



FORSVARSAKADEMIET

RESEARCH PAPER
PROJECT KITAE PART I

**BATTLESPACE AGILITY IN HELMAND:
NETWORK VS. HIERARCHY C2**

By Dr. William Mitchell, Dept. of Joint Operations,
C2 & Intelligence, Royal Danish Defence College



FORSVARSAKADEMIET

RESEARCH PAPER PROJECT KITAE PART I

BATTLESPACE AGILITY IN HELMAND: NETWORK VS. HIERARCHY C2

By Dr. William Mitchell, Dept. of Joint Operations,
C2 & Intelligence, Royal Danish Defence College



Royal Danish Defence College

The Royal Danish Defence College is the Danish armed forces' powerhouse for education, training and research-generated consultancy. Our research is conducted within a broad range of military-related topics. Our research priorities, such as topics and resource allocation are determined by the Commandant of the Royal Danish Defence College, who is aided by a research council.

Research at the Royal Danish Defence College should enlighten and challenge the reader, whether they are in the armed forces or in the surrounding environment. This is only achievable if the employees have the freedom to administer their own research projects and draw their own conclusions. This is a principle, which is honoured at the Royal Danish Defence College.

We hope you enjoy reading the Royal Danish Defence College's publications!

© Royal Danish Defence College

All rights reserved. Mechanical, photographic or other reproduction or photocopying from this book or parts thereof is only allowed according to agreements between The Danish Defence and CopyDan. Any other use without written consent from the Royal Danish Defence College is illegal according to Danish law on intellectual property right. Excepted are short extracts for reviews in newspapers or the like.

Copenhagen August 2011
Royal Danish Defence College
Ryvangs Allé 1
DK-2100 Copenhagen
Denmark
Phone: +45 3915 1515
Fax: +45 3929 6172
Editor: Flemming Splidsboel
Layout by Bent-Ole Kure
ISBN: 978-87-987720-5-7
Number printed: 300

Royal Danish Defence College Publishing House

Abstract

This research paper presents some of the preliminary results from Part I of project Kitae¹ in Helmand, Afghanistan with the purpose of identifying the command and control (C2) challenges in a complex battlespace. The objective is to highlight and analyze key C2 issues relative to battlespace agility and effect generation. The paper illustrates how the hierarchal operational C2 in battle reacts in the face of technology driven flat-lining and the onset of network C2. It relies on targeting data for the assessment of effects production vis-à-vis C2 structures. The results are giving clear indications that traditional C2 hierarchies negatively affect battlespace agility. While we have 21st century knowledge development and sharing technologies, we have a 19th century social organization that frustrates the full exploitation of these technologies, reducing the timely delivery of knowledge to assets with authority to take action, reducing battlespace effectiveness.

(1) KITAE (Japanese) - Ancient Samurai Art of Forming the Edge of the Sword

This research paper is part of a series developed from Project Kitae, a real-time participant observation project based on a 6 month tour as a Battle Group intelligence officer in Upper Gereshk Valley (UGV), Helmand, Afghanistan.

Kitae I identifies the key principles behind organizing the operational edge C2 for effect in a complex environment, specifically using a comparison of network versus hierarchal structures to help identify those principles.

Kitae II identifies the key principles of approaching the intelligence process for effective production of situational awareness in a complex battlespace, through a comparison of traditional time & space (TTS) approaches and Social Network Analysis (SNA).

Kitae III provides a case study on how you can formally engage the cognitive dimension of a battlespace through unit construction for effect.

Dedication

To those who died
Shaping the battlespace during the period referred to in this study.

Sapper Mark Antony Smith 26-07-2010
Lance Sergeant Dale Alanzo McCallum 01-08-2010
Marine Adam Brown 01-08-2010
Lance Corporal Erik Berre Rolandsen 07-08-2010
Corporal Jimmi Bøgebjerg Peteresen 07-08-2010
Lieutenant John Charles Sanderson 11-08-2010
Rifleman Remand Kulung 12-08-2010
Sapper Darren Foster 13-08-2010
Sapper Ishwor Gurung 13-08-2010
Lance Corporal Jordan Dean Bancroft 21-08-2010
Lance Corporal Joseph McFarlane Pool 05-09- 2010
Captain Andrew Griffiths 05-09-2010
Kingsman Darren Deady 10-09-2010
Trooper Andrew Martin Haworth 18-09-2010
Sergeant Andrew James Jones 18-09-2010
Private Simon Mundt Jørgensen 22-09-2010
Corporal Matthew Thomas 25-09-2010
Rifleman Suraj Gurung 02-10-2010
Sergeant Peter Anthony Rayner 08-10-2010
Corporal David Barnsdale 19-10-2010
Private Mikkel Jørgensen 23-10-2010
Sapper William Bernard Blanchard 30-10-2010
Senior Aircraftman Scott Hughes 07-11-2010
Ranger Aaron McCormick 14-11-2010
Lance Corporal Jørgen Randrup 14-11-2010
Guardsmen Christopher Davies 17-11-2010
Private John Howard 05-12-2010
Corporal Steven Thomas Dunn 21-12-2010
Warrant Officer Henry Wood 28-12-2010
Private Joseva Saqansgonedau Vatubua 01-01-2011
Private Samuel Enig 09-01-2011

...the more than 50 ANSF KIA

...the many CF/ANSF amputees

Foreword

When I first started this project to put theory to the test in a real battlespace I had no idea of the profound impact it would have on my views of modern warfare. It was a wake-up call as to how the world has changed socially since my first battlespace some 20 yrs ago –and how little the military has followed in terms of social organization. After returning home with some time for reflection, I can say with complete conviction that we are still in a transition period where the technological phase started in the early 90's will now be going over to an even more challenging social organization phase. Despite the reinvigoration of COIN thinking across western military sciences, there is still no military from any country in ISAF that could claim that they have the final answer. I would therefore like to express my sincere gratitude and greatest respect to my Danish, UK, and US colleagues who worked with CF NES N/16th Air Assault Brigade, for their brilliant efforts to deal with the most absurdly complex battlespace I have ever experienced. I would especially like to thank the Danish Battlegroup Commanders Col. Lennie Fredskov, Lt. Col. Thomas Funch Pedersen, Maj. Christian Bach Byrholdt (S3), and Capt. Thomas Larsen (S2). As the operational senior command element of the Danish Battle Group, they faced the tremendous challenges of having to field the rippling edge effects of a NATO in transition in terms of technology, doctrine, and organization. In the midst of a battle they had to deal with organizational changes, synchronize multi-national battle plans under constant pressure from a variety of actors, and implement both a developing Comprehensive Approach and a COIN doctrine. To add to this challenge they had to introduce Danish soldiers to 'partnering en masse' for the first time. This meant that daily warfighting routines had to make time for the introduction of new technologies, the merging of systems, and the testing of new organizational procedures throughout the 6 months. This included the implementation of human terrain mapping (HTM), biometrics, battlespace forensics, new ISTAR assets, legal procedures, COICs, new CI procedures, regional ISAF command restructuring, constant ANSF coordination meetings, and managing an extremely dynamic political situation and major vote in Helmand. If this was not enough, these changes in themselves compounded the challenge by producing uncertainty up and down a range of hierarchies not only in Theatre but also at home, resulting in over 200 VIP visits during the 6 months. All of which were dealt with very professionally by Team 10. These 'inside' challenges were played out against the kinetic backdrop 'outside of the wire' of trying to reverse the negative effects of a static battlespace and a deadly insurgent IED network that had emerged from it over the previous year. They had to re-establish the freedom of movement for their own forces amongst insurgent influenced tribal communities determined to protect some the highest yielding poppy hectares in the world with their established international criminal organizations that stretched from Gereshk to Los Angeles. I have no doubt that Team 10 has earned its place in history as participating in the epicenter of new age warfare complexities, where they engaged a battlespace driven to the extremes of complexity by forces within and without. I can therefore bare witness that the leadership, the staff, and the professional soldiers of the DABG made a superhuman attempt to get it all right. It has been an honor to serve with the Danes of ISAF 10. My deepest respect and great admiration should also be noted for members of the ANSF units such as the ATF - with whom I would go anywhere, and the 4th and 7th Commandos. Their courage, professionalism, and determination to fight for their own future create hope amongst the population, and for them, there is no respite after 6 months. I would also like to acknowledge the other NATO and US SF communities operating in Helmand, and for partnerships that provided the insight for many of the principles identified in this paper. In Denmark I would like to thank my colleagues at the Royal Danish Defence College for sup-

porting all initiatives in regard to the Kitae study, and 'covering my back' whilst away in Theatre. I would furthermore like to acknowledge the Danish Army Operational Command for their critical support in the preparation phase; the Danish Defence Command with their support and input in the preparation phase; and various members of the Danish Defence Intelligence community for extremely useful discussions and input before, during, and after the field study. On the academic side I would like to acknowledge the inputs from various international venues and arenas, particularly guidance and feedback from the Pentagons' Command & Control Research Program under Dr. Alberts; Defence Research and Development Canada and Keith Stewart; Maj. Pedro Fernandez at NATO School Oberammergau; the three time AFG vet Lt. Col Andrew Mackenzie of the NZ Defence; and finally Dr. David Phillips of the Tribal Analysis Centre, Washington D.C. for guidance and support in regards to tribal issues.

I have no words to adequately describe my appreciation and admiration for my wife and in-laws who together successfully ran the show on the home front for the second time in 3 years. Nor for daughters Ellen and Anna, who courageously watched their Dad fly off to his 9th battlespace for a half-year, yet with the first time understanding that not all who go to such places come home again.

A handwritten signature in black ink, appearing to read "William A. Schell". The signature is written in a cursive style with a prominent flourish at the end.

Table of Contents

Abstract.....	3
Dedication	4
Foreword	5
Table of Contents	7
Table of Acronyms	8
Table of Figures & Maps.....	9
Introduction	10
PART I: Analytical Framework and Method.....	11
Optimality.....	11
Variables.....	13
PART II: ANALYSIS.....	14
AUGUST 2010.....	14
SEPTEMBER 2010	17
OCTOBER 2010	20
NOVEMBER 2010.....	22
DECEMBER 2010.....	25
JANUARY 2010	27
CONCLUSIONS.....	29
References.....	31

Table of Acronyms

AFG	Afghanistan
ANSF	Afghan National Security Forces
AO	Area of Operations
BG	Battle Group
CIED	Counter Improvised Explosive Device
COIN	Counter Insurgency
CF	Coalition Forces
COI	Compound of Interest
C2	Command & Control
DABG	Danish Battle Group
EBT	Effects Based Approach to Operations
EBO	Effects Based Operations
FoM	Freedom of Movement
GIRoA	Government of the Islamic Republic of Afghanistan
GSM	Global System for Mobile Communication
HTM	Human Terrain Mapping
IED	Improvised explosive Device
INS	Insurgents
ISTAR	Intelligence, Surveillance, Target Acquisition, Reconnaissance
LN	Local Nationals
MoE	Measurements of Effectiveness
POI	Person of Interest
QEQ	Quantity Effects Quotient
RCT	Rational Choice Theory
SAQ	Structural Agility Quotient
SF	Special Forces
SME	Subject Matter Expert
SOF	Special Operations Forces
TiGR	Tactical Ground Reporting Tool
TFH	Task Force Helmand
UGV	Upper Gereshk Valley

Table of Figures & Maps

Fig. 1.0 RCT & EBT	12
Fig. 2.0 SAQ AUG	15
Fig. 2.1 QEQ AUG.....	16
Fig. 3.0 SAQ SEPT	18
Fig. 3.1 QEQ SEPT	19
Fig. 4.0 SAQ OCT	20
Fig. 4.1 QEQ OCT.....	21
Fig. 5.0 SAQ NOV.....	23
Fig. 5.1 QEQ NOV.....	23
Fig. 6.0 SAQ DEC.....	25
Fig. 6.1 QEQ DEC.....	26
Fig. 7.0 SAQ JAN 2011	27
Fig. 7.1 QEQ JAN.....	28
Map 1.0 August 2010 Tactical FoM.....	15
Map 2.0 September 2010 Tactical FoM.....	17
Map 3.0 October 2010 Tactical FoM	18
Map 4.0 November 2010 Tactical FoM.....	19
Map 5.0 December 2010 Tactical FoM.....	21
Map 6.0 January 2011 Tactical FoM.....	22
Table 1.0 Understanding Tactical Freedom of movement	14
Table 2.0 QEQ AUG.....	14
Table 3.0 QEQ SEPT	17
Table 4.0 QEQ OCT.....	18
Table 5.0 QEQ NOV	19
Table 6.0 QEQ DEC.....	20
Table 7.0 QEQ JAN.....	21

Asymmetric warfare is a confrontation between political, cultural, social and organizational systems, obedient to different logics, and far away from the single question of its weapons.²

Introduction

This research paper focuses on the challenges to current military C2 organization in terms of maximizing battlespace agility. Specifically, agility as it is used here is defined by the C2 structures ability to facilitate the transfer of developed knowledge from the complex battlespace in a timely matter to the decision point for action to promote effects. The structural role of the organization in the promotion of agility is to insure that decision-making authority for action and knowledge development are as directly linked as possible in order to insure maximum speed and precision of knowledge being converted into action. There are two key environments that affect battlespace agility in a COIN environment; the degree of complexity in which the actionable assets conducting operations at the edge find themselves; and the environment created by the C2 functions, structures, and processes of the organization itself.

The organizational context of the military's approach to planning in Upper Gereshk Valley (UGV), takes place within an Effects Based Thinking (EBT)³ planning environment where knowledge is developed to generate desired effects and the appropriate actions to achieve them. In terms of the practical implications at the Task Force (TFH) and battlegroup (BG) level, this was represented in a formal process particularly where it concerned deliberate operations that stretched out over 4 weeks. Or in a more informal process generated by framework operations, or just reacting to developments in the battlespace. As a fundamental aspect of this study, the EBT process constitutes one of the major pillars of gauging optimal decision-making, and is key to understanding the need for C2 agility. It has become the central guiding framework for military planning in a battlespace. No matter the level of formality surrounding the EBT process it requires a great deal of knowledge about the reality in which the actions will take place. The most important aspect for the application of this knowledge in relation to the EBT process is to ensure a "logical" relationship between end-state, objectives, effects, and actions.⁴

A complex battlespace is understood in this paper being asymmetric with both a cognitive and physical dimensions. It represented by the counter insurgency (COIN) environment consisting of the physical and human terrain referred to throughout the paper. In a COIN environment it is more important to control the people, rather than the terrain, as they are directly affect the freedom of movement (FoM) of both the insurgents and friendly forces. The observations for this study are taken from daily warfighting activities in one of the most violent areas of Afghanistan (AFG), the UGV in Helmand province within the area of responsibility belonging to TFH and the

(2) Henrotin, Joseph & Tanguy Struye de Swielande. (2004) "Ontological –Cultural Assymetry and the Relevance of Grand Strategies," *Journal of Military & Strategic Studies*, Winter 2004, Vol. 7, Issue 2:23

(3) Also commonly known as effects based thinking . EBT should not be confused with the independent US military Effects Based Operations (EBO) that is much more targeting driven. See Mattis (2008); For philosophical foundation see Smith (2005, 2006); Nicholson (2006); Mitchell (2004, 2008, 2010); and a doctrinal interpretation , see NATO (2007).

(4) Bi-Strategic Command Pre-Doctrinal Handbook (2007): 5-8 to 5-9; Smith (2006); Mitchell (2008, 2010)

Danish Battle Group (DABG). The UGV is one of the most complex battlespaces⁵ in AFG due to the concentration of narcotics and the various competing forms of governance, known to TFH as the *official* (GIROA⁶), the *traditional* (tribal), the *shadow* (Quetta based Taliban insurgency), and the *dark* (narcotics cartels). So for studies of agility in complex battlespaces, it provides extreme conditions for testing our organizational C2 capacities in regards to their abilities to promote agility in a complex battlespace.

The research paper is divided into three sections: Part I first presents the analytical framework and methodology including variable definition; Part II presents the timeline based comparative analysis that covers the period from August 2010 to January 2011 on a monthly basis; the final section contains the consolidated conclusion and reflections .

PART I: Analytical Framework and Method

This is not a theoretical paper, but as practical as a discussion on agility in a complex battlespace may sound, it cannot escape the formalities of presenting the meta-theoretical issues that form the fabric of the 'ontological' universe surrounding it. The meta-theoretical issues that lie behind this paper are drawn from the C2 studies on agility and sense-making,⁷ this research thread represents a very simple objective when it comes to military forces in a battlespace; we want our decision-making to be optimal with regards to the war fighting environment we are in. So optimality is the objective, both in terms of process and produced effects. The main ontological assumption of this paper is that all decision-making is assumed to be subjectively rational.⁸ This is not to suggest that it is the most rationally optimal decision from an objective perspective. However this ontological stance reflects the relativism necessary for managing the physical and cognitive domains of a complex battlespace, it is a necessary ontological stance that will allow a rational choice (RCT) approach to decision-making that includes both utilitarian and normative considerations, when it comes to the calculation of optimality.

Optimality

Historically the RCT assumption of optimality has been greatly influenced by the utilitarian material/efficiency interpretation of 'optimal gains' that has left the impression that the drawing on the physical domain is the only measure of optimal effects. However it should be obvious that RCT models of optimal preference selection are as affected by problems of relativity as any other social theory. (What one may believe is the optimal choice, may not be judged as having been the optimal choice by others.) Therefore if we subject the core conventional constructivist concepts

(5) For methodological foundation see Johnson & Levis (1988, 1989); Alberts & Czerwinski (1997); S. Metz (2001) For battlespace definitions see Smith(2006); Mitchell (2008, 2009; 2010)

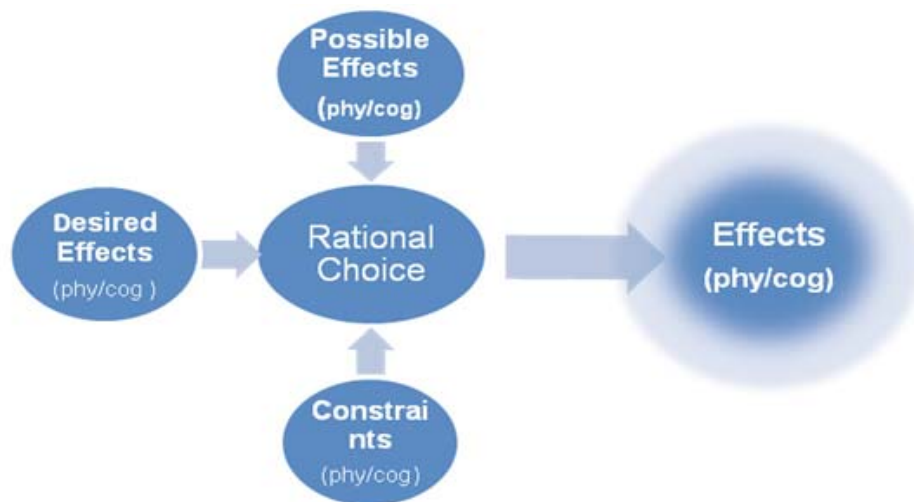
(6) Government of the Islamic Republic of Afghanistan

(7) Mitchell, William. Agile Sense-Making in an Intersubjective Environment. *International C2 Journal (IC2J)*. Spring 2010. http://www.dodccrp.org/html4/journal_v4n1.html; Mitchell, William. *Ch.3 The Comprehensive Approach Dilemma: No Unity of Command -No Unity of Effort*. Comprehensive Approach. Edited by Flemming Splidsboel Hansen. Spring 2010

(8) Mitchell, William. *Instrumental Friend or Foe? Constructivist Activism in Security Policy Means Analysis*. Aarhus, Denmark:Politica, 2004. <http://www.politica.dk/showarticle.asp?articleID=194>

of norms and identity to Colemans⁹ conditions for managing optimal effects assessments, one can quickly identify their methodological relevance for managing cognitive inputs and outputs within the knowledge development stage of EBT. Therefore where it concerns the assessment of the C2 processes supporting decision-making, both the physical and cognitive domains will be accounted for through different types of variables that have their ontological origins in an RCT approach that incorporates both utilitarian and normative concerns in 'live' instrumental evaluations.¹⁰ This ends the theoretical discussion. The remainder of the paper is dedicated to the practice of warfighting and battlespace agility.

Fig. 1.0 RCT & EBT



Commanders Intent and General Desired Effects

The main objective for the TFH during this period of this study was to promote the influence of the GIRoA throughout one of the most violent and complex battlespace areas of AFG, by mapping¹¹ and engaging the local nationals (LN). It was apparent from the start that if the DABG wanted to be able to engage and influence the local population, our FoM in the battlespace would have to be re-established. In short, a high degree of kinetics would be necessary to degrade the INS network to a sufficient degree to once again allow CF/ANSF to engage and influence the local population.

(9) See Mitchell (2004) for original adaptation; See foundational work with optimality in Coleman, James S. & Thomas J. Fararo (Eds.) (1992). *Rational Choice Theory: Advocacy and Critique*. Newbury Park: SAGE: 195 and Coleman, James S. (1990). *The Foundations of Social Theory*. Cambridge: Belknap

(10) For original reflections in this regard see Checkel's (1999) suggestion of 'flexibility' that in some circumstances an RCT approaches should be used and in other circumstances - constructivism. I continue to suggest however, that distinguishing between both the instrumental notion of rationality and the normative notion of rationality provides the basis for the actual flexibility identified by Coleman- and therefore material/efficiency concerns as well as normative concerns can complement each other under an RCT framework.

(11) Refers to Human Terrain Mapping (HTM)

The Commanders intent for the 6 months was to re-gain CF FoM in order to access the local population for human terrain mapping, and to set the foundation for expanding GIRoA influence.

Variables

The three main variables to be controlled for and discussed within the comparative framework come from the targeting for effects process, and include a representative structural agility quotient (SAQ), a quantity of effects quotient (QEQ), and a measurement of effects (MoE) assessment. Sub-variables from each of these categories will act as the indicators by which comparative agility assessments will be made between the hierarchal and network organizations. The timeline is from August 2010 to January 2011 and is divided into monthly periods.

Structural Agility Quotient (SAQ)

Within an EBT understanding for this case study, structural agility refers to the degree the organizational structure facilitates the speed it takes to develop and convert knowledge into actions in the pursuit of desired effects.¹² This presents a very straight forward structural understanding of the DABG command organization that can provide the basis for a hierarchy versus network comparison. The **total number of organizational filters (F)** between the source of developed knowledge and the decisions-maker with authority over actionable authorities will be counted. Simply dividing the (F) with **total number of actionable assets (A)** will provide a structural indicator of organizational agility within an EBT understanding.

$$\text{SAQ} = F/A$$

A measurement of 2 (or less) implies the optimal structural agility, from the perspective of the EBT framework, reflecting a direct line of communication between the point of knowledge generation and the capacity to act. Only absolute minimums, in terms of organizational filters, are recognized as it is structural facilitation of the social organization we are interested in here, and not the culture of communication between them.

Quantity Effects Quotient (QEQ)

As the SAQ does not account for the quantity of information that is relayed to the actionable assets in the form of situational awareness, for the purposes of a comparative analysis of social organization a **quantity effects quotient (QEQ)** is needed. This has been obtained by multiplying the **number of targets generated (TG)** by the **number of targets actioned (TA)**. Using the formal targeting (kinetic and non-kinetic) process as the basis for the measure provides the most concrete measure of effects produced as it is based completely on the principles of actionable intelligence. Essentially the more targets produced, the more opportunities for action towards desired effects. Success is not measured in this calculation, and therefore it is not a MoE vis-à-vis commanders' intent or the organization.

$$\text{QEQ} = \text{TG} \times \text{TA}$$

Nor does the QEQ account for quality of knowledge in the process, however a simple qualitative measurement of FoM effect relative to commander's intent will indicate if desired effects are being generated within the battlespace.

(12) This understanding should capture the common use of agility that implies not only speed, but a quality of action appropriate to different situations, while the issue of authority is explored in detail by Albert & Hayes (2007):172,175.

MoE: Tactical Freedom of Movement

The MoE relative to commanders intent is a *qualitative* estimate of the tactical FoM at the end of each month and is based on several indicators related to Human Terrain Mapping (HTM); the number of CF/ANSF patrols into local population centers; the range of those patrols from respective bases; the number of shuras held with the local population; and the state of the insurgency based on all-source intelligence summaries. This measurement does not represent atmospherics (attitudes of local population towards GIRoA) and refers only to tactical FoM where all force protection TTPs must still be followed. The MoE is geo-rectified for each month for the battlespace.

Table 1.0 Understanding Tactical Freedom of Movement

High	Assets present +HTM possible + creation of white space for shaping and shuras
Med	Limited assets + HTM possible with non-organic assets
Low	No assets – or essentially ‘no go’ within framework ops for organic assets –no HTM

PART II: ANALYSIS

In Part II, the field data analysis is divided up into 5 months, covering the period of August 2010 to January 2011 and the results are presented in a standard format. Assessments are at the end of the data sets for each month. Many of the sub-variables for C2 assessments are provided by NATO SAS-050, and are defined as necessary in the footnotes. It is important to emphasize that the network vs. hierarchy comparative C2 analysis presented here should not be considered within a zero-sum understanding.

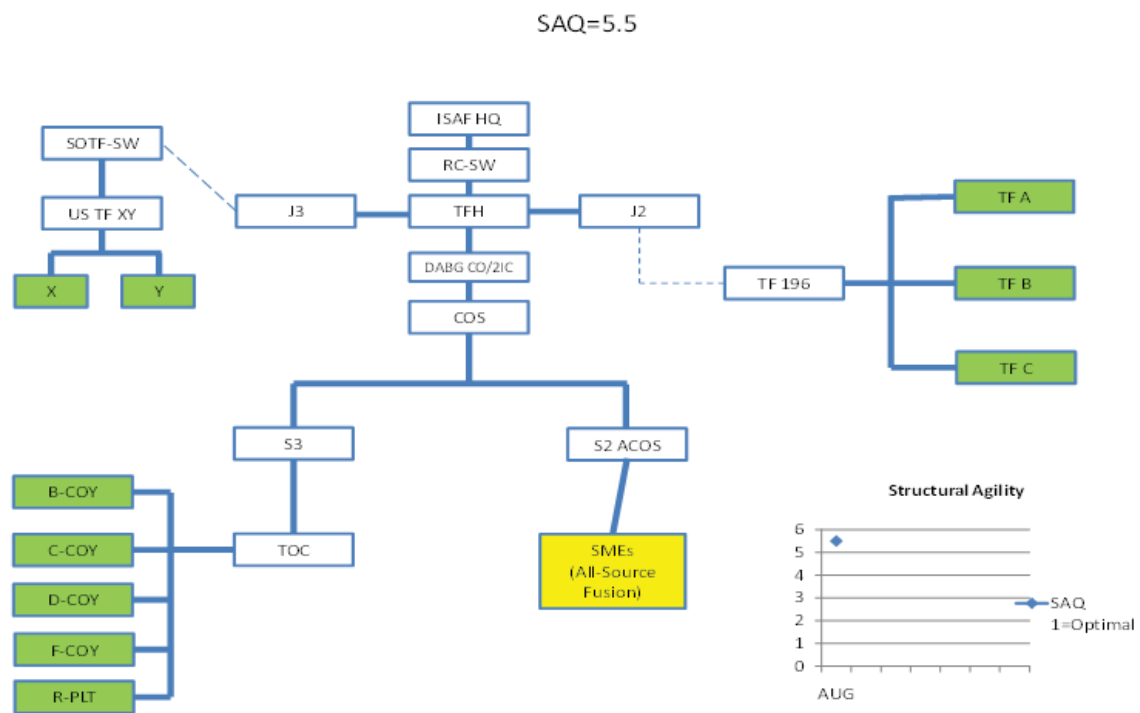
AUGUST 2010

BATTLESPACE NARRATIVE

Though the new DABG team was still emerging from the initial assessment phase of the military situation they would be dealing with, some key issues are emerging: The first was that the INS had both a physical and psychological influence capacity that extends from Gereshk in the south, to Qaleh ye Gaz in the North with several key nodes of INS C2 in key locations, that are used for the projection of influence and kinetic activity. The second is that the INS have apparently invested heavily in perfecting a multi-layered system of IED networks based on establishing short & long-term caches ranged to target seeding areas for convenience (30-300m/200-1000m), and larger IED production and storage facilities ranged to target seeding areas for security (2-20km). The objective appears to continue to fix our forces either in bases or limit our FoM to perform influence operations in conjunction with GIRoA This situation has developed over the past year where units have prioritized force protection of fixed bases, and because of the INS IED strategy, now find their FoM seriously restricted, and therefore contact with the local population throughout the AO extremely limited. This does not bode well for Human Terrain Mapping (HTM) as the units need to get out amongst the population. Finally, early indications are that a degree of agile intelligence driven kinetic operations to disrupt and degrade their IED network capacities

will likely be necessary to create a more permissive environment (FoM) for influence operations to actually take place.

Fig. 2.0 SAQ AUG

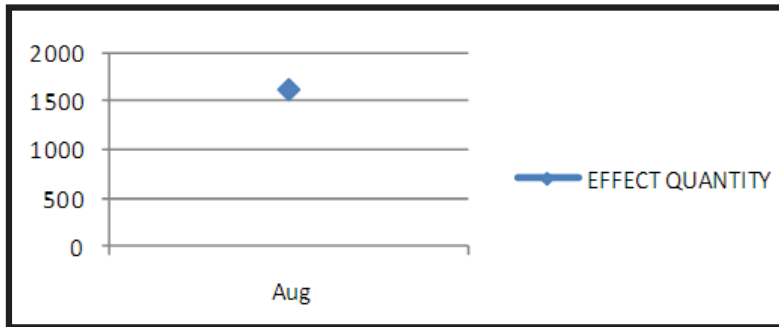


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence

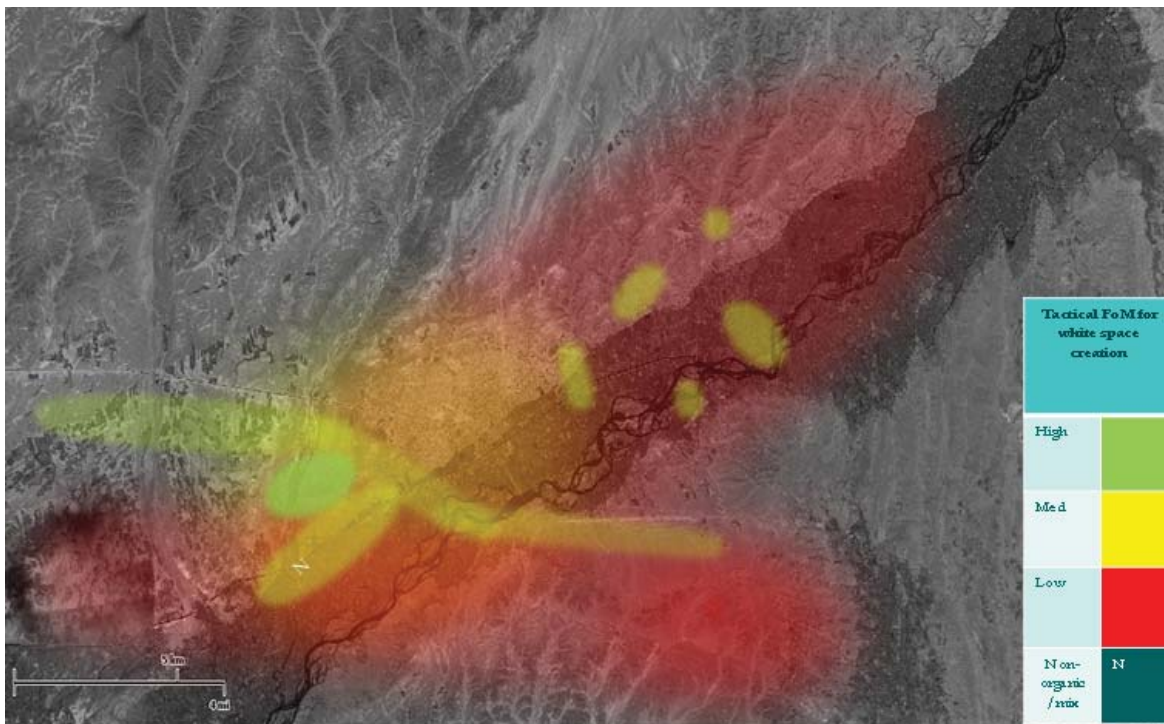
Table 2.0 QEQ AUG

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
59	18	9	12
TG = (59+18)		TA=(9+12)	
QEQ=TGxTA = 1617			

Fig. 2.1 QEQ AUG



Map 1.0 August 2010 Tactical FoM



(N)=TF X

Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence

ASSESSMENT AUG 2010

At the start of the tour the traditional C2 hierarchical structure was in place for managing the sharing of knowledge in order to produce situational awareness. From a C2 Planning Maturity Model¹³ perspective, the C2 structure of the BG had very restricted or 'stove piped' information flows, reflecting the traditional military hierarchy approach to social organization (SAQ=5). At this point it was the battlespace itself that was making us aware of the shortfalls of the hierarchal

(13) See Alberts & Hayes (2007):168-179.

structure in place. The planning procedures at several staff levels, with all the internal communication and 'stove piping' that accompany it, could not compete at all with daily INS agility. Quite simply information was being forced up and down the hierarchy, reducing information accuracy¹⁴ and currency¹⁵, and negatively affecting shared awareness¹⁶, decision correctness¹⁷, and finally action accuracy,¹⁸ precision,¹⁹ appropriateness,²⁰ and timeliness.²¹ The extra organizational filters of the hierarchy appeared to be forcing the situation to fit to its traditional operational planning role, extending timings on operational lines beyond all usefulness. In terms of optimality within an EBT context, the hierarchal structure was having a significant negative effect on the conversion of 'knowledge to action' processes both in terms of timeliness and quality. The most extreme example from this period was a real-time video showing an explosives cache being buried in a field relatively short distance from a main operations base. Though perfect for a quick reaction force pick-up, it was turned into a required 17 day 'concept of operations' process that resulted nothing except angry local farmers wanting compensation for the fields torn up by plethora of heavy vehicles. The first signs of a natural (not planned or organized) circumvention of the hierarchy began by the third week in august.

SEPTEMBER 2010

BATTLESPACE NARRATIVE

The military situation remains stable. There is relative quiet within our battle space with some minor SAF incidents. Unfortunately, the IED threat continues to affect our operations and restrict our FoM. It appears that despite the best efforts of the BG to over watch frequently used areas – it does not reduce the threat, but inspire the enemy to greater heights of deadly innovation. Of particular vulnerability is the PBL that continues to stand for the greater part of IED losses in the AO. However, it appears that the successful removal of a key INS Commander 'X' from the battlespace has, for the time being, contributed to maintaining the "military" status quo up to elections. Removing this key INS Commander 'X' who was reportedly ready to directly set his

(14) Information accuracy refers to the degree to which information quality matches what is needed. NATO SAS 050:129-149.

(15) Information currency refers to the degree to in difference between the current point in time and the time the information was made available. NATO SAS 050:129-149.

(16) Shared awareness refers to: 1) the appropriateness of precision of shared awareness for a particular use; 2) extent to which awareness necessary forms a complete shared understanding; 3) extent to which shared awareness is consistent within and across the war fighting organization; 4) extent to which shared awareness is consistent with ground truth; 5) time lag of shared awareness; 6) the level of granularity of shared awareness; 7) proportion of shared awareness that is related to the task at hand; 8) shared awareness timeliness; 9) subjective assessment of confidence in shared awareness. NATO SAS 050:129-149.

(17) Decision correctness refers to the extent to which a decision is consistent with ground truth. NATO SAS 050:129-149.

(18) Action accuracy refers to the extent actions executed are directed to the intended purpose. NATO SAS 050:129-149.

(19) Action precision refers to the extent to which actions executed are precisely related to the intended purpose. NATO SAS 050:129-149.

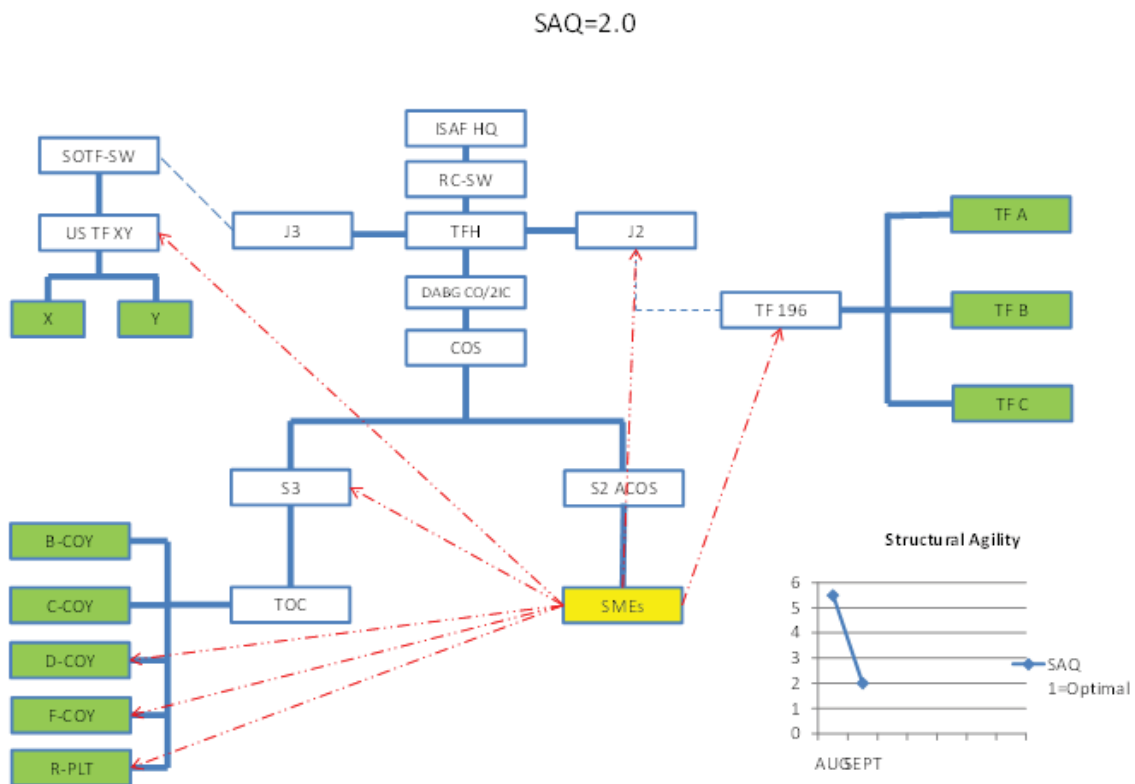
(20) Action appropriateness refers to the extent to which actions executed are the appropriate ones to achieve the intended purpose. NATO SAS 050:129-149.

(21) Action timeliness refers to the extent to which actions are executed at the time required by plan or order (in the case of self-synchronizing forces the plan could be an ad hoc arrangement between peers). NATO SAS 050:129-149.

kinetic resources into the pre-election campaign, likely removed a distinct strategic threat from the coming election. That the INS will be able to re-organize their capacities quick enough to generate complex attacks up to elections, is still to be seen. It will be interesting to monitor what military effects the absence of the key Commander will have on INS tactically as well as their lines of operations for UGV.

Fig. 3.0 SAQ SEPT

Note: SME - Subject Matter Experts

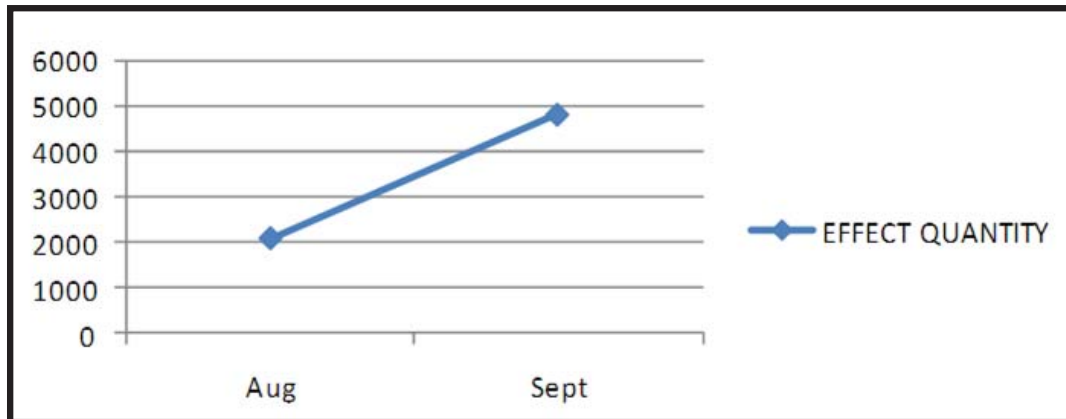


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

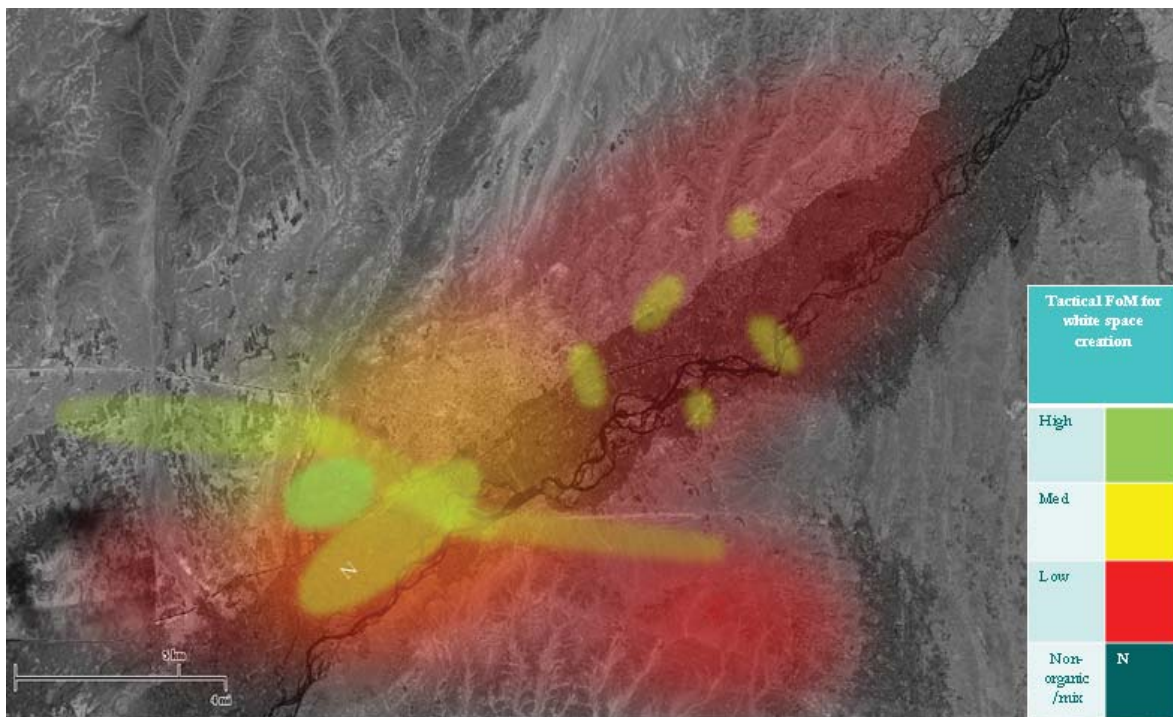
Table 3.0 QEQ SEPT

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
29	60	9	45
TG = (29+60)		TA=(9+45)	
QEQ=TGxTA = 4806			

Fig. 3.1 QEQ SEPT



Map 2.0 September 2010 Tactical FoM



$$(N) = TF X, TF Y, ATF$$

Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

ASSESSMENT SEPT 2010

The nature of the insurgency in itself required fast paced reaction times on intelligence in order to have any chance at breaking their very efficient IED belting organization, and degrading the INS IED network to create enough military FoM to access the population. Immediately, it became apparent that the pace of traditional organizational staff work could not match. Networking then developed

out of necessity (SAQ=3.) This necessity was assessed to be driven by a sense of responsibility attached to the awareness that the subject matter experts (SMEs) had knowledge important to the situational understanding. SMEs also had ownership of complete information as to who could use the knowledge in our battlespace. Thirdly, SMEs had the technological means to delivery it directly with a click of a button. It would defy logic with regards to units operating in the field - not to do it. This was reflected in an increase in the QEQ. More actions were being produced. It gave the BG its first actions with big effect in terms of a key threat to coming elections.

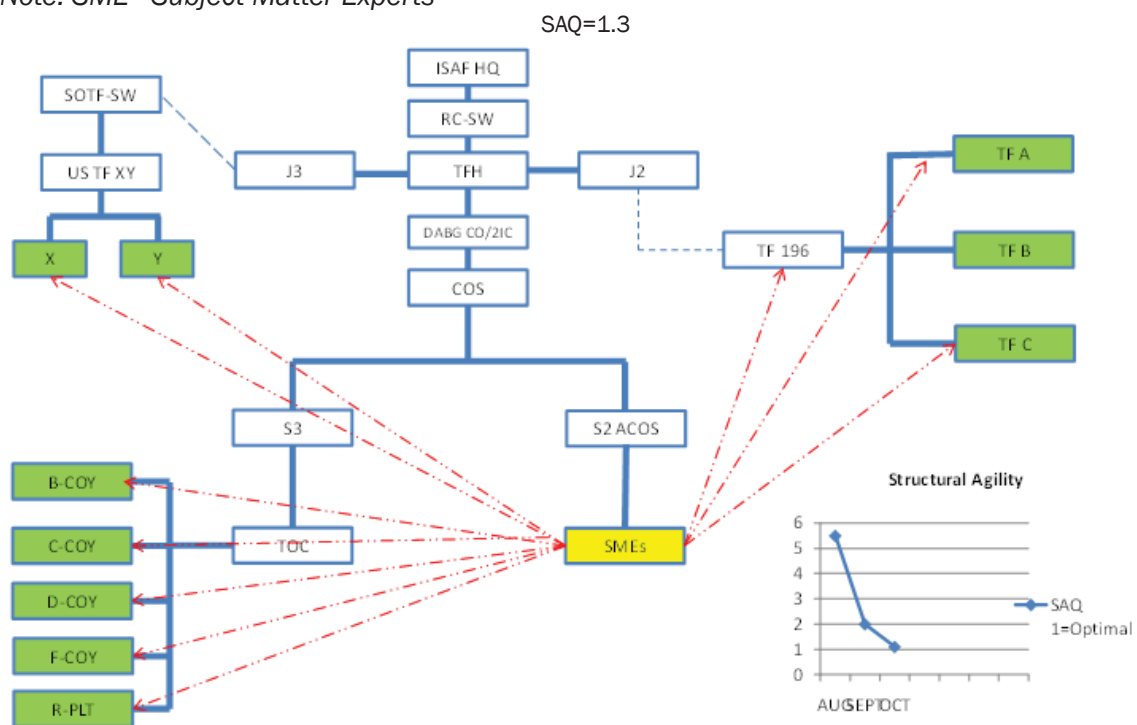
OCTOBER 2010

BATTLESPACE NARRATIVE OCT 2010

The military situation remains stable. There has been a sustained reduction in complex attacks on CF, a point also reflected in reduced radio chatter throughout the AO. It appears the INS are in a period of uncertainty, a recent INS shura held in the East of our AO was attended by 20 plus insurgents ended with an agreement not make attacks, contrary to the initial agenda. The cause of this uncertainty and reflection is likely due to the recent losses in leadership and facilitating infrastructure. This high risk environment for INS Commanders has particularly affected the, with several key INS leaders having been successfully removed from the battlespace. The assessed targeting effects in our AO have been relatively accurate, and the positive effects on disrupting the INS IED organization can be seen. Patrols are getting out amongst the population and beginning to conduct human terrain mapping.

Fig. 4.0 SAQ OCT

Note: SME - Subject Matter Experts

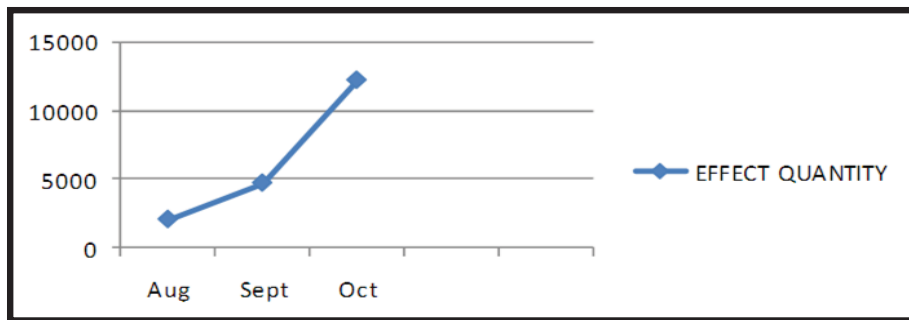


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

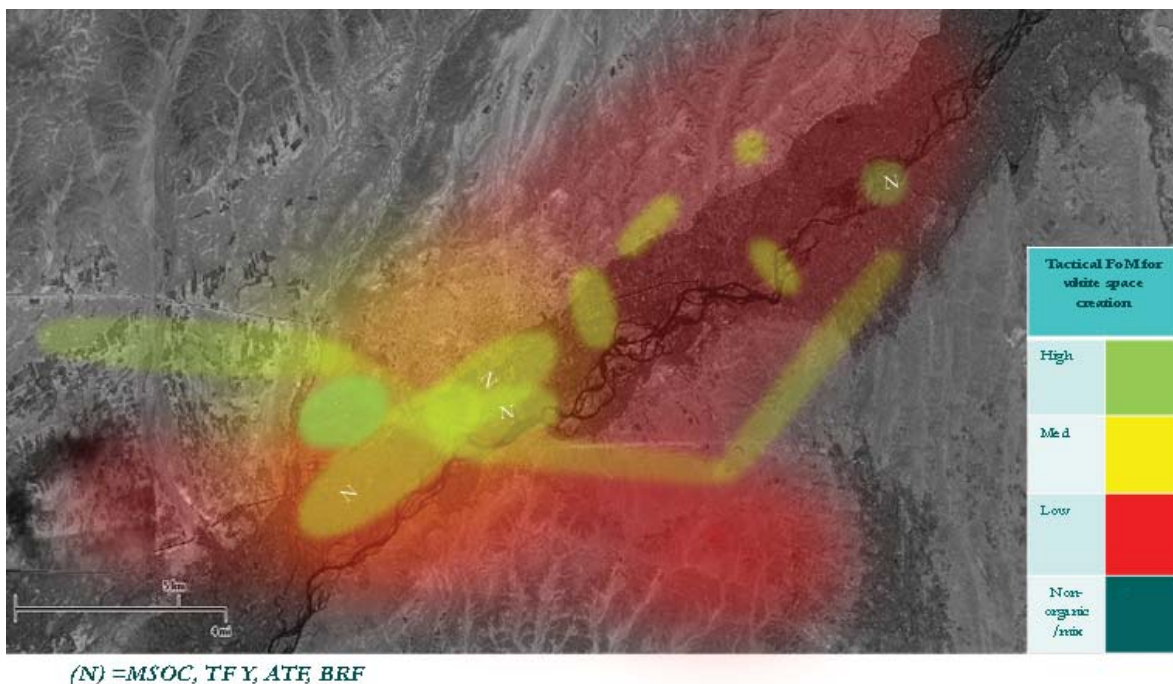
Table 4.0 QEQ OCT

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
98	84	8	59
TG = (98+84)		TA=(8+59)	
$QEQ = TG \times TA$ $= 12,194$			

Fig. 4.1 QEQ OCT



Map 3.0 October 2010 Tactical FoM



Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

ASSESSMENT OCT 2010

For the second month running, indicators suggest the more networked the 'knowledge to authority to act with assets' became, the higher the rate of effects produced. The SAQ was now 1 which that in terms of the formal targeting process, the organizational structure was optimal. The QEQ shot through the roof. However at this point frictions within the hierarchal organization became apparent. The structures in place had a clear expectation that their hierarchal at three different commands expected the level in under it to deliver complete information. As reporting returns from the increased rate of activity began to overwhelm traditional hierarchal levels, they could not meet this traditional hierarchal demand. The question to ask here is whether or not this negatively affected decision making in battlespace? It was highly unlikely, as the authority was already given to the assets to make decisions based on desired effects presented under Commanders Intent. Therefore it was a question of how much of the hierarchal requirement for ownership of complete information by each level was a simply a cultural function of the traditional hierarchal organization, rather than a necessity of the battlespace. In other words, was the requirement by the hierarchy done in the belief it would make the organization more effective, or was it force of habit? It certainly felt like information was beginning to flow in all directions as persons at various levels above and below struggled to keep up with the pace of activities at the edge. Serving the briefing requirements of various levels became more and more out of synch with the timeliness requirement for effective action. One thing was clear, that not only were the SF/SOF faster at turning generated knowledge into actions for effects, the effects were richer in terms of quality, and acted as an accelerator in terms of knowledge production.

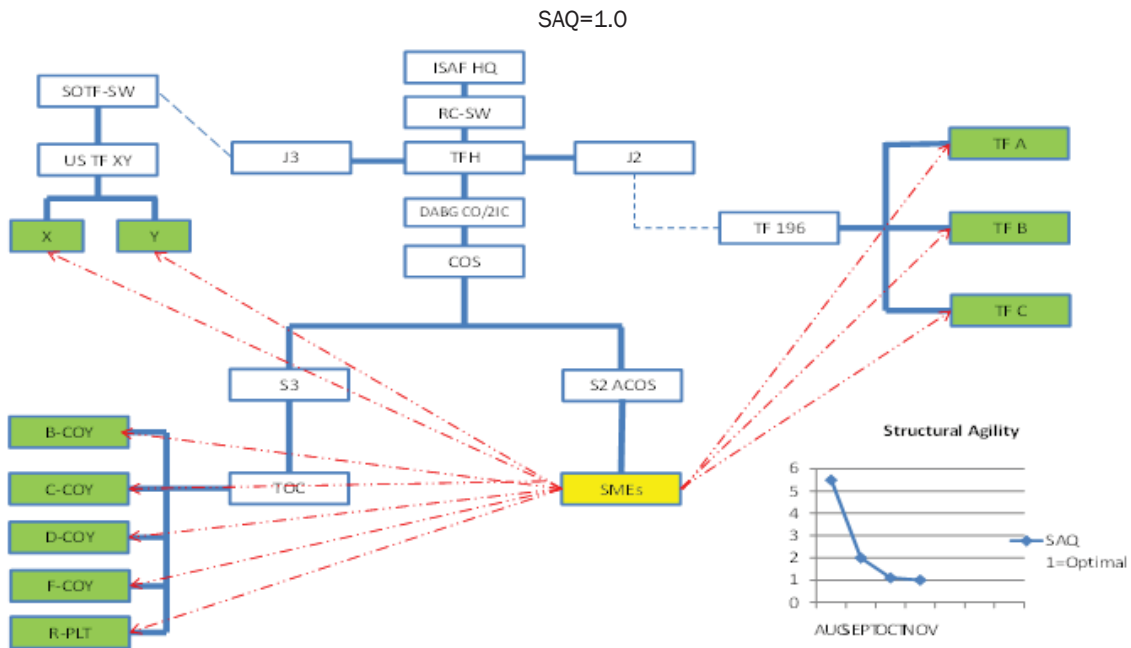
NOVEMBER 2010

BATTLESPACE NARRATIVE NOV 2010

The military situation in our AO is stable but dynamic with 4 concurrent operations ongoing throughout the AO and flank BG battlespace. After an initial increase in kinetic interaction due to new operations it appears senior key INS commanders have been given guidance to disengage from sustained engagements and return to a program of IEDs. Over the last two weeks our AO has clearly moved from a long static period, to becoming much more dynamic in favor of sustained CF initiatives back by improved information sharing, to frustrate INS networks. Seen from INS eyes, it must seem like a totally different CF MO being used throughout the AO. There are already clear signs that the increasing agile CF actions, are stressing the INS network in terms of weapons and ammunition, as they overinvested in a strategy based on the last two years success with IEDs.

Fig. 5.0 SAQ NOV

Note: SME - Subject Matter Experts

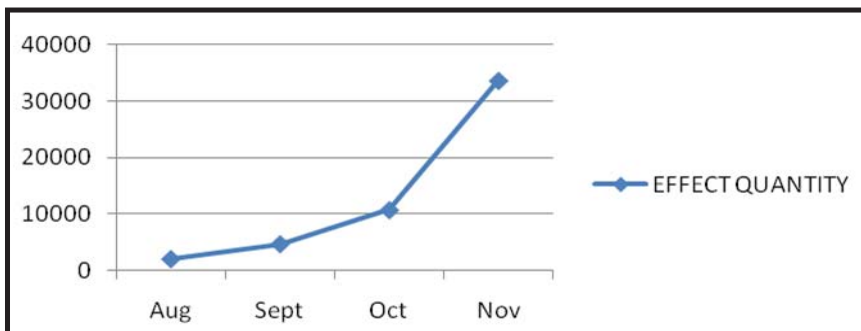


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

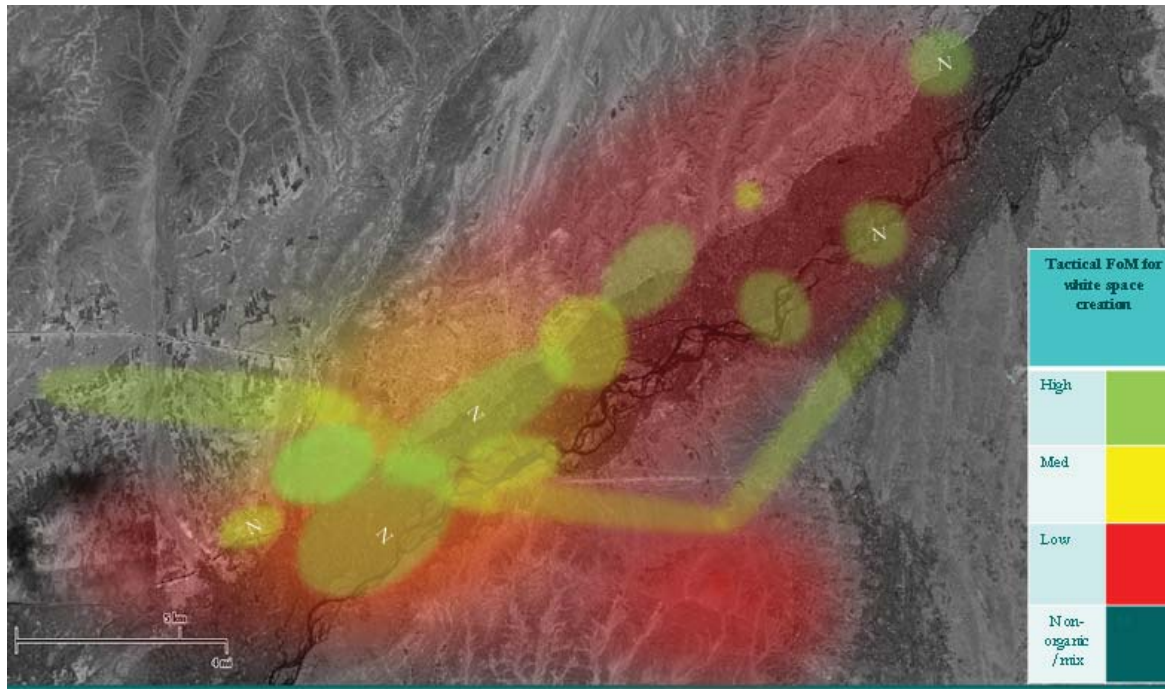
Table 5.0 QEQ NOV

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
269	157	26	53
TG = (269+157)		TA=(26+53)	
QEQ=TGxTA = 33654			

Fig. 5.1 QEQ NOV



Map 4.0 November 2010 Tactical FoM



(N) = MSOC, TF Y, ATF, BRF, BAG, AFG 7th and 4th Commandos

Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

ASSESSMENT NOV 2010

In November, as far as battlespace agility being related to the speed of relaying knowledge to assets to for action, we had reached maximum organizational agility seen from an EBT understanding. Knowledge produced was being delivered directly to all key assets with authority and capacities to take action, at the same time generated effects from those actions, were being delivered directly back to the SMEs (SAQ remained at 1). The QEQ once again shot through the roof, which is likely more a reflection of some sort of tipping point, where accelerated knowledge production used effectively, produced more useful knowledge at a higher rate, producing a higher rate of actions. There were far more targets (kinetic and non-kinetic) than could be persecuted in a timely manner, and therefore prioritization became an important issue in terms of effects assessment. However, frictional issues concerning situational understanding up the hierarchal organization would soon began to push back, as attempts at moving knowledge completeness away from the edge up the hierarchy were simply steamrolled by effects driven real time developments. The phones went mysteriously quiet, as the upper echelons of the various hierarchies activated email networks and naturally tried to resolve awareness completeness with networking of their own. This was the beginning of vertical networking, and constituted a reaction of the traditional hierarchy to organizational flat-lining.

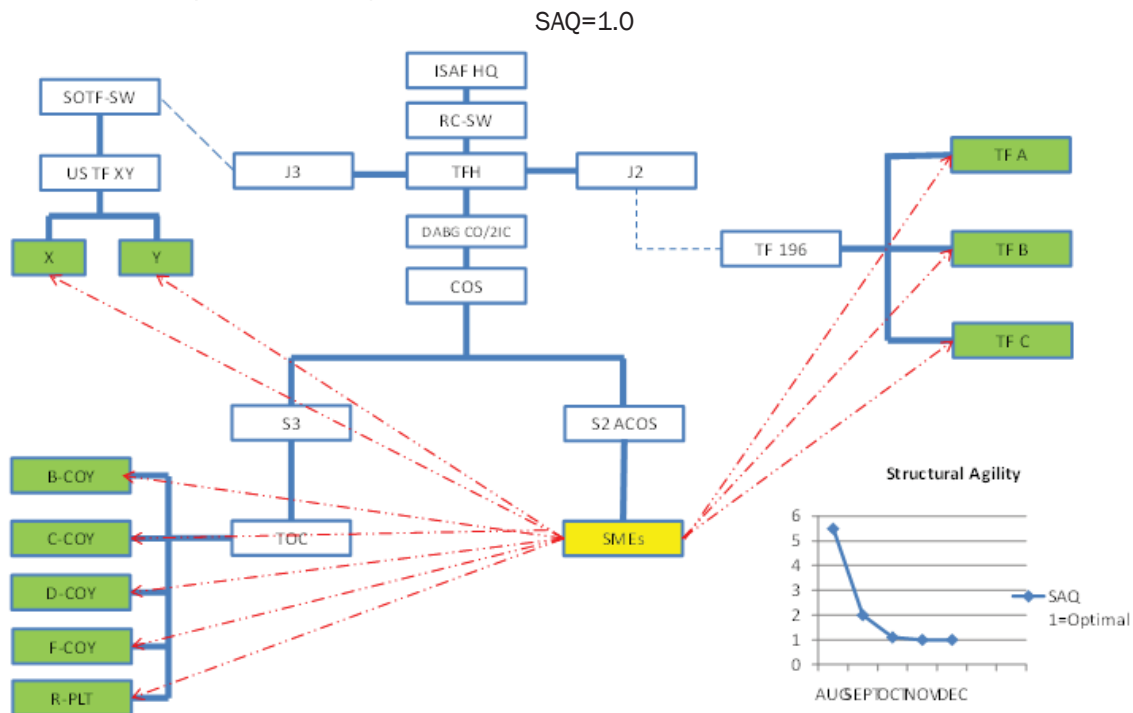
DECEMBER 2010

BATTLESPACE NARRATIVE DEC 2010

The military situation in our AO is stable. Reporting suggests the INS in general are slowing down their operations, with more requests for personnel, ammunition, and HME. It is likely due to a combination of factors including, a high CF tempo with regards to targeting, the poppy season, which tends to reduce INS operations or at least shift their focus squarely on IEDs production and dispersion. CF operations into new areas in the north have forced INS insurgents to move men and material around, providing new knowledge as to INS routes and TTPs.

Fig. 6.0 SAQ DEC

Note: SME - Subject Matter Experts

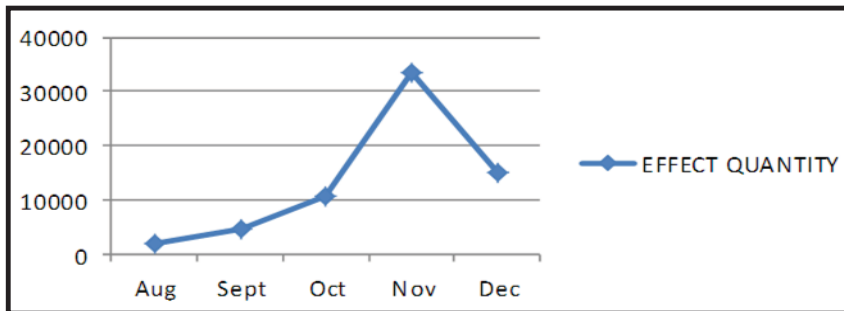


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

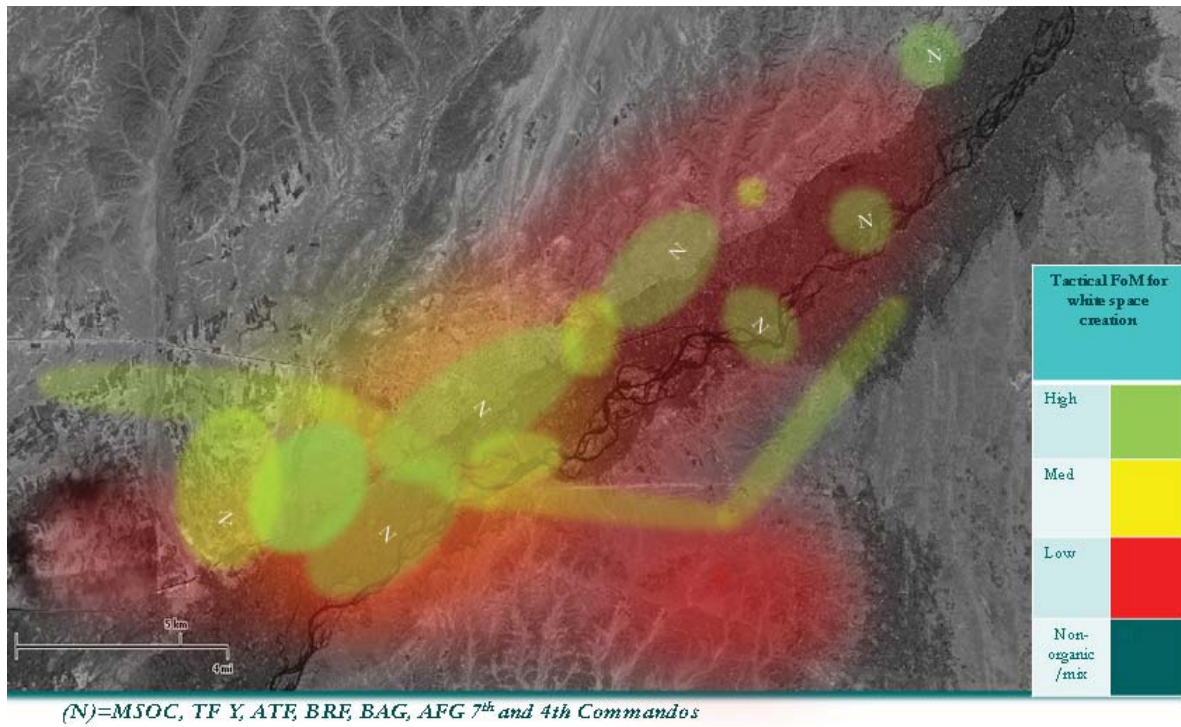
Table 6.0 QEQ DEC

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
238	30	35	21
TG = (238+30)		TA=(35+21)	
QEQ=TGxTA = 15,008			

Fig. 6.1 QEQ DEC



Map 5.0 December 2010 Tactical FoM



Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

ASSESSMENT DEC 2010

By the end of December, upper echelons seemed quite content to identify single issues within the battlespace for attention, rather than to try and maintain “complete knowledge” for all issues. This however resulted in the upper echelons unilaterally applying their authority over supplemental assets to be consumed in a particular case of interest, rather than based on a common situational awareness of the battlespace for synchronization to maximize effect. The situational understanding of the organization as whole was becoming fragmented, and signs that insulation²² at different hierarchal levels above was beginning to occur. In short, they we’re building their own

(22) See Mitchell (2004):85

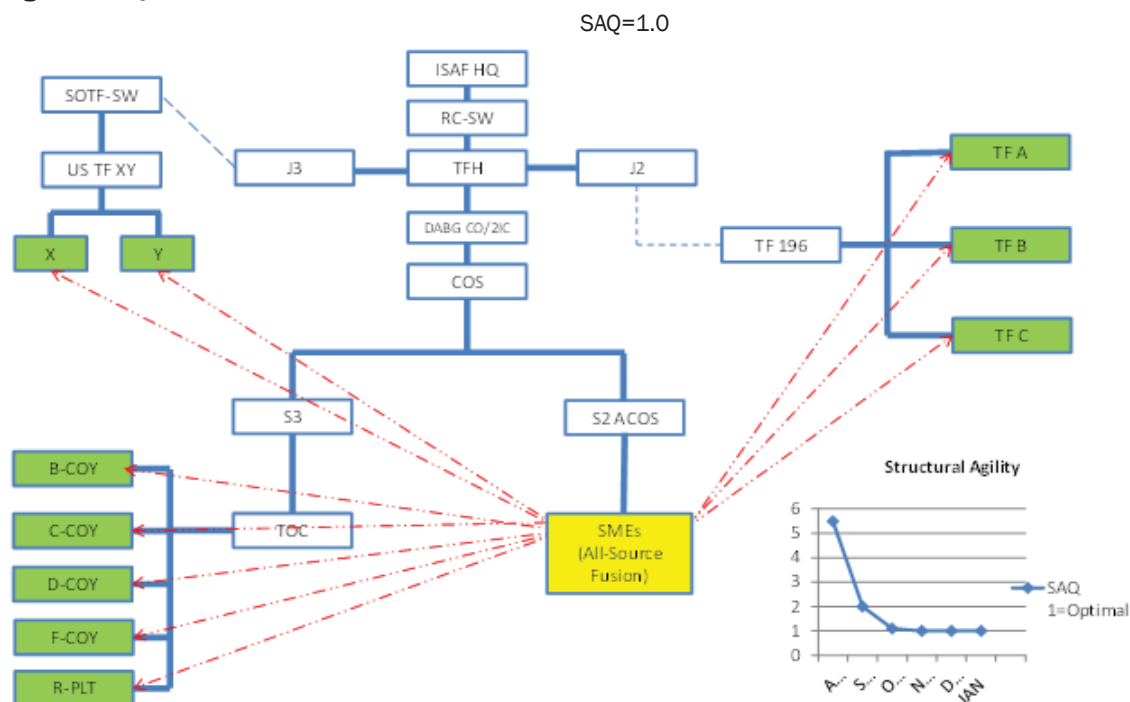
networks to assets at various levels for their topic of interest, and that naturally worked against the development of self-synchronization at the edge. It created vertical networks that would compete with the flat-lined network at the edge for assets. Arguably they were formed not to complete their own information awareness, as due to the synchronization and timeliness issues named earlier this was impossible, but to allow them to fulfill traditional requirements in the hierarchal system. This resulted in a limited degree of kaos, as information streams conflicted in terms of information accuracy, completeness, precision. It was no longer a question of structural friction contained within the organization, but now it was directly affecting the quality of knowledge in the battlespace. Battlespace agility remained high – however the exploitation of targets persecuted dropped as the lower levels of the hierarchy were now being circumvented. Self-synchronization at the edge became more difficult contributing to lower QEQ.

JANUARY 2010

BATTLESPACE NARRATIVE JAN 2011

The military situation remains stable with very limited INS kinetic response to CF operations. This week has shown a distinct decrease in kinetic activities during the period. During the reporting period CF have had a clear upper hand, causing frustration amongst the INS due to their limited ability to conduct offensive operations to counter CF. Despite reports of INS higher leadership directions in terms of an increased focus on IEDs and high-profile attacks, this has not materialized in the use of IEDs in order to compensate for the lack of fighters and possibility to counter CF operations throughout the AO.

Fig. 7.0 SAQ JAN 2011

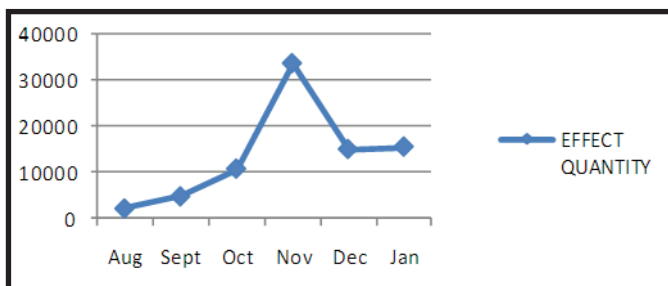


Dr. William Mitchell, Dept. for Joint Operations, Royal Danish Defence College 2010

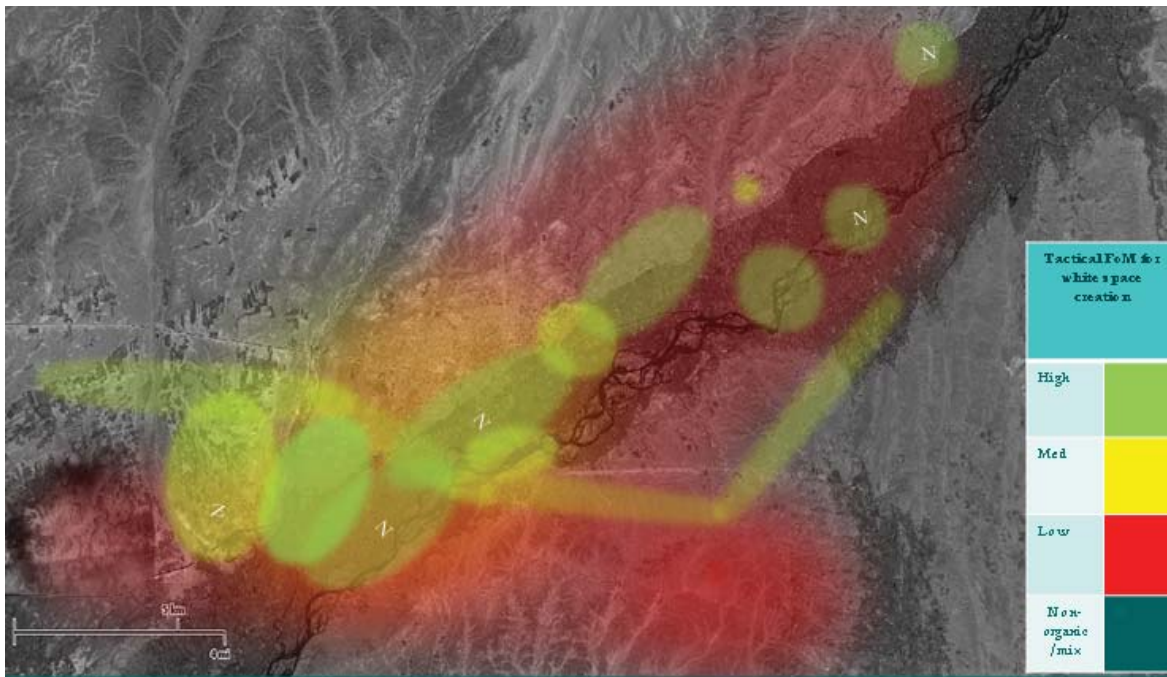
Table 7.0 QEQ JAN

Targets: Compounds of Interest (COIs), Persons of Interest (POIs), Battle Group (BG), Special Operations Forces/Special Forces (SOF/SF)			
Targets Generated for BG	Targets Generated for SOF/SF	Exploited by BG	Exploited by SOF/SF
282	35	33	16
TG = (282+35)		TA=(33+16)	
$QEQ = TG \times TA$ $= 15,533$			

Fig. 7.1 QEQ JAN



Map 6.0 January 2011 Tactical FoM



(N)=MSOC, TF Y, ATE, BRF, BAG, AFG 7th and 4th Commandos

ASSESSMENT JAN 2011

Once chaotic networking was identified as the problem, efforts were made to resolve the issue with the establishment of extra liaison officers (LOs) at higher levels by which to channel information to certain assets, however the intention behind the structural adaption was once again not driven by battlespace agility, but a structural addition to attempt to keep the hierarchy relevant. No authority to act was taken away from the assets, and the adjustment was quickly overtaken by the flat-lining of information on the new tactical ground reporting tool (TiGR) system. It was putting end for the hierarchy to require complete information from lower echelons as they could pull a great part of it themselves with a terminal. Anyone with a TiGR terminal has access to the most up to date information from the field units everywhere, no matter what level of the hierarchy one was on. It was another nail in the coffin of the “push” principle that drives hierarchal C2 (versus the “pull” principle that drives network C2) – at the time the study closed the QEQ was on its way back up.

CONCLUSIONS

Hierarchal C2 negatively affected battlespace agility as defined in this paper and reduced the warfighting effectiveness in a complex battlespace. It did so by negatively affecting information timeliness & currency. When information is subject to hierarchal C2 channeling, the speed and precision of the information flow and subsequent knowledge-action- effects conversion, becomes extremely open to perversions and delays by the structural requirements of each level in the hierarchy. Every time we delay the transfer of one piece relevant knowledge, for a fixed briefing - timeliness suffers, knowledge deteriorates, and we undermine our own flat-lining technological investments and their advantages.

Furthermore hierarchal C2 negatively affects information precision: Every time the knowledge is repeated, information precision is threatened. Like the ‘rumor’²³ game, every filter between the original source and the capacity to act, will without doubt, change the context to varying degrees. Information appropriateness suffered too, the fact that a complex battlespace requires an increase in the quantity of relevant information to the planning process²⁴exacerbates this phenomenon.

The quantity of information required at the edge for one unit engaged in the local environment has increased greatly, so the natural ownership of complete information to maintain battlespace agility has moved down the hierarchy out of pure necessity to tailor actions to fit the local complexities of a COIN environment. It is a fact.

Hierarchal operational information management is the major contributing factor to the undermining of hierarchal C2 organization. An issue identified by previous C2 research.²⁵ Socially, it cannot adapt to the speed of its own network technologies, and in a metaphoric sense ends up frustrating itself in terms of optimal decision-making within an EBT environment.

(23) The rumor game refers to the popular party game of taking a group of people in a room, whispering a story to the first person, who whispers it on to the next until it returns to the originator; the result is usually a very different story than first told.

(24) From 1 dimension of focus, the military, to 6 dimensions of focus built into PMESII.

(25) See available CCRP research at www.dodccrp.org.

There were two competing information management dynamics. The hierarchal C2 was driven by traditional 'push' procedures up and down stovepipes, this worked in stark contrast to the 'pull' dynamic driving the networked C2. The technology we now use is built to support to pull. (For example, JCHAT, Sharepoint, TiGR, and common geo-rectification software.)

SOF/SF units are more effective at using developed knowledge, likely because there are naturally less hierarchal in terms of C2, simply fewer layers between the source of knowledge and the actionable asset. SOF/SF also produced higher quality effects per action (see 'N' on all MoE maps.) This could be explained by a more efficient synchronization of 'plug and play' kinetic and non-kinetic means in their operations. More efficient because they have less traditional stove-piped C2 echelons along specialist lines. For example, plugging a Civil Affairs expert into a group for a specific mission, does not require coordination meetings between a S9 & S3, or J9 & J3, or CJ9 and CJ3, or all of the latter - to activate the specialist capacity needed for a particular mission.

Network C2 will naturally develop as long as the technology is there to promote it. Therefore where it concerns military social C2, our choices are few. Either we adjust the organization to facilitate the process to maintain effectiveness, or we try to stop the process to protect traditional C2 structures at a cost of undermining our own technology and overall effectiveness. It is likely we should be looking for new C2 roles within military social organization to facilitate the full exploitation of the technologies we are already using. We could have used something along the lines of "a social network manager specialist" to help maintain the integrity of information sharing networks within TFH and DABG, or a "specialist in synchronization" to ensure knowledge is delivered to all the right assets in order to maximize effect. However identifying those roles will require further research.

We have built a 21st century ISTAR²⁶ platform that provides real-time situational awareness; we have the 21st century information technologies that facilitate the flat-lining of knowledge sharing across an organization. This stands in stark contrast to the functional social organization of the military hierarchy that can still be described as Napoleonic.

(26) Intelligence, Surveillance, Target Acquisition, and Reconnaissance

References

- Abell, Peter (1991). *Rational Choice Theory*. Aldershot, UK: Edward Elgor.
- Alberts, David S. and Thomas J. Czerwinski.(1997) "Complexity, Global Politics, and National Security". June 1997.
- Alberts, David S. And Richard E. Hayes (2007) *Planning: Complex Endeavours*. DoD Command and Control Research Program, Washington, D.C., 1998
- Checkel, Jeffrey (1999). "Social Construction and Integration," *Journal of European Public Policy* Vol.6, No.4, September
- Coleman, James S. & Thomas J. Fararo (eds.) (1992). *Rational Choice Theory : Advocacy and Critique*. Newbury Park: SAGE.
- Coleman, James S. (1990). *The Foundations of Social Theory*. Cambridge: Belknap
- Czerwinski, Tom. (1998) *Coping with the Bound: Speculation on Nonlinearity in Military Affairs*. DoD Command and Control Research Program, Washington, D.C., 1998
- Czerwinski, Tomas J. (1996) "Command & Control at the Crossroads," *Parameters*, Autumn 1996:121-132
- Henrotin, Joseph & Tanguy Struye de Swielande. (2004) "Ontological –Cultural Assymetry and the Relevance of Grand Strategies," *Journal of Military & Strategic Studies*, Winter 2004, Vol. 7, Issue 2
- Johnson, Stuart E., and Levis, Alexander H. (eds.) (1989) *Science of Command and Control: Coping with Complexity*. Fairfax: AFCEA International Press, 1989.
- Johnson, Stuart E., and Levis, Alexander H. (eds.) (1988) *Science of Command and Control: Coping with Uncertainty*. Washington, DC: AFCEA International Press, 1988
- Mattis, Gen. J.N. USA DOD Doc. (2008) *USJFCOM Commander's Guidance for Effects-Based Operations*, Norfolk, VA: US Joint Forces Command, August 14, 2008.
- S. Metz, D.V. Johnson II, *Asymmetry and U.S. Military Strategy: Definition, Background, and Strategic Concepts*, London, Strategic Studies Institute, U.S. Army War College, January 2001, p. 6.
- Mitchell, William. *Ch.3 The Comprehensive Approach Dilemma: No Unity of Command -No Unity of Effort*. *Comprehensive Approach*. Edited by Flemming Splidsboel Hansen. *Spring 2010*
- Mitchell, William. *Agile Sense-Making in an Intersubjective Environment. International C2 Journal (IC2J)*. Spring 2010. http://www.dodccrp.org/html4/journal_v4n1.html

Mitchell, William. (2004) Instrumental Friend or Foe? Constructivist Activism in Security Policy Means Analysis. Politica, Arhus University, 2004

NATO (2007) Bi-Strategic Command Pre-Doctrinal Handbook “Effects Based Approach to Operations” 2007

NATO (2002) Code of Best Practice of C2 Assessment Analysts Summary Guide, Washington: CCRP

Nicholson, Peter. (2006) “Effects Based Strategy: Operations in the Cognitive Domain.” Security Challenges. Volume 2, Number 1, 2006:133-146

SAS-050 CCRP/NATO. (2006) Final Report: Exploring New Command and Control Concepts and Capabilities

Scott, John (2000). “Rational Choice Theory”. Browning, Gary et al., Understanding Contemporary Society: Theories of the Present. London: Sage; pp. 126-138.

Smith, Edward A. (2006) Complexity, networking, and effects-based approaches to operations. Washington: CCRP.

Smith, Edward A. (2005) Effects Based Operations: Applying network centric warfare in peace, crisis, and war. Washington: CCRP.

