

Australian Army Occasional Paper Command and Leadership Series 001 September 2017

## Command and control in modern warfare:

The importance of talent, experience and expertise

Serving our Nation



Australian Army Occasional Paper Command and Leadership Series 001

# Command and control in modern warfare:

### The importance of talent, experience and expertise

Lieutenant Colonel Grant Chambers, Colonel Chris Smith, and Dr Leanne Rees

Serving our Nation

#### © Commonwealth of Australia 2017

This work is copyright. Apart from any fair dealing for the purpose of study, research, criticism or review (as permitted under the Copyright Act 1968), and with standard source credit included, no part may be reproduced by any process without written permission.

ISSN: 2208-617X (digital version)

Inquiries should be directed to the Publications Manager.

Email: dflw.publications@defence.gov.au Web: <u>www.army.gov.au/</u>

#### AUSTRALIAN ARMY OCCASIONAL PAPER SERIES

This paper is the first in the series of Occasional Papers published by the Australian Army Research Centre (AARC). AARC was established by Chief of Army to foster knowledge of, and debate on, the profession of arms. To achieve this, AARC will sponsor research into the future of land power and related topics, and publish the results as either Occasional Papers or Monographs under one of the following seven themes:

- 1. Future of Army Series
- 2. Conflict Theory and Strategy Series
- 3. Command and Leadership Series
- 4. Human Performance Series
- 5. Operational Development Series
- 6. Technical Development Series
- 7. Ethos and Ethics Series

All papers published in this series will have the aim of advancing knowledge in an area related to Army, or fostering debate which is likely to enhance thinking about the profession of arms.

For further debate in some of these areas please see: https://www.army.gov.au/our-future/blog

#### **COMMAND AND LEADERSHIP SERIES**

This paper is the first in the Occasional Paper - Command and Leadership Series and is published in line with one of the Chief of Army's primary tasks for AARC: to enhance the quality of leadership in Army. Nothing is more important to an army than the standard of its leaders. Success or failure in every military endeavour throughout history can be linked to the quality of leadership displayed, and therefore, any research which can positively impact on the quality of Australia's future Army leadership is of paramount importance. AARC trusts that all leaders within Army will benefit from papers published in this series and that Army leadership may be enhanced through research such as this.

#### Foreword

The genesis of this paper was a chance meeting between Dr Leanne Rees and then Lieutenant Colonel Chris Smith on a windswept hill at the end of a major Army Exercise in 2013. Lieutenant Colonel Smith was the Commanding Officer of the 2nd Battalion, The Royal Australian Regiment and Dr Rees was a researcher with the Defence Science and Technology Organisation (DSTO). Dr Rees had been studying the performance of the brigade headquarters on the exercise and Lieutenant Colonel Smith was an exercise participant.

While waiting around between After Action Reviews, Smith and Rees met and quickly realised they shared a common interest in command and control practice in the Australian Army. The pair reflected on the growth in the size and complexity of the Australian Army's tactical headquarters over the preceding two decades and observed, despite the growth, headquarters may not be performing any better than they did when they were considerably smaller. In fact, they thought headquarters seemed to be unwieldy and beset by internal friction despite the best efforts of the headquarters staff. They agreed to continue to try to explain why an increase in the size and complexity of headquarters did not result in any observed improvement in their performance.

Coincidentally, the Army tasked Dr Rees and Lieutenant Colonel Grant Chambers, a staff officer in the Army's Directorate of Land Force Design (2015–2016), to evaluate command and control in the Australian Army. After two years of contemplation and further reflections by Chambers and Rees, a request from the Army to assist in evaluating a major Army exercise in 2016 offered an opportunity to test Rees' and Smith's original hypotheses. At the Army's request, Rees and Chambers participated as part of the evaluation team for the exercise, providing a report for the Army.

This paper is an elaboration of that report, aimed at translating the report's conclusions into change.

#### Introduction

Prior to the industrial revolution, commanders employed simple technologies to command and control (C2) troops on the battlefield such as trumpets, flags and messengers.<sup>1</sup> Armies were relatively simple organisations and commanders could more or less see the entire scope of a battlefield. The industrial revolution allowed nations to wage war on a much increased scale and advanced technologies have since become a major feature of modern warfare. Consequently, modern armies are far larger and more complex than their pre-industrial forebears. The scale of battle has also increased enormously. Larger armies and greater dispersion mean commanders can no longer see the complete battlefield. Headquarters have become larger and more sophisticated in order to direct bigger and more complex armies. Similarly, high-tech information-age C2 systems have replaced the flags, trumpets and messengers of the pre-industrial period.

The Australian Army's adaptation to the increase in sophistication and complexity of modern C2 has been challenging. The observations of this paper's co-author, defence scientist Dr Leanne Rees, who has observed Australian Army unit and formation headquarters over a career spanning Exercise Kangaroo in 1992 to Exercise Hamel in 2016, support this assertion. Her observations suggest the Army's headquarters are no more effective than their pre-digital antecedents in many respects. In some respects, they may be less effective despite a steady stream of investments in personnel, information management systems and information collection capabilities.

There is little doubt that sophisticated C2 systems are necessary to command and control contemporary technologically-advanced armed

forces. But Dr Rees' attempts over many years to model C2 systems were frustrated by an apparent 'X–factor'; a variable that seemed to exert greater influence over the performance of a headquarters than any of the objective and measurable elements of the C2 system. She hypothesised that the 'X–factor' was the commander. A recent scientific report prepared by Dr Rees and Lieutenant Colonel Chambers, based on observations of Exercise Hamel 2016, supports her hypothesis. It goes some way to dispelling the expectation of some people that the greater part of the solution to an improved headquarters functionality relies in investment in technical, structural and procedural improvements.

This paper finds that the experience, talent and expertise of the commander (and to a lesser extent the members of the staff), which manifests as capacity to cut through the fog and friction of war, in order to make appropriate, quick and intuitive judgements, are the primary arbiters of the quality of the performance of the headquarters. The paper finds that these qualities transcend technology, systems, processes, and the size of the staff. The paper concludes by suggesting greater investment in the early identification of talented future commanders and principal staff officers would benefit the Army. This investment should provide future commanders with the broadest practicable range of tactical experiences and mentorship to hone their expertise and judgement. Such investment, coupled with enhanced professional education, is likely to realise greater improvements in the function of headquarters than investment in systems, processes and additional staff.<sup>2</sup>

#### **Review of associated literature**

In his book, *Command in War*, Israeli historian and defence analyst, Martin van Creveld, puts command systems under the microscope. He regards them as functions of information, judgement, and decision-making.<sup>3</sup> He describes how command systems have evolved and functioned from ancient times to the near present. He observes that armies have always expended a great deal of energy in the pursuit of certainty about themselves, the enemy and the environment in the belief this certainty is sufficient to guarantee successful conduct of command in war.<sup>4</sup> He finds, though, that such certainty does not guarantee successful conduct of command in war.

According to van Creveld, the enduring problems of command faced by armies include:

Gathering of information on the state of one's own forces—as well as the enemy and on such external factors as weather and terrain. The information having been gathered, means must be found to store, retrieve, filter, classify, distribute, and display it. Based on the information processed an estimate of the situation must be formed. Objectives must be laid down and alternative methods for attaining them worked out. A decision must be made. Orders must be drafted then transmitted, their arrival and proper understanding by the recipients verified. Execution must be monitored by means of feedback system, at which time the process repeats itself.<sup>5</sup>

He contends command systems are a means of dealing with these enduring problems; arguing while technological advances give commanders new

tactical, operational, and even strategic possibilities, they also present new limitations.<sup>6</sup> He concludes:

no single communications or data processing system technology, no single system of organization, no single procedure or method, is in itself sufficient to guarantee the successful or even adequate conduct of command in war.<sup>7</sup>

He argues commanders are usually effective when they work out how to overcome the limitations of existing technologies rather than by simply employing additional advanced technologies.

John Keegan's *Intelligence in War* is also useful in understanding the relationship between information, decision-making and success in battle. Keegan finds that war is 'ultimately about doing, not thinking' and an information advantage in war is not necessarily decisive.<sup>8</sup> He disproves the widely-held and deterministic assumption that the more perfect a commander's knowledge of a situation the better their decisions will be. While he concedes 'to make war without the guidance intelligence can give is to strike in the dark, to blunder about, launching blows that do not connect with the target altogether'<sup>9</sup>, 'intelligence factors will rarely determine the outcome.<sup>10</sup> While intelligence, and, by inference, information are often necessary for victory in battle, it is not a sufficient condition for victory.<sup>11</sup> Other immutable characteristics of war such as human will and chance tend to have a much greater influence over events and outcomes.

Retired infantry officer and defence analyst, Jim Storr's *Human Face of War* includes a detailed consideration of tactical C2. He finds 'battle field decision making is not information intensive; it is information sensitive.'<sup>12</sup> implying battlefield decisions benefit from important specific pieces of information rather than lots of information. Appreciating the adversarial, dynamic, uncertain and confusing nature of combat, Storr asserts commanders should aim to develop plans that outline the 'sort of' approach that will be useful in the pursuit of objectives and communicate those plans quickly rather than prescribing detailed or rigorous plans that very specifically define the objectives and approaches. He suggests experienced commanders who are capable of highlevel abstraction are more resilient to battlefield stressors than highly-analytical approaches to C2 that rely upon rigorous analytical approach involves more staff, longer periods of continuous concentration and the probability more

options will become apparent. These elements are likely to be susceptible to friction, based on increased demand for information, staff fatigue and uncertainty. Experience-based abstraction is likely to be less susceptible.

Theorist Carl von Clausewitz, discusses in *On War*, command in Chapter Three of Book One titled 'On Military Genius'. He argues 'any complex activity, if it is to be carried out with any degree of virtuosity calls for appropriate gifts of intellect and temperament.'<sup>13</sup> He refers to these gifts as genius. Genius, he argues, is 'a very highly developed mental aptitude for a particular occupation'<sup>14</sup> and consists of 'a harmonious combination of elements, in which one or the other ability may predominate, but none may be in conflict with the rest.'<sup>15</sup> Clausewitz argues this combination derives from a special type of mind.

He outlines several behaviours and traits that make up this special kind of mind. The first is courage, which, according to Clausewitz, exists in two forms—courage in the face of danger and the courage to accept responsibility for the effects of commanders' actions on their people. The second trait is a sensitive and discriminating judgement, which includes a 'skilled intelligence to scent out the truth' in the uncertainty, misinformation, miscommunication and confusion of war. The third trait is the quality that allows the mind to emerge unscathed from the demands placed on it by uncertainty, friction and danger. Clausewitz refers to this as the combination of an inner light that even in the darkest hour leads to truth and the determination to follow this light. The fourth is the presence of mind to deal with the unexpected. The fifth is the will to overcome the resistance from within the commander's organisation as the demands of war begin to affect his soldiers. The sixth is the energy to remain staunch and endure prolonged resistance. Last is self-control.<sup>16</sup>

The work of these four authors indicates that while information is an important element of C2, it is not the only important element. Storr, Clausewitz and van Creveld suggest human psychological and cognitive factors and real deeds on the battlefield, even chance, are more decisive than information in war. Three of the authors assert that the commander's talent or 'genius' for the job (Clausewitz' combination of qualities) is an essential feature of good C2.

While arriving at similar findings to the other authors, this work is unique because of its focus on the Australian Army. It started as a search to uncover why the Australian Army's steady investment in technological

and procedural improvements to headquarters seemed not to have a concomitant effect on the performance of those headquarters. While its conclusions are similar to these other works, its unique contribution is its specific finding that the commander's talent, experience, and expertise (the 'X-factor'), and to a lesser extent the talent, experience and expertise of the principal staff officers, have a major, if not decisive, influence on the performance of headquarters.

#### The function of Information in C2

The broader functions of C2 are modelled in Figure 1. They are consistent with Martin van Creveld's summary of the enduring problems of command, which include: compiling, adapting and communicating the best approximation of the actual state of the situation (*Image*); deciding, planning, coordinating and communicating with and mobilising people and resources to do something about it (*Intent*); to create a new desired situation<sup>17</sup> (desired state). In simple terms, military activities aim to change the situation, or in military and scientific parlance, shift the *operating environment* from an undesired to a desired state. For example, the force may aim to capture a village occupied by an enemy force because it sits at the junction of important roads that give the occupier a marked advantage. A military force causes this change of state by executing a plan, which is conceived, prepared, communicated and coordinated through a system of C2.



Figure 1. The Information, Image and Intent (I3) Framework.

Commanders use C2 systems to effect events on the battlefield indirectly through instructions to subordinates, suggestions to adjacent units, and requests and reports to supporting units and superiors. C2 processes tend to be hierarchical and although system-dependant, information tends to flow up and down between the hierarchical layers of the organisation. This fact notwithstanding, contemporary communication systems and information technologies are capable of gathering data from a variety of sensors such as imagery from unmanned aerial systems and satellites, and making that data available simultaneously to many levels of the hierarchy to form what is known in military jargon as a common operating picture. (COP)

A COP amounts to the organisation's collective impression of the situation on the battlefield and is, in essence, the data made available for the commander and others in a readily consumable form. A commander and the staff develop and maintain awareness of the dynamic situation on the battlefield from information contained in reports presented by members of the staff, subordinate commanders, superior headquarters, and directly by electronic systems. The commander makes decisions based, in large part, on the information provided through the C2 system.

While a difference between the commander's impression of the situation on the battlefield and the actual state of things is inevitable, it is prudent nonetheless for the commander to reduce this gap to some extent. The more the commander, the staff and subordinates know about the actual state of the *operating environment*, the more likely the actions of the commander's forces will be appropriately focused and timed to achieve the desired change. As John Keegan cautions, 'to make war without the guidance intelligence can give is to strike in the dark, to blunder about, launching blows that do not connect with the target altogether.'<sup>18</sup>

Commanders close the gap between their impression of the undesired state of the *operating environment* and the actual state by collecting information from a wide array of sources. Information and intelligence flows to the commander from the *operating environment* through reports provided by subordinate, flanking and superior headquarters and other agencies and machines. Yet, pursuit of certainty is folly. Keegan himself says, warfare is 'ultimately about doing, not thinking.' There is a point after which a commander's investment in obtaining greater awareness of the situation begins to realise rapidly diminishing returns. Even if it were possible to have perfect knowledge of the situation, the effort to maintain that perfect knowledge is untenable. Accordingly, the commander is (or ought to be) aware that knowledge of the actual situation—the actual *operating environment*—will always be incomplete and inaccurate, and the degree of incompleteness and inaccuracy is itself uncertain.

Changing the situation from its actual state to the desired state in war is a dynamic activity. Therefore, plans for acquiring information about the battlefield must also be dynamic. Warfare is unlike an engineering project in which most of the variables are relatively fixed, or in which one can reasonably predict the effect of changing one variable on the others. Warfare is a contest akin to a duel. An adversary is normally trying to stop the commander from achieving their objectives (their desired state) and is often trying to deceive the commander as to the actual state of things. In addition, the adversary has their own objectives. Consequently, when considering the ways and means to achieve desired objectives, a commander must take into account the likelihood of unanticipated emergent circumstances and the risks and opportunities presented.

To complicate matters, the actual state and the desired state are not static. The enemy, one's own actions, other local actors, and regional and international events, among other factors, cause the actual state of things to change. In response, the commander may conclude that the future desired state is no longer appropriate or achievable, and so the commander may amend the desired state. This change may happen at inopportune times such as in the middle of planning or in the middle of the pursuit to achieve the original desired state. All the while, adversaries will oppose and hinder the commander's efforts to understand the situation and to achieve the desired state.

Given these dynamics, the commander ought to revise efforts to collect information to close the gap between the impression of the situation and the actual state of things. The greater the commander's perception of the gap between the impression of the *operating environment* and the actual state of the *operating environment*, the more comprehensive their actions to close that gap ought to be. For example, in the event that new information seems to render the commander's impression of the situation false, the commander may initiate a new planning cycle not only to reconcile the gap between the impression of the state of things and the actual state of things, but to modify the actions of own forces to reflect the actual situation more closely. A commander may believe, for example, an enemy force occupying a village to be relatively small, only to discover the enemy possesses a much greater and more powerful force. Such a situation may warrant a complete revision of the attack plans. This undertaking may occur in parallel to similar undertakings by superior headquarters and subordinate headquarters as well as other agencies and allies.

These dynamic factors compound to cause the end state to be different to the desired state envisioned at the outset, even if the commander regards the mission a success. Ideally, the commander's original desired state and the actual state that the commander's forces create at mission completion are similar. However, given that the commander's desired state may change as a result of the unfolding events on the battlefield, the final state will often be guite different to the originally-desired state and still be acceptable nonetheless; such is the dynamic and uncertain nature of warfare. For example, the desired states imagined by the commanders of the Army of the Potomac and the Army of Northern Virginia at the time of their first meeting engagement at Gettysburg in 1863 did not anticipate the events of the next three days or the final result of the battle and its implications for the war. Nevertheless, the result was highly desirable to the North. A failure to accept this feature of warfare results in commanders pursuing a fixed objective according to a fixed plan that are both likely to be made irrelevant by changes in the circumstances (known in military jargon as fighting the plan not the enemy).

Information in warfare is important but not necessarily decisive because of war's uncertain, confusing and dynamic nature, and because in war, thinking is not enough.<sup>19, 20</sup> While the pursuit of certainty about oneself, the enemy and the environment is futile, it is prudent nonetheless for commanders to seek to make their impression of the situation match, as closely as practicable, the actual situation lest they 'blunder about.' In the next section, the paper explores how information contributes to the commander and the staff forming their mental approximations of the situation.

#### The function of Image in C2

Discussion in the previous section suggests that adaptation is at the heart of successful command and that a commander's capacity to adapt corresponds with the capacity to visualise the situation and establish an adequate mental model. However, given the dynamic nature of war, the speed with which the situation changes, the number of variables at play, and the related uncertainty and confusion, the commander's mental model will be incomplete and incorrect. It can only ever approximate the actual situation or *operating environment* no matter how much the commander invests in achieving a perfect knowledge. This mental model is called the *'Image'* in the I3 Framework shown at Figure 1 and it is an abstraction of the actual state of the *operating environment*.



Figure 2. The activities of commanders, staffs and headquarters

Commanders and their staff utilise three broad types of information to compile, modify and share the *Image*. The three types of information are usefully described as objective<sup>21</sup>, subjective<sup>22</sup> and speculative.<sup>23</sup> Objective information is the raw information that staff members and commanders might treat as factual, impartial and unbiased; for example, that several enemy tanks are at a certain location. Junior staff such as watch keepers and junior intelligence staff are normally responsible for dealing with objective information; verifying it, storing it and moving it around the headquarters and passing it to other headquarters.

Subjective information is essentially the assessments and judgements people make about objective information; for example, that a group of enemy tanks is indicative of an enemy advance guard or a decoy. It is the product of bringing separate pieces of objective information together in a way that gives the information meaning, and necessarily includes subjective choices about which pieces of objective information to include or omit, and subjective weightings of the veracity, importance and relevance of information. Subjective information also includes peoples' judgements about the importance of the information and its implications for the commander. Subjective information is a function of the experience and intellect of those making the assessments. It is also a function of cognitive factors such as bias, fatigue, and temperament among others. How one person presents the subjective information to another is likely to affect how the other responds to it.

While all staff officers and commanders make subjective assessments about information, the individuals the commander relies upon most for subjective information are the principal staff officers. Whereas the junior staff officers of a headquarters largely work with objective information, making only limited subjective assessments, the principal staff officers largely work with subjective information and make many judgements about it. Commanders normally expect the principal staff officers, who by their seniority tend to have more experience than the junior staff members, to make connections between pieces of information reliably and to make subjective judgements about it.

However, subjective information is normally a product of an assessment of things that have occurred or are occurring, with a limited degree of anticipation of its influence on the future. The third type of information is speculative and amounts to judgements made about things in the future. It amounts to anticipating how events might unfold and how people might react to these events-how the *operating environment* might respond to action or stimulus; for example, whether a feint might draw the tanks away from their position. The commander's *Image* approximates not only the situation as it is at a given moment, but also how the commander expects events to unfold and how the enemy and others are expected to behave in response to these events (particularly the actions and intended actions of the commander's forces).

The commander's *Image* incorporates knowledge of a wide array of factors. These factors include:

- the mission,
- weather and terrain,
- available time,
- the commander's superior's intentions,
- the commander's experience and temperament,
- orders that constrain the commander's choices,
- the disposition of the commander's forces and other friendly forces,
- the state of the enemy's forces,
- the personalities on the commander's staff,
- his superior's personality,
- the relative fatigue and moods of these critical personalities,
- the status of the commander's materiel, supply and transport,
- whether his forces have had recent successes or failures, and much more.<sup>24</sup>

Critically, the *Image* includes the commander's judgements (speculation) about how each of these variables might affect and be affected by the range of possible scenarios that might emerge as a function of their interaction.<sup>25</sup> Consequently, the commander's *Image* is (or ought to be) pliable subject to constant review and revision. Most importantly, the commander's *Image* will unavoidably be determined by a good deal of speculation.

The extent that the commander speculates to derive the *Image* is probably much greater than many would realise. Experience prepares the mind to recognise information that is likely to signal something important

about the situation and thereby helps the experienced mind anticipate how the situation is likely to unfold. For example, a routine report by a reconnaissance patrol about the movement of a small number of enemy troops within a village might seem insignificant to the members of the reconnaissance patrol or an inexperienced staff officer, but it might subconsciously alert a talented and experienced commander to the potential for a decisive opportunity (speculative information). This capacity for the talented and experienced commander to recognise these opportunities or risks in an apparently obscure piece of information is part of what Napoleon referred to as *coup d'oeil*,<sup>26</sup> meaning a stroke of the eye, or a glimpse in English, and amounts to the intuition of an expert.<sup>27</sup>

The obscure but important piece of information alerts the commander to a critical divergence between the *Image* and the actual state of the situation or operating environment. It is often the case too that no one, including the commander, could have anticipated that this piece of information would be so important without the advantage of hindsight. The information may come from an unexpected answer to a commander's priority intelligence requirement or friendly force information requirements. It might come from the commander picking up on a radio message in the background while standing in the command post. It might come from an informal chat with the recently-returned members of the reconnaissance patrol. This phenomenon suggests though that commanders and their staff often rely on very little information to compile or modify their *Image*, given the powerful influence of the commander's and staff's experience and expertise in creating speculative information. It reflects Jim Storr's observation that decisions in warfare are information-sensitive rather than information-intensive and his important observation that commanders normally make decisions based on only five or six critical pieces of information.28

The implication of this discussion is that raw information is not very useful without people applying subjective judgements to it, and people have a finite capacity for dealing with information. More importantly, speculation about the future, which is irreducibly uncertain, is critical to the C2 function and depends on only a few pieces of information. Much of the commander's *Image* is likely to derive therefore from informal and arbitrary conversations and opportunities, as much as from formal elements of a headquarters' decision-making process. The commander's *Image* (both its creation and its dissemination) is a function therefore of a continuous discourse between the

commander, the staff, the commander's superior and superior headquarters' staff, subordinate commanders, flanking unit/formation commanders and any number of other interlocutors.

These findings are consistent with analysis by John Keegan and Martin van Creveld and suggest that commanders and principal staff officers ought not to isolate themselves entirely from access to and consideration of raw objective information; which is difficult to do in very large headquarters dealing with large quantities of information. The tendency for many of the best modern commanders to position themselves forward in battle at a place and time they expect to be decisive supports this observation. By positioning themselves forward where they can see events unfold with their own eyes or hear the communications of the commanders directly involved gives the commander access to raw objective information, including subtle cues and immediate feedback on decisions.

Given the commander's formulation of the *Image* is a function of human cognitive and psychological functions in the main, human factors likely play a more important role in C2 than technical or procedural factors. The intellect, experience, expertise and talent (the sort of genius described by Clausewitz) of the people in the C2 system are therefore essential factors to a C2 system's performance, particularly in the formulation of *Image*. Nevertheless, experience alone is not sufficient to guarantee good judgement or good anticipation. Intellect, talent, expertise, intuition, luck and a myriad of other human factors play a role (including good procedures and systems). And while talented, expert, experienced and intelligent officers are of course prone to error like any human being, these qualities together have a tendency to lead to a consistently higher level of judgement and anticipation in the same way that an experienced and talented footballer will tend to outperform a more junior footballer.

Making judgements about information and anticipating how events might unfold in light of seemingly obscure pieces of information are important for a commander in deriving the *Image*. They are also important in formulating *Intent*, which is the third element of the I3 Framework and the subject of the next section of the paper.

#### The function of Intent in C2

Knowing what is occurring on the battlefield (or anticipating what is about to occur on the battlefield) is one thing; but as John Keegan's work suggests, knowing is pointless unless it leads to troops doing something to create the desired state. The purpose of the C2 system must ultimately be to assist the commander in implementing military actions that achieve desirable change in the situation on the battlefield more so than processing information and creating a COP. A C2 system should allow the commander to communicate, give orders, plan, coordinate, motivate, and make effective deployments of personnel, equipment and facilities among other things.<sup>29</sup> The process of mobilising people, resources and machines to do something is reflected in the I3 Framework under the heading *Intent* (see Figure 1).

*Intent* is that part of the C2 process that works out how to change the situation or the *operating environment* from the undesired state to the desired state.<sup>30</sup> It is overwhelmingly a creative exercise and is largely a function of imagination. It has much in common with other forms of creative design. The designers (in this case the commander and the staff) imagine ways of using the means at their disposal to change a raw material into something desirable (in this case the battlefield). Whereas an architect works with a piece of terrain and raw materials such as stone and steel, the commander works with terrain, people, military materiel and an uncooperative enemy. In addition, like the architect who thinks largely about effects intended to employ against the enemy and environment.

Good solutions are not a function of simple deduction. Just as painting by numbers is unlikely to ever produce a masterpiece, so too military courses of action prepared by template are likely to be weak and, worse, predictable. Moreover, just as a novice artist is unlikely to produce a masterpiece until they master their materials, techniques, the subtle effect of light on the landscape and the like, so too a military novice is unlikely to produce good battle plans and see them through without mastering weapons, supply, transport, the behaviour of people in battle and the like (otherwise known as the martial arts).





So, having created an *Image* of the situation or the *operating environment*, and having created an *Image* of the desired situation or desired state, the commander then imagines how to use their resources to change the former to the latter. The commander may do this individually or in cooperation with members of the staff and others. Either way, communication is critical.

The capacity of the commander to describe a vision and for the headquarters staff to come to a common understanding is critical lest the plans the staff create result in the commander's forces doing other than that which the commander intends. Whether done formally or informally, the discourse between the commander and the staff and subordinates, and among the staff and subordinates, is therefore very important, irrespective of the means through which they communicate or display information<sup>31</sup>.

Given the dynamic nature of the battlefield and the uncertainty and confusion inherent in the commander's *Image*, it follows that the commander's *Intent* and the plans that flow from it should allow for changes. The elements of plans should be coupled to the least extent the given circumstances warrant. In other words, plans should allow subordinates the greatest degree of flexibility and freedom to exercise their initiative consistent with the circumstances; relying more on their capacity to cooperate than on their responsiveness to central direction.

This rule of thumb is warranted because the less prescriptive and detailed the plan, the less often it will need to change and the fewer instructions that a headquarters will have to issue as the situation changes or as the commander discovers that the *Image* poorly approximates the actual situation. Demand for more instructions increases the demand for information and staff coordination thereby increasing *friction*, causing a headquarters and its subordinate forces to slow to a walk under the weight of its own demand for information and orders. The ideal circumstance is an *Intent* that requires little modification despite frequent changes to the commander's Image because it places fewer demands on a C2 infrastructure which may fail or be subject to enemy interference, and because it requires less frequent communications, minimising the opportunities for confusion and misunderstanding.<sup>32</sup> Ideally, changes to the commander's Image should not necessitate changes to the commander's Intent and the commander's Image ought to change more frequently than the Intent.

## The human and systemic elements of compiling, adapting and sharing Image and Intent

Compiling information from various types of collection means, weighting each input according to its merits, and filling in gaps in the available information with assumptions based on speculation, are human cognitive skills. Similarly, visualising how to change an *operating environment* from an undesired state to a desired state, communicating that vision, mobilising people behind it, and then undertaking missions in pursuit of that change are human skills. They are all subject to the vagaries of the human mind and human behaviour, particularly the creative functions of the mind. There are any numbers of systems available to aid in the collection, processing and sharing of information as well as the communication of *Image* and *Intent*. However, acknowledging some experiments have given indications to the contrary, no artificial system is yet capable of carrying out the creative human functions described above. This realisation allows us to distinguish between areas of human endeavour and areas of systemic endeavour that can influence headquarters' performance.

The paper observed earlier that speculative and judgement-based outputs are more closely-related to exercising command and dealing with more dynamic and complex problems, whereas procedural or systems-based outputs are more closely-related to routine staff work such as managing objective information and dealing with relatively simple problems. Given their relative inexperience, and that they deal primarily with objective information, the junior members of a headquarters staff normally and appropriately rely on explicit procedures to fulfil their functions. Conversely, because they deal with far more complex and dynamic matters, the most senior members of a headquarters, particularly the commander, ought to be markedly less reliant on procedures to do their jobs.<sup>33</sup> And so, a tension exists in headquarters between the divergent demands of the systems-dependent objective functions of the headquarters and the systems-independent, creative, subjective, and speculative functions of the headquarters.

As with any tension, things tend to work best when the elements in tension are in balance. While the Army should cultivate improvement in both the human and the systemic domains of headquarters functionality, Doctor Rees's observations suggest current instances of Australian Army headquarters tend to emphasise the objective or systemic domain. The growing emphasis on the procedural and analytical *targeting* methodology as a proxy decision-making framework within Australian Army headquarters is, perhaps, indicative. This emphasis on objective elements of headquarters functionality may explain her observation that the Army's headquarters appear to be no more effective than their pre-digital antecedents in many respects despite a steady stream of investments in information management systems and information collection capabilities. In addition, the diversification and complexity of contemporary information and command systems, and the weight of information that flows through them, seems also to cause staff officers to spend a disproportionate amount of their time and attention doing objective functions. These include managing information and checking its veracity rather than subjective functions such as giving the information meaning.

The cause of this tendency is difficult to isolate; nonetheless, the staff's pursuit of greater certainty and accuracy about the situation for the commander (particularly a commander who is uncomfortable with uncertainty or who is cautious and averse to risk) may be an important contributing factor. Another cause may simply be the challenge of maintaining competency on and managing constantly evolving and complicated technical systems. Another may be the gradual increase in the size and complexity of the Army's tactical headquarters over the last two decades. Larger and more complex headquarters require individual staff members to invest more time, resources and attention in fulfilling the objective functions of cross-communication, staff coordination and managing the concomitant increase in the information produced by additional staff officers just to minimise the attendant potential for increased internal friction.

Together these various factors compound to draw the senior staff members, including the principal staff and commander, into dealing with greater quantities of objective information and objective functions, which is more appropriately the domain of junior staff officers, thereby denying the senior staff members and commander the time and attention to do the subjective and speculative work. In other words, an emphasis on objective elements of the headquarters such as technologies, systems, procedures, organisational structures and growth in personnel numbers causes the headquarters' focus to skew towards dealing with objective information thereby subverting the power of the experience, expertise and talent of the commander and the members of the staff.

The reflections of the staff members interviewed by Dr Rees and Lieutenant Colonel Chambers on Exercise Hamel 2016 support this observation. When asked what are the most important attributes of staff officers, most officers replied by describing objective qualities or knowledge of objective skills such as knowledge of the headquarters' C2 systems and processes. Few mentioned, for example, the importance of talent, experience, imagination, creativity, temperament, intuition, or expertise in tactics and logistics.

One of Dr Rees' recurring observations has been that the extent to which a headquarters tends to focus on objective functions, rather than subjective or speculative functions and vice versa, tends to be a function of the commander's interaction with the staff. When the commander tended to interact with the staff infrequently and formally, the headquarters tended to focus on objective functions. These commanders tended to act like directing staff on an Army staff course, approving packages of decisions made by the staff members, which the staff puts to the commander as options. When the commander tended to be more involved in the analysis and judgements leading to decisions—when they interacted with the staff members in an open and continuous discourse (particularly the principal staff officers)—the headquarters tended to focus on the subjective and speculative functions of the headquarters.

Dr Rees hypothesised that commanders, through their interactions with their staff, are able to elevate even the junior staff members into making good subjective judgements about information and cause them to begin to require less information. She also hypothesised headquarters that focused more on the subjective and speculative functions tended to perform better than those

focused on objective functions.

There are a myriad of potential factors to explain the difference between commanders and how they interact with their staffs. The authors can only speculate about these factors and their relative influence. The factors could potentially include things like the commander's personality and temperament. However, importantly for this work, the way a commander interacts with the staff may be a function of the commander's experience, expertise and talent; or at least their confidence in their experience, expertise and talent. Perhaps when a commander lacks experience, expertise or talent, the former approach is most appropriate or most appealing because it relies on objective analysis of all the factors more so than expert judgements, providing perhaps a potentially reassuring sense of greater rigour behind any resulting decision.

The way in which the Australian Army educational system prepares commanders may also be influential. Instructors on staff courses tend to play the role of the commander in simulated planning exercises. They tend to interact with the staff only formally at prescribed points in a process so as not to do the student's work for them and to preserve their ability to assess or evaluate the students objectively. Consequently, they unwittingly provide a particular and consistent example to generations of students, many with no other or limited experience of how commanders and staffs ought to behave and interact. This process might also inadvertently emphasise the objective functions of the headquarters and deductive reasoning at the expense of the subjective and speculation functions to generations of future commanders. A less objective approach to teaching the staff planning process involving more engaged directing staff might address this potential weakness.

Dr Rees' observation that headquarters seem to perform better when the commander is more engaged and interacts more frequently with their staff is consistent with the earlier deduction that the capacity of the commander to describe their vision and for the headquarters staff to come to a common understanding is critical to the performance of the headquarters. This deduction emphasises the importance of a continuing discourse between the commander and the staff, and among the staff members.

This phenomenon is also likely to be a function of the relative experience, expertise and talent of the members of the staff. After all, the quality of the discourse must depend on the capacity of the staff officers to comprehend the commander's *Image* and *Intent*, which is a function of their experience, expertise and talent. In other words, the more experienced, expert and talented the commander and the staff, the more the headquarters staff members function in the subjective and speculative domain, rather than the objective domain. In addition, by operating more in the subjective and speculative domain, a headquarters is likely to be more effective, irrespective of the C2 systems available to it.

### Investing in experience, expertise and talent

While this finding might seem obvious, it may not be matched by the Army's relative weightings of its investment between the objective, technical and systemic elements of its headquarters and its subjective elements. The Australian Army's Training and Doctrine Director General, Brigadier Mick Ryan's observations in his recent report on education and training in the Australian Army provides some indirect support for this hypothesis. The report asserts that the Army must 'identify the types of people it requires... including benchmarks of intellectual and personal qualities.'<sup>34</sup> This section looks to the future and asks what the Army might do in light of this conclusion. How might the Army inject more experience, expertise and talent into its headquarters?

One – Investigate aptitude-based accelerated development of commanders and staff. With a few exceptions, once enlisted or commissioned, soldiers and officers undergo very little aptitude testing to aid career management agencies in placing the right people into the right jobs. Augmenting what is already quite a comprehensive career management system with aptitude tests that seek to identify individuals with a talent for command and for senior staff positions might improve the Army's headquarters. The aptitude tests could be designed to be immersive and simulate the demands of command with a view to highlighting the relative strength of the immersed candidates' command qualities such as those described by Clausewitz. Those individuals with the greatest aptitude for command in battle might receive particular training and experiences to refine their raw talent.

Two-Reflect on whether the Army conflates the idea of a good officer with a good commander. The Army might reflect on the possibility that it conflates the idea of a good officer with the idea of a good commander. This tendency, if it is true, might be desirable; but, it might also diminish the relative importance the Army's education and personnel systems place on expertise in what is best described as one's 'tradecraft.' Good officership is eminently important for the Army and few would contend it is not a prerequisite for someone to be a good commander; but, good officership alone is insufficient for someone to be a good commander. A good officer does not necessarily need to be an expert in tactics and logistics for example; but expertise in tactics and logistics (among other things) are arguably essential qualities for adequate command of a combat formation or unit. Reflecting on the relative weighting the Army's education and personnel systems give to expertise in one's 'tradecraft' (such as tactics and logistics), when selecting and preparing officers for command or for appointments in tactical and operational headquarters, might reveal areas for improvement.

Three—Investigate the merits of giving greater emphasis to students' subjective and speculative judgements on staff and tactics courses as an extension beyond mastering procedures. Army's operational and tactical staff training courses focus on the military appreciation process. Army officers must have an understanding of the process but mastery of the process is not sufficient to master military planning. Some reflection on whether the balance between expertise in the planning process and expertise in tactics on staff and tactics courses might be prudent. Emphasising judgement and speculative ability over process may be a useful rule of thumb.

Four—Investigate incentives to encourage potential commanders to engage deeper in the study of warfare in order to educate themselves, thereby enhancing their expertise. Brigadier Ryan's review of training, education and doctrine in the Australian Army suggests that officers must invest in the deliberate and continuous study of the Profession of Arms if they are to succeed as tactical commanders in the modern world. For example, the review uses the analogy that military history forms the military officer's equivalent of the lawyer's case law; a deeper study of such case law would support a commander's intuition and tactical art.<sup>35</sup> Further, the review suggests that developing continuous professional military education requirements (including the study of military history, ethics, strategy and leadership) could be established as a framework for a professional code like those used by other professions.

Five-Keep scheduled demands on the commander's time to a minimum so that they are free to visualise their environment and develop and issue guidance to their staff and subordinates. A commander's capacity to seize upon the essential elements of a given set of circumstances is founded on their capacity to visualise their operating environment. The act of visualisation takes time. Therefore, within a headquarters, staff must allow the commander time to do it. Professional mastery and a mixture of formal and informal headquarters' practices aid commanders' development and adaptation of their Image. Furthermore, the written guidance that can communicate a commander's *Image* and *Intent* takes time to write. Staff discipline is necessary to preserve appropriate amounts of the commander's time for the commander to visualise 'what's next' and to let the commander perceive the operating environment through the eves of subordinate commanders. An essential element of staff discipline is exercising judgement and solving problems within the staff officer's assigned authority rather than referring those problems to the commander for arbitration. The capacity of the staff to exercise judgement is a function of their relative talent, experience and expertise.

**Six – Future work: verify and baseline this paper's hypothesis by quantifying headquarters' performance through additional research.** Additional research to quantify and verify the performance of headquarters through observation of significant activities performed by the headquarters eg working groups, military appreciation process, and key personnel eg the commander and principal staff officers. This additional research could be achieved through observational scans and interviews of headquarters' personnel and activities and their relationship to the objective, subjective and speculative positions to baseline performance of the headquarters. This data could then be used to identify areas for performance improvement.

#### Conclusion

Advances in information technology have resulted in an organisational focus on investments in technical systems and procedures, which have yet to yield significant increases in headquarters' performance. Military performance is linked to the human dimension of command and control, where commanders must pursue professional mastery based upon a foundation of tactical and logistical ability. There is currently an overemphasis on developing procedures for handling objective data rather than understanding a commanders' requirements, namely converting *Image* and *Intent* into an actionable desired state. Fostering continuous professional military education, providing opportunities for gaining experience and exercising judgement, building expertise and talent in commanders, enabled through aptitude-based development, has potential to enhance headquarters' performance.

#### (Endnotes)

- Robert R. Leonhard, Thomas H. Buchanan, James L. Hillman, John M. Nolen, Timothy J. Galpin, 'A Concept for Command and Control', Johns Hopkins APL technical digest, 29, No. 2, 2010, 157–170.
- 2 Mick Ryan, 'The Ryan Review: A study of Army's education, training and doctrine needs for the future, [cited at 13 Dec 2016], available at: <<u>http://www.army.gov.au/Our-work/Publications/The-Ryan-Review</u>>, 2016.
- 3 Van Creveld, Command in War, Harvard University Press, Cambridge, 1985, pp. 7–8.
- 4 Ibid.
- 5 Ibid., p. 7.
- 6 Ibid, pp. 261–275.
- 7 Ibid, p. 264.
- 8 John Keegan, *Intelligence in War*, Vintage Books, New York, 2004, p. 321.
- 9 Ibid, p. 334.
- 10 Ibid. p. 383.
- 11 Ibid.
- 12 Jim Storr, Human Face of War, Continuum Books, London, 2009, p. 131.
- 13 Carl von Clausewitz, *On War*, Michael Howard and Peter Paret (trans and ed), Princeton University, p. 100.
- 14 Ibid, p. 100.
- 15 Ibid, p. 100.
- 16 Ibid.

- 17 R.R. Leonhard, T.H. Buchanan, J.L. Hillman, J.M. Nolen, T.J. Galpin, op cit.
- 18 J. Keegan, op cit., p. 383.
- 19 Colin S. Gray. *Modern strategy* (Vol. 42): Oxford University Press Oxford, 1999.
- 20 Colin S. Gray. Another bloody century: Future warfare: Hachette UK, 2012.
- 21 R.R. Leonhard, T.H. Buchanan, J.L. Hillman, J.M. Nolen, T.J. Galpin, op.cit.
- 22 Ibid.
- 23 Ibid.
- 24 Carl H. Builder, Steven C. Banks, Richard Nordin, 'Command Concepts-A Theory Derived from the Practice of Command and Control', RAND, xiv, 1999; Leanne Rees, Derrek Lush, Barry Stanton, 'The Pen and the Sword', *The Journal of Australian Professional Arms*, No. 178, 2009, pp. 48–67; Leanne Rees, *A framework for collecting credible data in military operational environments*. PhD, UNSW, Canberra, 2016.
- 25 C. Builder, S.C. Banks, R. Nordin, xiv; L. Rees, D. Lush, B. Stanton, 48-67; L Rees
- 26 *Coup d'oeil* is the first element described in some detail by Clausewitz in his initial examination of military genius. In using this expression he is referring to that quality that 'conveys a quick recognition of a truth that the mind would ordinarily miss or could perceive only after long study and reflection.'
- 27 Thoroughness in this instance is used to describe how well the commander and staff have identified the known-knowns, known-unknowns and unknown-unknowns of their *image*.
- 28 Jim Storr, Human Face of War, Continuum Books, London, 2009.
- 29 R.R. Leonhard, T.H. Buchanan, J.L. Hillman, J.M. Nolen, T.J. Galpin, op cit.
- 30 Not all staff will have the wherewithal to undertake this visualisation. It probably entails visualisation by the more experienced and/or talented of the staff.
- 31 To direct action effectively, commanders must be able to communicate their *Intent*. The means of doing so will likely include a mixture of face-to-face discussions, voice, video, written orders and images. The formal forums through which the commander compiles, adapts and shares *Image* and *Intent* include problem-framing and operational design groups; intelligence preparation of the battle space; intelligence updates at the start of each military appreciation step; mission analysis;

staff working groups decision boards; command post drills; back briefs between subordinate and superordinate commanders; event overlays; concept of the operation overlays and various control measures; fire support coordination measures overlays; and commanders' update briefs. The informal forums include: tight five discussions between the Commander and their principal staff officers; bird table discussions for updates to guidance or contingency planning; discussions between commanders through battlefield commentary and battlefield circulation; conversations and written 'chats' between corresponding office bearers in super and subordinate headquarters; peer-to-peer conversations between staff; and through coordinating various arms and services. The importance of these informal mechanisms reinforces the need for heightened confidence and trust between the commander and staff.

- 32 As a commander's *Intent* forms, it is normally codified within the commander's written guidance to planners or within the execution paragraph of mission orders. Despite this, there is a preference for the commander's *Intent* to be shared in face-to-face forums or by voice. The sharing of *Intent* is supported by the dissemination of graphical overlays and written messages and may also incorporate commonly understood 'design rules' such as lines of effort, objectives and decisive events or points. Furthermore, *Intent* can be shared by derivative executive documents such as the high-pay-off target lists and attack guidance matrices. Consequently, the sharing of *Intent* is more complex and involved than using the codified format of purpose, method and endstate.
- 33 This conclusion is directed mainly at the combat arms principal staff and commanders.
- 34 Mick Ryan, Australian Army, 'The Ryan Review A study of Army's education, training and doctrine needs for the future', April 2016, pp. 89–90.
- 35 Ibid, pp. 89–90.

DPS JUL031-17