

Meeting capability goals through effective modelling and experimentation of C4ISTAR options

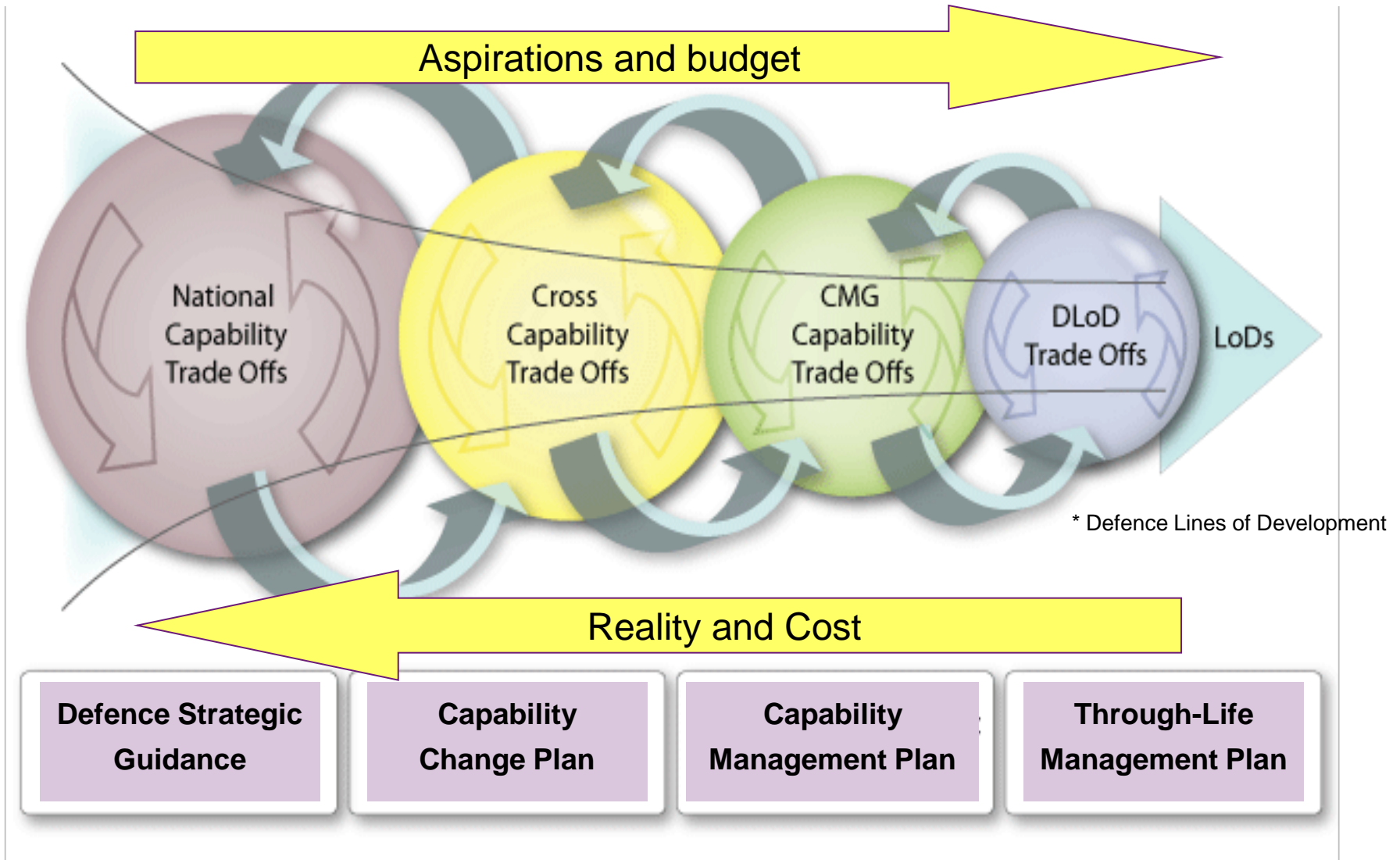


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Paper 007**

**Bob Barton, MD Niteworks
Dick Whittington, CSO Salamander**

Understanding the problem

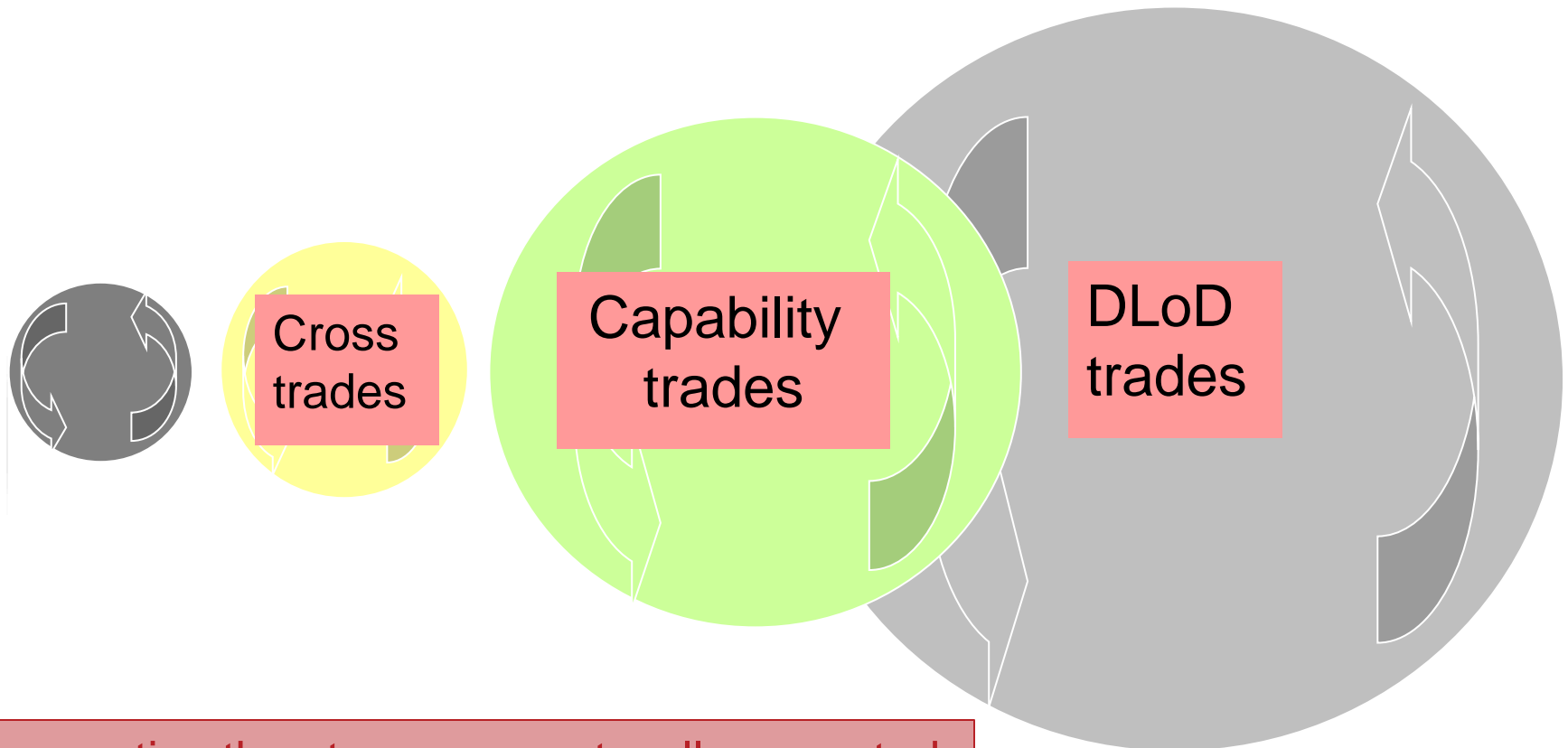
Capability and Trade Spaces



Trade Spaces or islands?

Demand

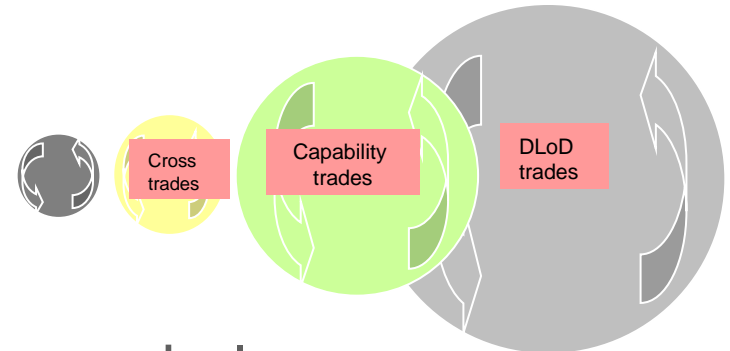
Supply



In practice the stages are not well connected

What does the model tell us?

- It emphasises the need for effective trades
- It shows how poor 'left hand' trades create work to the 'right'
- Volume of work runs in reverse to size of original circles
 - Logjam
 - Repetition
 - Poor risk understanding
 - Uncontrolled expenditure



- Better collective use of resources can help
 - Consultation and collaboration -

The need for a better approach

- ▼ Current acquisition process lacks focus at front end
- ▼ ‘concepts to capability gap’
- ▼ Driving early to competition is not the answer
- ▼ Exploring risks and options, safely, will drive success
- ▼ ‘Value for Money’ vs ‘Affordability’ - subjective/objective?

*“...we must **rebalance our relationship with industry** so that we achieve maximum value for money...”*

UK Secretary of State for Defence
22 Feb 2011

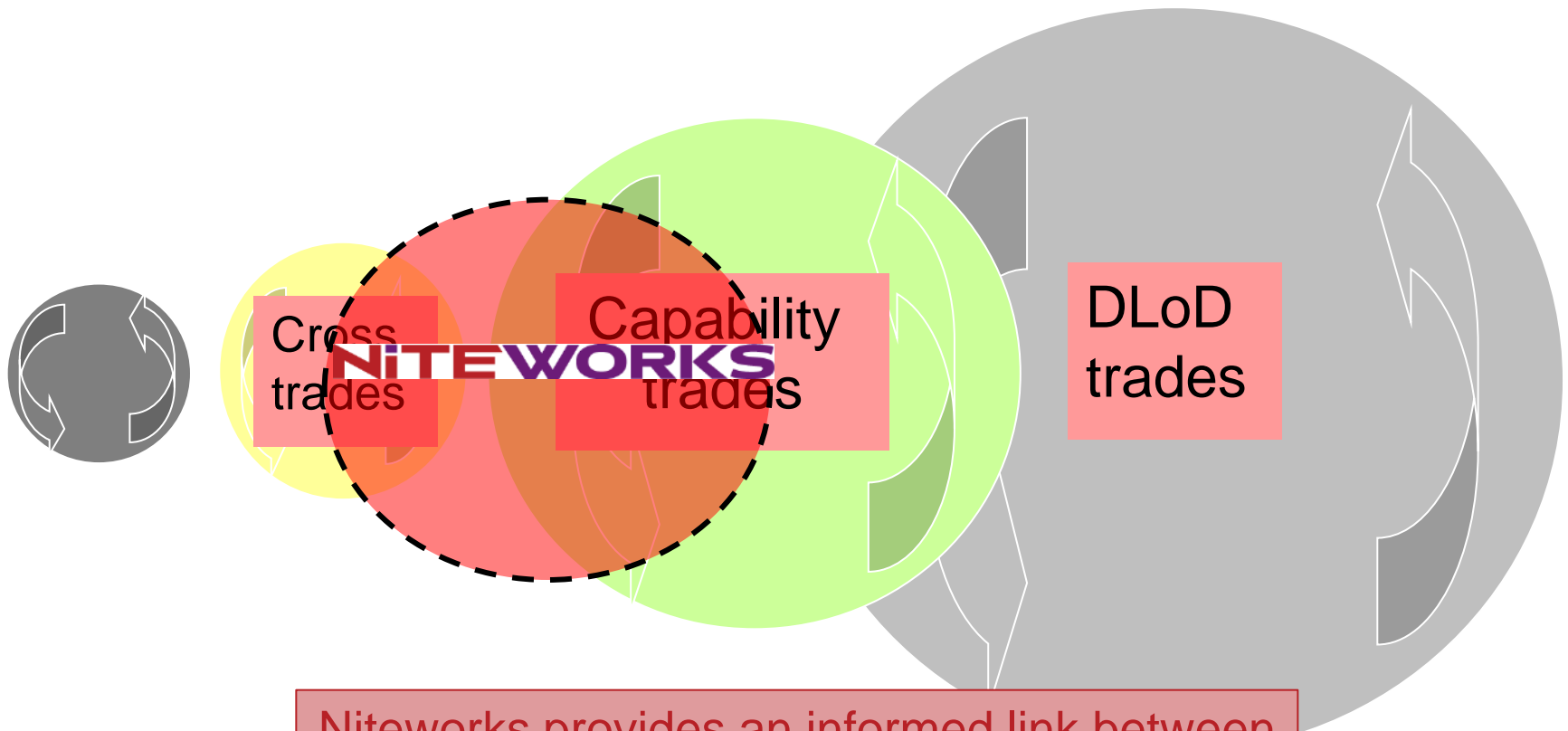
Competition vs collaboration?

Balance means getting the best of both – Niteworks!

Informing the process

Demand

Supply



Niteworks provides an informed link between two key elements of the process

Our approach

Key Facts



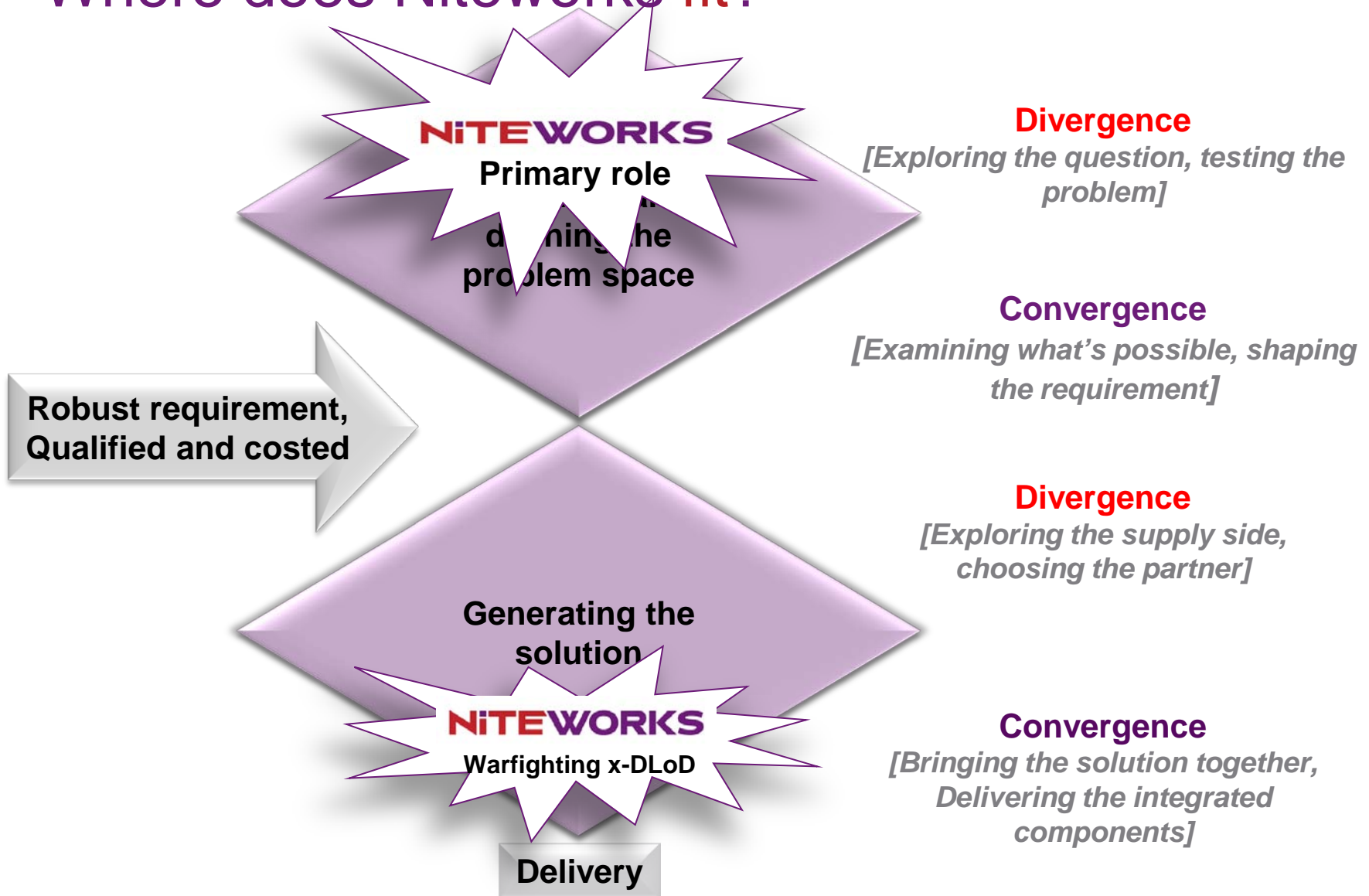
12 industry partners

drawn from the major defence providers

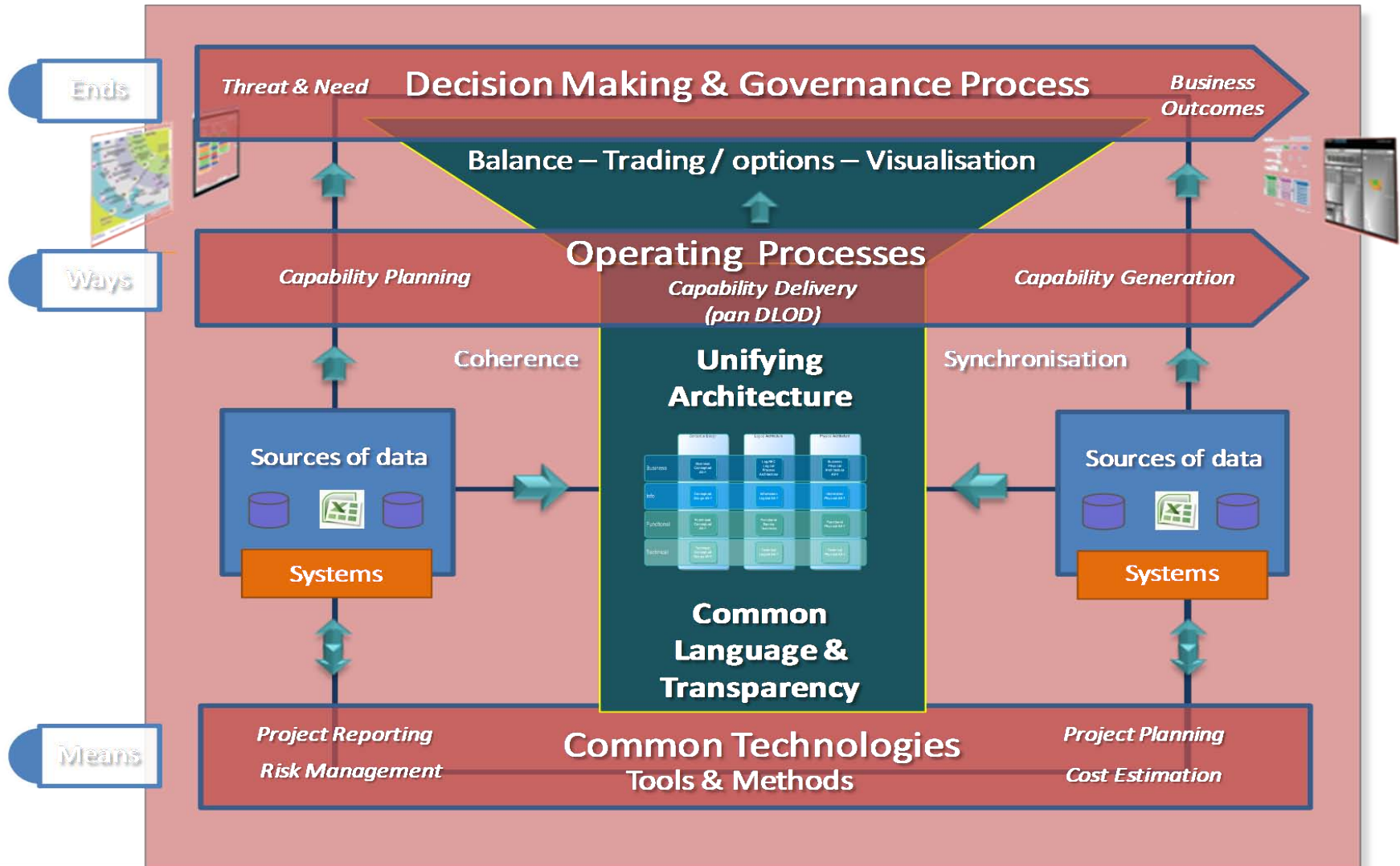


~80 associate members made up of small and medium sized enterprises (SMEs), specialists, academia and consulting companies

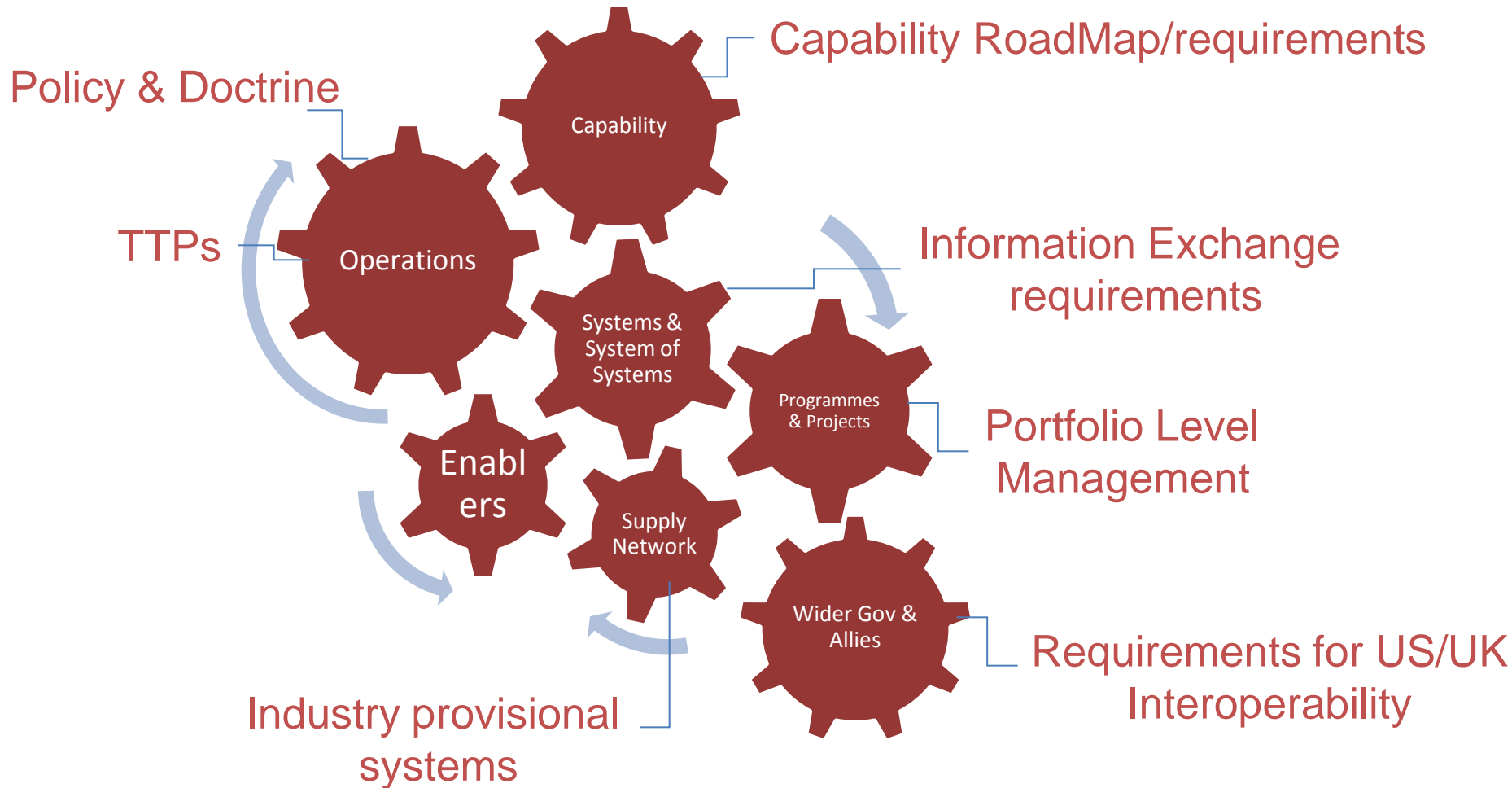
Where does Niteworks fit?



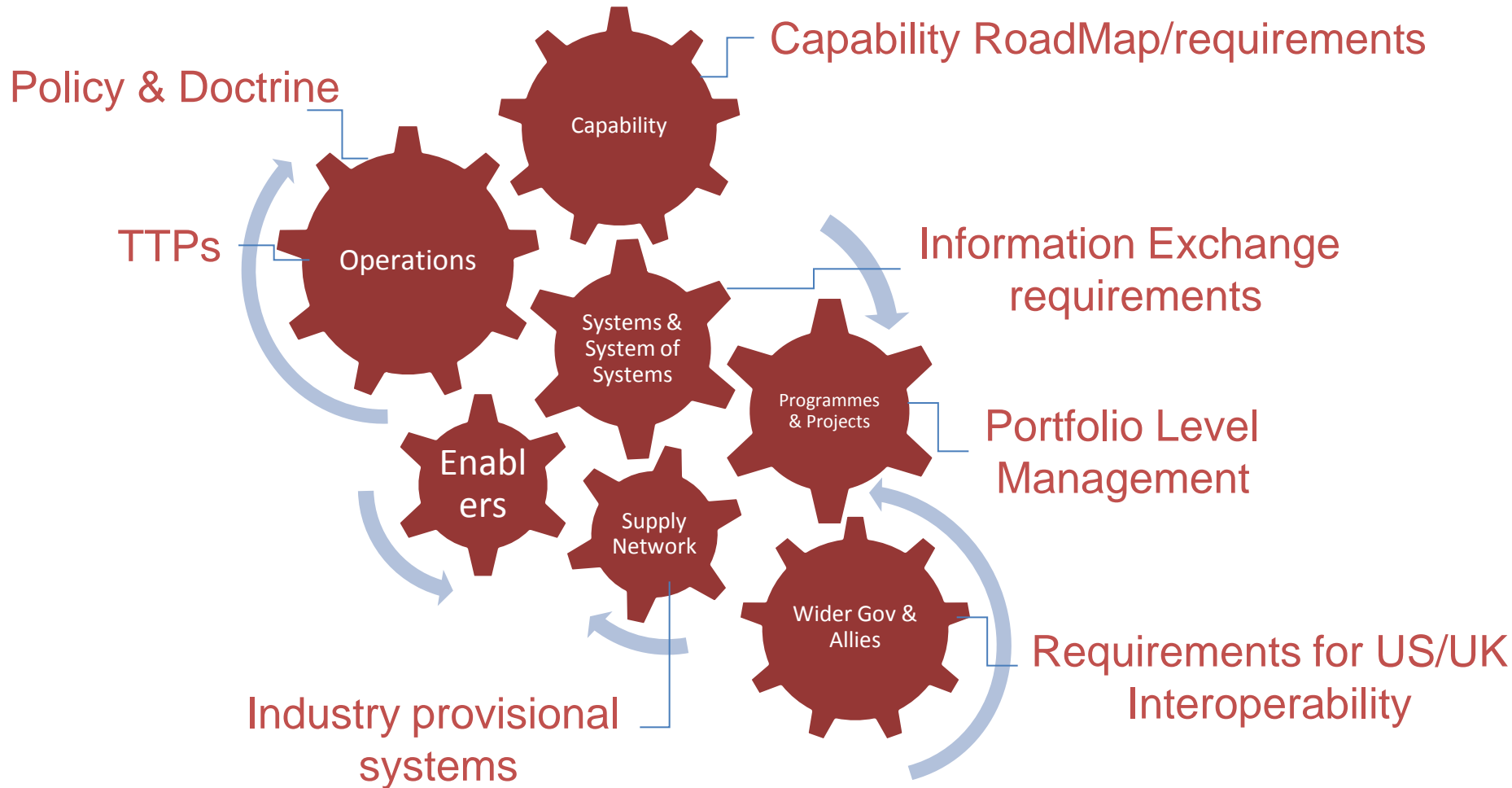
Model-Centric Implementation



The defence enterprise – complex relationships



The defence enterprise – complex relationships



Cross-capability planning

1. Understand
Capability Context

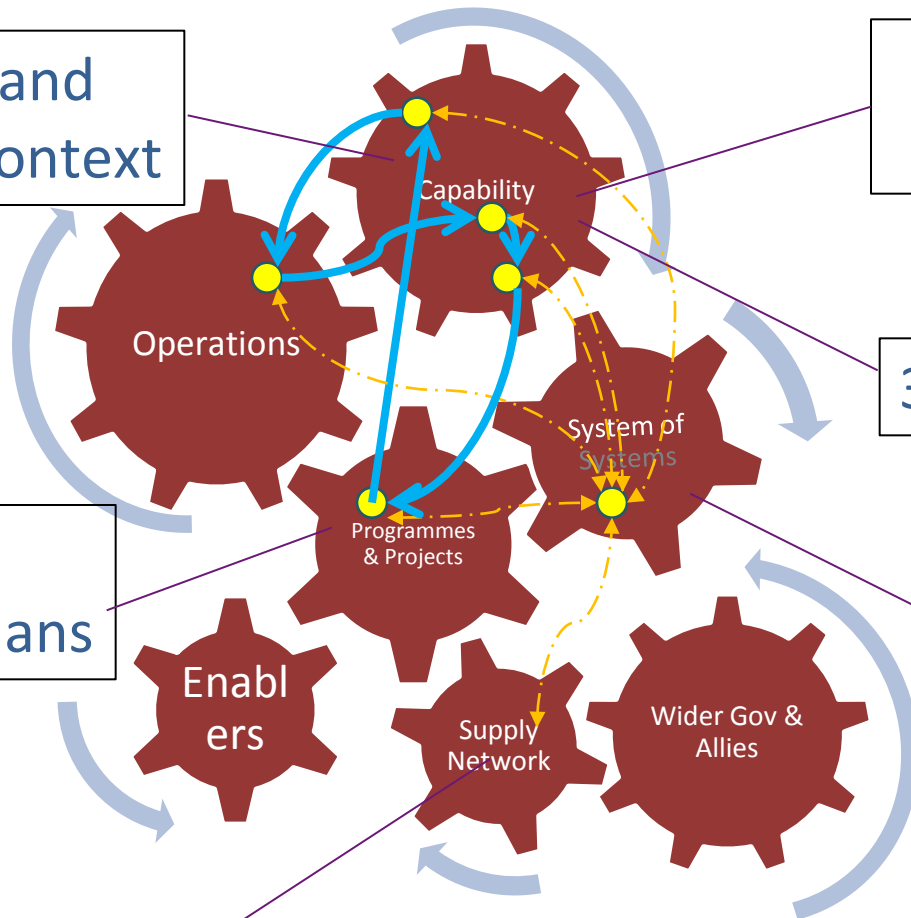
2. Understand
Demand Changes

3. Analyse Capability

4. Update
Capability
Strategy
and Plans

0. Maintain Supply
& Demand Baseline

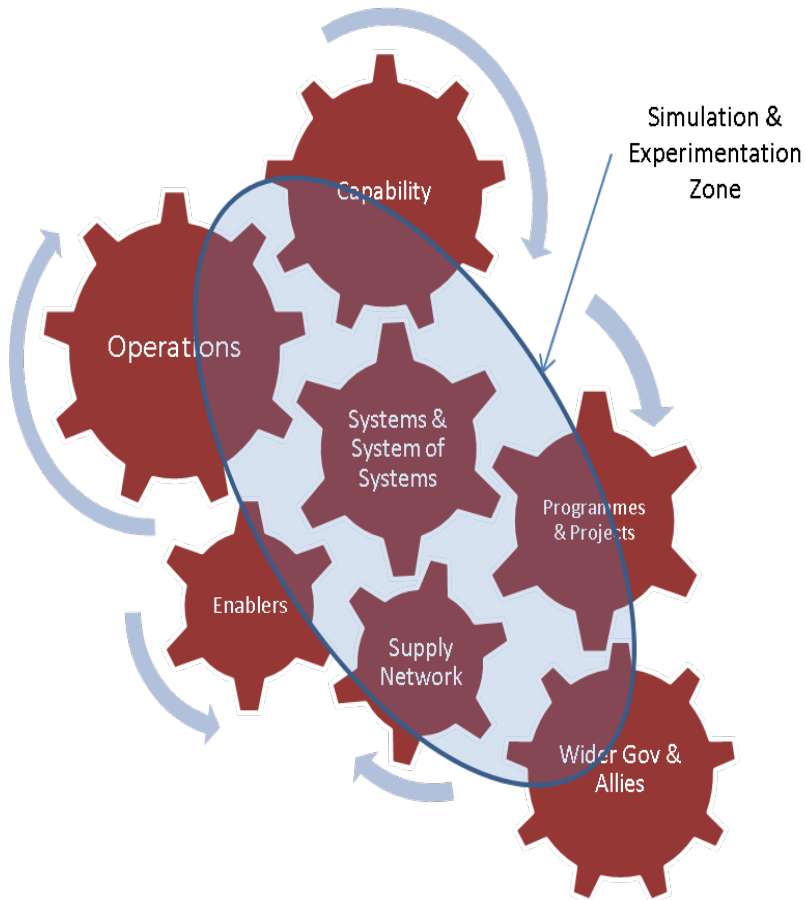
5. Adjust
Programme Plans



→ Deliberate or unplanned
Capability Planning
activities

↔ Continuous activities

Approach enables a number of aspects to be tested



- ✓ **Operational concepts and military procedures**
- ✓ **Pan-DLOD needs and interdependencies**
- ✓ **Technology maturity and the 'art of the possible'**
- ✓ **Capability goals, requirements and planning**
- ✓ **High level system of systems, and systems architectures**
- ✓ **Programme and project level requirements**
- ✓ **Integration and interoperability solutions**

Apply the approach – some case studies

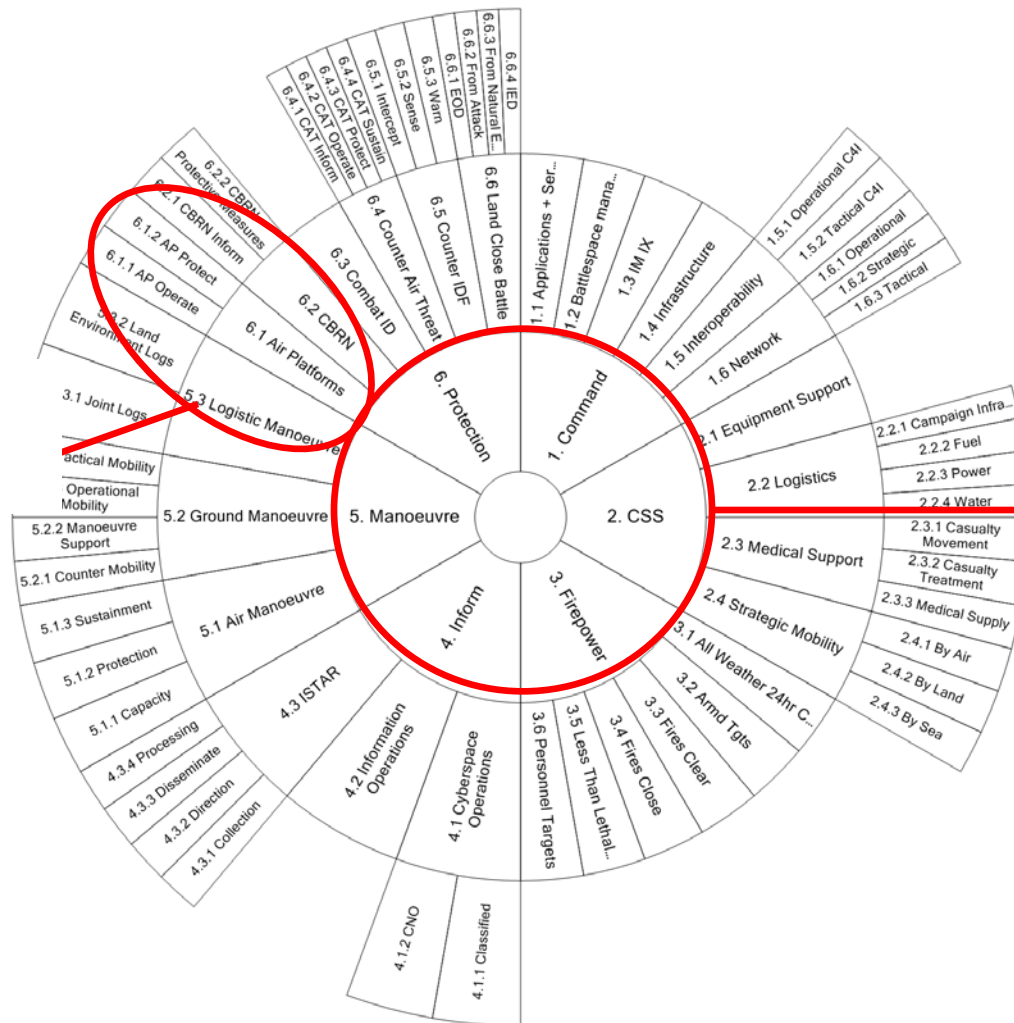
Case study: Army Equipment Development Plan

NB- ALL DATA IS ILLUSTRATIVE

Concept - taxonomy



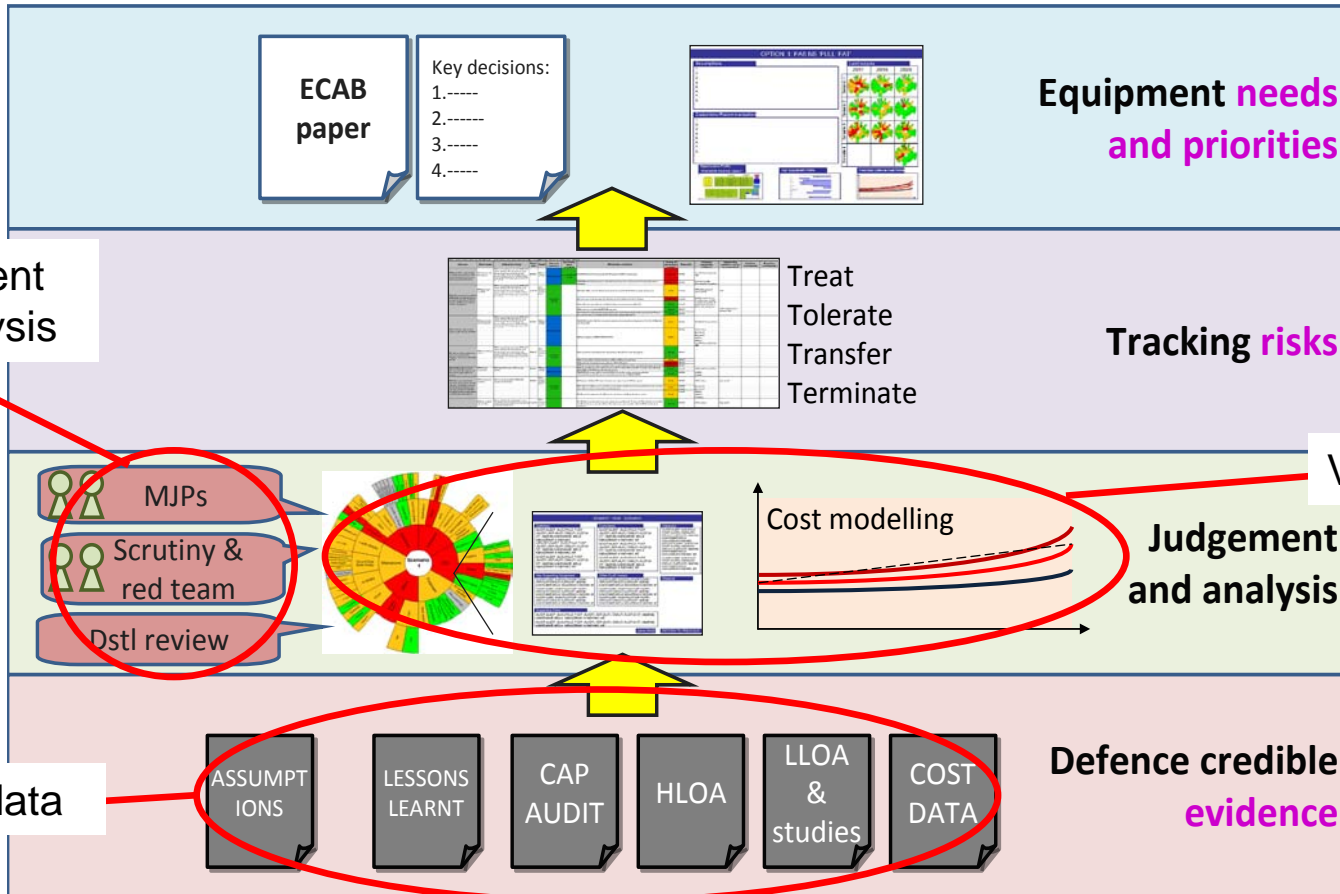
Elements with definitions from doctrine



Tactical Functions



Concept - methodology



Backed by data

Summary assessment – Land equipment capability

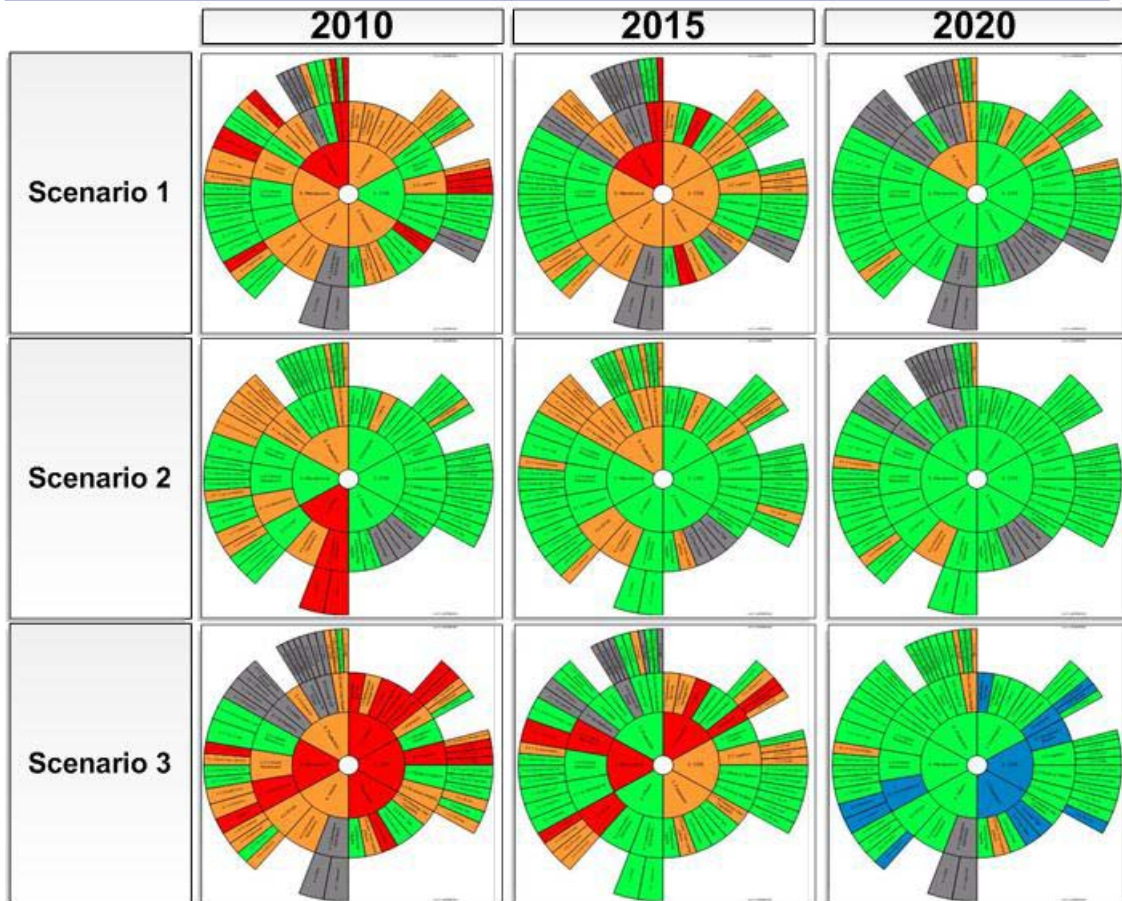
Assumptions

1. Key assumptions which drive the results
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Deductions/Recommendations

1. The key 'so what's' which form the basis of decisions taken to rectify the key issues identified
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

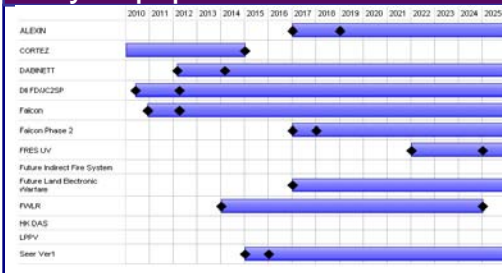
Land outputs



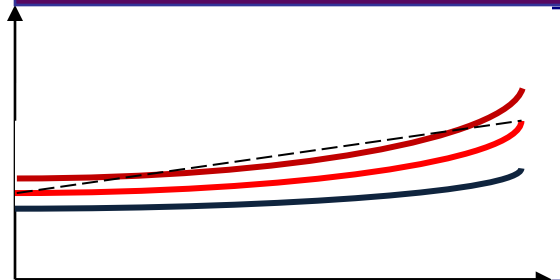
Organisation Profile:



Key Equipment Profile



Predicted Defence Cost Profile

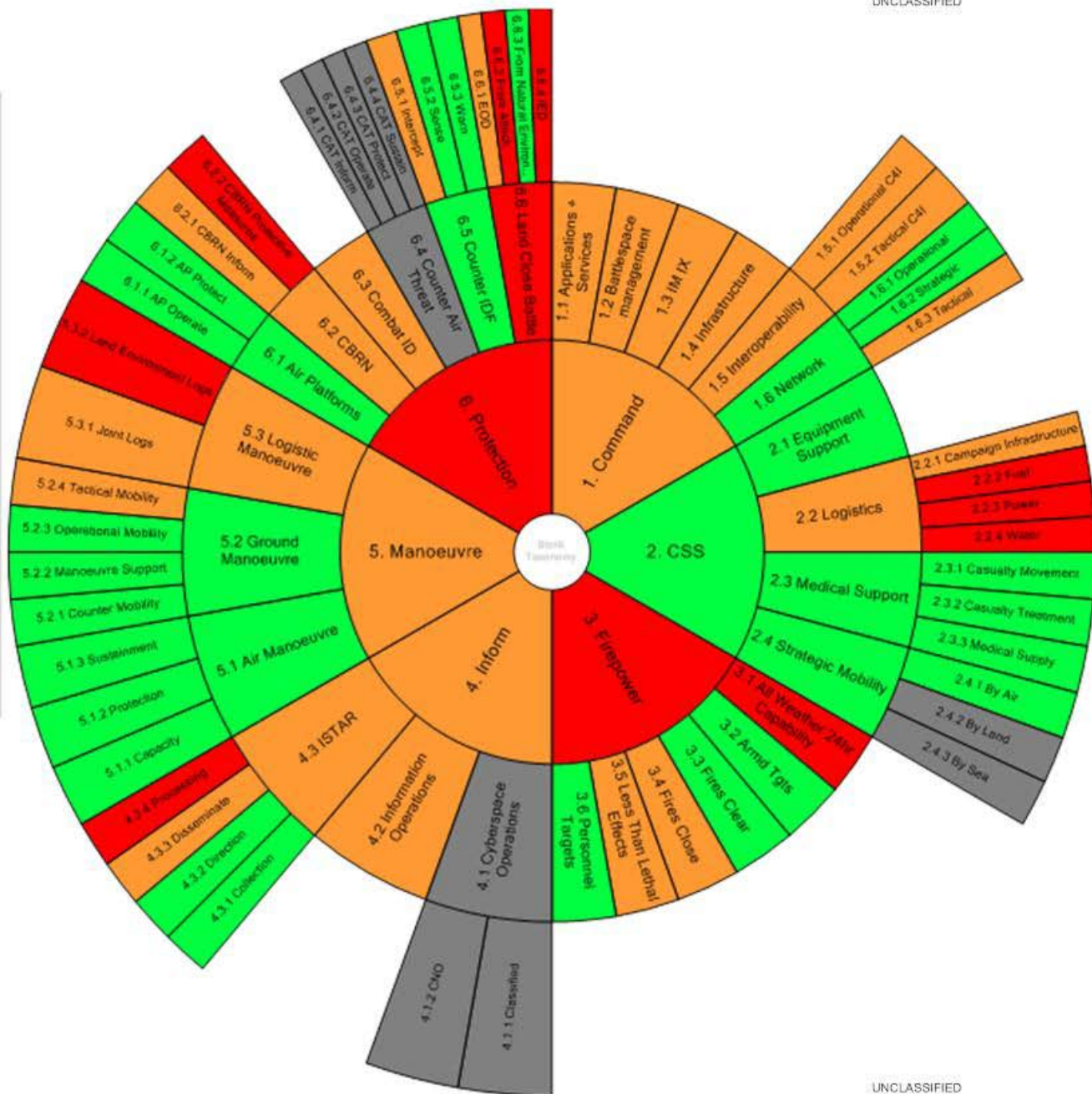


Timeframe 1 Scenario 1

Assumptions and constraints

A number of assumptions and constraints which define this scenario and timeframe. Particularly:

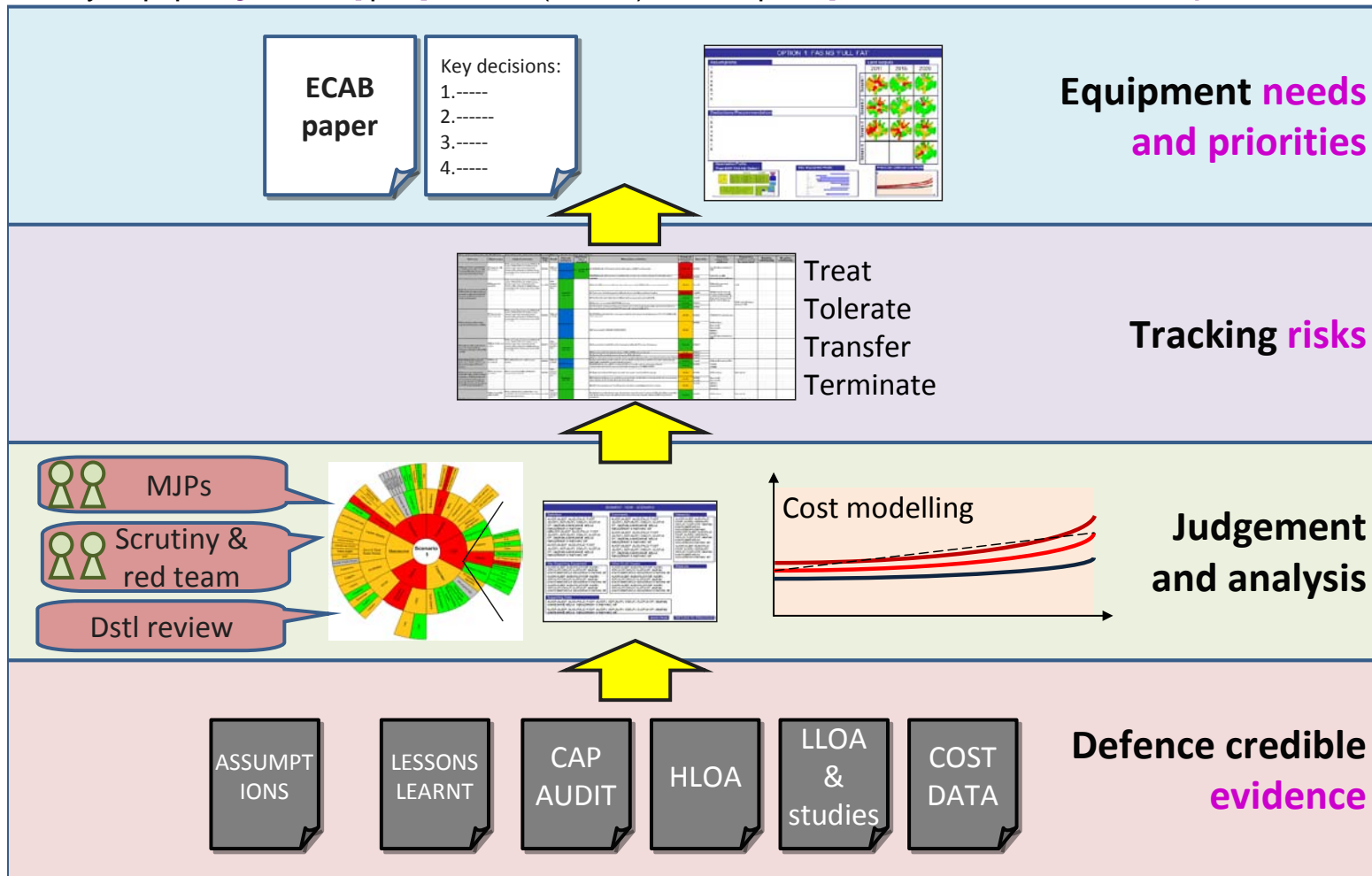
- 1) The policy environment which defines the requirement.
- 2) The level of forces in the scenario.
- 3) The amount and type of equipment that the forces have available.
- 4) The threat level.
- 5) Assumptions about concurrency and endurance.



RED	An equipment capability issue/risk impacting Defence outputs that must be addressed by ECAB/JCB
AMBER	An equipment capability issue/risk impacting Defence outputs that should be addressed by ECAB/JCB
GREEN	No equipment capability issue/risk impacting Defence outputs
BLUE	An over-supply or overmatch in equipment capability that must be addressed by ECAB/JCB
GREY	Not required in this scenario
WHITE	Classified

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The Army Equipment Development Plan (AEDP)

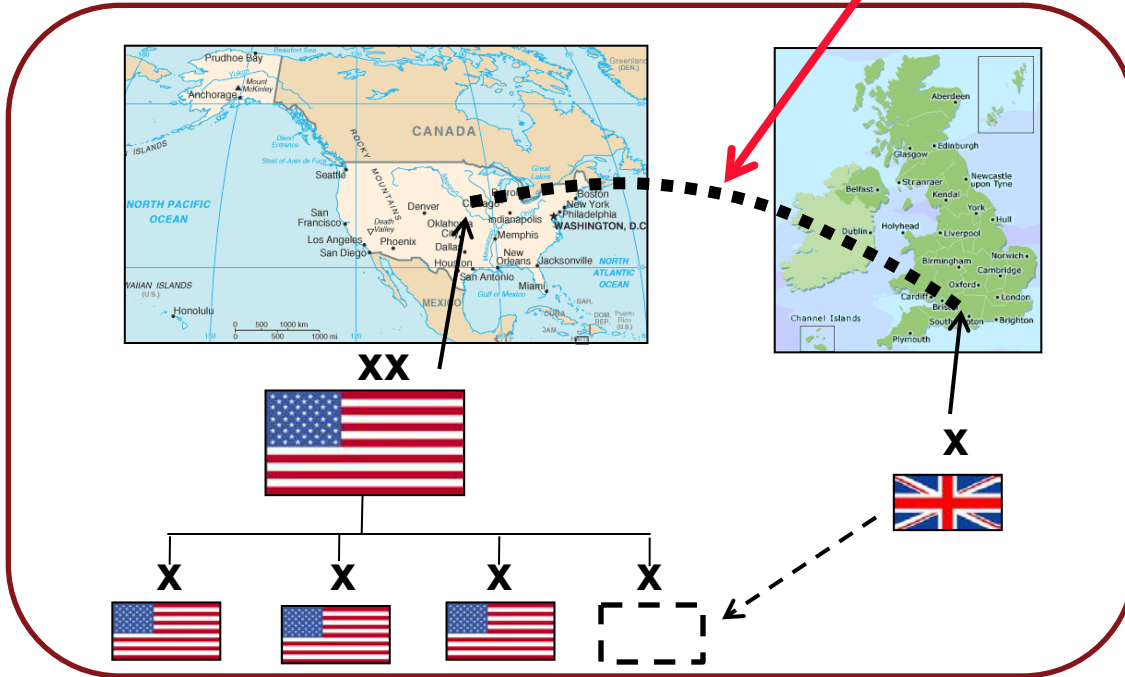


AEDP is a decision support visualisation and information environment based on comprehensive military judgement of Defence validated evidence sources

Case study: Talon Strike Multi-National Experiment

Talon Strike -the Problem

Distributed



Experimental Sequence



Systems- Using UK and US C2 Systems – EP/Overtask Compliant
People - Using UK and US operational Staffs – 10 Mtn Div/12 Bde
Processes - Tackling procedures and processes in digital age
Rapid Spiral Development for CIS Capability Area

Benefits of experiment

Provided insights into the issues of track management

Proved the value of experimentation as an integration tool which should be placed on an enduring basis for National and Multinational experimentation

Provided British Army with a better understanding of the technical challenges of C2 integration and interoperability

Proved that coalition interoperability was feasible from both a technical and process view and validated key Information Exchange Requirements

Allowed distributed training to be conducted by exploiting past investment

Exposed the complexity of achieving Shared Situational Awareness in a two-nation coalition WAN environment

Helped de-risk future requirements by assessing the use of OneSAF as a core simulation for Divisional level hybrid operations

Provided insights into the utility of specific existing C2 environments

Exposed the lack of standards for digital symbols and where in existence the disparate ways of interpreting them.

Exposed shortcomings in some theatre applications & other capability gaps for achieving Shared Situational Awareness (Some are now Urgent Operational Requirement actions)

Exposed the need for a Strategic authority on Coalition Network Standards

Confirmed the continued requirement to deploy digitally empowered LOs and the need to improve Information Management & Exploitation skills overall.

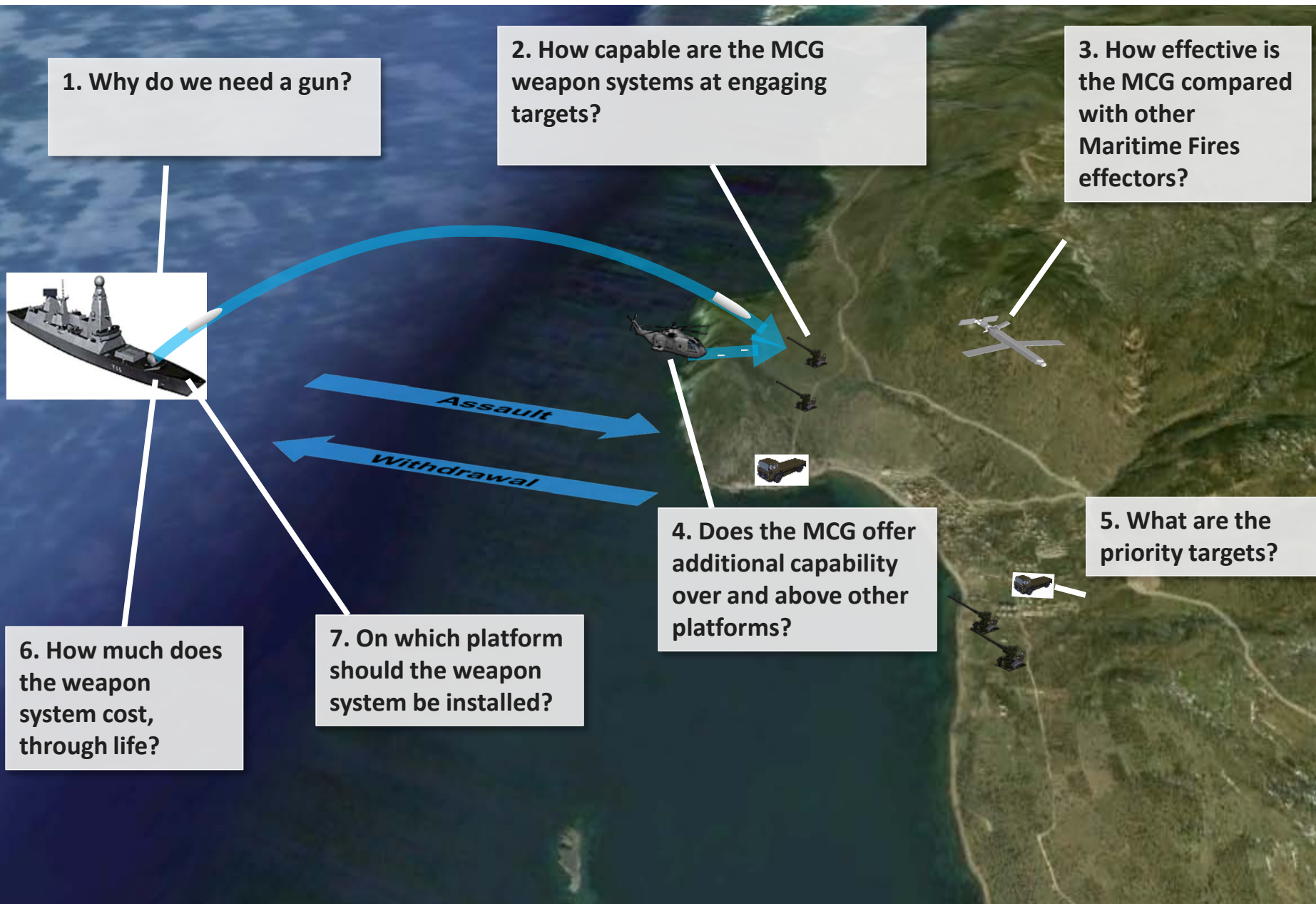
Case study: Future Maritime Fires (FMF)

Providing decision support, trade space analysis, for a fires capability

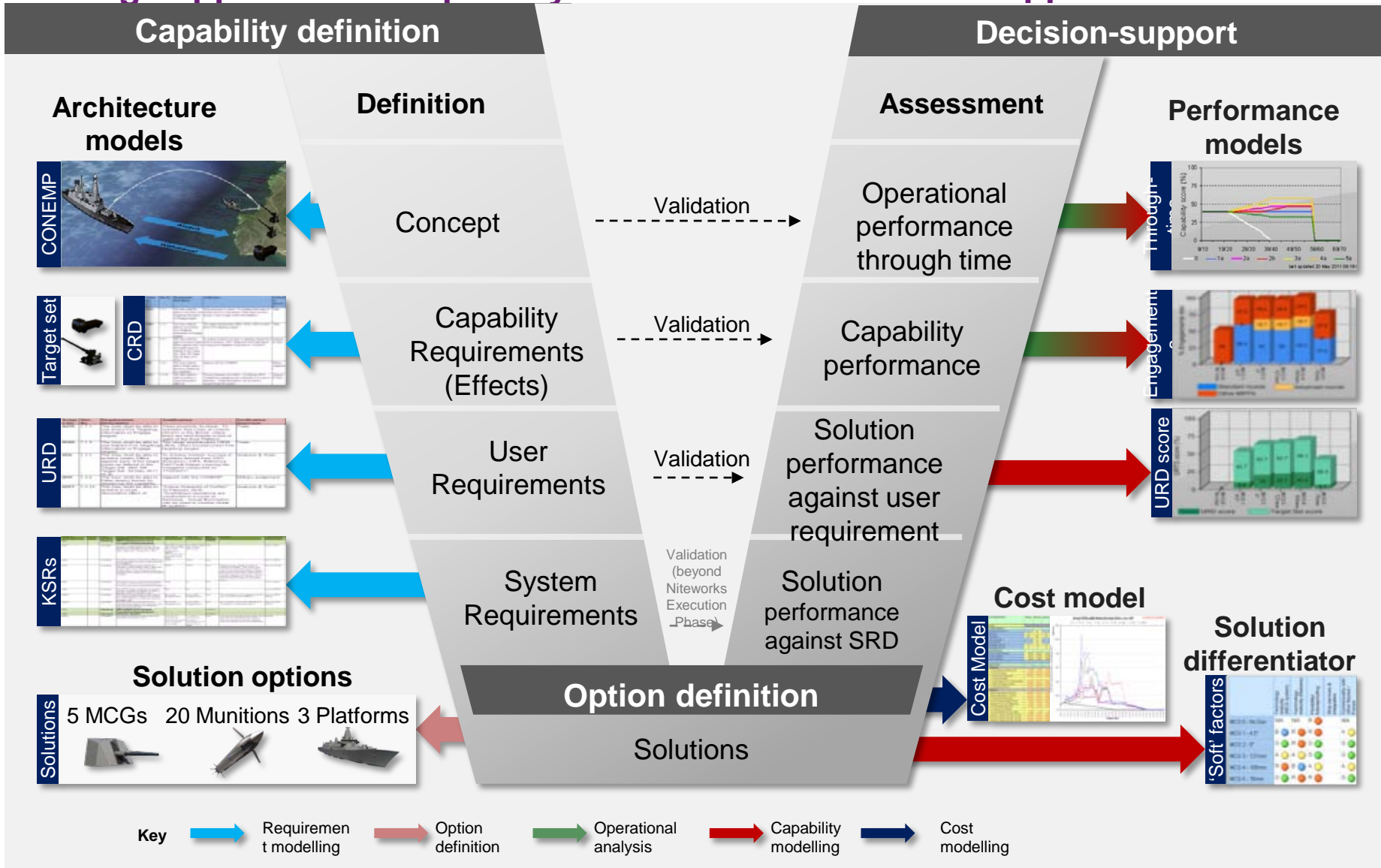


- ▼ Future Maritime Fires (FMF) is being delivered by International Guns, Missiles and Rockets (IGMR) Project Team and supported by Niteworks
- ▼ Niteworks is modelling requirements, capability & solution effectiveness and cost, enabling trades to be made as part of the acquisition process
- ▼ The FMF capability is to “engage and destroy land threats which have the capability to deny own forces the ability to control the Above Water Battlespace in the Littoral”
- ▼ The mix is expected to include:
 - ▼ **Maritime Indirect Fire System (MIFS):** which is expected to be predominantly met by the MCG
 - ▼ **Maritime Indirect Fire Precision Attack (MIFPA):** which is expected to be predominantly met by missiles
- ▼ The Concept Phase will determine the appropriate mix of capability to deliver the FMF requirement

Helping the customer answer the key questions about the Maritime Fires capability

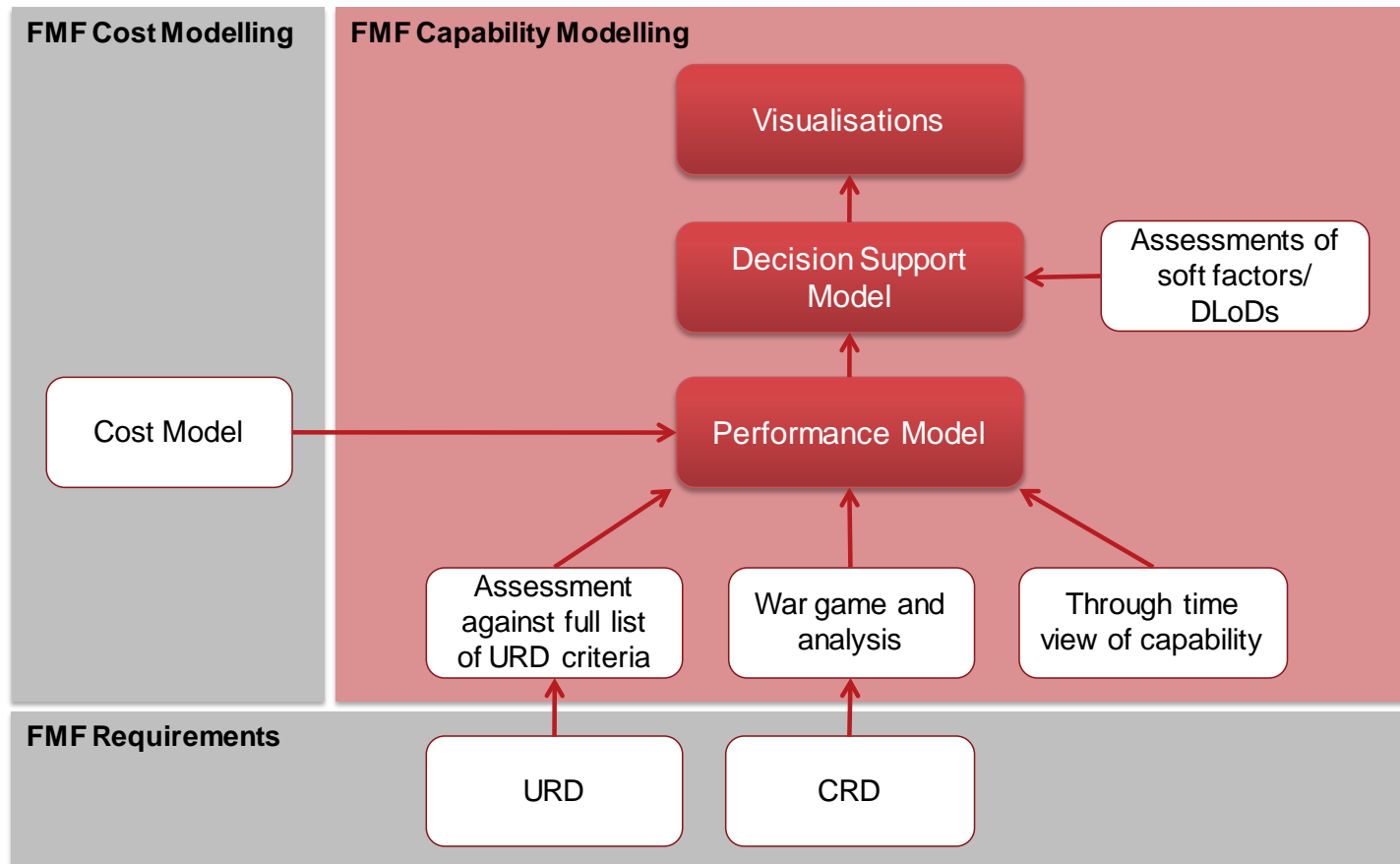


Modelling supports both capability definition and decision support

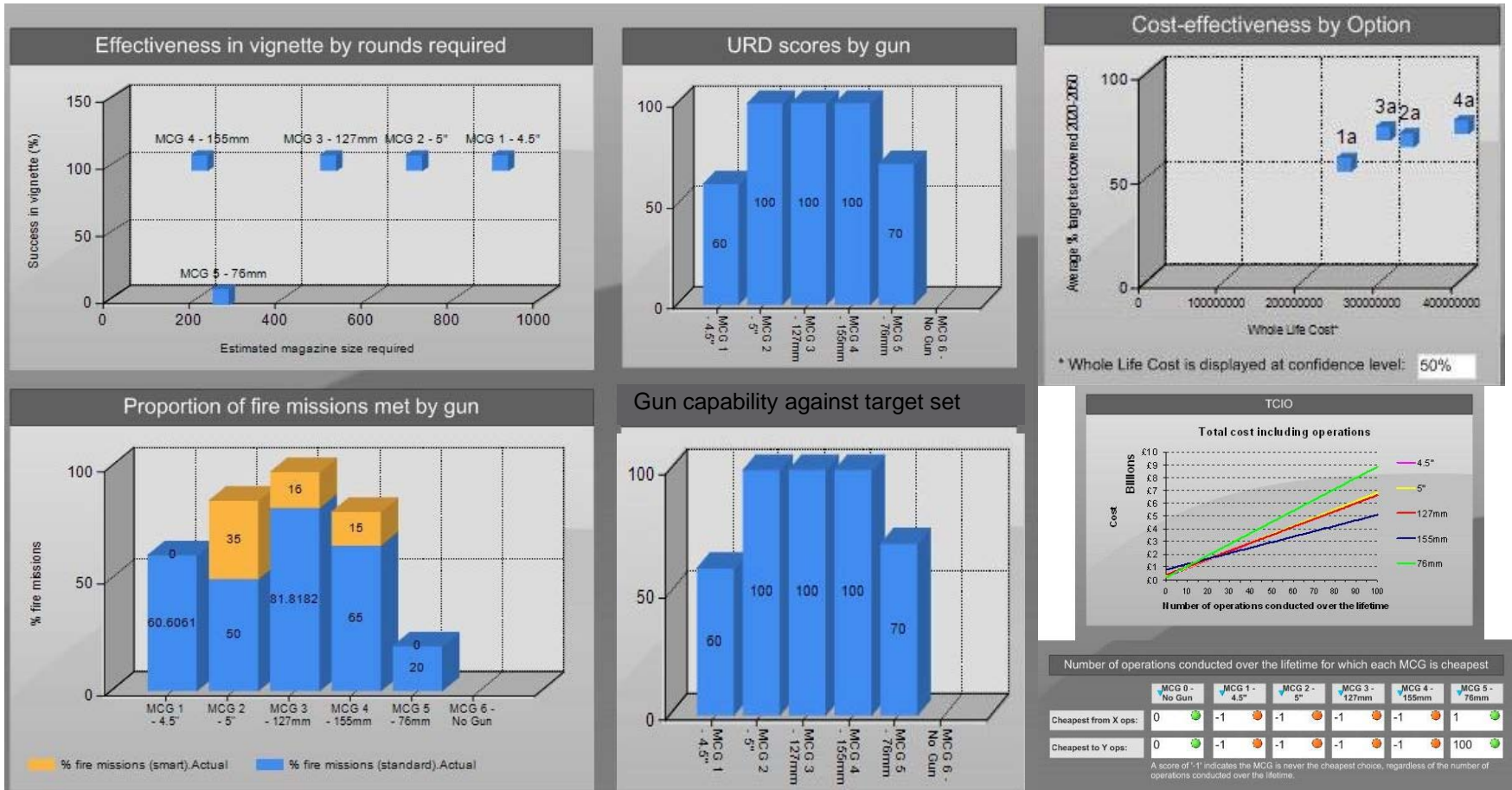


Capability Modelling provides a holistic view of Capability, Cost and Risk

- Flexible model
- Enable trading of Performance, Cost and Time
- Present Outputs as Visualisations as required by the Customer



The capability modelling visualisations support decision-making



Benefits from FMF analysis

- ▼ All stakeholders actively involved before key decisions
- ▼ Solid basis of evidence, robust analysis
- ▼ A model, refined and tested, for future use
- ▼ A model which permits trades between:
 - ▼ System of systems and concept of operations
 - ▼ Cost and performance
 - ▼ OA, Capability and user needs

.....handed over to MOD.....

- ▼ Subsequent trades to be performed by MOD staff

Summary and Conclusions

.....If you want the truth don't expect it to come from a bid

- ▼ Getting the requirement right
 - ▼ Not exhaustive, but test the “art of possible”
- ▼ Being prepared for change
 - ▼ Stuff happens – the more you experiment the lower the risk
- ▼ Managing Integration begins on day one
 - ▼ It's not something you do at the end
- ▼ Knowing where your degrees of freedom are
 - ▼ And be realistic about using them

Collaboration up front pays dividends

- *It explores the unthinkable, the ‘un-thought-about’*
- *Prepares the supply base*
- *Exposes the performance ‘knees’ which drive cost*

Headline benefits being delivered

- ▼ Shaping affordable requirements
- ▼ Informing Industry-informing MOD where no other mechanism can
- ▼ Developing methods which deliver coherence
- ▼ Confronting and solving the risks and “difficult issues”
- ▼ Providing an alternative to costly and unnecessary competition

Niteworks – the collaborative model

- ✓ A unique capability
- ✓ Constructive challenge
- ✓ Honesty replacing conspiracy

Better decisions, reduced operational risk, lower costs

....and finally.....

“....and there’s a trade-off between the gold-plated solution – often admired but rarely competitive even when it does at last hit the market – and what we can get quickly and at better value for money.....”

....that’s why I’m a supporter of the Niteworks Partnership which helps to improve requirements, reduce risk, and enhance value for money. Niteworks is one of our best kept secrets and deserves to be much better known.....”

Peter Luff
UK Defence Minister
February 2011