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14. ABSTRACT

Future technology will allow the Joint Force Commander unprecedented access to the tactical level of war. Depending on his personality, he may chose to directly control events unfolding at the tactical level or leave the fighting to individuals charged with employing their weapon systems. The ability of a pilot, tank driver or infantry battalion commander in the future to share his operational picture with the entire chain of command (shared situational awareness) and vice versa, begs the need for sound, authoritative command and control doctrine to maximize the inherent benefits of this information advantage. All players in this future system must share a common rule set in order to exploit the war fighting advantages described in *Joint Vision 2020* (JV 2020). Command and control doctrine must now outline this new rule set. With a common rule set, reorganization, training and education of staffs and combat units can begin. Overcoming old paradigms will be difficult, but by applying the doctrine of maneuver warfare to Network-centric Warfare (NCW) and JV 2020 concepts, a better command and control method can be implemented. The purpose of this paper is to reconcile the conflicts between maneuver warfare doctrine and the warfighting concepts currently being developed under JV 2020 and NCW by establishing a strong case for decentralized command and control.

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CAN DECENTRALIZED COMMAND AND CONTROL DOCTRINE COMPLEMENT NETWORK-CENTRIC WARFARE?

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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9 Feb 2004

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Introduction

For commanders to try to gain certainty as a basis for actions, maintain positive control of events at all times, or dictate events to fit their plans is to deny the nature of war.

MCDP 1, *Warfighting*

Future technology will allow the Joint Force Commander unprecedented access to the tactical level of war. Depending on his personality, he may chose to control directly events unfolding at the tactical level or leave the fighting to individuals charged with employing their weapon systems. The ability of a pilot, tank driver or infantry battalion commander in the future to share his operational picture with the entire chain of command (shared situational awareness) and vice versa, begs the need for sound, authoritative command and control doctrine to exploit the inherent benefits of this information advantage. All players in this future system must share a common rule set in order to exploit the war fighting advantages described in *Joint Vision 2020* (JV 2020). Command and control doctrine must now outline this new rule set. With a common rule set, reorganization, training and education of staffs and combat units can begin. Overcoming old paradigms will be difficult, but by applying the doctrine of maneuver warfare to Network-centric Warfare (NCW) and JV 2020 concepts, a better command and control method can be implemented. The purpose of this paper is to reconcile the conflicts between maneuver warfare doctrine and the warfighting concepts currently being developed under JV 2020 and NCW by establishing a strong case for decentralized command and control.

JV 2020 describes a conceptual template for the transformation of the nation's armed forces by leveraging new innovations and technologies to achieve full spectrum

dominance.[1] Full spectrum dominance is achieved through dominant maneuver, precision engagement, focused logistics and full dimensional protection. At the heart of these concepts is information superiority brought on by advances in technology. Technology, not withstanding, "Of greater importance is the development of doctrine, organizations, training and education, leaders, and people that effectively take advantage of the technology."[2] Since the publication of JV 2020, the U.S. Military has fought in both Operations Enduring Freedom and Iraqi Freedom and validated the statement above. Both major operations will be examined later in this paper.

Network-centric warfare is a model that attempts to provide the infrastructure and framework from which U.S. Forces can achieve their operational capabilities, as defined in Joint Vision 2020.[3] The NCW concept originated from business processes, which leverage information technology to obtain dominant market positions and growth, while effectively "locking-out" the competition. In the commercial markets, "locking-out competition and locking-in success can occur quickly, even overnight. We seek an analogous effect in warfare."[4]

Network-centric warfare attempts to move away from individual platforms fighting separate pieces of the battle, to a networked force fighting the whole battle.[5] By networking forces together, the increased level of shared knowledge will produce superior information at all levels of war. Information superiority will allow forces to organize from the bottom up -- or to *self-synchronize* their actions, speed up the decision-

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[1] Chairman of the Joint Chiefs of Staff, *Joint Vision 2020* (Washington, D.C.: U.S. Government Printing Office June 2000), 1-3.
[2] Ibid., 3.
[3] Department of Defense Report to Congress, *Network Centric Warfare,* [Online] (Accessed on 14 December 2003); Available from (www.c3i.osd.mil/NCW/ : 27 July 2001): internet, 2-4.
[4] Arthur K.Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origins and Future," *United States Naval Institute. Proceedings* 124, no. 1 (January 1998): 29.

making cycle, and produce a higher tempo of operations than the enemy. The enemy, unable to react to this *speed of command* will be "locked out" from the decision process. In other words, he will be unable to employ his strategy because the conditions around him are changing too rapidly for him to react.[6]

This philosophy closely parallels the guidance contained in the United States Marine Corps' warfighting doctrine of maneuver warfare. Maneuver warfare doctrine, as defined by Fleet Marine Force Manual 1, *Warfighting* in 1989 and subsequently updated in Marine Corps Doctrinal Publication 1 in 1997, "is a warfighting philosophy that seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions which create a turbulent and rapidly deteriorating situation with which the enemy cannot cope."[7] Maneuver warfare doctrine emphasizes initiative, focused actions, speed, surprise and decisive opportunistic actions concentrated on the enemy's critical vulnerabilities. Decision-making becomes decentralized in this environment to generate a superior tempo of operations to that of the enemy. Subordinate leaders who are in a position to observe actions taking place are empowered to act on that information rather than report it up the chain of command and wait for a decision to come back down. These commanders are expected to exercise their best judgment and initiative since they have a greater appreciation of the situation, based on their position, than the overall commander who may be some distance removed.[8] Maneuver warfare prescribes that commanders should be prepared to operate in an environment of uncertainty, constant change, friction and chaos.

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[5] Ibid., 34
[6] Ibid., 32
[7] United States Marine Corps, *Warfighting, MCDP-1*, (Washington D.C., 1997), 73.
[8] Ibid., 78-80.

The German concept of command and control, *Auftragstaktik,* best describes the C2 arrangement necessary to operate within maneuver warfare doctrine. *"Auftragstaktik* subsumes all the following concepts: individual initiative, independent decision making, and thinking leaders reaching tactical decisions on their own accord. In short, the commander would specify to subordinates *what* to do, not *how* to do it."[9] Independent action is the foundation of maneuver warfare. Subordinate commanders are expected to use their own initiative to seize opportunities.[10] They are guided by a clear vision of the commander's intent and desired end state.[11] This clear guidance establishes unity of effort throughout the operation amongst all the decision-makers. While all commanders would like to exercise this degree of freedom in combat, the reality is that politically delicate situations are making the battlespace less adaptable to this style of warfare. The information commanders need to make informed decisions in this environment is not currently available at the lower echelons of command. NCW is an attempt to correct this deficiency.

JV 2020 and NCW are at odds with maneuver warfare doctrine in another basic respect. While maneuver warfare assumes that fog, friction, uncertainty, and chance are part of the operating environment, NCW and JV 2020 operate on the assumption that those factors will be mitigated through technological advances in communications and information sharing. Command and control doctrine will need to reconcile these conflicts and establish C2 boundaries for commanders to operate effectively in future conflicts. To operate effectively means that subordinate commanders are able to make

[9] David M. Keithly and Stephen P Ferris, *"Auftragstaktik,* or Directive Control, in Joint and Combined Operations," *Parameters* 29, no. 3 (Autumn 1999), 118.
[10] Ibid., 124.
[11] *Warfighting MCDP-1,* 89.

informed decisions at the lowest level possible to execute combat operations on the principles of maneuver warfare; over supervision or micromanagement is avoided, and the commander still maintains the necessary control over the employment of his combat forces.

Background

Traditionally, subordinate commanders received orders from the top-down to achieve synergy within the chain of command. A joint force commander (JFC) and his staff would synchronize the operations of subordinate units because their Command, Control, Communications, Computers, and Intelligence (C4I) systems processed and managed information in that manner. The JFC's C4I system collected and fused information from the strategic level down to the tactical level to facilitate decision-making and synergy. Subordinate C4I systems lacked the lateral connectivity to "self-synchronize" and depended on this arrangement to achieve unity of effort. The current joint targeting process is an example of this. It is a 96-72 hour cycle where all subordinate commanders nominate targets to the JFC for execution.[12] In this case, subordinate units push information up the chain of command. Information, such as target data, friendly positions, enemy dispositions, and combat assessments are fused together and synchronized, then distributed down to the lower echelons for execution via the Air Tasking Order (ATO). This and other decision-making processes demand large staffs, stove-piped planning processes, inflexible battle rhythms and complex, time-consuming procedures. As Milan Vego points out in *Operational Warfare*, a centralized command arrangement "inherently constrains subordinate commanders, does not react well to

[12] US CENTCOM J-3, Air Operations, *USCENTCOM Concept of Operations for Joint Fires, 10 November 1999*, Unclassified. [On-line](Accessed 16 January 2004) from http://www.centcom.smil.mil; Siprnet, 19.

rapidly changing situations, and does not function well when the vertical flow of information is disrupted."[13]

NCW attempts to flatten out the traditional vertical flow of information so that commanders at all levels of war can plug into the system and collaborate on battlefield processes, such as joint fires. But, the same technology that makes NCW possible is creating a conflict between centralized and decentralized command and control choices. Technology is making it easier for the commander to implement a centralized C2 arrangement by giving him detailed knowledge of his subordinates' operating environment, and if desired, allowing him to micromanage his subordinates' actions. Meanwhile, twenty-first century warfighting doctrine is calling for rapidly planned and executed operations, self-synchronizing actions, flexibility, and effects-based engagements, all of which are designed to shatter the enemy's cohesion.[14] These concepts require a responsive command and control system designed to allow subordinate commanders freedom of action and decision-making. A directive, or decentralized, command and control philosophy (*Auftragstaktik),* strongly anchored in doctrine needs to emerge to fit our current warfighting doctrine of maneuver warfare.[15] Decentralizing command and control means decentralizing execution. Subordinate commanders would be entrusted with significant delegated authority. Tactical leaders should be empowered to make tactical decisions as long as it was consistent with the commander's intent, mission end state, and rules of engagement.[16] But the question still

[13] Milan Vego, *Operational Warfare,* NWC 1004 (Newport, RI: Naval War College Press, 2000), 189.
[14] Keithly and Ferris, 124.
[15] Ibid., 120.
[16] Ibid., 118.

remains: will technological advancements and the penalty for strategic mistakes permit the JFC to delegate this amount of responsibility to his subordinate commanders?

Twenty-first Century Warfare and Technology

The nature of twenty-first century warfare has changed. Our enemies have created a hostile environment for the JFC, one that is characterized by political and cultural sensitivity, where the price of failure is high, and where a tactical mistake can have strategic consequences. To deal with these threats, the Joint Force Commander must be able to selectively neutralize the enemy in order to defeat him, while mitigating collateral damage to a non-hostile population. A mistake at the tactical level of war, whether it is bombing a culturally significant site, inflicting too many civilian casualties, or suffering too many friendly casualties, could translate into mission failure in this environment. Therefore, a commander's information requirements need to be clearly defined, validated and disseminated among all subordinate commanders. Timely and accurate responses to a commander's information requirements can create rapid action and synergy among subordinate commands if properly coordinated in advance. These responses can be tied to flexible effects-based options that are designed to neutralize impending threats. The commander, being fully aware of the consequences of his decision in advance, can better assess strategic risk.

Technological advancements in intelligence, surveillance, reconnaissance (ISR) and communication systems are attempting to reduce the uncertainty a JFC may face. When these ISR and communications systems are integrated, networked, and distributed to all levels of command, as envisioned in Admiral Cebrowski's *Network-centric Warfare*, tactical leaders are expected to be able to neutralize an adversary's actions

through information superiority, shared awareness, adaptability, speed of command, and self-synchronization.[17] Neutralization does not necessarily mean destruction. The commander is expected to choose from a list of options, the best method of preventing an adversary from doing what he is doing or to make his actions ineffective by the most direct, discriminate method possible.[18] This concept is outlined in JV 2020, as *effects-based engagements*.

A look at three recent examples should help to clarify the question posed earlier of how much control a joint force commander should delegate to the warfighters in order to achieve speed of command while managing strategic risk. The first example will examine how chief executive officers (CEOs) of major corporations have led their companies through a networked and global market, where speed of command and self-synchronization are critical components of a successful company. The recent conflicts in Afghanistan and Iraq will round out the last two examples. Both operations provide an excellent comparison between a less networked, overly centralized C2 system (Afghanistan), and a more networked, more decentralized C2 system (Iraq). From each example, important doctrinal C2 recommendations will be established.

The Business Model

The business model of management reveals that a fundamental change in corporate decision-making is taking place. According to Thomas Friedman, Foreign Affairs Columnist for the New York Times, the most successful corporations are shifting from centralized decision-making to decentralized decision-making. Competition in the market place, brought about by the speed of information and capital flow, has essentially

[17] Arthur K. Cebrowski, "Network-centric Warfare, An Emerging Military Response to the Information age," *MilitaryTechnology* 25, no. 5, (May 2003): 17.

rendered the old approach of top-down decision making uncompetitive. Robert Shapiro, the Chairman of Monsanto, describes the old approach to decision making as beginning on the periphery, when a low-level employee makes an observation about the market or customer (it is mostly the low-level employees who are in a position to observe things). He would then send this information up the corporate management chain where the information would be forwarded, filtered, or discarded depending upon whether the information was deemed important enough or non-threatening to middle management. If the information did make it to the top, then the CEO would decide how to act upon it and send it back down the corporate ladder for action, provided the information was still timely and valid.[19] In this scenario, only a select few (the top managers and CEO) had a complete picture of company operations. This relationship is very similar to how combatant commander staffs function today in a centralized command organization. But, as former Deputy Treasury Secretary Larry Summers remarked, "…with the PC and microchip it became much more efficient to empower individuals who could get more information and make more decisions themselves rather than having a single person at the top trying to direct everything."[20]

Now with email, intranets and the internet, most employees have access to the same information the CEOs have, and because they are closer to their customers than the leadership at the top, their information is often superior. Robert Shapiro of Monsanto goes on to describe his new role as the company CEO, "In the past, I could justify [my leadership] by the fact that I had the broadest scope of information and therefore I had a

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[18] Ibid., 18.
[19] Thomas L. Friedman, *The Lexus and the Olive Tree, Understanding Globalization* (New York: Anchor Books, A Division of Random House, 2000), 86.
[20] Ibid., 85.

perspective that no one else in the company had, so I was adding value to the process by making decisions myself." Now he explains that:

> As the leader of the company, I have to make sure that my managers have the training in the culture, values, and strategy of the company so that when they are gathering information they have an appropriate context to assess it and know whether it confirms or contradicts the path that we are on.[21]

Robert Shapiro fully recognized that he had to decentralize decision-making within his organization to remain competitive. To do this, he had to foster mutual trust between seniors and subordinates and depend on employee initiative to succeed. The employee, on the other hand, had to understand the CEO's intent, his company's objectives, and level of risk he could take. With these relationships codified, the company could achieve a tempo of decision-making to keep them ahead of their competition. The codification of the CEO's command relationship to his employees and vice versa, reflects the corporate doctrinal changes, re-education, and reorganization that companies had to undertake to decentralize their top-down command and control structures in order to remain competitive.

Operation Enduring Freedom

As joint forces become more integrated, they will have to adopt a more decentralized style of command and control as well. The recent war in Afghanistan revealed many impediments to this C2 choice. The war demonstrated the awesome technological potential of a networked force and of commanders who were able to direct the actions of small units and individual aircraft from thousands of miles away.[22] Commanders, located in Florida, Saudi Arabia, Bahrain and Afghanistan, commanded

[21] Ibid., 88.

and controlled their piece of the fight over a rudimentary networked system. But, instead of creating an integrated, self-synchronizing joint force seamlessly operating across the strategic, operational and tactical levels of war, commanders established a network designed for an overly centralized process of decision-making.[23] Partly to blame for this was concern at the strategic level for adverse reaction among other Islamic nations, which were supporting U.S. efforts, that the war not be seen as a war against Islam or the Islamic People.[24] Therefore, U.S. Central Command retained tight control over all target nominations and approvals to mitigate the chances of a strategic mistake.[25] Rules of engagement restricted such actions as unobserved fires, landing zone preparation fires, and attacking targets of opportunity without proper target vetting through judge advocate lawyers at Headquarters, U.S. Central Command in Tampa.[26] Target vetting also required extensive inter-agency cooperation to precisely mensurate geographic locations, prevent friendly fire, determine legitimacy, and minimize collateral damage. Hastily deployed forward combat units and C2 platforms, such as AWACS and JSTARS could not replicate this process and relied on their reach-back capability to conduct the necessary coordination and deconfliction.[27]

Also to blame for the overly centralized C2 in Afghanistan was the inability of conventional ground and air units to deploy with their traditional C4 support. From the

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[22] Congress, Senate, Committee on Armed Services, *Statement of General Tommy R. Franks Before the Senate Armed Services Committee 9 July 2003*, [on-line] (accessed on 16 January 2004); available from http://www.au.af.mil/au/awc/awcgate/congress/franks_09july03.pdf; internet.
[23] Milan Vego, "What Can We Learn From Enduring Freedom?" *United States Naval Institute. Proceedings* 128, no. 7 (July 2002): 32.
[24] Message promulgated in the US CENTCOM OEF Unclassified Command Brief given to visiting military officers, diplomats and politicians. The author was a designated command briefer.
[25] Author worked targeting issues for OEF as a member of the US CENTCOM J-3 staff.
[26] Milan Vego, "What Can We Learn From Enduring Freedom?" 33.

start, Operation Enduring Freedom was a special operations war.[28] As conventional units deployed to Afghanistan, they fell onto a C2 system designed for covert operations, over-classification and stove-piped planning.[29] To make matters worse, the 10th Mountain Division deployed to Afghanistan piece-meal from Uzbekistan, where it was providing force protection at a coalition air base. Traditional Corps level assets, such as an Air Support Operations Center (ASOC) or Fire Support Coordination Center (FSCC), were therefore not available to this unit when their mission changed to execute Operation Anaconda.[30] The same can be said of units from the 101st Airborne Division when they deployed to Afghanistan to relieve the 15th Marine Expeditionary Unit in Khandahar in January 2002. Because of strategic airlift limitations, XVIII Airborne Corps C4I support did not deploy with this unit either. The consequences of these shortcomings resulted in operations and fires being deconflicted by time-consuming processes between ad-hoc liaison cells. These liaison cells depended on their reach-back capability and limited bandwidth. True unity of effort, integration of maneuver units, and integration of joint fires suffered as a result.[31]

Lessons drawn from OEF illustrate that C4I systems should accompany warfighters to the area of operations for greater decentralization of command and control to occur. This system has to be compatible with all joint forces (unconventional and conventional) and must be able to support the entire spectrum of military operations if

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[27] AWACS is an airborne early warning command and control platform designed to provide air intercept control to tactical aircraft. JSTARS is an airborne platform designed to survey and acquire ground targets. Both platforms were used for command, control and communications for OEF.
[28] Colonel Bruce Burda, *Operation Enduring Freedom Lessons Learned*, [Brief on-line] (United States Air Force Special Operations Command, accessed 16 January 2004); available from http://www.dtic.mil/ndia/2003solic/burda.pdf; Internet.
[29] Ibid.
[30] Unclassified findings from a joint fires review board the author participated in at US CENTCOM, May 2002. Results not published.

speed of command and self-synchronization are to occur. For the JFC to delegate authority to subordinate commanders, he must be convinced that his subordinate commanders have the information necessary to properly assess risk and exercise sound judgment when making decisions.

Maneuver warfare doctrine states that commanders should normally be positioned well forward to observe the action to gain a better appreciation of the situation that they cannot get from reports.[32]

> The ability to use advanced communications and information technologies should not be used as a justification for not establishing an intermediate level of command. Distance and time still matter, and the need for a commander to lead and motivate his forces remains one of the tenets of successful operational leadership.[33]

Operation Iraqi Freedom

OIF should prove this last point. As General Tommy Franks reported to the Senate Armed Services Committee after the war with Iraq, "[our] forces were able to achieve their operational objectives by integrating ground maneuver, special operations, precision lethal fires and non-lethal effects. We saw for the first time integration of forces rather than deconfliction of forces."[34] For OIF, U.S. Central Command and subordinate component commanders used the long lead-time and existing infrastructure to create a C2 system in theater to support the information requirements of subordinate commands.

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[31] Ibid.
[32] MCDP-1, *Warfighting*: 79.
[33] Milan Vego, "What Can We Learn From Enduring Freedom," 32.
[34] Congress, Senate, Committee on Armed Services, *Statement of General Tommy R. Franks Before the Senate Armed Services Committee 9 July 2003*, [on-line] (accessed on 16 January 2004); available from http://www.au.af.mil/au/awc/awcgate/congress/franks_09july03.pdf; internet.

> From a Joint Integration perspective, our experience in Operations Southern Watch, Northern Watch, and Enduring Freedom helped to develop a joint culture in our headquarters and in our components. These operations helped to improve joint interoperability and improve our joint C4I networks as joint force synergy was taken to new levels of sophistication.[35]

Not only did existing mutual relationships help, but also a detailed deliberate planning process proved crucial. The planning process identified many key decisions in advance that could be delegated to subordinate commanders to inject speed and efficiency into combat operations. Lawyers advised and commanders decided in advance who could authorize strikes on time-critical and strategically-sensitive targets. Exercise Internal Look, held four months prior to combat operations, validated many command and control arrangements. Decision support matrices, synchronization matrices, collaborative planning efforts and daily video teleconferencing all ensured that subordinate commanders understood the commander's intent, daily guidance and desired end state. With this level of shared awareness, the Joint Force Commander could confidently delegate much more authority to his subordinate commanders.

An integrated common operating picture (COP) proved to be a powerful tool for OIF. The common operating picture depicted friendly and enemy forces, air and sea tracks, and fire support coordination measures, all overlaid on detailed maps and satellite imagery.[36] The integrated COP provided a great enhancement to C2 processes. Also, new collaborative tools enabled traditional fire support agencies, such as the ASOC, FSCC, and Combined Air Operations Center (CAOC) to approve, deconflict, and

[35] Ibid., 5.
[36] Ibid., 7.

prosecute targets more rapidly and confidently.[37] The Joint Operations Center (JOC) for U.S. Central Command (deployed to the theater of operations) plugged into this network and many others to monitor current combat operations in Iraq. Virtual chat rooms for personnel recovery, air operations, and target intelligence are but a few examples of hundreds of chat rooms available for OIF, which staffs used to gain a shared awareness of the battlespace. The JOC furnished decision-makers with relevant information on the actions and results of current operations. This robust C2 network of shared information and real-time communications allowed subordinate commanders to conduct their portion of the campaign unimpeded by time consuming decision processes. Many of the JFC's information requirements could be answered just by plugging into the shared information networks that were established and exercised in advance.

Friendly fire incidents revealed that the technology still needs maturing. [38] Information overload is another problem that requires a solution. Protocols need to be established on how and where information is presented. Emails, for example, are an excellent information-sharing tool but only provide information to the addressees, and they often get forwarded to others without the originator's permission. Large files that accompany emails consume enormous bandwidth and can shut down low-density C2 nodes.

The last and most often overlooked piece of the decision-making process is assessment. The JFC requires timely feedback on the results of his guidance so he can modify or issue new guidance. Feedback communications channels and measures of

[37] Author worked with these agencies during OIF to ensure that targets scheduled on the ATO were deconflicted and that immediate target nominations could be properly vetted. Collaborative tools such as ADOCs (Automated Deep Operations Control System) and Chat were very useful.
[38] Ibid., 6-7.

success or failure must be planned for and posted to the information grid to keep all commanders attuned to the results of current operations.

Conclusion

OEF and OIF were both remarkably successful in spite of significantly different C2 arrangements. But one should not come to the conclusion that centralized command and control is acceptable for all crisis action situations, and decentralized C2 is acceptable for all deliberate planning scenarios. To gain the warfighting advantages described in JV 2020 and NCW, commanders at all levels should strive towards a decentralized command and control arrangement, whether responding to a crisis or executing a well-established plan. Just as the business world has had to adapt to a rapidly changing business environment brought about by the speed of information, so must the military. *Speed of command* and *self-synchronization* can only take place if subordinate commanders have the authority to act. A joint force commander will only be willing to delegate his authority if he is certain that his subordinate commanders have the best information to make informed decisions. This information sharing currently depends on a large networked infrastructure and enormous bandwidth. Crisis action planners should consider this when developing concepts of operations for future conflicts until available technology can catch up to doctrine.

However, technology should not lead us down the path of centralized command and control like it did in Afghanistan. Command and control doctrine, as established in

maneuver warfare doctrine (and U.S. Joint Doctrine), is sound and must be applied.[39] Barriers to overcome include educating junior commanders to think not only two levels higher but at the highest strategic level. Command relationships established early on, through collaborative planning processes, will help foster mutual trust and respect among all commanders and focus them on the strategic objectives. While certain decisions can be delegated to subordinate commanders, overall responsibility still resides with the JFC. A risk adverse commander would not function well in a decentralized role, especially within a politically sensitive, uncertain environment. Therefore, JV 2020 and NCW concepts should recognize risk as inherent to the nature of war, and C2 doctrine must evolve to develop commanders who can act rapidly and responsibly without perfect information.

Waiting for perfect information in order to act may be too late in many instances, particularly against a highly sophisticated enemy (unlike the Taliban). Maneuver warfare assumes fog and friction will prevail on the battlefield. JV 2020 and NCW must also recognize this as fundamental to the nature of war, as Clausewitz did nearly two centuries ago. Therefore, commanders must be skeptical of the information being presented to them and must be able to act using intuition, experience, and sound judgment. Only then, can *self-synchronization* and *speed of command* be achieved.

[39] Milan Vego, "What Can We Learn From Enduring Freedom?" 32.

Selected Bibliography

Barnett, Thomas P.M. "The Seven Deadly Sins of Network-centric Warfare." *United States Naval Institute Proceedings* 125, no. 1 (January 1999): 36-39.

Bingham, Price T. "Transforming Warfare with Effects-Based Joint Operations." *Air and Space Journal* 15, no. 1 (Spring 2001): 58-66.

____. "Seeking Synergy: Joint Effects-Based Operations." *Joint Force Quarterly* (Spring 2002): 52-59.

Burda, Bruce. "Operation Enduring Freedom Lessons Learned." *Air Force Special Operations Command*. < http://www.dtic.mil/ndia/2003solic/burda.pdf.> [16 January 2004].

Cebrowski, Arthur K., and John J. Garstka. "Network Centric Warfare: Its Origins and Future." *United States Naval Institute Proceedings* 124, no. 1 (January 1998): 28-36.

Cebrowski, Arthur K. "Network Centric Warfare: An Emerging Response to the Information Age." *Military Technology* 25, no. 5 (May 2003): 16-22.

Chairman of the Joint Chiefs of Staff. *Joint Vision 2020.* Washington DC: June 2002.

Command and Control Branch, Warfighting Development Integration Division. "Command and Control in 2015." *Marine Corps Gazette* 86, no. 8 (August 2002): 27-28.

Deloach, Jay, and Frank Yahner. "An Analytical Framework for Doctrine Writers." *A Common Perspective* 10, no. 1 (April 2002): 13-16

"Department of Defense Report to Congress." *Network Centric Warfare*. 27 July 2001. <www.c3i.osd.mil/NCW/> [14 December 2003].

Friedman, Thomas. *The Lexus and the Olive Tree: Understanding Globalization*. Updated and Expanded Edition. New York: Anchor Books, 2000.

Gosh, Sumit and Tony Lee. Asynchronous, Decentralized Command and Control." *Military Review* 80, no. 6 (November – December 2000): 77-81.

Joint Chiefs of Staff. *Joint Publication 3-0, Doctrine for Joint Operations.* Washington DC: 10 September 2001.

Keithly, David M., and Stephen P. Ferris. "*Auftragstaktik*, or Directive Control, in Joint and Combined Operations." *Parameters* 29, no. 3 (Autumn 1999): 118-133.

Myers, Gene. "Concepts to Future Doctrine." *A Common Perspective* 10, no. 1 (April 2002): 6-9.

Noonan, Michael P. "The Military Lessons of Operations Iraqi Freedom." *Foreign Policy Research Institute.* 1 May 2003. < http://www.fpri.org/enotes/20030501.military.noonan.miltarylessonsiraqifreedom.html> [14 December 2003].

Thomas, BGen John R. "Transforming Marine Corps C^4." *Marine Corps Gazette* 86, no. 8 (August 2002): 16-19.

Stein, Fred P. "Observations on the Emergence of Network Centric Warfare." *Evidence Based Research, Inc.* <http://www.dodccrp.org/steinncw.htm> [19 December, 2003].

U.S. Congress. Senate. Committee on Armed Services. "Statement of General Tommy R. Franks, Former Commander US Central Command." 9 July 2003. <http://www.au.af.mil/au/awc/awcgate/congress/franks_09july03.pdf> [16 January 2004].

Vego, Milan, "Net-centric Is Not Decisive." *United States Naval Institute Proceedings* 129, no. 1 (January 2003): 52-58.

____. *Operational Warfare*. NWC 1004. Newport, RI: Naval War College Press, 2000.

____. "What Can We Learn From Enduring Freedom?" *United States Naval Institute Proceedings* 128, no. 7 (July 2002): 28.

United States Marine Corps. *Warfighting.* Marine Corps Doctrinal Publication 1. United States Government as represented by the Secretary of the Navy, 1997.

United States Central Command. "USCENTCOM Concept of Operations for Joint Fires. Unclassified." 10 November 1999. <http://www.centcom.smil.mil.> [16 January 2004]. SIPRNET.

Zimmerman, John D. "Net-Centric Is About Choices." *United States Naval Institute Proceedings* 128, no. 1 (January 2002): 38-41.