Australian Government

Department of Defence
Science and Technology

OPERATIONS ANALYSIS (OA)

Supporting commanders in
operational environments

Executive guide

The Art of Military Science

WHO ARE THE OA ANALYSTS?

In its execution of military operations, the ADF recognises that at times it does not have the necessary capability or skillsets within its uniformed ranks to meet specific, unique, highly specialised demands. Defence Science and Technology Group scientists, engineers and analysts support ADF operations by undertaking tasks to close many of these critical 'capability gaps'.

VCDF Group are the capability manager for OA with DST Group maintaining the role of capability provider – the S&T 'Centre of Excellence'. The capability is managed by the DST Operation Support Centre (DOSC) based in Edinburgh, SA.

OA personnel deployed to theatre are S&T qualified individuals from a wide range of scientific disciplines who have been carefully selected and prepared to bring real scientific rigor and analytical tools to decision making in complex operational environments.

HOW ARE OA ASSETS EMPLOYED?

Analysts employ the scientific method to support operational commanders, this includes the scrupulous gathering of accurate date followed by systematic impartial analysis of that data to reach a conclusion or make a recommendation. To do this effectively, analysts need access across the HQ staff, to other commands and to interagency and coalition staffs. Solid working relationships, both horizontally and vertically, among the echelons contribute to the OA personnel's capacity for thorough analysis.

Both physical location and position within the HQ staff hierarchy are considerations in locating OA staff. Ensuring the senior OA staff member is included in the Principle Staff Officer corps is key to their access to both knowledge and the tone of operations and will be important in cross-staff interaction.

DST Group analysts have been selected for (and trained in) their ability to satisfy the following duties and responsibilities:

+ **Problem Definition.** Help the commander to articulate the problem to be addressed. Support staff to understand clearly defined and measurable outcomes based on the effects demanded of the military action.

+ **Planning Process.** Assist in decision-making by supporting the JMAP process with COA analysis, wargaming, resource allocation, optimisation of assets, probability studies, monitoring and assessing the execution of the plan.
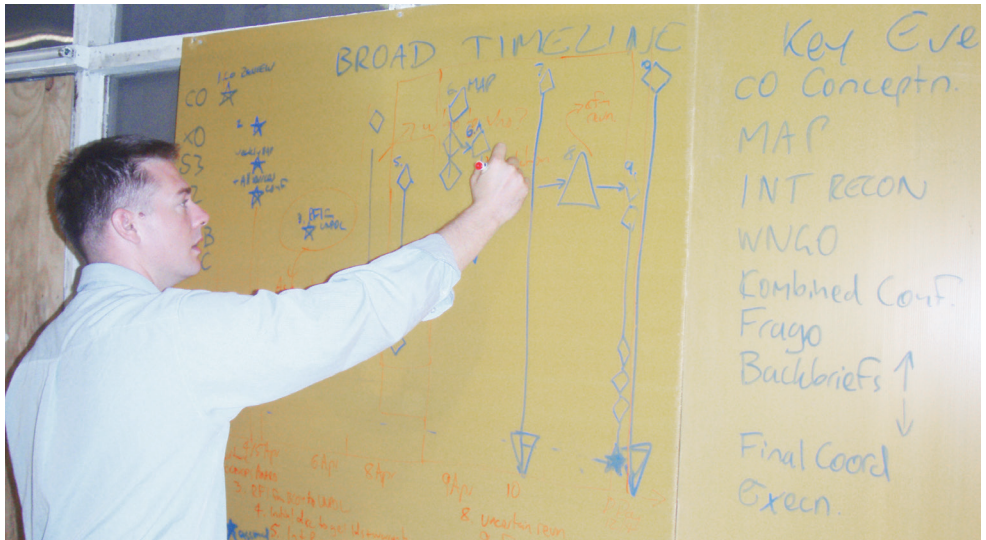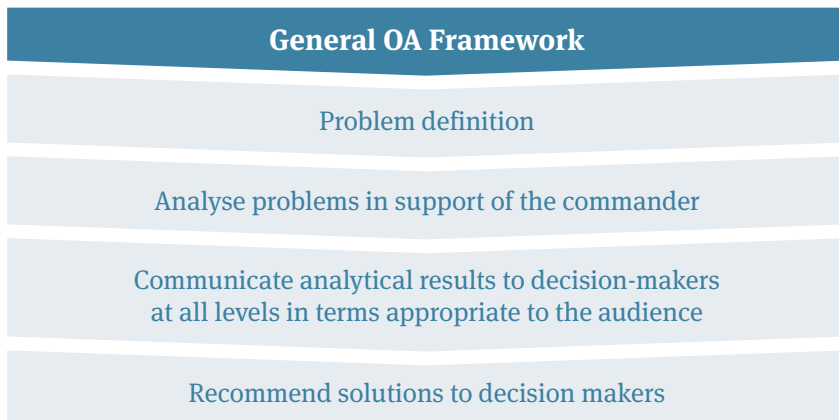
+ **Analysis.** Conduct analysis to support commander's decision-making processes. This may consist of answering requests for information (RFI) and conducting trend analysis on a wide range of data. Analysis often supports resource allocation, optimisation of assets, supports new technologies into theatre, risk, trends and battlespace transition.

+ **Assessment.** Identify, develop and analyse metrics that quantify effectiveness of military (and non-military) actions in support of the objectives and effects outlined in commander's operational plans. This may include task assessment (are we doing things right?), effects assessment (are we doing the right things?), and campaign assessment (are we accomplishing the mission?).

+ **General.** Supporting briefings with data visualisation and other staff duties as required.

HOW DO ANALYSTS ENABLE BETTER COMMANDER UNDERSTANDING?

In an operational environment where resources are finite, decisions need to be made quickly and plans executed rapidly, OA staff can add value in the following ways:

+ Manage, analyse and display large quantities of disparate data
+ Bring an analytical mind (scientific approach) to bear in strategy and courses of action (COA) development
+ Develop metrics for a wide array of topics, including campaign assessments
+ Provide recommendations based on data that are tactically, operationally and strategically relevant.
+ Effectively communicate implications and recommendations to senior leaders and decision makers (often supported by visualisation)
+ Improve overall staff abilities/effectiveness by sharing analytical and technical skills.

General OA Framework
Problem definition
Analyse problems in support of the commander
Communicate analytical results to decision-makers at all levels in terms appropriate to the audience
Recommend solutions to decision makers

WHAT DO OA STAFF BRING TO THE OPERATION?

OA personnel use quantitative and qualitative analysis throughout the decision-making process. They are adept at problem definition, problem solving, identifying risk, data collection and knowledge management, data visualisation, communicating results and making data-based recommendations. They do not make decisions; analysts analyse; commanders command.

OA staff can use a range of techniques to help define a problem, allocate scare resources and to prepare, plan, analyse and assess all aspects of military operations.

OA Methods and Technologies

- + data analysis
- + campaign assessments
- + risk mitigation
- + decision models
- + wargaming
- + simulation
- + resource management
- + survey design and analysis
- + data and info management
- + brainstorming
- + decision trees
- + influence diagrams
- + optimisation studies
- + nodal or flow modelling
- + interview techniques
- + qualitative assessments
- + cost/benefit analysis
- + probability assessment
- + trending and forecasting
- + geospatial analysis
- + effects assessment
- + logistics support analysis
- + cognitive mapping
- + social network analysis
- + spreadsheet modelling
- + prioritisation studies

WHAT TOOLS OR SPECIALISED EQUIPMENT DOES OA UTILISE?

OA personnel require access to specialised hardware and software to implement their analytical techniques. All OA staff have received relevant training and are equipped before deploying. Additional specialised software may be necessary in certain environments. Most of the tools used by forward-deployed OA personnel are standard Defence issue, currently a Microsoft suite of programs.

Microsoft Suite:

+ Excel

+ Access

+ PowerPoint

+ VISIO

Specialised software:

+ Statistical – SPSS, STATA, MiniTAB

+ Simulation – ProModel, Arena, MATLAB

+ Geospatial – ArcGIS, GRASS, GeoServer, FalconView

"DSTO will continue to provide direct support to current ADF operations, including attaching staff from the DSTO to deployed units"

DEFENCE WHITE PAPER 2013, PAGE 110

WHAT IS REACHBACK ANALYTICAL SUPPORT?

It is unrealistic to imagine that any one analyst has a full scope of knowledge and skill to contribute meaningfully to every military problem. Reachback allows forward-deployed personnel to draw upon both the resources and capabilities of DST Group, WoG Agencies, industry and academia institutions. Reachback analysis augments the operational OA capability.

Although deployed analysts should have a wide scope of talents to support commanders, frequently they will need to seek greater resources from experts located in Australia via the Reachback process which is managed by DOSC when the complexity, timeframe and/or scope of a given problem exceed their organic capability.

DOSC Reachback may respond to a request for support by sending a small team of subject matter experts forward (Fly Away Team) to address the immediate, defined problem. Any deployment of this nature will require the approval of DCJOPS.

OA personnel are well familiar with this process and the structure surrounding its access.

"Operations analysis needs to be a natural and integral part of the way we plan for, conduct and learn from all ADF operations"

LTGEN KEN GILLESPIE, CHIEF OF ARMY, 2010

STRONGER KNOWLEDGE MANAGEMENT LEADING TO SUPERIOR RESULTS

The defence environment is complex and dynamic. The nature of modern conflict, rapidly changing technology, changing attitudes to risk and the sheer diversity of actors from different cultural backgrounds are factors in that environment. Defence decision makers are confronted with an increasing operational complexity which have strategic implications and influence the attainment of national goals.

The ADF has looked to Operations Analysis which uses scientific methods – both qualitative and quantitative – to improve situational awareness thus enabling commanders and staff to better understand this complex operational environment. With a better understanding of the environment the supposition follows that commanders can make better decisions that lead to more favourable outcomes.

OA can further assist the commanders to 'close the loop' by measuring the effectiveness of their actions and adapting responses to their dynamic surrounds.

"On my return to Australia I can say this: I could have significantly reduced the size of my headquarters personnel and probably halved the number of intelligence staff... but I was convinced that I would never deploy again without a science team at my side. I believe their inclusion ultimately saved Australian lives"

LTCOL ROGER NOBLE, COMMANDING OFFICER, AL MUTHANNA TASK GROUP 1

HOW TO ACCESS THE OA PROGRAM

For further information please contact:

http://intranet.dsto.defence.gov.au/workareas/SptOps/

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Pass this executive guide on to management at senior and middle levels in your organisation and to any others who should know about the power of Operations Analysis and how to access it.

DST GROUP

Science and Technology for Safeguarding Australia