DECISION-MAKING:
International Perspectives

Edited by
Dr. Peter Greener &
Lieutenant-Colonel Jeff Stouffer

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CANADIAN DEFENCE ACADEMY PRESS

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Canadian Defence Academy Press
PO Box 17000 Stn Forces
Kingston, Ontario K7K 7B4

Produced for the Canadian Defence Academy Press
by 17 Wing Winnipeg Publishing Office.
WPO30490

Library and Archives Canada Cataloguing in Publication

Greener, Peter
Decision-making : international perspectives /
edited by Peter Greener & Jeff Stouffer.

Issued by: Canadian Defence Academy.
Includes bibliographical references and index.
ISBN 978-1-100-13770-4
Cat. no.: D2-255/1-2009E

1. Military art and science--Decision making. 2. Command of troops--
Decision making. I. Stouffer, Jeff II. Canadian Defence Academy III. Title.

U163 G74 2009 355.4 C2009-980313-5

Printed in Canada.

1 3 5 7 9 10 8 6 4 2

ACKNOWLEDGEMENTS

Decision-Making: International Perspectives represents the continued efforts and dedication of members of the International Military Leadership Association. As such, we would like to thank each of the contributing authors for not only their willingness to voluntarily participate in this endeavour, which extends well beyond their normal responsibilities, but also for their professionalism and dedication to this project.

The success of any publication is ultimately predicated to the production and technical support that is received. To this end, we would like to express our fullest appreciation and gratitude to Melanie Denis of the Canadian Forces Leadership Institute for her ever-present support and expertise. As always, Melanie's patience, tact, and subtle encouragements to ensure production deadlines were greatly appreciated. I would also like to thank Tracy McDonough of the Canadian Forces Leadership Institute for her considerable help with completing the citations and references of the book. As with previous volumes in this series, 17 Wing Publishing Office, especially Captain Phil Dawes, Evelyn Falk and Michael Bodnar, are applauded, especially given "last" minute time constraints, for turning this volume into a highly professional product.

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FOREWORD

I am extremely pleased to introduce *Decision-Making: International Perspectives*, the fourth and latest volume of the International Military Leadership Association (IMLA). The IMLA, originally established in November of 2005, gathers once a year to share military-specific leadership knowledge as well as to discuss and explore opportunities for collaborative research. Like its predecessors, this book originates from the continued efforts of a small and diverse group of professionals who represent leadership institutes, research organizations and defence colleges from a host of countries, including Australia, Indonesia, Switzerland, New Zealand, Singapore, Canada, the Netherlands and the United Kingdom.

Decision-Making: International Perspectives offers contemporary and diverse perspectives on the need for and development of sound decision-making models and practice. It emphasizes the need to review current decision-making protocols and doctrine, where doctrine exists, in view of challenges inherent to current operations at the tactical, operational, and strategic levels. Certainly, the decision-making practices detailed in this volume reflect the experiences of each participating nation. Regardless of the positions held or models espoused, however, each nation represented in this book recognizes the underlying requirement to develop or utilize sound decision-making models.

As with other volumes in this series, this book will contribute to the understanding of how militaries currently, or in the future, approach both simple and complex problems. Understanding the decision-making models will certainly contribute to each nation's ability to not only better understand the processes that guide decision-making and subsequent behaviours, but also will assist in its ability to effectively operate in coalition operations.

Decision-Making: International Perspectives represents another significant IMLA accomplishment and further demonstrates the commitment of this association to not only discuss matters of interest and importance, but to produce a tangible product to supplement the growing professional development literature of our respective nations. It also stands as testimony to the tremendous co-operation that exists within the IMLA community. I encourage all readers to contact the individual contributors and/or the Canadian Defence Academy, should you wish to discuss the contents of this volume.

J.P.Y.D. Gosselin
Major-General
Commander
Canadian Defence Academy

PREFACE

Although there are a number of aspects of modern warfare which would be unfamiliar to ancient generals, there can be no doubt that the fundamental nature of warfare itself is enduring. In its rawest form, warfare consists of groups of individuals, armed with a variety of weapons, closing with and attempting to kill an enemy. It is violent and bloody, and the accompanying physical and mental traumas will have a resultant impact on the combatants, their immediate kin, and sometimes successive generations. The underlying causes of conflict are also largely unchanged, in that the thin veneer of civilisation that covers a highly evolved and aggressive animal is easily stripped away by need, belief and/or avarice, and the manipulation that accompanies these. There are, however, some aspects of modern warfare beyond mere changes in weaponry which may be unfamiliar to ancient generals.

While all battlefields are surrounded by an information space consisting of intersecting multiple data lines of fact and speculation, modern intelligence, surveillance and reconnaissance provides a richness and complexity of data not previously available to commanders within short timeframes. The real challenge on the modern battlefield lies in the speed with which data is gathered, and the limited time available for commanders to process and make best use of that data. In effect, data gathering has outstripped data processing. As a result, modern commanders have an increasingly difficult task in taking the most coherent set of information from a large but still incomplete data set and making the best strategic, operational or tactical decisions in order to influence events in the battlespace. Thus, while the pressure on a modern commander to make the right decision is no less than that on commanders of previous times, the greater availability of data and ability to interpret that data is making the decision-making process increasingly complex.

It is the decision-making process that is the subject of this series of papers. Ultimately, military action is about achieving objectives, and that will always mean that the action is directed at 'winning'. These chapters emphasise the importance of understanding the issues around decision-making, in order that all resources and information may be best directed towards achieving the objective. From interagency co-operation for national emergency response operations, through theoretical constructs, to application in tactical scenarios, these chapters demonstrate clearly that those who best use information make the best decisions. Further, they reinforce the reality that, even in this age of advanced technology, the human-in-the-loop remains the hub of military action.

PREFACE

As those responsible for military decision-making, modern commanders at all levels face increased scrutiny over their actions. Countries are less likely to tolerate poor decisions that cost precious resources, both human and materiel. Examination by a better educated soldiery, a less compliant public and a more intrusive international media will soon expose faults. Poor decisions often result in greater individual trauma, and this will be contradictory to expected national outcomes. In order to 'win' in all aspects, a commander must be adequately prepared for the level at which they are expected to operate. The chapters demonstrate that there is still room for improvement amongst armed forces, both in training for complexity and in consideration of ethical issues in decision-making. This places an onus on the military education and training machinery to be working at the forefront of decision-making research and development.

There is a great degree of commonality throughout national armed forces in the underlying approach taken to develop decision makers. For example, there is general agreement that problem solving is a significant part of the role of a commander, as it is for a civilian manager. There is also general agreement that an individual's ability to solve complex problems is dependent on a few basic criteria; cognitive ability, experience, and the problem solving process used. This does not mean that any one approach is a complete solution in itself: instead, these chapters provide a number of alternate approaches.

The information presented on the application of training to group decision-making, reinforcing that military decision makers need development in order to work most effectively as part of a multi-party decision-making body, is one example. The use of technology and sophisticated actor-based modelling to simplify the experiential development of mental templates for field commanders is another. Understanding the inputs into, and the constructs of, the decision-making process is also seen in varying ways.

These chapters indicate that some of the processes currently used to enhance decision-making may not be sufficient for all levels of the current battlefield. To make better decisions than the enemy means going well beyond traditional linear planning processes, looking beyond 'hard' systems approaches to the 'soft' systems methodology and dealing with problems in all their true complexity. Developing the ability to understand the patterns of the whole battlefield may well be a major missing link in current training. Ignoring complexity is not an option.

Neither should we ignore the ramifications of understanding decision-making in complex environments. National military organisations are ultimately

funded by the population. Most countries have increased public scrutiny of military budgets, as pressures on education, health care and other welfare systems increase. The senior military personnel responsible for delivering national military capability operate in a legislative and fiscal environment that demands levels of thinking and planning equal to those of any battlefield. These personnel must therefore be equipped with decision-making processes that suit their daily operating environment. These chapters make it clear that the onus sits with those responsible for professional development to ensure such developmental progression is both timely and adequate.

The chapters give a combined perspective on decision-making that leads to the inevitable conclusion that there is still much work to be completed in this area. The modern military environment has tested current decision-making orthodoxy and found it somewhat lacking. The aim of this collection, then, is to stimulate thinking and to enhance military excellence through contribution of expertise and perspective. Readers will certainly benefit from the contributions herein. The authors and editors of this volume are commended for their contribution to a set of chapters that will stimulate further thought and action on such a vital area of professional expertise.

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Commandant, New Zealand Defence College

CHAPTER 1

BUILDING CRITICAL THINKING AND CREATIVE THINKING IN MILITARY DECISION-MAKING

*Lieutenant-Colonel Karuna Ramanathan**

The Singapore Armed Forces is currently seeking to build decision-making as a leader skill by enhancing the capacities of its leaders at all levels. Over the next few years, critical thinking, creative thinking and ethical reasoning skills will strengthen the individual and team capacities for decision-making.

One of the more recent discussions on decision-making identified it as not just a skills improvement issue, but a matter of life and death for the military officer.[1] Though much academic opinion exists in the three individual subjects of critical thinking, creative thinking and decision-making, there appears to be hardly any academic opinion on these three as a single area of research study. This chapter discusses critical thinking as an important leader skill in the military. In the context of the military, the ability to think critically is not simply the function of academic discipline, but is built on a foundation of military profession ethics. This chapter will discuss how ethics are different from morals and that, put together, the individual ability to think critically from an ethical frame will facilitate creative thinking in teams, and ultimately decision-making as an organisation. The chapter will conclude that analytical thinking, which we will take to mean critical thinking, complements intuitive decision-making.[2] To deal with the challenges posed by volatility, uncertainty, complexity and ambiguity, this chapter also proposes that critical and creative thinking should be formalised within the larger and intuitive military decision-making model.

INTRODUCTION

Military officers are trained to think in a certain way. Modern militaries develop their officers within a rigorous system where training is designed and progressively stepped up as they move into appointments that require greater responsibility and exertion of control. In the course of their training and deployments, military officers are exposed to a wide spectrum of planning

* The views expressed in this chapter are those of the author and do not necessarily reflect the official policy of the Singapore Armed Forces.

and executing situations that require wider and deeper appreciation of a multitude of issues and perspectives, spanning the moral, ethical and professional dimensions, while seeking to fulfil the tactical, organisational and ultimately the strategic imperatives.

Naturally, the demand on a platoon commander's thinking skills are not as rigorous on those of a brigade commander. In any case, the brigade commander would have risen through appointments such as platoon commander and would therefore be able to appreciate and also mentor down the chain of command, to better prepare younger officers for their appointments. Using these approaches, modern militaries have up to this point been able to groom officers to think and act within a mission-oriented frame of reference.

There are several issues in these preceding paragraphs that set the context for this chapter. This thinking is simplistic. Today, the platoon commander may find himself/herself caught in a time-critical situation that may require him/her to respond immediately; in a military-civilian action, for example. Though he/she may have been instructed by headquarters to seek guidance, he/she may not have the time, or perhaps even the communication link, to contact the brigade commander in real time. Left on his/her own, the platoon commander's frame of reference then toggles between his/her previous experience, his/her perspectives, his/her understanding of the issues and his/her current knowledge of rules, regulations and operating guidelines for his/her equipment and the resources under his/her charge. In all probability, the platoon commander would be considered inexperienced, though knowledgeable based on acquired professional training and academic education. The only problem is, in this situation he/she is accountable to not only himself/herself, but his/her charges, and ultimately to the military organisation as the actions or inactions and the subsequent outcomes will have a direct impact on the organisational and strategic frames. Herein lies the dilemma with which military leaders contend.

The research on decision-making supports this dilemma. Gary Klein, a psychologist famous for his work in the field of naturalistic decision-making, also researched intuitive decision-making, which is the alternative to rational decision-making. He found that the classical model does not work very well in practice; the real world is fraught with challenges, is complex and confusing, entails scarcity of relevant and time critical information, and has high stakes. However, for intuitive decision-making to be relevant, a key facet is the individual (or leader's) experience level, that allows him/her to recognise the patterns and cues. The intuitive decision-making model will be challenging to implement in an environment where military officers have

insufficient information, knowledge and experience, when the scenarios are non-repetitive, or more importantly, when the hierarchical climate demands compliance through command and control.

The key question that ought to be addressed is to what extent should critical and creative thinking feature in a decision-making approach that must include the intuitive aspects of how military officers arrive at decisions.

DIFFERENTIATING BETWEEN DECISION-MAKING AND DECISION-TAKING

Analytical thinking encompasses critical thinking. Critical thinking, creative thinking and decision-making are increasingly important skills that will be required not only in the leaders at the helm, but also by all who are engaged on the ground. In the current complex environments in which organisations are required to operate, no single leader can be expected to have complete and/or absolute knowledge or the ability to plan and drive towards the achievement of social, political and organisational goals purely on his/her own.[3] The major forces of the future environment as addressed by the professional space are connectivity, knowledge, speed, access and digitisation.[4] Decisions are expected to be made in any one or more of these force field interactions.

Increasingly, however, decisions are not related to anything that senior officers may have been trained in or experienced before. Many people would have to be involved, including those with special knowledge, skills and expertise in the robust decision making process. The ability of the military commander to harness individuals' knowledge and skills, and the expertise levels that exist within his/her unit and teams, will significantly contribute towards the quality of his/her decisions that he/she is required to make, and ultimately the outcome of his/her actions. Information superiority is often a necessary but insufficient consideration for decision superiority. We tend to equate productivity with speed, and that we need to reclaim time to think.[5]

Let's go back briefly to the platoon commander's scenario. Large organisations, and in this respect militaries that can traditionally be classified as large and complex organisations, tend to force people into moulds and stereotypes. Senior officers are typically responsible for strategic decisions, and the sergeant on the ground is responsible for providing the necessary information up the chain of command so that the flag rank can be briefed adequately and the required decision made. In this frame, the assumption is that knowledge and information would be held by a select few managers, and naturally protected, as knowing represents power. It is not difficult to accept this argument in the military; traditionally hierarchical, and power visible.

SINGAPORE

The challenges facing military decision makers can be best summarised as:

> *"...Time accelerates. Distance shrinks. Networks expand. Information overwhelms. Interdependencies grow geometrically. Uncertainty dominates. Complexity boggles the mind. Such is the environment and context within which current organisations must compete, survive and thrive."* [6]

Thus, the campaigns in Iraq and Afghanistan no longer qualify as purely military decision-making problems, but sit within a larger sphere of power and political perspectives, where alternative and counter opinions are hosted and circulated through the Internet. The situation is similar with North Korea and Iran, and more recently, the problem of pirates in the Gulf of Aden, off Africa.

Let us for a moment consider the equivalent of the platoon commander in the Gulf of Aden, in this instance a young naval sub-lieutenant. He is despatched in a rubber dinghy to lead a four man boarding team onboard a ship to confirm the crew identification prior to further activity. As he is embarking onboard he notices, crouched behind the capstan, what appears to be a young African crew-member, no more than 16 years old, pointing a rifle at his squad. He feels for his walkie talkie and realises that his walkie talkie has dropped into the rubber dinghy as he was starting his climb up the rope ladder from the dinghy to the ship. His squad has walked on ahead of him into the superstructure of the ship. What should he do?

Is this an ethical dilemma? Or is it a critical thinking problem? Should the young sub-lieutenant be rational, or creative? Is the decision his? Does he take the decision, or make it? Is there a difference?

Making a decision simply means that an individual is required to act on something, and he/she is therefore put in a position, sometimes not through his/her choice, where he/she has to use his/her judgement. Taking a decision is typically part of a larger process, in which the individual responsible in a team or in an organisation is by the very nature of his/her office and appointment in a place of responsibility to take a decision. These distinctions help us to better understand the bridge between intuition as based on experience, and analytical thinking, under which critical thinking and creative thinking are included. As Gary Klein noted, typically when one makes a decision, one would tend towards an intuitive preference. In most traditional organisations including the military, taking a decision requires a prescribed rational approach. For instance military planners are ingrained with the Battle Planning

Procedure, which is a prescribed set of steps to arrive at an Own Course of Action after a detailed analysis of the enemy options. What is common to both frames, making and taking decisions, is that judgement in the military context must be based on the code of ethics demanded by the profession and consistent with international law.

INTERACTION PERSPECTIVES IN THE MILITARY

The nature of interaction in military environments can be described in relation to three interrelated spaces. Though these interaction dimensions exist in many other organisation types, it is most visible within military organisations. These dimensions can be described as hierarchical, professional and social spaces. These interactions move from a scale of formality to informality, with the hierarchical being the most formal.

Hierarchical interaction is built by the chain of command which underscores the very visible hierarchical culture in all established militaries. The commander demands, and expects to be acknowledged in the chain of command. When it comes to decision-making, the commander takes the decision after he/she has been provided with the necessary choices and options that have been surfaced through a rational decision-making process that most militaries have as part of doctrinal planning, and exercise regularly as part of training. It is quite impossible to make important decisions by simply gathering and analysing all the facts, because there will be too many facts and too many combinations that will require attention.[7] Here attention of the reader is also drawn to the Bathsheba Syndrome[8] which highlights the potential danger of staying too long in a job, and the leader's ability to maintain moral standards. The leader's overestimation of control results in the covering of misdeeds by justification, and judgement is affected.

In the professional space, decisions are traditionally not made but inputs are provided. Professional domains such as intelligence, engineering, acoustics, armament and logistics have become increasingly important in determining the impact as well as the success of the military option. The go/no-go decision to launch a mission or an operation is dependent on the engineer's technical assessment of the situation, and the decision can sometimes be taken solely on the basis of that assessment. Extending this line of reasoning, the engineer makes the decision based on his/her professional experience and knowledge in his/her field, and the military commander takes the decision accordingly. In this case, the military commander cannot be expected to appreciate enough of the details of the situation, and must rely on the judgement of the engineer. For example, in modern warships, computers take such

decisions based on algorithms which are based on operating norms, limits and profiles. Hence the decision to fire a missile at sea is as much dependent on the rules of engagement as it is on the operating capability and serviceability of the missile.

In the social space, decision-making has traditionally flourished on trust and relationships. The military commander traditionally enjoys a social network unequalled in the commercial world. Soldiers train and go to war together, and commanders are leaders who seek to influence the troops they may well have to lead into harm's way. There is no doubt then that unit cohesion is a desired outcome for military leaders, and when this outcome is achieved, they have the privilege of using the social space for decisions. In this space also, the emotional persona of the commander becomes more apparent, and decisions might sometimes be taken in the social space with due regard to the emotional aspects of the problem. An example of this could be the decision to allow a soldier extended leave even while the unit is at a high state of readiness training, in order that he/she is able to visit a terminally ill relative, even when the relative does not qualify as next-of-kin according to administrative directives. In the social space, creative thinking is required, and is supported by trust and relationships.

In most organisations including the military, daily decisions are made and taken in the hierarchical space. Specific to the military, such decisions might concern traditional employment of forces and mission outcomes, with clear prescriptions of authority and responsibility. The dominant currencies in hierarchical space are rank and appointment, and these currency values are maintained in coalition and joint environments.

Up to this point, the contention has been that military decisions are increasingly made in the professional space, where authority and responsibility blurs. Type and task reporting channels, matrix and dual reporting responsibilities and a more consultative approach to arriving at decisions can potentially redefine traditional authority. For example, a specialist engineer who is considered to be the best authority on a particular topic, will be accorded a significant role in the decision-making, which ultimately contributes to the preferred option agreed upon and consequently the decision taken. The only problem is, this specialist engineer might not even be part of the military and therefore technically not part of the hierarchy. Extending this argument, the decision is made in the professional space, which has a different set of rules and considerations. In professional space, the currency is knowledge, and information and its attendant filtering has a major role to play in how knowledge is formed.

Why would critical thinking and creative thinking become relevant to the military today, when it was less important yesterday? In the traditional and hierarchical space, one would expect that the higher a leader is on the rank structure, the better equipped he/she is to take decisions. A key assumption behind this reasoning is that the environment is reasonably stable, there is past precedence, and clarity, expectations have been sought and met both horizontally and vertically. In such environments, the hierarchical space is useful for decision-making and taking as high performance states are demanded. A study of 18 outstanding companies over a six-year period in the early 1990s noted that such companies were organised (hierarchically), sensitive, balanced, values-based, and that they mitigated risk and carefully experimented.[9]

Militaries are no different, and one can argue that a similar study carried out in the 1990s of most modern militaries would have yielded somewhat similar results. Militaries, then, used to be outstanding organisations with clearly established hierarchical structures. These structures enabled decision-making and decision-taking within clearly established rules and norms that were based on previous engagements and encounters, and experienced military commanders had little difficulty exercising hierarchical wisdom in taking decisions to bring about the necessary organisational outcomes. In such an environment, critical thinking and creative thinking appeared as skills which were useful to have to deal with children and advertising agencies.

School education attempts to induce critical thinking approaches in students, whether in mathematics or literature. More so, since the field of mathematics is itself linear and rationally bounded, and critical thinking can arguably be established through mathematical approaches. Similarly, in literature, reasoning and arguments used to establish the writer's logic could qualify as critical thinking.

Creativity and creative thinking can easily be confused with critical thinking in the current culture that demands and values speed of response. Creativity, especially when considered as the generation of new ideas,[10] has been a subdued topic in most military curricula. It is no surprise then that most military officers would instinctively associate creativity with advertising agencies and media people who are traditionally considered creative due to the very demands of their work.

CRITICAL THINKING

In transforming and modern militaries, officers will need to be better educated in order to think and create, so as to lead soldiers, airmen and sailors to

meet the challenges and demands in the new operating environment. Such requirements map well with critical thinking. Though traditionally the domain of education, learning to think[11] is the central purpose of education, notwithstanding the argument that training in critical thinking should be the key focus in education,[12] the fact remains that personal decision-making requires good reasoning and good judgements.[13] Sound personal, team and organisational decisions require the ability to interpret media filtered information, and to dig within such information to differentiate imagery and bias from reason,[14] in other words, critical thinking.

Critical thinking has been defined by a consensus study in 1990 to be

> "...purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference, as well as the explanation of the evidential, conceptual, methodological, criteological, or contextual considerations upon which that judgement is based".[15]

The problem is that educational institutions struggle with critical thinking, and it has been recognised that education continues to graduate students who cannot reason well.[16] Richard Paul's model for critical thinking is used as the main model in the Foundation for Critical Thinking,[17] which has called for educational reform to better develop critical thinkers. Paul's model has been empirically tested in several studies, and the model is founded on "...a unique kind of purposeful thinking where the thinker...takes charge of the construction of thinking... according to the purpose, the criteria and the standards..."[18]

The challenge facing modern organisations, including the military, is whether critical thinking should be a considered a process or a skill.[19] The decision-taking process in most militaries is inherently well structured, and it is possible to argue that the demands of clarity (Understanding Commanders Intent), accuracy (Situation Data and Information Intelligence), precision (Targeting), relevance (Effects) and consistency (Precedence and Rules of Engagement) already incorporate the elements of rationality and critical thinking in arriving at judgement. The question is, if schools are not adequately preparing students, who go on to enlist in militaries, and if the demands of the operating environment become increasingly complex, and there is an eroding experience base, then is it fair to assume the existence of critical thinking as a skill in today's military officer? And on what should such a skill set be based on and built on for effective judgement ability?

Extending this line of reasoning, critical thinking should be increasingly viewed as a leader skill. When viewed as a skill, it may be articulated as

"...thinking about your thinking while you're thinking to make your thinking better..."[20] The judgement that is demanded at the end of the thinking process is founded on reasoning ability. In the military, such reasoning ability is built on the understanding of military ethics and hence, its influence over military decisions. In other words, military decision-making involves the solving of problems guided by ethical considerations. Critical thinking skills will thus have to be built on ethics, an understanding of what applies and what does not.

The Oxford Dictionary definition of ethics is "...study of the concepts involved in practical reasoning, good, right, duty, obligation, virtue, freedom, rationality, choice" and embraces the concept of reasoning. Ethics involves a values examination of one's choices or potential choices, and on this basis the study of ethics is largely an intellectual exercise. As ethical considerations in real time preclude a conscious examination of choices, the study of ethics alone is an insufficient condition for sound reasoning.

Military trainers can sometimes confuse ethics and morals. Daniel Lagacé-Roy points out that ethics is different from morals, though these terms tend to be used interchangeably.[21] He explains that moral problems refer to specific problems, example lying or stealing. Ethical problems on the other hand tend to be more general and theoretical, for example whether lying or stealing was right or wrong in a particular circumstance. The point here is that morality should not be the only determinant of judgement in a military context, rather, the link between morality and ethics should be established, and this should then form the basis of reasoning as it applies to judgment. Naturally then, militaries attend to ethics as a subject, and train officers in a basic understanding of ethics and how it applies to their work life. However, what is right and what is wrong then becomes an intellectual exercise governed by an understanding of humanistic principles and conventions. An agreement to adhere to these principles is in most military institutions a demand placed on a graduating officer cadet, and one that he/she proudly recites in his/her creed or commissioning oath. What may not have happened is the adequate embedding of ethics into his/her reasoning process. A superficial treatment of ethics could result in moral issues being addressed, instead of the deeper ethical considerations.

Most modern militaries use psychometric assessment and character interviews as pre-enlistment checks. For the majority of officer candidates screened and selected to enter the military, there is a fair assumption of a prevailing standard of morality, that is the person has not stolen, lied, committed a crime or broken a societal rule to the extent that he/she had to be

publicly punished. This baseline moral standard is sometimes, understandably confused for the person's ability to absorb the intellectual aspects of ethics as it applies to the military profession.

There are three moral facets to ethics when considered from a leadership development perspective.[22] These are the intentions and personal ethics of the leaders, the ethics of how the leader leads, and lastly the ethics of what the leaders actions are. Translated into the military commander's context, judgement is then inevitably influenced by ethics to the extent that the military commander is expected to be personally ethical, lead ethically, and make ethical decisions.

When the officer enters the workplace, he/she no longer has case studies or instructors to help with his/her problems and questions. He/she starts building his/her reasoning process, as he/she is faced with the need to make decisions daily. The regularity of decision-making, no matter how inconsequential, hones his/her judgement skills. According to Richard Paul, these judgements are inherently moral and ethical, because a moral judgement will involve him/her conceptualising the facts of a situation from a moral perspective, which on its own is an embodiment of moral principles. Judgement results when these principles are integrated with what are assessed to be facts within a particular perspective, and the act in question is then deemed right or wrong. Notwithstanding the argument that military officers can be assumed to pre-possess a high moral base, by the very nature of the rigorous selection process to be accepted into military commission, it nevertheless remains that an understanding of ethics would strengthen the principles by which they are expected to live and operate within. Critical thinking will play a big part in extending this thinking from principle to practice.

Military leaders need to learn how to think and lead. A large part of this is to understand how learning occurs, in order to optimise learning opportunities for individuals, teams and groups, and ultimately, for the military as an organisation. Learning is an essential part of leadership development; eventually, it contributes towards building one's self-awareness, self-management and personal mastery. Thinking, especially the ability to think critically, is a large part of such learning, and therefore, critical thinking is the ability to analyse and evaluate thinking with a view to improving it. This is an individual skill, and it can be taught. Based on work by Richard Paul, a well-cultivated critical thinker:[23]

1. Raises important questions and problems by formulating them clearly and precisely.

2. Gathers and assesses relevant information, and uses the techniques of abstraction and aggregation appropriately.

3. Arrives at well-reasoned conclusions and solutions, and is able to benchmark, test or assess these against relevant criteria and standards.

4. Understands and applies assumptions and limitations, to describe implications and consequences.

5. Is able to communicate to influence based on critical reasoning.

These attributes are necessary and relevant to military officers who aspire to operate in increasingly complex environments with which modern militaries have to contend. A practical and progressive manner in which these skills can be achieved is through practice and attention to military staff writing, which is a good way to train critical thinking skills. Good staff work is a function of two faculties – the ability to think and the ability to write. The clarity demanded in staff work is preceded by the ability to think critically, and presupposes basic grammatical skills. The ability to think and write well is also a key knowledge creation activity, which the military demands of its Officers in an increasingly time budgeted work environment. The ability to think critically can be taught, however the ability to write is a function of practice, and if not systematised, remains dependent on pre-existing grammatical and language abilities.

The popular belief about staff work is that officers with a good command of the English language will be able to produce better staff work. This is not completely true; good staff work is the ability to get the relevant points of argument across with clarity, accuracy and logic. As a key knowledge creation and critical thinking skill, staff work includes the ability to read and understand, as well as to listen, clarify, abstract instead of just aggregating information, and note-taking. Once military officers develop a basic ability to think critically, this can be extended into creative thinking.

CREATIVE THINKING

Creativity is the ability to consistently generate novel responses to all types of issues, problems, situations and challenges.[24] Leaders who promote creative thinking encourage soldiers, airmen and sailors to build on ideas that are generated and some of these eventually become innovations. Creative thinking is described as envisioning the future state, thinking creatively in order to construct new reality, and to find innovative ways to resolve problems to bring about breakthrough in deadlock situations. In popular literature,

creativity is generally defined as the goal directed production of novelty. A creative product, as an innovation, emerges when an individual intentionally produces something new in attempting to meet some goal. The creative process, generally referred to as creative thinking, consists of the cognitive processes that play a role in the production of innovations. Therefore a creative individual is one who is able to innovate.

In the context of military organisations, it would be challenging for creativity to be a direct adaptation of what is practiced in the business world. For instance, Edward de Bono's 6-thinking hats[25] may not be a suitable activity in the appreciation of situation in military planning. Quite paradoxically however, in the military's context, creativity is increasingly a necessary attribute in addressing the challenges posed by complex environments, where solutions cannot necessarily rely on earlier precedence and patterns. Therefore in the military, creativity can be seen as the generation of new ideas, either new ways of looking at existing problems, or of seeing new opportunities, perhaps by exploiting emerging technologies. Contrary to widespread perception, creativity is not the same as an "a-ha" moment, and instead, is the product of careful and deliberate thought. Such careful and deliberate thought provides its link to critical thinking, and critical thinking as a skill presupposes creative thinking.[26] This perspective is useful because it accommodates the view that military officers should be trained to think clearly and critically before they can be exposed to creative thinking.

Military commanders will need to appreciate their role in not just promoting innovation within their units, but to also allow for creative thinking so as to facilitate innovation within their units. Understandably, this will have to be balanced against hierarchy and command and control channels. One way for militaries to embark on this is that at a higher level, commanders can be introduced to "Thought Leadership" and "Leader of Change" concepts which are currently being practiced in innovation-heavy companies.

Another, and increasingly popular way, is to build storytelling skills in senior leaders. Storytelling by leaders is regarded as one of the most powerful ways to put ideas into the world today. Larry Prusak, a current opinion leader in knowledge management, narrates how he went to a meeting in Wall Street where he sat through a storytelling session. The storyteller was Lou Gerstner, the then Chief Executive Officer (CEO) of IBM, who told stories of IBM, and more importantly, stories about the future of IBM. According to Prusak, Gerstner was not telling the audience facts about the future, rather, he was telling them what IBM was about to do.[27] From a creative thinking perspective, storytelling promises huge yields when leaders tell stories.

Leadership development and knowledge systems create, disseminate, and store valued knowledge. Innovation from everyone and everywhere requires that knowledge be democratised and available to everyone. It also requires a continuous improvement process that enables continued learning and adaptation. An organisation-level innovation will also help steer learning across the organisation, and support learning within units.

The problem with teaching creative thinking is its ontological paradox, in that a generative process based on creative outcomes is by itself constrained by a model or theory that generalises what creativity is.[28] This said though, there are simple approaches to building creative thinking techniques in military units. One of these, brainstorming, is without a doubt the best known way of stimulating creativity in the workplace. There are three useful principles that can be incorporated in the military decision-making process, and these are postponing judgement (interestingly, suspending judgement and listening are Learning Organisation orientations), quantity breeds quality, and hitchhiking, that builds on the ideas of others (interestingly, scaffolding is a Knowledge Management concept).

Once the military officer demonstrates the ability to critically analyse a situation, creative thinking models can be introduced in military processes, particularly in the non-military operational environments such as disaster relief and civil military affairs. The stages in these models tend to be quite intuitive and include aspects such as objective finding, problem finding, idea finding, solution finding and acceptance finding. It would be possible to make direct comparisons with Richard Paul's critical thinking approach, and in fact the associations are quite obvious. In the non-military areas of work that commanders and leaders have to undertake on a day to day basis, such models can be used to provide an understanding of the purpose and scope of a project, generate new and useful perspectives in order to implement novel and actionable ideas, and potentially extend critical thinking into creative thinking outcomes.

DECISION-MAKING

The argument up to this point has been, a basic understanding and application of critical thinking is important to allow for creative thinking approaches to be part of decision-making processes. An inability to think critically could result in ungrounded ideation, which could escalate in terms of implications and consequences. Arguably, such ideation could be potentially disastrous for military decision-making.

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As we consider the dual effects of critical thinking and creative thinking on decision-making, specifically in the context of the military, it is useful to highlight a few key points. The first, and an early contention in this chapter, is the difference between decision-making and decision-taking. Decision-making is an elaborate process in the military, and is expected to remain as it is, clear, rational, information-laden, carefully considered courses of action in reaction to a pass down order to achieve a military outcome. Decision-making is predominantly hierarchical, and the system is to a large extent cushioned by the wisdom of the generals.

Senior military officers make decisions. They must, however, when faced with incomplete information or when under time constraints, reclaim time to achieve more effective decisions.[29] This brings us to the second point – that increasingly, military officers find themselves in situations like the one the young sub-lieutenant was earlier described to be in – having to take a decision without having ever experienced anything like it before, or not having been trained to respond to such a scenario. According to Gary Klein, this is where intuition will take over, and he defined intuition as "...the way we translate our experience into action..."[30]

Clearly then, the rational decision-making model with its attendant assumptions on seniority, knowledge, wisdom and the right to make decisions and act is increasingly challenged in the environments that military officers have to operate in today. Intuitive decision-making is a fascinating area of study, and is one that accommodates critical and creative thinking quite naturally. Gary Klein's model is particularly useful as it was developed and tested in the military context with the US Marines. As a testimony to the whole field of intuitive decision-making, the US Army in 2003 doctrinally endorsed intuitive decision-making.

Gary Klein proposes that the training required to develop intuitive decision makers involves the following outcomes: sizing up situations more quickly, recognising problems and anomalies, feeling confident on the selection of the first option, having a good sense on the next step, avoiding data overload, generating calmness in the face of uncertainty, and finding alternative solutions in difficulty. However, by itself, enhancing the intuitive process skills of military officers may not achieve the necessary effects desired to address complexity. After all, and as pointed out by Gary Klein, intuitive decision-making must be accompanied by the ability to employ analytical thinking.

Therefore, and as a conclusion to this chapter in exploring critical thinking and creative thinking in military decision-making, it is a fascinating first

exercise to conceptually align critical thinking, using Richard Paul's 1993 Elements, Traits and Standards Model into the domain of military decision-making use of the intuitive decision-making process. Here the model that is cited is Gary Klein's Recognition Primed Decision Model.

Klein's 2003 RPDM	Paul's 1993 ETS
Situation generates Cues	Understanding Purpose, Goals and Objectives, and the Question at Issue
Cues let you recognise Patterns	Scanning for Information, data, facts, observations and experiences
Patterns Activate Action Scripts	Interpreting and Inferring to raise conclusions and solutions
Action Scripts are assessed by Mental Simulation	Internalising through concepts, theories, definitions, laws (Ethics), principles and models
Mental Simulation use Mental Models	Raising assumptions, presuppositions and axioms
Action Scripts affect the Situation	Moving ahead with a thought through point of view based on a frame of reference (ROEs), perspectives (CPG) and orientations

FIGURE 1-1: Gary Klein's Recognition Primed Decision Model

Such a comparison allows for better visualisation and appreciation of the potential linkages between the two models, and is helpful in that military trainers and policy drivers will be able to use such a conceptual framing to achieve the following outcomes:

1. Build ethics as an area of study and demonstrate its link to judgement, which is an important aspect of Richard Paul's 1993 model.

2. Teach critical thinking within an established and relevant decision-making framework, which accounts for the intuitive nature of decision-taking.

3. Weave common and popular approaches to creative thinking into this framework such that military teams and groups can benefit from an individual's ability to think clearly and to harness intuitive ability.

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CONCLUSION

This chapter concludes with the argument that critical thinking is an important leader skill in the modern military. The ability to think critically in the military however is not simply an academic discipline, but is built on a foundation of military profession ethics. The arguments in the chapter have highlighted how ethics are different from morals, and that put together, the individual ability to think critically from an ethical frame will engender creative thinking in teams, and ultimately decision-making as an organisation. A key concept in this chapter expounds on Gary Klein's contention that critical thinking leads to analytical thinking which will complement intuitive decision-making. Hence, the justification that critical and creative thinking thought processes should be formalised within a larger decision-making model to deal with the challenges posed by volatility, uncertainty, complexity and ambiguity in the environment that militaries operate in today.

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CHAPTER 2

MILITARY DECISION-MAKING AND SOFT SYSTEMS METHODOLOGY

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War, as the great Prussian military theorist General Carl von Clausewitz recognized, is the province of danger, exertion, hardship and friction. Furthermore, he went on,

> "In war everything is uncertain, and calculations have to be made with variable quantities. Other theorists direct their inquiry exclusively towards physical quantities, whereas, all military action is intertwined with psychological forces and effects. They consider only unilateral action, whereas, war consists of a continuous interaction of opposites."[1]

NON-LINEARITY AND COMPLEX ADAPTIVE SYSTEMS

Decision-making in the environment described by Clausewitz is an extraordinarily difficult endeavour. This is so because war and conflict have the characteristics, in fact, of a complex and therefore, non-linear system. They are what the American mathematician Warren Weaver called "organized complexity" as opposed to problems of "simplicity" (analytical solutions) or "disorganized complexity" (statistical solutions).[2] Rationalistic models of decision-making such as the Operational Planning Process (OPP) in the Canadian context, suitable for the latter two types of problems are decidedly less useful when dealing with "organized complexity." For these problems naturalistic models derived from systems theory and based on systems thinking are required. Soft Systems Methodology (SSM) is one such model.[3] Soft Systems Methodology is a problem-solving tool, a process of developing a commitment to understanding complexity and some course of action.

For a system to be linear it must meet two simple conditions. The first is proportionality indicating that changes in system output are proportional to system input. Such systems display what in economics is called "constant

* The ideas expressed here represent the authors' point of view and not the official view of the Canadian Forces or the Department of National Defence.

return to scale," implying that small causes produce small effects and large causes generate large effects.

The second condition of linearity, called additivity or superposition, underlies the process of analysis of linear systems. The central concept is that the whole is equal to the sum of the parts. This allows the problem to be broken up into smaller pieces that once solved can be added back together to obtain the solution to the original problem.

Non-linear systems are those that disobey proportionality and additivity. Interactively complex, non-linear systems are highly sensitive to inputs: immeasurably small inputs can generate disproportionately large effects and vice versa. With interactive complexity it is often impossible to isolate individual causes and their effects, since the parts are all connected in a complex web. Interactive complexity produces fundamentally unpredictable and even counter-intuitive behaviour.

Clausewitz's *On War* is suffused with the understanding that every war is an inherently complex, non-linear phenomenon. In a profoundly unconfused way Clausewitz understood that seeking exact, analytical solutions does not fit the reality of the problems posed by war.

> *War belongs to the province of social life. War is not an activity of the will exerted upon inanimate matter like the mechanical arts, or upon a living but passive, yielding subject like the human mind and human feelings like the fine arts; but against a living and reacting force. Strictly speaking, war is neither art nor science, rather, it is part of man's social existence.*[4]

That is to say, Clausewitz maintains that the ideal of a logically complete or sufficient "answer" to any problem in warfare is a sheer delusion because war is a social rather than either a technical or an artistic phenomenon. Due to the social nature of human activity, problematical situations in and around the conduct of war can rarely be "solved." Instead, they must be understood and managed using a systems thinking approach.

Non-linear systems like war and conflict are sometimes called complex adaptive systems. This concept is actually a very broad meta-subject, but at its core is a single image – the concept of an adaptive whole, a system. This will contain sub-systems, while itself being capable of acting as a sub-system of a yet wider system. Such a whole may be able to survive in a changing environment, which is delivering shocks to it, if it has available both processes of communication and a repertoire of responses which can enable it to adapt to its changing circumstances. It is here that complexity theory and chaos theory come to bear.

The general model of organized complexity is that there exists a hierarchy of levels of organization each more complex than the one below. The higher level is characterized by emergent properties that do not exist at the lower level. Indeed, more than the fact that they do not exist at the lower level, emergent properties are meaningless in the language appropriate at the lower level.

Hierarchy theory is the discipline concerned with the fundamental differences between one level of complexity and another in a given system. Its ultimate aim is to provide both an account of the relationship between different levels and an account of how observed hierarchies come to be formed, what generates the levels, what separates them and what links them. Such hierarchies are characterized by processes of control operating at the interface between levels. In a hierarchy of systems, maintenance of the hierarchy will entail a set of processes in which there is a flow of information for purposes of regulation and/or control. All control processes depend upon communication, upon a flow of information in the form of instructions or constraints, a flow which may be automatic or manual.

THE GENERAL SYSTEM OF WAR AND CONFLICT

War and conflict must be viewed as such a system – the General System of War and Conflict. This system comprises a hierarchy of systems ascending from the tactical to the operational to the strategic and ultimately to the policy or political level. The system is depicted in Figure 2-1.

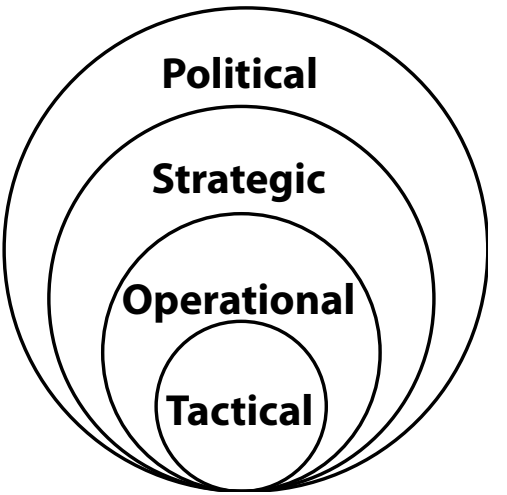

FIGURE 2-1: Levels of the General System of War and Conflict

As one rises through the system, emergent properties are identified; such as, for example, the emergence of manoeuvre at the operational level being that of a function of mass and mobility as opposed to fire and movement at the tactical level of the hierarchy.

In the General System of War and Conflict, policy is defined as "the expression of the desired end state sought by the government and guidance for the employment of the instruments of power." It is crucial to appreciate here, Clausewitz's insightful observation that the main lines along which military events progress, and to which they are restricted, are political lines that continue throughout the war and into the subsequent peace. This is so because, as Clausewitz defined it, war is merely the continuation of policy with the admixture of other means. The "logic" of war is supplied by policy, whereas, the "grammar" is supplied by strategy, operational art and tactics.

The strategic system is the dominant one below policy because it is here that the conflict's political goals are defined in terms useful for the military and other non-military actors. This is usually problematic since the criteria for politics are subjective, ambiguous and indeterminate while those for the military tend to be objective, concrete and relatively time-limited. With regard to the relationship between strategy and the operational level, it is the process of interacting with the strategic level, directly or indirectly, which causes the operational level commander to form his or her unique perspective. For the operational commander alone, to be successful, must conceptualize a military or multi-agency condition or conditions that will ultimately achieve the strategic goals.

Strategy is defined as the art of distributing and applying military force, or the threat of such action, to fulfil the ends of policy. There are four dimensions to the strategic system – operational, logistical, social and technological. It is, of course, largely the social dimension that injects non-linear complexity into the system. What makes strategy so difficult for the uninitiated is that it is virtual behaviour; it has no material existence. It is an abstraction, though it is vastly more difficult to illustrate virtually than are other vital abstractions.[5] If there is, therefore, a single idea which best captures the essence of strategy it is instrumentality. So long as one never forgets that strategy is about the consequences of the use of force and the threat of its use and not about such use itself, one will keep to the straight and narrow. Once the policy objectives have been established, strategy is the function that delivers the concept of victory.

Once leaders understand that the strategic system is a dynamic, non-linear feedback system they must see strategic thinking as involving the following mental tasks:

- Developing a new mental model for each new situation rather than applying the same general prescription to many situations. As Henry Mintzberg cautions:

> *formal planning and the associated forces that encourage it (e.g. analytical thinking) may discourage the very mental state required to achieve new strategies – a state of openness and easy flexibility that encourages people to step back from operating reality and question accepted beliefs. In short, formal strategic management may prove incompatible with real strategic thinking.*[6]

- Reasoning by analogy and intuition about qualitative irregular patterns rather than analysis and quantification.

- Thinking in terms of a whole, interconnected system, including relationships in it rather than as separate parts.

- Focusing on the learning process, and on the mental models governing the process, rather than the outcomes.

- Becoming aware of the effects of group dynamics on thinking and learning and trying to minimize dysfunctional group dynamics.

The interface between policy and strategy is the realm of civil-military relations. Issues of civil control of the military and structures and processes for effective communication across this boundary are always important ones. It is here that politics, military strategy and other elements of national power come together to formulate national security strategy. In the process of dialogue that should occur on the strategic bridge, both the soldier and the civilian politician need to adjust their preferences so as to meet the demands of the other. But a key function of the dialogue is to ensure that the spokesperson for policy and the spokesperson for military power each respect the core integrity of the logic or grammar of the other.

Nested within the strategic system in the General System of War and Conflict is the operational level system. It is the bridge between strategy and tactics where the coherent accomplishment of strategic objectives through the employment of tactical resources is achieved by the conduct of major operations and campaigns. Commanders and staff in this operational system employ operational art in achieving their aims. Operational art is the component of military theory concerned with the theory and practice of designing,

planning, conducting and sustaining major operations and campaigns aimed at accomplishing operational objectives in a given theatre.

Operational art is a creative enterprise which comprises a reciprocal discourse between the National Command Authority and the operator-designer focusing on the design of the operational concept and another reciprocal discourse between the operator-designer and the commanders of the tactical components concentrating on the detailed planning of the manoeuvre scheme. Like strategy, the operational system exhibits all of the characteristics of a complex adaptive system.

Tactics are the final nested element in the General System of War and Conflict. They are obviously important because only they deliver success within the context set by operational art and strategy. Any concrete military activity is inherently tactical, organized by operational art, but the consequences of all military activity are the realm of strategy. The factors of fear, danger, fatigue and extreme physical and mental exertion are either unique to the tactical system or their effects are greatly magnified there. Tactical manoeuvre, as already mentioned, is a function of fire and movement and is strongly influenced by technology. Tactics have, in fact, been altered as much, if not more, by technology than strategy and operational art.

At the tactical level in the hierarchy of the General System of War and Conflict actions and activities remain quite complicated but are less complex than higher levels. The system tends to linearity and analytical modes of thinking, decision-making and planning are generally appropriate.

In such complex adaptive systems as the General System of War and Conflict, as discussed earlier, the functions of communication and control are central to the system's functioning. In the General System of War and Conflict these functions are accomplished by commanders, leaders, staffs and staff systems, and the use of appropriate technologies to link all of the elements together. Generally speaking, command and leadership in the tactical system are direct and more or less face-to-face. In the operational and strategic systems these function are more indirect and are accomplished through system-wide directives and policies.

In addition, strategic and operational control must be understood in completely different terms than in the tactical system. These new terms involve political interaction and complex learning. Complex learning and political interaction are the only forms of control capable of operating in complexity and what is called "bounded instability"[7] and of dealing with situations of open-ended change.

To succeed, strategic and operational leaders must control their organizations during all kinds of change. The forms of control they need to use, however, are dictated by the nature of these changes. Applying planning forms of control to short-term, predictable change is not only possible but essential. Because the details of the long-term future are completely unknowable, however, leaders have to adopt a different form of control. This kind of control relies on self-organizing political interaction and complex learning. Leaders who use these processes are not abandoning concern for the long-term. They are simply showing a realistic recognition of the ambiguous and uncertain nature of the long-term future. Complex learning and political interaction, in fact, produce behaviour that is just as coherent and controlled as that produced by planning and hierarchical command and control structures. Finally, leaders understand that leadership in the operational and strategic systems, and sometimes in the tactical one, relies on relationship building over role defining, loose coupling over standardization, learning over knowing, self-synchronization over command and control and emergent thinking and what Clausewitz called intuition, over planning based on estimates.

SYSTEMS THINKING

The General System of War and Conflict, like all complex adaptive systems, must be addressed holistically. This can only be done through the application of systems thinking. Systems thinking stands in contrast to analytical thinking that underlies conventional planning procedures. Analytical thinking decomposes a subject successively into parts until it can explain the behaviour of each of the separate parts and then seeks to explain the whole as an aggregation of the behaviour of the parts. This process is sometimes called reductionist. Analytical thinking is extremely effective in dealing with linear problems and systems. It is, indeed, a powerful tool when applied to even the most complicated problems but is unsuccessful when tackling complex problems.

Systems thinking, on the other hand, is the practice of thinking that takes a holistic view of complex events or phenomenon seemingly caused by a myriad of isolated, independent and usually unpredictable factors or forces. Systems thinking views all events and phenomena as "wholes" interacting according to systems principles in a few basic patterns called "systems archetypes." These patterns underlie vastly different events and phenomena. Systems thinking recognizes that systems (organized wholes) ranging from soap bubbles to galaxies, ant colonies to nations, can be better understood only when their wholeness (identity and structural integrity) is maintained, thus permitting the study of the whole instead of the properties of their components. As a modelling language, systems thinking illustrates cause and effect

relationships that cannot be adequately explained by the subject-verb-object constructions of natural languages such as English.

The challenge of systems thinking lies in being able to recognize increasingly dynamically complex and subtle structures amid the wealth of details, pressures and cross-currents that attend all real settings. In fact, the essence of mastering systems thinking as a discipline lies in seeing patterns where others see only events and forces to react to.

The systems movement has evolved steadily since the late 1940s when General Systems Theory emerged.[8] In the 1950s, much of the work done was of a practical kind and represented the application to civilian situations of the lessons learned from the development of operations research (OR) during the Second World War.[9]

The application of the lessons learned in wartime OR to postwar activity in military, industrial and other organizations led to a number of organized forms of inquiry, problem-solving and decision-making. Bell Telephone Laboratories, for example, formalized their approach to new technology projects in "systems engineering"; the RAND Corporation developed "systems analysis" and when the first mainframe computers became available the analysis needed to design and establish a computer system drew on the same set of ideas.

This was the dominant trend in systems thinking in the 1950s and 1960s. Its essence was to define very carefully a desirable objective or need, to examine possible alternative systems which might achieve the objective and to decide among the alternatives, paying a great deal of attention to formulating criteria upon which selection is based. This is what is now known as "hard systems thinking," a systematic approach to achieving defined objectives. Hard systems thinking forms the basis for the Operational Planning Process and its counterparts developed in Western militaries in parallel with the methodologies outlined above.

In the 1970s and 1980s, a more systemic use of this approach was developed in a program of action research aimed at finding better ways of tackling the kind of ill-structured problem situations in the real world of human activity systems in which objectives are multiple, ambiguous and conflicting. This produced what is now known as Soft Systems Methodology, a much-used complementary approach to that of systems engineering/systems analysis. Many practitioners around the world have contributed to this development of so-called "soft systems thinking."[10]

SOFT SYSTEMS METHODOLOGY

SSM is a learning system, a system of inquiry. It makes use of models of purposeful human activity, each based on a particular declared worldview (since purposeful activity seen as "freedom fighter" by one observer may be interpreted as "terrorist" by another.) These models are used as devices to explore problematical situations. Comparing models with the perceived real world structures a discourse between conflicting interests which enable decisions to be made and "action to improve" to be taken. This action to improve can be as straightforward as understanding a complex situation or as difficult as arriving at new solutions to improve it.

The difference between "hard" and "soft" systems thinking lies in how systems thinking is used. In the "hard" mode the world is assumed to contain systems; and they can be "engineered" to work effectively. In the "soft" mode the world is taken to be problematical, but it is assumed that the process of inquiry and deciding can be organized as a system. It is this shift of systemaicity from the world to the process of inquiry into the world which marks the hard/soft distinction. In practical terms the "hard" approaches are appropriate where objectives are well-defined, the "soft" approaches in "messier" situations, or for what are sometimes called "wicked problems."

In dealing with the General System of War and Conflict, SSM can be applied as a decision-making tool at each of the tactical, operational and strategic levels of the hierarchy, but is especially useful at the operational level for campaign design and the strategic level for strategy formation.

SSM was originally developed in the United Kingdom at the University of Lancaster over 40 years ago. This development was initiated and led by Peter Checkland, Professor Emeritus at the University. It has since been applied in hundreds of complex situations in both the public and private sectors and is taught widely throughout the world. In recent years it has been used to shape one variety of problem-solving and decision-making in the United States Army and Marine Corps known as Systemic Operational Design (SOD) whose leading proponent, John Schmidt argues that linear planning for operations should be preceded by an "iterative, conversational design process based on systems thinking."[11]

SSM is, in the language of social theory, a shift from one philosophy and sociology to a different philosophy and sociology. It is a move from positivism and functionalism to phenomenology and interpretive sociology.[12] The nature of this shift is one away from a static view of social reality, as something "out there" which can be studied objectively by an outside observer as

if social reality were similar to natural phenomenon, to a process view which sees social reality as something being continuously constructed and reconstructed by human beings.

In SSM the social world is taken to be a very complex, problematical one, characterized by clashes of worldviews. In the context of the US Army's developments in the field of operational design, worldviews are known as frames, specifically, where "the language we use to catagorize and structure the world shapes our perspective."[13] This social world, with its conflicting worldviews is continuously being made and remade by people thinking and taking action. However, coping with it, the process of inquiry into it, and taking decisions about it, can itself be organized as a learning system. The notion of systematicity appears in the process of inquiry into the world rather than only in the world itself.

With this in mind, SSM can be defined as:

> *an organized process which articulates a social learning process by structuring discussion of a problem situation, discussion being based on models of concepts of purposeful activity (built on explicit worldviews) in order to decide on actions to improve to be taken.*

The methodology is applied iteratively in four main steps; each discussed in detail below.

- Find out about the situation by engaging in a dialogue (or better, discourse) with relevant stakeholders. The "finding out" is structured around three analyses – stakeholder analysis, social analysis and political (power) analysis. After an investigation has been undertaken, the objects in the system and relationships between them can be mapped out visually.

- When enough is known to start the next step (remembering that as an iterative process new learning will cause more to be "found out" about the situation – you have to start somewhere!), you create a statement, known as a root definition (RD) of the "ideal" system that seems to accommodate the worldviews of relevant stakeholders. In essence this statement takes the form: do what? (P), how? (Q), why? (R).

- Develop a visual model, or models, of this root definition. These are ideal-typical activity models of purposeful activities that would lead to the "system" desired. This is where the key learning takes

place and critical relationships are teased out. New perspectives can be expected to emerge during the discourse about the model and undisclosed assumptions unearthed. The model(s) developed include the explicit statement of three criteria to be met – efficacy, efficiency and effectiveness.

- Compare the model(s) to the real world situation to identify gaps or issues (organizationally or attitudinally) where purposeful action should be taken.

This process can be depicted in Figure 2-2 below.

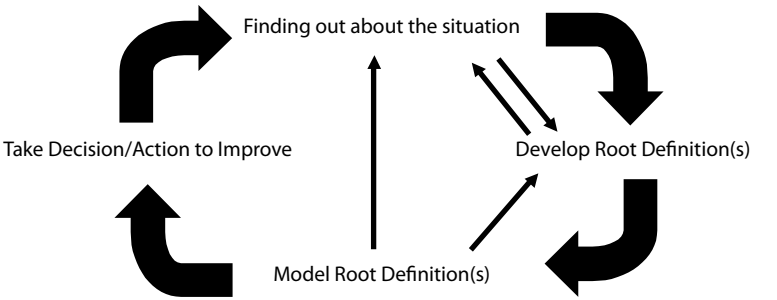

FIGURE 2-2: SSM Learning Cycle

The smaller arrows indicate that this is a thoroughly iterative and recursive process and thus, for example, it may be that in developing a RD there is a requirement to go back to find out more about the situation. Similarly, in the model-building phase it may be helpful to again go back to the "finding out" phase. This in turn could lead to a revision in the RD.

The methodology can be thought of as problem-setting – locating, identifying and formulating the problem, its underlying causes, structures and operative dynamics – in such a way that decisions can be taken on an approach to understanding and improving the situation. In the words of Nobel Laureate Herbert Simon, "solving a problem simply means representing it so as to make the solution transparent."[14] In a military or a whole of government/comprehensive approach the process entails assembling the individuals or groups interested in the "wicked problem" and needed to take decisions and actions to improve it. The team leader facilitates the application of the methodology but does not dominate it.

Finding out about the situation is structured in three analyses. An initial analysis to identify all of the relevant stakeholders; a second analysis, called

the social analysis, to examine the important norms, values, beliefs and attitudes of the major actors in the "messy situation"; and a third, political analysis to determine the power structures operative in the situation. An understanding of the stakeholders in the intervention is the first step in the finding out stage. The intervention covers the actions of the client (who caused the intervention), the would-be "problem solver", the issue owner, the stakeholders in the situation, in short, all those affected by the intervention. Those responsible for the intervention, the client, decide that they would like to take action to improve or understand the situation. Next, a social analysis of objects in the system involves, in a human activity system, examining the people and groups, their norms, values and roles. Also, the political analysis is concerned primarily with finding out where power lies in the system, with what groups, people or commodities. Like the results of the social analysis, a political analysis may reveal both informal and formal relationships, while a person in charge may seem to possess power, one or many informal leaders may also wield power in the system. Meanwhile, apart from who or what holds the power, how is it obtained? How is it preserved or perhaps relinquished? Applying these analyses to a situation like the conflict in Afghanistan, key stakeholders would be the North Atlantic Treaty Organisation (NATO), participating coalition partners, the Afghan actors, regional players, and so on. The values beliefs and norms of each of these actors will be very different and must all be acknowledged. Similarly, the power relationships are critical and will need to be assessed – how powerful is the government in Kabul versus the warlords, what influence does India exert and so on.

An important technique employed in SSM in this phase is the creation of "rich pictures" of the situation as it emerges from the three analyses. The rationale for this is that the complexity of a human situation is always one of multiple interacting relationships. Finding out about a complex situation involves more than an exploration of the objects within it. In complex problems, the relationships between objects in the system are also of the utmost importance and this investigative process must incorporate an examination of such relationships. George Reed, formerly of the US Army War College, develops a useful analogy. In examining a breed of insect to be eliminated from a farmer's field for example, it would be a simple, linear approach to focus on the object to be removed, the insect. However, the relationships of the insect to other objects in the system must also be considered, how the insect relates to other insects, to the soil, to the plants and so on. Killing the insect may have disastrous effects on the farmers' crops, far worse than the result of the insect. Importantly, this is not to say that if systems thinking were applied to for example, a counter-insurgency, that insurgent forces are best left alone. Their relationships to

other objects in the system must however be closely investigated, and more effective solutions to managing the problematical situation may emerge.

To meet this end, a picture is a good way to show relationships; in fact it is a much better medium for that purpose than linear prose. Hence, as knowledge of a situation is assembled it is recommended that the SSM user begin to draw simple pictures of the situation. These inevitably become richer (more sophisticated) as the inquiry proceeds and so such pictures are never finished in any ultimate way. In making a rich picture, the aim is to capture, informally, the main entities, structures and viewpoints in the situation, the processes going on, the current recognized issues and any potential ones.[15]

The next step in SSM is to create a root definition. This is a statement of purposeful action that describes what might be done to intervene and improve a "messy" situation. It is called a root definition because it is "rooted" in an explicitly stated worldview. In SSM an RD always takes the basic form – do what? (P), how? (Q), why? (R).

This skeleton definition is then enriched by using the mnemonic CATWOE. "C" is the client or group affected by "T", either as beneficiaries or victims. "A" represents the individuals or groups who will carry out the action. "T" is the transformation intended to be achieved through the action to be taken and "W" is elements of a specific worldview being expressed. "O" represents the owners of the action who wield control over the transformative process, in other words, those who could stop it if they so choose. Finally, "E" is the overall environment representing various constraints that could effect the action.

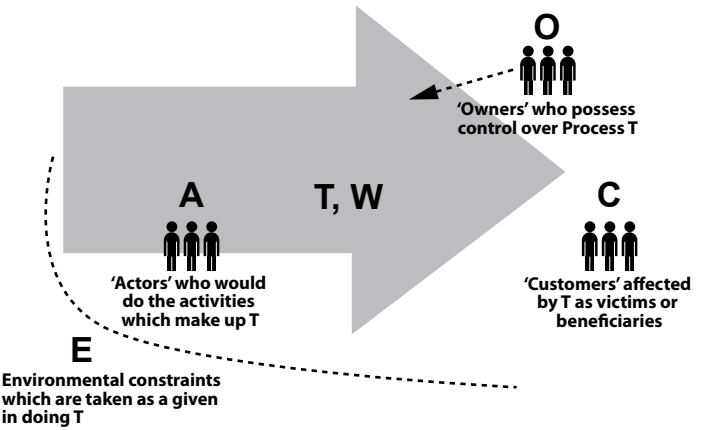

FIGURE 2-3: A Visualization of the CATWOE Mnemonic

Using CATWOE to fully develop the RD, the final result is usually stated as: "A system, owned by some entity, to achieve what, using which resources for what purpose." At the operational level of war and conflict this phraseology should be altered to say, "A design to …" Such an RD refers to a campaign design which should always precede a detailed campaign plan.

Using the NATO International Security Assistance Force Headquarters in Kabul, Afghanistan as an example (as a greatly oversimplified illustration) the root definition could run along these lines: "An ISAF owned campaign design involving diplomatic, developmental and military actions executed by contributing nations and Afghan forces to reduce conflict and stabilize the country in order to prevent it from again becoming a safe-haven for terrorists." Note here that the transformation (T) proposed – reducing conflict and stabilizing the country is motivated by a worldview (W) that Afghanistan should not be allowed to revert back to being a haven for terrorists. It is not a W that calls, for example, for a prosperous, democratic state, although, of course it could be written in this ambitious way.

At this stage it is useful to think ahead to the modelling phase and ask: what would be the measures of performance by which the operation of the system (design) would be judged? Thinking out what those criteria would be really sharpens up the thinking about the purposeful activity being modelled. Three criteria are relevant in every case and should always be named. These are:

- Criteria to tell whether the transformation (T) is working, in the sense of producing its intended outcome, i.e. criteria for **e**fficacy.
- Criteria to tell whether the transformation is being achieved with optimal use of resources, i.e. criteria for **e**fficiency.
- Criteria to tell whether this transformation is helping to achieve some higher level or longer-term aim, i.e. criteria for **e**ffectiveness.

These three Es will always be relevant in building any model, but in particular circumstances other criteria might also apply, such as, elegance or ethicality.

Model building can be described as putting together the activities needed to describe the transforming process, in other words defining and linking the activities needed to achieve the transforming process. Given the guidelines provided by P, Q, R, CATWOE and the three Es, this task should not be a difficult one. The only skill called for is logical thinking. The most

common error is to take your eye off the conceptually-based root definition and start modelling some real world version of the purposeful activity being modelled.

In a purely generic form an SSM model is illustrated in Figure 2-4.

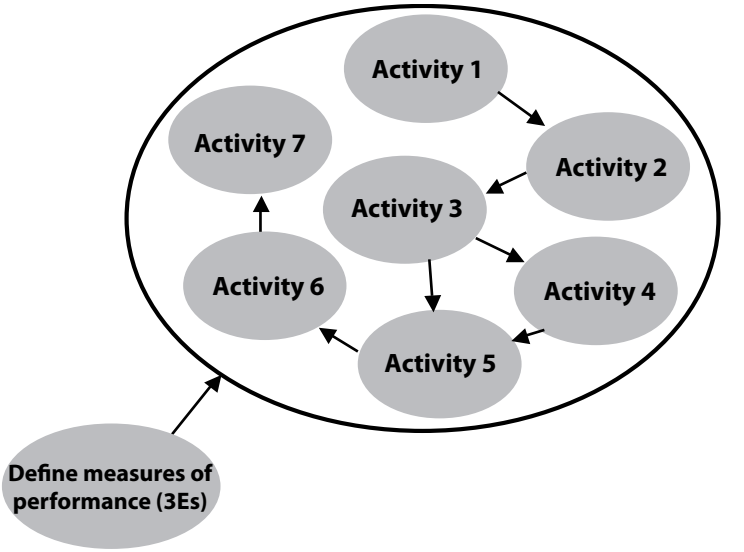

FIGURE 2-4: Generic SSM Model

Note that all activities are connected by arrows that specify the relationship between activities and actors. Finally, on model building, there is one more guideline worth taking seriously. Aim to capture the activity in the operational part of the model in the "magic number 7 plus or minus 2" (but do break the rule if necessary). This famous phrase comes from a celebrated paper in cognitive psychology. George Miller, based on laboratory work, suggests that the human brain may have the capacity to cope with around seven concepts simultaneously. Whether or not this is true, it is certainly the case that a set of seven (plus or minus two) activities can be tackled holistically. If the number seems low, this is not a problem. Any activity in a model can, in itself, become the source of an RD and an additional model. However, Peter Checkland, advises that in modelling over one hundred "wicked problems" it has never been necessary to expand beyond two levels below that of the parent model, and even then expanding only a few activities at the lower levels.

It is in the dialogue/discourse that takes place among the designers of the model that real learning takes place in the modelling phase. Various activities are discussed and selected and their importance and interrelationships are teased out.

If we take the situation in Afghanistan as an example the model, based on the RD created earlier, that might emerge would be along the lines of the following simplified version presented in Figure 2-5.

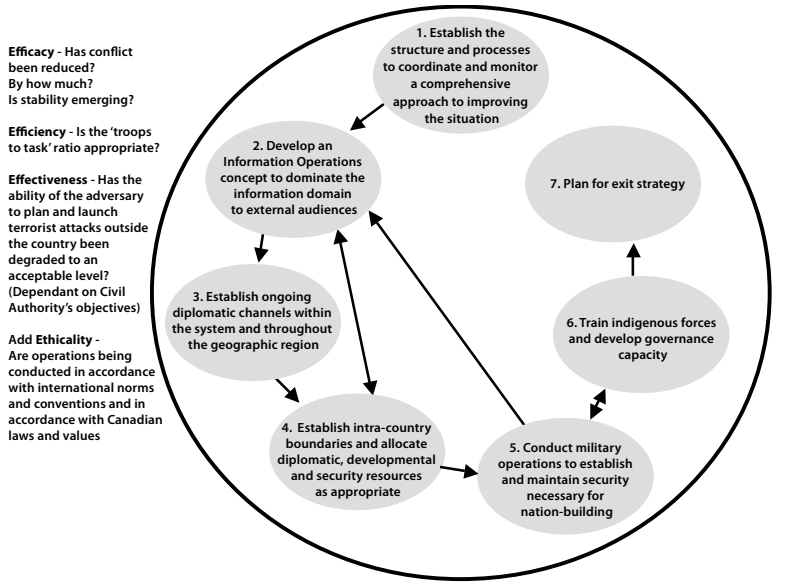

FIGURE 2-5: Example of a Purposeful Activity Diagram

In this simplified example, there are two important things to remember. First, each activity could, and probably would, have its own RD and be modelled as well. Secondly, it is the quality of the dialogue that identifies, articulates and refines each of the activities and their interrelationships.

When the model is sufficiently mature it can be compared to the real situation to determine what decisions need to be taken to "improve the situation." For example, it may be that there are multiple Information Operations plans, uncoordinated and lacking a strategic center of gravity. Efforts must be made to improve this. In another example, military operations may be relying too much on high technology with insufficient attention being paid to protecting the population.

CONCLUSION

As a decision-making tool, SSM accomplishes two things simultaneously. It injects systematic thinking into the learning process thus avoiding the pitfalls of analytical thinking unsuited to complexity. At the same time, SSM enables the user to "see" the system in question holistically. SSM models constitute the system in question within the boundaries of a yet wider system (environment). In a security environment that features widespread complexity and therefore unpredictability, the need for non-linear approaches in decision-making is evident. John Schmitt notes: "(the) recognition of significant and irreducible uncertainty as the fundamental challenge of command."[16] Fundamental to an operational commander is the ability to cope with pervasive uncertainty rather than trying to eliminate it and to manage complex problematical situations rather than trying to solve problems and predict outcomes. Of great use in campaign design and strategy formulation, the methodology's uses, of course, extend beyond these functions. In the field of military human resources, for example, the concern might be creating a human resources strategy for the organization, designing an appraisal system or developing a professional development program. These are all purposeful actions and hence, can be addressed through SSM. However, the real benefit that SSM can confer is not so much the specific outcome of a specific study; its main potential benefit is to improve the quality of the thinking capability of people in the organization

ENDNOTES

1 Carl von Clausewitz, *On War*, Peter Paret and Michael Howard (eds), (Princeton: Princeton University Press, 1976), 135.

2 Warren Weaver, "Science and Complexity", *American Scientist* (1948), 36, 540.

3 For a complete discussion of Rationalistic versus Naturalistic decision-making models see Colonel Bernd Horn and Dr. R. Walker (eds), *The Military Leadership Handbook,* (Toronto: Dundurn Press, 2008), Chapter 15.

4 Clausewitz, *On War*, 169.

5 Colin S. Gray, *Fighting Talk: Forty Maxims on War, Peace and Strategy* (London: Praeger, 2007), 48.

6 Henry Mintzberg, *The Rise and Fall of Strategic Planning* (NY: The Free Press, 1994), 114.

7 See Ralph Stacey, *Managing the Unknowable* (San Francisco: Jossey-Bass, 1992) for a complete discussion of this concept.

8 The classic account of General Systems Theory is contained in Ludwig Bertalanffy, *General Systems Theory* (NY: Brazilier, 1968).

9 A full and detailed account of the systems movement and its use in the social sciences can be found in Peter Checkland, *Systems Thinking, Systems Practice* (Chichester: Wiley, 1999).

10 Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity* (NY: ELSEVIER, 2009).

11 See John Schmitt, "A Systemic Approach to Operational Design", *Marine Corps Warfighting Lab* <http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf> p. 2. See also Stefan Banach and Alex Ryan, "The Art of Design", *Military Review* (March/April, 2009).

12 Phenomenology is the study of the nature of the phenomenon of meaning. Interpretive sociology is a school of sociology pioneered by Max Weber. Weber believed that man is a social animal suspended in webs of significance he himself has spun. Culture is these webs, and the analysis of it is, therefore, not an experimental science in search of law but an interpretive one in search of meaning.

13 Stefan Banach and Alex Ryan, "The Art of Design", *Military Review* (March/April 2009).

14 Herbert Simon, *The Sciences of the Artificial* (Cambridge, MA: MIT Press, 1966), 132.

15 See Peter Checkland, *Learning for Action* (Chichester: John Wiley, 2006) Chapter 2 for a complete explanation and examples of rich pictures.

16 Schmidt, "A Systemic Approach to Operational Design", 3.

CHAPTER 3

MILITARY DECISION-MAKING FOR FIELD COMMANDERS: THE INDONESIAN NATIONAL ARMY'S EXPERIENCE

Lieutenant-Colonel Eri Radityawara Hidayat
Lieutenant-Colonel Joko Purwo Putranto
Major Ardisutopo Endro Tjahjono*

Nothing is more difficult,
And therefore more precious,
Than to be able to decide

Napoleon Bonaparte, French Emperor[1]

INTRODUCTION

Decision-making is an important feature in human life, but more so in the military, as it often relates to life and death situations. Considering the fact that members of the armed forces are empowered by the state to use force lawfully, and subordinates must carry out orders and commands from superior officers without recourse, as eloquently mentioned two centuries ago above by one of history's greatest commanders, decision-making ability should become an essential element of an officer's military leadership competency. Yet, we can find in many military failures in modern history, especially at the tactical level where split-second decisions must be made and sound judgement is necessary, the commander's incompetence in decision-making was often the main culprit of the debacle. Moreover, first-rate decision-making is also necessary for unit effectiveness, because a bad decision committed by the commanding officer today, will undoubtedly impair the performance of the unit in the future. Therefore the Indonesian National Defense Force or *Tentara Nasional Indonesia* (TNI), considers sound judgment and superior decision-making skills to be the cornerstone for both military operations and unit effectiveness.[2]

For a long time, the TNI and especially the Indonesian National Army or *Tentara Nasional Indonesia Angkatan Darat* (TNI AD), has acted as one of

* The views expressed in this chapter are those of the authors and do not necessarily reflect the official policy of the Indonesian National Defense Forces or the Indonesian National Army.

the most important arbiters in the nation's decision-making process. However, with its democratic transition securely in place, Indonesia is transforming fast into a modern nation with all the trappings of a complex, changing and demanding society. As an important force in the country, the TNI/TNI AD must be able to produce leaders who can act and make decisions that are not only important for the defense of the motherland, but can also fulfill the expectation of the society that it ostensibly serves.

This chapter on decision-making in the TNI, especially in the TNI AD, attempts to provide some insights on the military decision-making process that is undertaken at the tactical or battalion level, as seen through the lenses of the field commanders and as the behavioural scientist who must select them for service as well as develop their decision-making competencies. With military professionalism and respect for human rights as its mantra, the transformation of the TNI would not be complete without a new model for the decision-making process, which hopefully will enable operational units to accomplish their mission, while at the same time also being ethical.[3]

The scope of this writing will cover the leadership aspects of decision-making, especially as they pertain to: the decision-making competencies of TNI AD officers; the current decision-making model that is being utilized by the TNI AD; the changing operational landscape faced by the TNI AD which necessitates the reformulation of the current model; and, finally, a proposal for a new model of ethical decision-making. Considering that the TNI AD is continuously conducting internal reforms so that it can become a truly modern and professional force, many of the ideas and thoughts that are being put forward in this chapter are probably only relevant during the time of writing. Therefore, with this understanding in mind, it is hoped that this chapter can become a stimulus for further healthy debate on the importance of ethical military decision-making in the TNI AD.

THE PSYCHOLOGY OF DECISION-MAKING

In order to accomplish any military mission, whether in combat or during peace time, what is known as "decision superiority" must be achieved, by means of which a commander of a combat unit can make a much better decision quicker than their opponent, or where a commander of a peace-time unit will be able to make the right decision that will provide the time required to implement the necessary changes that can improve unit effectiveness.[4] The question then is, is a better decision the result of a good decision-making process, or is it because of the superior decision-making competency of

the decision maker? While many researchers have found a better decision-making process to be helpful in answering this question, research on individual decision-making competency has also found that individual differences do produce a different quality of decisions.[5]

Ward Edwards, an expert in behavioural decision-making was among the first to put forward a "behavioural decision theory," in which he stated that there were two types of decisions that a person must make. The decision maker either must make an objective decision whereby the result of the decision can be measured physically, say in dollar terms, or a subjective one, in which the result can only be judged by its value or utility.[6] From this line of thinking, behavioural scientists then study the psychological processes that can explain how choices and judgment are made by an individual.[7]

Traditionally, cognitive psychologists found that in terms of decision-making, humans are rational beings who follow certain logical rules.[8] First, they map the problem situation and then based on their own objectives and values system, make a judgement on what course of action should be taken so that they can achieve their goals; in short decision-making it is a "situation-behaviour combination".[9] Decision-making itself refers to the entire process from problem definition to making a choice, while judgement is concerned with the assessment and prediction of the outcome.[10] Improvements to the decision-making process should be achieved through better mapping of the problem situation, perfection of the decision-making rules, and congruence between the value system and the goal that must be achieved in the decision-making process.[11]

On the other hand, other researchers who based their reasoning on the existence of individual differences in decision-making behaviour, are more interested in studying the decision makers themselves, especially in terms of their decision-making competencies or skills. In fact, Geert Hofstede, the multicultural guru, showed the universality of decision-making skills as a requirement for organizational success in every culture that he researched.[12] Likewise, other researchers found almost all modern managerial competency models included decision-making as part of their subcompetencies.[13]

Basically, researchers in this field, wanted to know the behavioural elements, traits or leadership styles that can be related to competent decision makers. For example, Spencer and Spencer, in their list of competencies taxonomy, described a behavioural description of a decision-making competency as an ability to recognize the problem situation and then take the appropriate action, in other words, a cognitive ability.[14] More current research found

effective leaders with good decision-making abilities possess high cognitive ability and are creative.[15]

Another field of research on decision-making theory concentrates on the decision maker's style. One theory worth noting is the General Decision-Making Style (GDMS), consisting of Rational, Intuitive, Dependent, Avoidant and Spontaneous Decision-Making Styles.[16] Researchers have found that the rational style, in which the decision maker follows a logical and structured approach to decision-making, and the intuitive style, whereby the decision maker relies upon hunches, feelings and impressions, can be classified as cognitive styles.[17] While on the one hand the rational decision maker needs time to think things through, and on the surface this is not appropriate in a critical situation, the intuitive decision maker will be better equipped in decision-making situations where he/she has to provide a quick response.[18]

MILITARY DECISION-MAKING COMPETENCIES

Notwithstanding our previous discussion on the decision-making process and individual decision-making capabilities, military decision-making, especially in times of war is an entirely different proposition. Arguably, peacetime military decision-making should not have different requirements from decision-making in general. On the other hand, battlefield decision-making seems to have unique characteristics that cannot be found in other settings, such as incomplete of information, time pressure, and unpredictability.[19] Therefore, for the purpose of our discussion, it is important to discuss each of these elements with the related decision-making competencies that must be possessed by field commanders facing these situations.

Contemporary military theories would likely argue that with advanced weaponry, superior information technology and network-centric operations, a modern army can lift the "fog of war" and go to battle with decision superiority based on information dominance.[20] Yet, the fact of the matter is battlefield information will always be incomplete, inconsistent or too little too late.[21] It is important therefore, to find out what personality characteristics should be present, so that field commanders will be able to make first-rate decisions based on insufficient information. Research on decision situations faced by US Air Force officers when information was incomplete, suggested that decision makers who have self-confidence and make the right decision, tend to be highly intelligent, self-reliant, and socially perceptive.[22]

In times of war, field commanders need to always keep the initiative in order to outmanoeuvre the opponent by speeding up the tempo.[23] Yet, research on the effect of time pressure on decision-making has shown that not only will it create stress, it will also lead to superficial decision-making.[24] In fact, the very short time span allocated for a complex problem-solving situation will impair the decision maker's cognitive functioning and lead him/her to become emotional, and further result in an oversimplification of the problem.[25] Research on Israeli military officers studying the effect of time pressure on decision performance showed that this impact is greater on inexperienced field commanders.[26] The research also suggested however, that apart from experience, personality traits such as calmness and confidence should play a significant role in improving officer performance.[27] On the other hand, studies on Swedish military officers found that intuitive and spontaneous styles of decision-making are the most appropriate for decision situations under time pressure.[28]

Finally, war is a very complex endeavour and there is no cookbook strategy to win it.[29] From the Peloponnesian War of ancient Greece, to the modern warfare of the 21st century, the nature of war remains the same in that it is very hard to predict the outcome.[30] The great Prussian military strategist, Carl Von Clausewitz, wrote succinctly about this around 200 years ago, when he said that, "No other human activity is so continuously or universally bound up with chance. And through the element of chance, guesswork and luck come to play a great part in war."[31] Therefore, war in general is nonlinear and it is almost impossible to structure and systemize an armed conflict due to its chaotic nature.[32] This is even more true in asymmetric warfare, where technological superiority is not the deciding factor, and where non-linear dynamics, complexity and eventually chaos will rule the day.[33] Yet, the most common pitfalls conducted by military strategists and thinkers is that they tend to conform to a linear intuition and resort to static models of warfare.[34] To solve this problem, proponents of complexity theory suggested that military officers should have the ability to learn continuously and be adaptive to the constantly changing and unpredictable environment.[35]

EXPECTED DECISION-MAKING COMPETENCIES FOR TNI AD OFFICERS

As an important element of the Indonesian Defense establishment, the TNI AD is expected to function as the strategic strike force capable of eliminating both internal and external threats to the sovereignty of the Unitary State of the Republic of Indonesia or *Negara Kesatuan Republik Indonesia* (NKRI).[36] Therefore, in a sense, the TNI AD is no different from other armies around

the world, requiring the same decision-making competencies of its personnel. At the same time however, the TNI AD is different from other Armies, because it has its own Core Identity (*Jati Diri*) as a People's Army (*Tentara Rakyat*), a Patriotic Army (*Tentara Pejuang*), a National Army (*Tentara Nasional*), and a Professional Army (*Tentara Profesional*), of the NKRI.[37]

As the direct descendant of the paramilitary groups that were formed by the people after the declaration of independence and who then fought the colonial powers to safeguard Indonesia's independence, the TNI AD as the People's Army is inseparable from the people.[38] As part of a Patriotic Army, TNI AD soldiers must be willing to show their best performances regardless of the circumstances, and be willing to defend the Republic without any thought of surrender.[39] As a member of a National Army, a TNI AD soldier is expected to have a nationalistic outlook and not to favour certain ethnic, religious, racial or other groupings, including his/her own; his/her loyalty is to remain loyal to the Republic and the Republic alone.[40] As a Professional Army, TNI AD soldiers are expected to be skilled in manoeuvring and operating war machines and combat equipment.[41]

Values from the Core Identity, together with other TNI values derived from it, such as the Soldier's Oath (*Sumpah Prajurit*), the Seven Fundamental Commitments (*Sapta Marga*) and the Eight Military Pledges (*Delapan Wajib TNI*), form the Soldier's Code of Conduct for TNI/TNI AD soldiers.[42] These TNI/TNI AD values are then incorporated in the values sub competencies of a competency framework (see Figure 3-1 below) designed by the Psychological Service of the Army or *Dinas Psikologi Angkatan Darat* (DISPSIAD), which also includes a decision-making subcompetency.[43] Therefore, TNI AD commanders are expected to consider these values, whenever they are in involved in decision-making situations.

FIGURE 3-1: Competency Framework of TNI AD Field Commanders

Taking into consideration the previous discussion on modern military decision-making, apart from the Military Decision-Making Process (MDMP) that must be followed by TNI AD field commanders, and the values from the core identity to which they must adhere, the competency framework also requires them to have certain qualities and psychological profiles. Psychologically, TNI AD field commanders are expected to have high cognitive abilities, including a high level of intelligence, systematic thoughts, good analytical skills, high flexibility in thinking, and a high level of creativity. As the previously mentioned research demonstrated, these qualities will help to improve decision-making accuracy.[44]

Personality wise, they are expected to be self-reliant, adaptive, have a strong sense of conscientiousness, be stable emotionally, possess good team work skills and be confident. In terms of decision-making competencies, they are also expected to be decisive, ready to make decisions, to take action or recommend a decision to their superior officer. In addition, they are also expected to be able to make accurate decisions based on factual information, logical assumptions and the availability of resources. Also, it can be said the

INDONESIA

TNI AD prefers a rational decision-making style, with some intuitive flare when the situation requires it. To assess these attributes, psychometric tests are administered by DISPSIAD when field commanders are selected. In addition, they must also go through Assessment Center exercises for their behavioural competencies assessments.

THE TNI AD'S DECISION-MAKING MODEL

Many military officers consider the MDMP as a deliberate, detailed and time-consuming procedure that enables a commander to make the best decision and choose the most appropriate Course of Action (COA). Theoretically, the MDMP is a method of choosing from the various COAs, making an assessment of them and then selecting one of the best options.[45] In other words, it is a matter of selecting the most effective COA from the less effective ones.[46]

However, the reality of military decision-making is not as simple as it seems to be. This is due to the consequences that a military decision might create, such as the risk to the lives of the soldiers who will implement the commander's decision, and the possible impact of a single mistake to the entire combat strategy. For these reasons, in military decision-making and action implementation, the commander is always assisted by his staff in order to minimize the risks. Through the differentiation of tasks, roles and responsibilities, the MDMP allows for the organization of relationships between the commander and his/her staffs.[47] For despite all the direction and guidance to his/her staffs, all of the consequences of the decision that are made, remain the commanders responsibility (i.e., the commander still has a central role in the process).[48]

The TNI AD's MDMP model, as it is taught at the Army's Staff and Command School or *Sekolah Staf dan Komando Angkatan Darat* (SESKOAD), is visualized in Figure 3-2 below. It consists of eleven major steps that include (1) receipt of mission, (2) data collection, (3) mission analysis, (4) planning direction, (5) commander's and staff estimation (6) staff estimation briefing, (7) commander's decision/general concept of operation, (8) order preparation, (9) commander's approval, (10) order production, and, (11) supervision.[49]

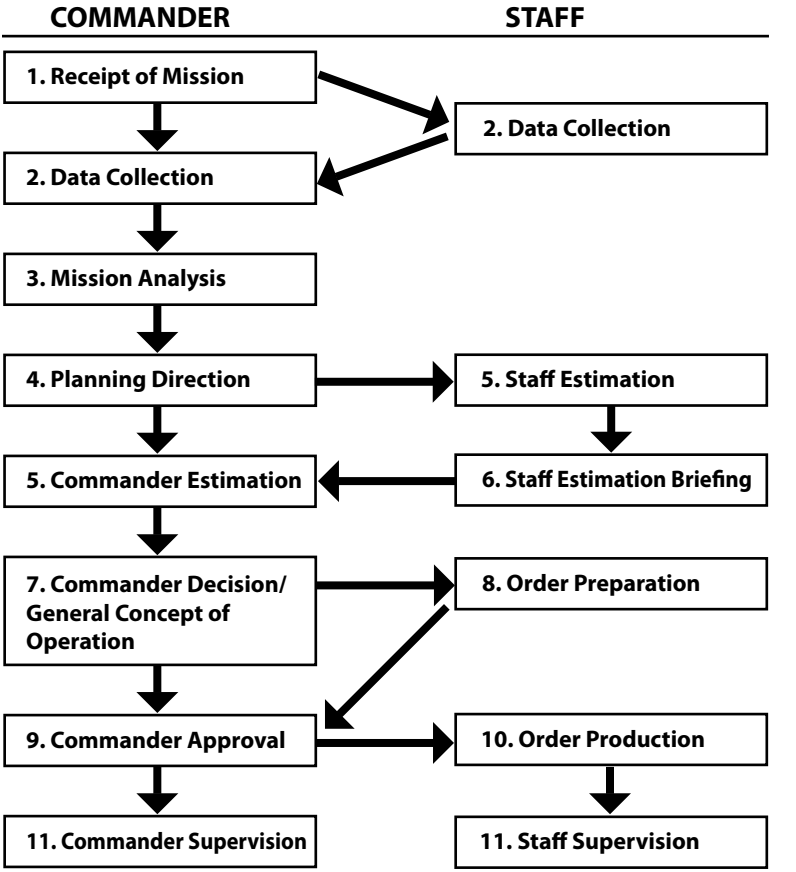

FIGURE 3-2: The Command and Staff Procedure (PROSHUB)

This model is similar to MDMP in other armies (e.g., the US Army comprises a similar seven-step process).[50] Since it is mainly a procedure on how a unit commander and his/her staff should act when they are faced with tactical decision-making situations, in the TNI AD, the MDMP is called the Command and Staff Procedure or *Prosedur Hubungan Komandan dan Staf* (PROSHUB). The eleven steps are described in more detail in the following paragraphs.

In the first step, Receipt of Mission, the PROSHUB process begins when a commander receives an order from a higher headquarters. The commander and his/her staff then analyze the order to enumerate all the tasks that

his/her unit has to accomplish in order to get the job done. Through a thorough analytical process on the ongoing situation, the commander and the staff can formulate a new mission. After the order is understood, step two begins (i.e., the Data Collection process), in which the commander and staff start to collect the data needed to undertake the mission analysis. These include factors that can impact his/her unit such as terrain, weather, enemy forces, own forces, social conditions in the combat area, and the time available. Basically, data is gathered from all the units involved in the operation, including the higher headquarters, friendly units or subordinate units. In addition, data can also be collected from analysis of the maps of the area of operation and intelligence products such as the analysis of the assigned area of operation. Although the TNI AD does not have a special term for this activity, it is very similar to what is commonly known in the US Army as initial Intelligence Preparation of the Battlefield (IPB).[51]

In the next step, Mission Analysis, the commander and staff begin to determine the specified, implied, and essential tasks. Once the staff have analyzed the specified and implied tasks, they will then brief the commander who will then approve the essential task (i.e., a task that must be executed by his/her unit in order to accomplish the mission). Next comes the Planning Direction step, in which the commander gives direction based upon the staff's restated mission, in the form of a general guidance, and those things that each staff must consider when they develop their own COA. It should be noted however, that at this stage the commander has not yet determined the COA. The commander only gives general direction in the form of a concise statement which covers pertinent issues such as intelligence, personnel, logistics, the use of auxiliary force, when the warning order will be issued, and other issues that the staff might ask about. Based on the commander's intent or direction, each staff then develops their own alternative COAs without much interference from the commander.

In step five, the Commander's and Staff's Estimation, both the commander and staff start to develop their own estimation. The commander's estimation is based upon each proposition from the different staffs; the commander has to analyze and compare the merits of each one of them. It is clear then that staff coordination is imperative at this stage, as the outcome of this step is the staff's suggestion to the commander on how the mission should be accomplished through the COAs that they have developed, analyzed and compared. In turn, the commander's estimation will also depend heavily upon the staff's creativity to produce a comprehensive and flexible COA within the time constraint.

Next comes the Staff Estimation Briefing. The developed staff estimation, which contains the latest updated intelligence situation, will be briefed to the commander for review. Each staff will, in turn, present their own estimation to the commander and subsequently, they must be prepared to provide explanations if the commanders ask for them. After that, the next step is the Commander's Decision. After the commander compares his own estimation to those of his staff, he will then have to make his final estimation which will become the commander's decision. His decision will then be briefed to the staff as a *formulated* task. The formula includes who, when, what, where, how and why. An example of a commander's decision is as follows:

> *The 17th Infantry Brigade (who) will attack at 050600 JUL 19B (when), capture and occupy Mt. 300 (1517) (what), seize ABC city (where) with 2 infantry battalions in front, 1 infantry battalion and 1 armour company as reserve (how), and continue the movement based upon orders.*

Once the decision has been made, the commander then issues the so-called General Concept of Operation or *Konsep Umum Operasi* (KUO). The KUO is the starting point for the staff to prepare an operation order or plan based upon the commander's decision.

The next step is the Order Preparation stage. The chief of staff will conduct a staff coordination briefing and prepare to issue the order based upon the commander's KUO. The order or plan contains a clear and concise statement on where, when, and how the operation will be conducted, so that the subordinate units will have no difficulty in understanding and accomplishing the mission. After the order is ready, the next step is the Commander's Approval. The chief of staff then submits the final order to the commander to get his/her approval. If the commander corrects a proposed order/plan, the staff will then have to refine the order/plan as directed, and the staff will immediately reissue a new order/plan.

Step ten is the Order Production. Before receiving an order, the staff will brief subordinates with all the necessary information, including intelligence and provide a detailed updated tactical situation to ensure that they understand the commander's intent and concept in how to defeat the enemy and accomplish the mission. Afterwards, the staff will reproduce the orders/plans and distribute them to subordinates. The final step is Supervision, in which the commander and his/her staff continuously oversee the performance of subordinates in the planning, preparation and execution of the operation.

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Currently, there are two distinctive models of PROSHUB, one for conventional operations and another for counter-insurgency (COIN) operations.[52] Basically, they follow the same process with the same eleven steps listed above. The only difference is that in conventional operations, time is limited which means that the tempo can be very fast. Strategically, it is critical to maintain the initiative in order to secure all of the tactical advantages. Therefore, the planning process must be quick and demands efficiency. On the other hand, COIN operations do not have the same time pressure as conventional operations.

In fact, for COIN operations in Indonesia, in which the TNI AD's involvement is in the form of neutralizing separatist armed rebellions, the TNI AD's strong points include the fact that it has force advantage in terms of personnel numbers, equipment, strategy and tactics. On the other hand, the separatist rebels mostly have lower capacities in terms of the number of personnel, technology and funding. However, although the commanders and their staff have more than adequate time to analyze the situation, any decision-making which results in a COIN operation, will have tremendous impact on the population at large, since in any COIN operation, the population will be the center of gravity. Therefore, the planning process must accommodate the best possible analysis.

IMPLEMENTATION OF THE PROSHUB

The previously described PROSHUB, is applicable for almost all operational and tactical army decisions, from the smallest unit (i.e., squad level), to the highest echelon such as corps headquarters. Although squad, platoon, and company level units have no staff as sophisticated as the battalion or higher level, the decision-making procedure is basically the same, and the PROSHUB, is being taught at every level in the TNI AD's education system. At the moment, however, published research resources on the TNI AD's PROSHUB for public use are very limited. Consequently, the discussion of its merit is more of an empirical standpoint, based on the experience of one of the writers as a TNI AD battalion commander. For this reason, it is hoped that this chapter will further encourage more discussions of a scientific and academic nature on this matter.

At the battalion level, where commanders have staffs, the PROSHUB provides an analytical approach to problem solving whereby the commander assisted by his/her staffs, should be able to examine a situation and then make a logical decision. In practice however, as Indonesia is not a nation at war and not every combat arms officer has the opportunity to practice their trade, not all

TNI AD's combat battalions are always fully resourced with experienced personnel who will be able to execute the PROSHUB flawlessly. Battalion staffs are comprised mostly of senior first lieutenants or captains who do not always have the necessary experiences and qualifications to perform as battalion staffs. Consequently, the success of the PROSHUB at this level will depend heavily on the commander's capabilities. Commanders will often independently and without much assistance from subordinates, assess and analyze every aspect that can directly affect the unit such as the task, enemy and terrain.

In fact, one can say that the battalion commander has a very central role in the decision-making process, providing focus and guidance to the staffs, and taking responsibility for whatever decision is made. As the most senior and most experienced officer, the commander is expected to use his/her expertise and creativity as well as battlefield awareness to accomplish the mission. In fact, the battalion commander is expected to be able to teach and train his/her staff about the PROSHUB and facilitate their mission planning and decision-making tasks long before an exercise or real combat begins.

This situation is of course a contradiction to the nature of the current PROSHUB, which does not place the commander as the central figure in the process. In fact, as can be seen from the previous discussion of the PROSHUB, not only do the staffs enjoy considerable flexibility in this process, they also play very important roles, from analyzing the battlefield situation, to war-gaming the COA, (the commander's involvement is kept at a low level throughout the process). The commander focuses on the staffs' effort to generate a comprehensive and flexible plan within the time constraints. In reality, however, the commander's direct involvement is needed to help the staff work faster and to enable them to anticipate different dynamics of the situation.

THE NECESSITY OF A NEW PROSHUB

Based on the previous discussions, the writers are of the opinion that one way to improve the effectiveness of the current PROSHUB would be to develop it in such a way that the field commander, at battalion level, and staff can examine the battlefield situation and adopt much better decisions, by placing the commander as a central figure in the process. A commander is responsible for any decision that the staff makes. Yet with the limited time constraints, the commander must be able to give the staff clear guidance and direction, enabling them to build up their analyses and compare the various COAs. This means that the commander has to work extra hard and be directly involved throughout the planning process.

Consequently, in this kind of situation, the commander's decision relies more heavily on his/her own expertise, intuition, and experience, rather than on a formal integrated staff procedure. Unfortunately, the current model does not allow commanders to develop intuition to minimize any shortcomings they might face, due to the fact that the PROSHUB model is a highly analytical model with a step-by-step procedure that must be followed sequentially. This phenomenon is actually not unique to the TNI AD. Research in the US Army also showed that due to similar constraints, experienced commanders are more likely to follow the so called "naturalistic" decision-making process instead of an analytical "by-the-book" procedure.[53]

Another suggestion that the writers have regarding the PROSHUB is in terms of the detailed explanation for each of the steps. The PROSHUB describes the basic doctrine of the roles, relationships, organization, and responsibilities of the staffs, and may work relatively well for brigade and division-level operations. Yet, it lacks in-depth instructions for each of the steps, which means that the procedure cannot be easily implemented by novice staff. Therefore, one way to solve this problem is by providing more detailed explanations for each step and then subsequently including them in the teaching and training of the model in the Basic and Advance Officers' Course curriculum. An MDMP field manual with a more comprehensive content than the current PROSHUB, will help the commander and staff to do their jobs in a relatively shorter period of time. This should result in more time for rehearsals, which is crucial for soldiers to accomplish the mission.

THE HISTORICAL ROLES AND ASSIGNMENTS OF TNI AD

The TNI AD's place in the national psyche is unique in that it was formed by the people in the shadows of Dutch colonialism. Imagine citizen militias banding together to form a national army without the government actually establishing it in a formal way. These militias then fought fiercely to drive out the occupier so that the nation's independence (proclaimed in August 17th 1945), could be safeguarded. Equipped only with a few stolen firearms, stones, sharpened bamboo sticks and anything else that can be wielded as weapons, they were able to force the more technologically advanced Dutch troops (who had much experience in the European theatres of World War II) to a stalemate, forcing the Dutch government to capitulate and acknowledge the sovereignty of the Republic of Indonesia in 1949.[54]

The TNI AD of course has become a modern professional organization, and represents the world's third largest democracy. Yet, undoubtedly, the memories of a youthful army living in the jungles and mountains near a hamlet,

working hand-in-hand with the villagers to conduct guerilla warfare, and fighting successfully against the Dutch cannot easily fade away. In fact, the 1945 Indonesian Constitution takes note of these unique close ties between the Indonesian military and the civilian population. It states that "every citizen of the nation has the right and responsibility to take part in efforts to defend the nation". Despite some criticism from those who wanted to create a distinct professional military modelled after the Western concept, the core identity of the TNI AD as a people's army, patriotic army, and national army remains the doctrine of the Indonesian army.[55] Only in recent years, after the TNI implemented internal reform following the downfall of President Soeharto in 1998, was a new identity as a professional army added to the core identity.[56]

The nature of any military is to defend the country from either internal or external threats. In the case of Indonesia however, it has not faced a significant external threat over the short to medium term.[57] However, internal stability has always been the most crucial security issue for the defense establishment. Such threats can take many forms, ranging from challenges to the state ideology of *Pancasila* (Five Principles), ethnic and religious conflicts, to other activities that can lead to the disintegration of the NKRI. Examples of these threats among others are the secessionist movements in Papua, in East Timor prior to the referendum that subsequently granted the East Timorese independence, and in Aceh prior to the 2005 peace agreement.[58] In fact, under the Soeharto regime, these threats became one of the justifications for the TNI to dominate every aspect of public life, especially in the troubled areas.[59]

Regrettably, in handling these internal threats, especially the ones which are secessionist in nature, the military has been attributed a series of human rights violations as a direct consequence of military operations.[60] To make matters worse, the outcomes of some past operations in those areas were indeed far from satisfactory. Instead of solving the conflicts in a relatively short period of time by winning the hearts and minds of the people, they were prolonged and tended to become more complex, generating further alienation in the local populace.[61] This in turn exacerbated the volatile situation, distancing their feeling of being a part of the great Indonesian nation. It is not that Indonesia was not recognized as having the rights to defend its territorial integrity. The problem in the past was more related to the fact that the international community did not always agree with the means the government employed to defend its territory by relying too heavily on military options.[62]

Fortunately, conflict in democratic Indonesia is now resolved through political means. As such, the TNI can now focus on external threats.[63] In fact,

this is in line with the national reform movement that demanded the TNI alter its traditional focus on internal security threats to a focus that is more external in nature.[64] The writers are of the opinion that this transformation is one of the most crucial changes in the modern history of TNI. In addition, considering the current democratic environment which demands civilian supremacy over the management of the armed forces, undoubtedly the role of the TNI will be more in line with other military institutions in other parts of the world. The question to be asked then, of course, is how does the new landscape and the changing environment have an effect on the TNI AD's decision-making process?

THE NEW OPERATIONAL LANDSCAPE

In a sense, Indonesia's experience in democracy is still "a work in progress". Even though, after gaining its independence in 1945, Indonesia was under the civilian leadership of Soekarno as the nation's first President, both Soekarno and his successor, President Soeharto, who was a military general, became increasingly authoritarian and centralized their powers. However, the financial crisis in 1998 eventually led to the fall of the Soeharto regime, which had been in power for thirty-two years, ushering in an irreversible democratic transition.

Without a doubt, this transformation created significant challenges for the TNI, which is responsible for maintaining security and stability, defending the country, and adjusting itself to the new democratic environment.[65] In terms of decision-making, the TNI AD has to adjust itself from being the single most important arbiter on the national decision-making process, to becoming a professional army responsible for defending the country against military threats, domestic or foreign.[66] To understand the impact of such reform on TNI AD decision-making, it is therefore imperative that we look at the origin of PROSHUB.

The TNI AD adopted the US. Army version of the MDMP – when many TNI AD officers were sent to the United States for training in the mid 1950s to 1960s.[67] The US Army originally developed the MDMP before the First World War. On recognizing the importance of developing a better military decision-making and planning procedure, the MDMP was revised during the Second World War.[68] Subsequently, when SESKOAD was established, the PROSHUB as it is known today, was reformulated to reflect the dynamic nature of the TNI AD's military operations, especially in the inclusion of the Territorial Staff, which was not part of the US Army version.[69]

With the current democratic environment requiring military commanders to be able to execute their mission through the lenses of a more democratic perspective, it is therefore necessary for the decision-making process to take this changing operational landscape into account – take for instance, respect for human rights. The current TNI AD doctrine explicitly states that the main military objective is to defend the motherland from external threats.[70] The non-offensive nature of this doctrine means that when the TNI AD must deal with internal separatist rebels who are actually their own people, they must ensure that human rights are respected.

Although the previously discussed PROSHUB is still valid and has not been changed since Indonesia transformed its political system from the previous authoritarian regime in 1998, apart from mission accomplishment, respect for human rights will certainly have to become a very important dimension in the decision-making process in the TNI AD, especially in the PROSHUB for COIN. While still in its early stages, there are already attempts to make the PROSHUB also cover lawful decision-making, especially in terms of respect for human rights. As an example, currently there are command post exercises in which estimation from military lawyers are included in the PROSHUB, especially for COIN exercises.[71]

CRISIS LEADERSHIP AND ETHICAL DECISION-MAKING MODEL

One of the most important competencies for military leaders – especially at the operational and tactical level – is leadership in a crisis situation, which can be tremendously difficult, complicated, and certainly very risky. Andrew DuBrin defined crisis leadership as the process of leading group members to face unexpected and mostly unanticipated, intensively negative and emotionally demanding circumstances.[72] There is no doubt that time constraints, poorly-structured problems, dynamic environments, changing and competing goals, as well as high decision complexity are factors that can contribute to a crisis situation.[73] Yet, the true test of leadership is leadership in times of crisis.

It is common sense that military field commanders are expected to perform in a crisis situation and be able to take decisive action. But it is not enough for an effective leader to do just that. They must also possess the competencies required to make ethical decisions. Lieutenant-General Johanes Suryo Prabowo, the current serving Vice Chief of Staff of the TNI AD, stated that ethical decision-making should be the cornerstone of the TNI AD's decision-making process and therefore army commanders must consider the acceptability of their actions.[74] What this means is that when formulating any COA,

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TNI AD officers must consider the issues of right or wrong, good or bad, just or unjust, and fair or unfair, and the decision-making process should employ ethical considerations at every step of its development.

An example of the implication of this policy is that in terms of Rules of Engagement (ROE) for decision-making in tactical and operational levels during a combat situation, the TNI AD currently expects its soldiers to recheck the target, prior to shooting at it, by giving a lag time to decide whether the target is really a combatant or not, or whether the enemy is armed or not. These rules are written as codes of ethical conduct in the TNI AD's pocket guide book for soldiers. This ROE was formulated as part of a policy to achieve an ethical and socially responsible organization.[75]

BUILDING ETHICAL DECISION-MAKING COMPETENCIES WITHIN THE TNI AD

Following the internal TNI AD reformation, the leadership training program for field commanders was revamped, the most important component being the building up of values-based competencies related to effective and ethical decision-making.[76] In the training arena, nearly all field grade officers now have to discuss and analyze case studies related to ethical decision-making, especially in relation to human rights issues. The materials are constructed from real cases from the field, related to military ethical dilemmas.

As an example, on leadership training conducted by DISPSIAD, participants were asked to evaluate leadership cases from a real situation by comparing them to TNI AD's values. Afterwards, they were asked to answer questions by using Dubrin's guidelines on ethical leadership decision-making as follows:

1. *Is it right*? This question refers to the universal principles of rightness or wrongness.

2. *Is it fair*? This question is based on the beliefs that certain actions are inherently just or unjust.

3. *Who gets hurt*? This question points to the fact that there is a utilitarian notion of attempting to do the greatest good for the greatest number of people.

4. *Would you be comfortable if the details of your decision or actions were made public in the media?* This question refers to the universal principle of disclosure.

5. *What would you tell your child, sibling or young relative to do*? This question is to evaluate the ethics of a decision by reversing the role of the decision maker.[77]

These exercises were designed so that field commanders can at the same time be decisive, yet ethical.

In addition, the multidimensional crisis in 1997 which led to the downfall of the Soeharto regime in 1998, as well as the largest natural catastrophe known in modern Indonesia in the form of giant tsunamis in 2004, have provided rich lessons learned in leadership and decision-making models in times of crisis.[78] Leadership development programs conducted by DISPSIAD also attempted to adopt valuable lessons from these crises into training sessions that promote ethical decision-making, especially in relation to the choice of COA by field commanders. The goal is to develop the capacity for decisive action, yet at the same time attempt to define the attributes and behaviours associated with effective leadership in times of crisis.

CONCLUSION

This chapter has discussed the theoretical framework of various decision-making issues, including both the decision-making process and the characteristics of the decision makers, and then compared them with the military decision-making model that is currently being adopted by the TNI AD. The TNI AD has produced many national leaders who were proven to be decisive and very effective. However, from the discussions described here, it can be concluded that in the face of the changing operational landscape, the TNI AD not only must improve its military decision-making process, but also needs army leaders who can perform in critical situations, can be decisive and yet ethical. In order to achieve this objective, it is very important for units like DISPSIAD to continuously seek ways to improve its assessment method, so that only the best field commanders are selected for the job. This, in addition to leadership training and a development program to promote ethical decision-making, will ensure that the TNI AD can remain true to its Core Identity as a People's Army, a Patriotic Army, a National Army, and a Professional Army.

As a concluding note, the authors would like to mention the last minute decision taken by General Sudirman, the legendary TNI Commander in Chief in December 19, 1948, prior to the fall of the temporary capital of the young Indonesian Republic in Yogyakarta.[79] The General was sick and was asked by the President to stay in the city to receive proper treatment. His decision

inspired and motivated all Indonesians (not only soldiers) to fight on all fronts.[80] This decision enabled the young Indonesian nation to prevail. Truly, this is a very good example of a field commander who was not only technically competent, but was also able to practice the values that are reflected in the organizational competencies of the TNI AD.

I am best with my soldiers.
I will continue the fight.
With or without the government,
The TNI will continue to fight!

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CHAPTER 4

DECISION-MAKING – NEW ZEALAND STYLE

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INTRODUCTION

Decision-making in the New Zealand Defence Force (NZDF) is not much different from other Western countries. At the strategic level, standardised processes exist for major force development acquisitions with project teams clearing a series of bureau-political committees. At each stage, either individuals or committees make incremental decisions before passing recommendations up to the next level. For campaigns and operations, similar approaches are used but the timeframes are often shorter and decisions less democratic.

At all levels, both team and individual decision makers mix intuition with scientific techniques to select an optimised solution. While various doctrinal processes – such as the Strategic Planning Process (STRAPP) and the Joint Military Appreciation Process (JMAP) – can at times help formalize the activity, ultimately the actual decision-making process is guided by wisdom. This is especially true for difficult compromises or ethical dilemmas where theoretical approaches come into play. Some of these include principles-based, values-based, risk-based, outcome-based, consensus-based, and managerial-based decision-making. Each of these have differing ideological foci and are beyond the scope of this chapter.

The aim of this chapter is to focus on new and emerging decision-making issues challenging the NZDF today. It begins with an exploration of problem types and decision-making factors before introducing two uniquely New Zealand tools – the Options Matrix and the Map-aware Non-Uniform Automated (MANA) tactical modelling software.

The two decision-making tools presented in this chapter both represent New Zealand solutions to this difficult cognitive process. The Options Matrix is a simple yet effective way of expanding the solution combinations for a decision maker in a way that makes selection, and mid-stream adjustments,

* Disclaimer – The views expressed in this chapter are those of the authors and not the New Zealand Defence Force.

easier. Importantly, it provides a big-picture visual representation of all key features to facilitate greater comprehension of complex problems. As an alternate tool, the MANA Model represents a purpose-built software package offering sophisticated testing of non-linear options to complex problems – including those with intangible dimensions.

OVERVIEW ON DECISION-MAKING

Decision-making is a cognitive process. Understanding how the brain solves problems is still an emerging field but many of the broad concepts are widely accepted in mainstream literature. For example, most cognitive psychologists treat the brain's processing much like Boyd's famous OODA loop (i.e., Observe, Orientate, Decide and Act).

Based on an input-processing-output schema, the human brain has both strengths and weaknesses. The quality of the decision made, for example, is influenced by not only the prioritizing and final selection but also the creation and comprehension of options – including the multi-order and interdependent effects. All of this is also influenced by the quantity and quality of starting information. At the micro level, the human brain receives inputs from the senses and processes this with existing knowledge stored in long-term memory.[1]

Our ability to interpret and process all the available information is often limited by our short-term, or working, memory. The working memory of most people is likened to seven (±2) boxes. When we attempt to exceed this number, either our ability to process information is degraded,[2] or we employ additional strategies. These range from simply writing things down to employing supercomputers to process massive amounts of data. We can derive formulae to calculate trends, patterns, intersections, and optimal events. But this is typically only suited for certain types of problems.

At each step of the decision-making process there are problems. The key, though, is to understand the nature of the decision-making process, and how various complexities impact it. The first step is gaining as much *relevant* information as possible – sifting out the white noise is in itself an art. The next important step is to determine and shortlist multiple realistic options. Ideally, these options will include innovative thinking beyond traditional paradigms. The final step is deciding.

DECISION-MAKING FACTORS

WORKING VERSUS LONG-TERM MEMORY

A key finding in the decision-making science literature is that people making time-critical decisions perform better when they identify analogies with past experiences to choose Courses of Action, rather than relying primarily on analytical thought processes to solve problems.[3]

The reason is that the human brain processes information at a finite rate, meaning that it will unavoidably require a delay before a decision can be made if analytical processes are used. In contrast, accessing long-term memory occurs almost instantly. Thus from a processing point of view, it is more time efficient to make decisions based on past experience stored in long-term memory.

In the literature, the memory component of human information processing is widely accepted to consist of both long-term and working memory. Long-term memory is believed to have unlimited capacity, whereas working memory has limited capacity and is involved in the temporary maintenance and manipulation of information. The performance of a secondary task by the working memory is assumed to be inversely proportional to the mental resource demands of the primary task.[4] Under stress, factors such as noise and anxiety can disrupt the tasks in the working memory. By contrast, retrieval of information from the long-term memory is not disrupted in the same way if that information is well memorized and rehearsed. Since rule-based decision-making approaches are readily recalled from the long-term memory, their use ought to substantially lower the demands on the working memory.

Consequently, good decision makers under pressure have been observed to heavily use simple "rule-based" methods (i.e. in this situation we do this) rather than analytical (i.e. I need to work out what to do), and have developed a rich network of such decision rules. Furthermore, in situations which fall outside the decision maker's direct experience, problems are often solved by analogy to these past experiences.

Studies into military tactical command decision-making by the US Marine Corps[5] have similarly shown that commanders solve tactical problems by using a large collection of schemas (i.e. templates simplified from the real world) which enable them to recognize a large number of situations. Insight into a particular problem is not so much based on knowledge of individual factors, but rather an appreciation of how these are combined in a specific

scenario. By contrast, novice commanders focus on isolated cues and tend to take these at face value, without recognizing the potential for missing information and how this may fit with the broader tactical problem. They are thus more likely to jump to erroneous conclusions.

ANTICIPATION

Another trait identified in good decision makers is that they try to anticipate events, as discussed in Jim McLennan *et al.*[6] They spend a lot of time on planning and scenario exploration prior to the activity. This is not the same as extensive planning in lieu of decision-making. Indeed, related research by McLennan presented at the Complexity 07 conference[7] suggests that overemphasis on planning can inhibit decision-making, as planners await evermore information before making a decision. In contrast, good decision makers often prepare for the "worst case" early. This helps to develop mental templates of various Courses of Action in advance, which can then be quickly implemented under pressure. This idea is captured somewhat in General Dwight Eisenhower's famous World War II quote, "Plans are nothing; Planning is everything".

CONTROL OF EMOTION

A further key trait of good decision makers is their ability to control their level of emotional stress and, in particular, to suppress negative emotions. Less effective commanders devote a much greater proportion of their time to noting their level of overload, and focus on self-assessment and criticism. They often appear overwhelmed by a pressure situation, and react to events in an *ad hoc* fashion, finding it difficult to formulate a coherent plan. Many subjects exhibiting these behaviours stated that they found it difficult to focus on the task at hand because of task-irrelevant self-critical thoughts. It follows from the information in the subsections above that this occurs as their cognitive capacity (i.e. short-term memory) becomes overloaded.

PERSONALITY AND INTELLECT

Interestingly, other researchers failed to find a particular "personality type" which made a better decision maker. Research does show though, not surprisingly, that general mental ability is a significant influencer.

THE IMPACT OF COMPLEXITY

Real-world problems are often complex. Recent advances in the study of complex systems demonstrate that these problems often defy conventional wisdom. For example, intuitively one might expect that the best approach to understanding a complicated problem is to break it down into its components to make it easier to understand.

Without a doubt, such an approach works very well in understanding how a motor engine works, and motor engines are undoubtedly complicated. However, they are also simple, in the sense that there are clear causal relationships between the engine components. Fuel is pumped into the combustion chamber, it is compressed and then ignited, and in return it produces a known, consistent and predictable amount of work.

However, the same is not true of most natural systems, for which it is more important to understand the system holistically than the detail of the parts. A good example would be to try to understand the behaviour of stock prices simply by examining in detail the tools used to place orders on the market.

Research also points to the frequent failure of decision makers to consider feedback loops and non-linear processes in complex dynamical systems, even when the decision maker is experienced.

The hallmarks of such situations are:

- Outcomes are commonly delayed and not attributable to a particular action.
- Some outcomes have a low probability of occurring but a large impact when they do, creating a distorted view of the behaviour of the system.
- There is often no information about what the outcome would have been if another decision had been taken.

Researchers[8] have made a case that such shortcomings in decision-making can be addressed by teaching "systems thinking" and the use of system dynamics constructs. These involve treating a system as containing a number of linked parts through which quantities flow (i.e. "stocks and flows"). This might be done by developing computer models of the system which decision makers can then use to educate themselves as to the behaviour of the system.[9]

NEW ZEALAND

An even more general and interesting class of systems are to be found in Complex Adaptive Systems Theory, or Complexity Theory.[10, 11] These theories espouse the use of agent-based models rather than structure-orientated models, like system dynamics tools. Agent models rely on the interaction of autonomous, pseudo-intelligent entities (the agents) to represent processes in a far less structured way. Patterns and structure emerge within these models as a result of the multiplicity of relatively simple interactions, rather than by design. This process is often referred to as "emergent behaviour", or simply, "emergence".

This type of agent-based approach has been exploited by New Zealand's Defence Technology Agency in the past to model non-linearity in warfare with considerable success.[12] It has been used, for example, to model peace support operations in East Timor,[13] and the interaction of air and sea platforms in maritime patrol.[14] In particular, the analysis conducted prior to the deployment of the final battalion rotated into East Timor is an example of the possibilities available in using models to improve operational decision-making, and will be discussed later in the chapter.

There is enormous potential, then, to improve decision-making not by improving the prediction of the outcome of a certain Course of Action, but by allowing decision makers to improve their understanding of the response times and feedback mechanisms of real-world systems. In terms of military deployments, a likely useful approach may be to teach the "adaptive stance".[15] That is, a greater emphasis on learning from and adapting to your environment and/or adversary. A contemporary example would be seen within the Australian Army, which has been testing such an approach in its deployments to Afghanistan.

THE RISE OF THE NEW SCIENCES

Indeed, towards the end of last century a growing recognition was developing in the US as to the limitations of the then current set of combat models and simulations. This largely stemmed from the fact that US analysts had projected that combat losses in the First Gulf War would be significantly higher than they actually were. Anecdotally, the British had done better at estimating casualties using much simpler models than the US. These took into account intangibles not included in the US models, such as troop quality.

This led the US Marine Corps to seek to develop models and techniques incorporating ideas from the so-called "new sciences" of Chaos, Complexity, and Complex Adaptive Systems theories, under the aegis of Project Albert.[16]

One approach was to seek to develop "distillation" models – a type of agent-based simulation that captures the essence of a given scenario, and utilises only what detail is absolutely necessary.

Distillations are fast-running, flexible, and importantly, easy to understand. Agents within these models may represent a soldier, aircraft, weapon, piece of terrain, concept, or anything relevant to representing the scenario accurately. An agent can be autonomous, reactive, motivated, adaptive, mobile, and communicative. This provides such models with enormous flexibility relative to previous generations of tools, and consequently allows for a much broader range of operational concepts to be explored, particularly non-conventional scenarios such as asymmetric attack.[17]

The approach of using distillations stands in contrast to many legacy combat simulations, which are so detailed and complicated that it can take a team of support staff a week to perform one run, representing just one point on a landscape of possibilities. Such models are the preserve of analysts and are of little use for training.

By contrast, former US Marine Corps Lieutenant-Genera Paul van Riper,[18] a proponent of the idea that combat is inherently chaotic and unpredictable regardless of the technology involved, speaks highly of the use of agent-based models in his forward to Andrew Ilachinski's influential book *Artificial War,*[19] which details in depth agent-based modelling approaches and their relevance to complexity and chaos theories.

One of the key advantages of using models of this type is that only a little detail is necessary to produce complex and unpredictable outcomes. However there are trade-offs, such as the need to balance the degree of detail used to accurately represent the scenario, against the need to explore as many aspects of the scenario as possible in a finite period. The more precisely we want to reproduce a real action, the greater the overhead in creating the scenario and modelling it. This restricts the number of variations that are possible to explore in a reasonable period of time, encouraging a tendency to focus on simulating one particular situation with high fidelity at the expense of exploring other possible variations. On the other hand, is there value in exploring a broad range of scenarios if these scenarios are not realistic?

In practice, military operations operate "in the realm of chaos and unpredictability".[20] An important part of the purpose of agent-based modelling is to represent this fact, rather than accurately predict what will happen in a given

scenario. There are too many intangibles and other quirks of nature to ever build a completely accurate model of a future operation.

AIDING OPERATIONAL LEVEL DECISION-MAKING

We make decisions either analytically or intuitively. "Analytical decision-making is based on a comparison of quantitative options, (intuitive) decision-making depends on a qualitative assessment of the situation based on the decider's judgement and experience."[21] Using the intuitive approach we typically seek the first workable solution (satisficing).[22] Using the analytical approach we aim to find the best solution (optimising). Consequently, when time permits, analytical approaches are favoured for making complex decisions that have significant consequences. This is why many organisations adopt an analytical decision-making model. A good example is the Military Appreciation Process (MAP).

The MAP and the tri-service Joint Military Appreciation Process are simple four-step decision-making models, based on the classical or analytical approach. The first step is to understand what problem needs to be solved. This is called Mission Analysis. The second step is called Course of Action Development. We will come back to this, but suffice to say this is where the problem solver considers all the facets of the problem and then devises multiple, practicable alternatives (Courses of Action) that are open to them and, where appropriate, the adversary.

While it is not specified, typically three Courses of Action are developed. Three courses support effective comparison but are not as onerous to develop and compare as four or more courses.

The third step is Course of Action Analysis. This is where each Course of Action is compared to a set of decision criteria or to each of the adversary's potential courses. The aim of this stage is to find out which Course of Action is most likely to succeed. The fourth and final step is Decision and Execution.

In short, the MAP identifies the problem, possible solutions, weighs them, finds the best one and then directs implementation. The strength of the process is that it forces the problem solver to consider all the possible alternatives. However, if they are not all considered, the process is invalidated and it would have been timelier to solve the problem intuitively.[23] This crucial second step is the focus, so let's look a little closer at Course of Action Development and the potential weaknesses in how we currently develop them.

WHERE ARE THE WEAKNESSES?

It is during Course of Action Development that, on the decision maker's behalf, we often intuitively prejudge what is and isn't relevant by selectively arranging the options to produce the "magic" three Courses of Action. There is, currently, no explicit means of knowing which options are being culled or included.

This is not necessarily bad. Certainly the more experienced the problem solver is with the situation the more likely the cognitive leap will be correct: but the converse is also true. What is lacking is a transparent way of presenting the information so the decision maker understands at a glance what has been included or excluded from each Course of Action.

Another issue is that complex problems are solved by shoe-horning them into a linear decision-making template. For complex problems, some options will morph or only become apparent with the passage of time or planning effort – they tend to require an iterative approach. Arguably, what we need is a "planning canvas" that allows us to add and amend alternatives as our understanding of the problem evolves.

Also, problematically, there is a lack of encouragement to include lateral or unconventional options due to the following of linear processes: even though unconventional solutions have often been decisive or at least catalytic throughout history.[24]

So, what if there was a simple way to highlight several Courses of Action while still enabling the decision maker to see the full range of options, including the unconventional ones?

OPTIONS MATRIX

The Options Matrix is a simple tool for producing Courses of Action based on an understanding of the fullest possible range of options at each level of the problem. Once the options have been tabulated, the problem solver can design Courses of Action by threading selected options together. Figure 4-1 illustrates an Options Matrix for a basic military mission.

Mission:

Task: Conduct a reconnaissance patrol.
Purpose: in order to identify the enemy commander's Headquarters.

Task Levels \ Range of Options	Low Risk	Medium Risk	High Risk	Unconventional
Insertion	Walk	Vehicle drop off (1)	Parachute (2) (3)	'Jingle' truck *(i.e. indigenous transport)*
Task	Standoff observation post (1)	Close Target Recce (CTR) (2)	Use locals to recce	(3) Incite enemy reaction so Signals Intelligence can ID the HQ
Extraction	Walk (1)	Vehicle pick up (2)	Helicopter (3)	facilitate *coup de main* and advance

Course of Action Statements	
COA 1 (1)	COA 1 uses a routine vehicle patrol to disguise recce patrol insertion. A Standoff OP and foot extraction reduce the chance of the enemy being aware that their HQ has been located. COA 1 will be slower to achieve the objective than COA 2.
COA 2 (2)	COA 2's insertion maximises surprise. Surprise is leveraged to enable a close target recce. Vehicle extraction provides speed and additional firepower in case the patrol is compromised.
COA 3 (3)	COA 3 parachutes recce patrol near suspected enemy HQ to create a reaction and enable signals intelligence to identify HQ location. Reaction is reinforced by night helicopter extraction, the method of which is designed to appear like the insertion of additional troops, thus prolonging the enemy disruption.

FIGURE 4-1: Tactical Example

As can be seen in Figure 4-1, only three courses are presented but there are numerous possible combinations, or Courses of Action. It is also possible to see, at a glance, how they stack up against each other and where risk is being taken or minimised.

The Options Matrix is adaptable to the problem being solved. For example, given a complex capability problem where the ability to affect change was an overriding factor, the Y axis might be "capability inputs". New Zealand and Canada use the PRICIE acronym, as shown in Figure 4-2. Instead of risk, the X axis might read "impact". Only the heading "Unconventional" would remain.

Figure 4-2 is an example of how an Options Matrix could be used to help design a new training force. Three points are noteworthy. It is possible to show contingencies (branches) to a Course of Action – contracting in specialists is a branch in Course of Action 3. Sometimes a task level does not lend itself to four options. In this case, information technology infrastructure only supports three options. Lastly, as in Course of Action 3 approach to IT

Infrastructure, it may be sensible for a Course of Action to combine two options at a particular level of the problem.

Mission:

Task: Create an opposition force (OPFOR) based on contemporary adversaries
Purpose: in order to improve the professional delivery of training and experimental analysis of adversaries' tactics.

Task Levels \ Range of Options	Low Risk	Medium Risk	High Risk	Unconventional
Personnel	Call for volunteers per training & experimental activity (1)	Full time cadre & a network of part time volunteers (2)	Full time OPFOR unit (3)	Contract-in media, immigrants & actors (3)
R&D	1-5% of effort ($ & time) (1)	10% of effort (2)	25% of effort (3)	Contracted advice from immigrants who are insurgency veterans
Infrastructure & Organisation	Established under an existing unit or school (1)	Semi autonomous unit (2)	Autonomous unit in purpose built facilities with an OPFOR Trade group. (3)	No facilities. Improvise *as per* operational conditions. '*Necessity is the mother of invention.*'
Concepts, Doctrine & Collective Training	Scripted actions only	Free flow & script training concept based on a templated adversary (1)	Free flow training based on near-real world tactics derived by OPFOR Cadre. (2) (3)	OPFOR anticipation of tactical evolution of adversary and develops counter tactics.
IT Infrastructure	Passive use of open source IT systems & commercial communications. (1)		Access classified info systems to extrapolate lasted adversary tactics. (2)	Monitor insurgent websites to extrapolate methodology. (3)
Equipment, Supplies & Services	Develop basic props (1)	Develop training infrastructure based on removable 'movie sets' (2)	Develop permanent training infrastructure/ equip (3)	Lease equipment as required. Repatriate captured equipment from operations

Course of Action Statements

COA 1 (1)	COA 1's is a volunteer-based solution that minimises the use resources, but also has limited potential to positively affect the professional delivery of training. It provides little if any capacity to conduct experimental analysis of adversaries' tactics.
COA 2 (2)	COA 2 is based on the principle of leverage. It leverages a permanent cadre to develop an OPFOR knowledge base and to control and synchronise the efforts of a volunteer network. It leverages wider organisational support for administration. It leverages classified and open source IT to keep pace with adversary developments. It also uses modular training aids to deliver training in different places and in different ways. The advantage of COA 2 is that it provides a flexible platform from which to scale training and experimentation up or down, as the situation requires. The disadvantage is that it consumes more resources than COA 1.
COA 3 (3)	COA 3 achieves the highest impact with augmentation from community based 'extras'. It also devotes more effort to R&D including the monitoring of insurgent websites. It invests in purpose built, rather than expedient, training infastructure and equipment.

FIGURE 4-2: Capability Design Example

WHAT ARE THE ADVANTAGES?

The advantage of an Options Matrix is that it makes all the feasible permeations transparent to the decision maker. If the decision maker does not like the courses presented they can direct a different combination, knowing how the change will relate to all the other possibilities. They can also quickly identify contingencies and, in the case of tactical problems, deception plans to deflect the adversary's attention from the real one. However, it is for complex problems that options-based planning really has the power to improve decision superiority.

With every cascading layer of complexity in a problem, the Options Matrix responds with up to four additional Courses of Action. In the PRICIE example above there are again numerous potential Courses of Action, instead of the traditional three or four we may struggle to develop. By using the Options Matrix as a planning canvas, amendments can be quickly and easily added, thus ensuring the planning process remains relevant to an evolving understanding of the problem. This need not be restricted to the planning phase, but could be useful in a changing situation, post planning.

While the Options Matrix is primarily an aid for analytical decision-making, it can support intuitive decision-making as well. In a field situation, the decision maker would simply make a quick mental note of the available options, the pro and cons of each, and then make a decision.

ON BALANCE

The Options Matrix is not a panacea and there will be situations where it is not applicable. Moreover, it is only a tool for developing Courses of Action. It does not and cannot supplant traditional decision-making models. But it can potentially augment their ability to develop multiple Courses of Action.

The hardest part of using the Options Matrix is devising the options themselves. If superficial effort is applied at this point, the Options Matrix will probably be of questionable value. However, devising options forces the problem solver to think conceptually about the problem and time spent on this aspect will pay dividends in terms of decision quality.

IMPROVING DECISION-MAKING

Designing solutions for complex problems requires more than just specialist knowledge and experience, it needs a systems awareness[25] of the profession and high-level cognitive, social, and change capacities.[26] Most staff course students are capable designers and are familiar with related concepts such

as mission command and manoeuvre warfare, but there are cultural barriers to fully accepting the need for systems awareness.[27] While the linear education model can help teach complex problem-solving strategies, there is still a need to encourage greater systemic thinking despite immersion in an environment where complicated thinking is the norm. Developing designers is itself a complex sociological problem.

Growing strategic leaders requires an adaptive and tailorable system to build on the unique backgrounds and abilities of these important people.[28] At the most senior levels of Professional Military Development (PMD) in the NZDF, unique programmes are personalised for selected officers. Here the programme is treated as a wicked problem requiring unique one-off solutions.

At the mid-ranking level, though, there is a challenge when treating PMD as a complex problem. The challenge for PMD is that designers must integrate with the linear training system used for tactical-level leadership development. But, in the same way that some students prefer superficial learning, there is a propensity for staff college level programmes to deliver linear, expertise-focused, systems. Although such an approach suits *ab initio* and junior-level requirements, students identified for senior leadership positions require higher-level cognitive capacities, capacities which in turn require different methods of education.

> *…what we really need are leaders who are adept at learning almost anything very quickly, or skilled at recognizing patterns and converting abstract knowledge to action appropriate for a given situation.*[29]

The discussions earlier in this chapter emphasized the importance of experience – and the development of appropriate mental templates – to decision-making under pressure. The importance of these appears not so much to be in the way decisions are made, but that having these templates takes away much of the mental workload, and hence much of the stress, from the decision maker.

Unfortunately it is not always possible to gain such experience in advance of a deployment, and hence methods for accelerating the development of these templates need to be explored. Several possible mechanisms for achieving this are now discussed.

LESSONS LEARNED

Careful examination of lessons from real life examples of modern operations is a practical option for preparing personnel prior to deployment. This

approach needs to aim to build mental models for trainees illustrating which decisions are appropriate for which situations. In its simplest form, this involves discussing past experience of what was necessary to be done in a particular situation to produce a favourable result.

However, research suggests that this is most effectively done using examples of real world mistakes rather than focusing solely on successes.[30] Non-error focused training is often suitable to acquire skills quickly and effortless for routine tasks, and concentrates solely on learning a skill or task.[31] Error-focused training allows the trainee to commit errors, then go back and examine why and how the error was made. As a consequence, it is more time consuming than non-error focused training, but more robust for learning to deal with complex problems.

The reason that error-based approaches are more successful for training for decision-making is that using examples of mistakes and their consequences seems to promote the use of "adaptive thinking" more readily than simply examining successful cases. It is thought that by focusing the trainees on errors, they are stimulated to think about alternative actions that may prevent errors, and build more fully developed mental pictures as a consequence.

By extension, learning tactics and doctrine from exercises and drill may lead to efficient learning of these routines, but will not encourage trainees to be able to adapt in circumstances where these procedures fail. This is likely to be particularly important for dealing with unpredictable threats, such as unconventional and asymmetric attack, because these attacks specifically target weakness in doctrine and training.

A particularly important technique in this regard is the concept of Red Teaming, in which the participants in either an exercise or wargame are pitted against an intelligent (usually experienced) adversary. Red Teaming wargames have had notable successes in the past at exposing weaknesses in current force structures and practices, though equally there have been dramatic instances of where these insights have been ignored.[32]

GAME THEORY

Game Theory is a scientific approach to analyzing Courses of Action between competitors, and teaching such classic theories may also assist in developing better decision makers. An understanding of it is particularly relevant to assisting decision makers to build mental maps of Courses of Action when facing an adversary.

Game Theory uses applied mathematics to generate optimal strategies for decision-making when faced with choices. It has been widely used in economics and the military to help inform the development of strategy. Typically in a Game Theory problem you have two or more options, each of which has some probability of success. Your opponent has some probability of successfully countering each option if he/she correctly guesses your Course of Action. The key idea is to calculate which mix of options gives you the greatest possibility of succeeding, regardless of what your opponent believes you will do.

In the context of military decision makers, it is not important to be able to make these mathematical calculations. Rather, it is the understanding of this interplay that is important. Furthermore, while "Game" scenarios can be formulated in terms of a linear programme and solved analytically, in practice this is not a suitable approach for real world problems and the uncertainties and complexities surrounding them. Most real systems contain non-linear elements which are difficult to capture accurately in such a model. Linear programmes also ignore the possibility of the opponent continuously adapting and thereby moving around the probabilities of success for the various options. Even if the model is a realistic representation of the real "Game", it is extremely difficult for decision makers to monitor and achieve the "optimal" mix of option choices when under pressure.

In noting the role of experience and the development of mental models, no account has been taken of the need to avoid behaving in a predictable fashion when facing an intelligent, adaptive opponent.[33] For example, it is quite appropriate for fire fighters to behave in consistent ways given consistent sets of circumstances, because while fires can be unpredictable, they do not learn from and exploit systematic patterns in fire fighters' behaviours. But the same does not apply to an adaptive adversary.

A higher level of decision-making is therefore needed and needs to be taught. Game Theory suggests that, rather than utilizing long-term memory to develop decision templates along the lines of "in this situation I do this", the templates need to become, "if I do this, and my opponent does that, then this is what is likely to happen".

Clearly, Red Teaming – where a tutor or other suitable person plays the role of the opponent within a simulated decision-making environment – is an important tool in developing this kind of awareness. Computer models and simulations are sensible platforms for Red Teaming exercises, since the cost of running the many exercises that would be required to develop breadth of

understanding of the decision options available to both teams is often prohibitive, both financially and manpower-wise.

TACTICAL TRAINING AND RED TEAMING

Red Teaming typically requires the use of wargaming or other kinds of tactical and decision-making simulations. In the modern era, the use of such tools for training dates back to around 1811, when the Prussian Army introduced *Kriegsspiel* (German for wargame). The series of military successes by Prussia in the late 19th Century led *Kriegsspiel* to become adopted widely outside of Germany. Today *Kriegsspiel* is considered the grandfather of modern wargames.

Similar approaches can be seen at the US Naval Postgraduate School, where students (usually serving military personnel) are encouraged to explore tactical "what ifs" for historical battles, often using computer modelling. Studies are also conducted into the effectiveness of various force structures, equipment uses, tactics and doctrine.

While these studies potentially have impact on the US acquisition and doctrine process, the main benefit is in teaching the students to understand the mechanics of doctrine, and provide them with greater insight into the operations they may face in future. In other words, it provides a mechanism for students to begin building the mental templates that they will use later on operations.

An interesting example of teaching tactical decision-making is the US Navy Fighter Weapons School, known as "Top Gun". The school was established in 1969 after a US Navy investigation into the relatively poor performance of fighter crews against Soviet-built and trained aircraft and pilots. The key concept at the school is Dissimilar Air Combat Training, in which foreign equipment and tactics are introduced to the students, using a combination of computer simulation, video analysis, and real dogfighting.

The approach pushes students to explore every element of dogfighting tactics and doctrine, and how an opponent might respond to them. This is seen as an absolutely critical element in becoming a top fighter pilot in the US. To quote F-22 pilot Major Paul Moga, United States Air Force (USAF):

> *It takes years of training and being exposed to different scenarios, and figuring out how you are going to handle those scenarios and still come away alive and having achieved your objectives.*[34]

While Top Gun is an extreme example, the process of thinking through scenarios, detailed study of past real-world examples, and deep consideration of the options available to an opponent, can nonetheless be translated straightforwardly to the Land or Sea environment.

Certainly the US has a tradition of using such exercises to push the intellectual bounds of warfare. An example is the US Millennium Challenge 2002 wargame, in which the Red Team utilised asymmetric warfare concepts to show how it was possible to lose a large number of major US warships in the Persian Gulf against a much weaker opponent. Attackers included a group of small attack craft (i.e. speed boats). Though the attacks, masterminded by General Paul van Riper, were effectively ruled invalid by the umpires when they "restarted" the wargame, the example has continued to gain notoriety since, particularly after the mock attack by several Iranian Islamic Revolutionary Guard small vessels on a convoy of US vessels early last year.[35]

In his presentation at Complex 07, Professor Alexander Wearing noted the use of computer simulations by the US to improve tactical decision-making. The desirable characteristics of these tools are:

- That they are domain relevant, low-fidelity tactical simulations. That is, the emphasis is in capturing the essence of the scenario, rather than incorporating a great deal of physical detail.
- They assist in the building of mental models and situation understanding. This means models must be flexible and allow the exploration of a large number of excursions around the scenarios.
- They support pattern recognition and evaluation, by being easy to understand and use, with transparent dynamics. Thus time is not wasted on trying to get to grips with intricacies of making the model do what it is supposed to.
- They focus the trainee on learning to anticipate and project.

THE *MANA* MODEL

We now discuss a case study from within the NZDF of how computer modelling was used for this purpose: i.e. to examine tactical decision-making scenarios to prepare personnel for operations.

The modelling platform, called MANA, was developed by the NZDF's Defence Technology Agency.[36] The MANA tool is a series of agent-based

distillation models originating in 2000. It was highly influenced by early Project Albert models, particularly the Center for Naval Analyses' Irreducible Semi-Autonomous Adaptive Combat (ISAAC) model.[37] It is now widely used around the world, including in the US, United Kingdom, Canada, Australia, Singapore, Sweden and Germany.

MANA is more suited to analysis of operations-other-than-war scenarios than traditional combat tactical training simulators like Janus (which was used at the NZ Army Simulation Centre at the time), due to its greater flexibility, and greater suitability to modelling small unit actions.

The MANA model has advantages over conventional combat models in four key areas:

1. It is highly non-linear. Therefore, there may be a great variation in results from run to run.

2. It takes into account intangibles.

3. The model is transparent and accessible. The model parameters are relatively simple, allowing them to be easily understood by non-experts.

4. It is flexible. Because MANA is not designed to model conventional warfare in great detail, its entities are easily able to be adapted to model elements from non-conventional scenarios. For example, MANA entities can easily model non-combatants, animals and even the conceptual elements of a scenario (such as spread of rumours).

These comments apply equally to other similar types of agent-based models, and are not meant to exclude the possibility of other approaches being useful.

In 2002, the possibility that MANA could assist with the deployments to East Timor was identified by the BATT6 Commanding Officer (CO) Lieutenant-Colonel Dean Baigent. He had previously had the responsibility for managing the Army's Capability Analysis and Doctrine (CAD) Branch prior to his deployment. This gave him intimate knowledge of the capabilities of MANA, and the role of Operational Analysis in particular.

Two questions were posed:

1. The first related to what was the most effective way to conduct a cordon-and-search operation on a designated village.

2. The second question – was it possible to show the benefit of "trackers" – boiled down to showing that "blocking" tactics were preferable to simply trying to chase belligerent groups intruding into the Area of Operations (AO) once contacts were reported.

In the deployment following the completion of this work, BATT6 conducted two cordon operations. It would be inappropriate to go into much detail comparing the actual operations and the MANA modelling here, as the models were constructed many months prior to the actual events and were not supposed to represent the operations exactly.

However, it is clear from comments from the CO and other staff that the exercise of designing Concept of Operations (ConOps) within the MANA model had been highly useful, and helped to provide confidence in the ConOps that were actually used.

Lieutenant-Colonel Baigent credited the modelling with assisting him to make some key deductions about the planned cordon operation, along with experimentation during rehearsals.

Furthermore, discussions with Alpha Company at Tilomar, which was responsible for monitoring the Tactical Control Line from that position down to the coast, revealed that the Company (Coy) had employed similar blocking tactics to those investigated using the MANA model. The Coy commander commented that the results of the MANA modelling had been heavily influential in his planning.

Further discussion with the commander and various section leaders described how the chasing of belligerents was largely a waste of effort, and that experience had confirmed that the best approach was indeed to use blocking-type tactics. What is particularly interesting about this case is that the modelled scenario was not an exact match to the operations conducted at Tilomar. The analysis presented to the officers prior to deployment concerned utilizing forces over the much larger AO assigned to the entire battalion. Nonetheless, the officer was able to, by analogy, recognize the similarity in the dynamics of the situation in the Coy AO and apply the same tactics.

Although it is difficult to prove that the modelling work and simulations improved the decision-making during these operations, it can at least be said that it had a heavy influence on the decision-making, and that such an approach is consistent with the goal of building mental decision-making

templates. Furthermore, the operations were successful, largely because they were well thought-out and planned.

The process used for this pre-deployment work was straightforward and involved:

1. The Army identifying the potential for Operational Analysis and MANA to be used in support of tactical decision-making.
2. Holding a seminar with the officers from BATT6 at Burnham.
3. Doing analysis on the scenarios generated in the seminar.
4. Presenting the results of the analysis to the Command group.

There seems little reason why this type of approach could not be used in future, utilizing analysis methods primarily developed for capability analysis to provide a form of tactical decision training, potentially in advance of deployments. Indeed, there is a high degree of synergy between acquisition/capability analysis and operational modelling.

CONCLUSIONS

In this chapter we have explored some of the critical components that go into good decision-making. Thanks to the ever improving understanding of decision-making in the scientific literature, we can better tailor our approaches to professional development. For example, an important element in decision-making under pressure is the development and utilisation of simplified, decision-making templates or models. We have examined a number of relevant concepts to developing these templates, such as the need to consider the applicable level of complexity, particularly in regards to determining Courses of Actions against an adversary. Methods such as the options matrix, and tactical gaming using tools such as MANA are options for helping to build these decision templates.

Though not dissimilar to approaches used by other nations, these two approaches are unique to New Zealand. This stems from the need to customise tools not just to the local culture, but also to ensure relevance to the type of operations conducted by New Zealand forces, and the budget and training time available. Ultimately, if these techniques are to have a lasting impact, they need to be sustainable. While in principle MANA, for instance, could continue to be used in the way described above, in practice it has had little impact as a training tool since that time. This is largely due to manpower

limitations and the need for the right people to be in the right places to exploit it.

The danger in viewing such sophisticated decision-making aids as a "nice to have" rather than critical is that we risk repeating the same mistakes again and again. Templates in themselves are not the complete answer. We need to concentrate on developing cognitive skills that enable individuals to deal with wicked problems. Education and training for decision-making, therefore, deserves to be a high-priority activity, especially given the growing understanding around it.

ENDNOTES

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CHAPTER 5

THE IMPACT OF TEAM STRUCTURE, ORGANIZATION, AND COMMUNICATION FLOW ON PROBLEM-SOLVING ACTIVITIES IN WORKING GROUPS: A COMPARISON BETWEEN MILITARY AND CIVILIAN TASK FORCES

Dr. Stefan Seiler*

This chapter deals with the impact of group processes on complex problem solving. First, it defines what a complex problem is and explains why military and civilian decision-making processes fulfill the criteria of complex problem solving. It then illustrates individual military and civilian problem-solving processes and discusses the importance of team processes in decision-making to solve complex problems in today's working environment. The military group problem-solving process is introduced and results from a study that compared military and civilian task force problem-solving processes are presented. The results show that military task forces applied their process knowledge in solving complex problems, worked in a much more structured way and achieved better intermediate as well as final results than civilian task forces. Detailed findings of this study, limitations, and practical implications are discussed in the last part of the chapter.

WHAT IS A COMPLEX PROBLEM?

A problem arises when the situation "as-is" differs from the situation "as-should-be" and when at least two options are available to eliminate or reduce the discrepancy between the "as-is" and the "as-should-be". A problem is considered complex when it meets at least two of the following four criteria simultaneously:[1]

- The people involved in solving a problem pursue several goals that are often vaguely or inaccurately outlined and may sometimes be contradicting. This results in the need for the consideration of a large number of (and sometimes contradicting) criteria by which the various possible solutions have to be assessed.

* The ideas expressed here represent the author's point of view and not the official view of the Swiss Armed Forces.

- There are many variables to be considered as possible starting points to reduce or eliminate the discrepancy between the situation "as-is" and "as-it-should-be". Hence, there are many possible options on how to approach the problem.

- No safe assumptions can be made about the development of situational and contextual variables relevant to the problem. This forces the decision maker to think in alternative scenarios dependent on situational changes. This leads to considerable uncertainty as the decision maker has little influence on the situational development.

- As situational circumstances differ from problem to problem, it is often not possible to refer to familiar problem-solving models, even for experienced commanders/managers. Hence, the choice for a particular solution results not only from a logical, rational deduction but on subjective, intuitive judgment as well.

Most problems in the military context fulfill these four criteria:

- The goals of a military mission are not always as clear as they often seem to first appear. Often, issues within a military mission such as the ultimate goal of a mission, possible collateral damage, casualties within own troops, long-term reputation, humanitarian aspects, etc, lead to conflicting requests in a particular situation. These conflicting requests lead to a large number of criteria to be considered in military decision-making. Hence, the first criterion of a complex problem is often fulfilled.

- Since an opponent's behaviour cannot be predicted, the choice of the best solution has to be made based on the assumption of the opponent's action; the assessment regarding the opponent's most probable behaviour can vary from commander to commander. Hence, the second criterion of a complex problem is fulfilled.

- The assessment of one's own options is to a large extent the result of the commander's subjective judgement based on the assessment of his/her own potential, the opponent's potential, and situational circumstances. Hence, the third criterion of a complex problem is fulfilled.

- The contextual circumstances as well as one's own and the opponent's options differ from situation to situation in military operations. Hence, the fourth criterion of a complex problem is fulfilled as well.

Civilian decision makers are also confronted with these four criteria:

- Different interest groups often follow different goals; the board of directors and senior management have to integrate these different goals into solutions.
- If an organization, for example, wants to increase its profitability, several options have to be considered and each of these options has its pros and cons.
- It is difficult to predict the behaviour of competitors and future economic conditions. This means that corporate decisions, like military decisions, have to be made based on unforeseeable/unpredictable environmental scenarios.
- In the case of important strategic decisions, it is often impossible to predict the economic consequences of different options. The decision is then made based on assumptions. These assumptions can be interpreted in different ways, dependent on the preferred scenarios. In this context, experience from the past might not be accurate to evaluate the current problem.

To sum up, important decisions in the military as well as civilian environment meet the criteria for complex problems.

Complex problems, however, are also solved intuitively or routinely, and do not necessarily lead to a conscious rational decision-making process. Conscious rational decision-making is only meaningful if a person or group considers the problem as significant (e.g., because they do not know how to solve the problem or the implications of failing to find an adequate solution are far-reaching). Problems with far-reaching ramifications are often highly complex. This complexity makes their rational handling far from easy. This leads to a paradoxical situation:

- Problems without far-reaching ramifications, which can be solved rationally because of their simplicity, are often solved intuitively.
- Problems with far-reaching ramifications, which ought to be solved rationally, are often too complex to be solved rationally.

This chapter focuses on complex problems with far-reaching ramifications that ought to be solved rationally.

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INDIVIDUAL PROBLEM-SOLVING AND DECISION-MAKING COMPETENCE

Solving complex problems is part of the professional life of every military commander and civilian manager. A big part of their professional success depends on adequate problem solving and decision-making competences.[2] There is a wide agreement that an individual's ability to solve complex problems is dependent on three criteria: cognitive ability, experience, and the problem-solving process or approach used.[3]

A high cognitive ability has been shown to have a positive influence on the ability to achieve an overview of complex situations, to identify relevant elements within a complex situation, to define the relations between these elements, and to draw the right conclusions from the analysis.[4] All these elements are important when it comes to complex problem solving. In addition, people with a high cognitive ability are more efficient in acquiring new knowledge and in integrating this new knowledge into existing knowledge structures. They are also able to identify and read the relevant situational patterns faster and to integrate these insights in their problem-solving process. Hence, they may have access to more situation specific information.

The second ability to solve complex problems is a person's experience with similar situations. Experience enables us to make assumptions of an outcome based on knowledge from previous outcomes in similar situations. Experience can lead to a faster and better understanding of the problem and can help to identify a general direction for the solution based on successful solutions from past problems with a similar structure and context. However, experience can also mislead decision makers as they transfer the solution from one problem to another problem without analyzing if the context, the people involved, and the situational structures are comparable. As each problem is unique, experienced leaders/mangers have to bear in mind that while their experience is a powerful resource, it can also be a misleading guideline if they do not reflect carefully whether the past problem-solving strategy and solution can be applied to the new situation.

The third ability that helps to solve complex problems is the approach used (i.e., the solution of the problem solving process). While the cognitive ability of commanders/managers is difficult to influence and experience is built over time, the way a problem is approached can be learned and practiced through leadership and management training. Hence, it is not surprising that the development of this structured individual problem-solving competence is an integral part of every military as well as civilian leadership development

program. The following presents a problem-solving and decision-making process for both military and civilian contexts.

The military problem-solving and decision-making process consists of six phases and two ongoing activities. Regulation 51.20 of the Swiss Armed Forces provides a detailed description of this process.[5]

1. *Apprehension of the problem.* In this phase, military commanders get an overview of the situation, identify the different problems, define sub-problems, establish a timetable, and initiate emergency measures.

2. *Assessment of the situation.* In this phase, a differentiated analysis of the identified problems is conducted. The individual analyzes his/her own and as well his/her opponent's options and situational parameters. Interdependencies are identified. The goal of this phase is to have in-depth understanding of the problem within its context in order to have a solid foundation for a decision.

3. *Decision.* Based on the assessment of the situation, commanders develop several alternative solutions and evaluate the pros and cons for each solution. Based on these alternatives, a justified decision is made.

4. *Plan development.* A detailed plan is developed in this phase. This plan consists of elements such as who is doing what, by when, allocated resources, etc. It defines the path of actions for the execution of the plan.

5. *Order.* In this phase, the commander gives clear orders to his/her subordinates. Based on these orders, the subordinate commanders begin their own problem-solving and decision-making process. A clear and precise order guarantees that the subordinates progress in the right direction to execute the plan.

6. *Controls.* Based on control processes, it is possible to identify whether the execution of the plan is consistently followed, whether the mission can be achieved with the allocated resources (human, material, financial, etc.), and whether new opportunities or threats require a change in the original plan.

7. *Time-management* and activities related to immediate *action requirements (emergency measures)* are two accompanying activities throughout all six phases. They are consistently re-evaluated and adjusted during the whole process.

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Figure 5-1 illustrates the military problem-solving and decision-making process.

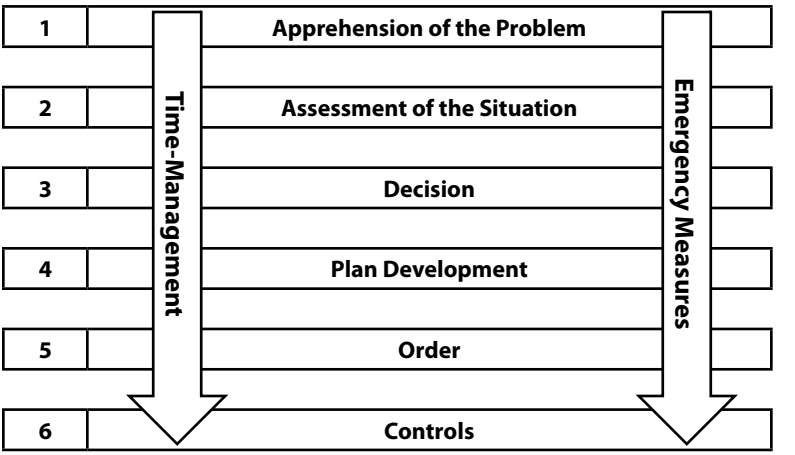

FIGURE 5-1: Military Problem-Solving and the Decision-Making Process (Schweizer Armee, 2004a).

Similar processes exist in the civilian management literature. Seiler[6] translated the military problem-solving process into the "Problem Solving Machine" model for civilian decision makers. This model has similar processes to the military problem solving but is tailored to meet the needs of civilian decision makers in terms of the culture and language. The "Problem Solving Machine" consists of the following eight phases and two ongoing activities:

1. *Problem identification.* In this phase, managers try to get an overview of the situation and to identify the problems and sub-problems. They seek clarification of what is expected from them, on goals to be achieved, and on types of resources that they can have access to. They also establish a timeline and initiate emergency measures.

2. *Problem analysis.* A differentiated analysis of the identified problem based on different perspectives such as resources (human, material, financial), processes, functions, long-term vs. short-term, etc. is performed. Following that, interdependencies are identified. Managers also identify their own potential in addition to analyze the market and their competitors' potential as well as the situational circumstances. In this phase, it is important to identify the cause of the problem. The origins of the problem could stem from: an unclear starting-point, an unclear end-state, the difficulty in comparing the difference between

the starting-point and the end-state, the identification of the operators used to solve the problem, the uncertainty about how the identified operators work, or from a combination of two or several of these problems.[7] Based on the problem identification, the right strategy to analyze the problem has to be chosen, for example a SWOT analysis (i.e., strength, weakness, opportunities, and threats), a benchmark analysis, a trial and error strategy, a cause and effect analysis, a fishbone analysis, and so on. It is important to note that different problems require different problem solving strategies.

3. *Developing alternative solutions.* Based on the problem analysis, alternative solutions with pros and cons are developed. The alternatives should cover a wide range of options and the pros and cons should reflect the relevant aspects of the problem.

4. *Decision with justification.* Based on the assessment of possible alternatives, a solution is defined. The solution can be one of the alternatives or a combination of different alternatives. A justification of the chosen solution is necessary to help subordinates understand the rationale behind the manager's decision as to why he/she prefers this solution against other solutions.

5. *Work-planning.* In this phase, a work-flow is planned, priorities are defined, resources are allocated, responsibilities are delegated, dependencies and interrelations are identified, and checklists are established. The classical "w-questions" (who, what, by when, with whom, where, with what, etc.) are a helpful guideline during the work-planning phase.

6. *Execution phase.* In the execution phase, tasks are delegated to team members. They begin their own problem-solving and decision-making process and execute the mission accordingly.

7. *Controlling of ongoing activities.* The goal of this process is to ensure that the plan is transferred into practice. Based on controls, it can be identified whether the execution of the plan is followed consistently, whether the mission can be achieved with the allocated resources (human, material, financial, etc.), and whether new situational circumstances arose that require a change in the original plan.

8. *Evaluation.* Once the mission is completed, an evaluation is necessary to show whether the defined measures were implemented and whether the measures were effective in solving the problem. If the problem

is solved, the process comes to an end, if not, the decision maker has to restart the problem-solving and decision-making process.

9. *Time-management* and activities related to immediate *action requirements (emergency measures)* are two accompanying activities during all six phases. They are permanently re-evaluated and adjusted during the whole process.

Figure 5-2 illustrates the Problem Solving Machine.

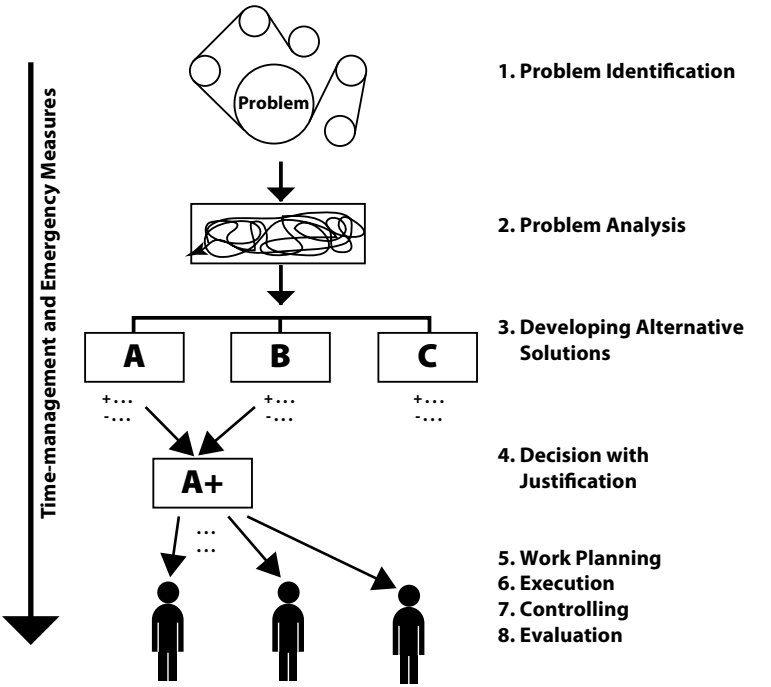

Figure 5-2: Problem Solving Machine.

SOLVING COMPLEX PROBLEMS IN TEAMS: A PROFESSIONAL REALITY

The above-mentioned problem-solving process described the steps undertaken by an individual when encountering a problem. In modern working environments, however, complex problems are most often solved in teams, and not individually. Rarely does a commander or manager solve a complex

problem in isolation. A team of subordinated commanders/managers and staff members and/or other experts work together as a team on the solution of a problem. Therefore, effective problem solving and decision-making are not only dependent on individual competences but on the ability of a team to also work together effectively.

Surprisingly, little research has been done in the field of the importance of team structure, organization, and communication flow with regard to complex problem solving. In most civilian management development programs (e.g. in business schools), the focus is clearly on the development of individual problem solving competences. An elaborated process in team problem solving does not exist. Hence, group processes cannot be trained and evaluated systematically. The Swiss Armed Forces have a well defined "Group Decision-Making Process" (German: *Stabsarbeitsprozess*) which defines the responsibilities of commanders and staff officers as well as the communication flow and decision-making process within its group. This group process and the above-mentioned individual problem solving and decision-making process are systematically taught and learned in military leadership development programs. This process is described in details in regulation 51.24.[8] A simplified version of the Group Decision-Making Process of the Swiss Armed Forces that captures all main aspects of the process is described in the following.

The Group Decision-Making Process integrates three relevant group elements in one dynamic process flow: a) tasks and responsibilities of the commander, b) tasks and responsibilities of staff officers, and c) coordination between the commander and the staff officers.

Phase 1: While the commander gains an overview of the situation (apprehension of the situation), the staff gathers as much relevant information as possible about the problem.

Phase 2: In an orientation meeting, the commander presents his/her apprehension of the situation and the staff officers provide their additional inputs from the information gathering. At the end of this meeting, the commander decides on the general direction and gives orders about next steps to the subgroups in his/her staff.

Phase 3: The commander conducts a general assessment of the situation while the staff officers work on their specific tasks (e.g. the communication officer develops a communication concept, the transportation officers develops a transport concept, the logistics officers develops a logistics concept, etc.).

SWITZERLAND

Phase 4: The commander presents his/her assessment of the situation to the staff and the staff officers present their specialized concepts to the commander and the rest of the staff. The commander receives important information from these concept presentations for his/her final decision. At the end of this meeting, the commander makes the necessary decisions that allow the staff officers to continue their work.

Phase 5: Staff officers finalize their concepts, develop alternative solutions including pros and cons, and formulate recommendations.

Phase 6: The staff presents the alternative solutions and recommendations to the commander. He/she discusses the recommendations with his/her staff and makes a decision. The necessary documents for the decision-making briefing with the subordinated commanders are prepared.

Phase 7: The "decision-making briefing" is held by the commander. Participants of this meeting include the staff officers and the subordinated commanders. The subordinated commanders receive their orders during this meeting.

Figure 5-3 illustrates this process.

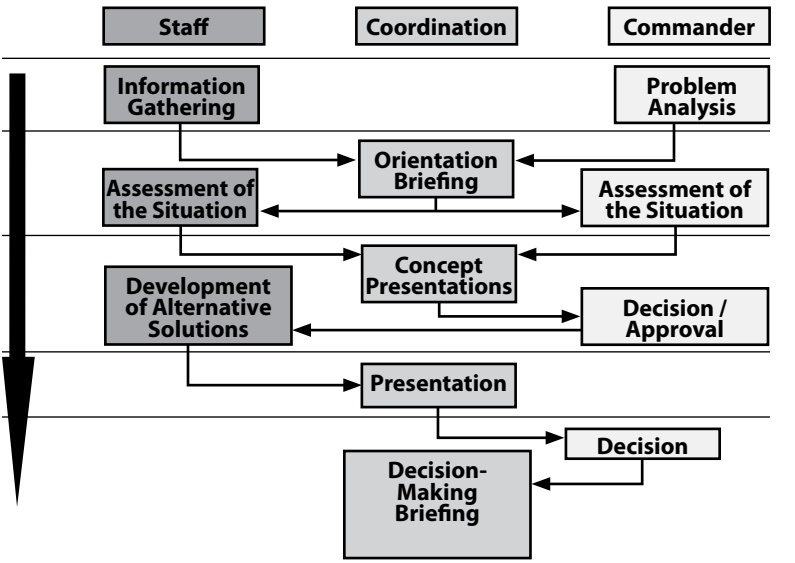

FIGURE 5-3: Military Group Decision-Making Process (Schweizer Armee, 2004b).

A CASE STUDY TO TEST THE EFFECTS OF STRUCTURED DECISION-MAKING PROCESSES IN TEAMS

Does structured military group decision-making training have an impact on the structure and organization, as well as the communication flow of a group of people working on the solution of a problem? If yes, it is important to know whether these structural and organizational differences have an impact on the quality of the output of the working group. To answer these questions, Munz, Grünig, and Seiler[9] conducted a pilot study with three military and three civilian "task forces". Each task force consisted of five team members including a designated commander/manager. The military task forces had prior knowledge and training in individual and group problem-solving processes while the civilian task forces only had prior training in individual problem-solving processes. Both task forces were asked to complete a complex non-military case study. Their task was to analyze the case, to identify the inherent problems, and to formulate concrete recommendations on how to improve the situation. They had four hours to solve the problem and to prepare a presentation for their Chief Executive Officer. The commander/manager gave the presentation after the four hour preparation time.

It was assumed that a) the military task forces would show a more structured problem-solving process than the civilian task forces, and that b) the military task forces would produce more elaborated intermediate as well as final results regarding the task than the civilian task forces. These assumptions were based on results from empirical research on team processes in general. For example, LePine and colleagues found that teamwork process were positively associated with team performance[10] and Jain and colleagues found that the right team structure is vital to high team performance and team effectiveness.[11]

The six task forces were monitored by three observers during their group work and assessed based on their solutions to improve the situation using standardized criteria. The evaluation focused on three aspects: 1) the problem-solving and decision-making process itself, 2) the work organization, work planning, and communication flow, and 3) the quality of the solution. These three aspects were evaluated on 13 criteria (see Table 5-1). Each of these 13 criteria was operationalized with several directly observable sub-criteria. The three observers assessed each task force based on standardized sub-criteria which were valued as either sufficient (value 1) or insufficient (value 0). Table 5-1 gives a detailed overview of the results of the six task forces, whereby task forces a, b, and c represent the military task forces and task forces d, e, and f represent the civilian task forces. The rating is the average of all ratings

of the sub-criteria and observers and ranges from 0 to 1. An average rating of 0 in Table 5-1 indicates that none of the sub-criteria was observed by the three observers while an average rating of 1 indicates that all three observers observed the respective sub-criteria and rated it as sufficient.

		Military Task Force A	Military Task Force B	Military Task Force C	Ø ABC	Civilian Task Force D	Civilian Task Force E	Civilian Task Force F	Ø DEF
Decision-Making Process	Apprehension of the Problem	1.00	0.67	1.00	0.89	0	0	0	0
	Assessment of the Situation	0.60	0.40	0.80	0.60	0	0	0.20	0.07
	Alternative Solutions	0.75	0.75	0.50	0.67	0.50	0	0.50	0.33
	Decision	1.00	1.00	1.00	1.00	0.67	0.33	1.00	0.67
	Ø	0.84	0.70	0.83	0.79	0.29	0.08	0.43	0.27
Work Organisationion & Planning	Time-table	0.80	0.60	0.80	0.73	0	0	0.20	0.07
	Distribution of Tasks	0.83	0.50	0.83	0.72	0.33	0.17	0.50	0.33
	Meetings	1.00	0.80	1.00	0.93	0.40	0.20	0.60	0.40
	Agenda	1.00	0.75	1.00	0.92	0	0	0	0
	Ø	0.91	0.66	0.91	0.83	0.18	0.09	0.33	0.20
Content of Solution	Identified Subproblems	1.00	0.80	1.00	0.93	0.60	0.40	1.00	0.67
	Results of Analysis	1.00	0.67	1.00	0.89	0.67	0.33	0.67	0.56
	Alternative Solutions	0.86	0.86	1.00	0.91	0.43	0.29	0.57	0.43
	Evaluation of the Alternative Solutions and Decision	0.60	0.80	0.80	0.73	0.60	0.40	0.60	0.53
	Quality of Presentation to the CEO	1.00	0.50	0.50	0.67	0.50	0.50	0.83	0.61
	Ø	0.89	0.73	0.86	0.83	0.56	0.38	0.73	0.56

TABLE 5-1: Results from Case Study (Munz, Grünig, & Seiler)

In general, results from this pilot study show that the military task forces were able to apply individual and group decision-making processes learned from the military training programs (high ratings in the decision-making process and in the work organization and planning criteria). They began the decision-making process with an apprehension of the problem, followed by an assessment of the situation, development of a minimum of three alternative solutions, and a decision for a solution. They managed their time systematically, organized themselves as proposed by the military group decision-making process and conducted the coordination and decision-making meetings as described in the process. Based on the assessment of the situation, alternative

solutions were developed and reviewed and the recommended actions for improvement were justified and clustered into short, medium or long-term solutions. The content of the solution can be evaluated as good (average rating of 0.83).

Results obtained from the civilian task forces show that their decision-making process was less structured. None of the civilian task forces was observed to analyze the problem in depth before entering the decision-making process. They also did not perform a clear delegation of task, definition of roles and responsibilities, and a systematic time management. They did not use an agenda to structure their meetings (if held at all). However, the content of the solution of the civilian task forces can also be evaluated as sufficient with an average rating of 0.56. The differences of the quality of the final results between the military and civilian task forces were much lower than the differences in the other two aspects (problem-solving and decision-making process and work organization, work planning, and communication flow). However, the final result of the best civilian task force was only as good as the result of the least performing military task force. While the results in the military task forces were primarily the outcome of a group process, the results of the civilian task forces were primarily the result of excellent individual contributions.[12]

TEAM STRUCTURE, ORGANIZATION, AND COMMUNICATION FLOW MATTERS

Findings from the pilot study show that military task forces work in a much more structured way when confronted with a new problem compared to the civilian task forces. Hence, it can be concluded that the exercises in the military training programs do have an impact on the working style of the participants. This is underlined by the fact that the military task forces that were trained in group decision-making and problem solving applied their process knowledge in a non-military case while the civilian task forces who were not trained in group decision-making did not apply a structured group problem-solving process. Findings from this study also suggest that a group problem-solving process can be learned and that this process knowledge can be applied to solve problems with different structures and content.

Why do groups that follow a structured approach show better results in the solution of complex problems? A structured approach in group problem solving has several advantages:

- The application of a systematic process opens up more capacity for content related activities rather than organizational aspects and

ensures that the time for process related discussions is reduced to a minimum;

- A systematic process ensures all important process steps are executed (such as apprehension of the situation, time management, group meetings, developing alternative solutions, etc.);
- Regular meetings ensure all members of the task force are integrated into the decision-making process, are oriented about the common goals, and are aware of the upcoming activities; and
- Standardized processes are particularly important when the individuals working together are not familiar with each others' working styles. The process helps to structure the collaboration and the working and communication flow and to orientate team members with different working styles.

However, structured problem-solving processes have a limitation. The inherent risk of structured problem-solving processes is that they are applied to every problem in an unreflective way. The awareness and interpretation of situational circumstances is an important aspect of problem solving. This is not only valid for the apprehension of the problem and the assessment of the situation but for the identification of the right process to solve the problem as well. A systematic approach may not always lead to the right decision; unstructured brain storming, a democratic debate, or even a decision based on intuitive feelings could be the right approach to solve a particular problem. What defines the "right approach" is the content, the people and the situational circumstances. This statement is not to undermine the systematic group problem solving process as the advantages of such a process have been clearly illustrated. Rather, it is a precaution against the belief that a structured process would be the best approach to every problem.

CONCLUSION AND LIMITATIONS

Systematic individual as well as group problem-solving and decision-making processes can be learned and applied to complex problems in different contexts. The pilot study conducted by Munz and colleagues has illustrated that military task forces applied their decision-making process to non-military problems and that their solution was more elaborated than task forces that did not follow a systematic group problem-solving process. This result shows that the military training commanders and staff officers receive has a clear added value not only in the military but when applied in the civilian context.

It also shows that investments in decision-making programs should not only focus on individual problem-solving competencies but on procedural knowledge regarding the structure, organization, and coordination of individuals working together on the solution of a problem as well. If commanders/managers are trained in structured individual and group problem-solving processes and are at the same time aware that different situations require different approaches to the solution of a problem, the probability of appropriate solutions for complex problems will increase.

Due to the limited sample size of task forces, findings from this pilot study have to be interpreted with caution. Generalization of the results is only possible if this study is replicated with a larger number of task forces from both the military and civilian context. However, findings from this pilot study have provided evidence for the importance of team structure, organization, and communication flow during problem solving and decision-making activities in working groups.

ENDNOTES

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3 Stefan Seiler, "Vorlesungsunterlagen Leadership II," (2009), retrieved 20 April 2009 from: <http://www.vtg.admin.ch/internet/vtg/de/home/schweizerarmee/organisation/hkaneu/milak/lehre/brigadier/3.html>.

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9 Martin Munz, Rudolf Grünig, and Stefan Seiler, "Bewältigung komplexer Probleme mit der militärischen Entscheidungsmethodik", *Allgemeine Schweizerische Militärzeitschrift* 1/2, 2009, 20-23.

10 Jeffery A. LePine, Ronald F. Piccolo, Christine L. Jackson, John E. Mathieu, and Jessica R. Saul, "A Meta-Analysis of Teamwork Processes: Tests of a Multidimensional Model with Team Effectiveness Criteria," *Personnel Psychology* 6 (2), 2008, 273-307.

11 Anshu K. Jain, Jon M. Thompson, Joseph Chaudry, Shaun McKenzie, and Richard W. Schwartz, "High-Performance Teams for Current and Culture Physician Leaders: An Introduction," *Journal of Surgical Education* 65 (2), 2008, 145-150.

12 The results presented in this chapter are a summary of a publication produced by Munz, Grünig, and Seiler (2009). The complete description of the background, the method, and

the results of this study can be found in Martin Munz' final thesis as a student at the Swiss Military Academy at ETH Zurich. M. Munz, "Entscheidungsfindungsprozesse und Führungstätigkeiten. Ein Vergleich zwischen militärischer und ziviler Stabsarbeit anhand einer Fallstudie. Bachelorarbeit an der Militärakademie an der ETH Zürich" 2008.

CHAPTER 6

DECISION-TAKING AND LEADERSHIP: SOME PERSPECTIVES AND CHALLENGES

Dr. Mie Augier
*Dr. Jamie MacIntosh**

INTRODUCTION

This chapter focuses on the problems and challenges in decision-taking, with regard to leadership, in terms of decision support processes and enabling decisive action that is coherent and sustainable.[1] Leadership is a compelling, yet elusive and ambiguous topic. It is one of the more important topics in contemporary debates, in education and in the functions and foundations of most of our organizations (military, business, political, etc). It is also fundamental for the practice of virtually all types of organizations; leaders play a critical role in building organizations, making strategies, creative exploration, enabling innovations, and navigating organizations, states and nations through good and bad times.

While there are differences and similarities between the type of organizations and how leadership is manifested in them, this chapter focuses more on the generic characteristics and decision-taking aspects of leadership that are relevant across different organizations; for leadership is an ethos from which flow the capacity and capabilities that are needed across all organizations and practices in today's society. How leadership is manifested is influenced by what an organization is capable of doing and how it learns. Leadership and decisive actions are co-evolutionary processes since decision-taking can shape the future environment and the paths organizations or countries can be led along.

While most existing conceptions and models of leadership and decision-making approach the topic either from a narrow disciplinary and static perspective or from only one aspect of the organizational practice, we emphasize in this chapter that leadership is a dynamic, integrative, interdisciplinary and empirically based concept and practice. Leadership cuts across the different functions in organizations and connects the organization, its members,

* The ideas expressed here represent the authors' point of view and not the official view of the British Armed Forces.

culture and practices to the larger societal (including political-legal) and global context. It is also worth mentioning that while one could make a case for local/national conceptions of leaders and leadership, the concept of leadership itself goes beyond narrow state-defined boundaries (just as it does with disciplinary boundaries). Leadership is more fundamental; and countries like the UK have traditionally held a wider and more '*glocal*' perspective.[2]

Seen this way, leadership becomes an important part of an organization's or nation's strategy making; one that helps not just reacting to events and challenges, but also helps proactively shaping the complex future environment in which the organization or nation operates. Indeed, across all the arms of States (diplomatic, information, military, economic, etc) it is inevitable that decision-taking and leadership will only confront increasing complexity. Thus despite much progress in our concepts and models of decision-taking, there is still (as Vice-Admiral J.H.S. McAnally commented in his preface to a recent book), "too much to muddle" in our military and governmental decision support processes. In keeping with the need for a far greater coherence of action across all arms of government, Su Maddock at the UK's National School for Government has called for leadership to embrace innovation on a scale hitherto difficult for bureaucracies.[3] Leadership, given the *glocal* challenges for decision-taking in dynamic networks when innovation has to be on an unprecedented scale and pace, is the issue at the heart of this chapter.

(TRADITIONAL) CONCEPTIONS AND MODELS OF LEADERSHIP

The word "leadership" has multiple connotations and meanings. It is often associated with such different and sometimes even contradictory terms as "visionary", "creativity", "dominance", "winning", "executive compensation", "ethics and morals" and "capacity for decision-taking". We also tend to associate leadership almost exclusively with particular figures, ranging from Gandhi to Churchill to Thatcher to Bin Ladin, Che Guevara and Putin and Mao, doubtless, these appeal to or appall various people for differing reasons.

Like many other topics, we can trace the topic of leadership back to the thinking classics such as Plato, Aristotle, Heraclitus and Machiavelli. In some early treatments, leadership was about gaining and maintaining the power of the leader and did not require any compatibility of goals with the followers.[4] This view of one-sided dominance of leaders was challenged with Chester Barnard's emphasis on the modern organization as a system of purposeful co-operation which requires a system of communication and some goal alignment to function.[5] Most organizations are systems of both conflict and co-operation; and leaders must be able to manage both. Similarly, leaders

of nations (and other non nation state actors) on the global scene must be able to lead and take decisions in both peacetime and in times of war and, in particular, crises. The leadership skills that may be appropriate during periods of stability are not necessarily fit for times in which greater degrees of uncertainty prevail. This shifting emphasis is as much to do with driving the up-take of innovation at anytime as it is during periods of lethal uncertainty in combat and emergencies. Creating and maintaining adaptiveness and flexibility in military organizations requires not only capabilities for sustaining existing competitive advantages in the strategic competition; but also capabilities and capacities for change and innovation to adjust to external changes that may come during times of conflict. War and innovation are deeply intimate; they make the challenges of leadership stark. At peace or war, the challenges to organizations (not least given that their very nature tends to resist change), demonstrates why leaders must be prepared for and able to lead and make decisions through both times of co-operation and conflict; and through times of continuity and change.

If one looks at the recent and current contributions, parts of the field seem to be dedicated to exploring indefinitely the nuances and remote issues of a particular aspect of leadership (such as the meaning of 'charismatic'), becoming more competent in a perhaps less useful way. Other parts of the literature seem to be random walks of fashionable ideas and fads, invention of new concepts, never gaining a competence in anything in real depth. Books on military and national leaders often focus on one side of whatever story that in history is seen to define the leader; trying to sustain the illusion that leaders create history more than history creates leaders.[6] To some extent, part of the confusion about leadership may be caused by ambiguity about the very notion of leadership itself. For example, an early organizations and management scholar, Chester Barnard, noted that research on "leadership has been the subject of an extraordinary amount of dogmatically stated nonsense".[7] Likewise, Stogdill in his *Handbook of Leadership* remarks: "Four decades of research on leadership have produced a bewildering mass of findings... It is difficult to know what, if anything, has been convincingly demonstrated by replicated research. The endless accumulation of empirical data has not produced an integrated understanding of leadership".[8] While the amount of 'research' on leadership has exploded, we are nowhere near a 'theory' or even a coherent understanding of the phenomenon, in part because the topic lacks definitional clarity and consensus with regard to fundamental understandings of 'what is a leader' and 'what is leadership'. In part this is because some leadership scholars make the term almost all-inclusive.[9] At the same time, the increasing complexity of the world and the changing security environment,

needs perhaps now more than ever, a coherent understanding of leadership and how people make decisions. In addition, recent events involving both national security and economics (and other) issues – spanning across business, military and government institutions – have only reinforced the need for better understanding, and practice, of, leadership. The current economic crises and their extensive and protracted consequences for global security and resilience is one example of the need for clear and durable strategy and leadership; of both our institutions and our countries, in order to navigate through the current and upcoming turbulence. The leaders of nations and military organizations will be challenged not just with the traditional difficulties of trying to change organizations that (almost per definition) resist change; but also with change-drivers that will make transformation imperative as the world economy rebalances, fiscal deficits correct and strategic alliances look to the fundamentals in ways perhaps unseen since the end of the Second World War. It will become increasingly important that leaders understand the networks and affects through different systems and how they are interrelated.[10]

Traditional conceptions of leadership from management scholars have brought some insights into the field and practice of leadership; for example Peter Drucker stated in the 1950s that "[t]he only definition of a leader is someone who has followers". However, he also notices its significance and tongue in cheek has remarked that, "[l]eadership is of utmost importance. Indeed, there is no substitute for it".[11]

In addition to management scholars, the phenomenon of leadership has attracted some attention from disciplinary perspectives by sociologists (Max Weber, of course, the famous inventor of 'charismatic leadership') and political scientists. Economists have traditionally focused on formal or contractual relationships within organizations, and see leadership as being something that can be accommodated within the rational choice framework of neoclassical economics through 'leading by example', a mechanism by which leaders convince followers that they are not misleading them. This ignores the imaginative, innovative and motivational dimensions of leadership, all of which are crucial. Moreover, military and political historians have provided a variety of concepts of leaders; mostly stories of success, and most have little insights into the nature and mechanisms of leadership and decision-taking.

Other parts of the literature also provide ideas on many different areas of leadership from the viewpoints of those such as theologians, neuroscientists, ecologists, mathematicians and philosophers. For instance, John Maxwell (a religious leader) stressed that "to be successful in any endeavour, we need

to learn how to get out of our own way. That's as true for leaders as it is for anyone else",[12] suggesting exercises for people and leaders to get to know themselves; for only when you can lead yourself can you aspire to lead others. One the other hand, Daniel Goleman, has popularised research linking leadership to emotional intelligence based on the groundbreaking interdisciplinary work emerging under the banner of Affective Neuroscience.[13] Goleman emphasizes that "self-aware leaders are attuned to their inner signals. They recognize, for instance, how their feelings affect themselves and their job performance".[14] Thus, for a leader to make good decisions, the leader must know how he/she would feel being in that situation. From a different (yet somewhat overlapping) angle, an article in Harvard Business Review written by a psychiatrist talks about the 'attention deficit traits' that people, including leaders, face in modern organizational life.[15] Further, a recent addition to the leadership literature includes the 'neuroscience of leadership' (interestingly, not always written by neuroscientists) that emphasizes, among other things, how different parts of the brain contributes new insights and skills needed for today's leadership.[16]

Thus, there are plenty of disciplinary and not-so-disciplinary perspectives on leadership, and only a few examples were provided to illustrate the complexity of the topic.[17] Before talking about some important features of leadership, we should perhaps mention that it is also important to not view leadership as a static phenomenon. Leadership is a dynamic characteristic, perhaps even an "emergent property", as are the concepts associated with it. We often see leadership as manifested in individual leaders but leadership may involve more of an ethos or movement through organizations or networks of organizations that enables people.[18] In addition, leadership and decision-taking happen in real, dynamic time. Leadership is not a timeless virtue; it is as much a product of the Arrow of Time as life itself.[19] Swept up in real (Bergsonian/dynamic)[20] time, creativity and imagination are vital. The future is not contained in the past but the past has consequences for the multiplicity of futures; so decision-taking is neither arbitrary nor contingent in a narrow relativist sense.[21] Decision-taking takes place in dynamic time and is spurred by the continuous creative destructiveness of evolutionary forces, which can make a virtue of imagination and intuition.

DYNAMIC LEADERSHIP AND THE IMPORTANCE OF VISION

> *"An optimist sees an opportunity in every calamity, a pessimist sees a calamity in every opportunity."*
>
> Sir Winston Churchill

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The Webster dictionary defines leadership as "leading others along a way, guiding". This points to the importance of vision; sensing changes in the art of the possible and gaining from these by making bounds fit for our times. John Gardner has hinted to the social aspects of leadership in his definition: "Leadership is the process of persuasion and example by which an individual (or leadership team) induces a group to take action that is in accord with the leader's purpose, or the shared purposes of all."[22] He is also explicit about the psychological/cognitive aspects of leadership in this interactive process: "leadership is an activity that occurs in the mind: the mind of the leaders, the minds of the followers, and the interactions and transactions occurring between and among those minds".[23]

As some (but not all) of the dictionary definitions indicate, it is important to understand leadership as a dynamic characteristic or emergent property at the interface of bodies and their environment. Taking decisions and enabling coherent actions within the decisive moments of events over variable scales and durations, requires specific and evolving skill sets and capabilities for imagination and innovation; for envisioning, for setting aspirations, and for motivating and enabling others in organizations and in society. Leadership is relational to place, time and bodies of mixed persuasions. Leadership is therefore a critical part of shaping the path or the strategy for any organization or nation.

Leadership cannot be understood in isolation. The ethos of leadership is embodied by whomever must provide vision, direction, energy and credibility that enables followers, sidesteps the irrelevant and overcomes adversity or adversaries. It is an organizational competence, but its performance is often manifest in a compelling personality. Effective leadership draws on many individual and organizational skills. It is particularly crucial when there is significant uncertainty and many possible paths forward. The leader will help create options, consider permutations of options, select among them, see that decisive action is taken and already be anticipating the decisions to be taken next as an ongoing process of learning. There is an important element of imagination here, which is consistent with Joseph Schumpeter's emphasis on vision as necessarily preceding (entrepreneurial) action and leadership:

> *we should first have to visualize a distinct set of coherent phenomena a worth-while object of our analytic efforts. In other words, analytic effort is of necessity preceded by a preanalytic cognitive act that supplies the raw material for the analytic effort. ... this preanalytic cognitive act will be called Vision.*[24]

Seeing leadership as a dynamic and interdisciplinary concept stresses the importance of vision to first imagine an idea or the art of the possible; commitment to execute it as a project or programme and thus bringing imagination to work; and persistence in the process of building better organizational structures or functions or competencies to help deliver upon the vision. Schumpeter's views of the entrepreneur nicely encapsulate our idea of leadership as an inherently entrepreneurial activity. The leader/entrepreneur is motivated by the "dream and the will to found a private kingdom"; the "will to conquer: the impulse to fight, to prove oneself superior to others"; and the "joy of creating, of getting things done".[25]

An example often cited for his strong leadership and vision is Churchill; but he was also a leader who inspired and motivated others through his vision and behaviour. One of his cabinet ministers Leo Amery, once commented: "No-one ever left his cabinet meetings without feeling himself a braver man." Thus, his vision and ability to motivate are not just words, but come to embody coherent actions, where uncertainty might otherwise leave inaction to prevail and thereby limit the options for vital learning.

Because leadership is critical to organizations and societies, the understanding of leadership and leaders should be central to the mission of our educational institutions in government, business and other parts of society. A better understanding of the fundamentals of leadership and leadership decision-taking can help shape individuals into understanding both the concepts and the empiricist practice of leadership. This is not an easy task, in part because leadership is often ill defined as an academic and practical subject. But we think that seeing leadership as a dynamic and interdisciplinary concept and practice and in emphasizing its behavioural and evolutionary elements, can help advance the treatment of the topic and take steps towards a better understanding of the dynamics of leadership.

THE INTERDISCIPLINARY, EVOLUTIONARY AND BEHAVIOURAL FOUNDATIONS FOR LEADERSHIP CONCEPT AND PRACTICE: TOWARDS A BEHAVIOURAL VIEW OF LEADERSHIP

While some of the existing approaches and models of leadership are insightful, most of them are inadequate. Leadership is an interdisciplinary phenomenon, not readily understood using just agency theory or contractual theory, or any other one-sided discipline; nor by examining a variety of leadership success stories or victories. To understand leadership and decision-taking, one must see through an interdisciplinary and dynamic and integrative

perspective; one that is empirically driven by the problems and issues of the world in which we live, yet analytical and forward looking enough to provide a framework and guide for decision-taking. Thus, we need to look into the nature of decision-taking and decision support processes. While aspects of systems thinking and management science methodologies may be useful for understanding certain aspects of organizational decision-taking, we believe that a broader and more interdisciplinary perspective may be better able to capture some of the dynamics of real world decision-taking processes and insights into what capabilities our organizations and leaders need.[26]

The foundation for such a perspective on leadership is found in the behavioural and evolutionary theories and insights into how people take decisions and organizations behave. Interestingly, many of those ideas were fostered in the same intellectual environment that initiated (or became home for) operations research (OR) and management science and systems theories – namely the RAND Corporation (see the chapter by Bentley and Davy in this volume).

Postwar interest in the systematic application of science to practical problems was stimulated by the scientific work that was done for the military during and after the Second World War. The Second World War was the first time in British and American history in which there was a large scale mobilization of scientists. They were enlisted to work on military problems at all levels; from scientists and technicians working on the atomic bomb project at Los Alamos, to the MIT Radiation Laboratory, to the Office of Scientific Research and Development (headed by Vannevar Bush), and to the Secretary of War's panel of expert consultants from science and industry. The success of wartime co-operation among scientists, the military, and industry encouraged postwar discussion of ways to allow peacetime scientists, now mostly returning to universities, to continue to work on national security problems. RAND was conceived as a supplement to having the US Air Force make contracts with university scientists for scientific assistance. The Scientific Advisory Board to the Air Force Chief of Staff became enamoured of the idea of creating a "think tank" independent of universities. Among the people involved in these deliberations were two from Douglas Aircraft. These individuals helped to convince that company to enter into a contract with the Air Force and to provide facilities. In 1946, RAND was created as a separate division of Douglas Aircraft Company to provide long-term scientific and technical planning for the Air Force; but soon thereafter they became an independent non-profit organization.

The development of RAND from an organization devoted to undertaking technical and scientific research for the air force to a hotbed of ideas about

the uses of mathematics and the behavioural and social sciences in thinking about making and implementing decisions occurred in the first decade after the end of the war. It reflected a sentiment among many leading scientists that the problems required knowledge about human behaviour and that the social science disciplines might be able to provide such knowledge. At a 1947 conference in New York devoted to recruitment for the RAND Corporation, Warren Weaver, head of the applied mathematics panel of the National Defense Research Committee (NDRC) during the war and a board member at RAND, articulated the contemporary creed:

> *...every piece of knowledge we have in sociology and in economics and in political science, everything we know about social psychology, everything we know about propaganda... everything we know about enemy morale ... Every piece of information of that sort, I say, is a weapon... since the last war there has been a change in the character of war, a change in the character of the inevitable amalgamation of all the intellectual and material resources of the country which are necessary to maintain our position in peace and to enable us to defend ourselves... There have also emerged some patterns of working together, particularly among the biological, physical and social sciences, which seem to me to have great promise... the whole fields of the social sciences and of the physical sciences must be brought more closely together.*[27]

One of the focuses of this conference was to discuss how social science could contribute to issues such as civilian and military policy; the costs of war, psychological warfare, and the economic war potential of Union of Soviet Socialist Republics (USSR) and US. And the conference is just one of many ways in which RAND served as the focal point for the development of what came to be known as behavioural science in the 1950s, accompanied by various satellite academic units established at MIT, Stanford, and, especially, Carnegie Tech. RAND did manage to foster Weaver's "working together" of researchers whom disciplinary boundaries would keep isolated in an academic context.

In particular after its reorganization in 1948 as an independent research corporation, RAND's mandate began to expand beyond mere weapons planning for the Air Force, and it quickly became a flagship institution for research on decision-taking and behaviour under conditions of uncertainty. As more and more social scientists were hired, RAND scholars pioneered research across a broad range of social sciences, importing techniques from systems analysis, game theory, and linear programming, and in many cases established the intellectual foundation that continues to underpin the state of knowledge in

these fields today. Several departments (numerical analysis, logistics, mathematics, economics) were subsequently set up at RAND to accommodate the growing diversity of scientists. However, because of the nature of the problems they were working on, departmental lines were frequently treated as "arbitrary". It was a working premise that military problems didn't conform to disciplinary boundaries and didn't often fit a particular academic category very neatly. And often, once projects started, research projects would migrate through several departments, involving men of different skills from many different departments. Thus, the interdisciplinary ethos that is needed for decision-taking was 'in the air' at the time.

Systems analysis and game theory were just two of the decision-taking tools that came out of the early RAND work. For example, to spur the development of game theory at this early stage, the corporation sponsored a conference on applications of game theory to military tactics in Chicago on March 14-15, 1949.[28] It was attended by everybody in early rational choice and game theory, including Kenneth Arrow, Belzer, Blackwell, Merrill Flood, Girshick, Savage and Lloyd Shapley, many of whom became staff or consultants to RAND soon after the conference; and soon the organization produced groundbreaking work in game theoretical formulations of duels, defensive tactics, and multimove games, among other things (such as linear and dynamic programming).

But it became increasingly clear that game theory was useful in analyzing only the simplest forms of conflict and would not soon provide a reliable tool for studying complex engagement, such as US-USSR relations. At the decision-taking level, it became clear to some RAND researchers, that real world decision makers were not as rational as the assumptions of game theory wanted them to be. People made mistakes; had imperfect knowledge of the future and other cognitive and computational limitations. Merrill Flood conducted a set of experiments supporting the notion that agents did not behave rationally (which, in turn, led to the famous Prisoners Dilemma). As a result, some scholars at RAND gradually realized the need for a broader, social science based, economics to help understanding, and illustrating the Cold War and the complex behaviour of individuals and large organizations, such as the Soviet Union.

The unrealistic assumptions in rational choice and game theory led the RAND strategist, Andrew Marshall, and a few others to start building a community at RAND around behavioural perspectives on organizational decision-taking, inviting Herbert Simon, James March and Sidney Winter (among others) to participate. This line of reasoning stimulated these and

others at RAND to thinking about bounded rationality, evolution, the effects of technological changes, and other things which are important in modern economics. RAND also hosted a conference on organization theory in August of 1951, in which Arrow, Morgenstern, Flood, and Newell (among others) participated. This conference brought together social psychologists who discussed interactions among small groups, roboticists who discussed automata, and economists who discussed mathematical models of choice and information.[29]

Casting doubts upon rational choice through the game theoretical experiments led others such as Herbert Simon, Allen Newell and James G. March to develop ideas on bounded rationality and behavioural economics and organizational behaviour. And herein lie, we think, the core ideas of a framework for understanding real world dynamic decision-taking. Key contributions in this perspective include 'A Behavioural Theory of the Firm', Simon's theory of satisficing and bounded rationality, and the emphasis on evolutionary dynamics that Nelson and Winter developed as well as modern behavioural economics.[30] The Behavioural Theory of the Firm is at heart a theory that is built around a political conception of organizational goals, a bounded rationality conception of expectations, an adaptive conception of rules and aspirations, and a set of ideas about how the interactions among these factors affect decisions in an organization.[31] A behavioural theory of leadership can build on these foundational ideas.

A POLITICAL CONCEPTION OF ORGANIZATIONAL GOALS

Goals in rational theory are pictured as given alternatives, each with a set of consequences attached, and the problem of choice consisting in the selection of the best alternative. Goals within behavioural theory, however, are pictured as reflecting the demands of a political coalition, changing as the composition of that coalition changes. Goals reflect several dimensions (such as the goals of the organization, and the presence of particular problems) and aspirations with respect to each dimension of the goals are pictured as changing in response to the experiences of the organization and its components, as well as the experiences of others to whom they compare themselves. Thus, it is the dynamic nature of aspirations which enables the generation of new decision alternatives. "Alternatives are not given but must be searched for."[32] The organization, therefore, must engage in active search and imagination to create sustainable strategic opportunities. Leaders must be able to stimulate the processes of search and imagination, aware of their own cognitive limitations/biases of the shifting political goals and coalitions of their organizations.

UNITED KINGDOM

A BOUNDED RATIONALITY CONCEPTION OF EXPECTATIONS

In the behavioural view, agents have only limited rationality, meaning that behaviour in organizations is intentionally rational; neither emotive nor aimless. "Organizations are formed with the intention and design of accomplishing goals; and the people who work in organizations believe, at least part of the time, that they are striving towards these same goals."[33] Organizations are seen as heterogeneous, boundedly rational entities that have to search for relevant information. As such, expectations in the behavioural theory of the firm are the result of making inferences from available information. This involves both the processes by which information is made available and to the processes of drawing inferences. Much data is gathered by search activity. The intensity of search depends on the performance of the organization relative to aspirations and the amount of organizational slack.[34] The direction of search is affected by the location (in the organization) of search activity and the definition of the challenge stimulating the activity. Thus, the search activity of the organization furthers both the generation of new alternative strategies, and facilitates the anticipation of uncertain futures. Embracing search processes, leaders can engage in pro-active strategic change and shaping of the environment, rather than just reacting to it. Another implication of limited rationality is that people rely often on routines and heuristics to ease or avoid decision-taking. The additional complexity of events and crises that leaders often come to face, including issues such as possibilities for civil unrest, role of ideologies, political roles and careers, resilience and the role of psychosocial stresses on cognitive processes, have been linked to the rhetorics of co-operation and compromise *vs.* aggression in situations of conflict.[35]

AN ADAPTIVE CONCEPTION OF RULES AND ASPIRATIONS

"Decision-taking" in the behavioural perspective is assumed to take place in response to a problem, through the use of standard operating procedures and other routines, as also through search for an alternative that is acceptable from the point of view of current aspiration levels for evoked goals. Decision-taking is affected, therefore, by the definition of the problem, by existing rules (which reflect past learning by the organization), by the order in which alternatives are considered (which reflects the location of decision-taking in the organization and past experience), and by anything that affects aspirations and attention. While it is important for leaders to have visions and goals, they must not be blinded by success and/or over-optimism in pursuing these goals and must sometimes adjust their aspirations. One study argues that while Adolf Hitler in the early days of his strategy may have been firm in his view that Germany wasn't ready to change the world, he worked towards shaping the perception of creating and realizing the goal.[36] Even in his second

phase (1936-1940) which included the remilitarization of the Rhineland, his optimism was modest. In his invasion of Poland and other countries, Hitler become very aggressive and his optimism was high. His leadership style, however, became inflexible – once in war, there was no turning back. And in the final phase of invading the USSR his levels of optimism were at their peak; but he was blinded by his own optimism and couldn't see the severity of the challenges that confronted him.[37]

Within the behavioural framework, Cyert and March developed four concepts. The first is the quasi-resolution of conflict, the idea that firms function with considerable latent conflict of interests but do not necessarily resolve that conflict explicitly. The second concept is uncertainty avoidance. Although organizations try to anticipate an unpredictable future insofar as they can, they also try to restructure their worlds in order to minimize their dependence on anticipation of a highly uncertain future. The third concept is problemistic search, the idea that search within a firm is stimulated primarily by problems and directed to solving those problems. The fourth concept is organizational learning. The theory assumes that organizations learn from their own experiences and the experiences of others. In organizations today, leaders may often face the problem of learning from events or history that isn't rich with experience – the problem of learning from small samples – which complicates the decision-taking, but it doesn't make it impossible to learn. Military organizations for instance may not have fought in particular types of battle, yet want to learn from history how to improve the ability to survive during wartime. Leaders may want to learn from a rare incident, such as an airline leader learning from fatal accidents, how to reduce the probability of such disasters. While learning in such environments is more challenging, scholars in organizations have pointed to the possibilities of simulating experience; creating hypothetical histories and creating a more rich experience from history as ways to improve learning from small samples/weak histories. In addition, learning from failures (and the logic of failures) is another important challenge.[38]

ADDITIONAL PSYCHOLOGICAL AND SOCIOLOGICAL ELEMENTS

Beyond such behavioural and evolutionary foundations, there are additionally specific insights that are important to understanding leadership; not least particular psychological and sociological mechanisms. The psychological aspects of leadership include different elements such as the effect of leaders on others and the personality of leaders. The sociological mechanisms include both the influence of the leader on nations and groups, and the influence of the groups on the leader; both of these are dependent on the specific situations so as a result, leadership both shapes and is shaped by various mechanisms of social

interactions that are influenced by factors such as culture, the organizational/institutional structure of the society, personalities, etc. Leadership is often also not an enduring role, so the selection of leaders becomes important.

In leadership, personalities are quite significant too; both because they signal some core values in the organization or nation that they lead, and because of how the organization/nation will likely interact with others and what decisions its leaders will make. Whereas in our society we look to leaders to provide stability in the midst of chaos through democratic and collective mechanisms (and we therefore look for leaders with corresponding personalities), other societies have leaders with quite different characteristics.

Consider for example Saddam Hussein; how did his personality affect his decision-taking and leadership style? One scholar and former Central Intelligence Agency profiler analyzed Saddam Hussein and his leadership of Iraq as a man who was not 'crazy', irrational or insane (as some may think of him); but rather as a thoughtful and quite patient person, who had a sense of loyalty and commitment, relative to the circumstances (which change). Saddam Hussein also viewed himself as a leader of the same rank as Castro and Mao Zedong and he admired them for their ability to adapt socialism to their environment without foreign dominance. Viewed in this perspective and against the background of his narcissistic personality, we can better understand some of his decisions.[39]

THE ROLE OF FOLLOWERS

It is important to understand that leadership has little affect if a leader has no followers; leadership is an embedded concept and practice and must be viewed in relation to the group or organization through which it articulates. Therefore, leadership depends in part on the structure and organization of the social system the leader is part of; which in turn is influenced both by the others in the group and by the leaders. The social interaction between the leader, the organization and the followers constrains and enables the leader's decision-taking. These interactions are amplified through relational bodies (firms, organizations, states, people, etc.) as they perceive and misperceive events in environments that are more or less hostile.

Within a group, the function of the leader can include things like: provide a focus for individuals and organizational members, serve as a 'focal point' for social interaction, and help define a division of labour within the group (and often also a division of power). All these dynamics tend to provide coordination and have a stabilizing effect on the group as a whole.

The behaviour of groups often matters in how we perceive leaders and their role. Would we, for example, see Osama Bin Laden as an effective or powerful leader if it wasn't for the "success" of the 9/11 attacks? The perceived success of a group influences the long term effectiveness of the leader and his organization in several ways. For example, a success is likely to increase the status of the leader in the perception of others, which will in turn increase the likelihood that others will follow (which in turn will further strengthen his ability to lead in the future). Moreover, perceptions of the leader and his group from outsiders will likely trigger (defensive) responses to possible future actions and decisions. Thus, leadership is not just about individual leaders; but also about their effect on others.

Leadership is usually not an enduring role; and leadership transitions can therefore have a potential destabilizing effect on the organization if overly invested in the cult of an individual. In western societies, leadership transition is often about elections and (in companies) succession planning, In some cultures, however, leadership transitions often run in families. But in others, legal and social structures may ensure some degree of permanence in leadership decision-taking.

Many variables are involved in researching leadership and decision-taking, whether done from a single or interdisciplinary approach. But there is probably not 'one' type of leadership personality; rather, leadership is about a fitness of character and capabilities to the pattern of events and being able to take decisions that enable decisive action accordingly. By including the evolutionary, behavioural, sociological and psychological dimensions in the concept of leadership, we also see that leadership is not just about a particular function of the organization or nation, or about an individual character of personality. Leadership also is an important social and psychological role and the successful adoption of leadership and leadership decision-taking depends upon a complex interaction of factors including leadership character, ability, traits and followers for instance.

CONCLUSION: LEADERSHIP IN THE CURRENT SECURITY ENVIRONMENT AND AS A DYNAMIC INTEGRATIVE PRACTICE

But what, on a practical side, makes great leaders? Although Plato established a school for leadership, 'the Paidea', in early Greece, most of our current understanding of leaders comes not from Platonic philosophers, but from the empiricism of political and military leaders acting in the real world: George Washington who defeated better equipped Hessian forces;

and Winston Churchill who kept up British spirits and capabilities during the Battle of Britain. But Hitler, Hussein, Mao and Mussolini were leaders too, which immediately suggests a possible undesirable side of leadership and people prone to their charms. The complexities and possible dark side of leadership highlights the importance to leadership of ethics and how to measure 'good leadership'.

Modern organizations are complex entities; and leading them towards maintaining or even improving their capabilities requires more than just the design of organizational and incentive structures and mechanisms. Leadership also involves creating internal organizational systems that supports the creation of an organizational ethos that is durable because it evolves fit for its time. As Herbert Simon noted: "It requires organizational identification, as well as sticks and carrots, to direct behaviour towards achieving organizational objectives, and in highly effective organizations, the former plays the dominant role. To state the matter in classical terms, the organizational goals must constitute major parts of their utility functions".[40] The mechanisms of organizational identification can even counteract opportunistic behaviour. As Simon suggested, relatively decomposed organizational structures are better mechanisms of identification. Perhaps this helps explaining why, in the national security context, countries and non state actors with less hierarchical organizations, but with strong leaders or leadership figures, seem to have less trouble being flexible and adaptive to change.

The challenge of overcoming organizational resistance to change is another aspect that leadership, once well understood, must tackle. Organizations, and people, resist change, and examples from military and business show how this often implies the continuation of inefficient or harmful practices even when newer and better ones are available.[41] The modern security environment itself with its in-connections to the systems of financial institutions, creates new opportunities as well as vulnerabilities that leaders must be aware of and factor into their strategy making. "Globalization", a word that has been used to characterize recent trends, is not just about the production and trade of cars, toys, and shoes; but also about the diffusion and proliferation of knowledge, of everything from the history of the Roman Empire, the symbolism of Auguste Rodin, and to how to build chemical weapons, and other things such as weapons, vulnerabilities in the financial industry, dependency on oil prices, changing demographical patterns and the implications – global as well as local – of the longer term effects of climate changes. In other words, 'leadership', and other functions, are needed not just on the part of the individual nations and groups – but also at the international and *glocal* sphere.

The overriding reason for arguing that a more interdisciplinary and integrative approach is needed for our understanding of leadership, decision-taking and strategy-making is pragmatism. The challenges of today and tomorrow consistently evidence the perils of trying to deal with a world as we would wish it rather than as it is or will become. A strategic context shaped by the forces of demography, finite resources, climate change and human expectations, for example, the consequences of changing diets of people in China and India, will throw up some of the most profound challenges for leadership in human history. Defence and security policy will have to come to terms with finite budgets in which investment decisions will increasingly rely on innovation and an ethos of leaders able to drive innovation. This is a capacity gap which Su Maddock and Hew Strachen are signposting in the UK; but something relevant too on an international scale.[42]

Decades of research on leadership have brought us many sometimes very different conceptions and understandings of leadership. We have discussed some of these above and tried to outline a behavioural and evolutionary framework for understanding leadership decision-taking and the essential function of leaders. Our framework is interdisciplinary and integrative and builds on ideas from organizational and behavioural theories in order to develop an empirically relevant set of ideas (if not yet a theory) of leadership that is consistent with the increasing focus on organizational and environmental change, and how leaders have to both anticipate and respond to such changes, as well as create them. Such an integrative approach is also consistent with James March's call for using both exploration and exploitation in organizational decision-taking and processes. As he said:

> "Organizations that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many undeveloped new ideas and too little distinctive competence. Conversely, organizations that engage in exploitation to the exclusion of exploration are likely to find themselves trapped in suboptimal stable equilibria. As a result, maintaining an appropriate balance between exploration and exploitation is a primary factor in organizational survival and prosperity".[43]

Thus both regarding leadership theory and understanding decision-taking in abstract, and the practice of leadership in strategy making, we must balance those forces of exploration and exploitation in order to better adapt to the evolving changes in the world.

ENDNOTES

1 Whilst most scholars and practitioners tend to use the term decision making, we will make more use of the the term decision-taking. This is to emphasize several points. First, in military command and control (C2) the distinction between decision support staff and decision-takers has to be clear. Second, from a scientific perspective any point in time necessitating a decision (i.e. a decisive moment) is one in which data always remains incomplete and inconsistent, hence the need for a decision to be taken, especially given our awareness of the limitations to rationality among interacting bodies on various scales through time.

2 The combination of Globalisation and Localism has been fused into the word g*local* to account for the dynamic networks within which we now live on multiple scales. The term was coined by Manfred Lange in 1989 in preparation for the Global Change Exhibition at the German Chancellery in Bonn (opened May 1990). The sense of the word *glocal* accords with complexity science's use of the term "Small Worlds".

3 Su Maddock, *Change You Can Believe In: The Leadership of Innovation* (Sunningdale Institute: National School of Government, 2009).

4 Of course, power also is an ambiguous concept in both theory and practice, and spans different levels and domains such as the coercive power of law and armed forces as well as the disciplinary power of bureaucratic administration. Leaders can rely on different powers in different situations. Indirect uses of power and influence are becoming increasingly relevant to our network societies.

5 See Chester Barnard, *The Functions of the Executive* (Cambridge, MA: Harvard University Press, 1938); James March and Herbert Simon, *Organizations* (New York, NY: Wiley; 1958).

6 The intricate relationship between history and leadership is a theme in Tolsjoy of course; the management and organization theorist James March have used Tolstoy to illustrate some of the central dilemmas of leadership. See his film, "Heroes and History", and "Passion and Discipline", available at <films.com>.

7 Barnard, *The Function of the Executive*, 80.

8 Ralph Stogdill, *Handbook of leadership. A survey of theory and research* (New York: Free Press, 1974), vii.

9 See for instance Warren Bennis: "Our family, friends, school and society in general have told us – by word and example – how to be. But people begin to become leaders at the moment when they decide for themselves how to be." Warren Bennis, *On Becoming a Leader* (Reading, MA: Addison-Wesley Publishing Company, 1989), 5.

10 The need for understanding the relations between economics and security highlights a need for developing what we might call a "new security economics" perspective.

11 Peter Drucker, *The Principles of Management* (New York: Harper Collins Publishers, 1954), 158. Philip Selznick is another original thinker in this area. He talks about leadership as an organizational mechanism for achieving efficiency and control and for building commitment, understanding and determination. Philip Selznick, *Leadership in Administration* (New York: Harper & Row, 1957).

12 John Maxwell, *Leadership Gold* (Nashville: Thomas Nelson), 2008.

13 Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions* (Series in Affective Science) (New York: Oxford University Press, 1998). Also see Gerald Edelman and Giulio Tonino, *A Universe of* Consciousness (London: Basic Books, 2000).

14 Daniel Goleman, Richard Boyatzis, and Annie McKee, "Primal Leadership" (Harvard: Harvard Business School Press, 2002), 30.

15 Edward Halloway, "Overloaded Circuits: Why Smart People Underperform", *Harvard Business Review* January 2005.

16 Robert Cooper, "A New Neuroscience of Leadership", *Strategy & Leadership* 28(6), 2000, 11-15.

17 For even more perspectives, a view of the last years issues of journals such as the *Harvard Business Review* will reveal the continuing growth of the field of leadership in many (and not always very consistent) directions.

18 While it is often hard for leaders to see beyond themselves, the recent US election illustrated the power of movement through networks; even with a leader, there wasn't a clear distinction of the role of followers, the networks, the organizations, and the leaders. As the world has evolved in recent decades, such movements are likely to become more powerful, as the literature on networks has argued.

19 For an introduction see, Peter Coveney Roger Highfield, *The Arrow of Time: The Quest to Solve Science's Greatest Mysteries* (London: Flamingo, 1991) which builds on Arthur Eddington's 1927 conception of time's arrow.

20 Henri Bergson, *Time and Free Will: An Essay on the Immediate Data of Consciousness* (Dover Publications, 2001).

21 Hence, imagination is not unconstrained; as Shackle notices, there are "degrees in which imagination can be constrained. With total absence of constraint it is mere fiction, fantasy, or daydream, ... to play its part in decision, imagination must be constrained to be congruous with what the decision maker knows of the nature of things in general ... Decision is an operation of an individual mind, and for such decision only those things count which belong to that mind, which are available to it and are sanctioned by it. For us, in attempting to analyze decision, possibility means the absence of fatal obstacles within the decision maker's knowledge; it means possibility, of some degree, registered and admitted by him" (Shackle, 1961:11-12). George Shackle, *Decision, Order and Time* (Oxford: Oxford University Press, 1961), 11-12.

22 Howard Gardner, "The Vehicle and Vehicles of Leadership, " *American Behavioral Scientist 42(6*), 1999, 1009-1023).

23 Ibid, 1999.

24 Joseph Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), 91. This is the essence of Schumpeter's entrepreneurship; in full length quoted as follows: "First of all, there is the dream and the will to found a private kingdom, usually, though not necessarily, also a dynasty. Then there is the will to conquer: the impulse to fight, to prove oneself superior to others, to succeed for the sake, not of the fruits of success, but of success itself. From this aspect, economic action becomes akin to sport. Finally, there is the joy of creating, of getting things done, or simply of exercising one's energy and ingenuity." It is worth noting that the entrepreneurial/leadership function is creative – not "equilibrating" as in other conceptions of entrepreneurship (in particular Israel Kirzner's). The reason is that entrepreneurship is an evolutionary process of creative destruction; one that "incessantly revolutionizes the economic system from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism" (1934, 83).

25 Ibid.,1954.

26 For a discussion of OR and systems thinking in the US and UK, see Paucar-Caceres,: "Operational Research, Systems Thinking, and Development of Management Sciences Methodologies in the US and UK", *Scientific Inquiry* 9(1) 2008, 3-18.

27 Warren Weaver, "Opening Remarks". RAND conference of Social Scientists, NY Hotel, September, 1947, Plenary session. RAND D-paper, RAND corporation archives.

28 Olaf Helmer, The Conference on Applications of Game Theory to Tactics, 1949, RAND D-444.

29 Merle Flood, *Report of a Seminar on Organization Science*. Santa Monica, CA: The Rand Corporation, Research Memorandum RM-709, 1951

30 For various aspects of this, see See Richard Cyert, and James March, *A Behavioral Theory of the Firm* (Endlewood Cliffs, NJ: Prentice Hall, 1963); Giovanni Dosi, "A Very Reasonable Objective Still Beyond Our Reach: Economics as an Empirically Disciplined Social Science", in Mie Augier and James March, eds., *Models of a Man: Essays in Memory of Herbert A. Simon* (Cambridge, MA: MIT Press, 2004); Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk", *Econometrica* 47, 1979, 263-291; Daniel Kahneman and Dan Lovallo, "Delusions of Success: How Optimism Undermines Executives' Decisions", *Harvard Business Review* July 2003, 56-63; James March and Herbert Simon, *Organizations* (New York, NY: Wiley, 1958); Richard Nelson and Sidney Winter, *An Evolutionary Theory of Economic Change* (Cambridge, MA: Harvard University Press, 1982). While there are some differences in the nuances in the branches of behavioural and evolutionary economics, our perspective on leadership decision-taking draws on the tradition as a whole and its underlying evolutionary epistemology.

31 Richard Cyert and James March, *A Behavioral Theory of the Firm* (London: Blackwell, 1963). For a summary and the author's views on its recent relevance, see the introduction to the 1992 edition.

32 Herbert Simon, "A Behavioral Model of Rational Choice", *Quarterly Journal of Economics* 69, 1955, 99-118.

33 Ibid.

34 March and Simon, *Organizations*, 47-52

35 Philip Tetlock, "Integrative complexity of American and Soviet foreign policy rhetoric: A time-series analysis", *Journal of Personality and Social Psychology: Interpersonal Relations and Group processes* 49, 1985, 1565-1585. .

36 Jason Satterfield, "Cognitive-Affective Sates Predict Military and Political Aggression and Risk – Taking", *The Journal of Conflict Resolution* 1998, 42(6), 667-690.

37 Kahneman and Lovallo discuss the 'optimism bias' in the context of business decision-taking. See Daniel Kahneman and Dan Lovallo, "Delusions of Success: How Optimism Undermines Executives' Decisions", *Harvard Business Review* July 2003, 56-63.

38 The best discussion of the intricacies of learning from rare and weak histories is: James G. March, Lee S. Sproull, and Michal Tamuz, "Learning from Samples of One or Fewer," *Organization Science 2,* 1991, 1-13. For learning from failures, see Dietrich Dormer, *The Logic of Failure* (New York: Basic Books, 1996).

39 Jerrod Post, "Saddam Hussein of Iraq: A Political Psychology Profile", *Political Psychology* 12(2), 1991, 279-289.

40 Herbert Simon, *An Empirically Based Microeconomics* (Cambridge: MIT Press, 1997), 201. Also see Herbert Simon, "Organizations and markets", *Journal of Economic Perspectives* 5, 1991, 25-44.

41 "Gunfire at Sea: A Case Study of Innovation". in Elting Morison, *Men, Machines and Modern Times* (Cambridge: MIT Press, 1966), 17-44.

42 Hew. Strachan, "The Strategic Gap in British Defence Policy", *Survival* 51(4), 2009, 49-70; Su Maddock, *Change You Can Believe In: The Leadership of Innovation* (Sunningdale Institute: National School of Government, 2009).

43 James March, "Exploration and Exploitation in Organizational Learning", *Organization Science* 2, 1991, 71-87.

CHAPTER 7

DEFENCE AS A WHOLE OF GOVERNMENT ACTOR: LESSONS FROM THE NORTHERN TERRITORY EMERGENCY RESPONSE

*Sean Hawkins**

This chapter examines Defence involvement in whole of government initiatives. To place the discussion in context, a brief overview of the concept, application, and issues with whole of government approaches are examined. Further, a discussion on selected Defence contributions, in different contexts, to whole of government initiatives is provided. The conclusion of the literature review is that whole of government operations are heavily influenced by the participating agency cultures and that by understanding and adapting to the cultural differences amongst the various agencies operational issues may be minimised. The chapter then briefly describes the context of the case study, the Northern Territory Emergency Response, and the research method. Based upon the responses of key individuals the concept of understanding and adapting to cross agency cultures to enhance collaboration and minimise operational issues is explored. Structural and accountability issues arising from the operation are discussed. An explanatory model representing the key findings is also provided. Finally, recommendations on how certain issues can be avoided or resolved while operating in a whole of government context are provided.[1]

Although the focus of this chapter is not specifically related to decision-making, it is hoped that it will aid with the understanding of the complexity involved in planning for and making decisions in contemporary military environments.

INTRODUCTION

In 2012, an outbreak of Foot and Mouth Disease in northern Australia threatens Australia's livestock industry and could cost between eight and thirteen billion dollars. The Prime Minister declares a national emergency and in order to contain the disease a whole of government approach is required. The Australian Defence Force (ADF) is deployed to support the Department of

* The ideas expressed here represent the author's point of view and not the official view of the Australian Defence Force.

Agriculture, Fisheries and Forestry (DAFF) in conjunction with Emergency Management Australia, the Department of Infrastructure, Transport and Regional Development and a host of other Commonwealth agencies. Additionally, the response includes agencies from the Queensland, Northern Territory and Western Australian Governments. The task of the ADF is to provide logistical and engineering support as well as ensure movement security in the areas under containment under the direction of DAFF. The length of the operation is undetermined with success being achieved when the disease is contained.

This scenario appears unlikely but such contingencies are already planned with Defence identified as a contributor to a response in emergencies.[2] Similar domestic whole of government responses whereby Defence is an envisaged contributor include an influenza pandemic, response to natural disasters and other national emergencies.[3] In overseas operating environments the benefits of interagency collaboration are receiving increased attention as the complexities of stabilisation and nation building become more apparent from experiences such as Afghanistan.

One domestic emergency was declared on 21 June 2007 when the then Prime Minister announced the Northern Territory Emergency Response (NTER).[4] This response was based on *The Little Children Are Sacred* report, commissioned by the Northern Territory Government, which identified significant social issues that contributed to the sexual abuse of Aboriginal children in the Northern Territory. In effect the Government identified that the behaviour in these communities represented a failed society and that radical intervention was necessary.[5]

On the 27 June 2007 it was announced that the ADF would assist in the NTER by providing logistical and liaison support. The ADF task was "to provide logistics, communications, mobility and local liaison support to site assessment teams that are led by the Department of Families, Community Services and Indigenous Affairs".[6] This task was directed primarily to the North West Mobile Force (NORFORCE). On 30 June 2007 Major-General David Chalmers was appointed Operational Commander of the Northern Territory Emergency Response Task Force (NTERTF).

This event reflects the increasing willingness of the ADF to be deployed, both domestically and overseas, to attend to emergencies or to promote Australia's national interests in a whole of government manner. This paper examines the concept of whole of government with particular emphasis on the involvement of Defence. The NTER is used as a case study to further explore Defence whole of government participation.[7]

RESEARCH AIM AND LIMITATIONS

The aim of the research is to satisfy the following question: What can be learned from operating in a whole of government context such as the NTER and how can this be applied?

This research does not attempt to assess the effectiveness of the NTER or the success or failure of the task force objectives. Additionally this research is confined to whole of government context as opposed to a whole of nation context and as such has not examined the role of Non-Government Organisations or industry. Importantly it should be noted that this research has deliberately avoided an examination of the political context and the implications to whole of government operations. While this may be considered a large flaw in the research, this decision was made based upon the ongoing nature of the NTER, the possible reticence of key individuals to participate and the enhanced potential to widely disseminate the recommendations.

RESEARCH METHOD

The research methodology partly uses grounded theory to explore the research questions. Grounded theory "starts with minimalist a priori constructs, inquires deeply into a substantive organisational issue and iteratively tests and forms theoretical constructs".[8] In essence a grounded theory methodology uses inductive, rather than deductive, reasoning to form theory in situations whereby either little explanation exists or the nature of the issue is complex. This approach uses multiple data sets to gain an appreciation of the situation which are then analysed and compared by the researcher to gain a more comprehensive understanding. Grounded theory has been termed a constructivist approach as it seeks to construct understanding from the data rather than a more positivistic approach that seeks to test theory of hypotheses deductively.[9] A more detailed description of grounded theory methodology is available from several authors.[10]

To obtain an appreciation of the whole of government experience, selected literature was reviewed and interviews were sought from a variety of people who were involved in the NTER. These people were selected based upon their previous or current involvement, availability and willingness to participate.

In total, 18 people were interviewed during May and June 2008. The people were guaranteed confidentiality in their responses to encourage an open and frank description of their experiences and opinions. The participants included Serving Members of the ADF, civilian members of Defence, members of the Australian Federal Police (AFP), employees of the Northern Territory

Government, employees of the Department of Education, Employment and Workplace Relations (DEEWR) and a Senior Executive Service Public Service member. The people interviewed were either operating in Canberra or Darwin with many of the Canberra based participants having worked previously in the Northern Territory.

The interviews generally consisted of the interviewer giving an overview of the research focus followed by questions relating to the individuals' role and their experiences in relating to other agencies. The interviews generally took between 30 and 60 minutes to complete with the interviewer recording responses. The broad areas explored included interagency co-operation and communication, structure and accountability considerations and perceptions of the agencies involved. These areas were introduced in general terms allowing the informants to identify their key observations and perceptions. The responses were analysed by themes to extract the key information and to maintain the confidentiality of the respondents.

One notable exception of the range of participants was those from the Department of Health and Aging (DOHA) and the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA). Due to an upcoming review being conducted by the current Government into the NTER, representatives from these agencies were unwilling to discuss the topic.[11] This is unfortunate as the FaHCSIA is the lead agency and DOHA is a significant receiver of Defence support and their perspectives may have provided additional insights. Regardless the range of agencies represented does allow for some conclusions to be drawn.

THE ALLURE AND CHALLENGES OF WHOLE OF GOVERNMENT

Whole of government approaches are attractive to governments as they are seen as a means of addressing complex issues using the combined expertise available within the public sector. There are two general scenarios where governments adopt this approach; to enact change in delivery of services or policy development or as a response to a complex emergency. This is potentially an extremely powerful means of harnessing the expertise and resources contained within the public sector. The circumstance when a whole of government approach is used represents a deliberate and considered government policy implementation mechanism or a rapid response that is deemed to require the whole resources of government to address.

Whole of government has been defined as:

> *public service agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues.*[12]

Internationally the concept of whole of government has been popular. In the UK the concept of "joined-up" government has attempted to incorporate central government interdepartmental collaboration with local government and non-profit organisations to enhance service delivery. In Canada, "horizontal management" is being used to address complex issues or "wicked problems".[13] Other nations such as New Zealand, the United States, the Netherlands and Sweden have also explored the whole of government approach.[14] The success of these whole of government attempts, and the Australian experience, has been judged as being moderately successful at best with significant issues remaining to be addressed.[15]

While currently popular the use of whole of government approaches is not new and arguably was used in Australia shortly after Federation with the creation of the Prime Minister's Office.[16] In 1976, the Coombs Royal Commission recommended a whole of government approach to facilitate increased access to government services. This resulted in a reduction of the number of departments with each remaining department being led by a Cabinet Minister. A key outcome, attributed to the Coombs Royal Commission, was the 1997 creation of Centerlink which amalgamated two departments and incorporated 25 agencies to provide a "one-stop shop" for social service delivery.[17]

A number of models have been developed to describe the various methods of implementing whole of government solutions.[18] Approaches to the coordination of the different agencies include interdepartmental committees, taskforces, joint teams, and frontier agencies. These approaches have been identified as being appropriate in a variety of circumstances with, for example, an interdepartmental committee being most appropriate in policy development.[19] However many authors suggest that each situation is unique and thus requires the development of structures and processes that suit the particular context or issue.[20] One currently popular model which is viewed as appropriate for crisis management is the "hub and spoke model" which was used to respond to the 2002 Bali terrorist attack.

In this circumstance a high level of political will resulted in definitive taskings and roles for the immediate response to the crisis. The Department of Foreign Affairs and Trade (DFAT) was appointed as the lead agency for overseas

operations and the then Department of Family and Community Services (FaCS) was the lead agency for the domestic response. The "hub and spoke" model, represented in Figure 7-1, effectively divided the response into a crisis management and a domestic recovery phase.

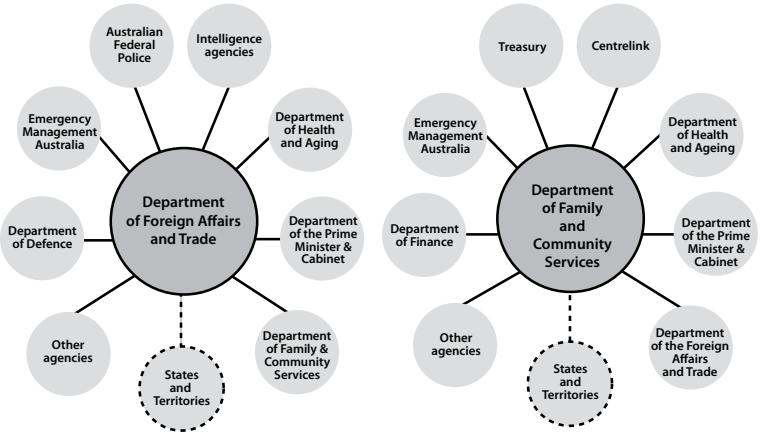

FIGURE 7-1: "Hub and spoke" model response to 2002 Bali terrorism attack.[21]

Control between these two agencies and their supporting agency was exercised using interagency meetings with senior representatives from each agency being able to rapidly decide on response actions. This approach ensured that the internal agency communication protocols and business processes were adhered to despite temptation to circumvent established procedures. This then reduced the risk of confusion and delays in action. Another advantage of adopting this model is that there was a clear delineation of each agency's mandate and a clear lead agency. Overall however the success of the operation was predominantly attributed to the participating agencies' willingness to overcome departmental cultural differences to increase coordination.[22]

However, other applications of this approach have demonstrated fragmentation and confusion resulting in delays to a crisis response. One such example is the United Kingdom (UK) response to the outbreak of Foot and Mouth Disease in 2001. In attempting to contain the spread of the disease the UK Ministry of Agriculture, Fisheries and Food led the response and was supported by the military, police, local government authorities and scientific agencies. While several reasons are cited for the failure of this whole of government action, one key reason was the bureaucratic conflict and defensiveness of the lead agency resulting in a lack of coordination and

paralysis of constructive action. The situation was eventually resolved by the UK Cabinet assuming control and enforcing delineation of responsibilities and tighter coordination. However, the opportunity for early containment of the disease was missed.[23]

The potential power of whole of government approaches to address complex issues is very attractive to governments but there are impediments to the effective use of this approach. One significant impediment may be that enduring whole of government initiatives to promote efficiency or effective crisis response are fundamentally flawed as competing political and structural factors do not allow for extended interagency co-operation. For example, it may be argued that the Westminster system is principally based on the competition for power amongst ministers which is provided by their portfolios and departments.[24] Additionally with increased competition for funds across government, being driven by a public seeking efficiency in the public sector, it may not be in the best interests of bureaucracies to collaboratively address issues. Furthermore, considering the scope of services delivered by the public sector it can be expected that broad ideological groups will form within departments and that these different ideologies will prevent effective cross-agency collaboration. If these arguments are accepted, it may be unlikely that a broad adoption of whole of government will be accepted and that whole of government initiatives will be confined to well-defined situations of limited duration. Additionally, trends towards outsourcing of departmental functions have entrenched a silo mentality and a reliance on the private sector and as such "whole of government approaches are not designed to provide universal solutions to connect the whole of government, but rather, they represent a reactive, ad-hoc array of individual solutions".[25]

A potential significant impediment to successful whole of government initiatives is the tendency of agencies to retain a silo mentality and to view structural solutions as the means of achieving effective whole of government initiatives. While appropriate interagency structures are considered important, cultural change within agencies that facilitates collaborative working arrangements is highlighted as crucial.[26] The current bureaucratic system uses vertical organisations and vertical control to achieve "a rational and efficient grouping of issues, clarity of focus to support a strong results orientation, and an effective basis for resource allocation and accountability".[27] In a whole of government context, organisations are required to operate horizontally towards a goal that may not neatly align with traditional departmental objectives or modes of operation. This then can create tensions and while the need for each agency to contribute to an agreed purpose is

recognised as crucial to success, the contribution may not be as meaningful as required as cultural differences translate into resource allocation and operational realities.[28] This may include agency actions that serve to protect power, employees, clients or degree of relevance at the expense of the whole of government action. To date the key means of addressing mixed organisational cultures has been strong and effective leadership and the willingness of individuals to create and maintain cross-agency relationships. However, there are examples whereby leadership and collegial working relationships have not been evident, resulting in poor or delayed achievement of the whole of government task.[29]

Other factors that have been identified widely in the literature that determine the success of whole of government action include the structure of the whole of government action and issues of accountability and governance. Numerous structures have been attempted, with the most popular currently being the hub and spoke model, however the literature suggests that while structure is important, it is modifiable. Similarly, the issue of clear accountability in whole of government initiatives has been identified as a required element for success. Ideally the budgetary and accountability framework should be agreed upon prior to any whole of government initiative. In circumstances where rapid action has been required accountability issues have been resolved.[30]

The literature suggests that working across different agency cultures is the most crucial element to whole of government success. To address this issue there have been calls for greater public sector mobility and a greater ability of public sector employees to work in a whole of government manner. The literature discussing the role of culture on whole of government situations does not explicitly define culture. In this paper culture is defined as "a description of a particular way of life which finds expression in institutions and behaviours".[31]

THE DEFENCE WHOLE OF GOVERNMENT EXPERIENCE

Arguably, today Defence is one of the most experienced agencies in working in whole of government settings both domestically and overseas. Support to events such as the 2000 Olympic Games, the Sydney APEC Summit and the Melbourne Commonwealth Games serve as examples of Defence working to enhance security. Defence has supported responses to natural disasters such as Cyclone Larry and the Canberra bushfires under the direction of Emergency Management Australia (EMA) or State authorities. Nation-building deployments such as those to the Solomon Islands and East Timor and deployments to Iraq and Afghanistan provide examples of operations overseas.

Depending on the context, Defence has operated in whole of government initiatives in addition to working with other forces and non-Government organisations in stabilisation and nation building, bureaucratic, domestic, and war-like contexts. While a comprehensive review of Defence operations in these contexts is beyond the scope of this paper, examining certain situations can provide lessons on operating in a whole of government context.

One of the most lauded whole of government successes that Defence has been involved in is the Regional Assistance Mission to the Solomon Islands (RAMSI). RAMSI, led by the Department of Foreign Affairs and Trade, predominantly supported by the ADF, AFP, AusAID and other Commonwealth agencies sought to "assist in re-establishing the conditions in which a functional (and respected) police force could operate and by which enduring governance mechanisms could be developed".[32] The key elements for success of the whole of government approach has been cited as the personalities of the three senior representatives from the ADF, the AFP and DFAT and their willingness to place the mission above agency or bureaucratic issues of conflict.[33] Other analysts consider that the effective leadership of the Special Coordinator, a DFAT representative, has been the key to effective whole of government coordination.[34] However, other sources identify that while the senior leaders may have had a common willingness to work co-operatively, the middle management level has been the area where interagency conflict and bureaucratic rivalries emerged.[35]

In responding to Government intent, a number of agencies were mobilised to deploy to the Solomon Islands in a very short period of time. In planning for this deployment there was limited ability for cross-agency interactions to accommodate the differences between the organisations. However, there was an opportunity for senior representatives of the various agencies to discuss scenarios and modes of operations prior to deployment, which was considered an important means of improving whole of government coordination. Despite the short preparation timeframe, this event allowed for information on capabilities and expectations to be shared; however, a rehearsal was also considered to be insufficient by some.[36] The value of this activity was highly regarded but the lack of more comprehensive interagency planning did result in confusion and in coordinating certain elements, such as Information Operations, when deployed.[37]

The planning phase strongly demonstrates that there were differences between the contributing agencies. For example, the extent and participation of the various agencies, and instances of planning in isolation, reflect the

different agencies respective emphasis on planning.[38] These differences, for example, are evident in Defence viewing the operation in the context of a wider campaign while the AFP planned in a more reactive manner. This translated to Defence planning for multiple contingencies while the AFP planned for task specific events as situations arose. These different views were compounded by communication issues generally and in particular to differing threat assessments.[39] However, while planning differences appear to have created operational difficulties one positive element that has been identified is that the minor differences in planning averted the tendency of "group think" to develop.[40]

Other operational issues arose because of the different cultures and communication issues. For example, logistic support expectations differed significantly amongst the various agencies partly due to the limited experience in deployment and the associated logistical support elements in agencies such as DFAT and the AFP. This resulted in difficulties in providing logistical support that met the expectations of each agency within resource constraints.

The lessons gathered from the RAMSI experience have been reflected in different contexts. For example, in the bureaucratic context Defence as a whole of government participant is involved in the reforms underway within the intelligence community. The Inquiry into Australian Intelligence Agencies or Flood Review proposed a number of broad recommendations including better coordination between the six intelligence agencies. The process of integrating these agencies has stalled primarily due to a resistance culturally and structurally to the proposed changes. Recommendations to increase the service delivery of the six core intelligence agencies have included the creation of a central agency to ensure a coordinated approach and to include other related governmental agencies such as the AFP and Customs. If, however, other agencies are to be effectively included extremely strong leadership will be required to resolve the cultural barriers that have become evident amongst the current intelligence agencies. [41]

A further example is Defence's involvement in the whole of government domestic security operation for the 2000 Sydney Olympic Games which provides similar whole of government lessons. In evaluating this operation the aspects that became apparent included issues relating to cultural differences, departmental turf protection and different planning methods and service expectations across agencies. The review also highlighted that the success of the operation was highly dependant upon the personal relationships across

agencies because of the structure and overlapping responsibilities. This was noted when the Department of Prime Minister and Cabinet sourced, within 48 hours, 150 ADF-qualified drivers to address a shortfall in New South Wales (NSW) Transport bus drivers.[42] The different agency cultures the of ADF, NSW Police and contractors and the need for rapid structural change resulted in different expectations and operating methods which in turn created operational difficulties.

A consistent theme from the literature generally, and in the Defence context, is that a significant factor in the whole of government operations is agencies' cultures. The ability to recognise the culture of other agencies and work co-operatively within the mix of cultures appears to be a significant factor in the success of whole of government operations. Also the structure of the whole of government approach seems to be a factor contributing to operational success.

EVOLUTION TO WHOLE OF GOVERNMENT OPERATIONS

Defence as a whole of government actor has a long, but sporadic, history which may be viewed as evolutionary. For example, the management of the effects of Cyclone Tracey and Cyclone Larry demonstrate a move from single agency management, where Defence had primacy, to Defence being but one agency in a suite under the direction of a coordinating agency. The emergency management undertaken by Major-General Stretton post-Cyclone Tracey in Darwin was not a whole of government operation and there were significant powers provided to manage the emergency.[43] This contrasts with the immediate aftermath of Cyclone Larry which damaged Innisfail and Babinda in 2006 where the immediate response was led by Emergency Management Australia with the ADF providing support in conjunction with other agencies.[44] The contrast between these two circumstances is that post-Cyclone Tracey Emergency Management Australia was formed with a specific mandate to prepare and manage such events. A similar example is the creation of the Australian Federal Police after the Bowral Callout in 1978. These examples demonstrate that while Defence has previously adopted a leading role domestically, political and legislative issues have resulted in the creation of new agencies which Defence now supports and that Defence must continue to evolve with this trend.

The high use of Defence in domestic whole of government operations and the experiences in overseas operations, has led to greater attention to inter-agency operations. In high threat environments it has been recognised that the introduction of other agencies allows for the ADF to transfer nation

building or development roles. These agencies, such as AusAID, are viewed by some as the bridge between military forces and the Non-Governmental Organisations and enable targeted assistance to be applied to further stabilise the situation.[45] However, as one army officer stated "I'm happy to work in a whole of government way if they could be bothered showing up".[46] While the frustrations of a military officer towards gaps in service delivery in a high threat environment are understandable, this has partly been addressed by the development of Adaptive Campaigning and future evolutions of whole of government approaches.

The development of Adaptive Campaigning reflects the recognition that whole of government functions may be required to achieve certain tasks but the Land Forces may need to assume these roles because specialist agencies are unable to contribute. The reasons for other agencies being unable to contribute may be due to the threat level or because other agencies may not perceive themselves as having an external responsibility and are not structured or funded for such a role.[47] Thus while the functions provided by other agencies are recognised as being important by the ADF there is also the recognition that at times the ADF will be required to preform those functions to achieve the mission.

It is conceivable that Adaptive Campaigning will be superseded by a new approach to overseas operations with a greater civilian presence throughout an entire operation regardless of the threat level. In this circumstance the role of the military would encompass the protection of civilian agencies with a gradual transition to increased civilian participation as the threat level decreases. This approach is detailed in Figure 2. This approach adopts a Civil-Military Co-operation interpretation that "helps to realize the commander's mission and end state through the interplay of military forces and other agencies, but it also contributes directly to the achievement of the strategic end state".[48] While there are significant issues to be resolved in the application of this approach, particularly in regards to the deployment of civilians in such a situation, it is feasible that such a model may be developed. Indeed, the United Kingdom is reportedly attempting to develop a permanent interagency force deployable to areas requiring stabilisation.[49] The release of the 2008 Australian National Security Statement alluded to the development of whole of government actions in overseas operations. While currently in its infancy, this approach would require Defence to become very adept at working in a whole of government manner but would also allow for greater preparation and cross-agency collaboration prior to deployment.

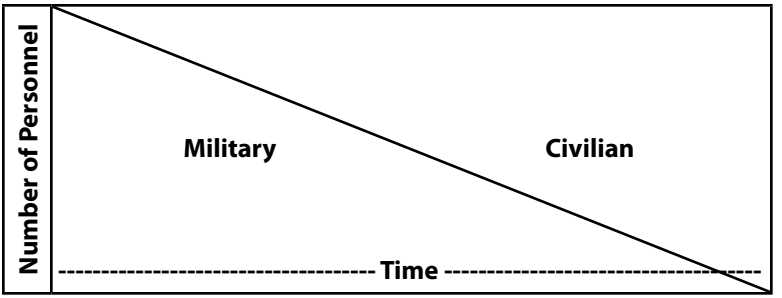

FIGURE 7-2: Potential whole of government approach in overseas operations.[50]

In response to the increasing whole of government operational requirements, several initiatives have occurred within Defence. One significant initiative is the development of interagency agreements that detail general principles of interagency collaboration. Of note, the draft agreement between the Department of Defence and the Australian Federal Police recognises the need to refine and further develop effective collaboration. This is supported by reviews of interoperability between the Defence and AFP and the proposed development of Defence-AFP joint doctrine, interagency training initiatives, intelligence sharing mechanisms, logistics policy and the clarification of legal issues.[51] The attention that these two agencies are providing to overseas and domestic interoperability indicates that future interagency operations are likely and that clarification of certain elements is required.

Defence has also issued guidance on participation in interdepartmental committees.[52] This guidance details the selection of Defence representatives, reporting requirements and record keeping. Additionally the importance of a whole of government awareness in civilian senior leadership is also reflected in the Defence Leadership Framework. This framework identifies skills in contributing to whole of government approaches at the Executive Level 2 to Senior Executive Service 3 levels.[53] There have also been initiatives that address the financial accountability of whole of government involvement.[54]

While these initiatives address certain elements of how Defence can operate in a whole of government context the key lesson from the literature is that overcoming different agency cultures is the central element that requires attention. From the cases described above it appears that understanding and working with other agencies cultures provides the most effective means of ensuring whole of government success. This concept is not new with calls for "a good understanding of the different cultures that operate in Defence

and civilian agencies" being made and recognition that "differences in agency cultures can threaten whole of government work".[55]

THE NORTHERN TERRITORY EMERGENCY RESPONSE

The decision of the previous government to intervene in the Northern Territory was based on three broad objectives that included the immediate protection of children and security within identified communities, improved service delivery and infrastructure and the long-term objective of increasing the socio-economic standing of Indigenous Australians.[56] To achieve the immediate objective of protecting children, improving safety in these communities and enhancing the future for Aboriginal people in the Northern Territory the Commonwealth Government created the Northern Territory Emergency Response Task Force (NTERTF). The NTERTF was chaired by Dr. Sue Gordon and included six other prominent individuals with expertise across a wide range of fields including Major-General David Chalmers, who was appointed the Operational Commander. The tasks assigned to the NTERTF were to provide advice to Government and to oversee the implementation of the emergency measures. The measures to be applied include:

- Increasing the number of police to enhance law and order,
- Conducting health checks on children,
- Adjusting welfare provisions to ensure children receive appropriate care and to increase economic sustainability in the communities,
- Banning alcohol and pornographic material in certain areas,
- Appointing Commonwealth Public Service Government Business Managers (GBM) to oversee community management and promote clean communities,
- Leasing townships for five years and changing the permit system, and
- Ensuring that children attend school.[57]

The implementation of these measures was to occur in 73 communities that were identified as requiring the intervention measures, some of which are isolated with limited infrastructure and access to services. In practical terms implementing the NTER was, and is, an extremely challenging task. The geographical spread of remote communities, the diversity of the socio-economic issues in each community and the need for a whole of government approach

provided a complex series of logistical, communication and bureaucratic challenges that need to be addressed and managed.[58]

The use of the ADF was confined to providing liaison and logistical support, which was tasked to the North West Mobile Force (NORFORCE). The use of the predominantly Aboriginal reserve soldiers as a means of gaining access and introductions into the identified communities appears to have been a major factor in the deployment of NORFORCE. While NORFORCE was identified as the major Defence contribution, other elements also contributed to the operation. These other elements included ADF members and Defence civilians providing contractual and accommodation support, ADF engineering support, command and staff support to the NTER operational command, Military Police Liaison and transport support.[59] Additionally, health support for ADF and civilian Defence members and health liaison teams was also provided. Despite the breadth of support that was, and is, provided the scale of ADF involvement is relatively small compared to other operations.

The appointment of Major-General David Chalmers as Operational Commander was based upon his previous experience and success in leading the task force that responded to the 2004 Boxing Day tsunami.[60] His role coordinated the NTER specific services delivered by Centerlink, police services (including AFP and other States' services under the command of the Northern Territory Police), DOHA, DEEWR, the Attorney General's Department (AGD) and the Department of Defence. The model applied to the NTER was the "hub and spoke" model similar to that used in the 2002 Bali terrorist attack response and utilised an interdepartmental working group to coordinate across agencies. In describing the role of the Operational Commander Major-General Chalmers stated that:

> *…my job is the rapid and coordinated rollout of the measures, and that is across the whole of government and across a range of policies. It is bit like being a bricklayer – the policies are bricks and I have to lay them in the right order, in the right place and at the right time.*[61]

At the time of writing, September 2008, the NTERTF had progressed the implementation of the NTER in a number of areas. These areas include the completion of 8754 child health checks, the placement of 51 GBM, the introduction of income management programs for 11000 people, licensing 55 community stores, the implementation of school nutrition programs, the deployment of an additional 51 police and the implementation of community clean up programs.[62] The NTER is an ongoing operation which does not have an identified timeframe other than a commitment by the current government

to continue until a review is completed. At the time of publication the ADF had ceased supporting the NTER however the other agencies are continuing to implement the actions identified in the NTER.

RESULTS

CULTURAL DIFFERENCES

A significant discussion thread with many of the respondents related to the differences between their organisation and other agencies. Similar to the literature review, this appears to be indicative of the agencies operating from their specific cultural bias. As an example, several ADF respondents reported that at the inception of the NTER, it became apparent that the lead agency did not have the expertise in planning and operationalizing at short notice. To address this, specialist ADF planners were supplied to assist. During this period it was noted that the other agencies were generally unwilling or unable to provided information that was considered key to the planning process. This was identified by a number of ADF informants as a source of frustration.

While these issues were cited by ADF respondents, non-Defence respondents stressed the overwhelming ADF presence in numbers, the use of jargon and acronyms and the persistent seeking of absolutes on issues. The number of people from the ADF involved in planning was considered to be large and effectively stymied the involvement of other agencies. The persistent seeking of absolutes possibly reflects the amount of detail required for the ADF planning process. Several respondents regarded the ADF planning process as rigid and unnecessary.

Comments from a former ADF officer, now a senior public servant, and another respondent concerning this disparity in planning between the ADF and other agencies elicited two explanations. One explanation is that public service agencies do not understand the difference between planning and a plan and thus fear to be confined to a set course of action. Further, there is a lack of understanding of the ability of the ADF planning process to adapt as new information becomes available and that, while the ADF might seek key information to gain certainty, other agencies prefer to gain flexibility by not committing until a decision is absolutely required. This difference does not presume that the Defence approach is better, as an agency's approach to planning is likely to have been developed to suit their operating context and core business.

A further example of the different cultural perspectives is the relationship with and use of the media. One respondent commented on the "culture of

announcements" that exists in public service departments. The term "culture of announcements" is understood to mean the tendency of public service departments to move information to the relevant Minister, where it is politically manipulated then released to the media. The informant also stated that the Department of Defence is not immune to operating in this manner. This contrasts with the ADF preference of enabling Service Members to release information to the media with a view of proactively managing media messages and with concepts such as information operations. To support this departmental approach to media management the liaison officers were reportedly restricted in their ability to communicate across agencies. This in turn led to poor communication and coordination at times, which was commented on by many of the respondents. The result of this "culture of announcements" was that high profile policy changes within certain portfolios were not communicated to other contributing agencies despite potentially impacting on the whole of government effort.

At the operational level, several respondents cited poor communication and public relations being provided at the community level and commented on the confusion generated in remote communities, particularly in the early stages of the operation. These respondents identified that the media response was extremely strong and often negative, which created a high level of concern amongst Aboriginal people living in these communities. This resulted in an emphasis on managing these issues during the initial visits to the communities. The ADF respondents reflected that the lead agency did not have an adequate focus or capacity to provide the public relations effort required, which was supported by one of the DEEWR respondents. An additional observation was made, however, that the then Minister responsible for Indigenous Affairs was effectively running the media management and that the internal ability of the lead agency staff may have been hampered by ministerial dictates, and that this situation could occur within Defence.

An additional example of the cultural differences is the support expectations of the other agencies at various levels. The ADF and civilian Defence support staff based in the Northern Territory reported that the expectations of living and working accommodation, transport, catering and other support provided differed markedly from the agencies receiving the support. This difference in expectations resulted in facilities being upgraded but not being used, as they were deemed unsuitable by the supported agencies.

These cultural differences appear to have been most evident between Defence and FahCSIA, DoHA and Centerlink and least with the Police service. This may be because of the nature of the work conducted by these other agencies

and the contrast with the work of the ADF. Departments such as FaHCSIA and DoHA have a strong policy development focus and use non-government service providers to achieve their service implementation. This is considerably different from the ADF mode of operation that informants purport to be more proactive in achieving the ends as defined by government.

The Police-ADF relationship was reported as good by both Police and ADF respondents. This may be attributed to the ADF and police services being more culturally aligned than the other agencies. Additionally there have been recent operations, such as RAMSI and domestic security operations, which have increased the exposure between these organisations. This additional exposure presumably has allowed for a greater appreciation of cultural, and thus procedural and operational, differences. This was particularly evident when the AFP respondents discussed the planning of joint whole of government operations. The view was that Defence tends to over plan and is rigid in its approach, but that this was expected by the AFP as an element of working with Defence. This suggests that while the Defence planning process may be viewed as tedious and overwhelming, the AFP has developed an understanding of the Defence processes and methods of working.

Other areas that were highlighted by respondents that indicate that there were significant cultural differences include the perceptions on the expenditure of funds and approvals required, speed of decision-making and ability to deploy rapidly.

STRUCTURE AND ACCOUNTABILITY

The topic of the structure of the whole of government response was discussed in detail by many of the respondents. Interestingly no respondent critiqued the hub and spoke model, however some respondents questioned the value of the daily interagency forum as an effective communication method. A number of respondents noted that while the structure of the NTER brought a range of expertise to address the issues, there was a tendency for each agency to narrowly view their contribution without consideration of the whole operation. One responded aligned this to each agency viewing the operation through a drinking straw and thus not being able to see the other elements of the operation. This was apparently most evident at the middle management level and was discussed at length by many respondents. Many of these discussions included the ADF as well as the other contributing agencies.

The senior management level reportedly had the ability to operate within their area of expertise and with consideration of the whole operation, albeit

with consideration of the political context as discussed above. The junior levels were also identified as able to collaboratively work across agencies. The respondents referred to a number of situations whereby senior management issued directions within their agency in line with the wider operation, but that implementation by middle management was stymied. This may reflect an element of turf protection existing at the middle management level, but could also reflect the emphasis of middle management on the delivery of agency-specific objectives. This is supported by several informants citing issues associated with decision-making occurring in Canberra, with little recognition of the issues associated with implementation in the Northern Territory. An example provided by one respondent was a lack of understanding at the political and senior management levels of the distances, seasonal impacts and costs associated with infrastructure development and service delivery in the Northern Territory. In attempting to meet the service delivery standards mandated by senior management, agency middle management may have focused on the delivery at the expense of interagency coordination. The DEEWR respondents reported that the working tempo had been high and the focus was on achievements in their particular areas which in some way supports this explanation.

The comments from the respondents on the co-operation of the middle management level strongly suggest that this was a significant structural issue, however, the reasons as to why this occurred are largely unknown and require further investigation. It may be a combination of factors that include the focus on service delivery at the middle management level, turf protection, a lack of skills in strategic thinking or a suite of other factors.

The issue of financial accountability was also raised by several of the respondents. One discussion related to existing funds that had been expended in the early stages of the operation and there was ambiguity as to how those funds would be recouped. Another respondent reflected that some of the agencies involved had unrealistic expectations as to the resources available to support them. This respondent stated that two agencies would refer to media releases that cited the Chief of the Defence Force (CDF) offering full support to the operation, which then was used as a justification for the demand of resources beyond the available support. In addition other respondents commented that there was a tendency for certain agencies to capitalise on the 'emergency' nature of the operation and relaxed accountability to address pre-existing resource issues. One prominent example noted by several informants was the lack of infrastructure that impeded service delivery in many communities, which was rapidly addressed possibly beyond what was necessary.

AN EXPLANATORY MODEL

A proposed explanation for these differences is displayed in the model provided in Figure 7-3. The definition of culture as "a description of a particular way of life which finds expression in institutions and behaviours" applies to this explanation.[63] In this model, it is proposed that from the available Australian workforce, a proportion of this population seeks employment in the public sector. The motivation to be employed in the public sector will vary between individuals, but it may be expected that a proportion will be driven by a desire to provide a public service generally. These people are drawn to different functional areas that deliver government services based upon variables such as skills sets, interests, chance, previous education or other factors. Once employed in an agency the core focus, explicit and implicit values and further training and education tend to socialise individuals into the particular agency's culture. The development of preferred processes, priorities and general ways of working are observable elements of each agency's culture and result in different concepts of operation and successes.

The extent to which an agency culture is adaptable to working in conjunction with other agency cultures is beyond the scope of this paper; however, it may be assumed that as a mix of agencies form in a whole of government manner, there will be a degree of confusion, differing expectations, goals and methods of planning and communication. It may also be reasonable to assume as interagency familiarity increases, so does the ability to effectively collaboratively work together as understanding and personal relationships develop. This is supported by the comments from the AFP that indicate that exposure to Defence planning processes increased understanding and the ability to work more co-operatively.

This model also seeks to describe the levels of apparent effectiveness within each agency at working in a whole of government operation. At the apex of each agency, senior management is able to engage in the entire operation and operate collaboratively. At the base of the triangle, the junior levels are similarly able to work collaboratively. The disparity between agencies at the middle management level is recognised by the gaps between the organisations.

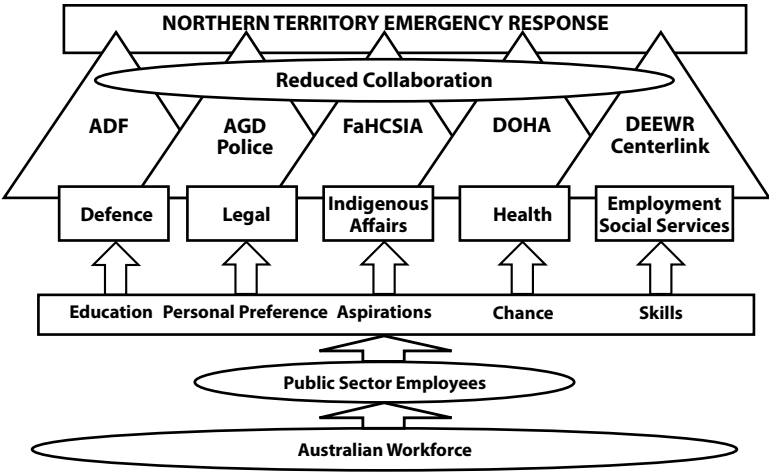

FIGURE 7-3: Explanatory model of different NTER agency cultures.

The above model does not account for a range of other factors such as inter-agency movement of personnel or career movement between the public and private sectors. The model also does not address the suite of other governmental agencies or the added complexity of other non-Commonwealth government agencies which may be involved in the whole of government action. In addition, the above model does not account for common specialisations, such as in financial management, that exist across all agencies.

This model is explanatory and requires testing, and potentially adjustment, which is beyond the scope of this paper. Such a conceptualisation, however, allows for an understanding as to how agency culture is a fundamental consideration in operating in a whole of government operation. This explanation may also be applied at different scales and with different fidelity dependant on the nature of the whole of government operation. This explanation also highlights the concern identified in the literature and in the case study of issues in collaborating at the middle management level.

This model may benefit from an expansion of the explanation to include agency agendas that would be expected to influence collaborative participation. Issues associated with the protection of power and influence, maintaining agency status and individual and political objectives would be expected to influence the extent of collaboration in a whole of government operation. These elements are difficult to identify, are likely to change over time and are

certain to influence how an operation progresses. Perhaps the appointment of a politically-savvy operational commander with strong leadership skills, who is able to identify these elements early and manage them in each particular context, is the most appropriate means of addressing this issue.

RECOMMENDATIONS

These recommendations are based upon the above analysis and explanation of the role of culture in influencing the conduct of whole of government operations. The explanatory model described above requires further analysis and as such the following recommendations need to be viewed in that light.

EXPECTATIONS

As mentioned above a consistent theme from the literature and interviews is that the expectations that the ADF has may differ significantly from the other government agencies. The level of support provided and the extent of available resources needs to be clearly articulated to avoid unnecessary expenditure of funds and interagency conflict, and to improve operational cooperation. In addition, the expectations that a serving member of the ADF may have towards the appropriateness of accommodation, transport and the like, may not reflect the standards expected by other government employees.

RECOMMENDATION

That clear and concise definition of capabilities and resource availability is made to other agencies prior to commencing any support and that other agency expectations are clearly stated. This must occur at the very senior levels and be reiterated and further defined at the operational level.

PLANNING

The experience indicates that while the ADF places a heavy emphasis on planning, this may not be as important to other agencies. The responses from the case study indicate that the AFP does have a well-developed planning system but the other agencies, notably those that that do not have an operational focus, may not have such capability or concern. Additionally, if other agencies do not have a similar planning framework, there is potential for the Defence planning process to be viewed as rigid and confining. At the extreme, the Defence emphasis on planning may be viewed as a mechanism to control the operation. If this perception arises and persists, other agencies may not react well, leading to the withholding of information and mistrust.

RECOMMENDATION

Be prepared to commit significant planning resources to assist other agencies particularly in the early stages of the operation and explicitly detail the planning process with an emphasis on including other agencies.

STRUCTURE

The literature suggests that whole of government structures are an important consideration and that the context will, to some extent, dictate the structure. The case study responses from the NTER indicate that the major structural issue is at the middle management level. The reasons as to why this is an issue are unclear, however the potential for operational difficulties arising from this are significant.

The development of the draft agreement between Defence and the AFP addresses potential issues that may arise, such as media management, and provides a clear understanding of operational collaboration. It may be prudent to further develop this form of agreement with a view of developing a generic agreement that can be used with any agency as required. This would serve to clearly define each agency's role and the processes that will be used on key issues. This document may then be promulgated throughout the organisations and may serve to mitigate co-operation issues at the middle management level.

RECOMMENDATION

That particular effort be made by Defence to cultivate relationships at the middle management level in, and beyond, whole of government operations and that clear agreements be formulated and promulgated throughout the organisations involved.

INTERAGENCY ISSUES RESOLUTION

The ability to express concern about the whole of government action does not appear to exist apart from high level discussions that potentially include political allegiances or informal discussions. The question that begs to be answered is: if a failing whole of government action is occurring how does an agency identify this and seek to remedy it? Considering the political influence at the very senior levels of each agency, and the potential for ministerial manipulation, there appears to be limited formal options to resolve interagency issues or highlight critical concerns. In the instance of the NTER, the appointment of an Army Major-General as the Operational Commander may have moulded the actions of the contributing agencies to an extent that it suited the ADF more so than had the Operational Commander been non-military. If the ADF is tasked to contribute to a whole of government

operation that lacks the necessary leadership or if the operation has serious failings, there may be a requirement to seek external assistance. Such external assistance at the ministerial level may be unrealistic due to potential political considerations. Alternatively, an informal discussion at the Secretary or CDF level may resolve issues but the reality of political alliances needs to be considered and, at times, could prove to be a barrier to issues resolution. As such, there needs to be an arbiter or facilitator who can act as required.

RECOMMENDATION

The creation of an enhanced monitoring and interagency coordination role for the Department of Prime Minister and Cabinet and the proposal of an effective mechanism to submit and resolve concerns if required. This option is considered to be a last resort if serious concerns arise.

INTERAGENCY CO-OPERATION

To achieve cultural change across the federal and state public sectors to encourage effective horizontal management of issues is the remit of the political level. While such reform may be required for effective whole of government initiative, it is unlikely to be achieved in the short term. For Defence, or indeed any other agency, successful whole of government participation appears to be in the management of cultural differences before operational difficulties arise. To this end there needs to be a greater understanding across all agencies of the particular cultural differences that exist.

The enhancement of understanding across agency cultures is possibly best achieved by appropriately identified individuals being placed within other agencies. This placement needs to be of sufficient time for professional relationships to be formed and for the individual to appreciate the nuances of the particular agency. While this is currently occurring between the AFP and Defence, it may need to be expanded to include other agencies. The use of placements in other agencies needs to be targeted, however, as the return on investment needs to be considered and while Defence has worked with agencies such as FaHCSIA, Centerlink and DOHA during the NTER, it is unlikely that future Defence operations will require similar collaboration. However, if the trend of increased interagency collaboration is to continue, particularly in the possible change in emphasis in overseas operations occurs, it may be prudent to extend interagency familiarisation to key agencies. While this exists to some extent at the Major/APS 6, Colonel/EL2 level with agencies such as the AFP and Australian Customs Service, it may need to be expanded to include those that will contribute to both domestic and overseas operations.

RECOMMENDATION

Increased collaboration with key agencies with a view to understand other agencies, and espouse ADF culture.

CONCLUSION

This research paper has examined the issues associated with whole of government operations in general, the Defence experience and the NTER to develop an understanding of Defence as a whole of government actor. In addition, several recommendations have been offered based upon the literature review and the case study. Again, although the focus of this chapter was not specifically related to decision-making, it helps in guiding our understanding of complexity and how it can aid the decision-making process.

The literature suggests that culture, structure and accountability are the key areas of influence in whole of government operations. The case study reflects these areas to varying extents. The role of different agency cultures is explored as a primary element that influences the extent of collaborative partnership and can create operational difficulties. To explain how agency cultures develop and influence a model has been developed which also addresses the key structural issue. The key structural issue identified is the decreased ability of middle management to fully participate in whole of government efforts. The reasons behind this are unclear and require further investigation. Additionally, the role of internal group and individual agendas and the extent of influence on whole of government operations also needs greater investigation.

This research primarily provides a basis for further enquiry. The model presented above does not fully describe the complexity of whole of government operations and needs refinement. With a greater understanding, additional mechanisms that assist in collaborative working arrangements can be implemented as this approach to addressing governmental agendum is likely to increase across all agencies in the future. However, as referred to above, the use of whole of government approaches is likely to be contained to specific issues or contexts because our current political situation does not encourage the sharing or diluting of departmental power. The situations whereby Defence will be called upon to work collaboratively with other agencies will include those that are complex both domestically and internationally. The challenge for Defence may be to continue to refine its ability to operate in this context and in critically analysing the culture of the ADF. The recognition of the cultural biases and mindsets within the ADF would assist the ADF in recognising and accepting other those of other agencies.

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GLOSSARY

ADF	Australian Defence Force
AFP	Australian Federal Police
AGD	Attorney General's Department
AO	Area of Responsibility
APEC	Asia Pacific Economic Co-operation
CAD	Capability Analysis and Doctrine
CDF	Chief of the Defence Force
CEO	Chief Executive OFficer
CO	Commanding Officer
COA	Course of Action
COIN	Counter-Insurgency
ConOps	Concept of Operations
Coy	Company
DAFF	Department of Agriculture, Fisheries, and Forestry
DEEWR	Department of Education, Employment and Workplace Relations
DFAT	Department of Foreign Affairs and Trade
DISPSIAD	*Dinas Psikologi Angkatan Darat* (Psychological Service of the Army)
DOHA	Department of Health and Aging
EMA	Emergency Management Australia
ETS	Elements, Traits and Standards Model

GLOSSARY

FACS	Department of Families and Community Services
FaHCSIA	Department of Families, Housing, Community Services and Indigenous Affairs
GBM	Government Business Managers
GDMS	General Decision-Making Style
IMLA	International Military Leadership Association
IPB	Intelligence Preparation of the Battlefield
ISAAC	Irreducible Semi-Autonomous Adaptive Combat
ISAF	International Security Assistance Force
JMAP	Joint Military Appreciation Process
KUO	*Konsep Umum Operasi* (General Concept of Operation)
MANA	Map-aware Non-Uniform Automated
MAP	Military Appreciation Process
MDMP	Military Decision-Making Process
NATO	North Atlantic Treaty Organisation
NDRC	National Defense Research Committee
NKRI	*Negara Kesatuan Republik Indonesia* (Unitary State of the Republic of Indonesia)
NORFORCE	North West Mobile Force
NSW	New South Wales
NTER	Northern Territory Emergency Response
NTERTF	Northern Territory Emergency Response Task Force
NZDF	New Zealand Defence Force
OODA	Observe, Orientate, Decide, Act

OPFOR	Opposition Force
OPP	Operational Planning Process
OR	Operations Research
PMD	Professional Military Development
PROSHUB	*Prosedur Hubungan Komandan dan Staf* (Command and Staff Procedure)
RAMSI	Regional Assistance Mission to the Solomon Islands
RD	Root Definition
ROE	Rules of Engagement
RPDM	Recognition Primed Decision-Making
SESKOAD	*Sekolah Staff dan Komando Angkatan Darat* (Staff and Command School of the Army)
SOD	Systems Operational Design
SSM	Soft Systems Methodology
STRAPP	Strategic Planning Process
SWOT	Strength, Weakness, Opportunities, and Threats
TNI	*Tentara Nasional Indonesia* (Indonesian National Defense Force)
TNI AD	*Tentara Nasional Indonesia Angkatan Darat* (Indonesian National Army)
UK	United Kingdom
US	United States
USAF	United States Air Force
USSR	Union of Soviet Socialist Republics

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