Searching for the ISR Holy Grail

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ISMOR - 31st July 2014
Background (1)

- Intelligence, Surveillance and Reconnaissance (ISR) is an essential enabler.
- Dstl’s J2M model is a key tool for assessing scenario specific ISR tasks in the context of the DCPD cycle.
Background (2)

- J2Ms outputs include:
  - The percentage of satisfied ISR tasks (Intelligence Requirements)
  - Reasons for failure (e.g. analyst, collector, comms bearer)
- “Better ISR: so what?”
- No exploitable understanding of how the fulfilment of these tasks relates to campaign outcome
  - E.g. Better battle damage assessment: so what?
  - J2M focus but problem across the ISR domain
Background (3)

• Two methods developed to answer the “Better ISR: so what?” question
  – Linking Intelligence Requirements to the Defence Tasks
  – Linking Intelligence Requirements to the Campaign End-state
Linking IRs to Defence Tasks
Linking IRs to Defence Tasks (1)

• What is an Intelligence Requirement?
  – A military commander’s request for intelligence
  – E.g. “Conduct battle damage assessment” and “Identify targets”
  – 50 per day in a typical J2M scenario

• What is a Defence Task?
  – 26 tasks that “differentiate defence from other government departments” (DIRM)
  – E.g. “Prosecute, or constrain the movement, of targets” and “Collect ISR”
Linking IRs to Defence Tasks (2)

• Analyst generates a spreadsheet linking the Intelligence Requirements to the Defence Tasks
• Hold a military judgment panel to review these links
  – Does meeting the Intelligence Requirement support the Defence Task?
  – E.g. Does "Conduct battle damage assessment" inform "Prosecute, or constrain the movement of, targets"
  – Is the link ‘essential’, ‘beneficial’ or ‘not required’?
Linking to Defence Tasks (3)

Intelligence Requirement Groupings

- Force Protection
- Measurement of Effects
- Target Id

Defence Task Groupings

- Command
- Inform
- Prepare
- Project
- Operate
- Protect
- Sustain

Measurement of Effects

Target Id

Command

Inform

Prepare

Project

Operate

Protect

Sustain
Linking to Defence Tasks (4)

- Produce tables stating how many ‘essential’ and ‘beneficial’ links there are in each group

<table>
<thead>
<tr>
<th>Command</th>
<th>Force Protection</th>
<th>Measurement of Effects</th>
<th>Target Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMAND</td>
<td>4</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>OPERATE</td>
<td>10</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>SUSTAIN</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>
Linking to Defence Tasks (5)

- Calculate the percentage of ‘essential’ and ‘beneficial’ Intelligence Requirements met for a given force mix

<table>
<thead>
<tr>
<th></th>
<th>Force Protection</th>
<th>Measurement of Effects</th>
<th>Target Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMAND</td>
<td>95 %</td>
<td>29 %</td>
<td>32 %</td>
</tr>
<tr>
<td>OPERATE</td>
<td>95%</td>
<td>37%</td>
<td>46%</td>
</tr>
<tr>
<td>SUSTAIN</td>
<td>95 %</td>
<td>49 %</td>
<td>-</td>
</tr>
</tbody>
</table>
Linking to Defence Tasks (6)

• Limitations
  – Military advisors required for a day long workshop

• Strengths
  – Relatively quick
  – Answers the “Better ISR: so what?” question
  – Can be used to identify whether or not there are any obvious gaps in the Intelligence Requirements
  – Can be applied to any scenario or vignette
  – Uses MoD defined data such as Defence Tasks
• Two methods developed to answer the “Better ISR: so what?” question
  – Linking Intelligence Requirements to the Defence Tasks
  – Linking Intelligence Requirements to the Campaign End-state
Linking Intelligence Requirements to Campaign End-state
Linking to Campaign End-state (1)

- Identify the Supporting Effects
  - "Control of the sea achieved"
  - "Blue ports and airfields protected"

- Identify the Decisive Conditions
  - "Access to region secured"
  - "Red aggression defeated"
Linking to Campaign End-state (2)

• Identify the Campaign Objectives
  – "Red defeated"
  – "Freedom of action maintained"

• Identify the Campaign End-state
  – "Pre-crisis territorial boundaries restored"
Linking to Campaign End-state (3)

• Link the Supporting Effects to the Decisive Conditions
  – "Control of the sea achieved" supports "Red aggression defeated"

• Link the Decisive Conditions to the Campaign Objectives
  – "Red aggression defeated" supports "Red defeated"
Linking to Campaign End-state (4)

- All Campaign Objectives link to the End-state
  - "Red Defeated" and "Freedom of action maintained" support "Pre-crisis territorial boundaries restored"
- Link the Intelligence Requirements to the Supporting Effects
  - "Identify targets" informs both "Control of the sea achieved" and "Blue ports and airfields protected"
Linking to Campaign End-state (6)
Contingent relationships

\[ V_{\text{parent}} = \frac{V_1 + V_2 + \ldots + V_n}{n} \]

- Maintain ability to detect attack: 0.9
- Identify targets: 0.8
- Battle damage assessment: 0.7
- Evaluate progress towards control of sea achieved: 0.6

Control of the sea achieved: 0.75
Compounding relationships

\[ V_{\text{parent}} = \min (V_1 + V_2 + \ldots + V_n) \]

- Control of the sea achieved 0.75
- Control of the air achieved 0.9
- Red forces removed 0.65

Red aggression defeated 0.65
Linking to Campaign End-state (7)
Linking to Campaign End-state (8)
Linking to Campaign End-state (9)

• Limitations
  – Scenarios need to have developed Supporting Effects, Decisive Conditions, Campaign Objectives

• Strengths
  – Military advisors required for a couple of hours
  – Answers the “Better ISR: so what?” question
  – Strong relationship with campaign plans
  – Can identify any obvious gaps in the Intelligence Requirements
The ISR Holy Grail?

• Two methods that answer the “Better ISR: so what?” question
  – Linking Intelligence Requirements to the Defence Tasks
  – Linking Intelligence Requirements to the Campaign End-state
Findings

• Linking Intelligence Requirements to Campaign End-state preferred method
  – Military advisors required for a couple of hours
  – Uses existing campaign plans
  – Less need for analytical judgement
  – Provides better discrimination between options

• Campaign details not always available
  – Link Intelligence Requirements to Defence Tasks instead
What next

• Apply the linking Intelligence Requirements to Campaign End-state approach to real problems answering “Better ISR: so what?”

• Map more scenarios (campaigns)

• Consideration of reusable vignettes