The Role of OA in Defence Research Concept Development
ISMOR 2012

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Concept, Development & Experimentation

- **CD&E Aim:** provide credible solutions to capability shortfalls
  - structured development of creative & innovative ideas into viable solutions for defence capability development

- **Concept:**
  - a notion or statement of an idea, expressing how something might be done or accomplished, that may lead to an accepted procedure or capability

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**Defence Capability Gaps**

**Identify & Design**
- Systems Concepts
- Technology Concepts

**Test & Evaluate**
- Experimentation
- Modelling & Simulation

**Exploit & Prioritise**
- Validated Solutions
- Research Requirements
- Quick wins
ISTAR Concepts & Solutions (ICS)

- Dstl led 5 year MoD research CD&E programme
  - Pilot year began July 2011
- Collaboration between UK Government, Industry, Academia & Allies
- Aim: To develop & validate credible applied concepts for future ISTAR* capability
- Focus on capability solutions across DCPD cycle in all environments

*Intelligence, Surveillance, Target Acquisition & Reconnaissance
ICS Assessment Process

Short term  |  Medium term  |  Long term

DG1  |  DG2  |  DG3  |  DG4

Concept  |  Options  |  End-to-End Solutions

Assessment Level 1  - Concept Utility
Assessment Level 2  - Cost-effectiveness of paper concepts
Assessment Level 3  - Utility of real concepts

Concept Maturity

Cost-Effectiveness

Experimental Activity

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Pilot Year Progress

• Prioritised Concept List
• User Working Group (UWG) set up
• First live DCPD experiment successfully completed Feb 2012
  – The Concept: Integrated Responsive Management of Layered ISTAR
  – Aims: Improve the time and quality of dynamic re-tasking decisions
  – Assessed benefits/dis-benefits of End-to-End Solutions
  – Solutions identified for future exploitation
Concept Capture – Assessment Level 1

• ISTAR Subject Matter Expert (SMEs) identified concepts that address capability shortfalls
  – Underpinned by previous OA studies
  – Expressed via rich pictures

• Lessons learnt
  – Captured high-level problem simply
  – Achieved UWG buy-in
  – Ensured ICS team understood boundaries
Concept Option Evaluation – Assessment Level 2

• Causal map of ISTAR domain
  – Understand benefits
  – Compare & rank concept options
• But…
  – Completed post experiment…should have been earlier
  – Concepts already selected & demonstrated
• Lessons learnt
  – Benefits analysis should be integrated into assessment & experimentation plans earlier
  – Benefits analysis supports problem & concept option structuring
DCPD Experiment – Assessment Level 3

• Successfully demonstrated concepts & facilities
  – OA used to capture concept option impacts (process times) & collate user feedback
  – Assess benefits / dis-benefits of options

• But…
  – Insufficient results?
  – Subjective conclusions?

• Lessons learnt
  – Integrate OA & experimentation
  – Explore alternative OA approaches e.g. simulation modelling

Time for dynamic re-task (ISTAR manager opinion)
CD&E Team Management

• Hans de Nijs:
  – Frequently, experimenters are conducting their experiments with the notion that analysis only needs to occur after the results are obtained, and only admit – prior to the conduct of the experiment – a role for the analyst as the drafter of the data collection and analysis plan.

• Thomas Ekström:
  – Concept Developer: artistic freedom
  – Experimenter: timely order
  – Manager: military relevance
  – Analyst: analytical structure & rigour

• Lesson learnt
  – Understanding team perspectives is key to integrating OA
Concept Exploitation

• Significant assessment results
  – Cost-Benefits, DLODs*, Human Factors
• But…
  – Sufficient evidence?
  – Exploitation routes?
• Lessons learnt
  – Obtain external advocate early
  – Enables exploitation route identification
    • MoD Procurement cycle
    – Drives evidence & timescales
      • Reduces the risk of over-elaborate analysis

* Defence Lines Of Development e.g. training, equipment, personnel, doctrine
Future ICS Plans

- Integrate OA with assessment plans for 3 further concepts
- Engagement with industry & academia
- Major experiment planned for Apr-May 2013
- High Level OA Links
- Allied collaboration
Conclusions

• OA is an essential part of the CD&E process
  – Problem structuring
  – Concept identification & assessment

• Number of challenges to overcome to embed OA

• Understanding CD&E team perspectives is key

• External stakeholders are essential for exploitation

• Concept Development, Integrated Analysis & Experimentation?
References & Reading

• Code of Best Practice for C2 Assessment, NATO
• Guide for Understanding and Implementing Defence Experimentation (GUIDEx), TTCP
• Concept Development and Experimentation Policy and Process: How Analysis Provides Rigour, Hans de Nijs (NATO)
• There is no ‘A’ in CD&E, neither for Analysis nor for Anarchy – Ensuring Scientific Rigour and Analytical Structure whilst maintaining Military Relevance and Artistic Freedom, Thomas Ekström (Swedish Defence Research Agency)
Questions?

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