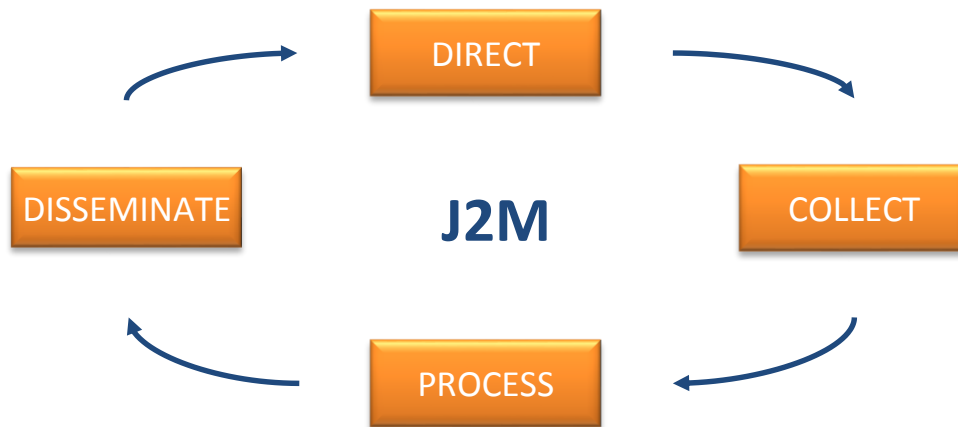# Searching for the ISR Holy Grail

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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
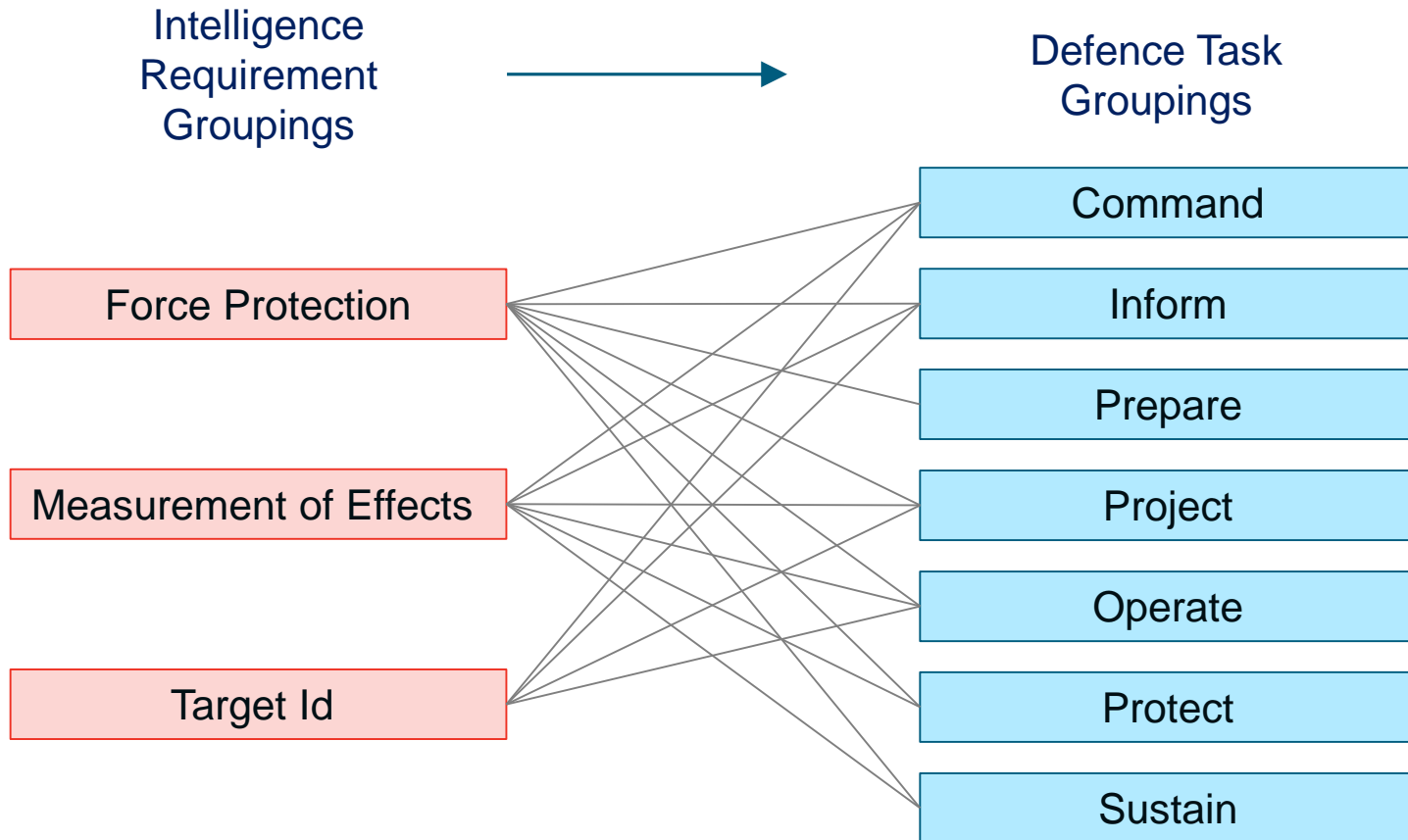
Linking IRs to Defence Tasks

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 → Defence Task Groupings

Intelligence Requirement Groupings:
- Force Protection
- Measurement of Effects
- Target Id

Defence Task Groupings:
- 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

	Force Protection	Measurement of Effects	Target Id
COMMAND	4	10	4
. . .	. . .	. . .	. . .
OPERATE	10	**21**	7
.	.	.	.
SUSTAIN	4	7	0

Linking to Defence Tasks (5)

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

	Force Protection	Measurement of Effects	Target Id
COMMAND	95 %	29 %	32 %
. . .	. . .	. . .	. . .
OPERATE	95%	**37%**	46%
.		.	.
SUSTAIN	95 %	49 %	-

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

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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**

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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"

Intelligence Requirements $\rightarrow$ Supporting Effects $\rightarrow$ Decisive Conditions

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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"

Intelligence Requirements → Supporting Effects → Decisive Conditions → Campaign Objective → End-state

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"

Intelligence Requirements

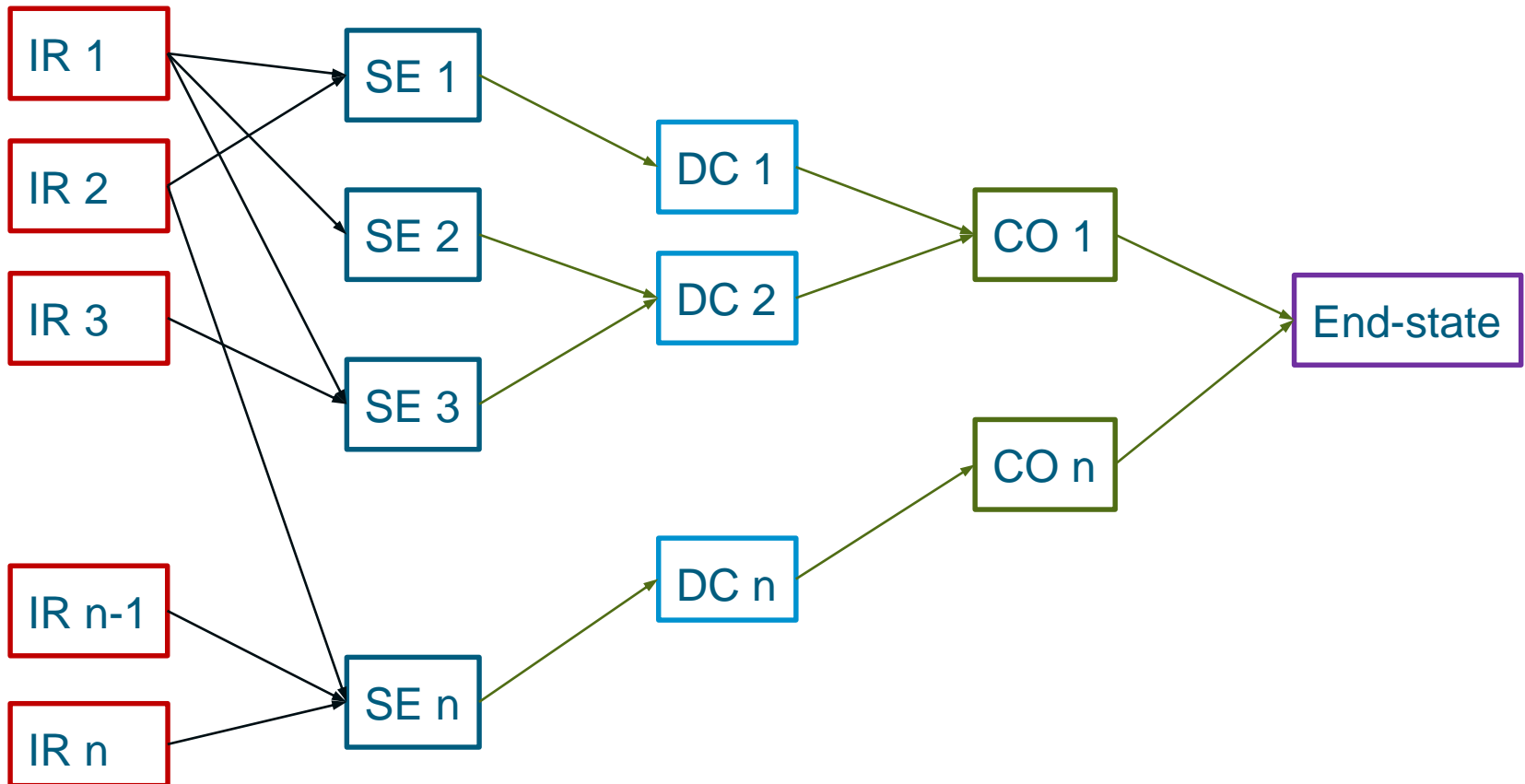Supporting Effects → Decisive Conditions → Campaign Objective

End-state

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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"
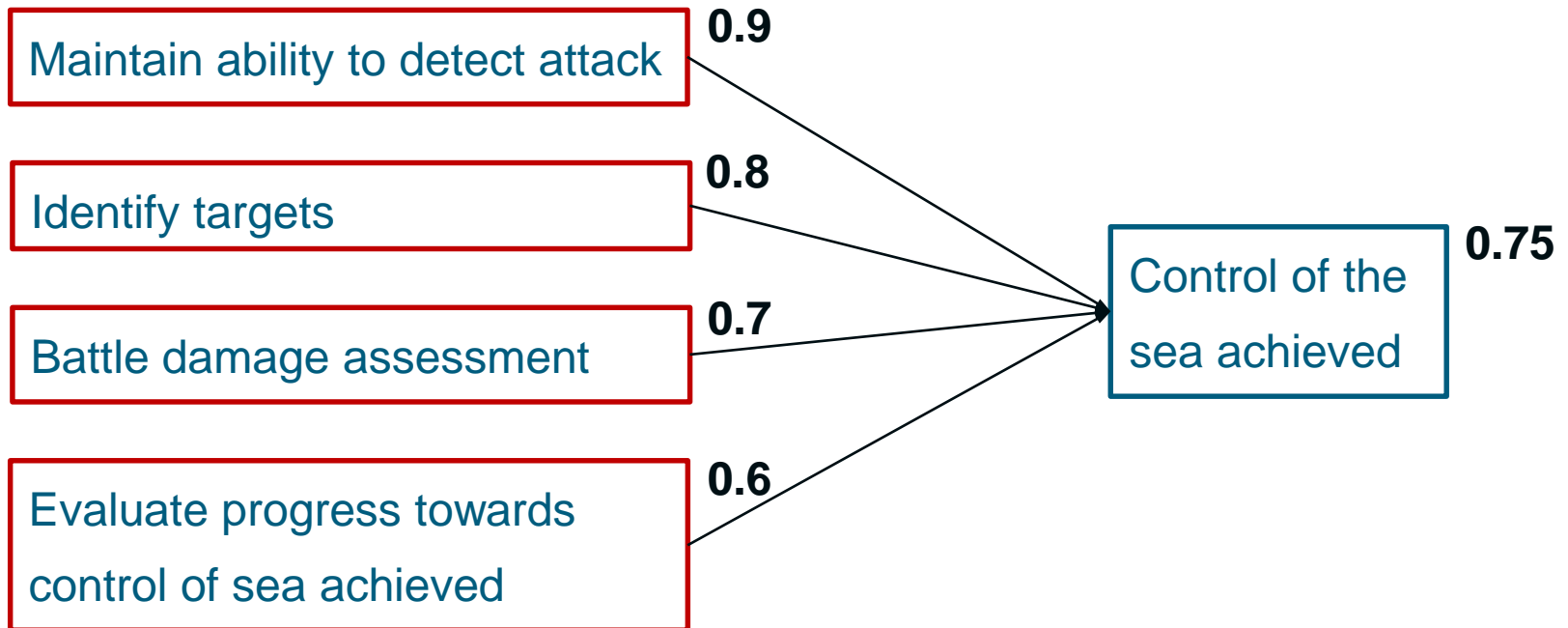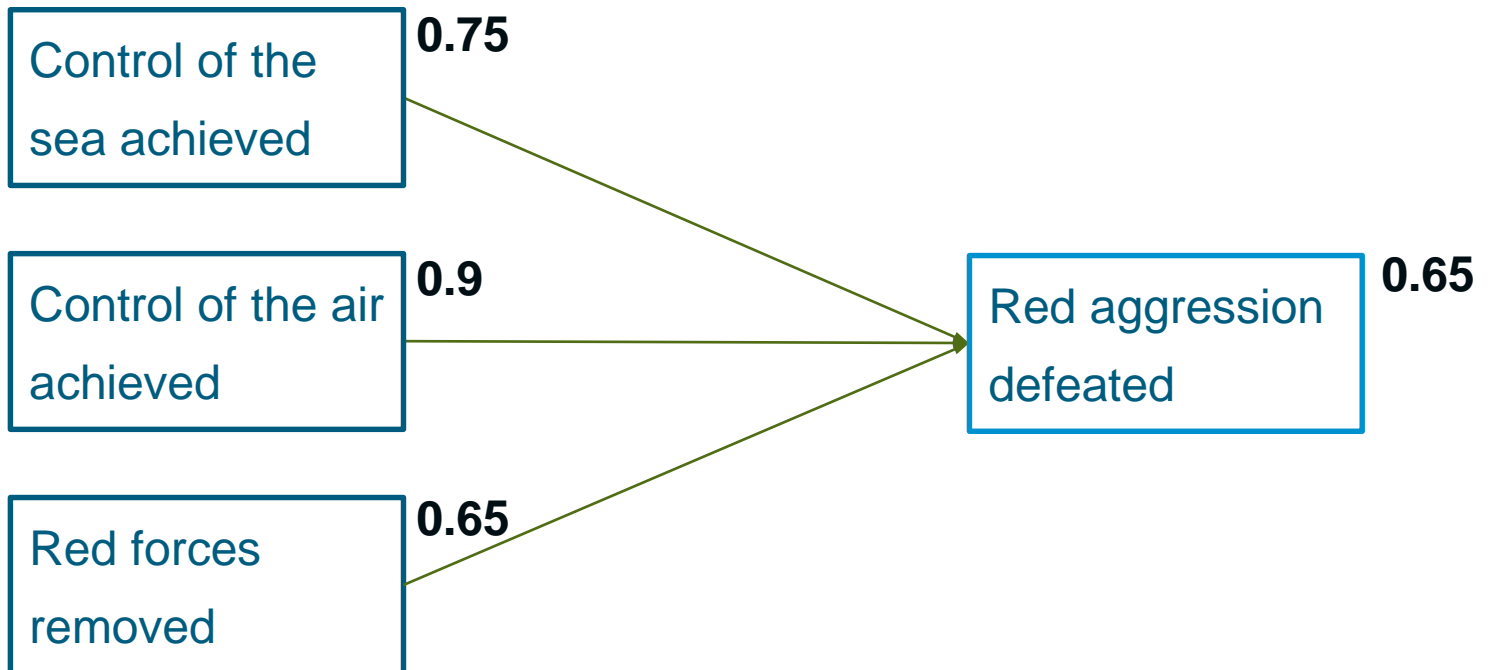
Intelligence Requirements → Supporting Effects → Decisive Conditions → Campaign Objective → End-state

Linking to Campaign End-state (6)

Contingent relationships

$$V_{parent} = (V_1 + V_2 + \ldots V_n)/n$$

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

$$V_{parent} = \min(V_1 + V_2 + \dots V_n)$$

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)
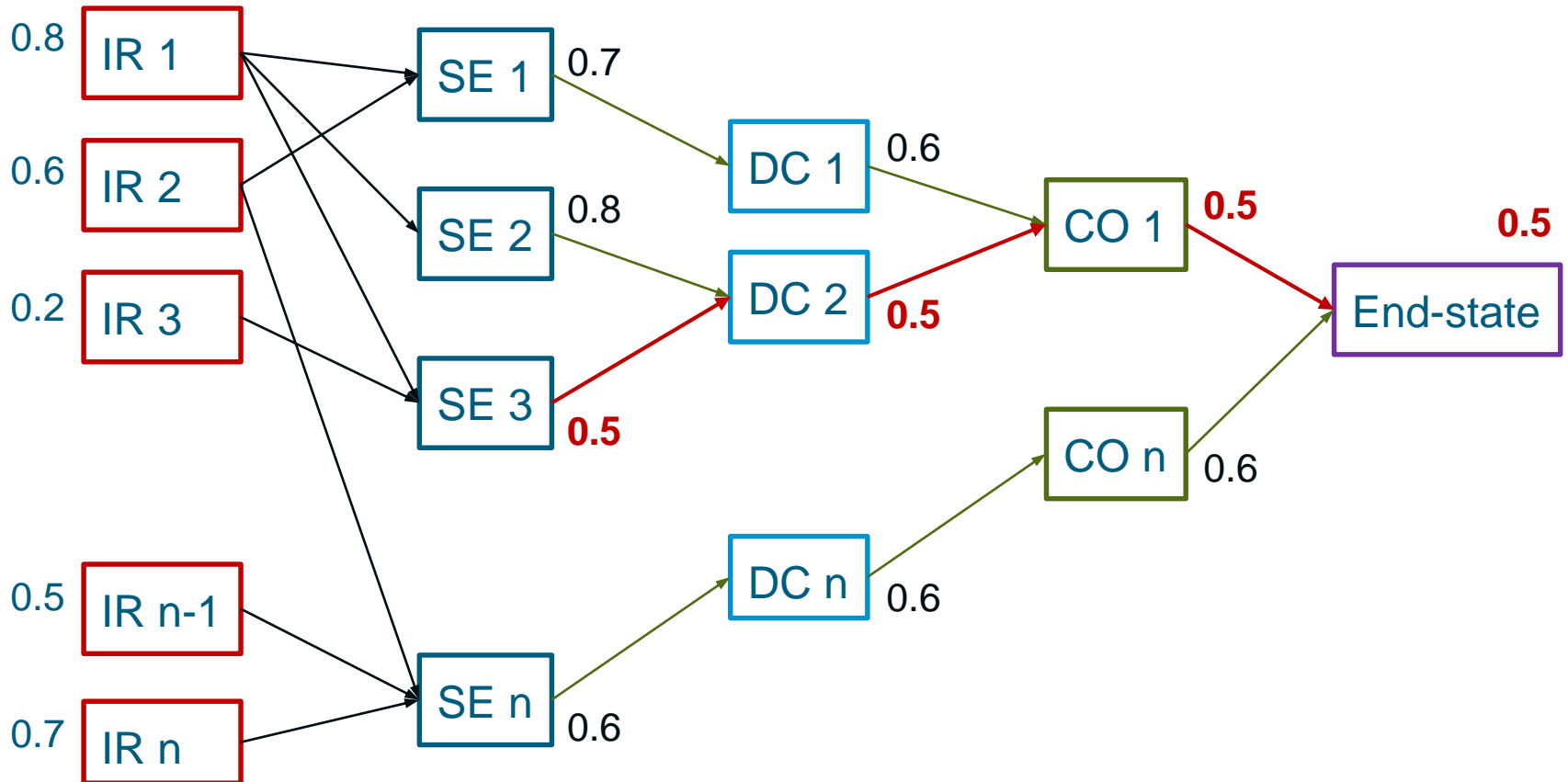
Linking to Campaign End-state (8)
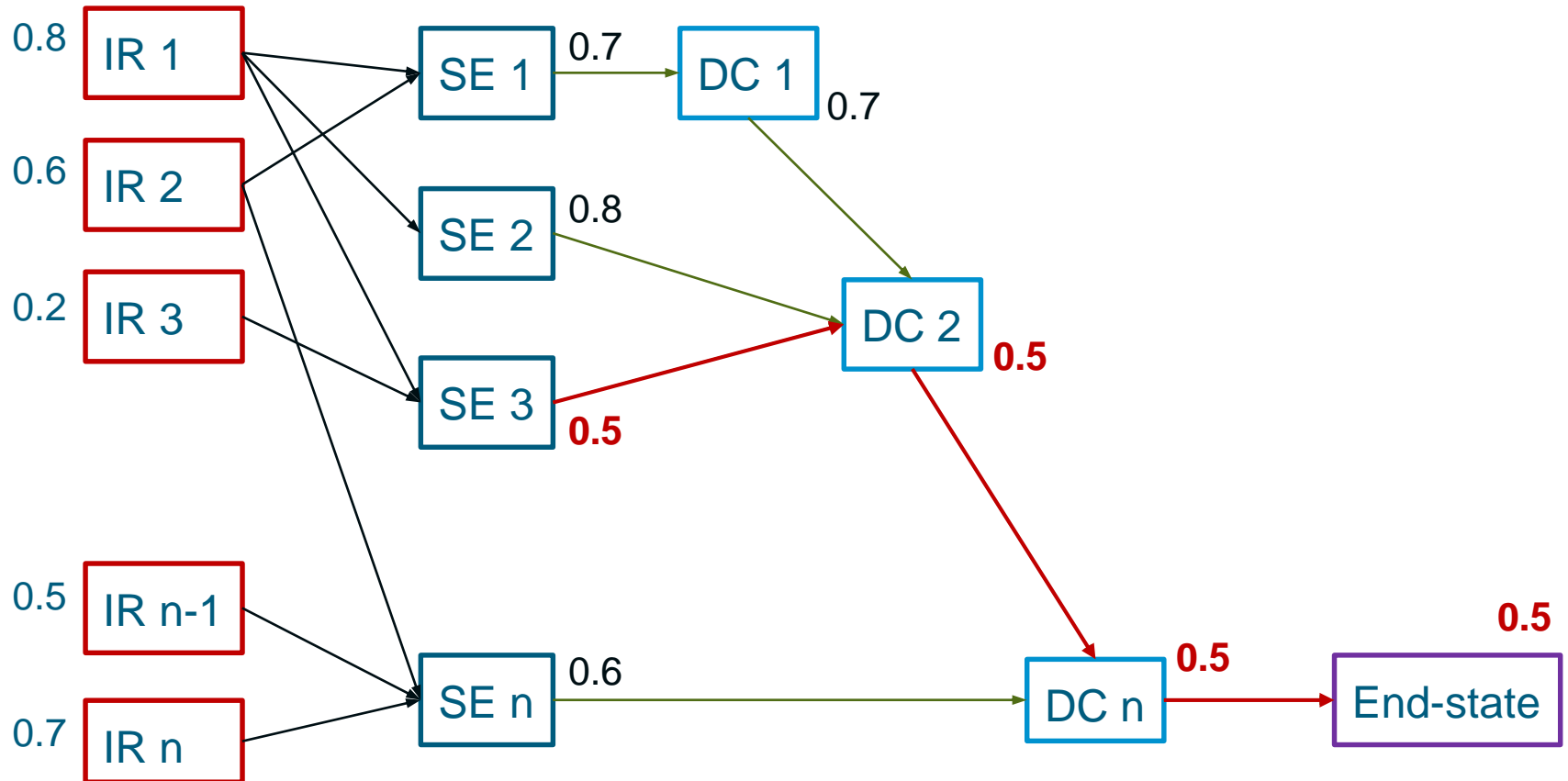
Linking to Campaign End-state (9)

- 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

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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

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07 August 2014

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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

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