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**SUMMING UP: COMMAND CONCEPTS AND THE  
HISTORICAL RECORD**

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If I always appear prepared, it is because before entering on an undertaking, I have meditated for long and have foreseen what may occur. It is not genius which reveals to me suddenly and secretly what I should do in circumstances unexpected by others, it is thought and meditation.

—Napoleon Bonaparte, 1812

Our spectrum of cases and concepts is broad enough to show that viewing C2 from the perspective of command concepts is consistent with the historical record: A commander's ideas and his ability to express them *are* reflected in the demands placed upon the C2 system. The case histories also illuminate the part of C2 that is most poorly handled by the dominant cybernetic paradigm (see Chapter One, "The Foundations of Existing C2 Theory"). When fully articulated, command concepts are generated over a long time scale, deemphasizing the reactive aspect of C2 that is the focus of the cybernetic approach.

**THE RELEVANCE OF THE THEORY**

In thinking about the processes that go on among command staffs prior to battle, we have offered a "minimal" hypothesis in which we try to capture as much as possible of this communication over time in a single construct: the commander's concept of battle. Our aim is to shift attention away from C2 support of weak commanders and doctrine-driven operations and toward support of creative, visionary commanders preparing their forces for battle.

Nimitz's concept was so close to the mark and so well understood by his subordinates that the burden on the C2 system (between Nimitz

and his subordinates) immediately before and during the battle was minimal. It is interesting to speculate how well the system would have supported his concept if the concept had been flawed. In this regard, we offer a few qualified observations.

First, Nimitz's objective was limited and well-specified, and was based on extremely good intelligence information about enemy dispositions and intentions. It is likely that he would have required an overwhelming quantity of contrary information to be convinced that the Japanese fleet was, in fact, not on its way to Midway. If that were the case, and in view of the vast distances involved, it is unlikely that his intelligence capability would have permitted him to assimilate, decide, and react appropriately. This fact reinforces our proposition that the quality of Nimitz's fundamental idea, which was based on relatively few key pieces of confirmed information, was critical to the effective functioning of his C2 system. Given that his command concept was basically correct, his system was capable of supporting it. If it had been widely off the mark, his C2 system would have failed him—but probably his available forces would have failed him too.

Guderian's concept seems to have been based less on an anticipation of the precise movements of the French army than on an understanding that violent offensive movement into France from an unexpected direction was certain to produce an opportunity to rout the French. Less certain of when that opportunity would occur than Nimitz was, Guderian positioned himself on the battlefield to recognize the opportunity when it arose and to capitalize on it immediately. In this sense, his concept was based on an understanding that a strategic advantage could arise out of the consistent application of superior tactical doctrine, rather than on an expectation of the juxtaposition of a particular correlation of forces.

Guderian's C2 system turned out to be unsupportive of his command style. It could not tell him when his opportunity arose; it did not allow him to verify or refute his concept. Guderian's response was to minimize the load on the system by transmitting only essential information to his Chief of Staff and to rely on the superb tactical ability of his subordinate commanders to operate with minimal guidance and maximum initiative. Guderian compensated for the inability of his C2 system to inform him by being present personally at what he envisioned would be the decisive point on the battlefield. He clearly

had given thought to “discovering what it [C2 system] could not do and then proceeded to do it nonetheless.” Had Guderian simply relied on the capabilities of his C2 system, the German offensive would likely have stalled at the Meuse. Additionally, had Guderian been badly wrong in his concept, there is little that his C2 system could have done to rectify the matter.

Schwarzkopf’s military problem in DESERT STORM was to develop a command concept that would offer a relatively short war, limited casualties, and a decisive defeat of Iraq’s military and military potential. Schwarzkopf’s C2 system was significantly more sophisticated than that of either Nimitz or Guderian. He had the unprecedented ability to focus on any part of the battlefield from his command bunker. Yet this ability did little to inform him about the Iraqi forces’ ability to resist, their willingness to fight hard, or their ability to respond to or anticipate his planned envelopment.

Ultimately, Schwarzkopf’s concept was informed by his own experience and judgment. In this case, however, his C2 system was critical to the successful *execution* of his concept. It was able to inform him of the Iraqi forces’ reaction to his offensive, and this information was critical to the timing of the various phases of the attack. Without his C2 system’s ability to cue him that the Iraqis were crumbling faster than expected, it is likely that a greater portion of the Iraqi army would have escaped and that his strategic objective would not have been achieved.

MacArthur’s command concept at Inchon was executed in the near absence of a C2 system. His fundamental idea was planned, rehearsed, and executed solely on the basis of his understanding of the overextension of the North Korean Army and the strategic impact of a landing deep in their rear area. Unlike Nimitz, whose similarly brilliant concept was executed in his physical absence, MacArthur had a front-row seat on his command ship. He watched stolidly as his operation unfolded according to plan, then laconically invited his commanders to get a cup of coffee when it became apparent that the landings were a success. His entire concept was based on his certainty that he would achieve strategic surprise and that resistance to the landings would be minimal.

If MacArthur's calculations had been widely off the mark, and there had been, for instance, several divisions of first-quality NKA troops opposing the landing, the burden on his C2 system to get that information to him would have been minimal. Personally observing the action, he would have quickly understood and been able to react by bringing additional sea and air power to bear in the landing areas.

Moore's fight at Ia Drang is an excellent example of an enormously capable C2 system being unable to rescue a failed concept. Although Moore's leadership was superior and his well-trained unit was able to survive a very difficult fight, he did not have the capability to *understand* what was happening outside his perimeter and what actions the NVA were taking to defeat him—and, consequently, what actions he could take to achieve his objective of destroying the NVA force that had raided Plei Me. Even if Moore's concept had been *right*, and he had successfully engaged an understrength NVA battalion upon landing at LZ X-RAY, his C2 system could not have informed him of threats to the accomplishment of his task, nor of how to exploit the initial defeat of his opponent.

Finally, the importance of getting the "idea" right is clearly demonstrated at MARKET-GARDEN. Montgomery's information architecture, while primitive, did provide the intelligence that German armored units were moving into the Arnhem area. However, Montgomery rejected this information, developing his concept instead on the assumption that the information was untrue. Once the operation was launched, the ability of the C2 system to support alteration or cancellation of the operation was nearly nonexistent: The seriousness of the British 1st Airborne Division's situation became apparent only after a physical link-up with advancing Allied units.

The historical cases we have presented suggest that the quality of the commander's ideas is a critical factor in the functioning of C2 systems. If the idea outpaces the system's ability to support it, the system will likely function poorly, and the command function will suffer. If the idea is flawed or if the concept does not identify the information critical to validating it, the system will likely become flooded with extraneous information, as units in battle attempt to make sense of what is happening.

These cases also suggest that the massive improvements in command-and-control-system performance over the past several decades have not altered the reality that human beings have to know what to look for in order to maximize the performance of the C2 system. From our investigation, we can hypothesize that a well-articulated command concept, one grounded in a realistic, accurate assessment of friendly and enemy intentions and capabilities, is likely to place a lesser burden on the C2 system during its execution, thereby enhancing the ability of the C2 system to provide the few, critical pieces of information that the commander so desperately needs—those that could refute the validity of his concept and cause him to alter the concept.

Finally the six cases examined here suggest two additional hypotheses:

- Information that leads to the development of a sound command concept is at least as important as the information that shows whether a concept is valid or invalid.
- A massive flood of real-time information during a battle is unlikely to significantly alter the outcome of the battle; i.e., there are steep decreasing marginal returns to information.

Our preliminary analysis indicates that those commanders who had a prior command concept and an intuitive feel for battle were able to exploit their technical C2 systems to support the pursuit of their command concept and thereby significantly determine their success. This separation between the intellectual performance of the commander and the technical performance of the C2 system should help both in the technical design and evaluation of C2 systems and in the training and development of battlefield commanders.

## **IMPLICATIONS OF THE THEORY**

The task of formulating command concepts needs to be embedded in warfighting doctrine. The mapping of command concepts to combat plans must be a feature of battle preparation at all levels.

Commanders at all levels should be evaluated by the quality of the command concepts they develop and promulgate *before* battle, not

just by their abilities to improvise and orchestrate actions in response to the unforeseen *during* battle. History—and not just the six cases examined here—suggests that preparation, not improvisation, and vision, not orchestration, are the qualities that have most often carried the day in battle.

To design C2 systems to support improvisation and orchestration—as many U.S. technical efforts seem to be doing—may be teaching future battle commanders the wrong lessons. C2 systems should be designed to help commanders—all commanders—develop sound command concepts before battle and promulgate those concepts clearly and fully to all concerned. During battle, the overriding function of C2 systems should be to inform commanders where and how their command concepts might be wrong and in need of alteration.

Thus, communications doctrine must reflect that heavy traffic in the C2 systems during battle is a sign of a failed command concept: If a commander at any level is improvising and orchestrating battle actions over the command nets, that should be interpreted as *prima facie* evidence that the commanded forces were not properly prepared for the circumstances they actually encountered in battle. This does not mean that the commander anticipates *every* situation that his forces will encounter. It does mean that his forces will know what to do in every situation in order to be acting most consistently with the ideas embedded in his concept—and this includes providing him with the specific information he needs to show him that his concept might have to be altered.

This idea has significant implications for training. Instead of striving to push as much descriptive information as possible up through a communications system during battle and waiting for a reply, the subordinate strives to understand and implement the commander's concept. The subordinate is primed to recognize information that may affect the validity of the commander's concept (a force in a place where none was expected, for example), which will cue the commander that something important is happening to his concept.

It is an accepted truism that armies fight as they have trained. In training today, descriptive information and reactive processes dominate the action. The tempo of operations is intense, both to mimic the realities of the modern battlefield and to maximize the use of

scarce training resources. The action focuses on the battle itself, and not on the key activities that, prior to the battle, are essential for developing an understanding of the enemy and his intentions, the structure of possible outcomes, and the elements of information that hold the key to mission accomplishment. Thus, U.S. commanders and armed forces may be training more for the failure of command concepts (and, by implication, commanders) than for how to develop concepts that will succeed in the battles of the future.

Ours is emphatically not an anti-technology argument. The theory simply suggests two things:

1. Command concepts that turn out to correctly anticipate developments on the battlefield will place less of a burden on the C2 system (enhancing its responsiveness, among other things).
2. If development, articulation, and execution of command concepts are the essential elements of the C2 process, then C2 systems should, at a minimum, be designed to ensure that they support that process.

Technology—lots of it—may be essential. When things go wrong in battle, the commander must very quickly develop and articulate a new concept, and this may require a massive amount of technological support in the form of sensors, bandwidth, and decision support systems, as the case of Moore at Ia Drang demonstrates.

The U.S. Army, in its developmental concept paper for Force XXI, is grappling with these same issues:

Clearly, information technology, and the management ideas it fosters, will greatly influence military operations in two areas—one evolutionary, the other revolutionary; one we understand, one with which we are just beginning to experiment. Together they represent two phenomena at work in winning what has been described as the information war—a war that has been fought by commanders throughout history.

First, future information technology will greatly increase the volume, speed, and accuracy of battlefield information available to commanders.

Second, future technology will require the Army to reassess the time-honored means of battle command—to recognize that in the future, military operations will involve the coexistence of both hierarchical and internetted, non-hierarchical processes. Order will be less physically-imposed than knowledge-imposed. . . . Such shared information, where, in some cases, subordinates have as much knowledge as commanders, changes the dynamics of leader-to-led in ways yet to be fully explored and exploited.<sup>1</sup>

Army force developers have concluded that, explosive technological change notwithstanding, the command function seems to possess some enduring characteristics. Technology may have significantly altered the physical aspect of war, but the cognitive aspect of command is proving resistant to technological enhancement.

### **RECONCILING CYBERNETIC THEORY WITH COMMAND CONCEPTS**

The approach to understanding command and control described in the report does not necessarily contradict the cybernetic view. A fusion of the two approaches may not be of practical value, but it could be accomplished conceptually by extending cybernetic models to represent longer time scales. The processes carried out by humans at various C2 nodes depend not only on general doctrine but also on their understanding of the commander's concept of battle. The formulation and transmission of the commander's concept could be considered as the content of the C2 system over the extended period of time prior to battle. If the commander's concept of the impending battle—communicated prior to battle, during less-intense phases—proves powerful in guiding the actions of subordinates during the height of battle, then its effect is to reduce the communications requirements during battle.

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<sup>1</sup>U.S. Army, Training and Doctrine Command, *Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century*, Washington, D.C.: TRADOC Pamphlet 525-5, 1994, pp. 1-5, 3-5.

## **DIRECTIONS FOR FUTURE WORK**

At least three directions can be taken for the next steps in the development of this theory.

The first direction is to examine the implications of this theory for the real-world problem of development of C2 system design. In an era of limited resources, what does the theory indicate for how to think about procurement decisions? How should trade-offs be made between improvements in raw power and enhancements to overall system flexibility? How should decision support systems be designed so that they are empowering but not constraining? What examples from recent history are illustrative of the rewards and pitfalls of making the right or wrong system decisions?

The second direction for additional work takes a different approach to validating the theory: Conduct a series of interviews or discussions with (a) living commanders from all the services, to reflect their experiences onto our theory and to inquire whether their experiences resonate with or undermine our theory, and (b) doctrine writers and force developers who are currently grappling with the issue of how to use technological advances to enhance force effectiveness.

The third direction is to extend and refine the theory to ensure that it can be generalized over all services and their different media for operations, especially in view of the growing emphasis on joint operations and military operations other than war.<sup>2</sup>

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<sup>2</sup>Allard (1996 rev.) catalogs many of these difficulties in Chapter 6, "Tactical Command and Control of American Armed Forces: Problems of Modernization," especially pp. 169–188.