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Architecture Benefits in SOSA

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Dr. Edwin Swidenbank, Chief Engineer, **Team Ensure**

MINISTRY OF DEFENCE

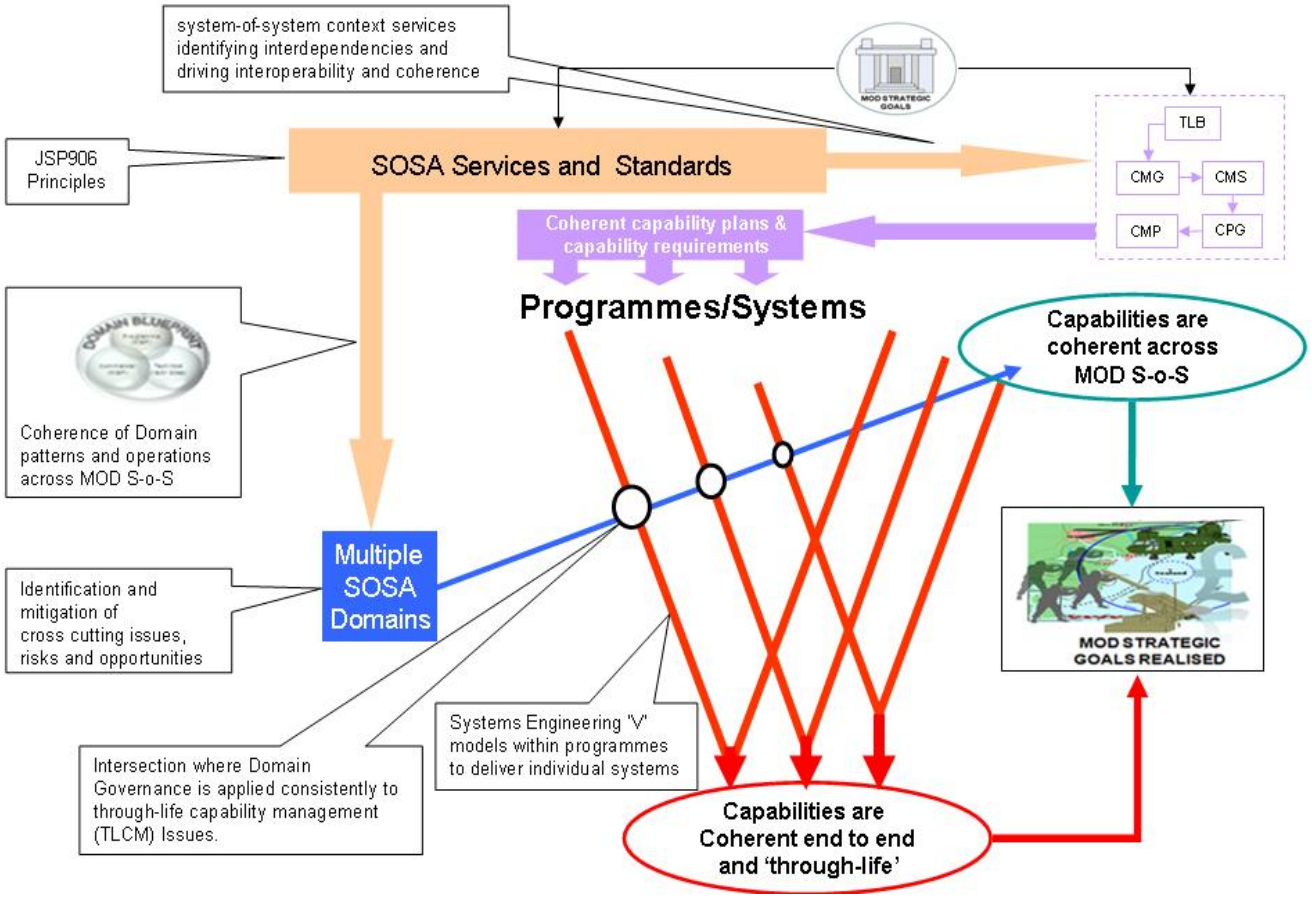
Outline Contents

- SOSA, Defence Reform Context
- Benefits Model
- SOSA Paradigm
- Achitecture…?
- Architecture Styles
  - Authoritative Architecture
  - Directive Architecture
  - Coordinative Architecture
- Conclusions
- Questions

SOSA, DEFENCE REFORM CONTEXT

"Enabling enhanced capability through achieving commonality, reuse and interoperability of independently procured systems"

SOSA Operating Model



SOSA Programme

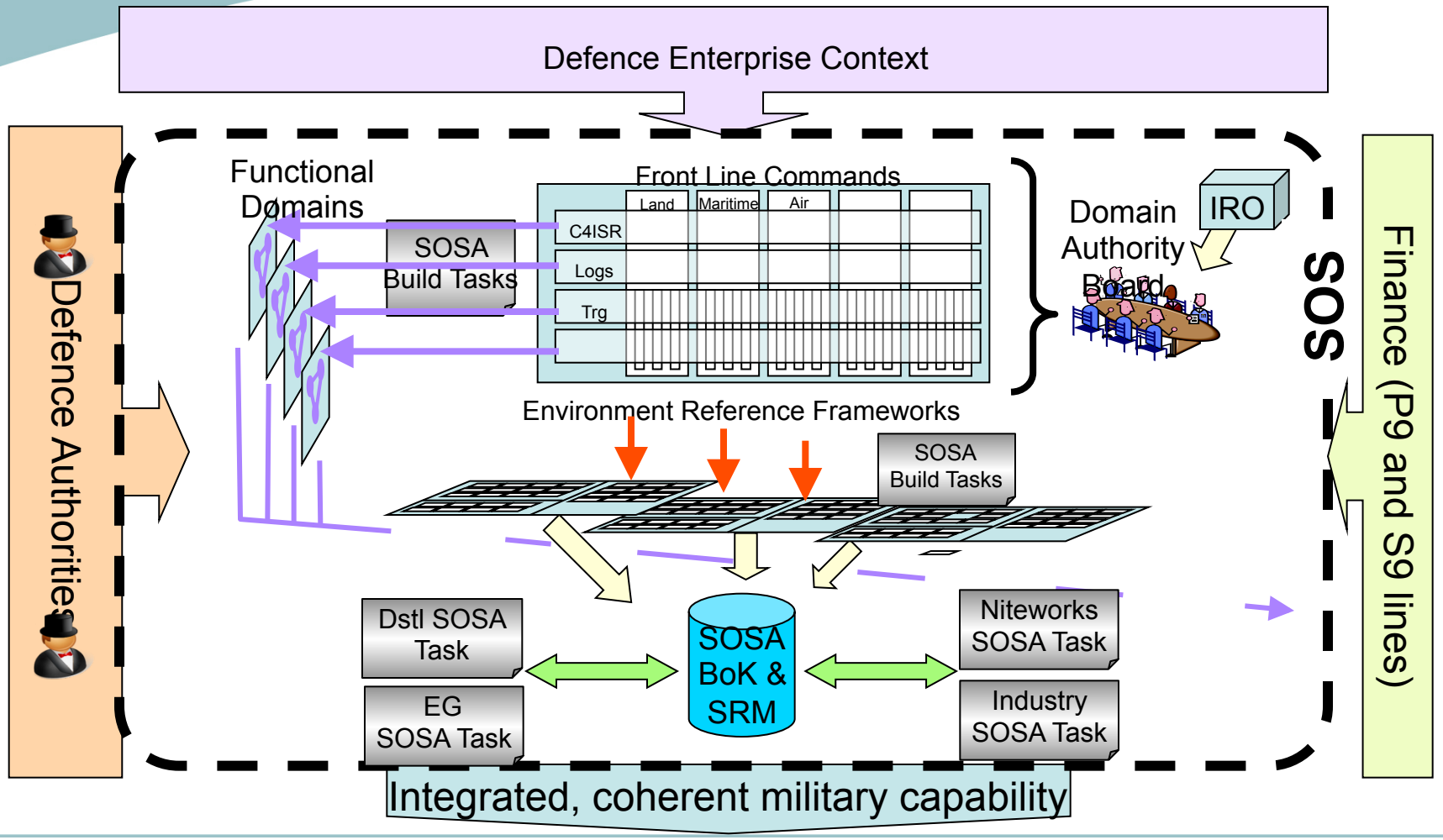
Current Tranche

- SOSA Coherence Services for Capability Management.
  Embedding SOSA into the Develop and Deliver functions within the through life Capability Management process as described in the Generic Capability Model (GCM)
- SOSA Functional Domain Coherence Services.
  Establishing SOSA Functional Domains where justified based on an analysis of the SoS coherence IRO.
- SOSA Central Coherence Authority Services.
  Development of Training, Education and Communications material. Align the SOSA 'Quality Management System' with wider management systems and reference models. Undertake a review of SOSA Principles (JSP906) and update if required. Develop and implement a process for SoS level coherence IRO gathering, reporting and management.

Next Tranche

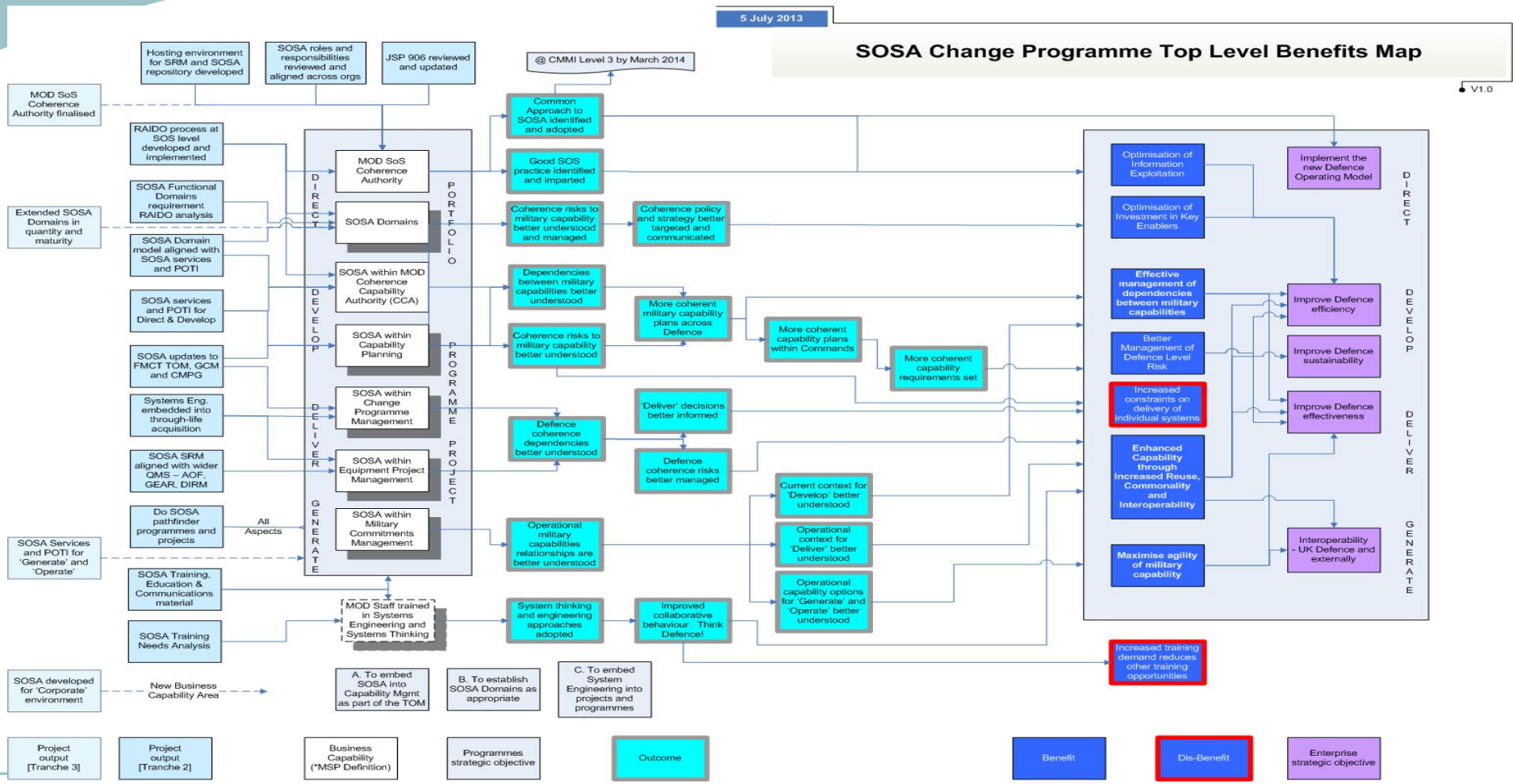
- Keep extending Domains in quantity (broadening) and maturity (deepening) updating relevant services and POTI as required;
- Further embed SOSA into through life Capability Management, focusing on the 'Generate and Operate' functions.
- Extend SOSA to the 'Corporate' environment (ie not just the 6 military capability environments)
- Maintain 'SOSA Central Coherence Authority' services and SOSA Business As Usual

Delivering Coherent SOSA Outputs

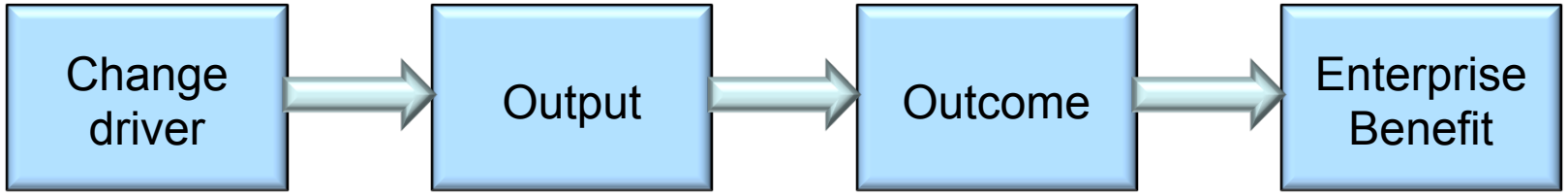


BENEFITS MODEL

SOSA Benefits Model



Simple Benefits Model



- Issue
- Risk
- Opportunity
- Requirement

- Evidence
- Analysis
- Investigation

- Decision
- Requirement
- Refinement
- Risk strategy
- Reuse
- Interoperability
- Coherence
- Consistency
- Enlightenment

- Economy
- Efficacy
- Efficiency

SOSA PARADIGM

SOSA Service Paradigm

Change

Service request

Service provision

Decision Maker

Capability Decisions

DLOD Decisions

Outcome

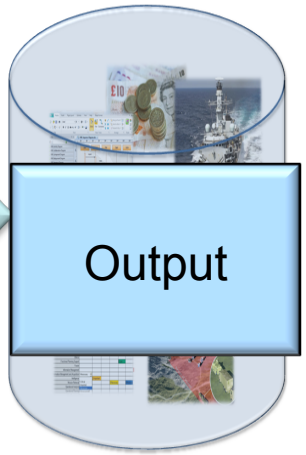
Programme

Maritime Reference Framework

Land Reference Framework

Medical Reference Framework

Management Information



Output

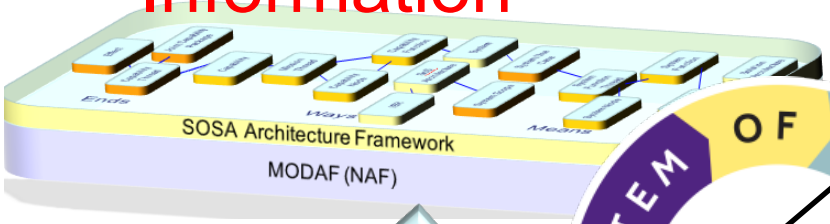
Architecture

Architect

Enterprise Benefit

Architecture Quality

Information



ISO/IEC/ IEEE 42010

ISO/IEC 15288

SOSA Reference Model

Process

GEAR

Tools

APPROVED

Architecture

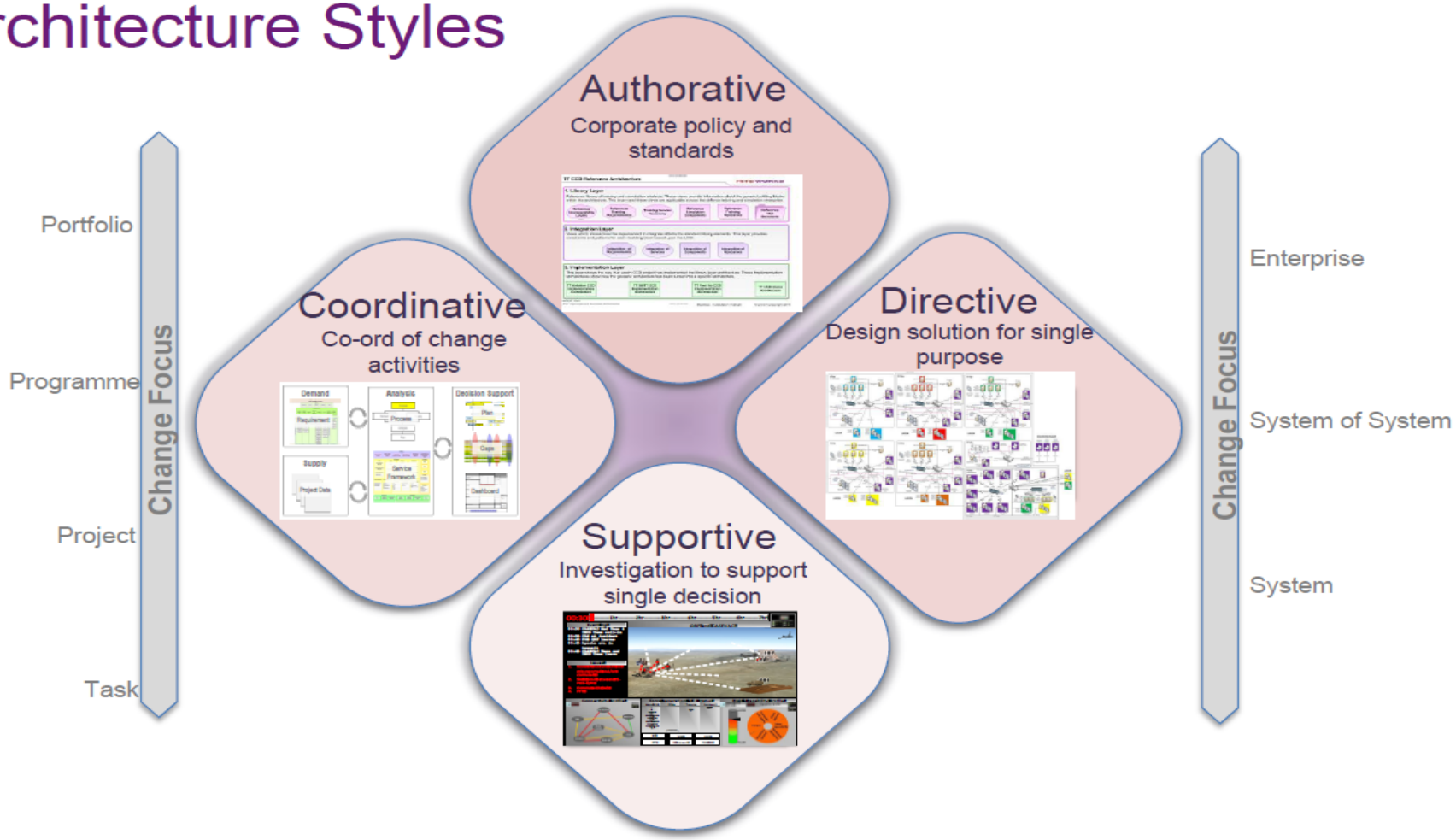
INCOSE International Council on Systems Engineering

Organisation (SQEP)

ARCHITECTURE....?

NITEWORKS

Architecture Styles



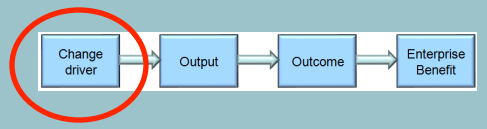
NITEWORKS

Styles of Architecture

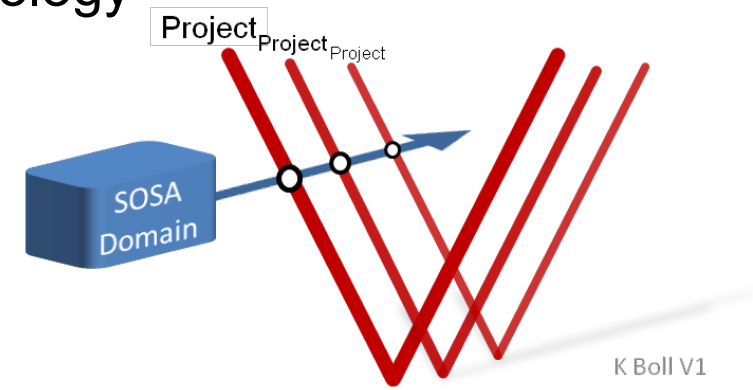
Authoritative	The Authoritative style provides direction/policy to one or more domains to drive coherency, consistency, reuse and alignment with corporate objectives. The architecture is an enduring reference source for other architecture activities and supports all phases of the enterprise life cycle. It requires constant management and strong governance to ensure it remains relevant and valid. This style is commonly enabled by a specialist team with a wide remit for coherence or interoperability across the enterprise.
Directive	The Directive style plays a key role in the development, design and implementation of new capability, processes or systems within existing engineering practices and governance. It is applicable to all domains but is normally focused on a single domain or sub-domain that is planning for, or going through change. Depending on the domain this style will use relevant reference models, policies or standards along with a range of dedicated/specialist tooling.
Coordinative	The Coordinative style supports the co-ordination of change activities within a single domain or sub-domains by aggregation across lower levels; it is normally used at the Programme or Enterprise level. Governance is needed to ensure that the supplied management information (MI) is of suitable quality to support required decisions. The approach draws heavily on broader P3M practices and may be part of a Programme Support Office (PSO). Tooling is specialised with aggregated data being presented through dashboards or composite graphics to meet different decision makers' needs.
Supportive	The Supportive style is a focused style that supports key interventions or decision points across all levels of change and it can also be used as an initial activity to identify the need for change. It can function with limited governance (eg peer review) but must be held to account when supporting key decisions. This style is normally undertaken by a small team of dedicated architects working as part of a wider team using best available tooling including standard office products.

AUTHORATIVE ARCHITECTURE

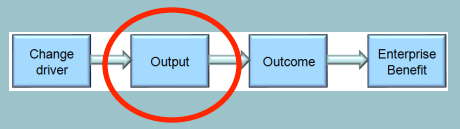
Change Drivers



- Not consistently meeting standards & policy (patterns and rules)
- Consistent definition of Defence Enterprise architecture artefacts
- Consistent terminology across capabilities
- Tighter definition of acquisition terminology
  - CONEMP
  - URD
  - ITEAP
  - .....
- SOSA Operating Model
  - Defence Operating Model / SOSA Domain intersection



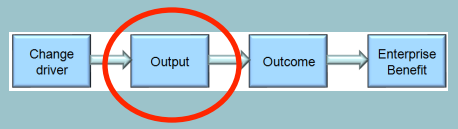
DIRM



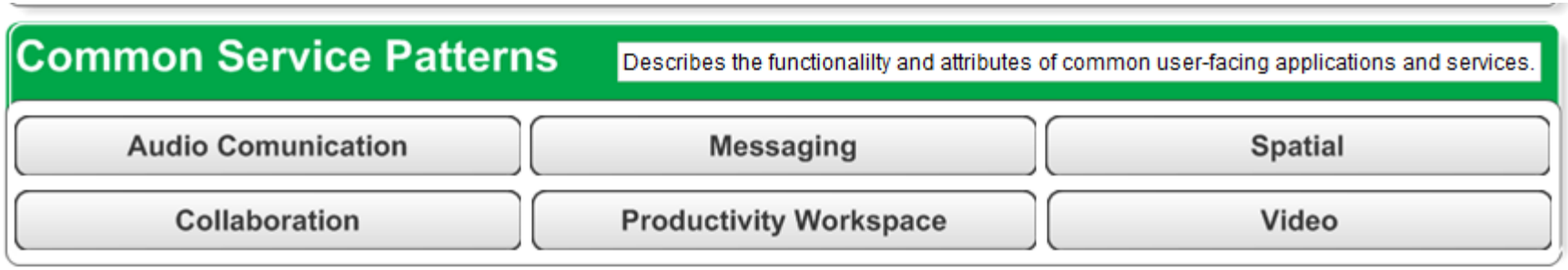
DEFENCE INFORMATION REFERENCE MODEL

	Conceptual	Logical	Physical
Defence Context Layer CTO Business Architect	DEFENCE CAPABILITIES 1	DEFENCE TASKS 2	PLACE HOLDER FOR: HOW DEFENCE EMPLOYS THE MEANS AT ITS DISPOSAL 3
Information Layer CTO Information Architect	MOD INFORMATION STRATEGY 2011 4	LOGICAL INFORMATION MODEL 5	DEFENCE REFERENCE DATA ARCHITECTURE [RLI] 6
Applications Layer CTO Solutions Architect	DEFENCE ICT STRATEGY 2013 7	INFORMATION SERVICES & APPLICATIONS GROUPINGS 8	DEFENCE APPLICATIONS REGISTER [RLI] 9
Technology Layer CTO Technical Architect	10	ENABLING TECHNICAL SERVICES & COMPONENTS 11	PLACE HOLDER FOR: ENTERPRISE TECHNOLOGY ROADMAPS ETC 12
	ENDS	WAYS	MEANS

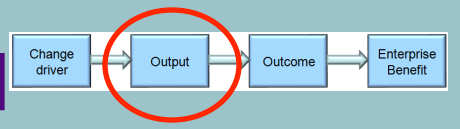
Architecture Patterns

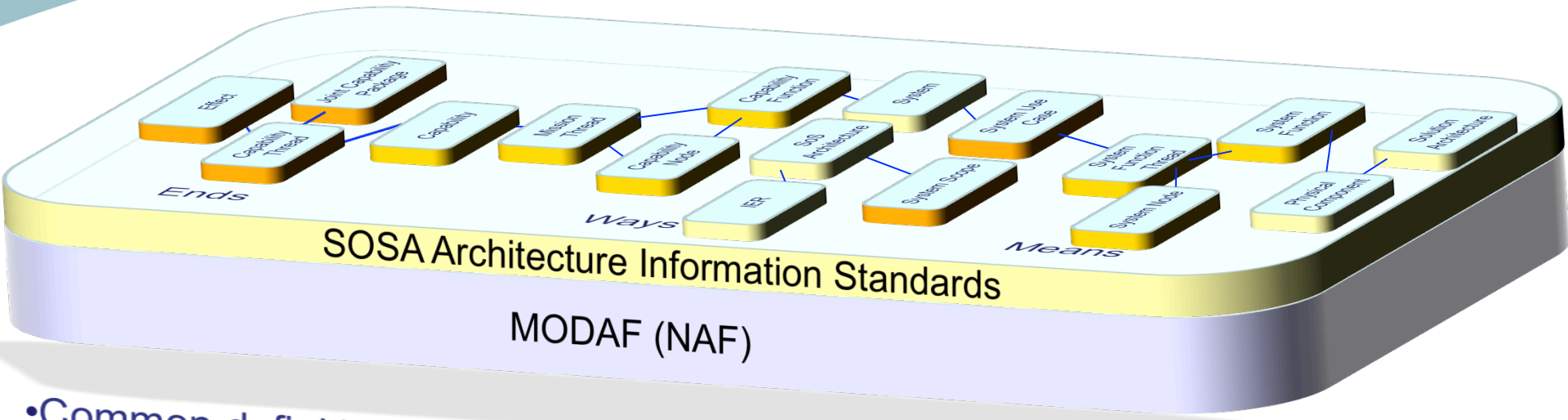


- LOSA
  - Generic Base Architecture
  - Generic Soldier Architecture
  - Generic Vehicle Architecture
  - Common Open Interface Land
- ICT Service Patterns



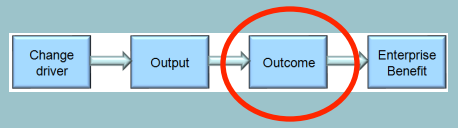
Architecture Information Standard



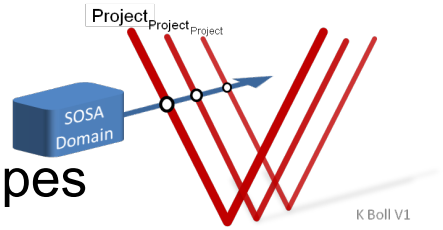


- Common definition of Defence architecture artefacts and views
- Associations between artefacts ("golden thread")
- Represents Supply and Demand
- Used and refined by every SOSA task (>100)
- Build on MODAF / NAF

SAIS Outcomes



- Coherency
  - Vertical: Through the Defence Operating Model
  - Horizontal: Across concurrent Capability stovepipes
- Consistency
  - Repeatable outputs
  - Repeatable processes
- Reuse
  - Architecture across the SOSA programme
- Alignment with Corporate Objectives
  - Common architecting and architecture
  - JSP 906 (Coherence, Reuse, Interoperability)

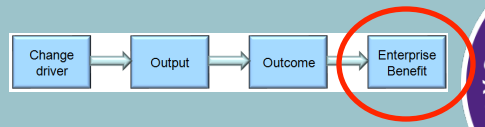


GEAR

SOSA Reference Model

Joint Service Publication
906
Design Principles for Coherent Capability

SAIS Benefits

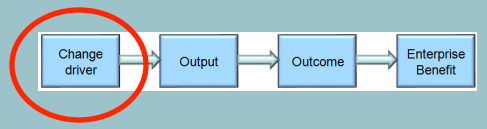


- Efficiency
  - Architecture teams are more productive
  - Architecture teams are more flexible
  - Quicker “out of the blocks”

- Efficacy
  - Improved trace to business needs and strategic goals

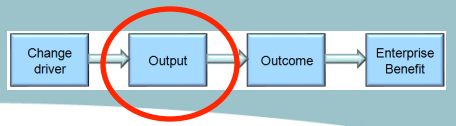
DIRECTIVE ARCHITECTURE

Change Drivers



- Poor justification of decisions:
  - Technical
  - Programmatic
  - Commercial
- Poorly managed risks
- Poorly understood interoperability
- Low reuse
- Vertical and horizontal coherence

Directive Architectures



UNCLASSIFIED

CEPP – Coherence and Dependency

Tasks 006/013/023 Start date: 2011 Closure date: 2012

Carrier Enabled Power Projection (CEPP) Assumptions Coherence and Dependency Management

Key Benefits:
- Clarification of dependencies between capabilities
- Single, integrated view of assumptions
- Improved coherence of Information Exchange Requirements
- Improved coherence of capability plans
- Reduced risk to interoperability

UNCLASSIFIED

Project SCAVENGER and MALE UAS Architecture and SRD Coherence

Task No. 18 & 27 Start Dates: 08/2011 & 10/2011 Closure Dates: 02/2012 & 05/2012

Project SCAVENGER (MALE UAS) Architecture Assessment Phase

Benefits:
- Better understanding of dependencies between military capabilities and risks to coherence
- Better understanding of the interoperability risks through the early life cycle stages (run up to Initial Submission)
- Enhancement of inter and intra-programme coherence of SCAVENGER and enabling more effe...

UAS PT

UNCLASSIFIED

Attack Helicopter CSP– Systems Modelling

Task No. 85 Start Date: 05/06/2013 In Progress

Attack Helicopter Capability Sustainment Programme Functional Systems Modelling

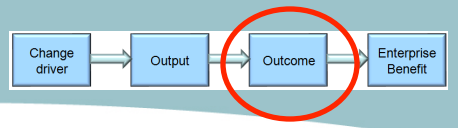
Key Benefits:
- Has removed uncertainty in identifying the risks to AH capability sustainment
- Removes the risk of a costly run-on programme for the WAH-64D
- Provides continuity of AH capability, ensuring that future deployed operations can be properly supported
- Gives EG and AH DT confidence that the SRD has been created from auditable and supportable information collated by SQEP in consultation with a broad and relevant stakeholder community

Attack Helicopter Delivery Team

...Hospital ...re Project

Benefits:
- The development of a User Requirement Document (URD) framework that is better aligned to relevant medical doctrine.
- A reduction in the time taken to develop the URD framework due to the re-use of the existing Medical Reference Framework.
- A more complete and coherent understanding of the dependencies and relationships with other capability areas.
- A better understanding of the limitations associated with the procurement of a MOTS solution.

Architecture Exploitation



Decision Maker

Business needs

Investment decision

Capability Decisions

DLOD coherence

Decision Justification

Dependencies

Capability coherence

Risk Management

Business Case

Overlap

Opportunity Management

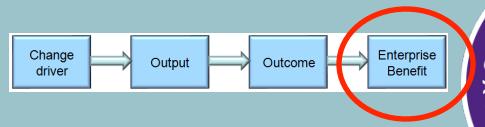
Gap

Contract

Integration Plan

MINISTRY OF DEFENCE

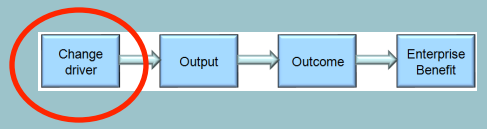
Benefits



- Economy
  - Cost avoidance
  - Cost saving. Better decisions; Reduction of rework
  - Opportunity realisation
  - Capability rationalisation
- Efficiency
  - Efficient end-to-end process through architecture reuse
  - Reuse of “enduring” architectures and patterns
  - Coherence of technical, programme and commercial activities
  - Solution identification and reuse
- Efficacy
  - Operational, support and disposal improvement
  - Interoperability (national and coalition)
  - Doctrinal improvements

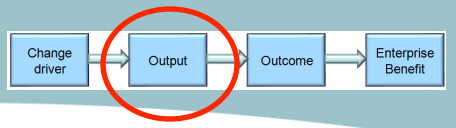
COORDINATIVE ARCHITECTURE

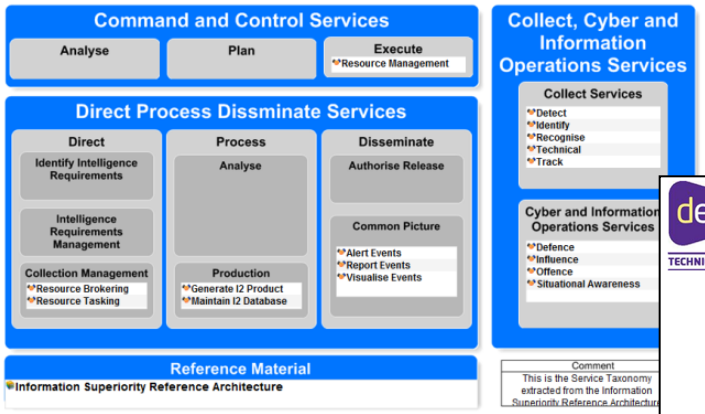
Change Drivers

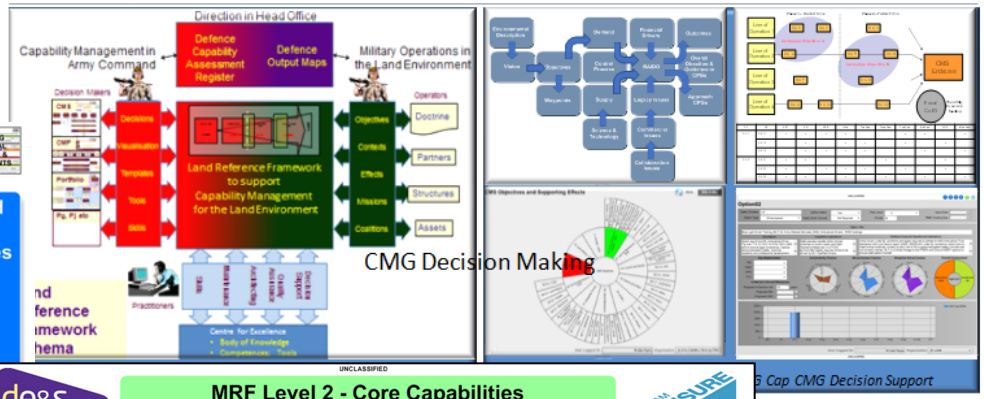


- Poor understanding of decision information
- Business transformation
- Poor Information Management and Information Exploitation
- Evidence based decision making and H2A!

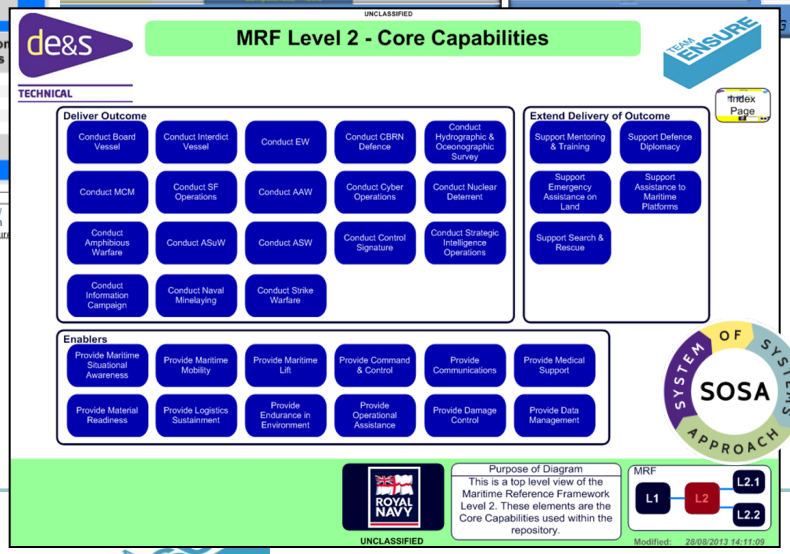
Coordinative Architectures





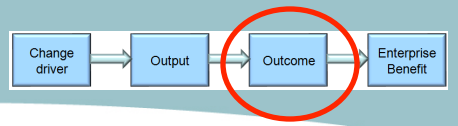


Land Reference Framework



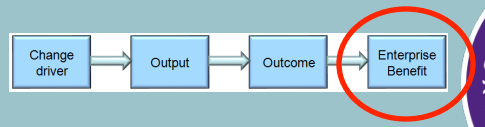
Maritime Reference Framework

Coordinative Architectures



- Improved P3M (better MI)
- Dependencies & risk management
- Information management, information exploitation
- Gap and overlap identification and management
- Golden thread trace to business needs
- Decision impact analysis
- Current capability state
- Planned capability state
- Decision evidence (H2A)
- Coherence with the DOM / GCM / CMPG

Benefits



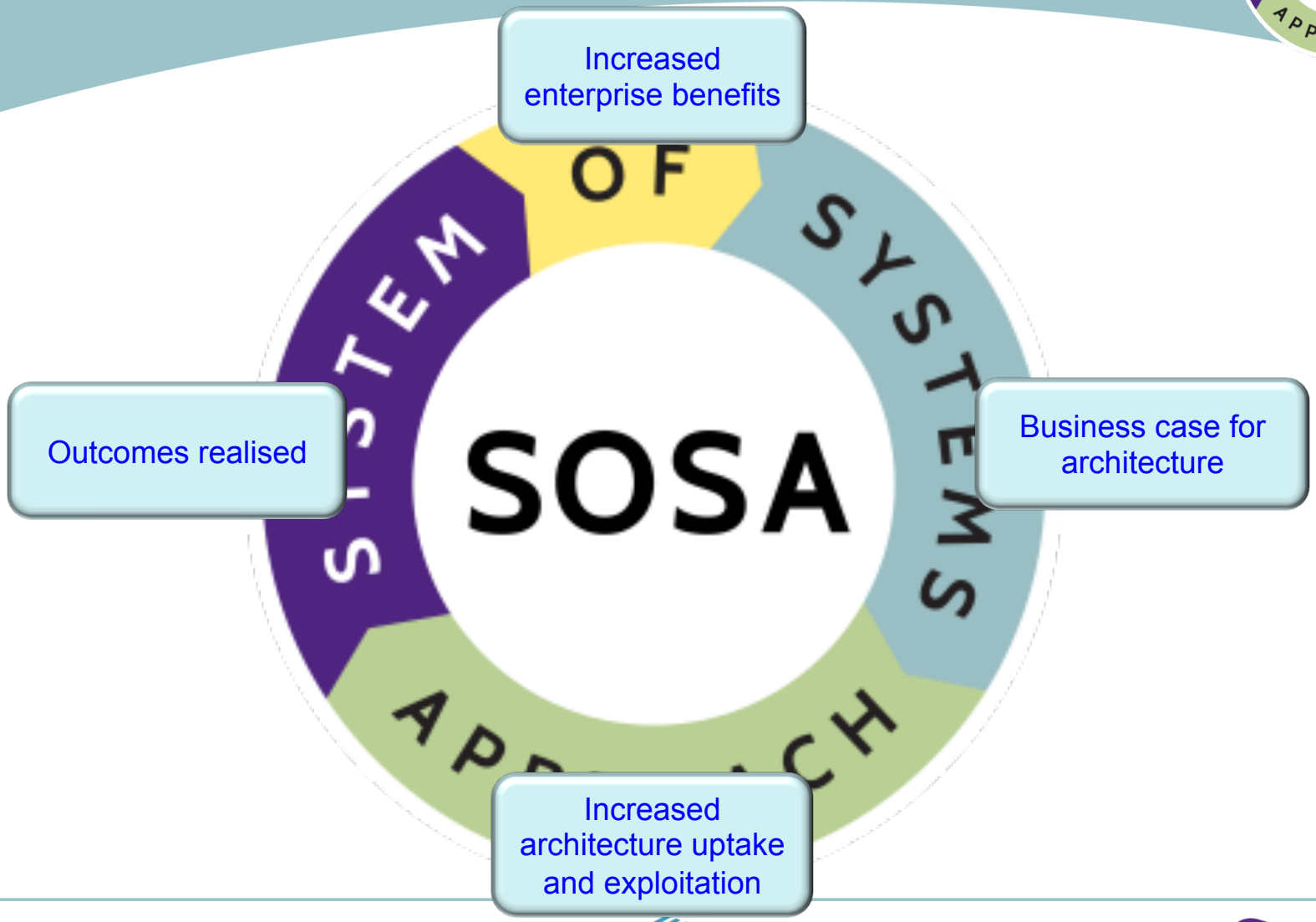
- Economy
  - Better investment decisions
- Efficiency
  - Improved access to management information
  - Access to coherence information across Capability Planning Groups, projects, suppliers
- Efficacy
  - Business needs satisfied

CONCLUSIONS

Observations

- We (architects) are NOT in control of benefits accrual (maybe not even outcomes!)
- Decision makers are unaware of the role and potential impact of architecture
- Architecture and architecting standards are imperative
- We must create the demand for the sake of the enterprise (focus on outcomes & benefits NOT outputs)

Virtuous Circle



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Dr. Edwin Swidenbank, CE Team Ensure,
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QUESTIONS