

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.

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1. REPORT DATE (DD-MM-YYYY) 02-05-2016		2. REPORT TYPE Research		3. DATES COVERED (From - To) August 2015 - May 2016	
4. TITLE AND SUBTITLE Command and Control for the Information Age				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER N/A	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) Major Michael T. Hlad				5d. PROJECT NUMBER N/A	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USMC School of Advanced Warfighting Marine Corps University 2044 South Street Quantico, VA 22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER N/A	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A				10. SPONSOR/MONITOR'S ACRONYM(S) N/A	
				11. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A	
12. DISTRIBUTION AVAILABILITY STATEMENT Unlimited					
13. SUPPLEMENTARY NOTES N/A					
14. ABSTRACT The US military has found it very difficult for its traditional hierarchies to fight against terrorist networks in Iraq and Afghanistan, in part because it continues to rely on the same Industrial Age model of command and control that was shaped by its experiences in World War II. Today, tens of thousands of warfighters are digitally linked, with better firepower, communications, and intelligence than the military had 20 years ago, yet the C2 model has not evolved. The military has built itself around a 20th Century model designed for efficiency and control that does not match with 21st Century complexity. These innovations and challenges effect no one more than the commander, with deep repercussions for his ability to command and control. The current Marine Corps command and control model is outdated and, while still effective, is falling short of its full potential. While the hierarchical organization may be more efficient, a networked organization can better adapt to the changes seen in today's environment.					
15. SUBJECT TERMS Command and Control (C2), Organizational change, Hierarchy vs networked team, Adaptable Command and Control, Leadership development, Empowering leadership, Shared leadership, Co-evolution in the Information Age,					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 23	19a. NAME OF RESPONSIBLE PERSON Marine Corps University / School of Advanced Warfighting
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (Include area code) (703) 432-5318 (Admin Office)

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES). Self-explanatory.

8. PERFORMING ORGANIZATION REPORT NUMBER. Enter all unique alphanumeric report numbers assigned by the performing organization, e.g. BRL-1234; AFWL-TR-85-4017-Vol-21-PT-2.

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10. SPONSOR/MONITOR'S ACRONYM(S). Enter, if available, e.g. BRL, ARDEC, NADC.

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School of Advanced Warfighting
Marine Corps University
3070 Morrell Avenue
Marine Corps Combat Development Command
Quantico VA 22134*

FUTURE WAR PAPER

TITLE:

Command and Control for the Information Age

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF OPERATIONAL STUDIES

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AY 2015-16

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Date: 2 May 2016

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Command and Control for the Information Age

“War is the realm of uncertainty, three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty... The commander must work in a medium which his eyes cannot see; which his best deductive powers cannot always fathom; and with which, because of constant changes, he can rarely become familiar.”—Carl von Clausewitz

Introduction: Efficiency vs Adaptability

The US military has found it very difficult for its traditional hierarchies to fight against terrorist networks in Iraq and Afghanistan, in part because it continues to rely on the same Industrial Age model of command and control that was shaped by its experiences in World War II. The Marine Corps understands that Command and Control (C2) is a complex and adaptive process, and Joint Doctrine specifically states that the function of command and control is ultimately the business of the commander. Joint Pub 1-02, Department of Defense Dictionary of Military and Associated Terms, defines command and control as:

“The exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and Control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating and controlling forces and operations in the accomplishment of the mission.”¹

Today, tens of thousands of warfighters are digitally linked, with better firepower, communications, and intelligence than the military had 20 years ago, yet the C2 model has not evolved. The military has built itself around a 20th Century model designed for efficiency and control that does not match with 21st Century complexity. These innovations and challenges effect no one more than the commander, with deep repercussions for his ability to command and control. The current Marine Corps command and control model is outdated and, while still

effective, is falling short of its full potential. While the hierarchical organization may be more efficient, a networked organization can better adapt to the changes seen in today's environment.

Since the Industrial Revolution and Frederick Taylor's "Scientific Management," business and military organizational culture has been dominated by a system that is excellent for achieving highly efficient execution of known, repeatable processes.² Historically, the military's response to new technology has always been greater centralized control. Unfortunately, greater centralized control is the exact opposite of what is necessary to succeed on the current battlefield. The Marine Corps must evolve its thinking on command and control in today's information-dominated environment, and adaptability, not WWII efficiency, must become the focus.

Change is never easy, particularly in an organization that has been as successful as the United States Marine Corps. However, the cost of doing nothing is the possible loss of the competitive edge against modern adversaries and the loss of the heritage and proud tradition of the Marine Corps. The necessary change encompasses a mental shift more than it entails adjusting communications links or line diagrams.³

Organizational Change: From Hierarchy to Networked Team

"Your structure is your strategy. In other words, how you organize your institution, how you think about questions of command and control, determines how you operate. You can talk about being agile and flexible all you like, but if you retain a traditional hierarchy, there are limits to how much you can achieve those goals. In order to really adapt, you must work not harder but differently."—Tom Ricks, author of *Fiasco: The American Military Adventures in Iraq*⁴

The organizational change the Marine Corps is looking for will require a change in organizational norms regarding structure, information flow, and leadership. Much like the Joint Special Operations Command described in Gen. Stanley McChrystal's book *Team of Teams*, the Marine Corps is uniquely prepared for a change in organization.

With the technological advances of the past 20 years, the costs of manipulating and disseminating information have dropped to near zero. This has enabled organizations to empower people in new ways, and in military terms that means empowering people with new levels of authority. This technology (think data-enabled cell phones or radios) gives organizations the ability to empower subordinates; however, current hierarchical structures are not built to support this. Such distributed information directly challenges the traditional top-down hierarchical model. Simply changing the organizational structure alone will not work. The culture and mentality must change. Otherwise, the Marine Corps cannot take advantage of these advances to their full potential. For example, the Marine Corps has an integrated team made up of three elements: the Air Combat Element, the Ground Combat Element, and the Logistical Combat Element. They are brought together under a Marine Expeditionary Force (MEF) to implement the Marine Air Ground Task Force (MAGTF) concept. This organization empowers subordinates, but empowerment without context will lead to disaster.⁵ This context, the knowledge and intelligence throughout the organization, comes from developing a shared consciousness. Shared consciousness is true transparency through the entire organization, with each of the elements having an unobstructed view into the rest of the organization.⁶ While the power of the MAGTF is greater than the sum of its parts, it has not achieved shared consciousness and empowered execution as an agile, adaptive force.

To fully change the Marine Corps mindset on C2, it must move away from the traditional line and block charts and the reductionism approach of the past century when looking at problems. Leaders must look at their organization from a perspective informed more by the biological sciences than the physical sciences. This is about the process of decision making and the behaviors involved in the decision making process. Anne Murray Allen, former head of IT

and strategy for Hewlett-Packard, and Dennis Sandow, Univ. of Oregon, teamed up on a study on social network analysis for organizations in the modern age. They wrote, “As the philosophy of the physical sciences dominated the Industrial Age, the philosophy of the biological sciences is beginning to dominate the Knowledge Age. This philosophy views knowledge, people and organizations as living systems... [which represents a shift from] (1) focusing on parts to focusing on the whole, (2) focusing on categorization to focusing on integration.”⁷ The Marine Corps’ current industrial models have worked wonders both for business and for the military as far as efficiency. They were ideal for effective, efficient use of resources and have sent men to the moon as well as ensuring that we had an effective operational structure for WWII. However, the speed and interconnectedness of the battlefield has changed, and to defeat networked terrorism and cyber threats and to wage conventional warfare, these insufficient management models must change. Smaller threats can connect in real time to outmaneuver our more powerful, vastly better equipped and trained forces. Understanding that the hierarchical, top-down headquarters will fight to make itself more efficient, the Marine Corps must shift its operational model in order to be more adaptive and better prepared for change.⁸

The MEF must break down its current “silos of excellence” and the isolated efforts among its staff sections and major subordinate elements. The Division, Logistics Group, and Wing are inwardly focused and often find themselves facing a prisoner’s dilemma within the MAGTF with regard to resources. The MEF headquarters, with its expertise and experience, must become a truly networked organization, encouraging inclusion, shared expertise, diversity, and shared consciousness across the MAGTF to truly harness the abilities of the team. It also must become more transparent and create a culture that can enable the three arms of the MAGTF to execute on solutions to complex problems. The failure to do so comes at the expense of the

relevancy of the Marine Corps in relation to the other armed services. The current structure and hierarchy that exist in the MEF HQ, amongst the MSEs, and across the Marine Corps, must evolve so the MAGTF can reach its full potential given today's technology and capabilities. Today's leaders must fight to change the staff to allow for better information flow, coordination, and execution on the battlefield. The goal is clear; the challenge is how to implement it. The Marine Corps must evolve as a thinking organization before it can simply change its structure, but the foundation for this evolved command and control model will be in leadership through education.

Steps to Evolve Commanders for Modern Command and Control

“...to instruct its members through the exchange of ideas in all areas of the art of war, in a manner that would encourage them to seek out truth, that would avoid the difficulties of private study with its tendency to onesidedness, and that would seem best suited to place theory and practice in proper relationship.”—Purpose of the Militrische Gesellschaft created by Gerhard von Scharnhorst⁹

Significant lessons have been learned in the past 15 years of war. This history can illustrate how organizations have evolved. Following the devastating Prussian defeat at Jena-Auerstedt in 1806 by Napoleon's forces, Prussia was forced to reflect on its government and military and recast itself anew¹⁰. Based on Enlightenment ideas and in line with ideas in Europe, Prussia reorganized its industry, government, and most importantly, its education system. Gerhard von Scharnhorst, then chief of staff for the military, convinced both his leadership and the King of the military reforms needed and the education required for the military. While the US has been fortunate to not find itself in Prussia's fate, military leaders must not fool themselves into thinking that the US military cannot be defeated. Like Scharnhorst, Marine leaders must focus on educating and adapting the force to the complexity of the current and

future environment, with a command and control model that can meet the speed and tempo of the Information Age.

Despite the major changes in warfare in the 19th and 20th centuries, General Eisenhower, Frederick the Great, and Napoleon all experienced similar command and control issues. Like the others, Eisenhower adapted and invested considerable energy in working around the limitations of his command system.¹¹ Eisenhower was successful due to his adaptations of his headquarters structure throughout WWII, through trial and error in North Africa and Sicily, and culminating at Normandy and the broad front attack on Germany. These great commanders did not stray from the nature of warfare, but rather adapted their organizations and leadership to the enemy and the context in which they were fighting. The Marine Corps must do the same. While Marine leaders cannot change the culture of the organization overnight, they can lay a framework to educate leadership, with a firm understanding of the context within which they will likely operate, so they can understand the changes required by warfighting command and control and can adapt when necessary.

Step 1. Leadership Development and Education

The Marine Corps has traditionally prided itself on its ability to adapt and overcome in any situation. The Marine Corps needs leaders who can adapt to change and be critical thinkers. These educated leaders need to understand how to build effective and adaptive teams at the operational and enterprise level of the Marine Corps, and not just at the tactical level, which tends to be the focus. This is particularly important as it faces an information-dominated battlefield. The development process for the Marine Corps' officers has changed only slightly since the end of the Cold War; while there is a dedicated Professional Military Education (PME) program that trains and educates Marines based on their respective ranks, this program must be

expanded from mere indoctrination to a rigorous course in critical thinking in order to develop better leaders able to adapt on the battlefield, particularly at the mid and senior levels.

Leadership is a common theme in all of the PME courses taught, yet leadership alone has not been broken out into its own field of study in Marine Corps PME. The competency-based approach to leadership development has merit, and it should be continued in these schools, but it is not sufficient for senior leaders to drive the required institutional changes. New techniques and information should be added to these courses and schools to better prepare Marine Corps leaders so that they are well armed for the future operating environment.¹²

Current Marine Corps PME does not introduce the leadership theories of transformational, empowered, and shared leadership, although they are practiced and required in the Marine Corps. The program is also critical toward organizational change and building a better C2 model. They aim to develop leaders in the resident schools, but they are failing to provide these future leaders with in-depth leadership education that would better prepare them for leading Marines and creating better organizations. While the PMEs have made an effort to include “leadership” in the curriculum, they fail to address the necessary components of leadership, specifically those leadership theories that could enhance leaders’ abilities in the future operating environment.

Marine Corps officers must have the ability to not only lead their Marines but also to lead their superiors: it is a 360-degree effort.¹³ The bottom line is that leadership is not positional. It is everywhere and in every situation. With a shared purpose, clear understanding of the context, and clear end state, articulated by the leader, subordinates have freedom of action to decide and evolve the situation to meet the described end state. The need for transformational, empowered,

and shared leadership theory in Marine PME is of utmost importance for Marine Corps operational leaders and their success in the current and future operating environment.

Shared leadership and situational awareness do not simply happen. It takes humble and educated leaders able to be aware of their organization and the context in which they are serving to set their organization on the right path. Being aware of limits, the decision making process, the behaviors of the organization, and the time necessary to make these decisions is critical. If Marines are to change their organizational model from hierarchical to a more networked or web-like system, they must have educated leaders who can empower subordinates and who are able to develop the trust and competency necessary to adapt.

Step 2. Empowering Leadership

With growing technological capabilities throughout the battlefield, commanders are able to watch combat actions via live feed, monitor communication radio links, and communicate from the highest levels of command to the tactical edge and dictate the actions of subordinates. Empowering leadership means more than just providing autonomy to ones' followers, it also "emphasizes the development of follower self-management or self-leadership skills."¹⁴ This has also been referred to as "superleadership" by Doctors Manz and Sims in their study of leadership.¹⁵ They saw self-management and self-leadership as the ultimate outcome of empowerment. The "empowering superleader educates the follower so that each learns how to act as a self-leader."¹⁶ Empowerment provides the framework for subordinates to enable, direct, and control themselves in carrying out their responsibilities in alignment with the commanders' intent and the mission of the organization. Empowerment and self-management is what makes

the Marine Corps capable of exploiting gaps in maneuver warfare and achieving success in a decentralized environment.

Behaviors of empowered leadership include independent action, opportunity thinking, teamwork, self-development, participative goal setting, and self-reward.¹⁷ Decentralized decision making enables authority, responsibility, and accountability down to the lowest level. Within a mission statement in the Marine Corps and the commanders' intent, the "how" is never stated. The implication of this is that the subordinate is empowered to shape the mission. Leaders simply make it clear in their statement of "what they want done and who is to do it." While this may make commanders uncomfortable, this empowerment is required for the team to be successful, particularly in a large command. This concept of empowerment is critical for a networked organization and has significant impact on the ability of Marines to make informed decisions. More importantly, leaders who resist the urge to jump in simply because they can, who leave decisions to those further down the chain of command, will get equally good decisions and a better organization.¹⁸

Step 3. Shared Leadership

Another leadership theory that is critical to evolving Marine Corps C2 is shared leadership. A study by Carson, Tesluk, and Marrone published in the *Academy of Management Journal* defines shared leadership as "an emergent team property that results from the distribution of leadership influence across multiple team members."¹⁹ Pearce and Sims have defined it as "distributed influence from within the team" and "lateral influence among peers." Carson, Tesluk, and Marrone's study adds to the growing body of evidence that a team does well

when it relies on leadership provided by the team as a whole rather than looking to a single individual to lead it.²⁰

Shared leadership may be a hard concept to grasp in a hierarchical setting such as the Marine Corps. It is most likely to be found in voluntary or empowered teams.²¹ Shared leadership may emerge from subordinate ranks and does not necessarily require a designated leader. This can be seen in highly effective staffs with an empowering commander or during decentralized execution with lateral communication amongst subordinate organizations. Although the commander, or a vertical leadership model, still provides a significant role in developing and maintaining shared leadership, lateral influence amongst peers contributes to team effectiveness.

As technology progresses ever more rapidly, we need leaders with personal will, moral courage, and compassion who will work for the right solutions. Courage plays in to the ability to make independent, autonomous decisions and compassion ensures that outcomes are good for the team as opposed to the “covering your rear” attitude of hierarchical leadership. The leadership culture of the Marine Corps can be changed, but it must start with a strong educational foundation of shared and empowering leadership models. If the Marine Corps wants to move to a higher level of performance, this is where the investment must be made.

Step 4. Human Factors and Co-evolution in the Information Age

There is no doubt that changing an Industrial Age structure that has served the Marine Corps well in the past will be challenging. For example, in the past, the military has had Army four stars like Gen. Eisenhower who commanded six million American soldiers in WWII with the assistance of far smaller staffs than the services have today. Meanwhile, the services are shrinking and yet the staffs are still growing to manage a smaller force. The evolution of

command and control, coupled with technological integration, cannot be a separate planning effort but must be logically planned to enable an effective command and control model. The leadership of the Marine Corps will be fighting against a service culture and organizational structure that has been petrified in the form of the industrial model. The choice to shift the information, decision making, and control to shared and empowered human networks within the organization rather than relying on the traditional hierarchical model is necessary.²²

To be effective, the Marine Corps will need to adapt its organization, its doctrine, and its warfighting strategy. Command and control in the Information Age cannot rest on outdated doctrine and structure that does not capture the tempo or complexity of the modern battlefield, let alone the battlefield of the future. Commanders can no longer allow formalized decisions to pass through bloated staffs and internal chains and get sidetracked. That process leads to a delayed decision that is no longer relevant and wastes the most important resource, time. Leaders need to communicate their intent explicitly and develop trust in their followers' ability to make decisions that may affect the entire organization. It is very difficult for traditional hierarchies to fight against networks. It will take networks to fight networks, in both the digital and human domains. The Marine Corps must adopt a more networked construct for command and control so that operationally it can adapt to an adaptive networked opponent. This C2 structure allows for the traditional control that commanders require, but it also enables the units in conflict to adapt, synthesize information, and rapidly take action when required. The challenge to the Marine Corps is to create a structure that can rapidly adapt to the low-end spectrum of conflict as well as the high end. They must codify this change in doctrine and craft a new strategy that allows the Marine Corps to enable commanders in the Information Age.

The Challenge for Commanders

The Futures Directorate of Marine Corps Combat Development and Integration has done a comprehensive study in an attempt to forecast probable futures that the country and Marine Corps will face. These assessments paint a picture for commanders of a world that is more complex and interconnected and is competing for limited resources. In this environment, commanders will have to predict and find solutions in an environment of increased instability and will need to be more nuanced than their predecessors. An updated C2 structure will allow Marine commanders to adapt to this complex environment, ensuring that the right structure is being applied to the current problem.²³

The Future Operating Environment, from Complicated to Complex

In 2013 the Atlantic Council observed, “The world is on the cusp of another set of major technological transformations. Just as a teenager today has more computing power in the palm of her hand than NASA had when it launched the Apollo 13 mission, the world of 2030 will feature surprises with benefits—and risks—we are only beginning to imagine.”²⁴ The Atlantic Council and the Futures Directorate agree that the world is on the verge of a third industrial revolution. The emergence of new technologies will impact global, economic, social, and military development through 2030 and beyond.²⁵ So what is the role of the leader in this environment and how does he manage or lead in this new environment instead of defaulting to a traditional command and control structure that is no longer valid?

The parts that make up complicated systems are known: one can look at the parts, see how they connect, and predict with relative certainty what will happen. Complexity, however, is when the number of interactions increases dramatically and the outcomes quickly become

unpredictable.²⁶ Practically speaking, the main difference between complex and complicated systems is that one can usually predict the outcomes of complicated systems by knowing the starting point. In a complex system, that same starting conditions can produce different outcomes (think Lorenz and the butterfly effect with weather) depending on the interactions of the elements in the system.²⁷ Leaders are now faced with complex problems in which they are unable to understand the situation and they fail to predict the unintended consequences of their actions.

Marine Corps leaders must understand the complicated or complex situations in which they find themselves, and more importantly, they must align the organization to be better prepared to face this operating environment. A study of Citigroup's near financial collapse in 2008 found that their organization locked sectors of their business in "silos" and withheld information from employees that could have enabled leaders to make better decisions. This is strikingly similar to the growing tendency of the staff sections at the major subordinate commands and MEF levels. The Citigroup study also pointed to a problem of "vantage point," i.e., when looking at complex situations, it is very difficult, if not impossible, for any singular leader to see an entire complex system. Science has proven that the world is producing more information than the human brain has the cognitive ability to recognize or integrate, and leaders faced with complex systems are relying on Industrial Age organizations to solve these problems, which has led to failure in both business and modern warfare.²⁸ Organizations have faced complicated problems in the past, but they were able to solve them by applying great effort and predicting the results. Now, with complex, networked, interconnected systems, increased effort on the part of organizations has not made the outcomes more predictable, despite the increase in technology. Because of this, the traditional concept of command and control, based on a

reductionist managerial role for planning and prediction, must be updated. Leaders are faced with multiple domains: land, sea, air, space and cyber, which are often challenged simultaneously at all levels of warfare. The Marine Corps must evolve its C2 structure and develop educated leaders who can adapt and ultimately dominate in this complex environment.

General McChrystal clearly articulates this issue as he describes remaking the Joint Special Operations Command as they were fighting in Iraq. In the traditional top-down hierarchical model of command and control to which the military is accustomed, he notes that subordinates provided information to leaders and leaders disseminated that information to commands. At JSOC, Gen. McChrystal and his team reversed it: they had leaders provide information so that subordinates, armed with context and connectivity, could take the initiative and make decisions. Ultimately what he and his organization achieved was “shared consciousness,” which gave decision makers, at every level on the organization chart, access to context and information that was traditionally limited to senior leaders.²⁹

This “shared synchronization,” “shared awareness,” or “shared consciousness” challenges the traditional model of command and control, moving decision-making down the chain of command and providing Marines with unprecedented insights so they can act decisively. The abilities above are shared abilities and describe a state in the “cognitive domain when two or more entities are able to develop similar awareness of the situation.”³⁰ Society and the battlefield have only become more complex, and so have the factors facing the Marine Corps and its leadership.

Conclusion

“If you can look into the seeds of time, and say which grain will grow and which will not, speak then unto me.”—From Macbeth, by William Shakespeare

The last 15 years of warfare have taught the Marine Corps many lessons and have exposed the damage that an asymmetrical threat that has networked itself can accomplish against a traditional military organization. Forecasting into the future, Marines will likely see an environment that will require more, not less, of its leaders. Through a change in the culture, leadership, and education system, and ultimately a change in the Marine Expeditionary Force, the Marine Corps can build a more resilient, adaptive, and networked team able to operate in the future operating environment. Marine leadership must recognize that the warfighting landscape has changed and that their current organization models are out of date. They must organize, educate, and train the force to meet this challenge.

The Marine Corps has a proud tradition of adapting to and overcoming challenges, and it has an opportunity to lead the DOD in a much needed overhaul of C2. The future environment will not allow the standard linear models, reductionism, or hierarchical organizations to be effective against America’s adversaries. To be successful in this developing environment, Marines must evolve, educate, and develop more dynamic command and control relationships and leaders in the Marine Corps. Human factors and complex systems have come to dominate the world, the battlefield, and management models. The civilian sector and Marine Corps adversaries have evolved and the Marine Corps must evolve with them, developing organizations within organizations, with educated leaders who are able to critically think and adapt, so that they can understand the complexity they face and put the right structured force in a position to make the right decisions and win.

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- ¹ MCDP 6, *Command and Control*.
- ² Gen Stanley McChrystal. *Team of Teams: New rules of engagement for a complex world*. New York, Penguin Publishing Group, 2015. p. 3.
- ³ Fussell. "Make Your Team Less Hierarchical." *Harvard Business Review*. Pub. July 15, 2015. p. 1. (<https://hbr.org/2015/07/make-your-team-less-hierarchical>)
- ⁴ Ricks. Quote from praise of *Team of Teams*: <http://mcchrystalgroup.com/teamofteams/>
- ⁵ McChrystal, Toqueville reference and discussions on "shared consciousness", p. 244.
- ⁶ McChrystal, section describing the "Learning from Cubicles and Failed Revolutions." p. 163.
- ⁷ McChrystal, As described in *Team of Teams*, discussing industrial age compared with biological science, p. 248.
- ⁸ Arguilla, Ronfeldt. "Looking Ahead: Preparing for Information-Age Conflict." *Rand Monograph*. Ch 19, Accessed 27 Feb 2016. p. 439.
- ⁹ White. *The Enlightened Soldier: Scharnhorst and the Militarische Gesellschaft in Berlin, 1801–1805*, p. 37.
- ¹⁰ Class notes from Napoleonic warfare, SAW 2015.
- ¹¹ Smith. *Network Centric Warfare, Command, and the Nature of War*. Land Warfare Studies Center. Canberra, February. 2010. p. 67.
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- ¹⁴ Pearce. "Vertical Versus Shared Leadership as Predictors of the Effectiveness of Change Management Teams: An Examination of Aversive, Directed, Transactional, Transformational and Empowering Behaviors." 2002. *Group Dynamics*. p. 172.
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- ¹⁷ Pearce & Sims, p. 172.
- ¹⁸ McChrystal, discussion on leadership and chapter 10, really the key take away from the chapter was on this style of leadership. P. 201.
- ¹⁹ Carson, Tesluk, Marrone. "Shared Leadership in Teams: An Investigation of Antecedent Conditions and Performance." *Academy of Management Journal*, 2007. p. 1217-1234.
- ²⁰ Carson, p. 1231.
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- ²² McChrystal p. 198. Discussion on coordinated operations and decentralized control.
- ²³ Futures Assessment Division, *Marine Corps Security Environment Forecast: Futures 2030-2045*. Quantico, VA: Marine Corps Warfighting Laboratory/Futures Directorate, 2015. p. iv (introduction).
- ²⁴ Atlantic Council, *Envisioning 2030: U.S. Strategy for the Coming Technological Revolution*. (Washington, D.C.: Atlantic Council, 2013), p. i.
- ²⁵ Futures Assessment Division, *Marine Corps Security Environment Forecast* p. 27.
- ²⁶ Cynefin framework reference as describes the Future Assessments Division when talking about complexity and complex issues. p.37.

²⁷ Sargut, Gokce and Rita McGrath. "Learning to Live with Complexity. *Harvard Business Review*. September 2011. (accessed 26 Dec, 2015).

²⁸ Gokce and McGrath, discussing forecasting methods p.7.

²⁹ McChrystal, p. 216.

³⁰ Alberts, David S, et al. *Network Centric Warfare: Developing and Leveraging Information Superiority*, CCRP Publication Series, Washington DC, 1999, p. 26 and p.69.

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