being. War has to be won as quickly as possible, regardless of the costs involved.[14]

The Human Factor

In both business and warfare, human factors have a central and critical role. Management is about human beings. Its aim is to make people capable of working as a team, enhancing strengths while minimizing weaknesses. Business management is deeply embedded into culture. To be successful, every business enterprise requires commitment to common goals and shared values; without that commitment, there is no enterprise. There is only a mob.[15]

DOD (Robert D. Ward)



Secretary Donald Rumsfeld briefs reporters on changes to Unified Command Plan, April 2002

The human element is the single most critical element of warfare. War is lost or won by humans and not by machines. In contrast to a business organization, humans in the military live and work in close proximity to each other. There is far less room for privacy than is the case in civilian life. The success of a military force in combat is largely dependent on small-unit cohesion. The higher the cohesion of tactical units, the higher the cohesion of large forces and formations taking part in a campaign or major operation.[16] A commander cannot be successful without a thorough understanding of the capabilities and limitations of human nature. Materiel represents the means, not the ends, in warfare.

Warfare is shaped by human nature and its complexities and the limitations of human and physical conditions. Clausewitz wrote that victory does not consist only in the conquest of the battlefield, but in the destruction of physical forces. He believed in a close linkage between morale and willpower.[17] Because all wars are conducted by humans, the actions and reactions of actors are hard or impossible to predict. The psychological state of individuals or groups and their possible reactions under stress cannot be entirely known. This is even truer when dealing with enemy forces. War is a field of danger.[18] Clausewitz observed that danger is "a part of the friction of war and without accurate conceptions of danger one cannot understand war."[19] In the face of acute danger and fear, human behavior cannot be anticipated or measured in any meaningful way. It is largely unknowable.

Rationality versus Irrationality

The aim of both business and war is to make rational decisions and to act or react rationally. Rational decisionmaking is the heart of sound business management. Economic theory is based on the assumption that all actors are rational. Nevertheless, irrationality plays a major part in economic behavior. Among other things, markets are dominated by bubbles, fads, and frenzies. Often, the financial institutions and market traders take risks that they do not fully understand. Market operators can miscalculate, be overly confident in their information, and overreact to bad news. For example, prior to the U.S. recession in the fall of 2008, many people took on too much mortgage debt, which in turn was a major cause of the housing collapse. When the housing market was hot, bankers assumed that their customers did

not want their houses to go into foreclosure and that they would act accordingly. The first assumption was correct, but the second assumption was wrong.[20]

The rationality of the economic model assumes that investors react to changes in economic events and are either fully aware of the long-term implications of these changes or have superhuman vision to see the future.[21] There are situations in which individuals might engage in economic activity rationally, but the market might behave irrationally. The rational behavior on the part of individual investors can lead to collective irrational outcomes or so-called bubbles, as was the case in the U.S. housing collapse.

In business activity, the relationship between a rational individual and an irrational group of individuals can be extremely complex. One possibility is mob psychology or a sort of groupthink, when virtually all of the participants in the market change their views at the same time and move as a "herd." Alternatively, different individuals change their views about market development at different stages as part of a continuing process. Most of them start acting rationally, but then more of them lose contact with reality, at first gradually and then more quickly. Another view is that different groups of traders, investors, and speculators succumb to the hysteria as asset prices increase.[22] Periodic bouts of *irrational exuberance* (a term coined in 1996 by Alan Greenspan) are endemic to the financial system.[23] Stock investors cause the market bubble through their greed and frenzy when a bull market exists. This irrationality, in turn, leads stock investors to overlook deteriorating situations because of their single-minded pursuit of ever higher returns. Eventually, the frenzy of greed turns into panic, and this drives investors to sell at any cost. This collapse in stock market prices can spread to the entire economy.

Clausewitz wrote that war is not the action of a living force upon a lifeless mass but the collision of two living forces that interact.[24] The enemy has his own will and will not behave the way one wants him to. He can react unpredictably and even irrationally. The timing and scope of irrationality can be neither predicted nor measured. The irrational decisions on either side in a conflict can have significant consequences on both the course and outcome of a war. It is difficult or even impossible to rationally explain the continuation of hostilities for 2 more years on the Western Front after 1916 despite huge losses in personnel and financial exhaustion.[25] Likewise, one cannot explain why Adolf Hitler continued the war after 1943. It is also hard to rationally explain interminable interclan fighting in Somalia, genocide in Rwanda in 1994, or the Serbian ethnic cleansing in Bosnia and Kosovo in the 1990s.

U.S. Navy (Marcus L. Stanley)

USS *Freedom* conducts replenishment at sea with USS *Bonhomme Richard* in Pacific

Risk-taking

Both business executives and military leaders must take risks in making decisions. The higher the level of authority and responsibility, the higher the stakes in taking risks. Business theory acknowledges the importance of risk. The opportunity cost of capital depends on the risk of the project. Reward as profit is determined by the risks one is willing to take. By failing to understand business risk, one can make his business vulnerable to sudden collapse. However, in contrast to the conduct of warfare, business theory postulates that individual risk does not necessarily matter. Rather, what matters is the risk in shares of similar businesses on the stock market adjusted for a further risk weighting. Some large businesses grow by transferring their business risk onto other people, as is the case in a buyout model.[26]

Despite technological advances, a commander rarely knows all the elements of any given situation. This is especially the case at the operational and strategic levels of war. And it is at these levels where wars are won or lost. In the absence of positive knowledge of a situation, commanders must make certain assumptions that might be partially or completely wrong. Then they have to make decisions by taking prudent risks. Willingness to take such risks means making operational decisions in varying degrees of uncertainty. Such decisions are critical for success, especially when the operational commander's forces are weaker than those of the enemy. They are not gambles, but carefully made calculated decisions.[27] In contrast to the conduct of business, decisions made by the military commander can cause huge losses in one's personnel and materiel. Another difference is that a commander cannot share with or delegate risk to subordinate commanders. He is solely responsible for making decisions pertaining to the planning, preparation, and execution of campaigns or major operations.

Efficiency versus Effectiveness

The uncritical acceptance of a business model for the conduct of warfare by the U.S. military led to an increasing emphasis on efficiency rather than on effectiveness. *Efficiency* is the ratio of the output to the input into any system. It deals with one's skillfulness in avoiding the wasting of time and effort. A business can improve its bottom line by focusing on the few things that it does well and abandoning markets in which it is performing poorly. By eliminating redundancies and focusing on the areas in which they can excel, companies can dramatically improve their competitive position in some markets, even at the cost of sometimes abandoning others.

In business terms, *effectiveness* is related to the enterprise's objective rather than the technical quality of output. A common indicator of effectiveness is related to customer satisfaction rather than output. Therefore, the effectiveness measure of a business process can be indicated by the resource inputs needed to produce a level of an enterprise objective. In a military context, effectiveness pertains to one's ability to accomplish the assigned objective—the starting point and a single most important element of both planning and execution in the employment of one's combat forces. Yet Rumsfeld's vision of U.S. military transformation was focused almost exclusively on efficiency rather than effectiveness.[28] For example, the U.S. Navy made a series of decisions regarding its force structure based almost entirely on the requirements of military efficiency rather than military effectiveness. Among other things, most newly built ships and aircraft were assigned a growing number of missions so that fewer platforms had to be built, thereby reducing the costs. No one should dispute the need to have the highest degree of efficiency in managing a large military organization and for force planning. However, when a choice has to be made, military effectiveness should never be sacrificed for efficiency.

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Leadership versus Management

In generic terms, leadership can be described as the art of direct and indirect influence and the skill of creating the conditions for sustained organizational success in achieving desired results.[29] In contrast to leadership, management deals with the allocation and control of resources, whether human, materiel, or financial, in order to attain the objectives of an organization. Good management skills require neither an overabundance nor a shortage of resources.[30] The objective of management is to make people capable of joint performance through common goals, common values, correct structure, and training and development.[31] The superiority in materiel was one reason the U.S. military traditionally emphasized management thinking and a business approach to solving military problems. Among other things, the prominence of managerial values and entrepreneurial ethics was the main reason for the inability of U.S. Army officers to perform well in Vietnam.[32] Leadership is one of the most critical yet most complex aspects of warfare. The higher the level of command, the more

German battalion commander briefs GEN Petraeus on challenges NATO forces face in northern Afghanistan

U.S. Air Force (Bradley Lail)

important leadership skills are. The quality of one's leadership cannot be measured; it is essentially intangible. No weapon, no impersonal piece of machinery ever designed, can replace the human element in warfare. The excessive emphasis on management skills in the U.S. military today cannot but weaken the quality of leadership, especially at the higher command levels. In contrast, militaries that traditionally emphasized leadership and warfighting, as the German military did, proved much more effective as a fighting force. The Germans focused on leadership as one way of enhancing combat power and compensating for inferiority in materiel.

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Logistics

One of the key transformational concepts during Rumsfeld's tenure at the Pentagon was so-called just-in-time logistics, the purpose of which was to reduce inventory to a minimum. Its proponents apparently believed that logistics planning is outdated. They claimed that demand is the true control signal in the logistics system containing more information about local operational conditions than a classic aggregation of supply.

U.S. forces used the just-in-time logistics concept during Operation *Iraqi Freedom*, but they encountered numerous difficulties due to poor planning and overreliance on information technology. Logistical problems during the major combat phase of *Iraqi Freedom* included stretched supply lines during the rapid advance to Baghdad. Priority was given to the supply of fuel, ammunition, and food, causing delays in supply of some critical spare parts. Logisticians were often unable to distribute many items from ports to tactical units in an accurate and timely way. Logistics units had inadequate communications and could not track transit time once items were removed from their shipping containers.[33]

Just-in-time logistics was an attempt to apply commercial practices to trim inventory and make the logistics system more efficient. However, it could work properly in ideal conditions on the battlefield but not in the face of a determined enemy's opposition. It is inherently inflexible, vulnerable to damage, and unable to service prioritized needs. The U.S. military also adopted the commercial enterprise resources planning system to its logistics. The result was sense-and-respond logistics, a system supposedly grounded in NCW theory and joint expeditionary warfare practice. It also borrowed from the commercial sense-and-respond adaptive managerial framework originally developed by IBM. Sense-and-respond logistics is based on the premise that changes in business, security, and technology environments are so rapid that they have outstripped the ability to be foreseen and planned for. A successful response would come from rapidly sensing and adapting to change rather than relying on process designs, hierarchies of authority, and industrial age command and control action plans designed for more predictable events.[34] However, employment of combat forces during a major operation or conventional campaign is relatively short. Thus, the argument that one cannot properly plan for operational logistics support and sustainment is false. Among other things, the commander and planners must properly synchronize operations and logistics; otherwise, a campaign or major operation might fail. This, in turn, requires thorough and timely logistical planning.

Walmart and NCW

The Pentagon became enamored with Walmart's approach to business. NCW proponents described Walmart as a self-synchronized distributed network with real-time transactional awareness. The stores' cash registers automatically transmit sales data to Walmart's suppliers. The inventory is managed through horizontal networks rather than through a traditional head-office hierarchy.[35] The conglomerate was successful because it used vast computer systems to lower inventories, respond better to consumer demand, and even predict where prospective markets were headed. The Walmart system comprises three grids: infrastructure, sensor, and transaction. The infrastructure grid or sensor grid generates competitive space awareness, a key competitive advantage in the retail sector, while the transaction grid exploits high levels of awareness to increase competitiveness.

The entire NCW concept is essentially based on the Walmart business model. Only the names of the grids have been changed to reflect the use of weapons and sensors.

Walmart

Network-centric warfare concept is based on business model followed by Walmart president and chief executive officer Mike Duke

Battlespace is considered the military equivalent of Walmart's "intelligent sales point." The sensor grid is composed of ground-, sea-, air-, space-, and cyber-based sensors. It provides the joint force with a high degree of awareness of friendly and enemy forces and the environment across the joint battlespace.[36] The information grid consists

of a network of networks encompassing numerous communications paths, computational nodes, operating systems, and information management applications, allowing network-centric computing and communications across the joint battlespace. It is designed to provide the means to receive, process, transport, store, and protect information for the joint and combined forces. The shooter (or engagement) grid consists of geographically dispersed platforms capable of delivering more responsive, accurate, and lethal fires.[37]

NCW proponents misapplied the business theory of Metcalfe's law[38] in their claims that one of the great benefits of networking one's forces is the significant increase in the forces' combat power.[39] Metcalfe's law as applied to business states that the value of a network increases with the square of the number of network users.[40] Yet the leading NCW advocates changed the word *value* (or *utility*) to *power* and thereby significantly altered the true meaning of the law.[41] The most serious error is replacing the term *computers* with the word *computing* (a gerund). They carried Metcalfe's law even further by asserting that the power of transactions carried on a network increases with the square of the number of users of the network.[42] However, the law does not describe the gains obtained from network-enabled military interactions. In fact, the benefits of military networking have upper limits; the NCW thesis implies substantial centralization of authority and control. Also, one might add that complexity of a system is proportional to the cube of the number of nodes and reliability in inverse proportion to complexity.[43] The more complex the system, the more likely it is that something will not work as designed or even lead to a complete breakdown.

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Leading proponents asserted that NCW increases the speed of command—a process by which a superior information position is turned into a competitive advantage. One's speed of command is characterized by "decisively altering initial conditions, developing high rates of changes, locking in success while locking out enemy alternative."[44] This concept is based entirely on a business model. Some critics argued that the central weakness of the lockout concept is that the enemy could and would respond asymmetrically and "illogically." Moreover, the enemy would always have other options unless he was physically surrounded and threatened with immediate destruction. The concept of locking out a competitor might work in business but is highly unlikely to work in war. For example, the Israelis showed high tactical agility on the battlefield in their invasion of Lebanon in 1982. However, they still failed at the operational and strategic levels because their opponents outthought them.[45]

Walmart

Concept of self-synchronization is adapted from Walmart method of near-real-time inventory replacement

NCW advocates introduced the term *self-synchronization* to replace the well-understood term *initiative*. This concept was copied from the Walmart model of sharing inventory control information in near–real time with its suppliers using network technology. The sale of an item off Walmart's shelf automatically initiates a purchase requisition with the supplier to replace the item without the need for an intermediate central purchasing department.[46] Supposedly, self-synchronization increases the value of subordinate initiative to "produce meaningful increase in operational tempo and responsiveness and . . . assist in the execution of the commander's intent."[47] NCW proponents asserted that the traditional top-down method of synchronizing the actions leads to unnecessary losses of one's combat power due to supposed errors in force movements. It can also cause repeated breaks in the fighting at the operational level, giving the enemy the opportunity to recover as one's force is compelled to have what is called an "operational" (actually "tactical") pause before making another step.[48] The use of the term *self-synchronization* is yet another example of the almost exclusive mechanistic focus of NCW proponents.

As mentioned above, NCW proponents also borrowed another term from the Tofflers' book: *demassification*. They explained that NCW would enable a move from an approach based on geographically contiguous massing of forces to one based upon achieving effects. They explained that the use of information would lead to achieving desired effects, limiting the need to mass physical forces within specific geographic locations. Demassification increases tempo and speed of movement throughout the battlespace to complicate the opponent's targeting problem.[49]

Use of Business Metrics

Since the end of World War II, the Pentagon has used various quantifiable measures based on mathematical and statistical methods in trying to evaluate the effectiveness of bombing or ground forces involved in low-intensity conflict. It

was not surprising that both McNamara and Rumsfeld, because of their business backgrounds, tried to use business metrics in running the Pentagon. McNamara and his "whiz kids" believed that computers would transform the management of business. They invented a world where all decisions could be made based on numbers. They found power and comfort in assigning values to what could be quantified—and deliberately ignoring everything else. McNamara brought analytical discipline to the military. But he went too far by trying to conduct war by using the Ford Motor Company business model where if an investment would not bring immediate profits, it was vetoed. However, Ford's model for quantifying customer loyalty and the value of new equipment and quality was not available. The whiz kids did not look far enough ahead with their cost-cutting calculations. They did not anticipate that they would lose customers and their engineering innovation in the long run.

Since the late 1990s, the emphasis on business practices by the Pentagon led to an excessive reliance on various "metrics"[50] in evaluating the progress toward accomplishing battlefield objectives. These quantification methods replaced the commander's judgment, intuition, and independence of execution. However, there are too many aspects of the military situation, especially at the operational and strategic levels, that simply cannot be counted or quantified in any meaningful sense. The use of metrics is highly subjective; the higher authority arbitrarily selects which aspects of the situation should be counted and evaluated. But even if the metrics are correctly determined, it is often difficult to evaluate hidden elements.

Systems analysis and the use of other quantification methods in measuring progress on the battlefield fell in disrepute after McNamara left the office in 1968. In the post-Vietnam era, the body count became irrelevant. But the U.S. military reverted to the use of body counts in fighting a determined counterinsurgency in Iraq and in Afghanistan.[51] In early 2009, U.S. commanders in Afghanistan started to publicize every single enemy fighter killed in combat. Supposedly, the U.S. military adopted use of the body count to undermine Taliban propaganda and stiffen the resolve of the U.S. public. The commanders, though, often have great difficulty in acquiring precise information on losses. Often, in fact, the Taliban remove bodies.[52] To win the hearts and minds of Afghans, the Taliban are inflating the number of civilians killed and understating the number of their fighters killed. In short, a body count is an unreliable metric and should not be used in measuring progress of a war, especially in such a complex environment as counterinsurgency where control of population, not the number of the enemy fighters killed, is the key for ultimate victory.

Critics of applying metrics in war in Afghanistan pointed out that too many current measures of progress have little or no value, report meaningless nationwide data, or are more designed to spin immediate success than to win over time. The true complexities, uncertainties, and risks involved in dealing with ethnic, sectarian, tribal, and regional problems are downplayed or ignored. One of the most damaging aspects of U.S. intelligence and advisory reporting is the tendency to focus on orders of battle that, at best, show manning levels and sometimes major equipment; it says little about unit progress and activity. Overt violence is always an uncertain measure of insurgent activity and success.[53]

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There are a number of similarities between business activity and conduct of war. The human factor plays a critical central role in both business and warfare. Emotions, uncertainty, chance, and pure luck are characteristics of both business and warfare. Successful business managers and military commanders must often take calculated but high risks. Rationality and irrationality pervade decisionmaking and reactions in both business and warfare.

However, for all the similarities, there are some significant differences between business and warfare. Clearly, the single most important distinction between the two is in their respective *purposes*. Management is much more important in business, while leadership counts far more in the conduct of war. Military effectiveness is the key for success in war, while efficiency is the primary consideration in making profits in business activity. Yet in their zeal to adopt business models, military technocrats focused almost exclusively on efficiency rather than military effectiveness.

The Walmart business model cannot be literally applied to the conduct of war as NCW enthusiasts tried to do. Likewise, just-in-time and sense-and-respond concepts work well for business but might not be suitable for logistical support and sustainment in combat. There is no similarity between the conditions of the marketplace and the battlefield. Errors or an inability to bring certain items on the market do not result in lives lost or property destroyed. Similar deficiencies of fuel, ammunition, and water can doom the military effort and result in large losses of life.

In adopting various business metrics, the U.S. military paid little or no attention to intangible factors in the military situation. Such quantification methods are often unsuccessful even in business because managers do not properly evaluate intangible factors in the marketplace. Metrics might have some limited utility in assessing the situation on the battlefield, but ultimately success will be achieved by the decisions made by the commander based on his judgment and experience.

By its uncritical acceptance of business models, the U.S. military has neglected the critical and timeless importance of leadership and the human factor in the conduct of war. It has also blurred the need for the distinction between business activity and warfare. The U.S. military should use business practices whenever possible in enhancing the efficiency of the military establishment and services, force planning, and weapons and equipment design. However, using business models in the planning and conduct of war itself and in assessing the performance of one's forces in combat can have disastrous results, as the U.S. experience in Vietnam shows. One can ignore lessons of history only at great peril. **JFQ**

NOTES

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[18] Alfred Stenzel, *Kriegfuehrung zur See. Lehre vom Seekriege* (Hannover/Leipzig: Mahnsche Buchhandlung, 1913), 40–41.

[19] Clausewitz, 133.

[20] Marshall Goldsmith, "Human Nature: The X Factor in Economic Theory," *Business Week*, January 20, 2009, 2, available at <www.businessweek.com/managing/content/jan2009/ca20090120_4029>.

[21] Charles P. Kinderberger and Robert Z. Aliber, *Manias, Panics, and Crashes: A History of Financial Crises* (Hoboken, NJ: John Wiley and Sons, 2005), 38.

[22] Ibid., 41–42.

[23] Roger Bootle, *The Trouble with Markets: Saving Capitalism from Itself* (Boston: Nicholas Brealey Publishing, 2009), 210.

[24] Clausewitz, 86.

[25] Hammes, 23.

[26] A leveraged buyout or highly leveraged transaction (or "bootstrap" transaction) occurs when a financial sponsor acquires a controlling interest in a company's equity and where a significant percentage of the purchase price is financed through leverage (borrowing). The assets of the acquired company are used as collateral for the borrowed capital, sometimes with assets of the acquiring company. The bonds or other paper issued for leveraged buyouts are commonly considered not to be investment grade because of the significant risks involved.

[27] Field Manual (FM) 22–103, *Leadership and Command at Senior Levels* (Washington, DC: Headquarters Department of the Army, June 21, 1987), 33.

[28] Kagan, 3.

[29] FM 22–103, 3.

[30] Cited in Brian Howieson and Howard Kahn, "Leadership, Management, and Command: The Officer's Trinity," in *Airpower Leadership: Theory and Practice*, ed. Peter W. Gray and Sebastian Cox (London: The Stationery Office, 2002), 23.

[31] Drucker, 18.

[32] Richard A. Gabriel, *The Antagonists: A Comparative Combat Assessment of the Soviet and American Soldier* (Westport, CT: Greenwood Press, 1984), 83.

[33] Kim Burger, "Iraq Campaign Raises New Logistics Concerns," *Jane's Defence Weekly*, September 10, 2003, 16–17.

[34] IBM Consulting Service, "Transforming the Military through Sense and Respond," white paper, January 2005, 1–2.

[35] Tom Engelhardt, "Tomgram: Mike Davis on a 21st-century Assyria with Laptops," February 26, 2003, available at <http://tomdispatch.org/post/440/mike_davis_on_a_21st_century_assyria_with_laptops>.

[36] Fred P. Stein, "Observations on the Emergence of Network-Centric Warfare," 2, available at <www.dodccrp.org/files/stein_observations/steinncw.htm>.

[37] Ibid., 2–4, 6–7.

[38] Metcalfe's law (proposed by Robert C. Metcalfe, inventor of the Ethernet) says that the total value of a network to its users grows as the square of the total number of its users; hence, the ratio of value to cost of adding one more network user grows disproportionately as the network grows larger.

[39] They claim that the reason for this is that according to Metcalfe's Law, the power (value) of a network increases as the square of the number of nodes in the network (N^2).

[40] Darryn J. Reid and Ralph E. Giffin, "A Woven Web of Guesses, Canto One: Network Centric Warfare and the Myth of the New Economy," 8th International Command and Control Research and Technology Symposium, Washington, DC, June 2003, 6.

[41] Arthur Cebrowski and John Garstka, "Network-centric Warfare: Its Origins and Future," U.S. Naval Institute *Proceedings* (January 1998), 35; cited in Reid and Giffin, 7.

[42] Reid and Giffin, 6.

[43] Hammes, 23.

[44] Arthur Cebrowski, "Network-centric Warfare: An Emerging Military Response to the Information Age," presentation to Network Centric Operations NDIA Conference, June 29, 1999, 3.

[45] Hammes, 25.

[46] Cited in David P. Wells, *Managing the Double-edged Sword of Network-centric Warfare* (Newport, RI: Naval War College, January 30, 2003), 2.

[47] *The Implementation of Network-Centric Warfare*, 9.

[48] Cebrowski and Garstka, 33.

[49] *The Implementation of Network-Centric Warfare*, 9.

[50] In business terms, *metrics* is defined as any type of measurement used to gauge some quantifiable component of company performance. They are a part of the broad area of business intelligence that comprises a wide variety of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users to make better business decisions. Systematic approaches such as the balanced scorecard methodology can be used to transform an organization's mission statement and business strategy into specific and quantifiable goals and to monitor the organization performance in terms of achieving these goals.

[51] Tom Engelhardt, "Pentagon Tracking a Whole Series of Metrics in Iraq," *The Financial Express*, October 9, 2007, available at <www.thefinancialexpress-bd.com/2007/10/09/13819.html>.

[52] Michael M. Phillips, "Army Deploys Old Tactics in PR War," *The Wall Street Journal*, June 1, 2009, A1.

[53] Anthony Cordesman, *The Uncertain "Metrics" of Afghanistan (and Iraq)* (Washington, DC: Center for Strategic and International Studies, May 18, 2007), 3–4, 6.