



Friction, Chaos and Order(s): Clausewitz, Boyd and Command Approaches

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A former writer of British military doctrine, Jim Storr, recently lamented that, although many books explore *what* happens in war (history) or *why* wars happen (international relations), very few focus on *how* wars should be fought (warfare).¹ He concluded this reflects warfare's status as 'a poorly developed discipline'. Consequently, 'It is incoherent, contains a range of poorly described phenomena and is pervaded by paradox.'² The underdeveloped discourse concerning warfare, and within it the limited consideration of different approaches to command, may be considered an important contributor to the longstanding gulf between the doctrine of Mission Command espoused by the United States and British armies and actual operational practice,³ such that the doctrine is 'realized only in some places some of the time'.⁴

Understandably, the pressing practical concerns of serving officers encourage focus on the application of doctrine, rather than its theoretical basis. But this brings significant dangers: reliance upon a descriptive paradigm ('do this *because* it works') as opposed to an analytical paradigm ('this is *why* it works') can lead to Mission Command being perceived as merely a technique, divorced from its connection with the basic nature of warfare. Consequently,

¹ Jim Storr, *The Human Face of War* (London: Continuum, 2009), p. 2.

² Storr, *Human Face*, p. 10.

³ For example, Major John D. Johnson, 'Mission Orders in the United States Army: Is the Doctrine Effective?' (unpublished master's thesis, US Army Command & General Staff College, Fort Leavenworth, KS, 1990), Major David J. Lemelin, 'Command and Control Methodology: A Sliding Scale of Centralisation' (unpublished master's thesis, US Army Command & General Staff College, Fort Leavenworth, KS, 1996), and Brigadier Nigel Aylwin-Foster, 'Changing the Army for Counterinsurgency Operations', *Military Review* (November-December 2005), 2-15.

⁴ Eitan Shamir, *Transforming Command: The Pursuit of Mission Command in the U.S., British and Israeli Armies* (Stanford, CA: Stanford University Press, 2011), p. 201.

discussion of command approaches may be reduced to simplistic two-dimensional models.⁵ Elsewhere, I have attempted to take a first step beyond such limited thinking, developing a typology of command approaches that treats command as a response to the essence of warfare: friction.⁶

This article seeks to take two further steps towards establishing a conceptual foundation for discussion of command approaches. First, it examines how each of the command approaches defined in the typology interacts with the different aspects of friction identified by Clausewitz, thereby enabling an assessment to be made of the likely effectiveness of each approach in reducing friction. Second, it turns the issue of friction on its head and, drawing on the work of John Boyd, explores how each command approach responds to the challenge of actively *increasing* the friction experienced *by the enemy*, in order to achieve destruction of their strength. In so doing, connections are made with two other vital (but rarely analysed) elements of warfare: tempo and shock.

Through analysis of the relationship between command approaches and friction, this article seeks to support the contention that a command system is not simply a neutral technique, but (whether consciously or not) is a response to the fundamental nature of warfare. As such, some approaches are more likely than others to deliver victory.

Typology of Command Approaches

Clausewitz was the first to understand how friction creates the gulf that so often exists between what commanders *intend* to happen and what *actually* happens.⁷ As he noted, 'This tremendous friction, which cannot, as in mechanics, be reduced to a few points, is everywhere in contact with chance, and brings about effects that cannot be measured, just because they are largely due to chance. [...] Friction [...] is the force that makes the apparently easy so difficult.'⁸

⁵ For example, Lieutenant-Colonel W. Lossow, 'Mission-Type Tactics versus Order-Type Tactics', *Military Review* (June 1977), 87-91, Richard E. Simpkin, *Race to the Swift: Thoughts on Twenty-First Century Warfare* (London: Brassey's, 1985), p. 228, Lemelin, 'Methodology', p. 3, and Richard E. Simpkin, *Human Factors in Mechanized Warfare* (London: Brassey's, 1983), pp. 153-154.

⁶ Martin Samuels, 'Understanding Command Approaches', *Journal of Military Operations*, 1(3) (Winter 2012) (<http://www.tjomo.com>) [accessed 12 July 2014], 25-29.

⁷ Hew Strachan, *Clausewitz's On War: A Biography* (New York, NY: Atlantic Monthly, 2007) p.153.

⁸ Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), pp. 120-121.

Clausewitz recognised that friction was expressed in several different ways. Internal aspects of friction, generated within the army itself (such as insufficient knowledge of the enemy, or commanders' uncertainty about friendly forces' location and strength), creates a gap between the plans of commanders and the actions undertaken by their troops. Friction generated by the environment (such as weather, terrain, and logistics) produces a gap between the action and the expected outcome. Stephen Bungay has recently shown that the interaction between these aspects of friction produces a third gap – the actions taken by an army, even if these are according to the commander's plan, may not deliver the desired outcome.⁹

This produces the following model of friction:¹⁰

- Knowledge Gap: plans are imperfect because there is a gap between what commanders would *like to know* about the local situation and what they *actually know* – as Clausewitz noted, 'This difficulty of *accurate recognition* constitutes one of the most serious sources of friction in war, by making things appear entirely different from what one had expected';¹¹
- Alignment Gap: actions are imperfect because there is a gap between what commanders *want* units to do and what they *actually* do – 'A battalion is made up of individuals, the least important of whom may chance to delay things or somehow make them go wrong';¹² and
- Effects Gap: outcomes are imperfect because the nature of war means an army's actions may produce *unexpected results* – 'Particular factors can often be decisive – details only known to those who were on the spot'.¹³

The model exposes the alternative options open to commanders:

- Knowledge Gap: commanders may know either more or less about the local situation than do their subordinates, and, if less, may seek to close this gap either by demanding more information or by adapting their command approach to cope with less;
- Alignment Gap: subordinates may implement their commanders' instructions to a greater or lesser extent, and, where these instructions are not implemented, commanders may seek to close this gap either by

⁹ Stephen Bungay, *The Art of Action: How Leaders Close the Gaps between Plans, Actions and Results* (London: Brealey, 2011), pp. 30-35.

¹⁰ Bungay, *Art of Action*, pp. 43-45.

¹¹ Clausewitz, *On War*, p. 117 (emphasis in original).

¹² Clausewitz, *On War*, p. 119.

¹³ Clausewitz, *On War*, p. 595.

limiting themselves to orders setting out their general intent, leaving implementation to their subordinates' initiative, or they may require their subordinates to follow detailed orders precisely; and

- **Effects Gap:** events on the battlefield may or may not turn out as the commanders had intended, and, where they do not turn out as intended, commanders may respond to this gap either by intervening or by allowing their subordinates to react to the changed situation.

As I have described elsewhere,¹⁴ considering knowledge, alignment and effects in this way, as three broadly 'either/or' axes, allows us to generate a simple model having 2x2x2 (that is, eight) permutations. These are listed at Figures One and Two, and described in more detail at Figure Three.

Figure One: Eight Permutations

Knowledge Gap	Alignment Gap	Effects Gap	Title
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¹⁴ The following description of the eight command approaches largely reproduces Samuels, 'Command Approaches', pp. 26-27, with kind permission of the publishers, The IJ Group.

Superior knows less than subordinates	Subordinates should use initiative	Superiors will intervene	1: Enthusiastic Amateur
		Superiors will not intervene	2: Mission Command
	Subordinates should do as they are told	Superiors will intervene	3: Restrictive Control
		Superiors will not intervene	4: Detached Control
Superior knows more than subordinates	Subordinates should use initiative	Superiors will intervene	5: Directive Control
		Superiors will not intervene	6: Umpiring
	Subordinates should do as they are told	Superiors will intervene	7: Logistic Control
		Superiors will not intervene	8: Neglected Control

Figure Two provides an alternative way of presenting the permutations, through two four-box models, which allows the relationships between the eight command approaches to emerge more clearly.

Figure Two: Command Approaches

(Knowledge Gap)	<i>Superiors Know Less Than Subordinates</i>			<i>Superiors Know More Than Subordinates</i>	
(Effects Gap)	Enthusiastic Amateur	Restrictive Control	<i>Superiors Intervene</i>	Directive Control	Logistic Control
(Alignment Gap)	<i>Subordinates Should Use Initiative</i>	<i>Subordinates Should Follow Orders</i>	<i>Superiors Do Not Intervene</i>	<i>Subordinates Should Use Initiative</i>	<i>Subordinates Should Follow Orders</i>
	Directive Command¹⁵	Detached Control		Umpiring	Neglected Control

The names applied to each of the command approaches were coined for ease of reference and, where possible, to avoid negative perceptions. The aim was to identify the full typology, rather than make judgements regarding relative effectiveness. That assessment is made in later sections of this article.

Having identified the basic nature of the eight approaches, Figure Three defines and describes them.

¹⁵ While there are considerable similarities between Mission Command and Directive Command, I use the latter term here partly to retain consistency with my earlier work and partly to draw a distinction between Directive Command as a theoretical concept and Mission Command as the espoused doctrine of various armies.

Figure Three: Describing Command Approaches

Title	Description	Context
1: Enthusiastic Amateur	Superiors intervene, despite the fact they know less than their subordinates do and these will use their initiative.	Might be typical of the early stages of a large civil war (such as the American Civil War or English Civil War), where most commanders act enthusiastically and in accordance with the perceived common good, but where command issues relating to decentralisation have not yet been agreed.
2: Mission Command	Superiors will not intervene, because they know less than their subordinates do and are confident these will use initiative.	May be considered the default preference of the German Army for more than a century. It is widely held to be appropriate to the armed forces of many developed states, but requires significant levels of responsibility, initiative and training on the part of subordinates.
3: Restrictive Control	Superiors know less than their subordinates, but issue definitive orders (in the expectation these will be adhered to), and intervene to ensure compliance. <i>In practice</i> , they act as if they know more than their subordinates do.	May arise where a small professional army has experienced rapid expansion at the start of a major war, such as the British Army in 1914-16 and the American Army in 1941-42. It may also reflect arrogance on the part of superiors, where the potential ability of subordinates to use initiative is discounted, perhaps because of the selection and training of commanders. ¹⁶
4: Detached Control	Superiors know less than their subordinates know, but nevertheless issue definitive orders, and then leave their	Probably unthinking and may reflect inadequate training of superiors. They have been taught command and staff processes (perhaps by rote), but understand neither their own limitations nor the ability of subordinates to get things done.

¹⁶ Jörg Muth, *Command Culture: Officer Education in the U.S. Army and the German Armed Forces, 1901-1940, and the Consequences for World War II* (Denton, TX: University of North Texas, 2011), p. 80.

	<p>subordinates struggling to put these into effect. Subordinates actually know more than superiors, but are not allowed (or expected) to use initiative to resolve the problems arising from orders based on a poor understanding of the situation.</p>	<p>Critically, it may be what is actually practised (as opposed to intended) in modern western armies. The fault may lie in overly prescriptive doctrinal pamphlets (and training systems).</p>
5: Directive Control	<p>Superiors know more than their subordinates know, issue definitive orders and will intervene, but require their subordinates to use their initiative.</p>	<p>An expression of the German approach of 'the commander at the <i>Schwerpunkt</i>'. It suits a situation where the senior commander takes personal control at the critical point, but has subordinates with the training, education and experience to display initiative. It is also perhaps appropriate in large-scale operations where the big picture is more important than local detail, such as the D-Day landings in Normandy.</p>
6: Umpiring	<p>Superiors will not intervene, even though they know more than their subordinates do, as they are confident subordinates will use initiative.</p>	<p>Can be seen as careless (failing to take responsibility to intervene when things go wrong) or as Mission Command gone wrong (failing to pass relevant knowledge down to subordinates, so they can use initiative effectively). It may be well intentioned, sometimes resulting from command relationships that are too familiar or insecure, such as where commanders hold the same rank as their subordinates. It may have been characteristic of formation-level commanders in the pre-1914 British Army.</p>
7: Logistic Control	<p>Superiors know more than their subordinates</p>	<p>A very highly centralised command system. It might be representative of the position sometimes</p>

	and issue definitive orders, then intervene to ensure these are acted on, recognising (or believing) subordinates cannot be relied upon to use initiative safely.	achieved in modern high-technology warfare, where sophisticated intelligence systems may (appear) to give commanders more information than can be gained by their subordinates. The term Logistic Control was coined to suggest that, in the first instance, subordinates (and formations) are treated largely as inanimate objects to be pushed around, like boxes to be delivered. The Soviet Army may have aspired to this approach in the 1980s.
8: Neglected Control	Superiors know more than their subordinates and issue definitive orders, yet fail to intervene when events work out differently, since they are content to see subordinates fail (thereby strengthening their own position).	May describe a situation in which a superior seemingly deliberately sets up their subordinate(s) to fail. Despite seeming unlikely, it may perhaps reflect situations where allegiances are uncertain and political considerations outweigh immediate military objectives, such as in a civil war or the Italian Army of 1940-42. An alternative explanation is that it reflects a personal or cultural avoidance of responsibility. As with Umpiring, the commander may not feel his responsibility extends to correct problems at lower levels, even though this may prejudice mission success. Whatever the case, this describes behaviour few would describe as professional.

The model of command approaches developed above is intended to demonstrate the full range of possible options open to a commander, based on the alternative situations for each of the three gaps that together represent friction. Designed to represent the totality of the system, the descriptions are deliberately neutral in tone. Before moving on the consider their relative effectiveness, it should be underlined that these represent theoretical extremes, since the 'either/or' basis for the three gaps would, in reality, be more properly represented by a spectrum. For the current purposes, however, the division into eight idealised command approaches provides a useful basis for their characteristics to be explored.

Reducing Friction Experienced by Friendly Forces

The next step is to assess the effectiveness of each in reducing friction, and hence its value on the battlefield. In so doing, it must be recognised that command approaches do not exist as independent variables without context.

Two aspects of context¹⁷ are important here:

- Whether warfare is inherently chaotic or else essentially structured, and commanders' different perception of this aspect of warfare's basic nature.
- The organisational culture of an army, especially the beliefs and values surrounding the relationship between commanders and subordinates.

Chaos and Structure

The essence of the Knowledge Gap is whether commanders have an understanding of the local situation relevant to the orders they give and receive.

A central characteristic of the Knowledge Gap is that it is easy for commanders and their subordinates to make incorrect assessments of their own and each other's knowledge. Consequently, commanders and subordinates may believe their own knowledge of the local situation is either greater or less than the reality, and they may be similarly incorrect regarding that of each other. This unconscious factor is one of the main factors widening the Knowledge Gap, increasing friction.

The command approach adopted by an army, or an individual commander within it, is influenced by whether it is considered practical for commanders to gain a better understanding of the local situation than can their subordinates. A key consideration is whether warfare is seen as inherently chaotic or else as structured.¹⁸

¹⁷ The importance of these aspects was originally highlighted in Martin Samuels, *Command or Control? Command, Training and Tactics in the British and German Armies, 1888-1918* (London: Cass, 1995), pp. 3-6.

¹⁸ Samuels, *Command or Control?*, pp. 3-5. See also Spencer Fitz-Gibbon, *Not Mentioned in Despatches... The History and Mythology of the Battle of Goose Green* (Cambridge: Lutterworth, 1995), pp. xiv-xvi.

If warfare is basically *structured* (linear in cause and effect relationships), commanders can expect to have better knowledge of the local situation than their subordinates, given the greater intelligence resources available to more senior commanders and their staff's ability to analyse alternative scenarios. Consequently, commanders can objectively predict emerging opportunities and obtain detailed knowledge of new situations, thereby reducing the Knowledge Gap. Linearity also implies that the outcomes of combat actions are broadly predictable, reducing the Effects Gap.

Since the main remaining aspect of friction is the Alignment Gap, armies that perceive warfare as linear may be expected to emphasise extensive planning and detailed orders, to which subordinates must adhere rigidly. This appears to have been the model adopted by the Soviet Army: the Marxist belief that human interaction was subject to immutable laws (and consequently that warfare was inherently structured) led it to conclude that commanders could use their understanding of these laws to develop detailed plans in advance, which their subordinates simply needed to follow to the letter.¹⁹

This may lead to the 'Logistic Control' command approach being favoured as the most effective means to reduce friction. In turn, this may encourage commanders to expect that they will have greater knowledge of the situation than their subordinates, and hence fail to recognise when this is not the case, thereby causing them to slip unwittingly into 'Restrictive Control'.

By contrast, if warfare is fundamentally *chaotic* (non-linear in cause and effect relationships), commanders (given their distance, in time and space, from unfolding events) can rarely know the local situation as well as (let alone better than) their subordinates. The Knowledge Gap is therefore wide. The absence of linear relationships between actions and results means that the outcomes of combat actions are also less predictable, widening the Effects Gap. By comparison, the Alignment Gap may be less critical to the overall level of friction.

Armies that perceive warfare as chaotic are therefore likely to emphasise the importance of subordinates showing initiative, rendering the Knowledge Gap less significant, and to focus on reducing the Effects Gap. Since these armies believe victory is gained through rapid actions to seize the fleeting and unpredictable opportunities generated by this chaos, subordinates must be allowed maximum scope within which to apply their initiative – guided by the commanders' overall intent. The adoption of Mission Command by the American and British armies in the

¹⁹ Major George W. Eisel, 'Befehlstaktik and The Red Army Experience: Are There Lessons for Us?' (unpublished master's thesis, US Army Command & General Staff College, Fort Leavenworth, KS, 1993), pp. 4-23.

1980s was in part driven by precisely the belief that warfare was inherently chaotic, with ever changing scenarios, which therefore demanded the flexibility offered by this doctrine.²⁰

This may produce a preference for the 'Directive Command' command approach as the most effective means to reduce friction. In turn, this may lead commanders to overlook the possibility that sometimes they will have greater knowledge of the situation than do their subordinates, causing them to slide unwittingly into 'Umpiring'.

A perception of warfare as inherently chaotic may also encourage commanders to emphasise efforts to reduce the Knowledge Gap by securing personal observation of the local situation at the decisive point,²¹ resulting in the use of 'Directive Control'.

Since an army's *perception* of the nature of warfare as being either chaotic or linear significantly influences the command approaches adopted, it is necessary to consider warfare's *actual* nature. Given that the typology of command approaches is based on Clausewitz's description of friction, it is appropriate to use him as our guide when considering the fundamental nature of warfare.. The richness, depth and complexity (some might say obscurity)²² of Clausewitz's work here is demonstrated by the extensive secondary literature that it has inspired.²³ It is possible, however, to highlight the main positions through consideration of two seminal articles.

Alan Beyerchen²⁴ argued that Clausewitz saw warfare as inherently non-linear, in that outputs may be disproportionate to inputs and results may be sensitive to initial conditions – such systems being termed 'chaotic' in natural science.²⁵ Central to this understanding was that the outcome in warfare is, by definition, the consequence of the dynamic interplay between the opposing forces. Clausewitz used the analogy of a wrestling match²⁶ to highlight that the positions and moves adopted by one wrestler are often made possible only by those of their opponent. In passing, this alone should demonstrate that the study of one army alone can

²⁰ Major John F. Antal, 'Combat Orders: An Analysis of the Tactical Orders Process' (unpublished master's thesis, US Army Command & General Staff College, Fort Leavenworth, KS, 1990), pp. 14-19.

²¹ Muth, *Command Culture*, pp. 99-101, and *On the German Art of War: Truppenführung*, ed. by Bruce Condell and David T. Zabecki (London: Rienner, 2001), pp. 36-37.

²² Michael Howard, 'The Influence of Clausewitz', in Clausewitz, *On War*, pp. 27-44 (p.27).

²³ See the Clausewitz Homepage (<http://www.clausewitz.com/>) [accessed 19 March 2013].

²⁴ Alan Beyerchen, 'Clausewitz, Nonlinearity, and the Unpredictability of War', *International Security*, 17(3) (Winter 1992/93), 59-90.

²⁵ Several definitions of chaos are provided in a popular introduction to the topic by James Gleick, *Chaos: The Amazing Science of the Unpredictable* (London: Vantage, 1998), pp. 306-307.

²⁶ Clausewitz, *On War*, p. 75.

provide only a very partial understanding of a battle (just as a radio commentary of a soccer game that never mentioned the opposing team would render the course of play impossible for the listener to understand) – yet this is the norm in military history.

This interpretation was rejected by Terence Holmes,²⁷ who argued the passages used to support it had been misinterpreted. He suggested instead that Clausewitz believed detailed planning – a linear approach – was central to victory. Holmes took particular issue with Beyerchen's suggestion that Clausewitz considered warfare unpredictable, with the result determined by the combination of chance and the actions of the opponent. He noted that the famous saying, 'no war plan outlasts the first encounter with the enemy', comes not from Clausewitz but from the Elder Moltke. Instead, he argued Clausewitz placed great emphasis on effective advanced planning, focused on the desired objective, and a relentless concentration on the delivery of those elements of the plan central to the attainment of that objective. For this, Clausewitz borrowed another term from physics, the *Schwerpunkt*, to denote an object's centre of gravity – 'the point against which all our energies should be directed'.²⁸

It may be suggested Holmes was right to argue Clausewitz did not consider warfare completely unpredictable. Indeed, were this the case, the task of the commander would be impossible. But Beyerchen overstated the position when he suggested chaotic systems are, by definition, unpredictable. A distinction can be drawn between systems that are completely unpredictable and those that cannot be predicted with certainty. That this distinction is far from semantic may be demonstrated by analogy with the weather. The weather is certainly a non-linear system, but this does not mean it cannot be predicted. Weather forecasts can be quite accurate over short time horizons, and, over a longer period, we can be almost certain the weather during the winter will be colder and wetter than in the summer, even though it may be impossible to predict more than a few days in advance whether it will snow on a particular day in January or be sunny during a specific week in August. It is therefore entirely possible for Clausewitz to have regarded warfare as inherently chaotic, as Beyerchen argued, while still placing great weight on the importance of planning, as Holmes suggested. This is perhaps best summed up by the actual quotation from Moltke: 'No plan of operations extends with certainty beyond the first encounter with the main hostile force. [...] Yet in spite of all this, the conduct of

²⁷ Terence M. Holmes, 'Planning versus Chaos in Clausewitz's *On War*', *Journal of Strategic Studies*, 30(1) (February 2007), 129-151.

²⁸ Clausewitz, *On War*, pp. 595-596. It should be noted the German Army's longstanding use of the term differs from Clausewitz's definition, which is the current US Army usage. Major-General David T. Zabecki, *The German 1918 Offensives: A Case Study in the Operational Level of War* (London: Routledge, 2006), p. 31.

war has never degenerated into blind arbitrariness.²⁹ Moltke was not saying commanders should not have a plan. Rather, they should not be surprised if events unfold differently from their intention, and should be prepared accordingly.

If warfare is therefore inherently chaotic, 'Directive Command' may be the most effective command approach for reducing the level of friction experienced by friendly forces, supplemented by 'Directive Control' when commanders can position themselves personally at the decisive point. Its assumption that the Alignment Gap is the least significant of the three gaps, and hence its reliance on subordinates' initiative to achieve the commander's intent, based on their greater knowledge of the local situation, highlights the second critical aspect of the context within which command is undertaken – the trust between commanders and subordinates.

Trust, Initiative and Orders

The extent to which commanders can rely upon their subordinates to carry out their instructions as intended (and hence the width of the Alignment Gap) has two main aspects: motivation and capability. These may be mutually reinforcing. For example, William DePuy emerged from the Second World War convinced American troops were 'inherently reluctant to take risks and, because of inadequate training, unable to take charge in the absence of orders from a superior.' He therefore felt he could not trust his troops to perform as required without a system of 'detailed orders and thorough supervision by commanders'.³⁰

As with the Knowledge Gap, commanders' assessment of the motivation and capability of their subordinates may be incorrect – over- or underestimating these factors. Such incorrect assessments may cause commanders to issue orders that are either too general or too detailed for the capability of their troops. If too general, the Alignment Gap widens, as subordinates are unable to identify the most appropriate actions by which to achieve the commander's intent. If too detailed, the Effects Gap increases, since subordinates follow precise orders, even if inappropriate to the local situation.

²⁹ Moltke *on the Art of War: Selected Writings*, ed. by Daniel J. Hughes (New York, NY: Ballantine, 1993), pp. 92-93.

³⁰ Major Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations* (Fort Leavenworth, KS: Combat Studies Institute, 1988), p. 16.

The command approach adopted by an army, or an individual commander within it, will be affected by whether it is believed realistic for commanders to have trust in their subordinates sufficient to allow them significant freedom of initiative.

Questions of capability may arise where commanders find themselves leading newly raised forces, with limited training or combat experience. Alternatively, subordinates may be operating in an unfamiliar context, whether against a different enemy or in a novel environment. This may be particularly likely early in a major war. The quest for rapid victory may place a premium on every available soldier joining the fray, as with the German volunteer corps decimated at Langemarck in October 1914, whose mere two months of training meant they were capable of little more than massed frontal charges.³¹ Conversely, a small professional army may experience a traumatic expansion into a mass army, as when the US Army officer corps mushroomed thirtyfold in the two years to 1943.³² In such situations, commanders may well be justified in doubting the capability of their subordinates, hence assuming they cannot be trusted to act appropriately without detailed instructions.

Questions of motivation may arise where subordinates are perceived as inherently unwilling to further the commander's intent. Such situations may occur in conscript armies when the war has limited popular support, such as during the later stages of the Vietnam War.³³ Equally, this may happen when volunteers come forward only due to the absence of alternative employment options. For example, before 1914, over ninety percent of recruits to the British Army were previously unemployed and a majority failed to reach the minimum physical standard.³⁴ Where subordinates have little connection with the cause or with their unit, their willingness to put themselves at risk through active initiative may be doubted.³⁵

These (comparatively objective) factors affecting whether subordinates will carry out their commanders' instructions as intended may also be influenced by an army's organisational culture, specifically the relationship between commanders and commanded. Where command

³¹ Alex Watson, "'For Kaiser and Reich': The Identity and Fate of the German Volunteers, 1914-1918", *War in History*, 12(1) (2005), 44-74 (pp. 62-70).

³² Martin Van Creveld, *Fighting Power: German and U.S. Army Performance, 1939-1945* (Westport, CT: Greenwood, 1982), p. 140.

³³ Richard A. Gabriel and Paul L. Savage, *Crisis in Command: Mismanagement in the Army* (New York, NY: Hill & Wang, 1978), pp. 39-46.

³⁴ E. M. Spiers, 'The Regular Army in 1914', in *A Nation in Arms: A Social Study of the British Army in the First World War*, ed. by Ian F. W. Beckett and Keith Simpson (Manchester: Manchester University Press, 1985), 37-62 (p. 44).

³⁵ E. A. Shils and Morris Janowitz, 'Cohesion and Disintegration in the Wehrmacht in World War II', *Public Opinion Quarterly* (Summer 1948), 280-315 (pp. 314-315).

is considered a prerogative, initiative by subordinates may be perceived as a threat, encroaching on the commander's authority.³⁶ Conversely, armies with a strong sense of individual honour may feel it disrespectful to constrain subordinates through detailed orders.³⁷ Thus, just as with the question of whether warfare is linear or chaotic, an army's beliefs may affect its attitude regarding whether troops can be relied upon to act in accordance with the commander's intent, quite independently of their capability or motivation.

Taking this together, commanders who believe their subordinates incapable or unwilling to act with initiative to secure the overall intent are likely to seek to close the Alignment Gap by favouring command approaches featuring detailed orders, from which subordinates must not deviate. Since the essence of the philosophy is that subordinates cannot be trusted to act independently, the command approaches of 'Detached Control' and 'Neglected Control' would appear to be inherently dysfunctional, as in these the commander does not intervene to close the Effects Gap, leaving their subordinates adrift.

As has been noted, armies that consider warfare to be inherently structured are likely to have few reservations about seeking to close the Alignment Gap through reliance on detailed orders. They expect commanders to have sufficient knowledge of the local situation (leading to a narrow Knowledge Gap) and to be able to predict the outcome of their 'timetable tactics' (narrowing the Effects Gap). Hence, they may seek to operate through 'Logistic Control'.

However, if warfare is in fact fundamentally chaotic, commanders' knowledge will normally be less than their subordinates', such that the Knowledge Gap is wide. Reliance upon detailed orders in these circumstances would mean the approach adopted was instead 'Restrictive Control'. This carries the significant risk that closing the Alignment Gap may come at the expense of increasing the Effects Gap. The commander's intervention, based on inferior knowledge, may merely worsen the situation. In some situations, the choice of 'Restrictive Control' may be forced upon commanders, encouraging reliance upon highly-stylised tactical schemes, typified by a reliance upon overwhelming force and a low rate of tempo (an issue considered in detail below). For example, senior British commanders in the First World War recognised that Kitchener's New Army formations, hastily raised from volunteers at the

³⁶ Colonel S. L. A. Marshall, *Men Against Fire: The Problem of Battle Command* (Norman, OK: University of Oklahoma Press, 2000), pp. 61-62.

³⁷ For example, Frederick Charles, Prince of Prussia, 'The Origins and Development of the Spirit of the Prussian Officer, its Manifestations and its Effect' (1860), reprinted in K. Demeter, *The German Officer Corps in State and Society: 1650-1945* (London: Weidenfeld & Nicolson, 1965), pp. 257-266 (pp. 260-261).

outbreak of war and almost devoid of Regular officers,³⁸ were at first incapable of any but the simplest manoeuvres based on detailed orders.³⁹

It should also be noted that commanders' insistence that subordinates adhere rigidly to detailed orders may hinder development of the very capability and motivation to act with initiative whose absence generates the need for detailed orders in the first place, thereby creating a vicious circle. Equally, commanders may become so accustomed to issuing detailed orders that they fail to recognise when their subordinates become reliable. 'Logistic Control' may therefore decline into 'Restrictive Control', and this be retained when circumstances no longer require it.

Conversely, where commanders believe their subordinates have the capability and motivation to achieve the overall intent, they will focus on approaches emphasising maximum scope for lower level initiative. This suggests that the 'Enthusiastic Amateur' command approach is inherently dysfunctional, as in this situation commanders intervene even though they recognise that they have less knowledge of the local situation than do their subordinates, and that these can be trusted to act appropriately. Enthusiastic Amateurs simply hinder their competent and better-informed subordinates, creating disorder through widening the Effects Gap. Conversely, commanders' confidence in their subordinates can lead them to overlook situations where they do in fact have greater local knowledge than do those subordinates, leading to the dysfunctional 'Umpiring' command approach.

Relative Effectiveness of Command Approaches

This discussion of whether warfare is inherently structured or fundamentally chaotic, and whether commanders can trust their subordinates to act appropriately on their own initiative, suggests that four command approaches ('Enthusiastic Amateur', 'Detached Control', 'Umpiring', and 'Neglected Control') are inevitably dysfunctional. They are clearly misaligned with the nature of warfare, regardless of whether it is perceived as structured or chaotic, and so lead to a widening of the Effects Gap. The history of war, however, shows many commanders have adopted these approaches, normally inadvertently. But their relevance to the current discussion is limited and they will not be considered further.

³⁸ All of 21st Division's battalion commanders had been called out of retirement, as had fourteen other regimental officers. All the others were newly commissioned. Peter Simkins, *Kitchener's Army: The Raising of the New Armies 1914-16* (Manchester: Manchester University Press, 1988), p. 218.

³⁹ Brigadier-General James E. Edmonds, *The Official History of the Great War: Military Operations: France & Belgium, 1915, vol. 2: Battles of Aubers Ridge, Festubert, and Loos* (London: Macmillan, 1928), p. vii.

Under 'Logistic Control', commanders believe that they have greater (or more relevant) knowledge of the local situation than do their subordinates (so the Knowledge Gap is narrow), that their troops are unable or unwilling to exercise effective initiative (widening the Alignment Gap), and that there is a linear relationship between commanders' instructions and the results achieved (narrowing the Effects Gap). Since the main source of friction is the Alignment Gap, the appropriate response is for the commander to issue detailed orders, to which subordinates must comply unwaveringly – what the Germans called *Kadavergehorsamkeit* (corpse-like obedience).⁴⁰

Even competent and motivated subordinates may be unable to exercise initiative effectively in some circumstances, such as when they have less knowledge of the local situation than their commander does. For example, during a complex manoeuvre in August 1870, during the Franco-Prussian War, the Elder Moltke issued detailed orders directly to several corps, bypassing two army commanders. He recognised that his superior knowledge of the road network and of the location of formations meant relying on the initiative of his subordinate commanders, no matter how competent, would simply lead to gridlock.⁴¹ Commanders may also create such imbalances of knowledge deliberately, as when secrecy is required prior to an attack, in order to minimise the risk of information leaks and thereby maintain surprise.

Although 'Logistic Control' can therefore be an effective command approach under the right conditions, the chaotic nature of warfare means that these conditions are likely to be relatively unusual. Commanders will normally have less knowledge of the local situation than their subordinates (widening the Knowledge Gap), such that attempts to employ 'Logistic Control' will actually result in 'Restrictive Control'. In these circumstances, closing the Alignment Gap through detailed orders may widen the Effects Gap. The commander's lesser knowledge of the local situation means the orders are unlikely to reflect that situation properly, a state of affairs compounded by the limited connection between plans and results. Together, these factors mean the original orders are unlikely to lead to the desired results, rendering the commander's orders irrelevant and leaving subordinates unable or unwilling to continue to act in accordance with them. In the absence of an expectation, supported by previous training, that troops should exercise initiative, they are likely to remain passive until fresh orders are received, passing the initiative to the enemy. In order to minimise these risks, commanders intending to adopt 'Logistic Control' should seek assurance that their knowledge of the local

⁴⁰ Dennis E. Showalter, *Tannenberg: Clash of Empires, 1914* (Washington, DC: Brassey's, 2004), pp. 114-115.

⁴¹ Bungay, *Art of Action*, pp. 220-222.

situation, and their ability to predict the results produced through subordinates following their orders precisely, are soundly based.

The weaknesses of 'Restrictive Control', as an attempt to adopt 'Logistic Control' in an inappropriate context, should not obscure the fact that this command approach may sometimes be forced upon commanders. They may find themselves with subordinates unable or unwilling to exercise initiative effectively, yet be unable to secure sufficient knowledge of the local situation. As has been noted, such situations may arise in the case of formations hastily established from raw recruits at the start of a war. Equally, they may be prevalent towards the end of a war, where troops are convinced their cause is lost and so become apathetic: in the autumn of 1918, 'exhausted German soldiers simply waited for the advancing Allies to roll over them'.⁴²

Given the unwelcome nature of the circumstances that force commanders into 'Restrictive Control', they may be expected to make significant efforts to change this state of affairs. Armies that consider warfare to be inherently structured may be more likely to focus on closing the Knowledge Gap, in order to shift into 'Logistic Control'. This is an attractive option, as increasing commanders' knowledge may appear easier and quicker than increasing the capability and motivation of subordinates, which may accordingly be relegated to a lower priority. However, the chaotic nature of warfare suggests that attempts to gain greater knowledge are unlikely to be effective, while downplaying efforts to increase subordinates' initiative may trap commanders into continued reliance on 'Restrictive Control'.

By contrast, commanders confident their subordinates will exercise initiative effectively are in a much stronger position. This renders the Knowledge Gap much less important and makes 'Directive Command' the most appropriate means by which to reduce friction. But reliance on subordinates' initiative to close the Alignment Gap must be grounded on their competence and motivation. The mere granting of freedom to subordinates to use their initiative does not in itself mean they will do so in practice, or will choose the most effective course of action. Instead, the trust commanders have in their troops must be derived from a solid foundation of training, which has developed subordinates' capacity and capability to the level required to enable them to act effectively and reliably on their own initiative. One important aspect of this is that commanders must accept that subordinates will sometimes make mistakes.⁴³ It is noteworthy that the question of whether commanders were safe to make these

⁴² Alexander Watson, *Enduring the Great War: Combat, Morale and Collapse in the German and British Armies, 1914-1918* (Cambridge: Cambridge University, 2008), pp. 230-231.

⁴³ See Major Jim Storr, 'A Command Philosophy for the Information Age: The Continuing Relevance of Mission Command', *Defence Studies*, 3(3) (Autumn 2003), 119-129 (pp. 124-125).

assumptions, and so trust their subordinates, was a focal point in the debate between the supporters of *Auftragstaktik* and those of *Normaltaktik* in Germany during the late nineteenth century.⁴⁴ In the absence of reliable subordinates, attempts to employ 'Directive Command' are likely to lead to significant friction, through widening the Alignment Gap.

This question of trust, and especially the inevitable need for commanders who place trust in their subordinates' judgement to accept that mistakes will sometimes happen, is an important one, which deserves fuller consideration than is possible here. However, a brief excursion is justified. While the basic model of the eight command approaches has been developed through idealised extremes, in order to highlight contrasts, reality is rarely so clear-cut. Commanders may well find themselves having to make a judgement regarding the competence of their subordinates. A key factor in such situations may be the perceived consequences of what may be termed the 'well-intentioned mistake'. As Storr has noted, if a mistake (whether well-intentioned or not) may result in significantly negative consequences for the commander, human nature is such that the commander will default into retaining close personal control of the situation and leave minimal scope for initiative to subordinates. Storr argued that counteracting the insidious impact of this tendency required armies to be consciously aware of the issue and then to take active and explicit steps to make clear their firm support for any soldiers, whether commanders or subordinates, in the event of well-intentioned mistakes leading to undesired results. If this was not done, 'the good will leave and only the obedient, subservient and unimaginative will stay'.⁴⁵ While there can be little doubt that this is indeed the only practical solution, questions must remain whether this is always realistic, given the prevalent culture in many countries that leads to political and media expectations that mistakes by definition imply fault, which should be addressed through blame and resignation or dismissal.

As well as being sensitive to the reliability of their subordinates (and the consequences of well-intentioned mistakes), commanders seeking to employ 'Directive Command' need to recognise that there are some situations where they may indeed have greater knowledge of the local situation than their subordinates. As has been noted, failure to recognise or act on such greater knowledge may cause commanders to slide into dysfunctional 'Umpiring'.

That said, the use of initiative by subordinates must be recognised as no more than a means to achieve the end of delivering their commanders' intent. Commanders should not use their confidence in their subordinates as a reason not to grasp every opportunity to increase

⁴⁴ Samuels, *Command or Control?*, pp. 68-77.

⁴⁵ Storr, 'Command Philosophy', pp. 124-125.

their knowledge of the local situation, thereby allowing them to shift into 'Directive Control'. As Richard Simpkin put it, 'By being on the spot [the commander] gets the true feel of the situation, the thing that makes folks go to ballgames rather than watch them on television. [... But,] however he intervenes, he is going to tread on somebody's toes'.⁴⁶ For example, on 14 May 1940, when the German breakthrough in the Ardennes was at its most vulnerable stage, General der Panzertruppen Heinz Guderian, commander of the key XIX Panzer Corps, visited the forward regiments of his divisions and was then himself visited by Generaloberst Gerd von Rundstedt, commander of Army Group A.⁴⁷ In both cases, these commanders were operating 'two-down', in order to ensure their personal understanding of the situation and to drive the troops onwards, while recognising that their subordinates could in general be relied upon to use their initiative effectively. The intervention of commanders at the critical point reduces both the Knowledge Gap and the Alignment Gap, and consequently enables the Effects Gap to be narrowed.

This summation of these four command approaches brings out a central factor in the framework: the correct assessment by commanders of their level of knowledge, compared to that of their troops, is the driving force behind the subsequent steps taken to reduce friction.

If commanders have less knowledge of the local situation than their subordinates (likely to be the norm, given the chaotic nature of warfare), the most effective response is to adopt a system of command by intent, which relies on troops using their initiative and skill to exploit the emerging opportunities that only they perceive: 'Directive Command'. Where it is not possible to rely on such initiative, detailed orders, based on commanders' greater professional knowledge, must be employed: 'Restrictive Control'.

By contrast, if commanders have superior knowledge of the situation than their subordinates and the outcome of actions can be predicted, then a system of close control through detailed orders that must be followed precisely offers the best route by which to reduce friction: 'Logistic Control'. Where it is not possible to predict outcomes with certainty, close personal control coupled with the exercise of initiative by subordinates may be more appropriate: 'Directive Control'.

The conclusion of this assessment of the effectiveness of the different command approaches must therefore be that none is inherently superior to the others, as they are all dependent upon context. All should therefore be acceptable in practice. The chaotic nature of

⁴⁶ Simpkin, *Human Factors*, p. 149.

⁴⁷ General Heinz Guderian, *Panzer Leader*, trans. by Constantine Fitzgibbon (London: Futura, 1974), pp. 104-105.

warfare, however, suggests that armies that focus on developing the initiative of their troops, and which emphasise 'Directive Command' as the default approach to command, are more likely to be able to reduce the level of friction experienced.

Increasing Friction for the Enemy

Reducing friction for friendly forces, however, is only one side of the picture. It is equally necessary to consider the friction experienced by the enemy. Indeed, the most important consideration regarding friction in warfare may not be the *absolute* level affecting a given army. Rather, it may be the *relative* level of friction experienced by the respective opponents. Clausewitz's analogy with wrestling, noted earlier, underlines warfare is not like those sports where athletes individually seek to achieve the best absolute time or distance, with minimum interaction between the competitors, such as in sprinting or gymnastics. Rather, warfare is like soccer or tennis, where victory is secured through one participant directly defeating the other, with success based on comparative performance.

Clausewitz argued victory was achieved through the 'destruction of the enemy's forces', putting them 'in such condition that they can no longer carry on the fight'.⁴⁸ This can be defined as 'rendering the enemy force operationally irrelevant'⁴⁹ or 'a reduction in strength relatively larger than our own'. While recognising that inflicting physical casualties is an important element of destruction,⁵⁰ Clausewitz noted that 'the loss of morale has proved the major decisive factor.'⁵¹

As Marshal Foch, quoting Joseph de Maistre, put it, 'A battle lost is a battle one thinks one has lost; for a battle cannot be lost physically'.⁵² While not literally true, of course, Foch was correct to highlight that the loss of confidence in victory on the part of the commander is a key tipping point. The history of war proves repeatedly that this is the case: indeed, the very fact that so many orders and regulations exhort troops to carry out their tasks 'regardless of cost' suggest this is rarely happens in practice. For example, when Crete fell to German airborne assault in May 1941, British battle casualties numbered 3,479 men, but over twelve thousand

⁴⁸ Clausewitz, *On War*, p. 90.

⁴⁹ Simpkin, *Race to the Swift*, p. 139.

⁵⁰ Storr, *Human Face*, pp. 70-73.

⁵¹ Clausewitz, *On War*, pp. 230-231.

⁵² Marshal Ferdinand Foch, *The Principles of War*, trans. by Hilaire Belloc (New York, NY: Holt, 1920), p. 286. See also the discussion in Simpkin, *Race to the Swift*, pp. 214-215.

were ordered to surrender after their commanders concluded the position had become hopeless.⁵³ That Foch and de Maistre were not completely correct, of course, may be demonstrated by the defence of Okinawa in 1945: 'there was only one kind of Japanese casualty – the dead'.⁵⁴ This being the exception that proves the rule, maximising the *psychological* impact of operations on the enemy must therefore be of central importance. As Simpkin argued, 'a commander's ultimate aim should be to implant a picture of defeat in his opponent's mind'.⁵⁵

Yet, in considering friction, Clausewitz was primarily concerned with *decreasing* its impact on friendly forces. It was Colonel John Boyd of the US Air Force, drawing especially on his reading of Sun Tzu,⁵⁶ who suggested this was one-sided. Instead, he argued commanders should equally aim to *increase* the friction experienced by the enemy, in order to achieve destruction of their strength.⁵⁷

The OODA Loop

Despite the widespread impact of Boyd's theories, it was long difficult to be precise about his thought since his prose work comprised only a single, unpublished essay: *Destruction and Creation*.⁵⁸ In part, this was due to the anti-intellectual culture of Boyd's background as a fighter pilot, combined with a deep sense of the imperfection of his own thought. But perhaps the key factor was that he normally communicated through the military model of the oral briefing.⁵⁹ Boyd therefore primarily encapsulated his thinking in the slides prepared for four standard briefings: *Patterns of Conflict*, *Organic Design for Command and Control*, *The Strategic Game of ? And ?*, and *The Essence of Winning and Losing*.⁶⁰ These slides essentially provided prompts from which Boyd elaborated his argument. They were repeatedly revised as his

⁵³ David Fraser, *And We Shall Shock Them: The British Army in the Second World War* (London: Hodder & Stoughton, 1983), pp. 145-147. This is not to argue the commanders were wrong in their assessment of the situation.

⁵⁴ Quoted by John Terraine, *White Heat: The New Warfare 1914-18* (London: Sidgwick & Jackson, 1982), p. 17.

⁵⁵ Simpkin, *Race to the Swift*, p. 227.

⁵⁶ One of several editions used by Boyd was Sun Tzu, *The Art of War*, ed. by James Clavell (London: Hodder & Stoughton, 1981).

⁵⁷ John R. Boyd, *Patterns of Conflict*, p. 41.

⁵⁸ Grant T. Hammond, *The Mind of War: John Boyd and American Security* (Washington, DC: Smithsonian, 2001), pp. 118-120. The piece is reproduced in Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (Boston: Little Brown, 2002), pp. 451-462.

⁵⁹ Hammond, *Mind of War*, p. 17.

⁶⁰ These and other related briefings are available at <http://dnipogo.org/strategy-and-force-employment/boyd-and-military-strategy/> [accessed 5 April 2012].

thinking developed as he delivered these briefings hundreds of times over many years. As a result, their precise meaning is not always immediately clear when considered in isolation. It is therefore to be greatly welcomed that Frans Osinga, an officer of the Royal Netherlands Air Force, has produced a detailed, at times slide-by-slide, exposition of Boyd's thinking in these seminal briefings.⁶¹ This allows their full meaning to become available to those who were not fortunate enough to hear Boyd speak.

Boyd argued that the commander's intent should be 'to shatter cohesion, produce paralysis, and bring about collapse of the adversary by generating confusion, panic, and chaos'.⁶² In achieving this, his starting position was a model of combat that proposed that each participant, whether an individual pilot or an entire army, repeatedly goes through a four-stage cycle:⁶³

- *Observation*, where information about the current situation is gathered;
- *Orientation*, where that information is processed in order to produce an understanding of the situation;
- *Decision*, where that understanding is used to develop plans; and
- *Action*, where those plans are implemented.

Termed the 'Boyd (or OODA) Loop',⁶⁴ the concept has been widely adopted, not least by the British and American armed forces, especially the US Marine Corps.⁶⁵

It should be recognised there are weaknesses in the conceptual basis of the Loop. While Boyd drew his original inspiration from studies of aerial combat in Korea, more recent analysis of the methods used by the most successful fighter pilots shows they rarely participated in classic dogfights. Rather, fighter aces usually destroyed their targets during a single pass, not the iterative model proposed by Boyd. There must therefore be some caution whether the Loop reflects the reality of aerial combat, and hence can safely be extrapolated to other contexts.⁶⁶

⁶¹ Frans Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd* (Delft: Eburon, 2005).

⁶² Coram, *Boyd*, pp. 332-334.

⁶³ William Lind, *Maneuver War Handbook* (Boulder, CO: Westview, 1985), pp. 4-5.

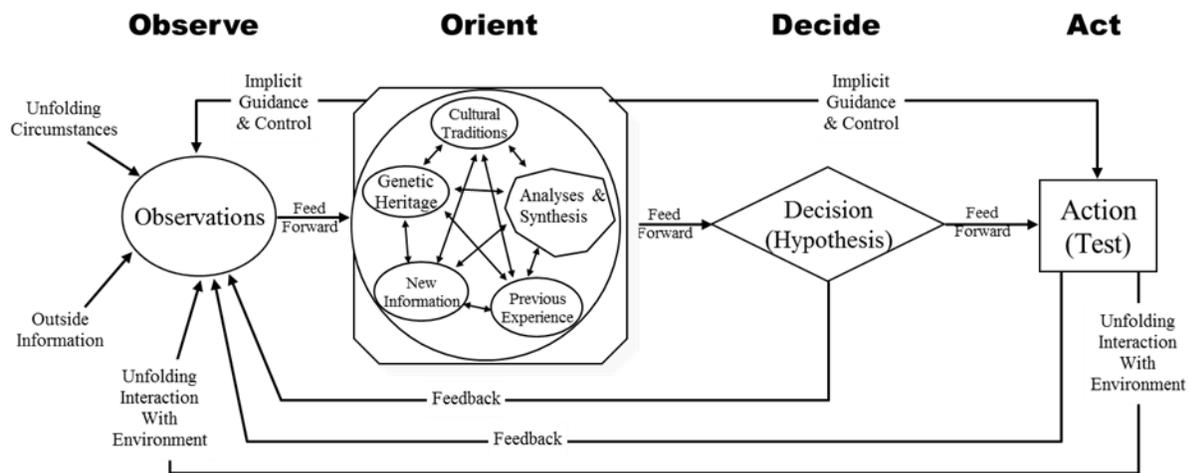
⁶⁴ Boyd himself preferred the usage 'O-O-D-A Loop', but found himself forced to accept the more common form. Coram, *Boyd*, p. 334.

⁶⁵ Hammond, *Mind of War*, pp. 194-195.

⁶⁶ Storr, *Human Face*, pp. 12-14.

Yet this by no means requires that we discard the Boyd Loop. Despite its perhaps questionable empirical basis, the Loop provides ‘a descriptive framework on which to hang discussions of command and control’⁶⁷ – an example of George Box’s famous maxim that ‘all models are wrong, but some are useful’.⁶⁸ This is all the more apparent when it is recognised that Boyd presented the Loop in graphic format only once, and this in the last of his briefings – *The Essence of Winning and Losing*⁶⁹ – prepared in 1995, just two years before his death.⁷⁰ Whereas descriptions by other authors had reduced the Loop to a superficial four-step cycle, Boyd in this final briefing demonstrated its true richness. He showed the Loop not only as a double-loop learning process, but with a double-loop process within the Orientation phase.⁷¹

Figure Four: Boyd Loop



In considering the relevance of the Boyd Loop for the framework for command approaches, two aspects are of particular importance: the central importance of the Orientation phase,⁷² and the impact of getting ‘inside the adversary’s time cycle or loop’.⁷³ It is here argued

⁶⁷ Storr, *Human Face*, p. 33.

⁶⁸ George E.P. Box and Norman R. Draper, *Empirical Model Building and Response Surfaces* (London: Wiley-Blackwell, 1986), p. 424.

⁶⁹ John R. Boyd, *The Essence of Winning and Losing*, p. 3.

⁷⁰ Osinga, *Science, Strategy and War*, p. 268.

⁷¹ Osinga, *Science, Strategy and War*, p. 271.

⁷² John R. Boyd, *Organic Design for Command and Control*, p. 16.

these aspects relate closely to two of the gaps central to friction: the Knowledge Gap and the Alignment Gap.

Orientation and Decision-Making

In our earlier discussion of the Knowledge Gap, it was identified that the correct assessment by commanders of their level of knowledge, compared to that of their troops, is critical to the subsequent steps taken to reduce friction. That discussion focused on the quantity and quality of information: plans are imperfect because there is a gap between what commanders would *like* to know and what they *actually* know. Armies have often sought to banish the fog of war, and so close the Knowledge Gap, by increasing the volume of information available to commanders, a trend reinforced by developments in modern information technology.⁷⁴

It is therefore perhaps surprising that statistical analysis of decision-making reveals that, if both sides make decisions at the same speed, the most likely outcome is a stalemate. More unexpectedly, this is true even if one side's decision-making is of much higher quality than the other's. By contrast, if one side makes decisions twice as fast as the other, it is almost certain to secure victory, even if its decisions are of lower quality than those of its opponent (subject to a minimum standard).⁷⁵ What is key from this analysis is that a decision that is 'about right' (not simply a quick guess!), but made and implemented at speed, is much more likely to inflict friction on the enemy than is a decision that is completely right, but slow. As Patton recognised, 'A good solution applied with vigour *now* is better than a perfect solution ten minutes later'.⁷⁶

Boyd understood this and therefore argued the commander should aim to 'operate at a faster tempo or rhythm than [his] adversaries.'⁷⁷ This has often been misunderstood, with the Loop reduced to 'a simplistic, one-dimensional cycle [...where] speed is the most important element of the cycle, [such] that whoever can go through the cycle fastest will prevail'.⁷⁸ For example, Simpkin erroneously defined tempo as the 'operational rate of advance [...], the

⁷³ Boyd, *Patterns of Conflict*, p. 5.

⁷⁴ Shamir, *Transforming Command*, pp. 166-168.

⁷⁵ Storr, *Human Face*, pp. 132-137.

⁷⁶ Charles M. Province, *The Unknown Patton* (New York, NY: Hippocrene, 1983), p. 165.

⁷⁷ Hammond, *Mind of War*, p. 123.

⁷⁸ Coram, *Boyd*, p. 334.

distance from the initial line of contact to the back of the final operational objective'⁷⁹ – that is, speed of movement (not even speed of reaction). That mere speed, by itself, does not necessarily increase the enemy's friction may be demonstrated by Rommel's famous 'dash to the wire' during Operation Crusader in November 1941, where he moved around the exposed southern flank of the British Eighth Army to threaten its supply lines and so prompt a precipitous withdrawal. This underlined again the superior speed of the Africa Corps' operations, but the manoeuvre failed to disconcert Auchinleck and ultimately led to Britain's first victory of the war over German ground forces.⁸⁰ In fact, as Osinga shows, 'Boyd advances the idea that success in war [...] hinges upon the quality and tempo of the cognitive processes of leaders and their organizations'⁸¹ – a much more complex model.

The pace with which commanders can go through the Loop is therefore of great importance. Here, the key factor is the emphasis placed by Boyd on the Orientation phase – 'without orientation there is no command and control worthy of the name'⁸² – and its impact on the Knowledge Gap. In this context, the Knowledge Gap should be understood not simply in terms of quantity and quality of information (Observation). Rather, the essence is the commander's ability to make use of the information available, in order to make and implement a 'good enough' decision *quickly*, even in the absence of significant elements of the whole picture (Orientation).

Boyd defined the Orientation stage as 'an interactive process of many-sided implicit cross-referencing projections, empathies, correlations, and rejections that is shaped by and shapes the interplay of genetic heritage, cultural tradition, previous experiences, and unfolding circumstances. [...] Orientation is the *Schwerpunkt*. It shapes the way we interact with the environment – hence orientation shapes the way we observe, the way we decide, the way we act'.⁸³ In a truly postmodernist appreciation, Boyd recognised Orientation is not simply a process of objective analysis of the information collected during the Observation phase. Rather, it involves the interaction of information and individual to create a subjective interpretation of reality.⁸⁴

⁷⁹ Simpkin, *Race to the Swift*, pp. 106-107.

⁸⁰ *The Rommel Papers*, ed. by B. H. Liddell Hart (London: Collins, 1953), pp. 163-167.

⁸¹ Osinga, *Science, Strategy and War*, p. 3.

⁸² Boyd, *Organic Design*, p. 25.

⁸³ Boyd, *Organic Design*, pp. 15-16. Boyd here uses *Schwerpunkt* in the Clausewitzian sense of 'centre of gravity', rather than the classic German military sense of 'point of main effort'.

⁸⁴ Osinga, *Science, Strategy and War*, p. 237.

Boyd argued superior Orientation was central to the rapid decision-making required to confuse the enemy. As Rommel noted, 'it is often not a question of which of the opposing commanders is the higher qualified mentally, or which of them has the greater experience, but which of them has the better grasp of the battlefield'.⁸⁵ Boyd recognised this 'grasp of the battlefield' was not achieved simply through laboriously going through each of the four stages of the Loop in turn at a faster pace. Instead, the ideal was to short-circuit the process.

There is significant evidence to suggest that battlefield commanders in practice base decisions on only a small proportion of the information available.⁸⁶ Indeed, receiving too much information can overwhelm commanders and their staffs, leading to paralysis.⁸⁷ Clausewitz understood this, noting 'war has a way of masking the stage with scenery crudely daubed with fearsome apparitions'. He concluded, therefore, that the challenge facing commanders was not so much to secure full information, but rather to achieve 'accurate recognition'.⁸⁸ This is not simply a question of the quantity and quality of the information *received*, but of its *use*.

Boyd adopted the term *Fingerspitzengefühl* (finger-tip feeling),⁸⁹ defined as 'an instinctive sixth sense for terrain and tactics',⁹⁰ to describe the ability of the commander 'to bypass the explicit "Orientation" and "Decision" part of the Loop, to "Observe" and "Act" almost simultaneously. The speed must come from a deep intuitive understanding of one's relationship to the rapidly changing environment'.⁹¹

Boyd argued superior Orientation – the ability to 'create mental images, or impressions, hence patterns that match with [the] activity of [the] world' – enables commanders to inflict friction by 'deny[ing the] adversary the possibility of uncovering or discerning patterns that match our activity, or other aspects of reality in the world'.⁹² The result is commanders' actions 'appear ambiguous (unpredictable) [and] thereby generate confusion' among the enemy.⁹³ Thus, the ability to make a good decision quickly, based on a minimum of information, thereby

⁸⁵ *Rommel Papers*, p. 122.

⁸⁶ Storr, *Human Face*, p. 131.

⁸⁷ Storr, *Human Face*, p. 140.

⁸⁸ Clausewitz, *On War*, pp. 117-118.

⁸⁹ John R. Boyd, *The Strategic Game of ? And ?*, p. 45.

⁹⁰ *Generals Balck and Von Mellenthin on Tactics: Implications for NATO Military Doctrine*, edited by General William DePuy (McLean, Va: BDM, 1980), p. 21.

⁹¹ Coram, *Boyd*, pp. 335-336.

⁹² Boyd, *Organic Design*, p. 16.

⁹³ Boyd, *Patterns of Conflict*, p. 5.

narrowing one's own Knowledge Gap, has the effect of widening the Gap experienced by the enemy and consequently increasing their friction.

Having explored the connection between Orientation and the Knowledge Gap, it is necessary to consider the effectiveness of the four key command approaches in facilitating rapid and effective decision-making.

Under 'Logistic Control', commanders' greater knowledge should allow them to achieve better orientation and, as such, the quality of their decisions should be higher. When considering the ability of commanders to use this narrowing of the Knowledge Gap to maximise the friction experienced by the enemy, the question is whether Logistic Control is compatible with *Fingerspitzengefühl* and tempo.

It seems likely that the Logistic Control commander will be at a headquarters some distance behind the frontline, at the nodal point of a network of information-gathering systems, supported by a large staff. Gathering significant amounts of information during the Observation stage, and collating, analysing, and synthesising it during the Orientation stage, will take a considerable amount of time. This reliance upon superior information runs counter to the essence of *Fingerspitzengefühl*, which commanders using Logistic Control may consider rash and unsystematic – intuition rather than deliberation. In addition, because, under this command approach, subordinates are expected to follow orders to the letter, the orders themselves are likely to be more detailed and hence take longer to prepare, thereby adding further to the time required between Observation and Action. For example, Simpkin noted the Soviet Army of the 1980s sought to use the power of information technology to enable senior commanders to operate a system he dubbed 'forward command from the rear' and which was essentially Logistic Control, but that this failed to offer sufficient 'speed and aptness of response to the actual situation'.⁹⁴

While commanders' orientation under Logistic Control may therefore be superior to that of their opponents, it is probably rather slower, making it less likely that they will achieve tempo and thereby inflict significant friction on the enemy.

Under 'Directive Control', by contrast, commanders' greater knowledge of the local situation is likely to come from personal observation on the ground, such as that sought by a German corps commander, Otto von Moser, during the surprise counterattack at Cambrai on 30

⁹⁴ Simpkin, *Race to the Swift*, pp. 43 & 52.

November 1917⁹⁵ - the assault regained much of the ground lost to the massed British tank attack ten days earlier and took over two and a half thousand prisoners.⁹⁶ This command approach is likely to be highly compatible with *Fingerspitzengefühl*. At the same time, the ability of commanders to rely upon their troops to act appropriately in order to achieve the intent even in the absence of detailed orders indicates that the amount of time required between Decision and Action will be short. This combination of strong Orientation and rapid Action may give the best chance of achieving tempo. For example, on 25 September 1915, following a major French assault in Champagne that had brought the German defence to breaking point, the newly-appointed chief of staff of Third Army, Colonel Fritz von Lossberg, made a personal observation of the new front line. This detailed understanding of the situation led him to undertake an immediate redesign of the defensive system, such that only days later French attempts to take advantage of their initial successes came to nothing.⁹⁷

The combination of rapid, accurate Orientation, coupled with quick implementation due to the ability to issue brief orders that capable subordinates can apply with initiative, offers a high probability that commanders employing 'Directive Control' will achieve tempo.

Under 'Directive Command', the key difference is that commanders have less knowledge of the situation than their subordinates do. While it is by no means impossible for them to achieve *Fingerspitzengefühl*, this is likely to be more difficult and slower than under 'Directive Control', as they have less information on which to base their Orientation and it is likely to take longer to reach them than if they were able to observe directly. However, since their subordinates can be relied upon to use their initiative to achieve the intent, orders can be short and issued quickly.

Perhaps the most famous example of this approach came in August 1914. Appointed chief of staff of the Eighth Army, which was in full retreat in the face of a two-pronged Russian invasion of East Prussia, Erich Ludendorff, eight hundred miles away in Coblenz, received only a basic briefing on the situation, yet was able to develop the plan that led to the annihilation of the Russian Second Army at Tannenberg. Even then, however, he recognised that the

⁹⁵ General Otto von Moser, *Feldzugsaufzeichnungen als Brigade-, Divisionskommandeur und als kommandierender General, 1914-1918* (Stuttgart: Belsersche, 1920), p. 323.

⁹⁶ Bryn Hammond, *Cambrai 1917: The Myth of the First Great Tank Battle* (London: Weidenfeld & Nicolson, 2008), pp. 325-383 and Jack Sheldon, *The German Army at Cambrai* (Barnsley: Pen & Sword, 2009), pp. 227-272.

⁹⁷ Captain Greame C. Wynne, *If Germany Attacks: The Battle in Depth in the West* (1940, reprinted Westport, CT: Greenwood, 1976), pp. 90-98.

Knowledge Gap meant, 'an actual decision as to the plan to be adopted could be given only on the spot'.⁹⁸

Taken together, skilled commanders, able to use with insight what information they have, coupled with reliable troops, may achieve a fairly high tempo through 'Directive Command'.

Finally, under 'Restrictive Control', commanders find themselves in the unenviable position of having less knowledge of the local situation than their troops, yet unable to rely on them acting appropriately on their own initiative. This may cause commanders to devote time to efforts to gain additional information about the situation, in order to narrow the Knowledge Gap, while also spending significant time on the preparation of detailed orders. Thus, during the attack on Thiepval, part of the opening day of the Battle of the Somme on 1 July 1916, the significant initial gains made by 109th Brigade of 36th (Ulster) Division were lost to German counterattacks after the corps commander rejected requests by all three of his divisional commanders to commit his reserve at that point of the line. He felt he needed further information before issuing detailed orders to troops he believed were of questionable capability.⁹⁹ In the event, Thiepval was not to fall into British hands until 27 September.¹⁰⁰

The combination of difficult orientation with the lengthy time required to prepare detailed orders means commanders relying on 'Restrictive Control' are almost certain to experience a slow cycle time, making it unlikely they will achieve the tempo required to inflict friction on the enemy.

Taking this together, through their reliance upon the commander's intent as a guide for subordinates, the speed of decision-making under both 'Directive Command' and 'Directive Control' is likely to be faster than under 'Logistic Control' or 'Restrictive Control', since the time required to develop and issue high level directives will normally be much less than for detailed orders. However, the quality of decision-making is likely to be lower in the case of 'Directive Command' and 'Restrictive Control', as the commanders in those situations have a wider Knowledge Gap and hence their Orientation is likely to be less effective than under 'Logistic Control' or 'Directive Control'.

⁹⁸ General Erich Ludendorff, *Ludendorff's Own Story, August 1914-November 1918; the Great War from the siege of Liège to the signing of the armistice as viewed from the grand headquarters of the German Army*, 2 vols. (New York, NY: Harper, 1919), vol. 1, pp. 49-55.

⁹⁹ Samuels, *Command or Control?*, pp. 150-151.

¹⁰⁰ William Philpott, *Bloody Victory: The Sacrifice on the Somme* (London: Abacus, 2009), p. 375.

In summary, an army employing ‘Directive Control’ can expect to make good decisions (based on personal observation) rapidly, thereby getting inside their adversary’s Loop. By contrast, an army applying ‘Restrictive Control’ is likely to make poor decisions (due to an incorrect assessment of the relative knowledge of commander and subordinates, or an inability to rely on subordinates’ initiative) at a slow pace. The chances of getting inside the enemy’s Loop in order to inflict friction are therefore low.

In terms of likelihood of achieving tempo, therefore, ‘Directive Control’ would appear best placed and ‘Restrictive Control’ worst. Given the relationship between speed and quality of decision-making, the quality of decision-making under ‘Logistic Control’ would need to be much higher than under ‘Directive Command’, in order to counteract the differential in speed. This is expressed in Figure Five.

Figure Five: Tempo and Command Approaches

	<i>Logistic Control</i>	<i>Directive Control</i>	<i>Directive Command</i>	<i>Restrictive Control</i>
<i>Speed of Decision Making</i>	Slow	Quickest	Quick	Slowest
<i>Quality of Decision Making</i>	High	Highest	Low	Lowest
<i>Likelihood of Achieving Tempo</i>	Medium to Low	Highest	Medium to High	Lowest

Tempo and Shock

The ability to short-circuit the Loop (narrow the Knowledge Gap) through *Fingerspitzengefühl* and hence superior Orientation, enables commanders to achieve ‘tempo’, getting ‘inside’ the enemy’s Boyd Loop. But this is only half the picture. Central to the concept

of tempo is its impact on the enemy. This leads to its definition as ‘the actuality of total domination of the “Being” of the enemy’.¹⁰¹

Boyd argued that ‘operat[ing] at a faster tempo or rhythm than our adversaries [...] will make us appear ambiguous (unpredictable), thereby generating confusion and disorder among our adversaries. This will cause our adversaries to be unable to generate mental images that agree with the menacing and faster transient rhythm or patterns they are competing against’.¹⁰² Similarly, he suggested getting inside their Loop has the effect of ‘folding our adversaries back inside themselves, morally-mentally-physically – so that they can neither appreciate nor cope with what’s happening – without [us] suffering the same fate ourselves.’¹⁰³ Consequently, the enemy becomes ‘unable to adapt to rapidly changing circumstances thereby convincing him to give up’.¹⁰⁴

What Boyd was describing, and hence the means by which tempo achieves an increase in the level of friction experienced by the enemy, appears to be the combination, often mutually reinforcing, of surprise and shock.

In seeking to connect surprise and shock with tempo, it is helpful to start with J.F.C. Fuller’s definition: ‘Surprise may be considered under two main headings: surprise effected by doing something that the enemy does not expect, and surprise effected by doing something that the enemy cannot counter. The first may be denoted as moral surprise, the second as material.’¹⁰⁵

‘Moral surprise’ may be achieved through timing, direction, means, or methods. For example, statistical analysis of battles demonstrates that frontal assaults on average result in the attacker suffering twice as many casualties as the defender, whereas unexpected attacks against the enemy’s flanks reverse that ratio, and attacks against the enemy rear double it again – making an unexpected rear assault on average eight times as effective as a frontal attack. Storr suggested these results derive in part from the immediate effects of surprise: physiological arousal, uncertainty, ‘attentional blink’, and the cessation of ongoing activity. In combination, these make surprised troops briefly unable to take an active part in combat, thereby giving the attacker the advantage. Over a longer period, surprise also leads to stress, which in turn may prompt irrational attempts to reduce uncertainty, expressed through ‘big-picture blindness’ or

¹⁰¹ Michael Elliott-Bateman (in conjunction with Spencer Fitz-Gibbon and Martin Samuels), ‘Vocabulary: the Second Problem of Military Reform – I. Concepts’, *Defense Analysis*, 6(3) (1990), 263-275 (p. 267).

¹⁰² Hammond, *Mind of War*, p. 123.

¹⁰³ Boyd, *Strategic Game of ? And ?*, p. 45.

¹⁰⁴ Boyd, quoted by Hammond, *Mind of War*, p. 143.

¹⁰⁵ Colonel John F.C. Fuller, *The Reformation of War* (London: Hutchinson, 1923), p. 50.

micro-management.¹⁰⁶ For example, at the climax of the Battle of Mars-La-Tour on 16 August 1870, the French commander, Marshal Bazaine, focused his attention on the placing of a single artillery battery, clearly unable to cope psychologically with the unexpected disaster unfolding around him.¹⁰⁷

With regard to shock, this reduces the effectiveness of the defence by about forty percent. Storr identified the main causes of shock as being 'surprise, rapid bombardment, sudden approach, the use of armour, and the use of certain types of weapons'. As with surprise, shocked troops withdraw from active or useful participation in combat, but this appears to be due to a state of psychological numbness, deeper than the 'blink' of surprise.¹⁰⁸ This suggests a connection with the second element of Fuller's definition: 'material surprise'. Shock appears to be more likely when troops are presented with a sudden intervention they believe themselves unable to counter, be this a saturating bombardment, an attack by seemingly invulnerable tanks, or in conditions of poor visibility.¹⁰⁹ This may also be related to what Boyd termed 'menace', defined as 'impressions of danger to one's well being and survival',¹¹⁰ which can cause moral strength to 'evaporate'.¹¹¹

It is clear that inflicting surprise and shock upon the enemy greatly increases the friction they experience.¹¹² This is principally through widening the Alignment Gap, as troops become unable or unwilling to carry out the tasks desired of them. Similarly, if commanders are themselves shocked or surprised, there may arise a gap between the orders they *ought* to give to achieve the intent and those they *actually* give (or fail to give).

Boyd's emphasis on 'getting inside the enemy's decision loop' can therefore be seen as being based on the conviction that the ability to make 'good enough' decisions quickly, and then implement them faster than the enemy, makes it easier for commanders to achieve surprise and inflict shock. This causes the enemy to experience both a wider Knowledge Gap (as events outpace their commanders' knowledge of the local situation) and a wider Alignment Gap (as surprised and shocked subordinates become unable to undertake their tasks effectively). The

¹⁰⁶ Storr, *Human Face*, pp. 84-86.

¹⁰⁷ Michael Howard, *The Franco-Prussian War* (London: Routledge, 1988), pp. 155-156.

¹⁰⁸ Storr, *Human Face*, pp. 87-88.

¹⁰⁹ See also Clausewitz's comments about the psychological impact of threats of encirclement. Clausewitz, *On War*, p. 233.

¹¹⁰ Boyd, *Patterns of Conflict*, p. 122.

¹¹¹ Osinga, *Science, Strategy and War*, p. 214.

¹¹² Boyd, *Patterns of Conflict*, p. 98.

consequence is a great increase in the differential combat potential of the two forces, and hence the probability of achieving victory is significantly improved.

As Clausewitz noted, 'All in all, loss of moral equilibrium must not be underestimated merely because it has no absolute value and does not always show up in the final balance. It can attain such massive proportions that it overpowers everything by its irresistible force. For this reason *it may in itself become a main objective of the action*'.¹¹³

Finally, if the purpose of achieving tempo is to make it easier to inflict surprise and shock on the enemy, given the dramatic reduction in combat capability that this can cause, it is necessary to complete the circle and return to one's own forces, in order to consider the effectiveness of the different command approaches in protecting friendly forces against surprise and shock.

'Logistic Control' and 'Restrictive Control' seek to narrow the Alignment Gap by requiring subordinates to follow detailed orders, and to await further orders if their original orders become inappropriate. However, troops waiting for revised orders are likely to be passive or following orders that are no longer aligned to the changed situation. As a result, actions by the enemy that are suited to the situation as it has now become are likely to come as a surprise. In addition, troops accustomed to relying on orders before acting may be more likely to feel unable to counter an unexpected action by the enemy, and hence more likely to experience shock. Consequently, reliance on 'Logistic Control' or 'Restrictive Control' may make troops more susceptible to surprise and shock, thereby widening the Alignment Gap.

Conversely, under 'Directive Control' and 'Directive Command', the expectation is that subordinates will continuously assess their local situation in order to identify the best means by which to achieve their commanders' intent. As a result, those subordinates are likely to use their initiative to reduce the chances of their being surprised by the enemy. They are also likely to have a greater sense of being able to respond to 'material surprise', thereby reducing shock. Consequently, it will be harder for the enemy to inflict friction on them through widening their Knowledge and Alignment Gaps.

¹¹³ Clausewitz, *On War*, p. 232 (emphasis added).

Concluding Thoughts

Based on a typology of command approaches developed through considering the possible responses to friction, this article has sought to take two further steps towards establishing a conceptual foundation for discussion of command approaches. We have examined how each of the command approaches interacts with the different aspects of friction identified by Clausewitz. This makes possible an assessment of the likely effectiveness of each approach in reducing friction. In so doing, we considered the fundamental nature of warfare, exploring whether it is inherently structured and linear or instead fundamentally chaotic and non-linear, concluding that the latter is more the case, and examined the consequences for command approaches. We then turned the issue of friction on its head and, drawing on the work of John Boyd, explored how each command approach responds to the challenge of actively *increasing* the friction experienced *by the enemy*, in order to achieve destruction of their strength. In so doing, connections were made with two other vital elements of warfare: surprise and shock.

The basic contention has been that a command system is not simply a neutral technique, but (whether consciously or not) is a response to the fundamental nature of warfare. As such, some approaches are more likely than others to deliver victory.

This analysis has suggested that four of the command approaches are intrinsically dysfunctional, as they are deeply misaligned with the nature of warfare, whether it is perceived as being structured or chaotic, and so inevitably widen the Effects Gap. In 'Detached Control' and 'Neglected Control', commanders believe subordinates cannot be trusted to act independently, yet do not intervene to close the Effects Gap, leaving them adrift. In 'Umpiring', commanders also fail to intervene to close the Effects Gap, but this time because their confidence in their subordinates means they overlook their own greater local knowledge. By contrast, 'Enthusiastic Amateurs' intervene even though they recognise that they have less knowledge of the local situation than do their subordinates, and that these can be trusted to act appropriately. Enthusiastic Amateurs simply impede their competent and better-informed subordinates, creating disorder through widening the Effects Gap.

Of the remaining four approaches, the most effective is likely to be 'Directive Control' and the least effective 'Restrictive Control', with 'Directive Command' and 'Logistic Control' between them.

Both 'Directive Control' and 'Directive Command' are likely to reduce the friction experienced by friendly forces, while at the same time inflicting friction on the enemy. In both

cases, commanders draw upon the information available to them to achieve rapid Orientation and quickly issue brief orders, centred on their intent. Both rely on troops having the capacity and willingness to exercise initiative to further the commander's intent, and the skills to do so effectively. This places great emphasis on the training of quite junior troops and on the ability of commanders to recognise the delicate balance, when giving their subordinates scope for initiative, between the benefits to be gained from the greater responsiveness this brings and the risk of those subordinates making mistakes that might undermine the commander's intent. Especially during periods of rapid expansion, such as at the start of a major war or when heavy casualties cause a high turnover of manpower, achievement of the required level of training may be difficult, if not impossible. In these circumstances, if commanders persist in expecting subordinates to exercise significant initiative, the result may be a descent into 'Umpiring', where commanders incorrectly assess troops' knowledge, or 'Detached Control', where subordinates are left to exercise initiative beyond their capability.

'Directive Command' in particular also relies on commanders feeling comfortable with uncertainty, yet this may be difficult to achieve during periods of peacetime, when the structured nature of military life may make it especially attractive to authoritarians. This tendency may be reinforced if the consequences of subordinates making even well-intentioned mistakes may be severely negative, whether directly to the success of the engagement, or to the future career prospects of the commander. The solution – an explicit corporate recognition that mistakes happen and that those making well-intentioned errors should be protected – may be easier to promote in theory than to apply in practice.

By contrast, 'Logistic Control' relies on commanders having greater knowledge of the local situation than do their subordinates. Given the chaotic nature of warfare, such circumstances will rarely occur for more than brief periods, despite rapid advances in information technology. In the absence of such greater knowledge, commanders seeking to control their subordinates absolutely may instead slide into 'Restrictive Control'. Yet this is not necessarily a dysfunctional command approach. Commanders may find themselves responsible for subordinates with only the most basic training, such that they possess minimal capacity and capability for action beyond that prescribed in advance. But lower standards of training are easier to achieve, especially during financial stringency, rapid expansion of forces, or following heavy casualties. In addition, the attractiveness of peacetime military life to personalities that feel most comfortable with order, hierarchy, and certainty may mean both 'Logistic Control' and 'Restrictive Control' fit with the cultural grain.

There seem to be clear advantages in effectiveness from commanders seeking to achieve tempo through rapid Orientation, ideally based on personal observation of the battlefield

through the principle of 'the commander at the *Schwerpunkt*', followed by speedy issuing of brief directives, leaving space for capable and trustworthy subordinates to exercise initiative to exploit emerging opportunities, in order to get inside the enemy's Boyd Loop and inflict friction through surprise and shock.

Yet it must be recognised that these approaches are dependent upon context. Where subordinates cannot be relied upon, commanders may be better advised to fall back upon detailed orders and rigid control. This may be less likely to achieve tempo, but it is also more likely to avoid the high levels of friction associated with 'Umpiring' or 'Detached Control'.

Command approaches are not absolutes. They are contextual, in terms of their relative effectiveness. Warfare is not a race against the clock, rather it is a game of 'rock, paper, scissors'.

And Yet...

Although this article has sought to explore the relative effectiveness of the various command approaches identified through a model of responses to friction, we should end by noting one of Clausewitz's most important warnings: 'Given the nature of the subject, we must remind ourselves that it is simply not possible to construct a model for the art of war that can serve as a scaffolding on which the commander can rely for support at any time... *talent and genius operate outside the rules, and theory conflicts with practice.*'¹¹⁴

¹¹⁴ Clausewitz, *On War*, p. 140 (emphasis in original).