# MINISTRY OF DEFENCE

# MOD Architectural Framework

# White Paper on Strategic View 2 (StV-2): *Capability Functions*

**Version 1.0**
**3 March 2005**

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Approved by:-

# RECORD OF CHANGES

This page will be updated and re-issued with each amendment. It provides an authorisation for the amendment and a checklist to the current amendment number.

| Issue No. | Date | Revision Details |
|---|---|---|
| Draft 0.1 | 19 November 2004 | First draft for review |
| Draft 0.2 | 23 November 2004 | Included additional Parameter and Metric information to enhance view |
| Draft 0.3 | 25 November 2004 | Formatting enhancements |
| Draft 0.4 | 22 December 2004 | Revised Data model section |
| Draft 0.5 | 14 January 2005 | Changes made following review meeting of 5 Jan 05 |
| Draft 0.6 | 17 January 2005 | Revision to data model section |
| Draft 0.7 | 27 January 2005 | Final revision prior to release |
| Version 1.0 | 3 March 2005 | Updated to include linkage to MODAF meta model and finalised for publication |

# Introduction

*The purpose of this paper is to describe the initial content and layout of the Capability Functions (StV-2) view in a way, which would allow peer review from stakeholders. With the exception of this section, the rest of the paper follows the layout of the DODAF volume II document. The intention is that this format will be retained and used in the final MODAF documentation, currently scheduled for publication in July 2005.*

The MOD Architecture Framework (MODAF) is being developed with the intention of providing a rigorous way to specify systems of systems, and is a key enabler to NEC[1]. The framework will predominantly be used for acquisition purposes, and a key driver for its adoption is the need to improve interoperability between systems. However, the MODAF could equally well be used to analyse existing, operational systems and better enable their integration with other systems (both new and existing).

An architectural framework defines a set of key business and technical information for describing a system of systems architecture. The purpose of an architectural framework is to define the operational context (organizations, locations, processes, information flows, etc.), the system architecture (interfaces, data specifications, protocols, etc.), and the supporting standards and documents that are necessary to describe the system of systems. The information presented in an architectural framework is split into logical groupings – usually known as views. The same system and business elements may be present in more than one view, but the purpose of each view is different and so each provides a different viewpoint on the information.

The most mature and widely adopted architectural framework in the defence industry is the US DoD Architectural Framework (DoDAF). This framework has its origins in the C4ISR community and is seen as a fundamental part of the DoD's drive towards Network Centric Warfare. The MODAF is to based on the DoDAF specification, and will use many of the aspects of DoDAF without alteration. MODAF will also add a number of new views needed to support MOD-specific processes and structures. In addition, other views will be modified, based on lessons learned by users of DoDAF.

The *Capability Functions* (StV-2) view is one of the new strategic views that MODAF adds to the base DODAF standard. The purpose of the StV-2 view is to provide a structured list of capability functions that are expected to be available within a capability area during a defined epoch.

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[1] CM(IS) NEC Next Steps paper of April 2003

# Capability Functions (StV-2)

## Capability Functions (StV-2) – Product Description

**Product Definition -** The *Capability Functions* (StV-2) view provides a structured list of capability functions that are required to be available within a capability area during a certain epoch.

**Product Purpose -** The StV-2 view is used to support the Capability Audit process, providing a structured framework or taxonomy.  In addition it can be used as a source document for the development of high-level use cases and KURs.

**Product Detailed Description -** The StV-2 view is used to capture and organise the capability functions required to deliver the vision set out in the *Capability Vision* view (StV-1) into a structured list.

The structured list provided in the StV-2 view will be a comprehensive list of the functions that will need to be delivered during a particular epoch.  The list is structured hierarchically, where necessary sub-dividing each Capability function into sub-capabilities and/or functions, to provide clarity and the necessary level of granularity to support subsequent processes in the Capability management process.   All terms used in the StV-2 should be expressed only in non-platform specific based terms e.g. Capability based not equipment focused.

In addition to the Capability nomenclature, appropriate quantitative attributes and metrics for that specific Capability or function should be included e.g. the required speed of processing, the rate of advance, the maximum detection range, etc.  These attributes and metrics will remain associated with the Capability whenever it is utilised across the MODAF framework. The quantitative values expressed could be linked to specific epochs, or be 'as-is' values and/or or 'to-be' targets.

The StV-2 view has no mandated structure although the format selected must be able to support the representation of a structured/hierarchal list.  This structure could be delivered using textual, tabular or graphical methods.  The associated attributes and metrics for each Capability function can either be included on the main StV-2 view, or in tabular format as an appendix if the inclusion of the attributes and metrics would over complicate the presentation of the view.

Examples of an StV-2 view for CBM(L) capability functions are included in Figures 1, 2 and 3 below:
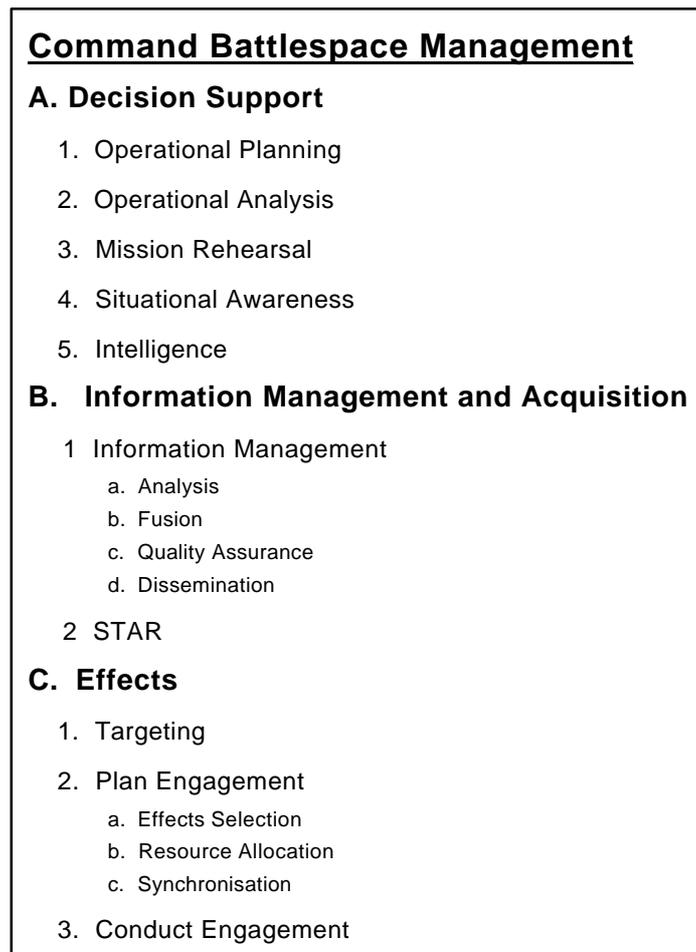
**Command Battlespace Management**

**A. Decision Support**

   1. Operational Planning

   2. Operational Analysis

   3. Mission Rehearsal

   4. Situational Awareness

   5. Intelligence

**B.  Information Management and Acquisition**

  1 Information Management
      a. Analysis
      b. Fusion
      c. Quality Assurance
      d. Dissemination

  2 STAR

**C.  Effects**

   1. Targeting

   2. Plan Engagement
      a. Effects Selection
      b. Resource Allocation
      c. Synchronisation

   3. Conduct Engagement

**Figure 1:** An example of the StV-2 view - Textual Representation
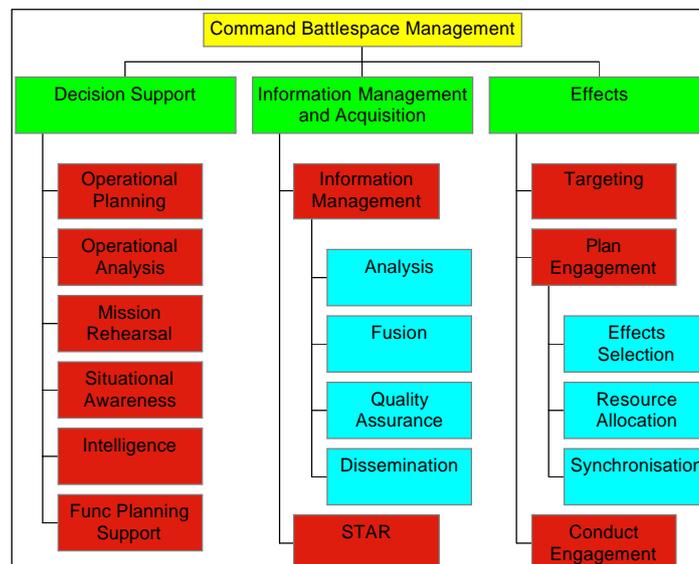


**Figure 2:** An example of the StV-2 view - Graphical Representation

| Command Battlespace Management | | |
| --- | --- | --- |
| **Decision Support** | **Information Management & Acquisition** | **Effects** |
| 1. **Operational Planning:**<br>• Initiation<br>• Mission Analysis<br>• CCIR & planning guidance<br>• Estimate<br>  - COA<br>  - Wargaming<br>• Decision<br>• CONOPS<br>• SoM<br>• Assemble/review Plan<br>• Orders<br>2. **Operational Analysis**<br>3. **Mission Rehearsal**<br>4. **Situational Awareness:**<br>• Physical Env<br>• Mission Env<br>• Blue Env<br>• Red Env<br>• White Env<br>• APNLRS<br>• CID<br>5. **Intelligence:**<br>• CCIRM<br>• Int Direction<br>• Collection mgt<br>• Collation mgt<br>• All-source fusion<br>• Dissemination | 1. **Information Management**<br>• Information Analysis<br>• Information Fusion<br>• Information Quality Assurance<br>• Information Dissemination<br>2. **STAR**<br>• STAR Asset Management/Tasking:<br>  − STAR asset status monitoring<br>  − Mission planning<br>  − Mission control<br>  − Sensor cueing<br><br>• STAR Product Management**:**<br>  − Product analysis<br>  − Collation and fusion<br>  − Product Dissemination | 1. **Targeting**:<br>Target selection<br>Target List management<br>Attack Guidance Matrix<br>Targeting Cycle:<br>• Detect<br>• Recognise<br>• Identify<br>• Track<br>• Decide<br>• Engage<br>• Assess |
| 6. **Functional Planning Support:**<br>• Arty Fire planning<br>• Engr Obs planning<br>• Engr Sp planning<br>• EOD planning<br>• AD planning<br>• EW planning<br>• Air planning<br>• Avn planning<br>• CIS planning<br>• Info ops planning<br>• Log planning<br>• Sup<br>• ES<br>• Tpt<br>• Med<br>• Personnel planning | | 2. **Plan Engagement**:<br>• Effects selection<br>• Resource allocation<br>• Synchronisation<br><br>3. **Conduct Engagement**:<br>• Decision<br>• Fires/Mission Control<br>• BDA<br>• Reporting |
| **Information and Communications Infrastructure** | | |

**Figure 3:** An example of the StV-2 view - Tabular Representation

## Taxonomies

The MODAF Taxonomy is to be developed in a related project in conjunction with the communities of interest. The Integration Authority is coordinating current work and subsequent ownership will rest with DG Info.

## UML Representation

The StV-2 view can be represented easily in UML. An example of the StV-2 view expressed in UML is shown in Figure 4 below.
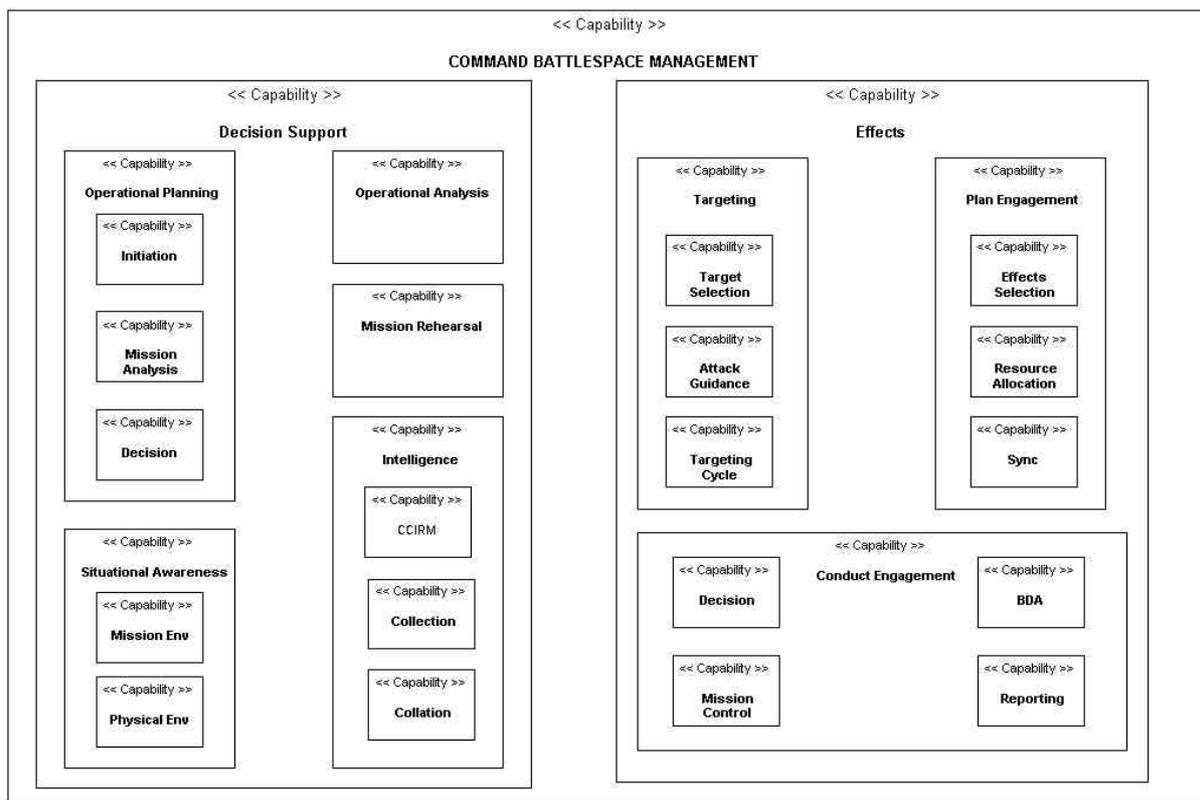
**Figure 4:** An example of the StV-2 view expressed in UML

## MODAF Meta-Model Support for StV-2

The MODAF Meta-Model defines a UML profile for exchanging information between MODAF tools using the XMI file format. For StV-2 the appropriate section of meta-model needed to exchange that view's information is shown in Figure 5. It should be noted that the classes shown for one view may be used in several other views.

The classes defined in the MODAF Meta-Model specify the allowable UML stereotypes that may be exchanged in an XMI file. As it is a meta-model, all relationships that feature in the view are also modelled as classes. Rather than define a class for every conceivable item that could appear in a view, the meta-model defines generic classes and allows references to the MODAF Taxonomy. For example, the MOD would be represented in XMI as an Organization stereotype, with a tagged value referring to the element in the taxonomy which says "Ministry of Defence".

For more information on the use of XMI in MODAF, refer to the document "XMI UML & MODAF", available from www.modaf.com

**Figure 5** – MODAF Meta-Model Excerpt for StV-2

## Model Element Definitions

*Capability* – A high level user requirement, usually functional. A capability may have performance metrics represented as Physical Properties.

*CapabilityComposition* – A parent-child relationship between two capabilities – i.e. the relationship indicates one capability (child) is a sub-capability of the other (parent).

*PhysicalProperty* – A property of something in the physical world, expressed in amounts of a unit of measure. The property may be effective between two points in time.

*UnitOfMeasure* – A determinate amount or quantity adopted as a standard of measurement for other amounts or quantities of the same kind.