

MODAF-M10-014

# MINISTRY OF DEFENCE



## MOD Architectural Framework

## Sustainment Deskbook

Draft 0.4

8 August 2005

**MODAF**  
partners

Prepared by:-

Approved by:-

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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.

<b>Issue No.</b>	<b>Date</b>	<b>Revision Details</b>
Draft 0.1	1 July 2005	First Outline
Draft 0.2	3 July 2005	Update as a results of COI workshop and Deskbook integration workshop.
Draft 0.3	5 August 2005	Internal release
Draft 0.4	8 August 2005	Major rework after engagement with D. Log. Info. and internal review

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## **1. Foreword**

*(Generic foreword - championing the use of MODAF, covering mandation issues and policy, emphasis of the benefits of MODAF and an architectural approach – to be written by MOD)*

## 2. Introduction

This is v0.4 of the MODAF Deskbook for the sustainment community. It reflects as much as possible of the input from those organisations and individuals who have expressed input to the Deskbook development process. It is still incomplete as far as worked examples are concerned due to the amendment in the scope of Sustainment (see section 3.2 for details). These will be developed in the near future.

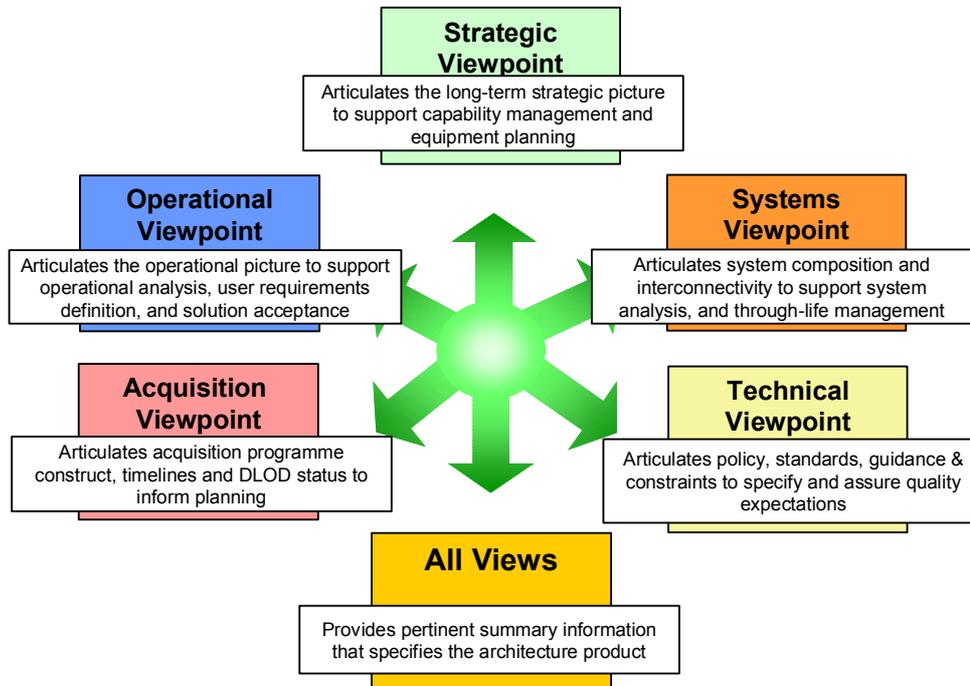
*[Please note that the full planned suite of MODAF v1.0 documentation is in the process of being reviewed and updated for consistency and to become best fit-for-purpose. As a result, this Section 2 in this version of the sustainment Deskbook may well change prior to final release. It is likely, however, that its current content will exist somewhere in the MODAF v1.0 documentation.]*

*The Review Board stated at their 22 Jul meeting that they wanted several specific topics to be covered here. DM responsible. To include:*

- *Intent of Deskbooks. (They are intended to be an introduction to how to operate in a MODAF-underpinned MOD / Services environment. They will be supported in that aim by training for relevant users. They are NOT intended to be guides for architects. Architects will receive special training and will need to use the MODAF Technical Handbook.)*
- *Explanation that the focus in the diagrams and related text is on information needs, not the current situation*
- *Explanation that, in the early stages, some expected Views will not be available to users. If needed, the user is advised to create such a View (or have it created for her / him) and try to have the intended author approve it*
- *Special versions of any of the MODAF documentation will be prepared for individuals with accessibility difficulties.*

## 2.1 What is MODAF?

The MOD Architecture Framework (MODAF) provides a means to model, understand, analyse and specify Capabilities, Processes, Systems and Systems of Systems (SoS) to assist in the improvement of military and cost effectiveness across the MOD.



**Figure 2-1: MODAF Viewpoints**

MODAF uses six Viewpoints, depicted in Figure 2-1, each consisting of a number of modelling Views, to provide clarity of the complex MOD activities. Not all MODAF Views are needed for every architecture and it is intended that users select those which most effectively represent their area of interest.

MODAF may be applied across a wide variety of MOD processes, including capability management, acquisition, operational analysis, planning, through-life management and operations. Applied appropriately, MODAF will be an enabler to the successful delivery of Network Enabled Capability (NEC)<sup>1</sup>.

Amongst the benefits of MODAF to the sustainment community are:

- Improved military decision-making through a better understanding of relationships between all the elements of the military landscape (e.g. capabilities, activities, systems, roles, etc)
- Improved clarity of the context within which a new capability will operate – compliment CONOPS, CONEMP and CONUSE

<sup>1</sup> Reference the new Handbook for NEC JSP777 Apr 05.

- Improved efficiency through easier identification of opportunities for rationalisation of activities, roles and equipment, and faster, more effective feedback.
- Improved interoperability between systems
- Reduction in risk for introduction of equipment.

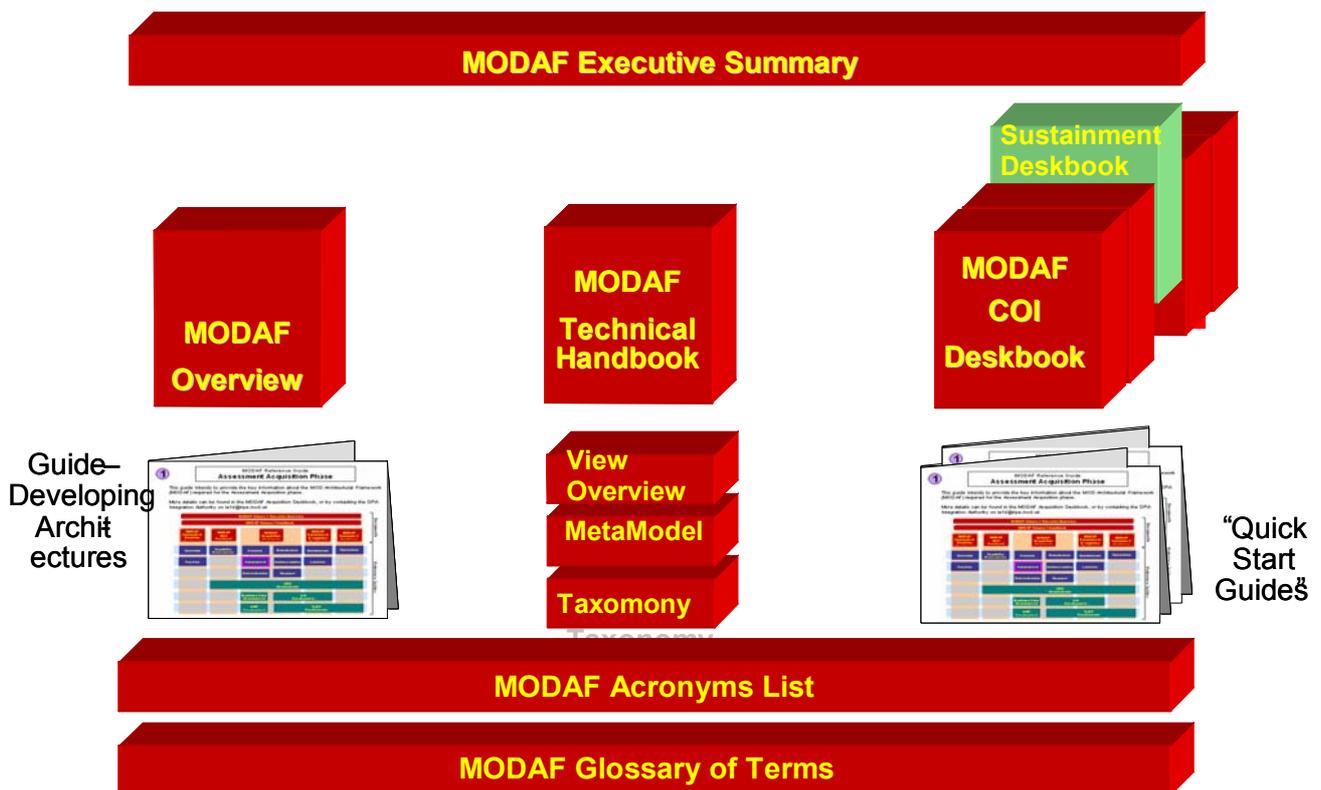
## 2.2 Guide to Deskbook

### 2.2.1 Purpose

The purpose of this document is to illustrate to the general Sustainment community how the MODAF Views within these architectures can support the various elements of their processes and activities.

### 2.2.2 Context

The Sustainment Deskbook forms part of the overall suite of MODAF 1.0 baseline documentation as shown in Figure 2-2.



**Figure 2-2: MODAF 1.0 Baseline Products**

The main elements of the MODAF baseline are:

- Executive Summary – provides a brief summary of the entire MODAF baseline documentation
- MODAF Overview – describes what MODAF is, why it should be used and details the process for developing architectures. This should be read prior to this deskbook

- MODAF Technical Handbook – provides details of the construction of MODAF Views and their relationship to the MODAF meta model (M<sup>3</sup>). This is supported by:
  - View Overview – a short summary of each View intended for quick reference by MOD users
  - Meta Model – used to define the architectural objects that are permitted in MODAF Views and their relationships with each other
  - Taxonomy – provides the approved names and definitions for architectural objects to be used within the MOD’s architectures

MODAF Deskbooks – describe how users within particular communities in the MOD are expected to utilise MODAF architectures to support their processes. Each of the Deskbooks has one or more “quick start guides” that provide an easy reference summary of the relationship of MODAF Views to the community’s processes.

For the purpose of describing the relationship of MODAF to MOD’s processes, five Communities of Interest (COIs) have been considered as shown in Figure 2-3.

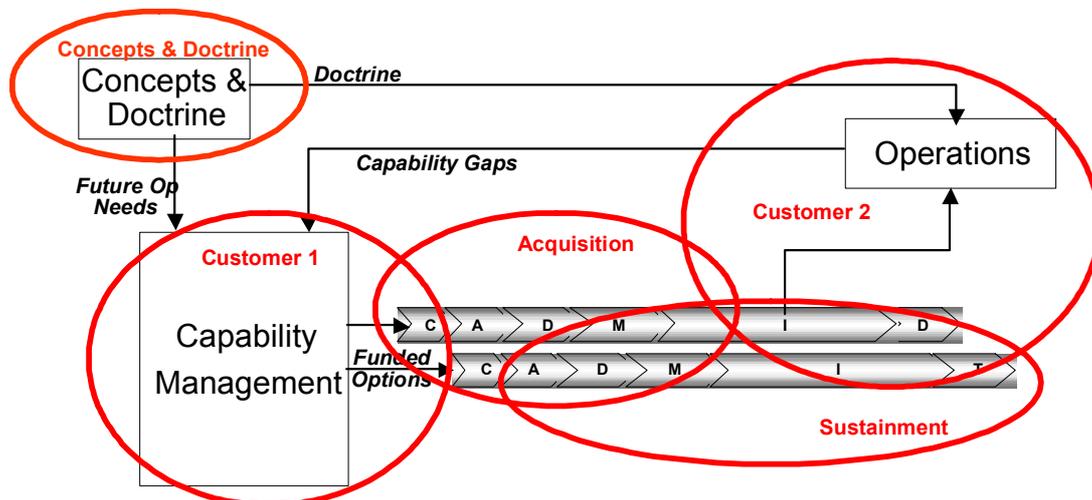


Figure 2-3: Community of Interest Deskbook Scope

Note that this diagram illustrates both CADMID and CADMIT cycles. The high level scope of these COIs is:

- **Concepts and Doctrine** – the development of analytical concepts (e.g. Joint HLOC), applied concepts (e.g. Carrier Strike Concepts) and high-level in-service doctrine, SOPs and TTPs
- **Capability Management** – the monitoring of capability gaps against future needs, building the Equipment Programme (EP) and ownership of URDs for new capabilities
- **Acquisition** – the development and fielding of new military capabilities. The primary focus is up to the acceptance into service of a fully operational capability

- **Sustain**<sup>[MJD1]</sup> – the processes to maintain military capability in line with the relevant Through Life Management Plan while recognising the in-theatre sustainment roles of the relevant Second Customer's Pivotal Managers (covered in the Customer 2 Deskbook)
- **Customer 2** – the Front Line Commands planning and conducting their operational activities including their Core Leadership and Pivotal Management roles as defined in Smart Acquisition<sup>2</sup>

### 2.2.3 Deskbook Structure

The remainder of this version of the MODAF Sustainment Deskbook comprises two key sections:

#### **Section 3 – MODAF's Relationship to the Sustainment Processes and Activities**

– this section will: briefly define what is meant by Sustainment and outline its real world boundaries; define the scope of the Sustainment processes to be covered by this Deskbook; and then identify the relevant end-to-end business processes and how they can be captured and supported by MODAF Views.

**Section 4 – Worked Example of MODAF for Sustainment Processes** – this section demonstrates how MODAF Views of the the logistics business space can be used practically by the Defence Logistics Organisation to support the Core Leader and Pivotal Manager functions in ensuring that the 'Sustainability' Line of Development is properly integrated with the other Lines of Development to deliver optimum military capability.

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<sup>2</sup> Customer 2 (Core Leadership) is defined as follows: Undertaken by single-Service Chiefs to provide overall strategic management of individual Services and their professional direction. Core Leadership provides advice to Customer 1 on the full range of factors contributing to military capability across the Lines of Development. The roles of each Core Leader are:

- to translate the equipment capability provided by Customer 1 into an operational Military Capability through the Capability Integration process;
- to manage the availability of the in-service equipment;
- to provide the relevant advice and expertise; and
- to support Customer 1's remit to deliver the required equipment capability and to be the user.

Customer 2 (Pivotal Management) is defined as: Undertaken by those who use the equipment in service, primarily the front line and training commands, in order to provide the user perspective and manage allocated resources to achieve the required output.

### 3. MODAF Relationship to sustainment Business Processes and Activities

#### 3.1 Architecture Development Process

##### 3.1.1 Six-Stage Architecture Development Process

The approach to developing a MODAF-compliant architecture is shown in Figure 3-1. This shows how a MODAF user within any community in the MOD goes about establishing the intended use, scope and data requirements, developing the architecture, using this to conduct the required analyses and documenting the results. A more detailed description of this six-stage architecture development process is provided in the Overview of MODAF (MODAF-M09-002).

Prerequisites	1. Establish Intended Use	2. Define Architecture Scope	3. Develop Data Requirements	4. Capture Architecture	5. Conduct Analyses	6. Document Results
<b>MODAF Governance</b>		Inform Central Reg.	Query of Avail. Data Sources	Provide Extant Arch. Data  Publish Baseline to MODAR		Publish Final Arch. to MODAR
<b>MODAF Users</b> ◆ User training - MODAF principles	◆ Workshop - Determine Architecture Usage  Architectural Use Doc.	◆ Workshop - Bound Architecture Scope ◆ Workshop - Determine Use Cases Plan of Time & Resources Architectural Scope Doc.	◆ Workshop - Establish Data Needs  Data Gathering Plan Tool Selection	◆ Tool-specific Training  Baseline Arch. Review  Baseline Architecture	◆ Analysis Review  Initial Analysis Final Analysis	◆ Finalised Arch. Review  Finalised Architecture
<b>MODAF Resources</b> ● MODAF Baseline ● MODAF Training Material	● MODAF Tiger Teams ● MODAF Help Desk	● MODAF Tiger Teams ● MODAF Help Desk ● Hybrid View Development	● MODAF Tiger Teams ● MODAF Help Desk ● Certified Tool List ● Tool Advice	● MODAF Tiger Teams ● MODAF Help Desk ● MODAF Taxonomy ● ERM / M3	● MODAF Tiger Teams ● MODAF Help Desk	● MODAF Tiger Teams ● MODAF Help Desk

**Figure 3-1: General Process for Building MODAF-Compliant Architectures**

In addition to showing the steps that a MODAF user should follow, Figure 3-1 also highlights the MODAF resources that are available to help them and the key interactions that are required with the MODAF governance processes.

One of the key MODAF resources will be the MOD architectural repository (MODAR) that is being defined by the Integration Authority (IA)<sup>3</sup>. It is intended that this can be used to run queries and extract existing architectural data – such as information on the systems that a new capability has to interface with. It will be essential to the enablement of NEC that all new architectures and updates to existing architectures are lodged with MODAR to inform others and allow the re-use of new architectural

<sup>3</sup> An initial version of MODAR is currently available, accessible through the IA. Please refer to the MODAF Overview paper (MODAF-M09-002) for further information regarding MODAR and its usage.

data. Furthermore, the IA provides additional integration services that assist in modelling end-to-end performance and interoperability assurance<sup>4</sup>.

Another key resource will be the list of certified tools. The MODAF tool certification scheme is still being developed at the time of this MODAF baseline issue, definitive guidance as to tool availability and fit with different COIs is not currently available. Therefore, interim guidance exists on the availability of MODAF convergent tools<sup>5</sup>.

It is recognised that aggregation of data in MODAR raises classification issues, and some information may be Commercial-in-Confidence from industry suppliers. This data will be handled as per current procedures for data handling and storage, although such considerations must be taken into account prior to publishing any architecture for general use.

In order to facilitate the searching and query of architectures it is essential that the All Views (AV-1 with meta data regarding the architecture and AV-2 with the architecture's object dictionary) be completed thoroughly for all architectures before they are published. Further information on the All Views can be found in the MODAF View Overview Document. It is worth noting that most architecting tools provide functionality to automatically generate the object dictionary from the description fields as the taxonomy is defined.

The All Views should be completed as early as possible in the architecting process, and therefore may already be defined during creation of the URD Views, prior to the IPT taking over responsibility for the architecting tasks.

### **3.1.2 Architectural Data Sources**

When the development of MODAF architectures is a mature process, an IPT could expect to commence its lifecycle with a comprehensive set of data sources including MODAF architectures supporting the capability definition (Strategic Views), URD and CONEMP (Operational Views), interfacing systems (System Views), applicable standards (Technical Views) and programmatic information (Acquisition Views). Realistically, most IPTs will find some or all of these are missing when they commence their architectural activities and will have to backfill the key elements themselves and validate them with the stakeholders who should have provided them (eg URD Views with Customer 1, TLMP with Acquisition).

Many architectural products from one sustainment lifecycle stage will form inputs to the architectural activities of the next lifecycle stage. However, it is important that the IPT explicitly repeats the six-stage architectural process for the new stage as the required outcomes; assumptions, scope, data sources etc may have changed between stages. Indeed, it is quite likely that the nature of modelling / Views and the level of granularity will change from one lifecycle stage to the next.

Any team conducting architectural activities in MOD should contact the IA as custodians of the MODAR in order to establish what extant architectural data may exist or to understand who else may be developing related information – all of which will minimise the degree of nugatory work.

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<sup>4</sup> Please contact the Integration Authority, DPA, Abbeywood, for further information regarding interoperability services.

<sup>5</sup> Interim NEC, CBM and BMS MODAF Modelling Policy, DEC(CCII) File ses 046-05, 1/3/05.

Industry is likely to be involved in the sustainment processes and associated architecture development throughout the lifecycle. IPTs are supported by Industry, and their engagement is initiated by the IPT. MODAF architectures will play several important roles in the process of industry engagement:

- Developing a clearer understanding of requirements and contextual information against which Industry will be bidding. This should enable better estimates to be obtained with lower risk content and hence improved project outcomes in terms of cost and schedule
- Providing a mechanism to document the design solution being provided by Industry so that others may more readily interface with or utilise it – improving interoperability

However, initially at least, it is not expected that Industry will provide documentation of more than its highest level designs in MODAF formats and it will wish to protect its proprietary information and technology. Therefore, it is expected that industry will provide “grey box models”<sup>6</sup> of its solutions during the sustainment lifecycle. These models will be expected to provide comprehensive definition of the system interfaces / services, applicable standards and data formats but will not expose more than basic information regarding the internal system functions.

### **3.1.3 Application to Sustainment Process**

The intent is that the architecture development approach should be applied by all acquisition IPTs as they progress through the CADMID / CADMIT lifecycle<sup>7</sup> in order to deliver the required new or enhanced military capability.

For Version 1.0 of MODAF, Views have been mapped to Sustainment processes based on a series of engagements with the Sustainment community and an understanding of the CADMID lifecycle. The application of specific MODAF Views to the different elements of Sustainment activity is described in more detail later in this section.

### **3.1.4 Overview of MODAF View use**

MODAF Views support business processes at a variety of different levels - from being the core basis for a business activity, to providing some supplementary guidance to that activity. AcV-2, for example, showing the SoS Acquisition Programmes, is the basis for scheduling decisions regarding selection of technology options. However, it can also be used to analyse the scheduling effect on the system dependencies when considering detailed design options.

MODAF Views may also provide a means of communication between different stakeholders in a process.

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<sup>6</sup> A “black box model” is one where the inner system workings are not described: only the interfaces, inputs and outputs are published. Slightly more information regarding the workings of the system will be required in MODAF, however not every detail – hence the use of the expression “grey box”

<sup>7</sup> Further information on the CADMID / CADMIT lifecycle can be found on the Acquisition Management System (AMS) – <http://www.ams.mod.uk>. The later sections of this document refer to ‘CADMID’ for ease of reference: the reader should note these could also be applied equally to CADMIT.

Two levels of use have been defined for MODAF Views identified in this Deskbook, reflecting the level of support provided by a View to a particular activity:

- **Essential** – Views that are essential for use during a particular Acquisition activity
- **Highly Desirable** – Views that are recommended to inform a particular activity, given that they contain a significant amount of data of value to that activity in the majority of scenarios or circumstances.

The Essential Views are the starting point for any new MODAF user. Highly Desirable Views are more appropriate to users who have experience of MODAF View use and are looking for further ways of using MODAF Views to inform an activity. This may include the need for greater rigour in analysis, or the need to find a way of addressing a specific scenario or circumstance.

Any View may be used in addition to the Essential and Highly Desirable Views at any stage if it helps in the execution of the analysis / task.

### 3.1.5 Key to the Process / View Mapping Diagrams

The key to the Process / View mapping diagrams is as follows:

- **Activities** are shown as unshaded rectangles with the name of the activity inside the rectangle in larger font
- **Inputs** and **outputs** are shown as shaded rectangles with the name of the input / output inside the rectangle
- **MODAF Views** are shown as follows:
  - Essential MODAF Views are shown as rectangular objects, colour-coded by Viewpoint
  - Highly Desirable MODAF Views are shown as ellipse objects, similarly colour-coded

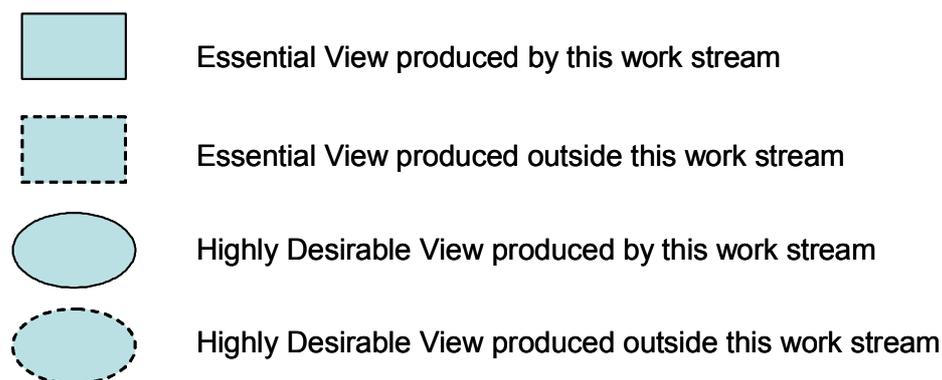


Figure 3-2: Key to the View Mapping Diagrams

### 3.1.6 Ensuring Views are MODAF compliant - hybrid and modified Views

As identified in Figure 2-1, MODAF provides a discrete set of Views that can be selected to create an architecture. However, it is possible for a user to create Views

that look similar to those specified by MODAF, but that are not compliant to MODAF, without understanding the data elements and relationships that MODAF specifies within the View construct.

In brief, a View is considered MODAF compliant when the data elements and relationships within that View are the same as those specified by MODAF, in what is known as the meta-model. Otherwise, the View created is an independent architecture, and cannot claim MODAF compliance. For further information regarding MODAF compliance through the underlying data elements, please refer to the MODAF Technical Handbook (MODAF-M07-022).

A 'hybrid' or 'modified' View is a MODAF compliant View that deviates in content from a View provided in the MODAF View suite – as shown in Figure 2-1. A hybrid or modified View does not contain the data elements specified by one of the MODAF provided Views, eg StV-3, OV-5 etc, it contains a hybrid combination of the data elements and relationships of one or more MODAF provided Views, eg a combination of SV-1 and SV-2.

### **3.2 Sustainment Process**

Sustainability is one of the essential Lines of Development required to deliver any military capability. 'Sustainment' is the process of ensuring that the required level of military capability is defined, developed and then maintained for the duration specified in the Through Life Management Plan. Meeting Sustainability objectives is the combined responsibility of both the Second Customer (in the role of Pivotal Manager) and the Integrated Project Team. At an organisational level the lead responsibility for the end-to-end process belongs to the Chief of Defence Logistics (CDL) as the owner of the Logistics Business Process.

While in terms of the scale of organisational resources expended Sustainment is focussed on the in-service phase, as an end-to-end process it spans the whole CADMID life-cycle. As such it inevitably involves the whole of the Acquisition and Customer 2 Communities as well as extending back to the industrial base through the strategic supply chain as operated by the Defence Logistics Organisation (DLO).

However, as outlined earlier in this section, there is a specific MODAF Deskbook for the Acquisition Community that focuses on the CADM phases of the CADMID cycle, and another specifically for the Customer 2 Community that includes the Pivotal Manager's responsibilities for operational/in-theatre aspects of sustainment during the In-Service phase of CADMID. Therefore, to be useful, this Deskbook will focus on the use of MODAF Views to support that part of the Sustainment Community responsible for the Strategic Base<sup>8</sup> aspects of sustainment during the In-Service phase of the CADMID lifecycle. In terms of end-to-end logistic process it will cover that part of the logistics supply chain that extends from the manufacturer to the interface with the Forward Mounting Base. The Deskbook will take as its point of

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<sup>8</sup> The Strategic Base is underpinned by static depots, repair workshops, installations and stockpiles of materiel, located largely within the UK and often loosely referred to as 'The Base'. It is one end of a continuum, the other being the frontline it supports. The Base is supported further by civilian contractors and industry (the so called 4<sup>th</sup> line) from within the national infrastructure and together they form the Strategic Base. The Base, although owned by the military, is civilian in character, both in its business practices followed and its manning. Through the MOD planning process it translates industrial capacity into military capability against programmed objectives.

reference the current BMS Logistics Model which explicitly identifies the Chief of Defence Logistics (CDL) as the end-to-end process owner.

The scope of this Deskbook is defined in the following two diagrams. The first shows the timing and organisational focus of sustainment in terms of the CADMID lifecycle while the second (drawn from the Army Logistics Doctrine) shows an outline Concept of Logistic Operations that can be related to geographic and functional boundaries.

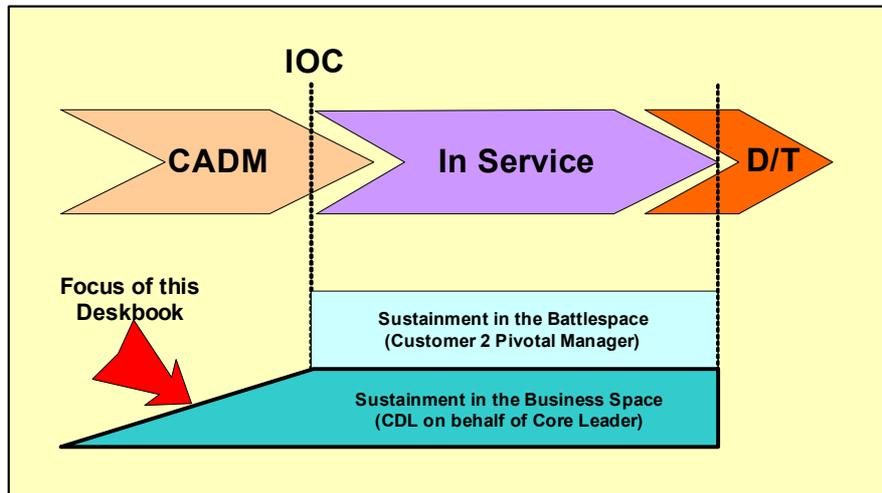


Figure 3-3: Scope of the Sustainment COI Deskbook

[MJD2]

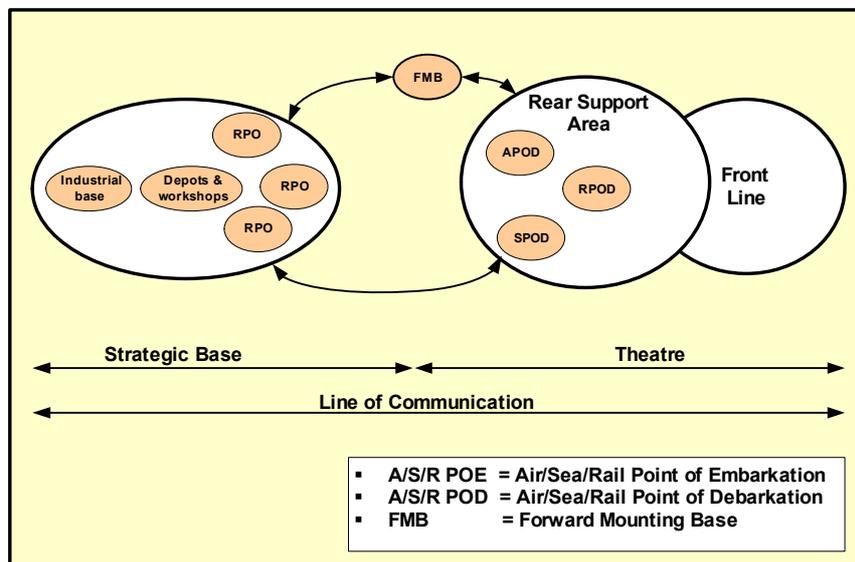
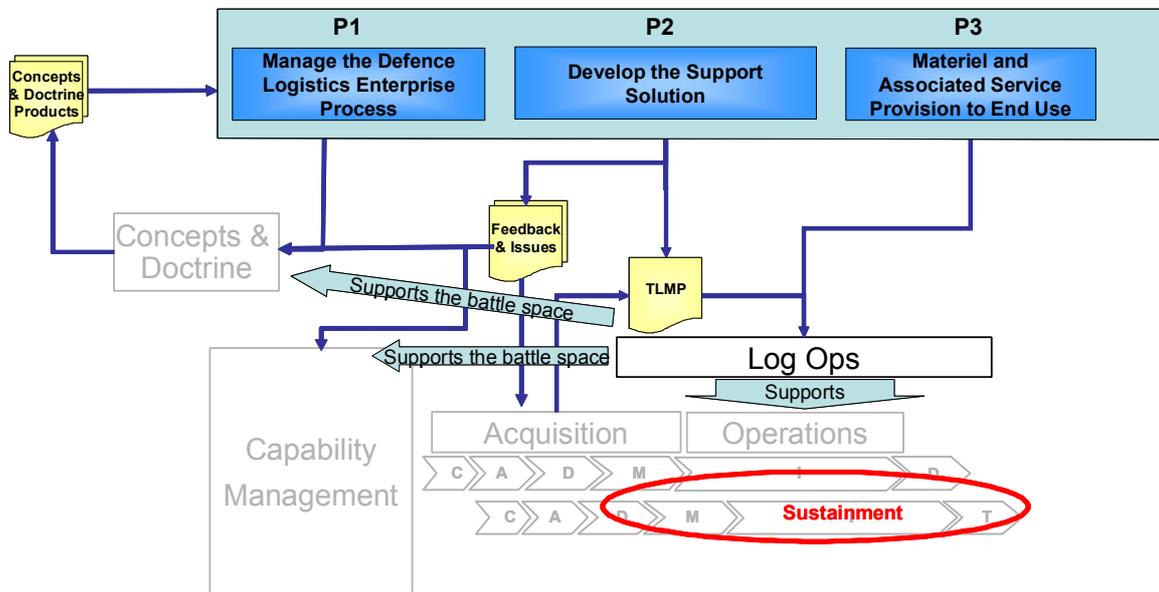


Figure 3-4: Interface of the strategic base with other parts of the support solution

MODAF is explicitly intended to support both war fighting and business tasks. In NEC terms this means that MODAF Views must be developed to support those processes specific to the 'battle-space' **and** those processes specific to the 'business-space'. The aspects of Sustainment covered in this Deskbook are those that take place in the logistics business space. Consequently, when this Sustainment Deskbook refers to Operational Views it is generally referring to a representation of those activities

carried out in the logistics business space to sustain a capability while the Systems Views capture those logistic support systems used to sustain a capability (i.e. not system views of the capability itself). Therefore, the owner of the Operational Views relating to Sustainment will be CDL while the principal IPT concerned with logistic support systems, and therefore the de facto owner of the majority of System Views relating to Sustainment, will be the LAIPT.



**Figure 3-5: Key Elements and Interfaces of sustainment COI Processes**

The Sustainment COI processes interface with all of the other COIs, but since they are all firmly in the battle space and concerned with military capability, it is in a supporting role only.

The function of MODAF architectures in supporting the Sustainment COI processes and its key interfaces with the other COIs is described in the sections that follow, structured according to the main sub-processes shown in Figure 3-5.

### 3.3 P1 - Manage the Defence Logistics Enterprise Process

This section describes the use of MODAF of the Logistics Policy Setting work stream. The logistics process owner plans and monitors the logistics end-to-end process across defence, through life and across the operational planning cycle. The ACDS(Log Ops) is the Process architect on behalf of CDL. The key activities, described in this section, which may be helped by the use of MODAF are:

- Plan, Source & Monitor the Logs Enterprise, including management of top level interface with other BMS Processes and functions
- Set Logistics Process Policy within which the Logistics Solution is to be delivered and conducted.
- Set Requirements for and acquire Enablers in support of logistics planning functions
  - Provide Customer 2 Core Leader for Logistics Process.

- Provide Logs Requirement to support New and Enhanced Military Capability (N&EMC) Process.
- Provide Output Requirements for support solution outputs (Military and Logistics Requirements)

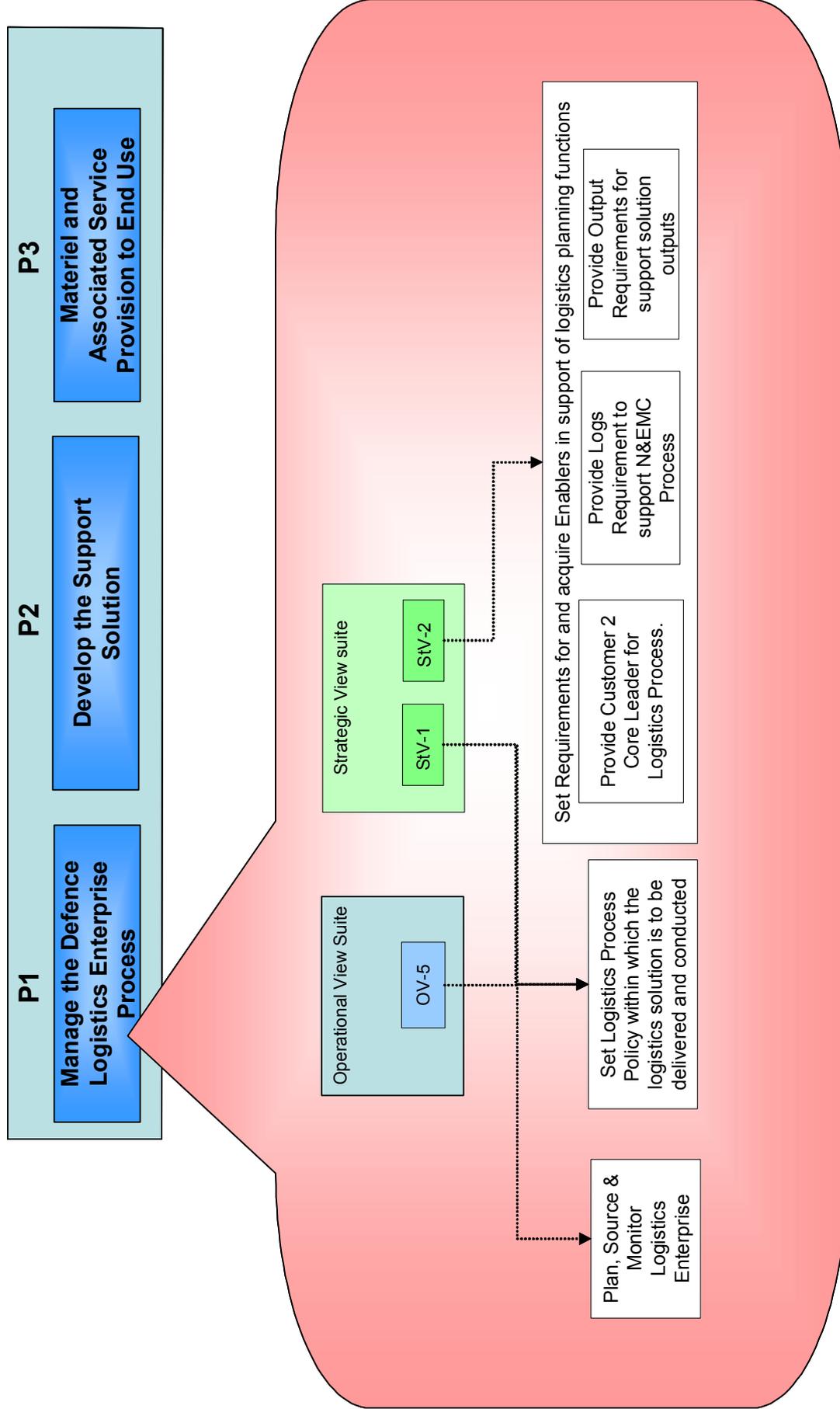


Figure 3-6: Key MODAF Relationship to Logistics Policy Setting Processes

### **3.3.1 Plan, Source & Monitor the Logs Enterprise**

The input for this is the Defence Logistics Vision.

*[Examples of views and their application to be provided later]*

### **3.3.2 Set Logistics Process Policy**

**StV-1** is the high-level capability vision for the Logistics support solution and not for the equipment platform. It is generated by ACDS (Log Ops) on behalf of CDL. It is a textual document.

*[Examples of views and their application to be provided later]*

### **3.3.3 Set Requirements for and acquire Enablers**

**StV-2** (Capability Taxonomy) provides a comprehensive and structured definition of capabilities in non-system specific effects-based terms. It also contains appropriate attributes and metrics for each capability. This document specifies the Policy.

*[Examples of views and their application to be provided later]*

## **3.4 P2- Develop the Support Solution**

Operating within the overarching rules set by the Process Owners, this phase deals with designs of material things, systems and service specifications. It establishes authorised specifications and services to/from Front Line Commands and other end users across defence and industry. Issues are predominantly of a technical nature but include 'design' aspects of support systems and the associated 'design' component of operational logistics. It includes safety and configuration management of the design and associated audit trail. NB. This process is about establishing authorised design intent, supply system 'configuration' (aka design) and Op Log work to establish required range and scale.

The key activities, described in this section, which may be helped by the use of MODAF are:

- Plan, Source & Monitor Conduct of P2 (System & Materiel Specification Definition Process)
- Set policy, strategy doctrine for conduct of P2 Within bounds set by P1.
- Define the enabler requirements and acquire enabler services and systems for conduct of P2 Process. Develop Authorised and Configured Solution Specification; includes:

- Develop N&EMC Requirement Specification (URD/SRD to Tech Spec)
- Source and Undertake military system / equipment design and analysis (inc trade-off (CQT and with Support Design/Analysis))
- Source and Undertake Logistic System Design and associated LSA (this function includes Op Log design function)
- Source and Manage Configuration of Design intent including military equipment and logistics support systems.
- Provide Authorised specifications to P3 & requirements for additional materiel or services (including those to be delivered by other BMS Process Owners).

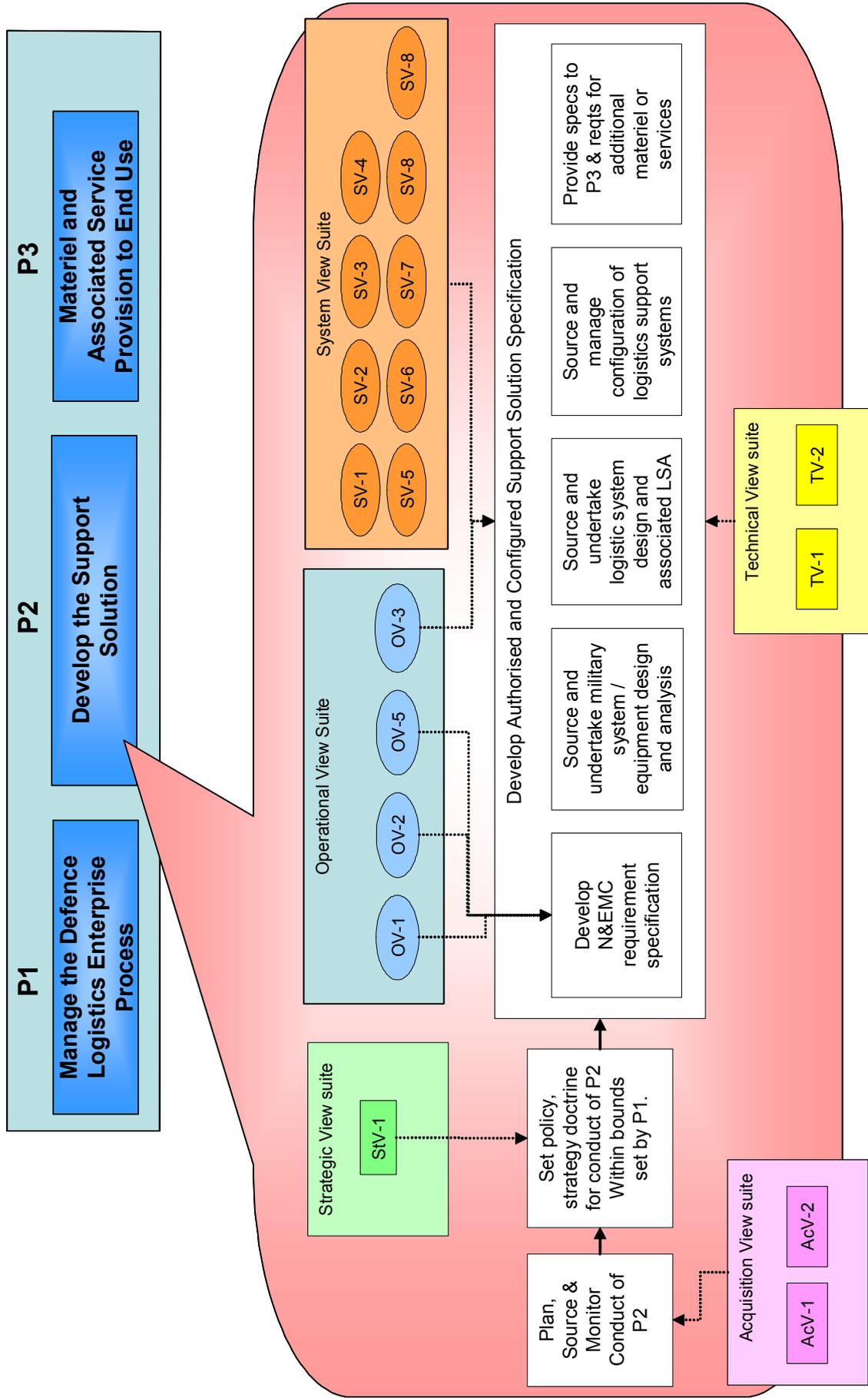


Figure 3-7: Key MODAF Relationships to developing the support solution.

### **3.4.1 Plan, Source & Monitor Conduct of P2**

*[Examples of views and their application to be provided later]*

### **3.4.2 Set policy, strategy doctrine for conduct of P2 Within bounds set by P1.**

*[Examples of views and their application to be provided later]*

### **3.4.3 Develop Authorised and Configured Solution Specification**

This activity will identify, develop, validate, and enhance an optimized support solution definition for the product in focus, exercising appropriate influence on the product design

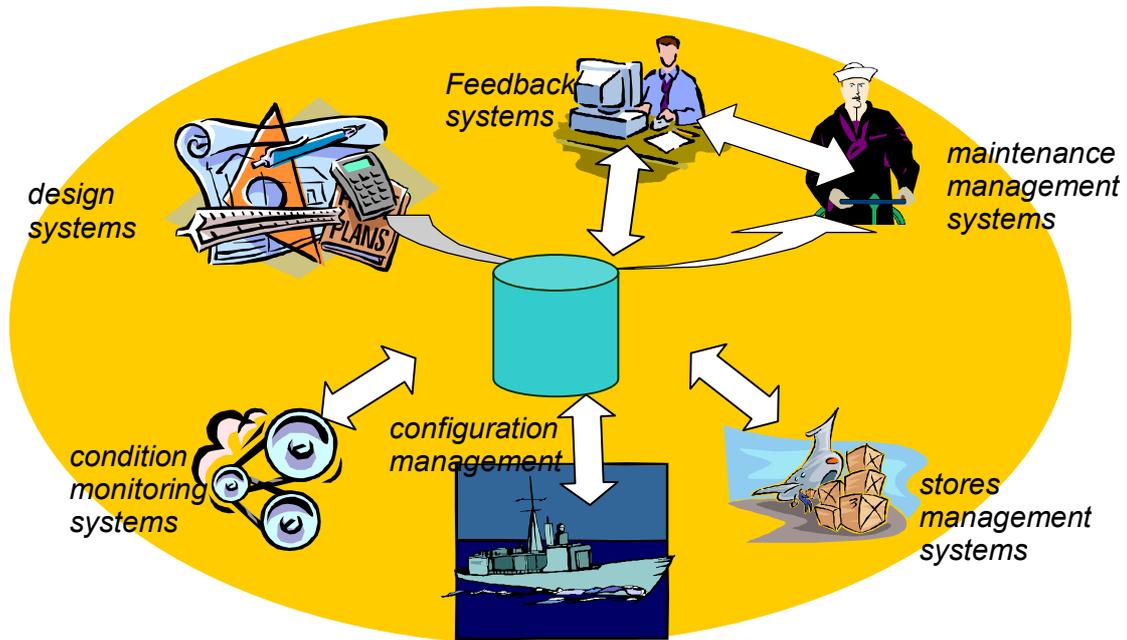
This activity is assumed to be performed in an environment of concurrent engineering and integrated teams as defined by the life cycle owner. It may apply when designing the product and its support concurrently, when developing a support solution for a pre-existing product that is not yet in use or when updating an existing support system. The PIF maybe supported by several support solution definitions, each tailored to a specific group of products, users, roles and support capabilities, collectively known as a deployment environment. The activity includes:

- identification and analysis of support requirements;
- definition of the support activities;
- definition of the resources required for support, including skilled personnel;
- specification of design requirements for support elements and for embedded support features;
- the identification, definition, generation and management of support engineering analysis data;
- the identification, definition and analysis of support cost and readiness drivers;

It also includes the identification and analysis of product availability and support system performance metrics during life cycle of the product. This activity can be necessary more than once for any given product in focus in order to meet changing and evolving requirements.

#### **A. DEVELOP N&EMC REQUIREMENT SPECIFICATION**

The **Ov-1** Operational Overview is produced to give a system non-specific summary of the Logistics Architecture to be considered.



**Figure 3-8: Ov-1 Summary of the Support Architecture**

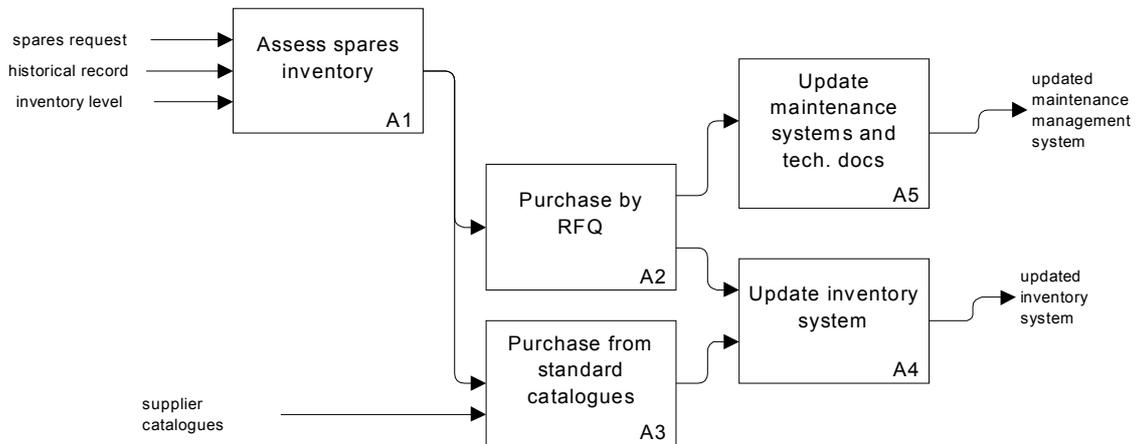
**B. SOURCE AND UNDERTAKE MILITARY SYSTEM / EQUIPMENT DESIGN AND ANALYSIS**

**OV-1c** Operational Performance Attributes can be used to articulate the availability, sustainability, reliability and maintainability of the system.

Attribute	Measure	Value			
		As-Is	Epoch 1	Epoch 2	Target
Availability	Number of hours planned downtime	30 hrs/year	20 hrs/year	10 hrs/year	5 hrs/year
Maintainability	Support personnel required to sustain the system	50	40	30	25
Reliability	Number of hours unplanned downtime	10 hrs/year	5 hrs/year	3 hrs/year	1 hr/year

**Figure 3-9: OV-1c can be used to articulate availability, sustainability, reliability and maintainability requirements**

**OV-5** Operational Activity Model is used to identify the operational activities in which the system will be involved, and therefore in which it will need to be supported, to inform the ILS approach.



**Figure 3-10: An OV5 Activity Model for Spares Sourcing**

**C. SOURCE AND UNDERTAKE LOGISTIC SYSTEM DESIGN AND ASSOCIATED LSA**

This function includes Operational Logistics design function

An input to this process is the **SV-9** Technology Forecast, which shows how technology will change during the life of the Logistics system:

Area	Short Term 1-3 years	Medium Term 3-6 years	Long Term 6-9 years
Default digital signal processor speeds	2Ghz Processor		10Ghz Processor
Default storage capacity for Personal Computer	60GB		180GB
Networking philosophy	Fixed Point To Point Networks	Virtual Networks (including VLAN)	Service Orientated Networking
Windows Version	XP	XP	Not disclosed

**Figure 3-11: SV-9 Technology Forecast**

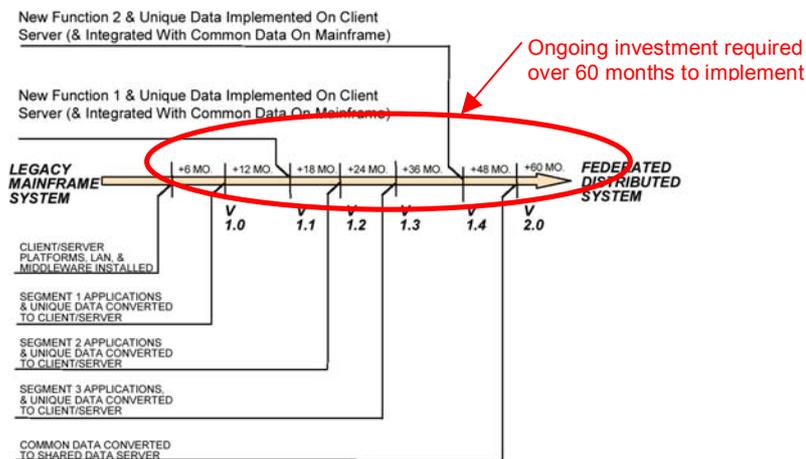
Along with the **SV-9**, the **TV-2** Technical Standards Forecast shows how standards are likely to evolve. The two taken together provide a long-term view of changes, to which the chosen solution will need to adapt.

Standard/ Policy	Short Term 1-3 years	Medium Term 3-6 years	Long Term 6-9 years
MODAF	MODAF v1.0 XMI v2.0	XMLv2.1	MODAF v2.0
MOD Systems Engineering Standards	Local Systems Engineering Management Plan (SEMP)		MOD System Of Systems Engineering Management Plan (SEMP)
MOD Communications/ Networking Policy	WAN: PDH Technology	WAN: SDH Technology LAN: Gigabit Ethernet Backbone	

**Figure 3-12: TV-2 Technical Standards Forecast**

**D. SOURCE AND MANAGE CONFIGURATION OF LOGISTICS SUPPORT SYSTEMS.**

SV-8, the Systems Evolution Description, feeds into the Whole Life Costing outlined at this stage by describing the transition of the new system into service (e.g. will this be an incremental release, building on functionality between IOC and FOC, or is the entire required functionality included in the first system release). This will have an affect on the development and maintenance costs for inclusion in the TLMP.



**Figure 3-13: SV-8 shows the ongoing costing to provide full functionality as the system evolves**

Throughout the CADMID cycle, Industry will be monitoring technological and standards development, to ensure that the solution to be delivered will not quickly become obsolete.

SV-9 Systems Technology Forecast and TV-2 Technical Standards Forecast are the Mandated Views for this process, and they will be updated as technology and standards develop, and the future technological landscape becomes clearer.

SV-9, the Systems Technology Forecast, shows how technology is expected to evolve in the short-, mid- and long-term. This informs the TLMP, showing whether there are any step-changes in available technology expected within the life of the system. If this is the case, there may be considerable upgrade costs to keep the system up-to-date with the latest technology.

JTA Service	TECHNOLOGY FORECASTS		
	SHORT TERM (0-6 Months)	MID TERM (6-12 Months)	LONG TERM
<b>Application Software</b>			
Support Applications	Microsoft Office 2000 available (for Windows 2000)	Microsoft Office 2000 stable enough for full-scale implementation	Microsoft Office available for Linux E-mail on wireless PDAs commonplace
<b>Application Platform</b>			
Data Management	Oracle 9i available MySQL (Open Source DBMS) available		
Operating System		Next MS Windows desktop upgrade expected Next Red Hat Linux major release expected	Next MS Windows server upgrade expected
Physical Environment			Intel IA-64 becomes standard processor for desktops Influence of quantum computing technologies
<b>External Environment</b>			
User Interface		Thin screen CRT monitors for PC desktops become price competitive	Thin screen LED monitors become price competitive for desktops Conventional CRT technology monitors for desktops become obsolete
Persistent Storage	5G PCMCIA type 2 card available		Disk storage capacity doubles again
Communications Networks		Cable modem service available for most telecommuting staff	Fiber optic connections available for most telecommuting staff

Desktops may need upgrade in the long term to take advantage of new

**Figure 3-14: SV-9 shows how technology is expected to evolve. Annotation shows the impact of this on the whole-life cost for the system**

**E. PROVIDE AUTHORISED SPECIFICATIONS TO P3 & REQUIREMENTS FOR ADDITIONAL MATERIEL OR SERVICES.**

*[Examples of views and their application to be provided later]*

**3.5 P3 - Materiel and associated service provision to End Use**

It establishes authorised specifications and delivers physical materiel and services to/from Front Line Commands and other end users across defence and industry.

Operating within the overarching rules set by the Process Owners, this process delivers physical materiel and services to/from Front Line Commands and other end users across defence and industry. It covers their provision (manufacture, maintenance, repair, assembly/embodiment, disposal/termination, supply - delivery/return), management of the asset (history, state of embodiment etc) and associated Logistics C4I services

The key activities, described in this section, which may be helped by the use of MODAF are:

- Plan, Source & Monitor Conduct of P3 (Materiel and Service Provision to End Users)
- Set Policy strategy doctrine for conduct of:
  - P3 (within bounds set by P1 & P2)

- MEMR&CM & User Requirement for associated Enablers (within bounds set by P3 Plan)
- Deliver/Return Processes (inc all aspects of PHS&T) & User Requirement for associated Enablers (within bounds set by P3 Plan)"
- Define enabler requirements and acquire enabler services/systems for conduct of:
  - P3 Process (e.g. Management and Log C2 info services)
  - P3 'Material Engineering' Processes
  - P3 'Physical Supply' Processes"
- Conduct Logistic Material activity/services:
  - Physical Supply (Deliver and Return and all aspects of PHS&T) and associated components of Asset Mgt – inc inventory management)
  - MEMR&CM (Manufacture, Embodiment, Maintenance, Repair and Condition Monitoring) and associated aspects of Asset Management.

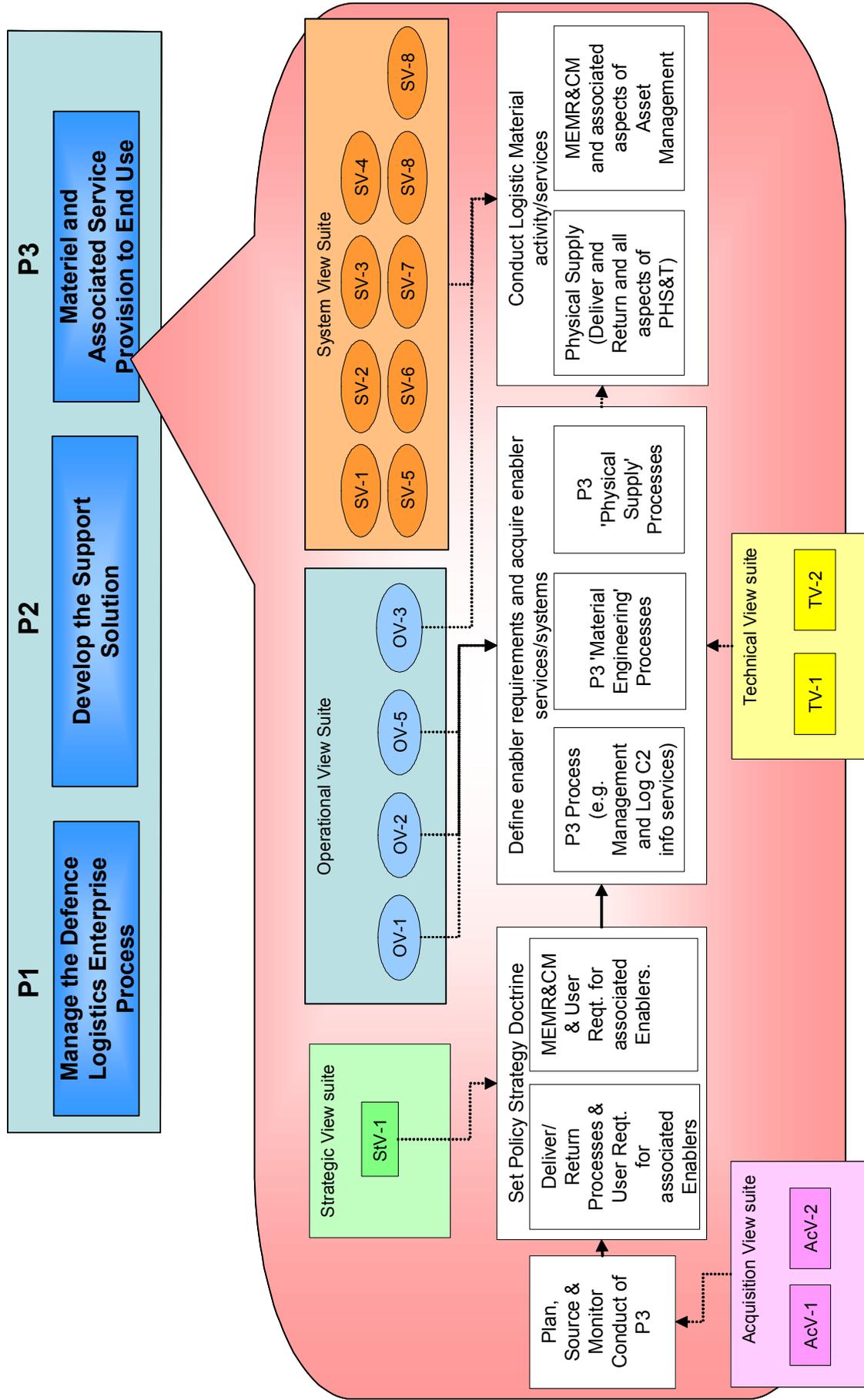


Figure 3-15: Key MODAF Relationships to delivering the support solution.

### **3.5.1 Plan, Source & Monitor Conduct of P3**

*[Examples of views and their application to be provided later]*

### **3.5.2 Set Policy strategy doctrine**

#### **A. FOR CONDUCT OF P3**

*[Examples of views and their application to be provided later]*

#### **B. MEMR&CM & USER REQUIREMENT FOR ASSOCIATED ENABLERS (WITHIN BOUNDS SET BY P3 PLAN)**

*[Examples of views and their application to be provided later]*

#### **C. DELIVER/RETURN PROCESSES (INC ALL ASPECTS OF PHS&T) & USER REQUIREMENT FOR ASSOCIATED ENABLERS (WITHIN BOUNDS SET BY P3 PLAN)"**

*[Examples of views and their application to be provided later]*

### **3.5.3 Define enabler requirements and acquire enabler services/systems for conduct of:**

#### **A. P3 PROCESS (EG MANAGEMENT AND LOG C2 INFO SERVICES)**

*[Examples of views and their application to be provided later]*

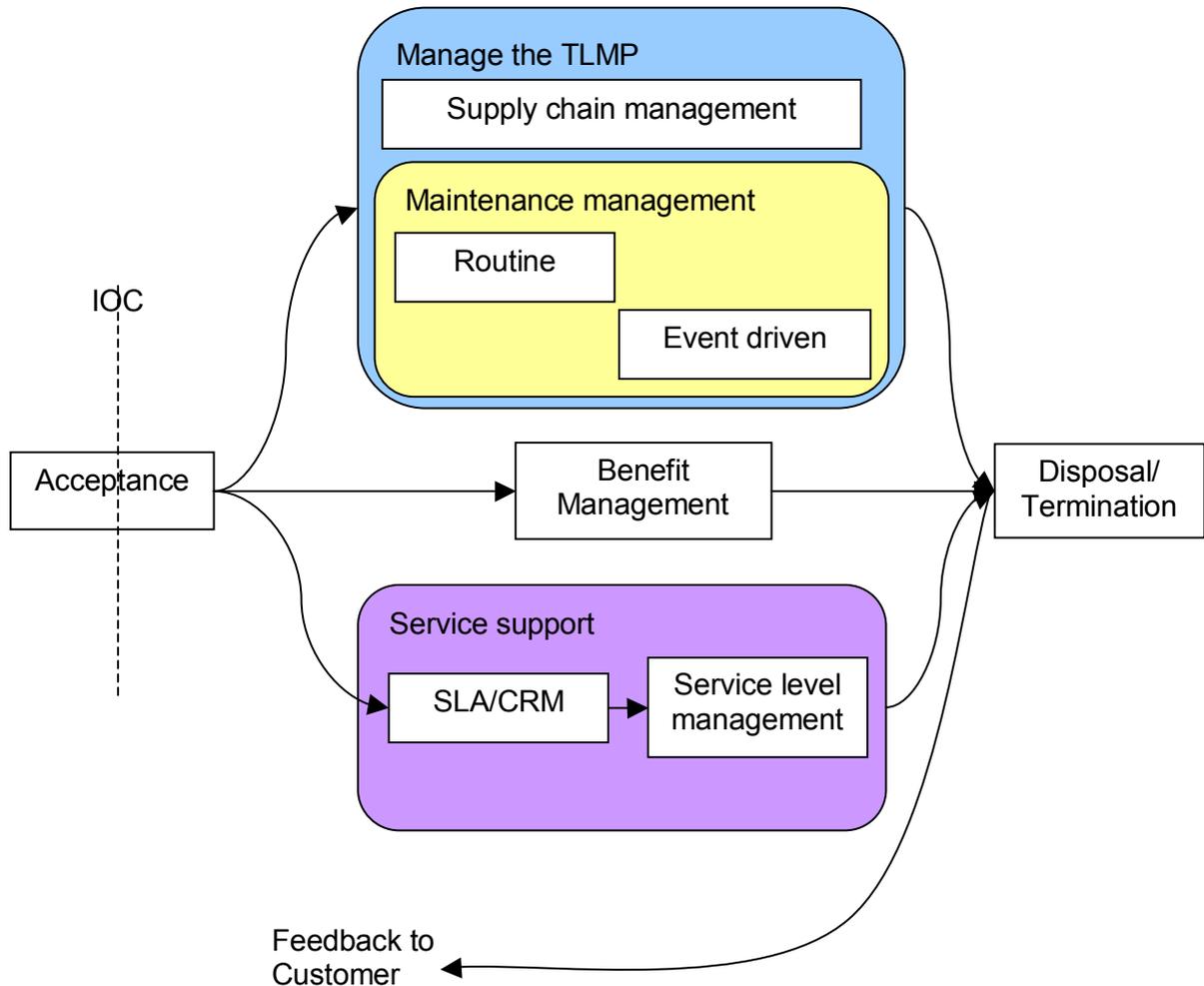
#### **B. P3 'MATERIAL ENGINEERING' PROCESSES**

*[Examples of views and their application to be provided later]*

#### **C. P3 'PHYSICAL SUPPLY' PROCESSES**

*[Examples of views and their application to be provided later]*

### 3.5.4 Conduct Logistic Material activity/services:



**Figure 3-16: Overview of Conduct Logistic Material activity/services**

The Logistic Supply activity comprises those In-service processes which support the execution of the Through-life Management Plan (TLMP) from Initial Operational Capability (IOC) through to Disposal/Termination. The Through-Life Management Plan (TLMP) is initiated during Concept, and revised and refined throughout CADMID and throughout the In service phase as the capability evolves.

- A. *PHYSICAL SUPPLY (DELIVER AND RETURN AND ALL ASPECTS OF PHS&T) AND ASSOCIATED COMPONENTS OF ASSET MGT – INC INVENTORY MANAGEMENT)*

*[Examples of views and their application to be provided later]*

**B. MEMR&CM (MANUFACTURE, EMBODIMENT, MAINTENANCE, REPAIR AND CONDITION MONITORING) AND ASSOCIATED ASPECTS OF ASSET MANAGEMENT.**

*[Examples of views and their application to be provided later]*

## **4. Worked Example**

### **About this section**

This section will present a worked example of MODAF View development in the Sustainment community. It is intended to add clarity, and realism, to the overview of the MODAF View relationship to the CADMID process provided in the previous section.

This section will be updated once example material is available from the LAIPT pilot. For an example of what information this section will provide, please see section 4 of the ECC Deskbook, available on [www.modaf.com](http://www.modaf.com).

## 5. Document Maintenance

It is intended that the MODAF product suite will evolve through time in order to reflect learning from experience, changes to the MOD's processes and the evolution of architectural best practice. A change control process will be established for all MODAF products and suggestions upon the refinement / improvement of this and related products are welcome. The formal MODAF change control process shall be published in due course. In the interim, suggestions should be forwarded to the MODAF project manager:

EC CCII I2b

Tel: 0207 807 8884

### Acknowledgements

This document has been developed by MODAF partners as part of the MODAF 1.0 Baseline that is being prepared by DEC CCII supported by the IA. Other organisations that have contributed to the content and / or review of this document are:

- DCBM(Army)
- DJtCap
- Fleet HQ
- DCIS (RAF)
- ACCS IPT
- AWC Air
- D Log Info
- PJHQ

The role of Industry is also acknowledged in providing support to the MODAF development and in reviewing the MODAF products prior to its release.

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The MODAF 1.0 Baseline has been developed for the MOD by MODAF partners. The MODAF partner's team leaders for this work have been:

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## 6. References

The following reference sources were consulted in the compilation of this Deskbook:

- DODAF Handbook Vol 1 and 2
- DODAF Deskbook
- MODAF Handbook
- MODAF ECC and Acquisition Deskbooks
- Army, Navy and RAF Customer 2 Handbooks
- Joint 2<sup>nd</sup> Customer Handbook (Draft edition 1)
- DCBM (Army) guide to producing User Requirements, using MODAF.
- AMS and BMS websites
- AM conceptual model.