

MINISTRY OF DEFENCE



MOD Architectural Framework

Overview of Strategic Views

Draft 0.2
29th September 2004

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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	23 rd Aug 2004	First Draft Issue: New document to provide guidance on implementation of MODAF Strategic Capability Views prior to availability of MODAF handbook.
Draft 0.2	29 th Sep 2004	Updated to reflect policy to name these views Strategic Views. This version is an unapproved draft provided for initial guidance only.

Introduction

DODAF views tailored to MOD processes and lifecycle

The MOD Architectural Framework (MODAF) is being developed as a critical enabler of NEC¹, which enables improved interoperability and should realise significant cost avoidance benefits through improved efficiency of the MOD acquisition processes and reduction in the amount of rework required to deliver interoperability and integration. The full rationale behind the development of MODAF and its expected benefits are described in more detail within the MODAF PID and its associated business case.

MODAF will be based largely upon best practice, which for defence acquisition is mainly the US Department of Defense Architectural Framework² (DODAF). However, DODAF was developed over a number of years to meet the needs, organisational structure, doctrine and acquisition processes of the US armed forces and as a consequence is not always ideally suited to MOD needs. Therefore, although many DODAF views will be used as-is, some are likely to be dropped, as mandatory views at least, and others added to supplement the needs of the MOD processes and lifecycle.

Key amongst these additions will be the Strategic Views (StVs) that describe the requirements, relationships and acquisition timeline for military capability elements. These views will mainly support the capability management processes and their interfaces with other key MOD processes such as operational concepts and acquisition. Furthermore, the StVs are intended to characterise military capability across all of the lines of development.

Aim

The aim of this paper is to give an overview of the Strategic Views whilst the full MODAF documentation is being developed. This paper therefore provides interim guidance only and will be superseded by the MODAF handbook when available.

Scope and Exclusions

The scope of this paper is limited to the Strategic Views and is provided as interim guidance only whilst the MODAF views are fully developed and documented in the MODAF handbook. A similar paper will be developed on the Acquisition Views. For all other views (Operational, System and Technical) it is recommended that the DODAF documentation is consulted until definitive MODAF documentation is available.

Development of StVs

The utility of StVs has been established for some time and their current definition owes much to the System of Systems Architectural Framework³ developed by the Integration Authority. This work identified the 5 potential StVs documented here. The concept of employment for these views and their associated roles and responsibilities were further developed by the MODAF project during its initial consultation with the relevant communities of interest

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

² DOD Architectural Framework, version 1.0, February 2004.

³ Land Digitisation, System of Systems Architectural Framework, IA, July 2003.

(COI) as part of the start-up and initiation stage of the project.

A number of pilot projects are being utilised by the MODAF project to assess the utility of different MODAF views to a variety of projects – which will cover a broad spectrum of MOD activities and stages through the CADMID cycle. The feedback from these pilots will be used to identify issues with the StVs as currently defined and develop improvements for inclusion in the MODAF handbook.

During the development stage of the MODAF project the StVs will be further refined through consultation with the main affected stakeholders and document more fully in a MODAF handbook, similar in style to volume 2 of the DODAF suite of documents.

Strategic Views (StVs)

Five Strategic Views support the Capability Management process

The StVs are intended primarily to support the Capability Management process, which involves the management of a wide variety of issues associated with the development of military capability, including:

- Measurement of capability / effectiveness
- Capability Audit process including the identification of capability gaps and overlaps
- Development of capability goals and requirements
- Identification and management of cross-capability dependencies
- Balance of investment analyses including affordability constraints
- Management of the acquisition process and capability delivery
- Capability integration including integration across all the lines of development

These activities are undertaken largely by the ECC, but with major contributions being made by a number of other MOD organisations, including the Front Line Commands and the various branches responsible for operational concepts and doctrine.

There are currently 5 candidate StVs that are intended to support the Capability Management process. However, since the intent is that MODAF will only mandate 10 to 15 views overall, it is likely that only 2 or 3 StVs will be mandated. The remaining StVs will still be documented within the MODAF handbook as optional views and may still be used by the relevant MOD communities as they see fit.

The 5 candidate StVs are:

- StV-1 Capability Vision
- StV-2 Capability Functions
- StV-3 Capability Phasing
- StV-4 Systems of Systems Clusters
- StV-5 Capability to Systems Deployment Mapping

A summary of each of these views is included below.

StVs should be focussed on a bounded capability area and time scale

A question that often arises with the development of MODAF views is what their scope should be. Although it may be possible to develop a suite of StVs that cover the entirety of the MOD military capability this would be difficult to compile and maintain. Furthermore, there are few Capability Management issues that would require analysis across such a broad overview. Conversely, set of StVs that focus around each acquisition project (ie IPT) would mean that a prohibitively large number of architectural views would have to be consulted to address many typical Capability Management issues. Therefore, the most sensible level of abstraction at which to develop sets of linked StVs across a closely coupled, but bounded capability area. This might sensibly align with the organisational boundaries of the DEC's (eg ISTAR) or for larger DEC's some subdivision may be required (eg communications, infrastructure and applications within DEC CCII).

A similar question arises in relation to the time scale that should be addressed with a MODAF view or set of views. StVs must clearly relate to points in time, since the military capability to which they refer changes continually. However, with the issues being addressed through the StVs it would be inappropriate for the views to consider each minor change to military capability. Instead, the concept of "epochs" has been developed⁴ which define a windows in time over which relative stability in military capability exists and the changes between epochs represent a step change in military capability. Examples might include the digitisation of Land Forces through BOWMAN that moves them from the "Digitisation Stage 1" epoch to the "Core Digitisation Stage 2" epoch. Although there may be a number of capability increments within an epoch (eg the various BISA upgrades associated with each annual CBM(L) increment), the basic capability remains broadly the same within an epoch (ie the BOWMAN infrastructure).

The majority of StVs will therefore relate to a bounded capability area and bounded time scale or epoch.

StV-1 Capability Vision

StV-1 captures the vision for military capability

StV-1 Capability Vision provides an outline of the vision for a capability area over a particular time frame. This vision may start as a very broad operational concept such as the HLOC⁵ which covers a wide range of capability areas and time scales. However, this will become more meaningful in capability terms when it has been developed to describe how high level goals and strategy are to be delivered in capability terms.

The StV-1 view is likely to be developed from inputs by the operational concepts and research communities and will serve to inform the long term capability planning process as to what the future capability needs might be.

⁴ See the LDI System of Systems SEMP, IA, July 2003.

⁵ UK Joint High Level Operational Concept, JDCC, October 2003.

StV-1 Format There is likely to be little prescribed structure or format to StV-1, it being largely textural with illustrations as appropriate. An example from the HLOC is included below.

DRAFT	UNCLASSIFIED	DRAFT
THE JOINT HIGH LEVEL OPERATIONAL CONCEPT		
CAPPING PAPER		
<p>1. The UK Joint High Level Operational Concept (HLOC) provides a transformational head mark for UK operations in 2020. It is an analytical concept that uses the Defence Capability Framework¹ for which seven separate papers articulate the detail². This paper summarises essential issues. Historical research, a review of current doctrine and analysis of lessons identified in major operations over the last 12 years provides a strong sense of what should endure for future operations as much as what might need to change. This allows the concept to be framed in a way that will help the single Services to interpolate coherent interim steps for their own force development. The HLOC provides guidance for research, experimentation, single Service concept development, force development and future capabilities requirements. The UK may not have the resource to risk large scale intervention in equipment programmes or other lines of development, therefore the concept assumes pragmatic evolution toward the head mark, albeit with the transformational goals below always clearly in sight.</p>		
OPERATE CORE CONCEPT		
An agile task-oriented joint force with freedom of action to synchronise effects throughout the battlespace and with maximum potential to exploit fleeting opportunities.		

StV-2 Capability Functions

StV-2 identifies the required capability functions StV-2 Capability Functions is used to develop a structured list of capability functions that are expected to be available within a capability area during a certain epoch. This list should be a comprehensive list of the business functions that have to be fulfilled by the military capability. This should be expressed in terms of command support / effects.

Ideally, the StV-2 should demonstrate traceability to the StV-1 capability vision – which will change through time. It is likely to have inputs from operational concept branches and Customer 2.

Usage of the StV-2 is likely to include providing a framework for the capability audit process and for high level use cases / KURs.

StV-2 Format There is no prescribed structure for the StV-2 although it is likely to be a structured hierarchy of capability functions – in textural, tabular or graphical terms. An example of StV-2 for CBM capability functions is included below.

Command Battlespace Management		
Decision Support	Information Management & Acquisition	Effects
1. Operational Planning: <ul style="list-style-type: none"> • Initiation • Mission Analysis • CCIR & planning guidance • Estimate <ul style="list-style-type: none"> - COA - Wargaming • Decision • CONOPS • SoM • Assemble/review Plan • Orders 2. Operational Analysis 3. Mission Rehearsal 4. Situational Awareness: <ul style="list-style-type: none"> • Physical Env • Mission Env • Blue Env • Red Env • White Env • APNLRs • CID 5. Intelligence: <ul style="list-style-type: none"> • CCIRM • Int Direction • Collection mgt • Collation mgt • All-source fusion • Dissemination 6. Functional Planning Support: <ul style="list-style-type: none"> • Arty Fire planning • Engr Obs planning • Engr Sp planning • EOD planning • AD planning • EW planning • Air planning • Avn planning • CIS planning • Info ops planning • Log planning • Sup • ES • Tpt • Med • Personnel planning 	1. Information Management <ul style="list-style-type: none"> • Information Analysis • Information Fusion • Information Quality Assurance • Information Dissemination 2. STAR <ul style="list-style-type: none"> • STAR Asset Management/Tasking: <ul style="list-style-type: none"> - STAR asset status monitoring - Mission planning - Mission control - Sensor cueing • STAR Product Management: <ul style="list-style-type: none"> - Product analysis - Collation and fusion - Product Dissemination 	1. Targeting: <ul style="list-style-type: none"> • Target selection • Target List management • Attack Guidance Matrix • Targeting Cycle: <ul style="list-style-type: none"> • Detect • Recognise • Identify • Track • Decide • Engage • Assess <hr/> 2. Plan Engagement: <ul style="list-style-type: none"> • Effects selection • Resource allocation • Synchronisation <hr/> 3. Conduct Engagement: <ul style="list-style-type: none"> • Decision • Fires/Mission Control • BDA • Reporting
Information and Communications Infrastructure		

StV-3 Capability Phasing

StV-3 captures capability phasing information

StV-3 Capability Phasing is used to capture the planned availability of military capability at different points in time, ie different epochs. This will be built up from an analysis of programme data as to when elements of military capability are delivered – structured according to the required capability functions (from StV-2) and the epochs appropriate to the capability area.

This view is likely to be compiled by the ECC but with extensive programme information provided by the acquisition community and assessment of different military capabilities by Customer 2.

StV-3 can be used to identify where there are capability gaps (ie no fielded capability to fulfil a particular capability function) or potential capability overlaps (multiple fielded capabilities for a single capability function). However, such simple interpretations will have to be backed-up by more in-depth analysis, for instance considering the different echelons that various capabilities will be available to and different performance characteristics.

StV-3 Format

StV-3 is most easily presented in tabular form – typically with a structured list of required capability functions running in one direction and epochs running in the other. At each row-column intersection the nature of the available capability within that epoch that satisfies the capability function would be entered. If there are no entries that satisfy the capability function in that epoch then a capability gap has been identified.

One possible template for an StV-3 is included below.

Capability Category	Epochs				
	Epoch 1 Now-2008	Epoch 2 2004-2007	Epoch 3 2008-2011	Epoch 4 2008-2012	Epoch 5 2010-2017
Command Support					
Decision Support					
Decision Support Interoperability					
Functional Planning Support					
Functional Planning Support Interoperability					
IS Infrastructure					
Communications Infrastructure					
STAR					
Asset Management/ Tasking	█	█	█	█	
STAR Product Management					
STAR Interoperability					
STAR Sensors					
EFFECTS					
Targeting					
Plan Engagement		█	█		█
Conduct Engagement					
Effects Interoperability					
Effectors					
Enabling Projects					

StV-4 System of System Clusters

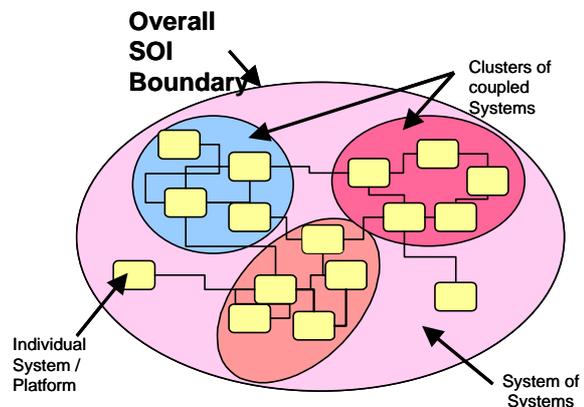
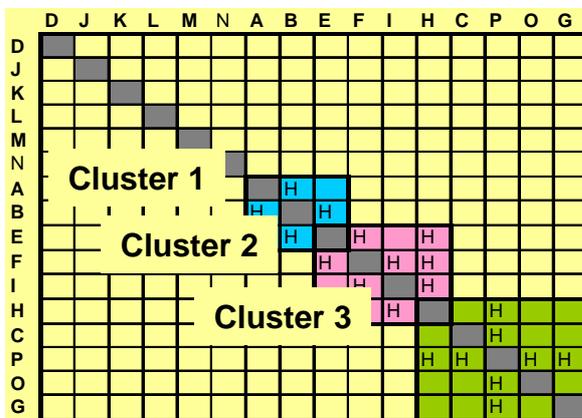
StV-4 identifies logical grouping of capability elements

A common Capability Management problem is the identification of the dependencies between the various capability elements – including those associated with all of the lines of development. The StV-4 System of Systems Clusters provides a means of analysing the main dependencies between capability elements and hence their most logical grouping for acquisition and capability integration purposes.

This view is likely to be compiled by the ECC but with interface and dependency information provided by the acquisition community and Customer 2. The capability elements included within StV-4 should not only equipment projects but also key developments across non-equipment lines of development. The relationships between capability elements may include system interfaces, programmatic dependencies, technology relationships, industrial relationships, etc.

StV-4 will aid the construction of the optimal clusters through which to manage acquisition / capability integration.

- StV-4 Format** There are a number of possible formats with which to describe relationships between capability elements. These include:
- The systems engineering N-squared diagram (shown in the example on the left below)
 - Graphical presentation such as the schematic show in the example of the right below



StV-5 Capability to Systems Deployment Mapping

StV-5 shows the connectivity between capability elements and the systems that support them StV-5 Capability to Systems Deployment Mapping shows the planned capability deployment and interconnection by echelon / epoch.

The StV-5 is constructed, probably by the ECC, from a synthesis of information including: capability functions, system connectivity, echelons, epochs and programme data.

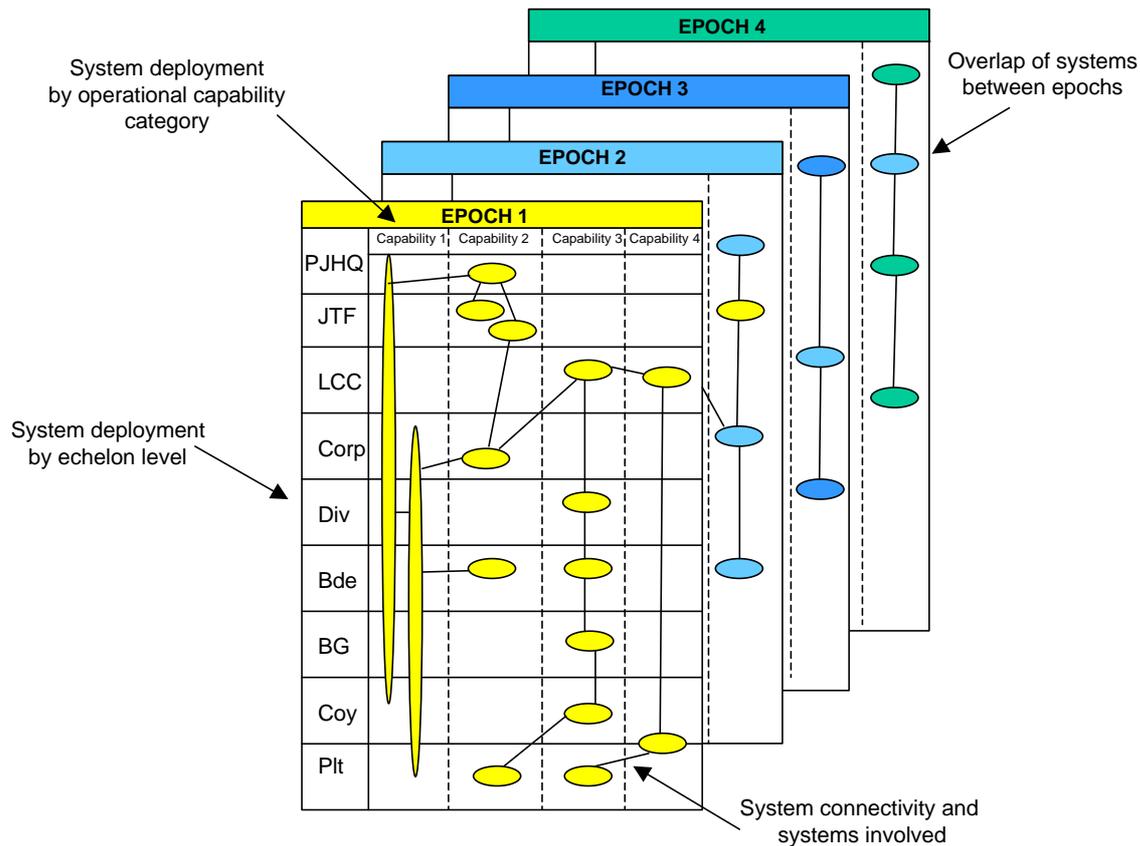
StV-5 could be used for a variety of capability analyses, including:

- Capability overlap/gap analysis
- Deployment level shortfalls
- Identifying connectivity issues
- System interoperability by echelon
- Identifying legacy issues

StV-5 Format

An StV-5 will have to be produced for each epoch. It is based upon a tabular representation with a structured hierarchy of the force structure on one axis and the capability areas / sub-areas on the other. Capability elements are represented by graphical objects appearing in the relevant capability area and spanning the echelons of force structure that have access to their services. Links are shown between capability elements that have system interfaces between them.

One possible template for an StV-5 is included below.



Strategic Views Concept of Employment

Supporting Capability Management

The primary role of the StVs is to support the decision-making regarding the management and evolution of military capability. These views provide a link between the development of new operational concepts and strategic visions and the acquisition processes that will deliver the military capability that can satisfy these concepts and visions. For example, the High Level Operational Concept⁵ and NEC concept⁶ go some way towards defining how the MOD expects to operate in 10 to 20 years time. The challenge for the Capability Management process operated by the Equipment Capability Customer (ECC) is to determine the best means of delivering military capability that can fulfil

⁶ NEC Outline Concept. DSTL, May 2003 and NEC – An Introduction, CM(IS), April 2004.

these needs whilst considering the impact of existing and planned capability and affordability constraints. Through the Capability Management process the ECC will then determine the optimum acquisition actions, including potential changes across all line of development – not just equipment.

Although the StVs play an important role in Capability Management within the ECC, there are many other organisations providing input to, developing and utilising these views. An initial assessment of which organisations are associated with each of the StVs is included in Appendix A to this paper. This analysis of the StV roles and responsibilities will be developed further and validated through stakeholder consultation during the development of the MODAF handbook.

COI feedback on StV utility

As part of the MODAF project start-up and initiation stage an initial consultation was conducted with a wide variety of MOD stakeholders who were expected to utilise architectural products that would be developed in MODAF. This was conducted through a number of COI workshops, each of which included a survey of the degree to which the respondents expected each candidate MODAF view to contribute towards the needs of that COI.

The results of this survey in relation to the utility of the StVs as perceived across a number of different COIs is summarised in the table below. This shows that although some views such as StV-2 Capability Functions are seen as having wide utility across many COIs, others such as the StV-4 SoS Clusters were seen as having utility only within a narrow group, in this case the acquisition related COIs.

This information is being used to aid the initial MODAF view development and will be validated through further stakeholder consultation.

View	Description	DPA	DCSA	DEC	Gov'nce	Cust 2	Aggregate
StV-1	Capability Vision	5%	3%	6%	2%	5%	4%
StV-2	Capability Functions	6%	8%	6%	3%	8%	6%
StV-3	Capability Phasing	6%	2%	8%	6%	6%	6%
StV-4	SoS Clusters	5%	2%	9%	3%	2%	4%
StV-5	Capability to Systems Deployment Mapping	5%	3%	3%	7%	2%	4%

Produced by Dave Mawby, IA1CON7 (07887 540406) of the MODAF team using information from the following sources, with thanks:

DEC(CCII), IA, US DOD Architecture Framework Volume II, John May for the LDI SoS Architectural Framework and Fariba Hozhbrafkan of Cornwell Associates.

Appendix A: MODAF Strategic View Roles and Responsibilities

The following table defines the organisations that may be involved in providing information for, compiling and using each of the StVs. These roles and responsibilities were based upon inputs provided to the MODAF project team through the community of interest workshops and other briefings. These will be validated through further consultation during the development of the MODAF handbook.

View Ref	View Title	Inputs to View	Compiles View	Purpose of View	Uses View
StV-1	Capability Vision	JDCC, Warfare Centres, DGD&D, CBM J6	JDCC	Communicate vision regarding capability evolution	ECC, Customer 2
StV-2	Capability Functions	JDCC, Warfare Centres, DGD&D, CBM J6, ECC	JDCC	Codifying required capability elements. Capability audit	ECC, DSTL
StV-3	Capability Phasing	ECC, IPTs, Customer 2	ECC	Capability gap analysis	ECC, DSTL
StV-4	SoS Clusters	ECC, DPA, Customer 2	ECC	Analysis of capability dependencies	ECC, Customer 2, DSTL
StV-5	Capability to Systems Deployment Mapping	ECC, IPTs, DCSA, Customer 2	ECC	Capability options analysis	ECC