

SERVING DEFENCE AS THE DEFINITIVE PARTNERSHIP

Steve Hitchins, Chief Architect



“.... experimentation is critical to ensure we deliver what the front line needs. Niteworks provides a unique ability to link from ‘current to concept’ and ensure we deliver practical, affordable increments...”

VAdm Paul Lambert, DCDS(Cap)



THINK **NiTEWORKS** FIRST

“Niteworks is the only thing which saves me money”

(Outgoing) DCDS(Cap)
Lt Gen Andrew Figgures

Agenda

- The Niteworks Context
- Re-Use of Architectures
- Practical Actions
- SOSA

Niteworks Key Facts

- Partnership between UK MOD and UK Defence Industry
 - MOD part includes Dstl
 - Industry part includes major defence suppliers, SMEs, specialists and consultancies
- Flexible decision support
 - Across Defence Lines of Development (DLOD)
 - Centre of excellence for experimentation
 - Provision of the Key Systems Advisor
- Impartial culture and commercial model
 - Impartiality through full partnership engagement
 - ‘Best Athlete’ resourcing of projects
 - Foreground IP owned by MOD, background IP protected
- Mixed funding model
 - Niteworks infrastructure is centrally funded
 - Specific projects require ‘customer’ funding

Partnership Members...



Niteworks Priority Areas

- Support to front-line operations
- Support to JCB decision-making
- Support to capability-based acquisition programmes
- Enabling NEC through the Key Systems Advisor service



Niteworks Services

- Context setting (eg for strategy formulation)
- Problem/requirements formulation
- Solution/architecture development
- Option definition, assessment and trades
- Programme formulation and support
- Process development and guidance
- Review, analysis and audit
- Stakeholder forum facilitation and management
- Transformation support (KSA)

The Big Issues

- Evolving threat and need for agility/flexibility
- Acquisition problems and dependence on UoRs
- Strong pressure on the Defence Budget
- Limited scale in the UK Defence Market
- Particular NEC issues
 - Inconsistent, misaligned capability strategies
 - Lack of ‘business’ and ‘information’ perspectives in requirements setting
 - Cross-domain network and spectrum issues not considered effectively
 - Lack of coherent, supported operational focus for capability planning, delivery and management functions
 - Incoherent governance, standards, architectures and policies across systems and platforms

How do we use EA/MODAF?

- Model the baseline architecture
- Model the experimental architecture
- Capture warfighter behaviour
- Model Information Exchange Requirements
- Demonstrate an understanding of platform and system of systems functionality

Re-use of Architecture and Models

- Obvious principle
- Easy to articulate and understand
- Hard to do in practice
- A very worthy goal



What does “Re-use” mean?

- Re-use of artefacts across a range of projects
- Re-use of artefacts through life
- Re-use of knowledge gained
- Re-use of standard components and patterns



Challenges

- Provenance
- Level of abstraction
- Level of detail
- Degree of validation
- Consistency of interpretation of MODAF
- Compatibility of tools
- Style and appearance
- Access and Visibility

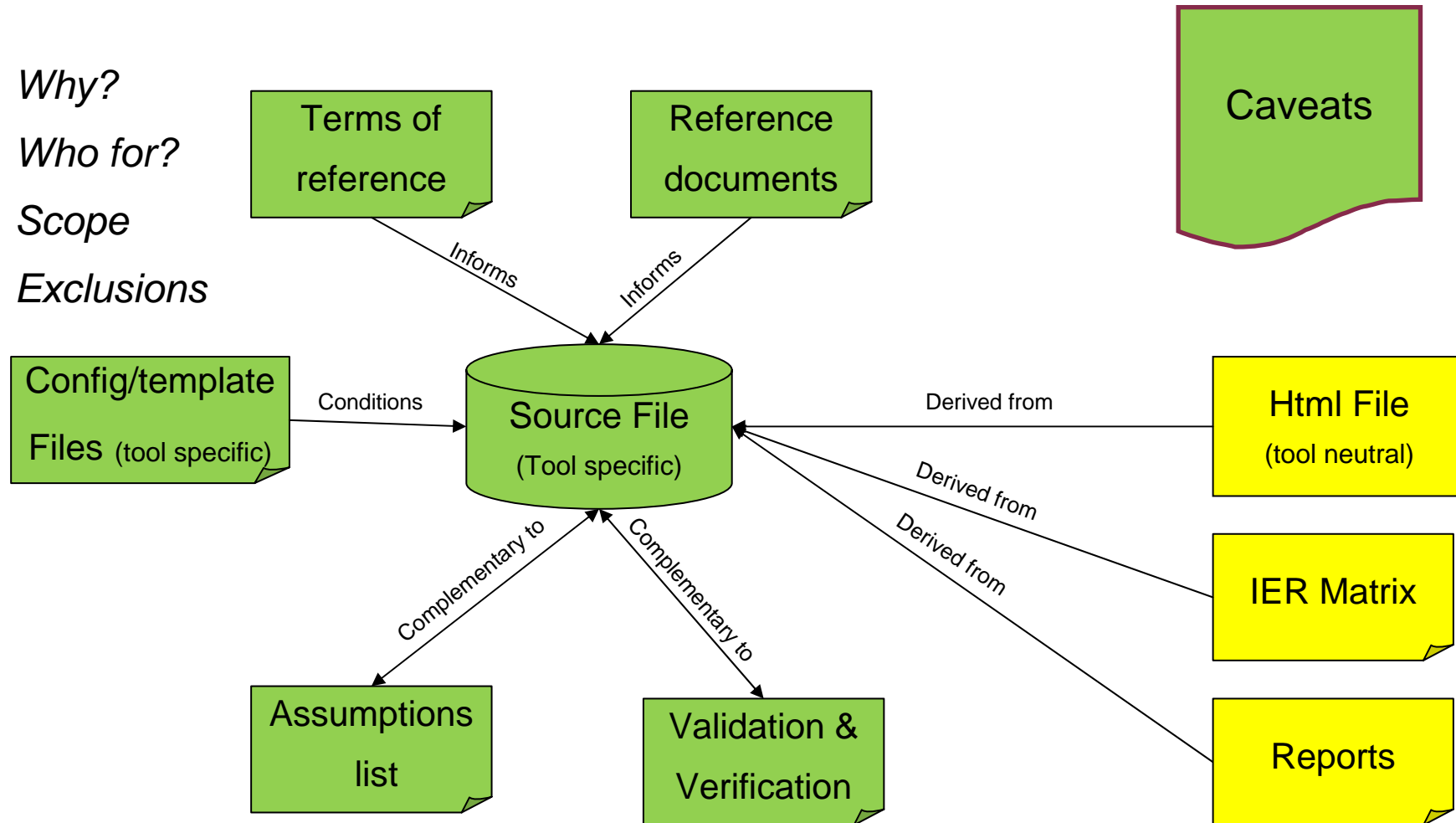
Provenance

Why?

Who for?

Scope

Exclusions

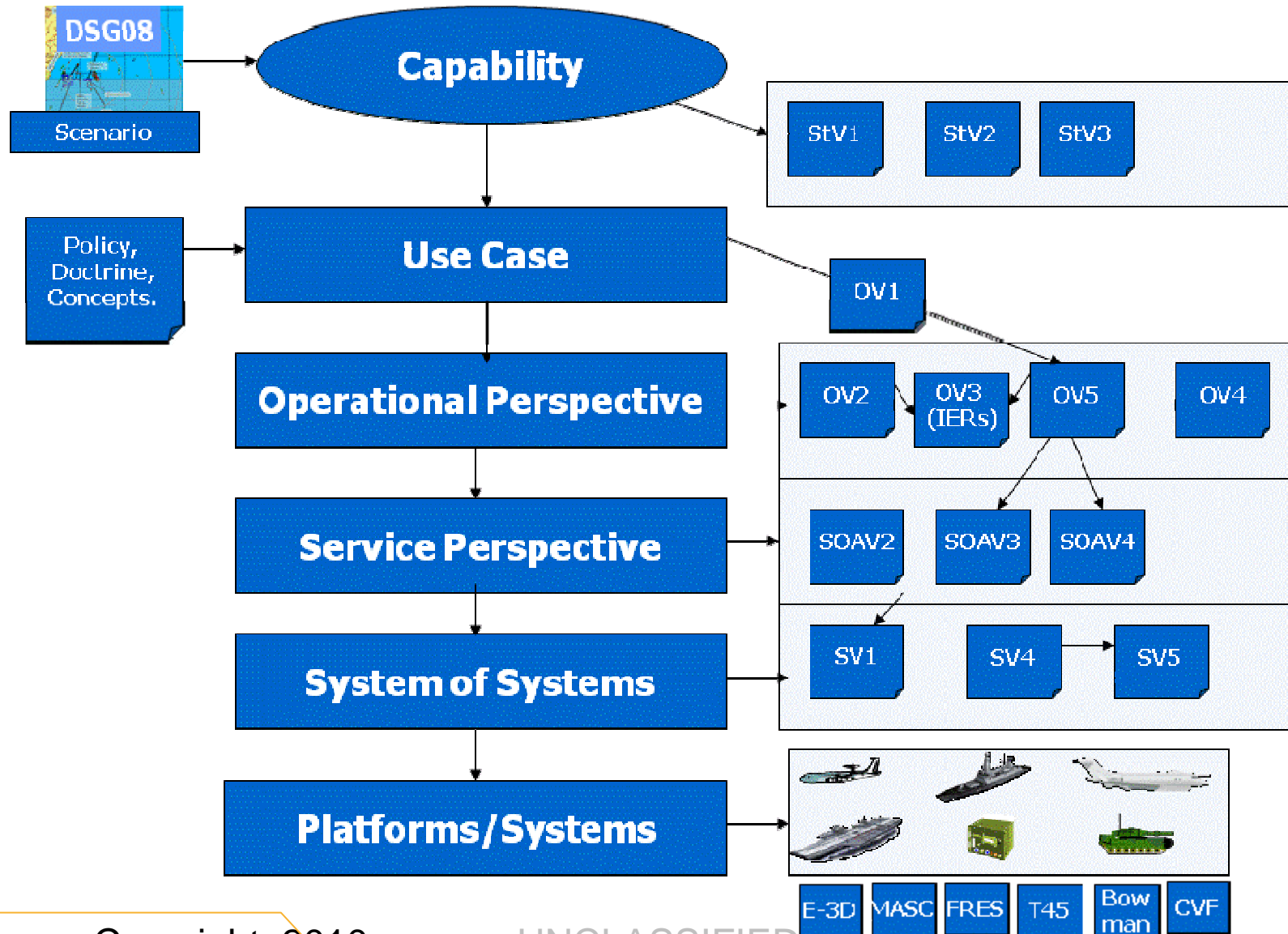


Source Niteworks ISTAR Domain Architecture Library Project, Jan 2010

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Level of Abstraction



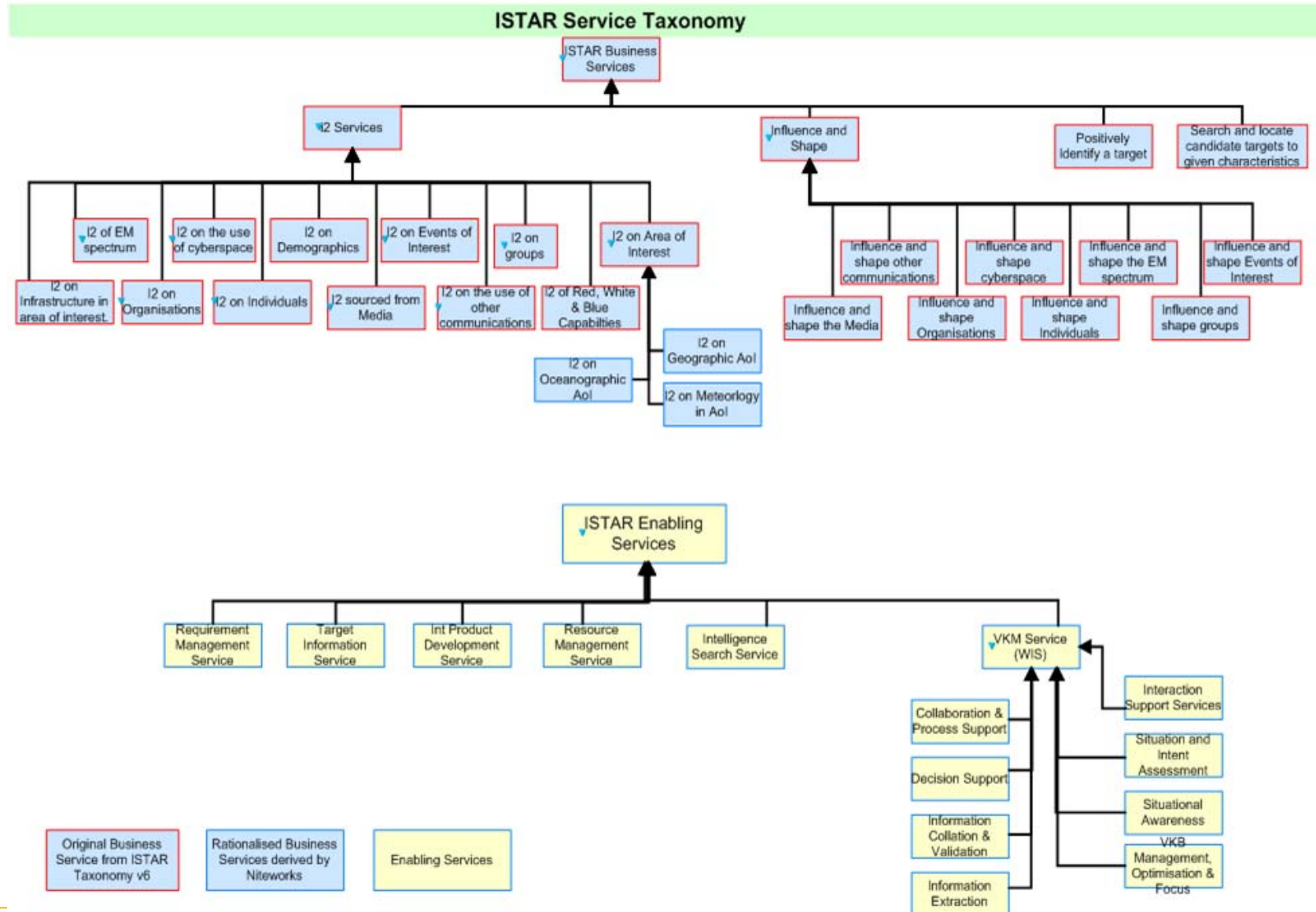
Level of Abstraction - Services

Enterprise or Military Services

Enabling Services

Technical Services

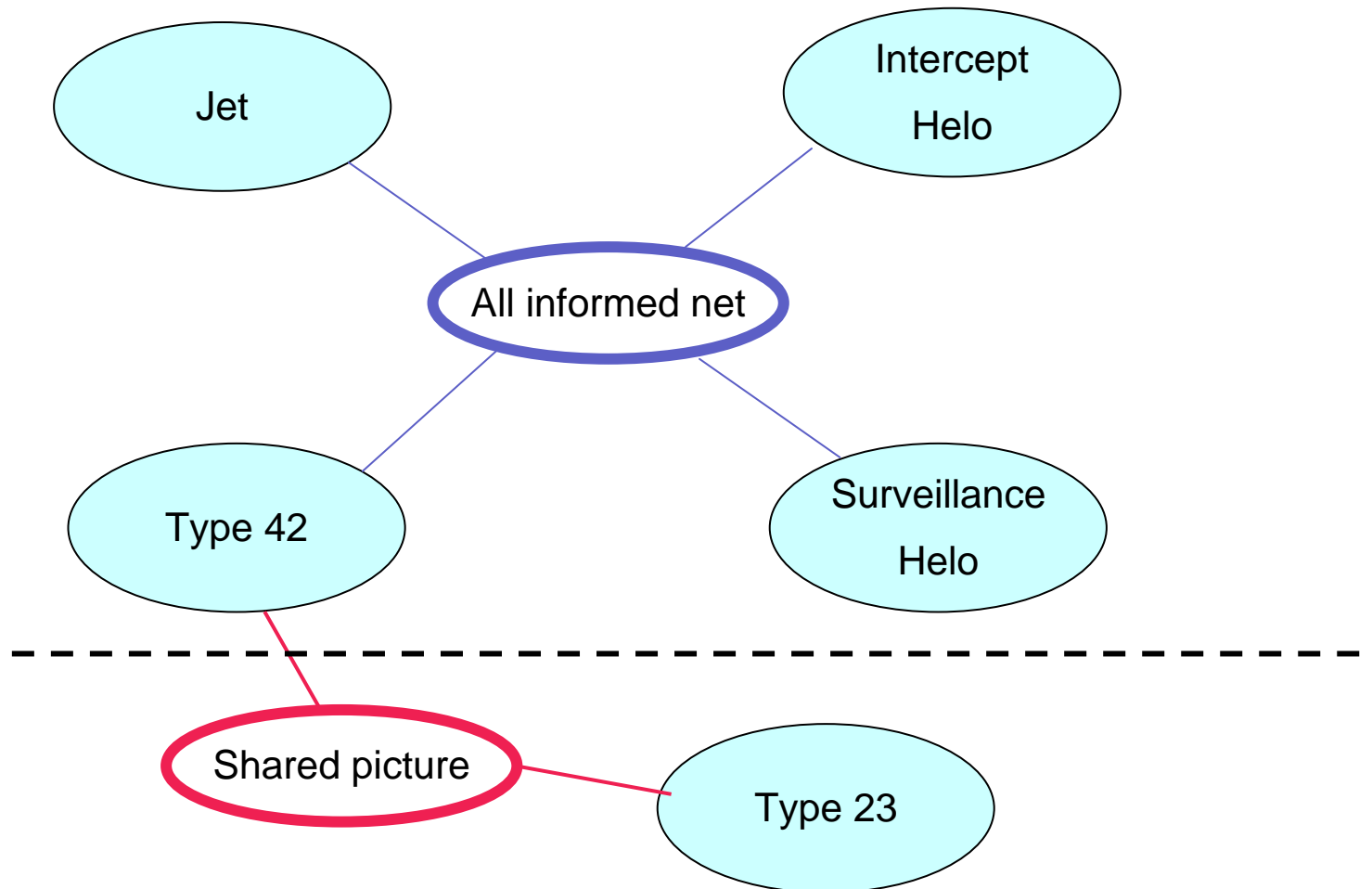
ISS and ISTAR Services



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Level of Detail



Level of detail

Associated Funded Programmes
 T23 CUP
 CIWS Optimisation
 155mm TDP & 4.5 Inertialive Munitions
 Oust IAE
 MRR
 T23 PRISM
 GSA&GRED
 SMALL BOATS
 RADAR T996SEAWOLF Block 2 & MLU
 DLN - Offboard active decay
 DNA7
 WECDIS
 AIS



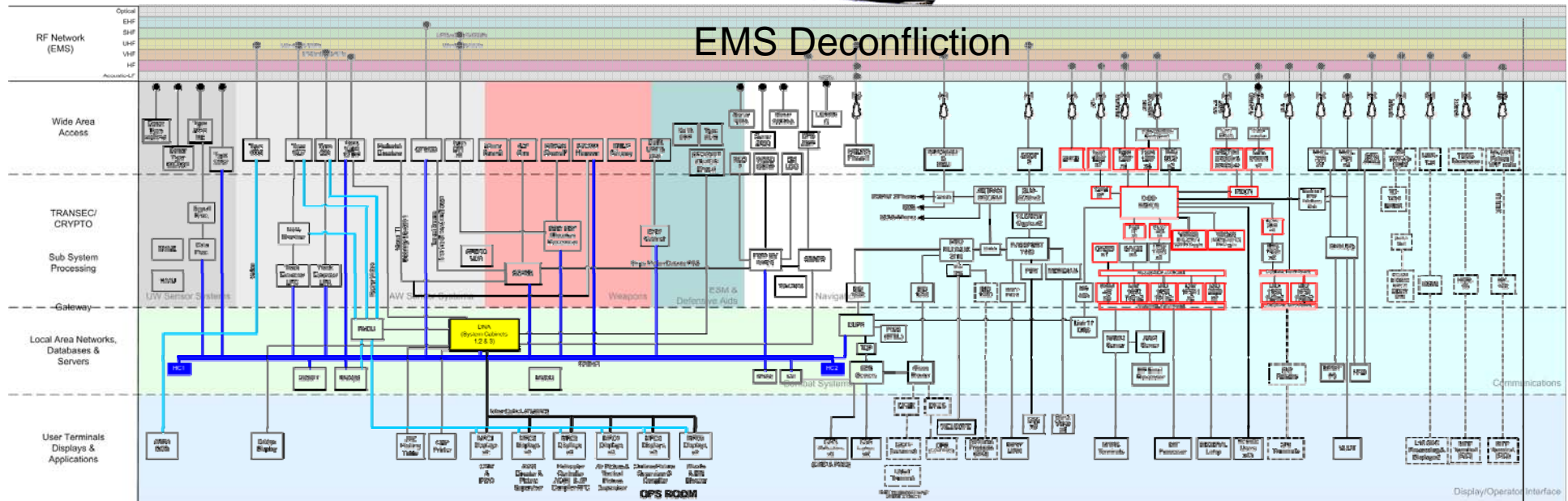
Type 23 Frigate

NOTES:
 Not showing, Airwave/Mobile Phones,
 AIS & SIO equipments. Other sub systems are not
 broken down and further information should be
 sourced from latest available information e.g. WEG,
 DSCA Corsham, Frigates IPT
 Owner of diagram IA7a@dpa.mod.uk

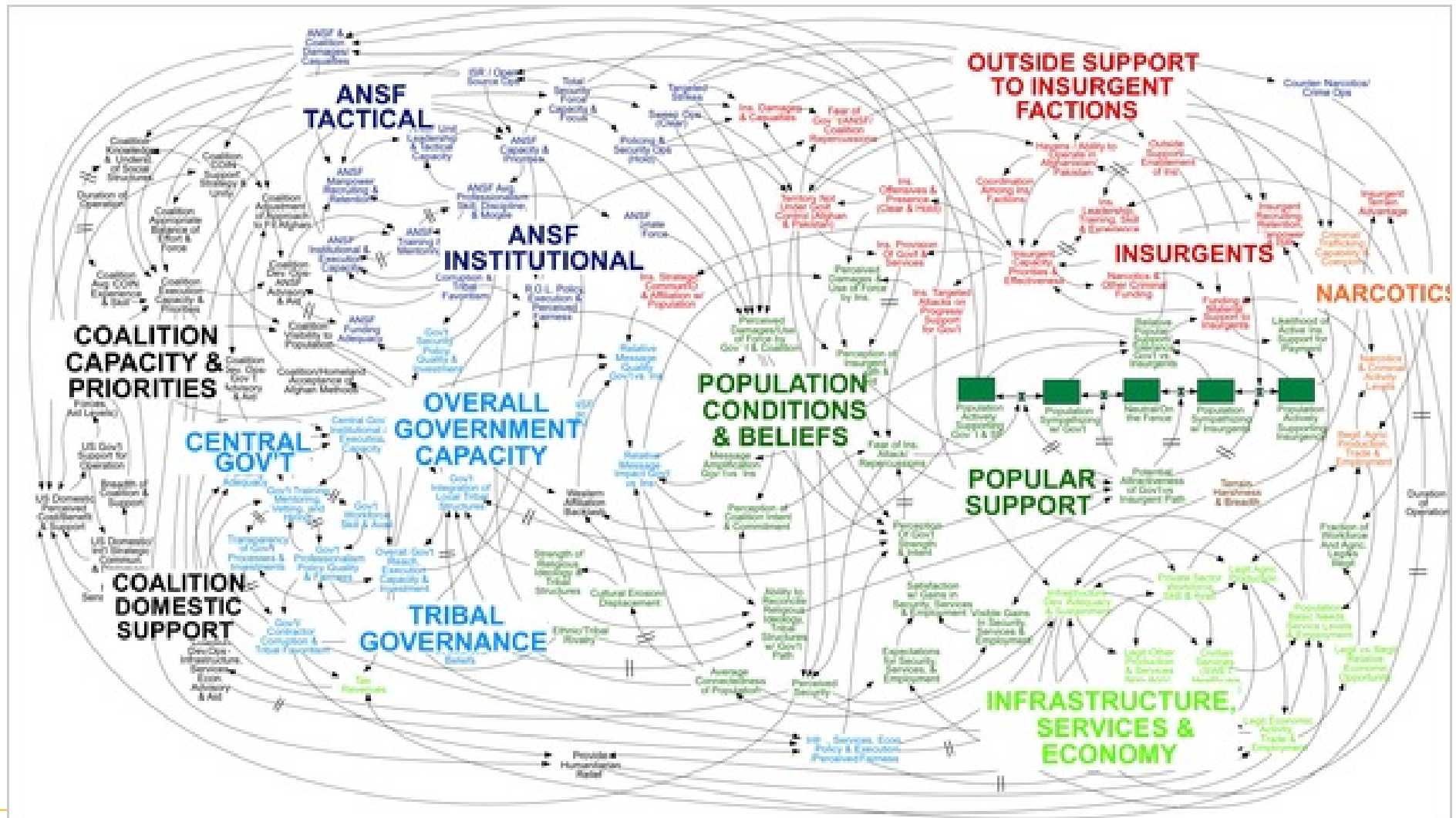
Near term - (Current +5yrs)
 STDL, GAOSS, 1202, 1207 Upgrades
 IC56
 STDL (no RNJTIDS)

Medium Term - (5-10 yrs)
 Potential programmes impacting T23 include
 CEC, SHAMAN, LISTENER

Longer Term - (10+ yrs)
 Communications Alignment with CVF, T45,
 DSG 03 Drivers to align with US migration,
 AEHF? Unmanned Vehicles? SCMR? Imagery?
 Battlstaff Support

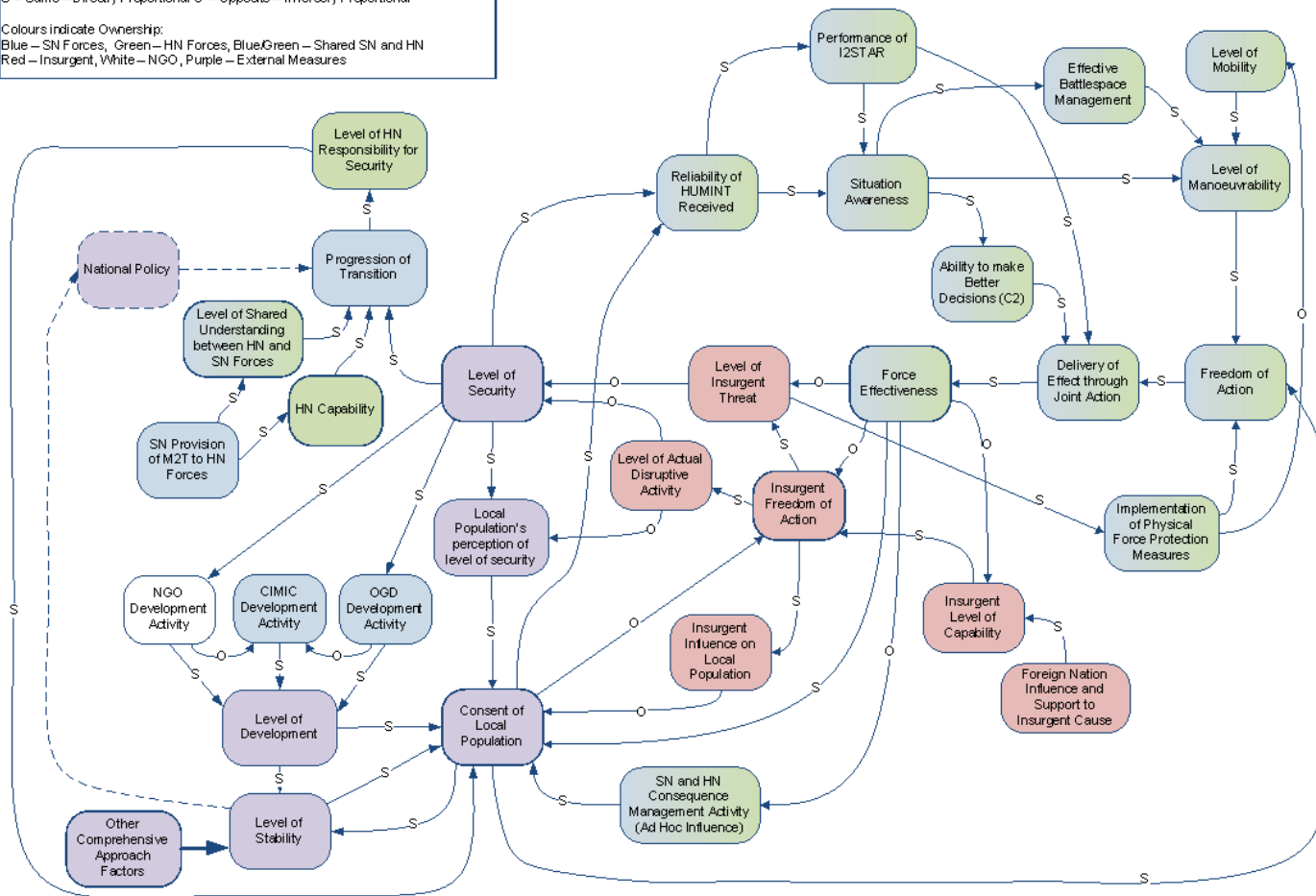


Level of detail – US Style



A readable summary

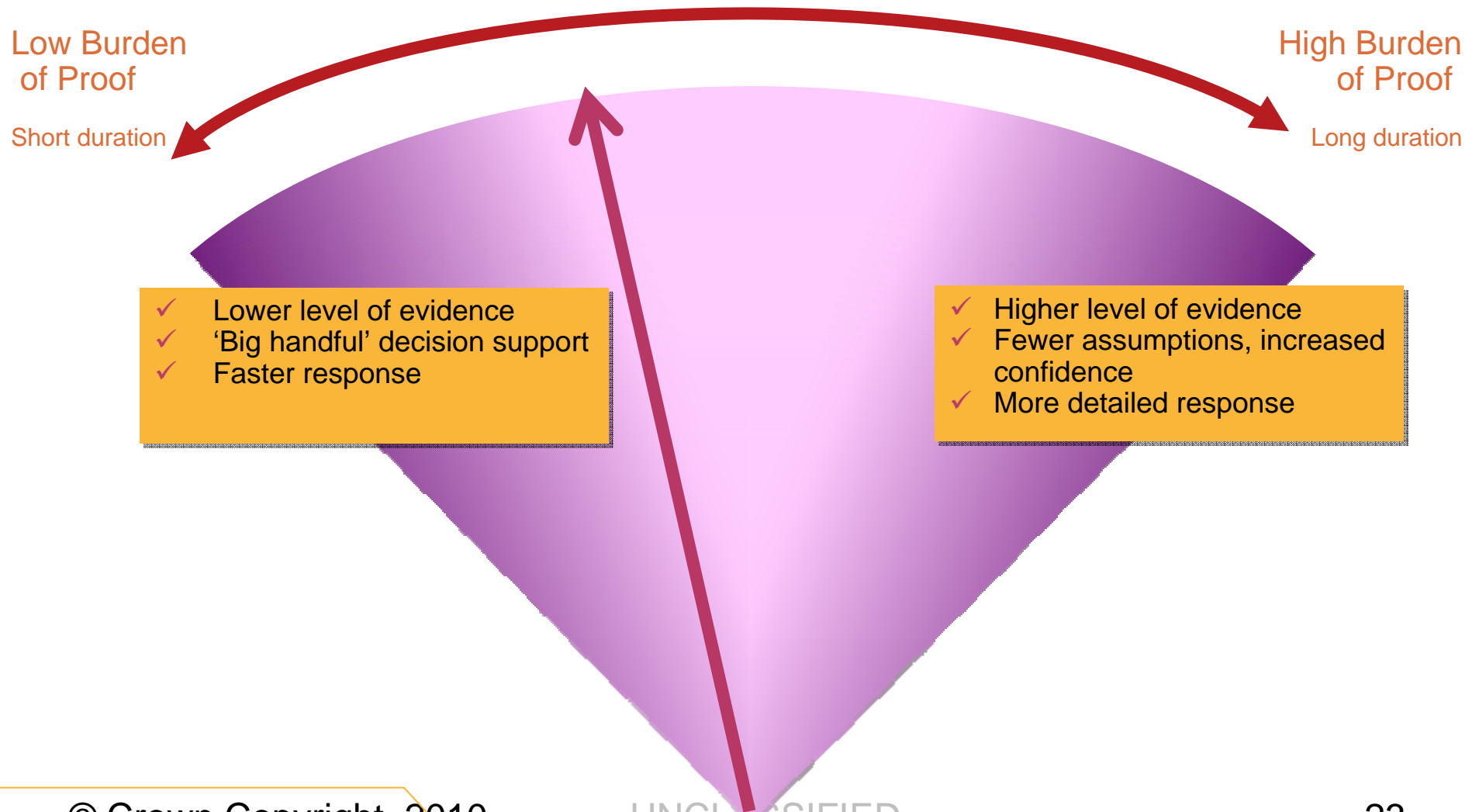
High Level Influence Diagram to show key concepts of Transition Operations.
 S = Same – Directly Proportional O = Opposite – Inversely Proportional
 Colours indicate Ownership:
 Blue – SN Forces, Green – HN Forces, Blue/Green – Shared SN and HN
 Red – Insurgent, White – NGO, Purple – External Measures



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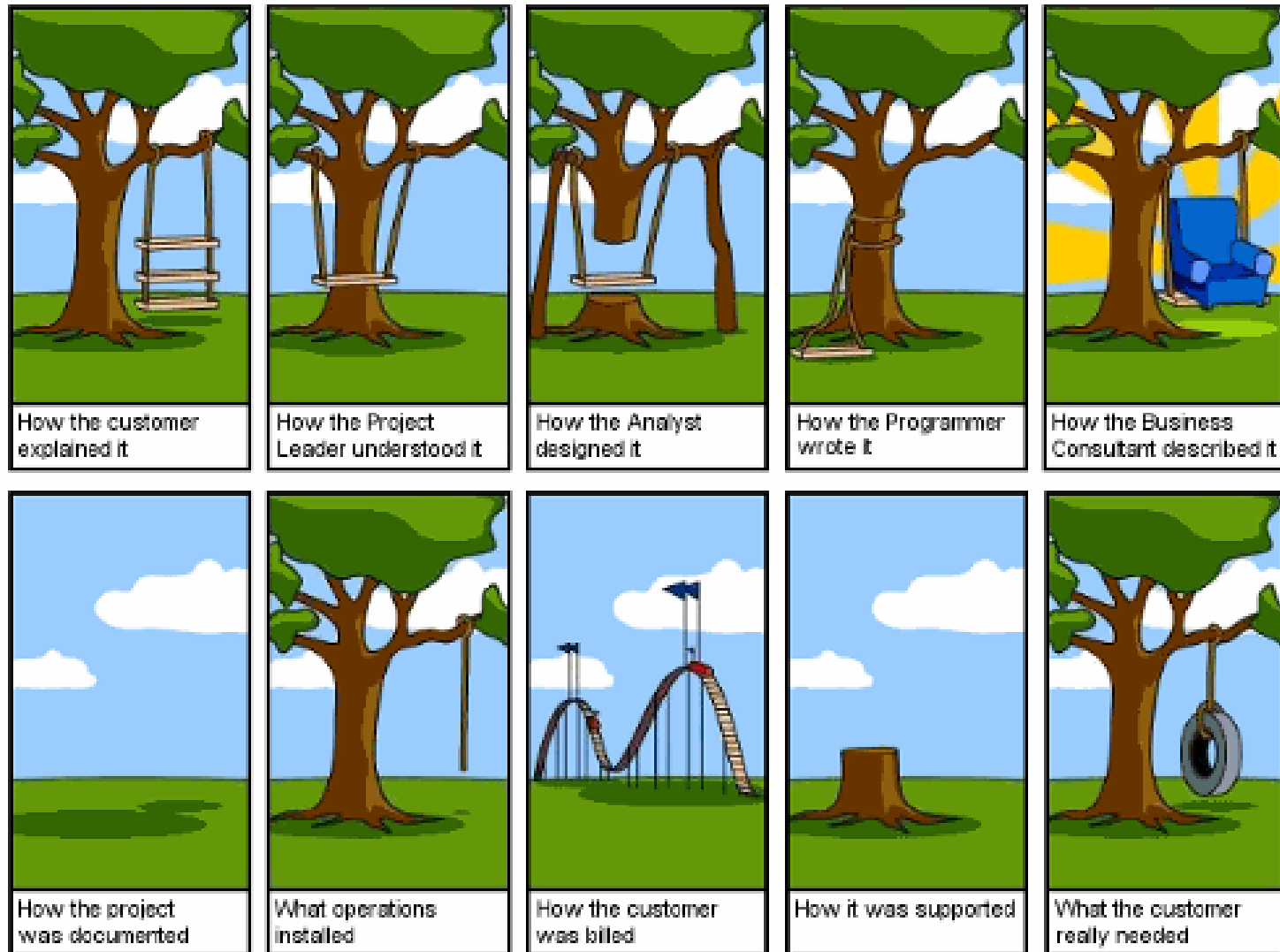
Degree of validation



Challenges

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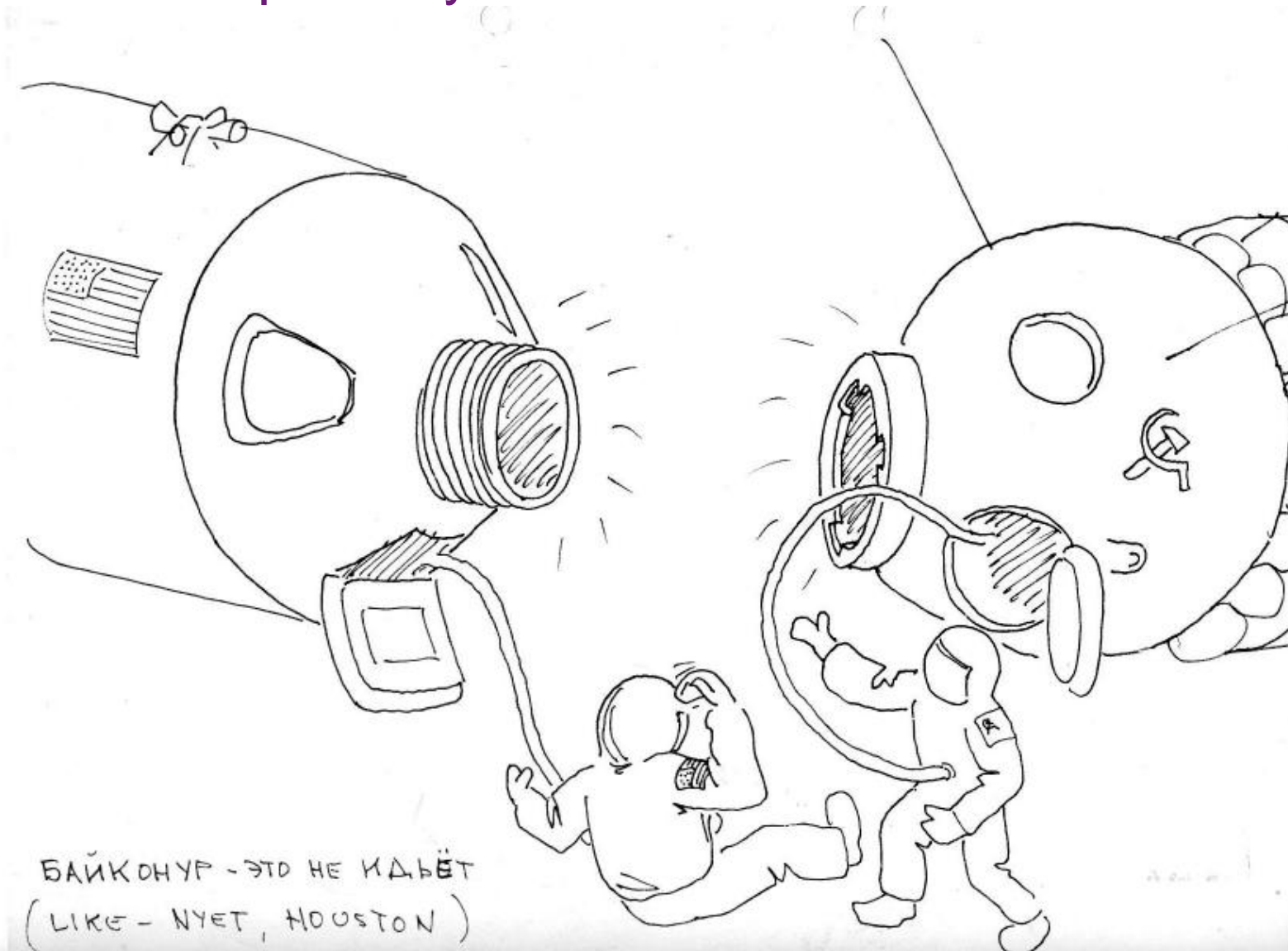
Consistency of interpretation of MODAF



Challenges

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Tool compatibility



Future Logs C2 Project

- Context supplied in Mood. Mostly process and rich pictures.
- Project work done in System Architect to generate IERs and build coherent data model (OV6)

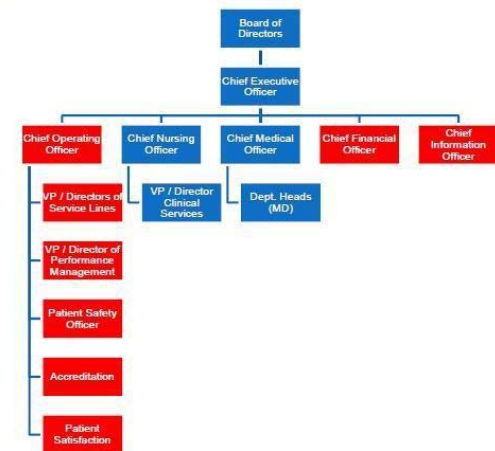
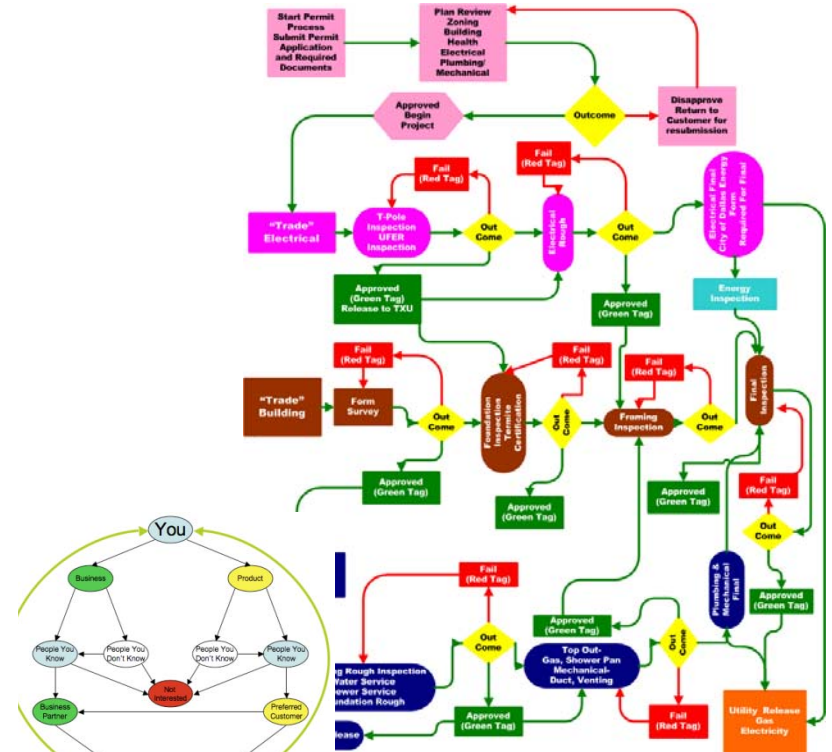
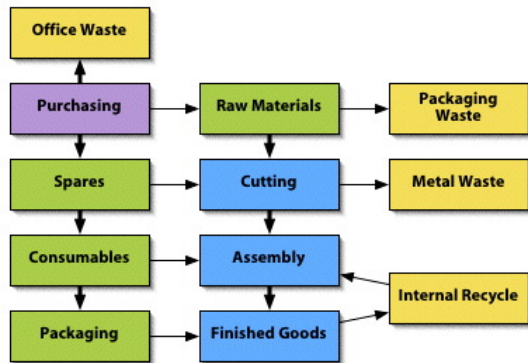
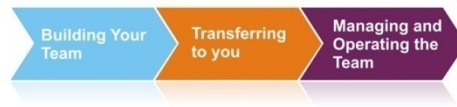
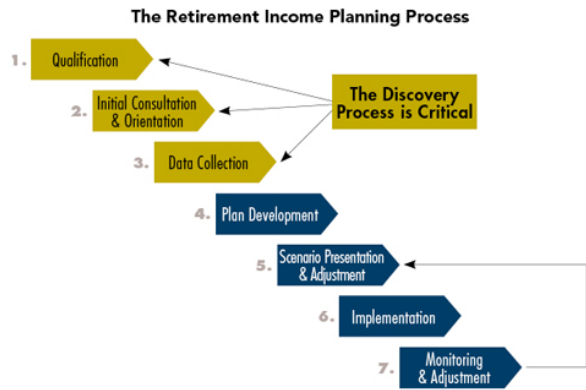


Processed into
one combined
web report

Challenges

- Provenance
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- Style and appearance
- Access and Visibility

Style and appearance



Challenges

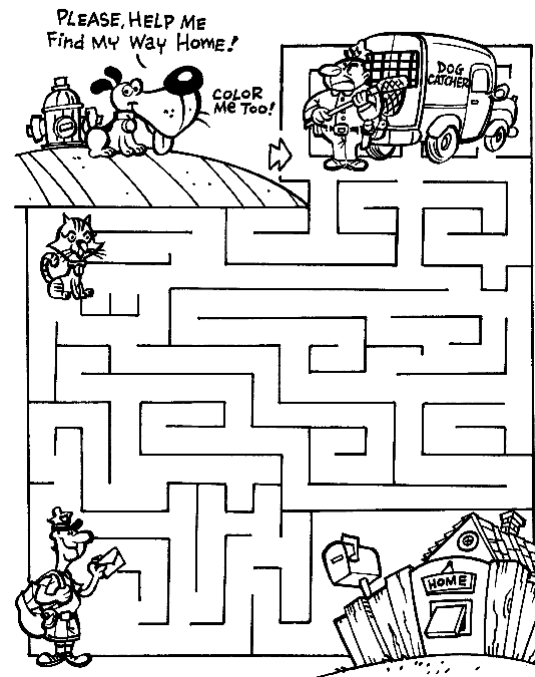
- Provenance
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- Standardisation of appearance
- Access and Visibility

Access and Visibility

- Can you see it?



- Can you find it?

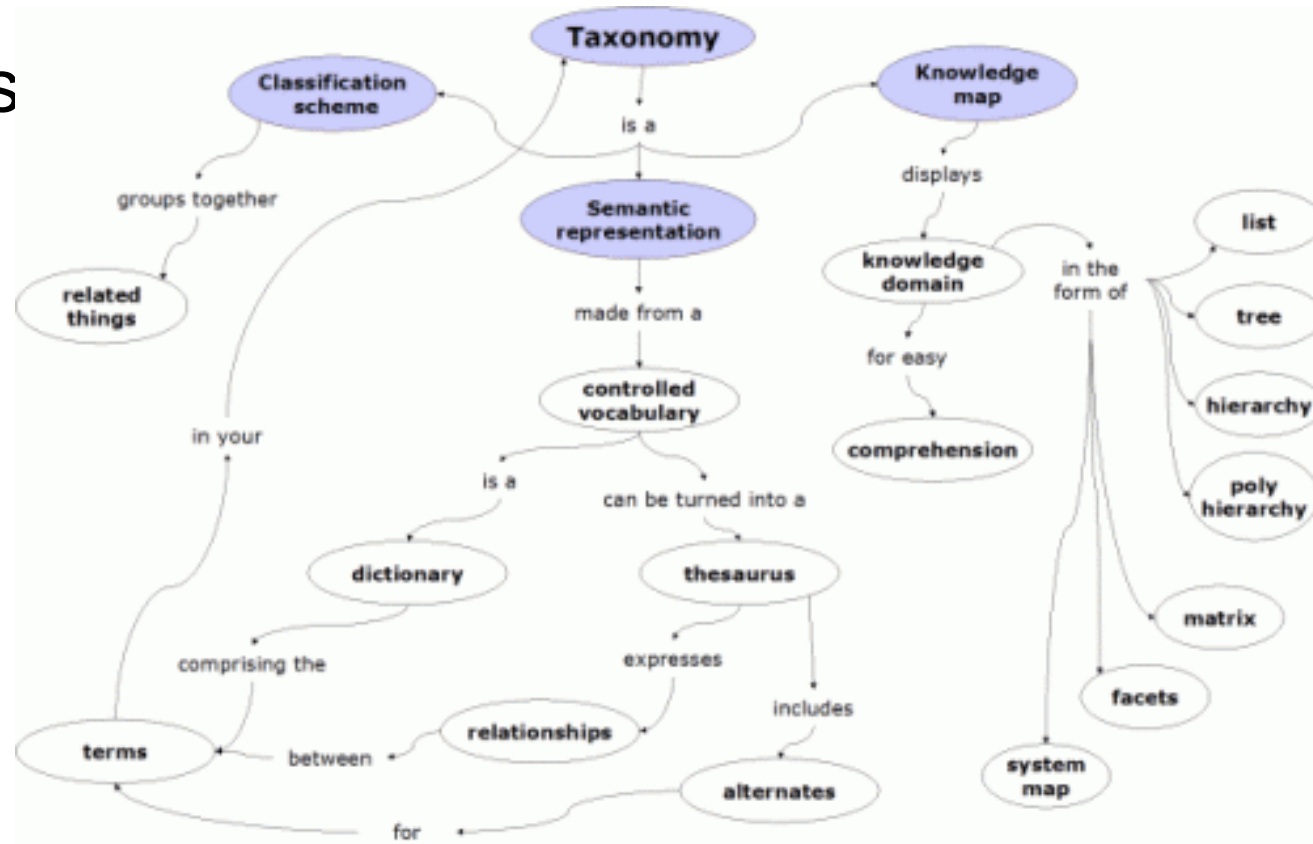


Practical Actions

- Common Taxonomy
- Use services approach
- Points of coherence
- Indexing and Meta data
- SOSA Principles

Taxonomy/Ontology/Glossary

- Capability
- Operations
- Systems
- Scenario
- Threat



Architecture Coherence
Points



Taxonomy



MDAL
Scenario
High Level Process
Performance Metrics

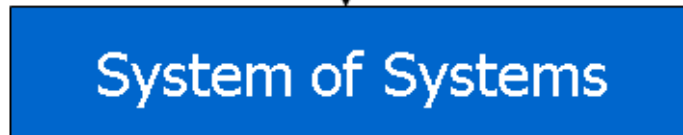
System Architect
MooD
Metis/Troux
Artisan
Enterprise Architect
Visio
PowerPoint



Process (BPMN)
IER (CSL)
Org Chart



Business Service Library
Orchestration script (BPEL)



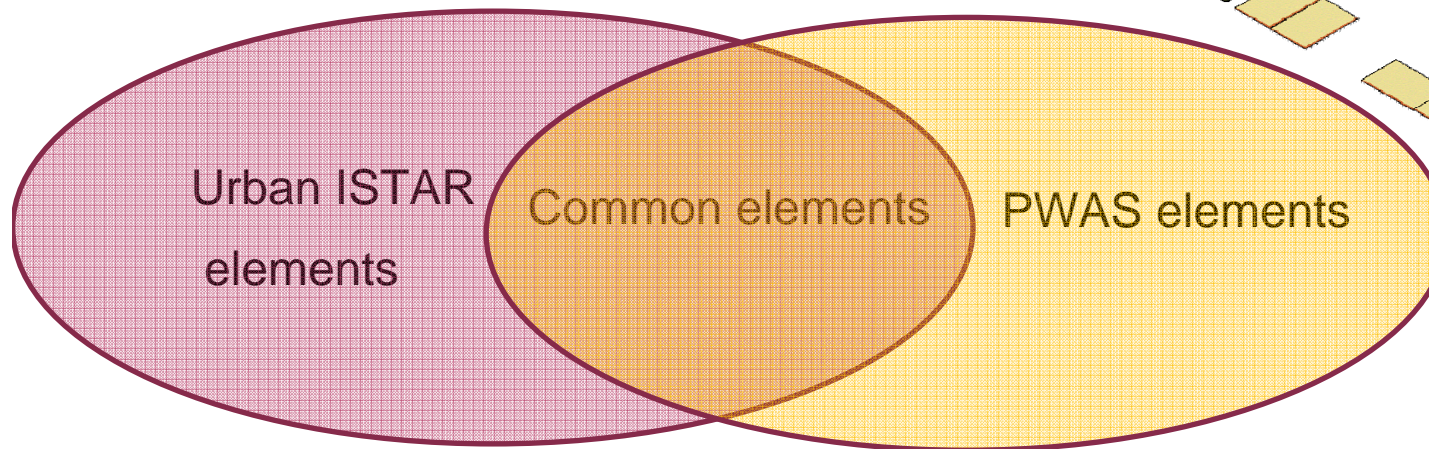
Communications Bearers
Communications Protocol



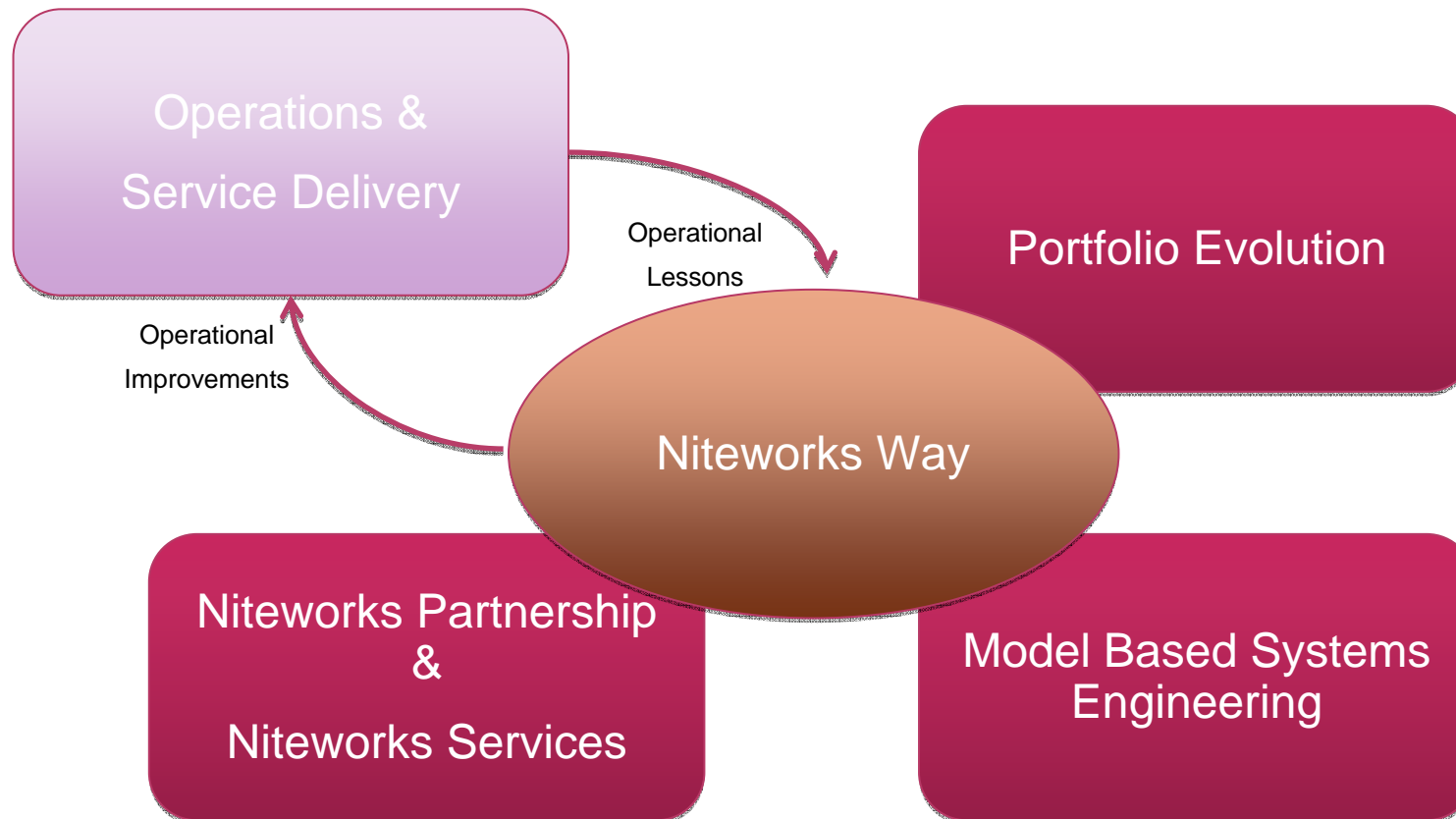
Voice Comms,
Data Comms
ISTAR Feeds
Sensors & Effectors

Urban ISTAR - PWAS

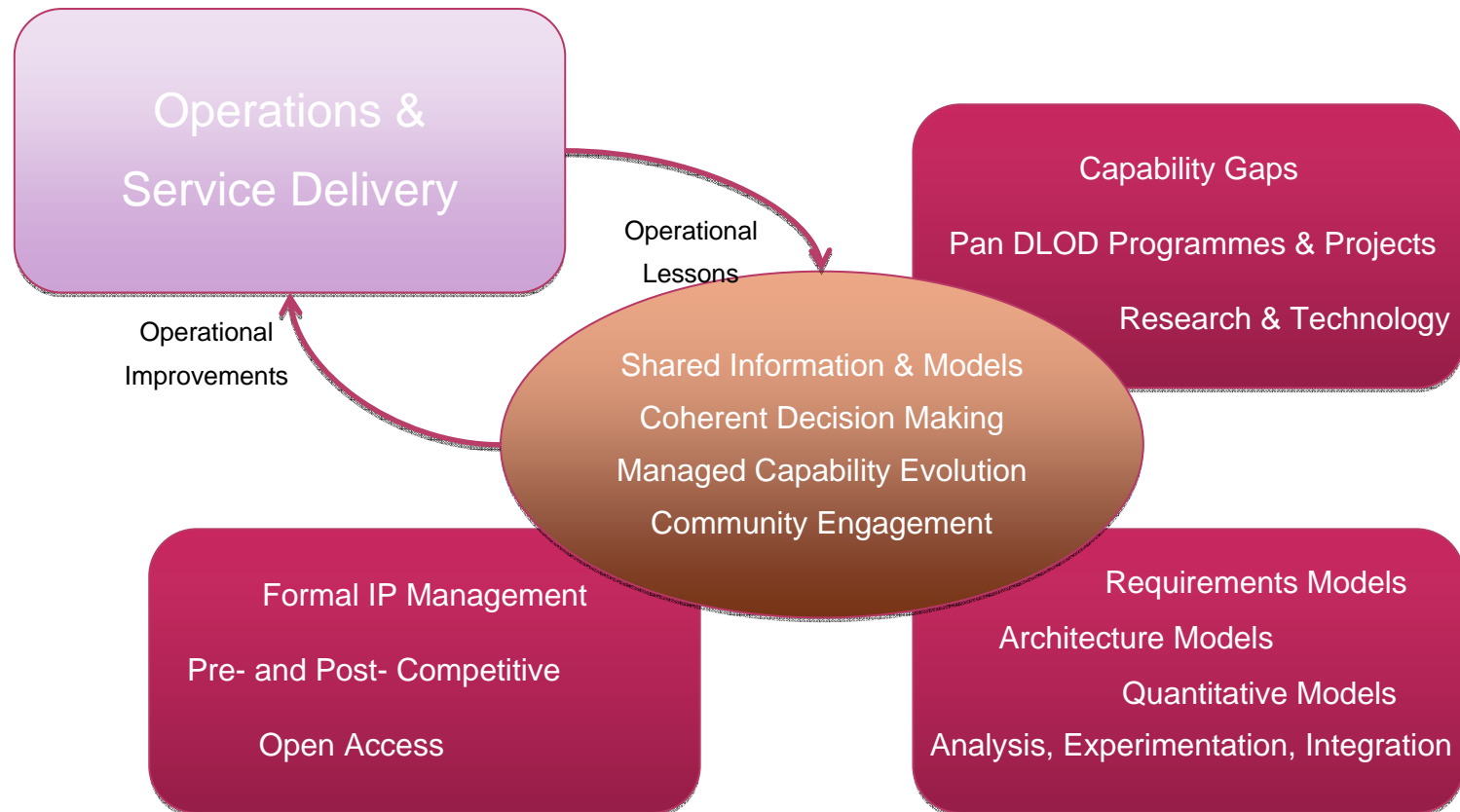
- 2 Different projects
- Shared architecture
- Shared model
- Similar scenario



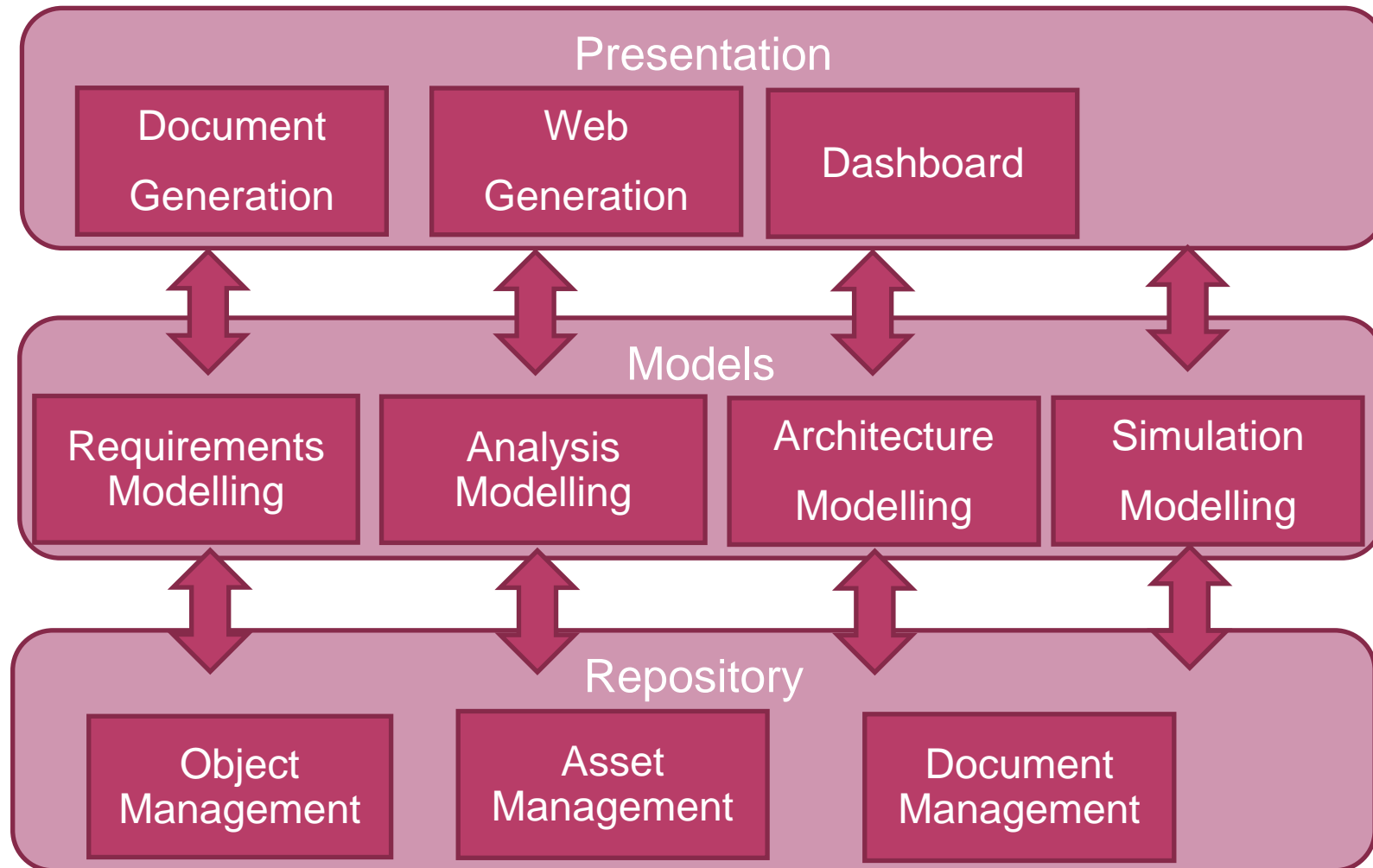
Embedding within the Enterprise



Details of the Model



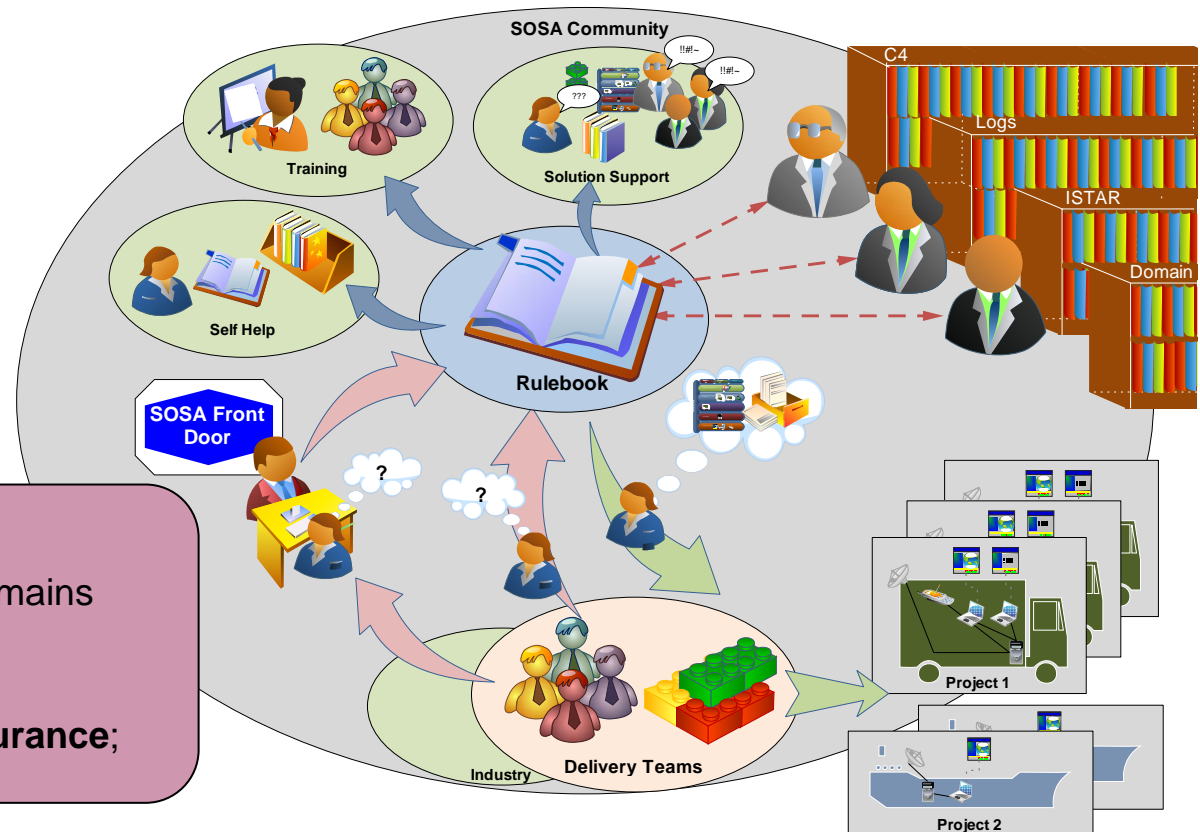
3 layer MBSE Model



SOSA: Uniting the acquisition organisation around the Rulebook

- The Rulebook provides the single common truth, which lays out a set of rules to drive everyone to a common and agreed conclusion.

- Rulebook consists of:
 - Guiding Principles
 - Strategies
 - Guidance
 - Best Practice
 - Rules & Policy
 - Processes
 - Frameworks
 - Services and re-usable elements

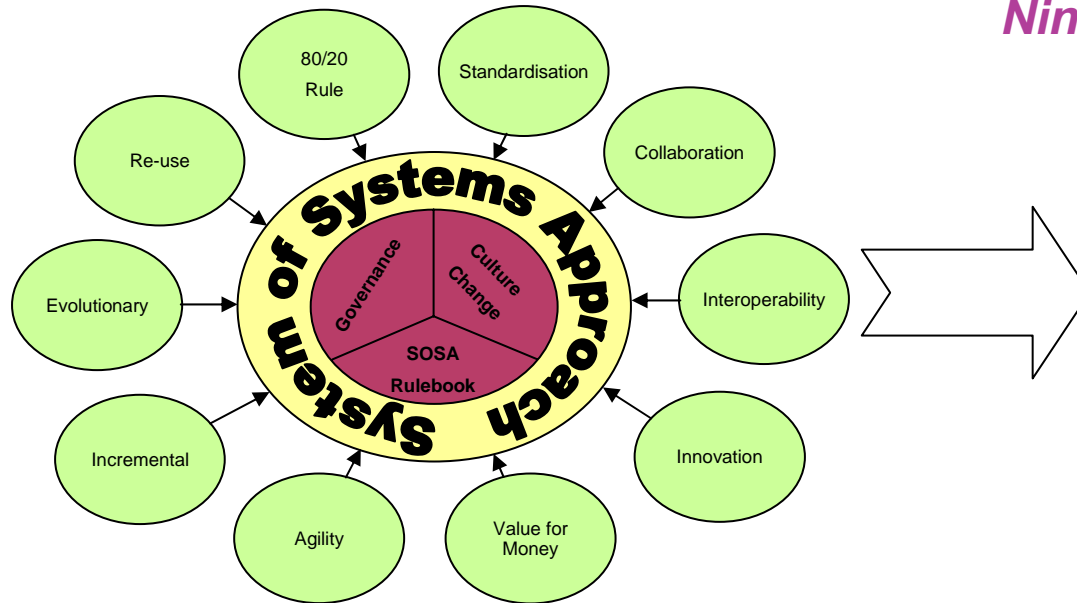
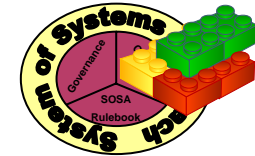


SOSA is more than a rulebook:

- **Operating model;** SEIG and the domains working collaboratively to support programmes and projects
- **Information and Engineering Assurance;** aligned with the SOSA Principles

Most of what we need already exists ... it just needs to be shared

What might good look like?



Nine SOSA Guiding Principles:

<p>P1. Delivering the Defence Enterprise: The MoD will achieve common business and operational goals and priorities, which will be delivered through a governance framework. The framework will be used to assign authority and direct dedicated delivery teams. Delivery teams will be responsible for ensuring collaboration in achieving these goals, in delivery and through life management of coherent solutions and their acceptance into service.</p> <p>P2. Driving business and operational effectiveness: Requirements will include the through-life dimensions of development, use and support, across all DLoDs. Dimensions to be considered include financial, exportability, performance, assurance, dependability, reliability, security, safety, sustainability, end-to-end military integrity, business continuity and supportability. Solutions will be developed to deliver business and operational effectiveness that is informed by experience.</p> <p>P3. Minimising diversity: Solutions will be delivered to achieve operational effectiveness, whilst ensuring that the number of different systems, components, tools, facilities and infrastructure used in the Defence Enterprise is minimised across all Defence Lines of Development (DLoD).</p>	<p>Business Driven</p>
<p>P4. Design for Reuse: All Defence Lines of Development (DLoD) will deliver solutions by exploiting those already in existence and ensuring that new solutions and their constituent parts are designed in a way that allows for their reuse across the Defence Enterprise.</p> <p>P5. Building with proven solutions: Solutions will be Off the Shelf (OTS) based. Only when this is proven to be ineffective, in terms of cost, time or performance, will tailored OTS or bespoke solutions be procured.</p> <p>P6. Ensuring commonality of services across the Defence Enterprise: Common business and operational activities will be supported by the same service irrespective of organisational and operational location, security domain and infrastructure.</p>	<p>Reuse</p>
<p>P7. Designing for flexible interoperability: Solutions will be designed to meet their Interoperability needs. Solutions will be of modular design aligned to business process allowing solutions to be responsive to changes in acquisition and operations.</p> <p>P8. Adopting open standards: Solutions will be designed with open standards in a manner that is not detrimental to security, innovation and operational superiority.</p> <p>P9. Information and Data as an Asset: Solutions will be developed to enable information and Data to be managed and exploited across the Defence Enterprise, maximising accessibility without compromising security.</p>	<p>Interoperate</p>

The desired effects of SOSA captured in a set of Guiding Principles

SOSA Guiding Principles

The objective?

- The endorsing and adoption of this set of SOSA Guiding Principles by MoD

What will Principles provide?

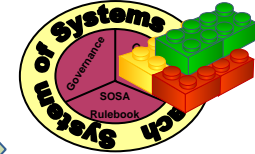
- CIO endorsed advice describing the NEC context
- Assistance in the identification of the NEC trade-space and the implications of decision making

The approach to embedding the Principles within the MoD

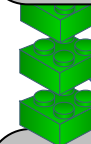
- Creation of a Joint Service PA CIO SDG Governance Framework
- A Blueprint for Info Capability assurance
- Constraints and context for the SOSA rulebook
- The common rules to support the MoD in shaping programmes and making coherent decisions
- A shared understanding, language and approach publication (JSP906):



Business Drivers



- Delivering the Business
- Driving Business & Operational Effectiveness
- Minimising Diversity



Reuse

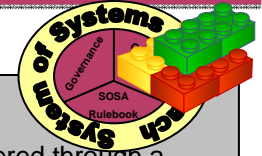
- Design for Reuse
- Building with Proven Solutions
- Ensuring Commonality of Services across the Enterprise



Interoperability

- Designing for Flexible Interoperability
- Conforming to Open Standards
- Information and Data as an asset

Principles short paragraphs:

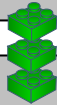


Business Driven

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P3. Minimising diversity: Solutions will be delivered to achieve operational effectiveness, whilst ensuring that the number of different systems, components, tools, facilities and infrastructure used in the Defence Enterprise is minimised across all Defence Lines of Development (DLoD).



Reuse

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Interoperate

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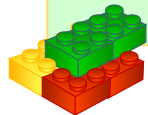
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SOSA Guiding Principles

The objective?

What will Principles provide?

The approach to embedding the Principles within the MoD



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JSP 906

**Joint Service Publication
906
Design Principles for the Acquisition of Capability**

MINISTRY OF DEFENCE

March 2010

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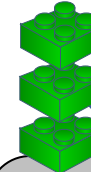
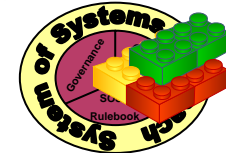
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Business Drivers

- Delivering the Business
- Driving Business & Operational Effectiveness
- Minimising Diversity



Reuse

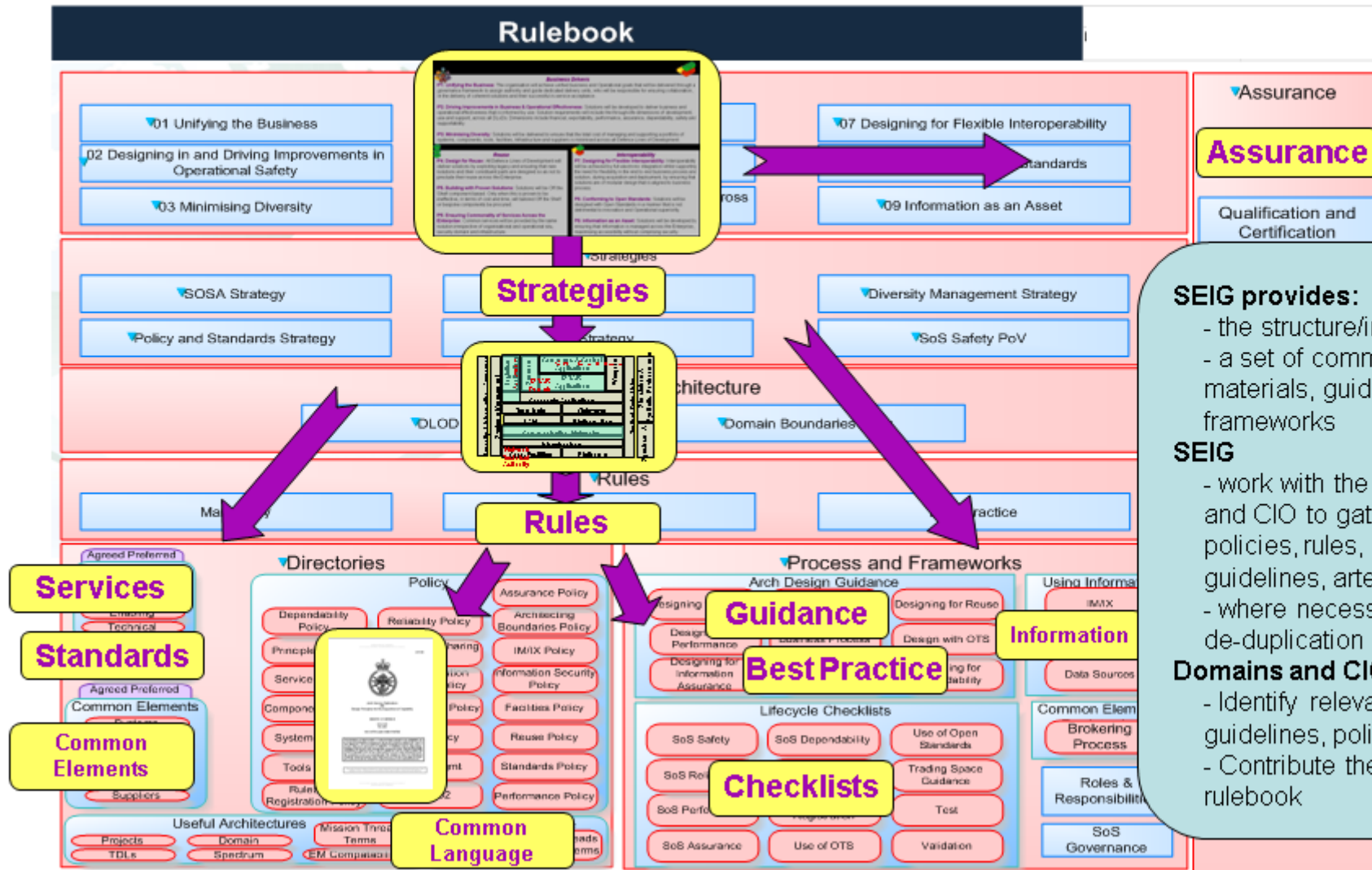
- Design for Reuse
- Building with Proven Solutions
- Ensuring Commonality of Services across the Enterprise



Interoperability

- Designing for Flexible Interoperability
- Conforming to Open Standards
- Information and Data as an asset

High Level view of SOSA Rulebook



SEIG provides:

- the structure/index
- a set of common materials, guidelines, frameworks

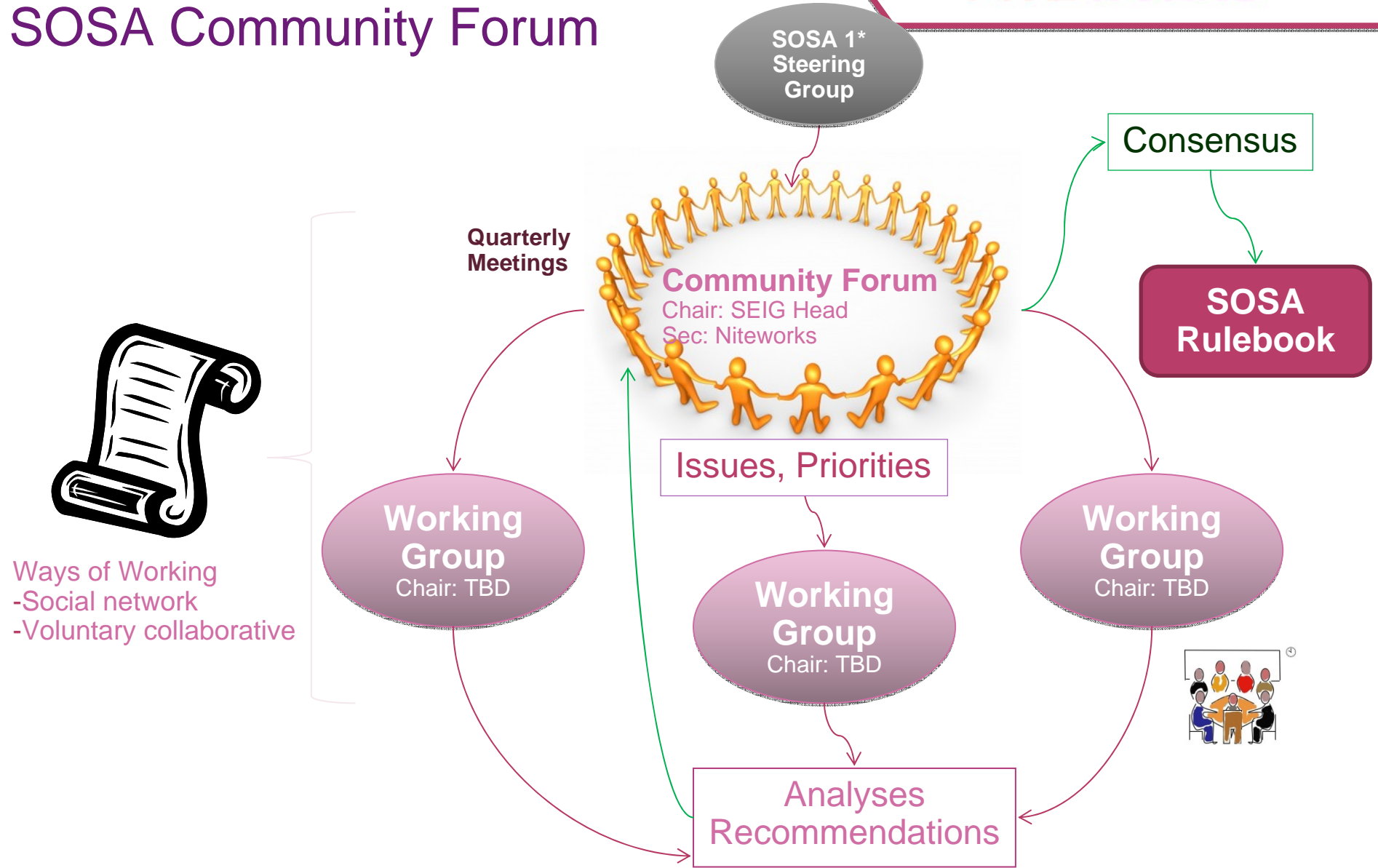
SEIG

- work with the domains and CIO to gather relevant policies, rules, services, guidelines, artefacts etc
- where necessary, broker de-duplication

Domains and CIO will

- Identify relevant services, guidelines, policies etc
- Contribute them to the rulebook

SOSA Community Forum



Inaugural meeting 7th September

Conclusion

Effective re-use:

- Does not happen by accident
- Requires planning
- Requires collaboration

But it can be done!



Questions?

SOSA Community Forum

7th September – DCC Shrivenham

steve.hitchins@niteworks.net