Applying the RAAAKERS™ framework in an analysis of the command and control arrangements of the ADF Garrison Health Support

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Abstract

Australian Defence Force Garrison Health Support operate in a complex relationship between a geography-based National Support Area (NSA) health care model, in which most of the medical resources and staff are owned by the single services; deployable capabilities, also owned by the Single services; and a National health care system that provides primary, secondary and tertiary health care both to the NSA and to deployed forces.

The Alexander Review, amongst other things, was required to inform the development of a command and technical control structure for health units that optimizes operational efficiency and effectiveness, and clarifies accountability to the Service headquarters and other Groups in the ADF. The RAAAKERS™ (Responsibility, Authority, Accountability, Awareness, Knowledge, Experience, Resources and Systems) framework was used as an analysis tool to assist in understanding the main command and control stress points in the Defence Health Services Division (DHSD). Structured interviews with many of the key staff of DHSD allowed the RAAAKERS™ construct to probe into the alignment of elements related to command capability, such as the Responsibility, Authority and Accountability attributes, and those associated with elements of control, such as the KERS attributes. In particular the paper shows how data from the interviews enabled construction of RAAAKERS™ metrics to highlight problematic areas related to technical control and to a lack of alignment in Responsibility, Authority and Accountability in some areas of DHSD.

The Viable Systems Model (VSM), developed by operations research theorist Stafford Beer, is a model of the organisational structure of any viable or autonomous system. As an additional analysis tool for the Alexander Review, VSM techniques were used to study Garrison Health Support and to determine the structure of the five internal systems needed for viability. This preliminary study also indicated stress points in the technical control aspects of Garrison Health Support and provided some support to the findings of the RAAAKERS™ investigation.

Introduction

In March 2008 a Review into health support to the Australian Defence Force (ADF) was announced with MAJGEN Paul Alexander as head.

One of the purposes of the Review, colloquially known as the Alexander Review, was to:

"Inform the development of a command and technical control structure for health units that optimizes operational efficiency and effectiveness, and clarifies accountability to the Service headquarters and other Groups. This structure must comply with baseline clinical governance standards for patient safety, provider competency and reporting;"

The Defence Science and Technology Organization (DSTO) was engaged to provide lines of evidence in the report with respect to this requirement. In this paper a novel technique for measuring command and control capability is outlined and the related results from a study of Defence Health Services Division (DHSD) are presented. The RAAAKERS™ framework was used as an analysis tool to assist in understanding the main command and control stress points in the DHSD. RAAAKERS™ stands for Responsibility, Authority, Accountability, Awareness, Knowledge, Experience, Resources and Systems and was created by one of the authors (Durant-Law) as a way of representing the main attributes associated with management of a large or complex enterprise. This case study is the first time it has been applied to a real situation.

As described here RAAAKERS™ was used in the Alexander Review to shed light on command and control issues.

It may also be thought of more generally as a diagnostic approach for effective management of organisations. RAAAKERS™ may be contrasted with the Balanced Scorecard (BSC)[1]. The BSC is based on the perception of the firm as a largely stand alone profitability machine, which needs to be optimized to reach maximum efficiency[2]. It can provide a systematic tool for combining financial and non-financial performance indicators in one measurement system, but it does not offer anywhere near the same degree of insight into command and control as does RAAAKERS™. More interesting is Drucker's Five Most Important Questions self-assessment book and tool[3]. As part of a high level environmental scan of an organisation this asks the questions:

- What is our mission?
- Who is our customer?
- What does the customer value?
- What are our results?
- What is our plan?

It can be viewed as a guide for Boards of Management to enable them to stay focussed at the strategic level. However it lacks the level of detail necessary for the Alexander Review requirement to look into efficiency and effectiveness of Health command and control. Neither the BSC nor Drucker's approach capture the complexities of the Garrison Health Support environment where the single Services and DHSD have overlapping areas of responsibility.

Background

The Alexander Review also considered recommendations from previous reviews into the ADF Health Services, including the Stevens review conducted in 2004[4]. Clifford[5], in re-considering the Stevens review and its terms of reference, identifies command and control as central issues for the ADF Health Services. In particular Clifford argues that the decision to maintain the ADF Health Services long-standing command and control arrangements - in which the single services often have command of health capabilities and materiel whilst the DHSD was given technical control – leads to inherent difficulties for DHSD to meet its mission.

In this context the analysis reported here may be seen as providing detailed information and diagnostics on the current (mid 2008) model of command and control within DHSD.

The next section describes how data from the DHSD was gathered for the RAAAKERS™ framework and key results are presented. Based on the findings, Command and Control measures of effectiveness are also computed and discussed in terms of the insight these provide to the Alexander Review.

Data Gathering

Structured interviews were held with the senior managers and managers of the key directorates within DHSD. Each interview focussed on a questionnaire based on the eight attributes in the RAAAKERS™ framework. For each attribute a series of relatively straightforward questions probed the respondent for their judgement on how well their work area rated against that element. A summary question for each section was used as a data assurance technique to safeguard the overall score assigned to a RAAAKERS™ element. This method allowed the data to be gathered in approximately ½ hour for each interviewee.

Table 1 shows the guidance provided to the interviewees on the elements in the framework. Note the definitions of, and distinctions between, knowledge and experience in the table. In RAAAKERS™ knowledge refers to understanding of a field of endeavour gained through study or past training, while experience refers to the application of this knowledge in the context of the work currently undertaken (in this case by DHSD).

Results and Interpretations

The RAAAKERS™ data obtained for DHSD is summarised in this section. Table 2 shows a summary across the work areas surveyed [1].

As Table 2 shows Accountability is the one element that scores in the high range. However Figure 1, which plots Accountability and Authority across the work areas, shows that the Authority to go with this accountability is often lacking. Note that in Figures 1 and 2, lines join the data points for ease of viewing though the variables are not continuous.

Table 1: RAAAKERS™ Elements explained

RAAAKERS™ Attribute	Questionnaire Guidance
Responsibility	This section looks at attributes related to the sphere or extent of your activities and roles as head of a unit. It seeks to find out how you view your responsibilities, how well defined they are, to whom you are responsible, and how others see your responsibilities.
Authority	This section asks about the authority you have to carry out your roles and responsibilities. This relates to the amount of control you have, both within the work unit and outside, over tasks and activities that you rely on to carry out your role.
Accountability	This section asks about how accountable you are for the outcomes of your work unit. In this section we are particularly interested in misalignment in accountability and responsibility - for example when you may be accountable for an outcome over which you have little control.
Awareness	This section relates to the awareness you and your staff have of the state, activity, status or situation of your own work unit and those with which you deal with on a regular basis or those who you rely upon. For example, knowledge of the state of readiness of medical staff in an Area Health Service or in the Reserves is a type of awareness at the operational level, as is changes in the situation with respect to recruitment or retention of medical staff at the strategic.
Knowledge	This section relates to the knowledge available to you to assist in performance of your duties. This knowledge is closely related to the "Familiarity, awareness, or understanding gained through experience or study" and pertains to medical, academic, or military training and experience that can be brought to bear on the tasks and activities of the unit.
Experience	This section relates to the experience of staff available to you to assist in performance of your duties. In this context experience refers to familiarity and practice in working in the DHSD to achieve its outcomes. In contrast with the knowledge referred to in the previous section this is about how medical, academic or military know-how can be applied in the ethos, work structures and business processes of the DHSD.
Resources	This section relates to the resources available to you in your work unit and to the resources of other units that you rely upon. These resources can include access to personnel, and budget $ to run programs, perform training and attract and retain staff.
Systems	This section relates to the systems available to you in your work unit. These could include information systems, communication systems and systems for induction or on-the-job training.

Table 2: RAAAKERS™ Summary for DHSD

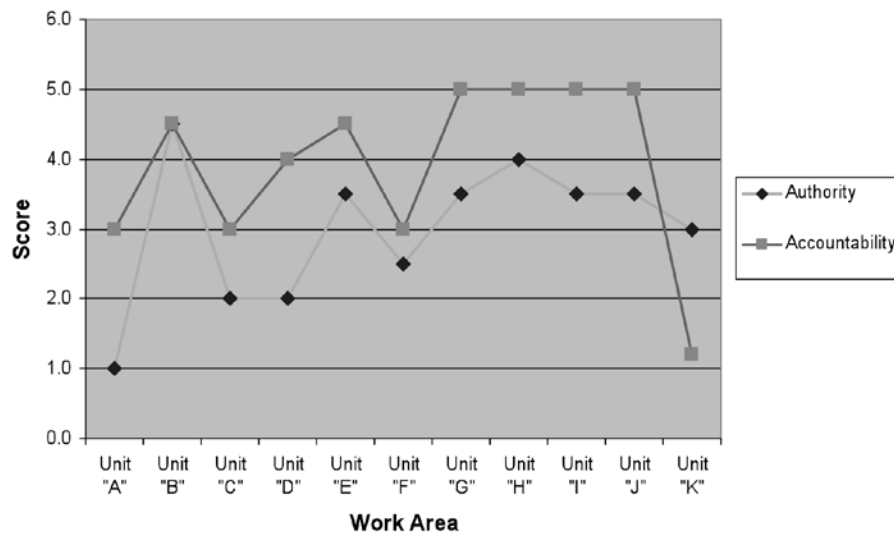|	RAAAKERS™ Attribute	Possible	DHSD
1	Responsibility	5	2.8
2	Authority	5	3.0
3	Accountability	5	3.9
4	Awareness	5	3.0
5	Knowledge	5	3.3
6	Experience	5	3.1
7	Resources	5	2.7
8	Systems	5	1.4
	Total Score	**40**	**23.6**

Figure 1: DHSD Authority vs Accountability

In order to further explore the implications of the data the following section outlines a basis for measurement of command and control capability. This is used to compute Command and Control measures of effectiveness for the areas surveyed in DHSD.

Command and Control Measures of Effectiveness

The current definition of Command and Control (C2) for the ADF is "Command and control is the system that empowers designated commanders to exercise lawful authority and direction over assigned forces for the accomplishment of missions and tasks."[6]. *Command* and *Control* are seen as separate but mutually reinforcing constructs[7] with Command defined as "the creative expression of human will necessary to accomplish the mission" and Control as "those structures and processes devised by command to enable it and to manage risk"[8].

For the RAAAKERS™ framework we propose that *Command* capability is strongly related to the elements Responsibility, Authority and Accountability and that *Control* capability is related to the attributes Knowledge, Experience, Resources and Systems. We further propose that it is the *minimum* value of the set {R, A, A} which determines the overall Command capability represented by these elements. This conjecture was tested in the questionnaire. At the end of the questions relating to the first three elements – Responsibility, Authority and Accountability - a separate question asked to what extent these three elements are in alignment and sufficient to enable the work area to carry out its roles and responsibilities. In

all but one case the answer to this was a value close or equal to the minimum of the set {R A, A}.

This approach is similar to the Balanced Command Envelope (BCE) of Pigeau and McCann[9]. This provides a method for describing those human attributes essential for command in the context of three command dimensions: competency, authority and responsibility. Pigeau and McCann write "We posit that the level of competency, authority and responsibility held by individuals in Command should ideally lie within a *Balanced Command Envelope*, a volume within the Command Space that balances the attributes in the three dimensions".

The value for *Control* capability was taken to be the average of the set {K, E, R, S}. We argue that these elements of the RAAAKERS™ framework are closely related to the "structures and processes devised by command to enable it and to manage risk" and are important elements that enable a control capability. The average is used in the absence of any published guidelines in this area.

These definitions allow us to compute Command, Control capabilities or measures of effectiveness (MoE). Table 3 shows the values across the work areas surveyed. It also gives a combined "Command and Control" MoE which is taken to be the product of the individual MoEs. The data has been normalised to lie in the range 0-1 where the scale ranges from zero to maximum capability for the measure in question. Figure 2 plots the values in Table 3.

Table 3: Command and Control MoEs by Work Area for DHSD

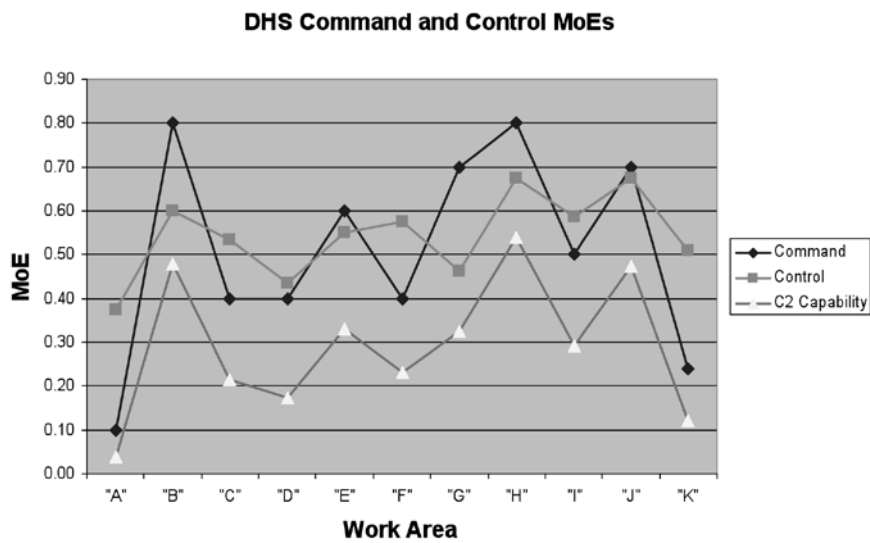|	Unit	Command	Control	C2 Capability
1	"A"	0.10	0.38	0.04
2	"B"	0.80	0.60	0.48
3	"C"	0.40	0.54	0.21
4	"D"	0.40	0.44	0.17
5	"E"	0.60	0.55	0.33
6	"F"	0.40	0.58	0.23
7	"G"	0.70	0.46	0.32
8	"H"	0.80	0.68	0.54
9	"I"	0.50	0.59	0.29
1	"J"	0.70	068	0.47
1	"K"	0.24	0.51	0.12
	Overall Average Score	**0.51**	**0.54**	**0.29**

Figure 2: Command and Control MoEs by Work Area for DHSD

It is apparent from Table 3 and Figure 2 that there are substantial problems with command and control across the areas surveyed. Work area "A" in particular, which is one of the central elements in DHSD, has particularly low scores reflecting low RAAAKERS™ element ratings for this unit.

The overall average C2 MoE for DHSD of 0.29 (according to the traffic light analogy of Table 2) reflects an overall issue with command and control for DHSD.

In order to get a different perspective on these findings, and on the functioning of the Garrison Health Support more generally, we looked at Garrison Health Support through the lens of the Viable Systems Model.

A Viable Systems Model Analysis

The Viable Systems Model (VSM) was created by operations research theorist Stafford Beer[10,11]. In this work he attempted to define the principles that underpin all viable or autonomous organisations –

defined as those entities capable of functioning and adapting successfully in a changing environment. VSM belongs to the field of Organizational Cybernetics - the use of effective methods for studying and controlling organizations.

The VSM has been used both as a way of understanding and diagnosing organisational problems and as means of organisational design. It provides a completely different view of an establishment to that provided by the organisational chart, and provides a different vocabulary (based on cybernetics rather than top-down command and control) for describing this view.

Beer used the VSM approach in Project CyberSyn, an ambitious attempt to provide the equivalent of a nervous system to an entire national economy [12]. This was Chile in the early 1970s where the government of Allende attempted to apply techniques from Beer to manage an economy beset with command and control problems. CyberSyn involved the use of Telex machines to daily transmit data relating to factory output, logistics flows, and other indicators such as rates of absenteeism. A single computer stored the data for inspection by the Government.

A fascinating review of Beer's career is given in reference 13. This includes advice offered in 1970 to the administrator's of the British National Health Service (NHS). In this Beer diagnosed the NHS in the following terms:

". . . three monolithic blocks: the hospitals, general practices, and local health authorities . . . an introverted organization, preoccupied with its own antecedents, its internal power struggles, its levels of status, its costs and its wages, which solves its management problems in equations of political factors and psychological stress".

His analysis led to a suggested reformulation of the way hospitals should be run, based on *information*, within a health service run on *regulative* lines.

In the VSM a viable system needs to have five key systems in place in order to operate effectively. These are: Implementation, Co-ordination, Control, Intelligence and Policy. The purpose of each of these systems is described in Table 4.

Table 4: Key Systems for Viability in the VSM

System	Function
1. Implementation	This system contains several primary activities. Each System 1 primary activity is itself a viable system due to the recursive nature of these systems. These are concerned with performing a function that implements at least part of the key transformation of the organisation.
2. Co-ordination	This system represents the information channels and bodies that allow the primary activities in System 1 to communicate between each other and which allow System 3 to monitor and co-ordinate the activities within System 1.
3. Control	This system represents the structures and controls that are put into place to establish the rules, resources, rights and responsibilities of System 1 and to provide an interface with Systems 4/5.
4. Intelligence	This system comprises those parts of the System-in-Focus which are concerned with Future plans and strategies in the context of environmental information. It also performs an intelligence function.
5. Policy	This system is responsible for policy decisions within the organisation as a whole to balance demands from different parts of the organisation and steer the organisation as a whole.

A preliminary VSM diagnosis of Garrison Health Support was performed using the methods given by Walker [14]. The purpose was to identify the five systems (See Table 4) needed for viability for Garrison Health Support, and to map the existing structure and work units onto these systems.

The first step in this process that defines the boundaries of the system-in-focus was in some respects the most difficult. This is due to health units on a base being under command of a different system – for example the Army – but still part of the Garrison Health Support system. In the analysis this was glossed over and units were considered to consist of the medical staff, materiel and facilities in the nine Area Health Services plus sundry other Health units such as CAMU (Canberra Area Medical Unit). In addition Health capability deployed on operations was not considered part of the system. This is because the Garrison Health Support was viewed as the raise-train-sustain function for Command Joint Operations Centre (CJOC) and the deployed Commander having command and control of all deployed capability.

Table 5 shows a summary of the VSM sub-system analysis for Garrison Health Support.

Table 5: The VSM systems for DHS

	System 1	System 2	System 3	System 4	System 5
Role	**Primary activities – operational units**	**Regulation and tactical planning**	**Operations Planning & Control**	**Future Plans, Research, Program development**	**Overall Policy**
JHSA Units	The nine AHS Three Health Units	SHOs and BMs in the AHS	Health Services Branch Health Reserves for each service under SGADF	Strategic Health Policy and Plans Branch Defence Health Consultative Groups	Head DHS SGADF DGHS, DGHPP

AHS – Area Health Service; SHO – Senior Health Officer; BM – Business Manager SGADF – Surgeon General ADF; DGHS – Director General Health Services; DGHPP - Director General Health Policy and Plans; JHSA – Joint Health Support Agency

This preliminary analysis produced the following results. Firstly Garrison Health Support as constituted when the study was carried out had the necessary systems for viability. Secondly a more detailed work unit breakdown than that shown in Table 5 showed that one work element of DHSD was spread across Systems 2, 3 and 4. This is possibly an indication that autonomy is fragmented for this area. Interestingly this was also the unit that showed up with the lowest RAAAKERS™ scores and C2 MoEs.

Conclusion

In support of the need in the Alexander Review to look at command and control arrangements in the ADF Health Services we have presented an analysis based on RAAAKERS™ and an analysis based on the VSM. The RAAAKERS™ data, and the measures of effectiveness which are calculated from the data, indicated problems with command and control. These are exacerbated by lack of support in decision-making tools and data for management purposes. Primary amongst a number of issues were that many senior staff felt they were accountable for outcomes over which they little authority and that there was in consequence a lack of unity of command. The VSM provided support for some of the findings from the RAAAKERS™ analysis and bears further investigation as a diagnostic tool for complex organisations.

The results provide strong support for the ideas put forward by Clifford[5] who also saw command and control as central issues for the ADF Health Services.

The head of the review, MAJGEN Alexander, used the results as a line of evidence in a submission to the Chiefs of Service Committee (COSC) recommending a number of changes to the ADF Health Services. COSC accepted the preliminary findings of the Review and

agreed to create Joint Health Command and the position of Commander Joint Health as the first step to achieve unity of command.

The results presented here, and the degree to which they were understood, accepted and used by MAJGEN Alexander, suggests that RAAAKERS™ is a viable diagnostic framework for the types of problems under investigation. We believe that it is sufficiently generic to be applicable across a number of domains including Defence operations.

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