Improving Capability Effectiveness in a Complex Environment

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Improving Capability in a complex environment

- A bit of background to defence projects
  - Nature of the environment
- Why is experimentation so important?
  - Dealing with complexity
- About Niteworks
  - A unique mechanism
- How does experimentation make a difference?
  - Worked examples
- Lessons learnt
  - Some conclusions for the future
It involves a lot of Organisations Who have very different needs And very different pressures
Problems faced by defence solutions

- Optimism at the bid stage – ‘must win’ contracts
- Untested or unreasonable requirements
- Complex components/constituents
- Resilient and reliable solution - long life expectancy
- Use of new technology, technology immaturity
- Complex integration
- Emergent properties

And a linear acquisition process that limits the ability to prototype

Maybe a ‘playpen’ would help?
Niteworks is the only thing which saves me money

(Outgoing) DCDS(Cap)
Lt Gen Andrew Figgures

“... 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)

......better by experimentation
An impartial environment where MOD and Industry work together

- A gateway to breadth and depth of expertise that has no individual company bias
- An extant, flexible and proven contracting mechanism
- A capability that delivers scalable decision support
- A team which provides trusted evidence
- A means of getting answers quickly to meet the needs of operational tempo
Strength of the Partnership
The partnership perspective

MOD: Need and advice

Dstl: Context

MOD options
Industry transparency
Mutual understanding

Industry: Skill and knowledge

Niteworks: Core services

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Advantages of experimentation?

- Look into the future before committing
- Fast forward scenarios
- Play what-ifs
- Make trade-offs
- Optimise solutions – and not just equipment!
- Improve alignment and thinking between stakeholders
  - At all levels !!
- Build Confidence, understanding
- De-risk
- Reduce uncertainty, ambiguity
An essential aid to Managing Complexity

Most major projects are non-repetitive
- Treating them as if they are is the first mistake

Stuff happens
- Is the environment in which you work prepared for this?

Everyone is a stakeholder
- You just have differences which must be reconciled, not ignored

Preparation is everything
- Experimentation can significantly de-risk

Risks abound
- They must be worked on as if they are mutually owned
Divergence
[Exploring the question, testing the problem]

Convergence
[Examining what’s possible, shaping the requirement]

Divergence
[Exploring the supply side, choosing the partner]

Convergence
[Bringing the solution together, Delivering the integrated components]
Sample Benefits
tween 2003 & 2007, exploitation of e-works output delivered an estimated £40m in financial value to the MOD with estimated £195m potential benefits still to be realised.
Since Jan 2008, Niteworks Projects have de-risked a number of separate MOD capability delivery projects of the following categories:

- 3 x Cat A (>£400M)
- 4 x Cat B (>£100-400M)
- 2 x Cat C (>£20-100m)
- 2 x Cat D (< £20M)
Benefits to Capability Delivery: ISTAR Case Study

Information Requirements Management & Resource Tasking (IRM&RT)

**OD Sponsor:**
E&S - ISEPO

The project provided evidence to support the Initial Gate Business Case (accepted) for the BIINETT IRM&RT Project

**Project output improved precision and accuracy of:**
- User Requirement Document (URD)
- System Requirement Document (SRD)
- CONEMP
- Capability Boundary Definition
- Concept of Analysis

**Estimated Benefit:**
MOD estimated that the Niteworks Project reduced Concept Phase project risk exposure by £2.28M & 11 months duration
detailed Example – experimental results

Army Equipment Development plan (AEDP)

A practical example undertaken for Decision makers which compares options and guides the user through understanding the outcomes

Utilises TRA\textit{i}DE methodology for decision analysis

All data (e.g. colour scorings of taxonomy elements) shown within the visualisations is, for classification purposes, representative only and does not represent the data gathered all information relating to scenario, assumptions, deductions and key equipment issues has been removed
CLASSIFICATION

M Robust Acquisition inclusive Decision-making Environment

Features of the TRAiDE™ environment

- Open approach – enabling utilisation of separate sources of data
- Information flows through a single information manager, regardless of source/destination
- Usivity - designed to utilise new and existing mechanisms, tools and their providers
- Intuitive visualisations – enabling plier interpretation of results
- Evolutionary – incremental and pragmatic development based on user feedback
- Scalable – enabling aggregation of information at all levels
- Reliability and quality – appropriate outputs, matched to customer need and decisions

Underpinning TRAiDE™ is a meta-model
Bullseyes

The bullseye provides an 'at a glance view' of the status of a number of related elements within a hierarchy, applying a common structure, context and language to support strategy, planning and decision making within an organisation. Applying a consistent taxonomy and measurement framework provides a 'like to like' comparison of capability delivery options.

The following left hand bullseye provides a view of the status of risks within a given capability area (colour of each segment). The right hand bullseye provides a view of the status of priority against the same area.

An advantage of TRaIDE is the ability to overlay bullseyes. For example the two bullseyes above can be overlaid to indicate areas of high risk and high priority when carrying out strategic decision making (areas in red).

Campaign Plans

Campaign Planning is the technique that allows activities to be planned and monitored in such a way as to achieve certain outcomes through the delivery of supporting effects. As such it links in directly to the delivery of capability, which also focuses on the achievement of particular effects.

Activities are mapped according to a time line and are organised usually by defence lines of development, as illustrated below.

The Campaign Plan will show interdependences between activities and then activities can be linked into the resource they require. The Campaign Plan itself is dynamic and elements on it can be moved interactively and the result of these movements assessed.

Within the TRaIDE environment you have the ability to drill down into areas of interest and investigate potential solutions and impact of options, allows detailed analysis to be carried out.

From an industrial perspective this visualisation is commonly called a 'Plan on a Page' or 'Road Map'.

Capability Management (TCM) requires visibility to the decisions and trades at each level in the organisational structure and throughout the decision chain.

Visibility and decision making requires well formed, detailed, integrated and consistent information, analysed in a coherent way so that it can be used to display real time information, from various sources within specific domains for the purpose of business performance measures.

Information in a timely manner, minimising those unnecessary embellishments that create reporting problems can lead to inaccurate reporting.

Organise business information to support capability and maintain consistency of reporting and accurate interpretation. The following TRaIDE Dashboard is used to investigate the status of key activities within MoD Programme Boards. Plans, Capability, Finance, and Previous Actions are displayed and reviewed through this Dashboard. Relationships were identified between business processes, allowing consistent analysis to be performed accessing the impact of any given activity.
### Key Equipment Profile

- **January:**
  - [Equipment 1](#)
  - [Equipment 2](#)

- **February:**
  - [Equipment 3](#)
  - [Equipment 4](#)

### Predicted Defence Cost Profile

- **FAS NS ‘FULL FAT’**

### Land outputs

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>2011</th>
<th>2015</th>
<th>2020</th>
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</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
<td><img src="image3" alt="Graph" /></td>
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<td>Scenario 2</td>
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<td><img src="image5" alt="Graph" /></td>
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<tr>
<td>Scenario 4</td>
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<td><img src="image11" alt="Graph" /></td>
<td><img src="image12" alt="Graph" /></td>
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</tbody>
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### Options

- **Solutions/Recommendations**

### Options Profile:

- **DR’ FAS NS: Option 1**

### Classification

- **Land outputs**
<table>
<thead>
<tr>
<th>RED</th>
<th>An equipment capability issue/risk impacting Defence outputs that <strong>must</strong> be addressed by ECAB</th>
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<tbody>
<tr>
<td>AMBER</td>
<td>An equipment capability issue/risk impacting Defence outputs that <strong>should</strong> be addressed by ECAB</td>
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<tr>
<td>GREEN</td>
<td>No equipment capability issue/risk impacting Defence outputs</td>
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<tr>
<td>BLUE</td>
<td>An over-supply or overmatch in equipment capability that <strong>should</strong> be addressed by ECAB</td>
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<tr>
<td>GREY</td>
<td>Not required in this scenario</td>
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<tr>
<td>WHITE</td>
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Organisation Profile

Deployable Army Structure
### Key Equipment Profile

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### Relation to FiC

- Functions in Combat
  - Command
  - CSS
  - Protection
  - Employment

- Systems
  - Manoeuvre
  - Fire Support
  - Support
  - Command
  - Protection
2020

Scenario 1

Scenario 2

Scenario 3

Scenario 4
Scenario 1
Scenario 3

2015

2020
Scenario 2 2011
Scenario 3 2011
Scenario 2 2015

Taxonomy

Scenario 2
Scenario 1 2020
Scenario 2 2020
Scenario 4 2020
<table>
<thead>
<tr>
<th>Supporting Equipment</th>
<th>Comments</th>
<th>Hierarchy</th>
<th>Measure</th>
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<td><strong>This Element</strong></td>
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<td><strong>This Element</strong></td>
<td>An over-supply or overmatch in equipment capability that should be addressed by ECAB</td>
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<tr>
<td></td>
<td></td>
<td><strong>Parent</strong></td>
<td>No equipment capability issue/risk impacting Defence outputs</td>
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<tr>
<td></td>
<td></td>
<td><strong>Grandparent</strong></td>
<td>An equipment capability issue/risk impacting Defence outputs that should be addressed by ECAB</td>
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</table>

**Measure**

- An over-supply or overmatch in equipment capability that should be addressed by ECAB
- No equipment capability issue/risk impacting Defence outputs
- An equipment capability issue/risk impacting Defence outputs that should be addressed by ECAB
- An equipment capability issue/risk impacting Defence outputs that must be addressed by ECAB
- Not required in this scenario
Equipment Look
Key benefits of experimentation - being wiser before the event

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

Collaboration up front pays dividends
- It prepares the supply base

Knowing where your degrees of freedom are
- And be realistic about using them

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