

Chapter 3 – C2 APPROACH

INTRODUCTION

In order to identify the range of possible approaches to Command and Control, the Working Group had to specify the factors that determine the essence of these two interrelated functions. While both the U.S.¹ and NATO² have formal definitions of “Command and Control,” these have been developed for legal and institutional purposes. As a result, they are politically rather than scientifically correct. They are not well suited to support research and development efforts. Indeed, these institutional definitions are typical products of consensus building and largely reflect what is considered current best practice, which developed during the Industrial Age. Hence, they do not leave room for approaches that are radically different from the established way of doing business. For example, they fail to distinguish between the functions of “command” and “control.” They also assume that the processes associated with these two concepts are the same throughout the force and across time, despite the fact that we know that there are significant differences in the way they occur across echelons, functions, and classes of situations. Moreover, these traditional definitions focus on the formal and legal distribution of authority and responsibility despite the fact that military forces are heavily impacted by informal organisations and linkages. Finally, they assume specific structures that are hierarchical and depend on a unitary command function, thus ignoring a host of potential alternatives.

THREE FUNDAMENTAL DIMENSIONS

Drawing on the experience and expertise of the Working Group and examining a number of historical systems, three fundamental dimensions that govern command and control were identified. These are the:

- Allocation of decision rights;
- Patterns of interaction among the actors; and
- Distribution of information.

All three of these factors deal with the reality within the system, not the theory behind it. For example, the allocation of decision rights includes the informal way the system functions, not just the formal structure. Similarly, the patterns of interaction deal with those that actually occur, not those that are supposed to occur. Finally, the distribution of information is the realistic one in the force, not the ideal called for by doctrine, tactics, techniques, and procedures. All three of these factors also are important for both the function of command and the function of control, though they mean somewhat different things in those two arenas.

¹ The Department of Defense defines “command and control” as “the exercise of authority and direction by a properly designated commander over assigned and attached 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. Also called C2.” Department of Defense Dictionary of Military and Associated Terms. Joint Publication 1-02. <http://www.dtic.mil/doctrine/jel/doddict/data/>. (April 07, 2005)

² NATO defines “command and control” as “the functions of commanders, staffs, and other command and control bodies in maintaining the combat readiness of their forces, preparing operations and directing troops in the performance of their tasks. The concept embraces the continuous acquisition, fusion, review, representation, analysis and assessment of information on the situation; issuing the commander’s plan; tasking of forces; operational planning; organizing and maintaining cooperation by all forces and all forms of support; organizing command and control; preparing subordinate command and control bodies and forces for combat operations; supervising and assisting subordinate commanders, staffs and forces; the direct leadership of troops during performance of their combat missions.” <http://www.nato.int/docu/glossary/eng/15-main.pdf> (April 07, 2005)

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All three may be impacted by culture, level, or training, or the technologies available to support communication and collaboration.

Figure 3-1 shows the three dimensions as though they were orthogonal dimensions and formed a cube. The allocation of decision rights can range from unitary (one actor hold all the rights) to peer-to-peer (equal rights for all). Patterns of interaction can range from fully hierarchical through fully distributed. The distribution of information can range from totally controlled through broad dissemination in which every actor has access to every item.

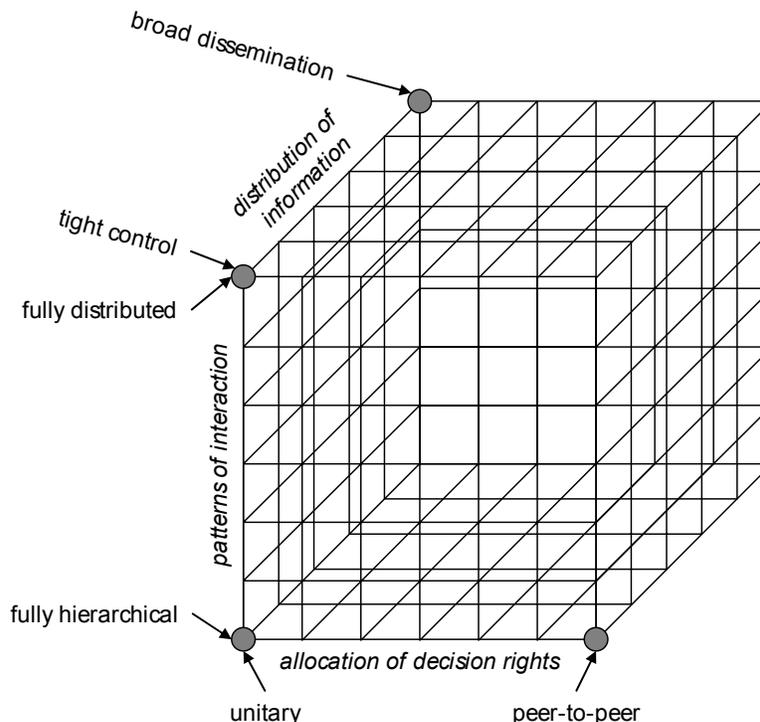


Figure 3-1: Depicts the C2 Approach Space Formed by these Dimensions.

The allocation of decision rights is the fundamental way that authority and responsibility are distributed within the force. For any given actor, this means the decisions that are assigned, as well as those that are permitted under some circumstances, as well as those the actor participates in but does not dominate. Decisions here include determining the occasion or opportunity for making a decision as well as the decision (choice among alternatives) itself. The control function deals with those decisions that are prohibited to some actors. For example, the use of special weapons systems may require the approval of particular levels of command and therefore be prohibited to others.

Patterns of interaction may also be required, permitted, or (control function) prohibited. These may be limited by the infostructure available as well as doctrine, culture, or other factors. The patterns of interaction are heavily influenced by the allocation of decision rights and have some influence on that factor (particularly in terms of informal interactions) as well. This deals with the reach (number and variety of participants in the interaction), richness (the breadth and quality of the content involved), as well as the quality of the interactions (media, availability, continuity, etc.) themselves.

The distribution of information also has positive (command) and negative (control) meaning. Here again, it is useful to think of information sharing that is required, permitted, and prohibited. This distribution is heavily impacted by both the allocation of decision rights and the patterns of interaction. Over time, it also feeds back to impact those two factors. Hence, these three factors (a) form a mutually reinforcing syndrome over time and (b) are far from independent from one another.

TWO SOURCES OF DYNAMICS

The fundamental dimensions determining a C2 Approach are not, however, static. They vary across at least two dimensions: function and time. The functional variation is the more obvious; different approaches to C2 are often apparent in operations and logistics, but may also occur in air and ground operations, special forces and conventional forces, and so forth. However, forces also change their C2 Approach over time. For example, during a crisis, the C2 Approach may be tightly centralized (narrow allocation of decision rights, continuous and doctrinally specified patterns of interaction, tight control over information) and emphasize control. However, if war breaks out, many of these constraints (for example, rules of engagement that restrict decision options) may suddenly be removed.

Indeed, dynamics across the three fundamental dimensions of C2 Approach and the ability of a particular force to operate differently over time and across function are key indicators of the capacity for agility. In particular, the capacity for adaptation (change in organisation and work process in response to differing conditions in the operating environment) is directly reflected in the range of C2 Approaches a given force is capable of adopting. In the Industrial Age force, this range is relatively narrow because it is optimized against a particular type of adversary and set of battlespace conditions. In more Information Age forces, a wide range of C2 Approaches is enabled by the types of personnel, training, technologies, leadership, organisation, and doctrine employed. These more agile forces also have the ability to recognize a need or opportunity to make meaningful adaptations and to act efficiently.

TWO SIDES OF THE COIN

As noted earlier, the three fundamental dimensions deal with both the function of command and the function of control. Within the SAS-050 Conceptual Model, Command Approach is a composite variable made up of:

- 1) Allocation of Decision Rights;
- 2) Patterns of Interaction Enabled;
- 3) Information Distribution;
- 4) Dynamics Across Purpose (Command); and
- 5) Dynamics Across Time (Command).

Not surprisingly, Control Approach also includes:

- 1) Restrictions on Decision Rights;
- 2) Patterns of Interaction Not Allowed;
- 3) Restrictions on Information Distribution;
- 4) Dynamics Across Purpose (Control); and
- 5) Dynamics Across Time (Control).

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In addition, the extent of Constraint Enforcement and Selectivity are also classed as parts of the Control Approach.

CONCLUSION

At its core, the C2 Approach deals with the allocation of decision rights, the patterns of interaction, and the distribution of information that characterises the force. These three core factors are dynamic; they may differ over time and across function, even within the same force. The range of values that are possible for a particular mission capability package determines its agility in the Command and Control functions.