

# Review of the modelling approaches for Availability Contracts in the military context.

by

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# Agenda

- Research Background
- Key Terms
- Contracting for Availability Life Cycle
- Modelling Practices
- Modelling Techniques
- Opportunities for Improvement
- Conclusion

# Background

- Ministry of Defence (MoD) **contracting policy has changed by transforming secure information sharing for through life collaboration in defence acquisition and support.**

(Ref: <http://www.ukceb.org/>)

- **The MoD's Defence** Equipment and Support (DE&S) spends about half its annual budget on servicing equipment, **outsourcing the work to private companies.**

(Ref: [www.ft.com](http://www.ft.com))

- **“Contracting for Availability (CfA)** is a commercial process which seeks to sustain a system or capability at an agreed level of readiness, over a period of time, by building a partnering arrangement between the MoD and Industry.”

(Ref: MoD guidelines, 2007)

- **“The availability** (of an item) is the ability to be in a state to **perform as required**, under given conditions, at a **given instant**, or given **time interval**.”

(Ref: <http://www.sars.org.uk/>)

# Key Terms

Military Requirements

Availability Contracts: Type,  
Duration, Life Cycle Stages

Through-life Engineering

Modelling Techniques

Cost Assessment

Risk and Uncertainty  
Assessment

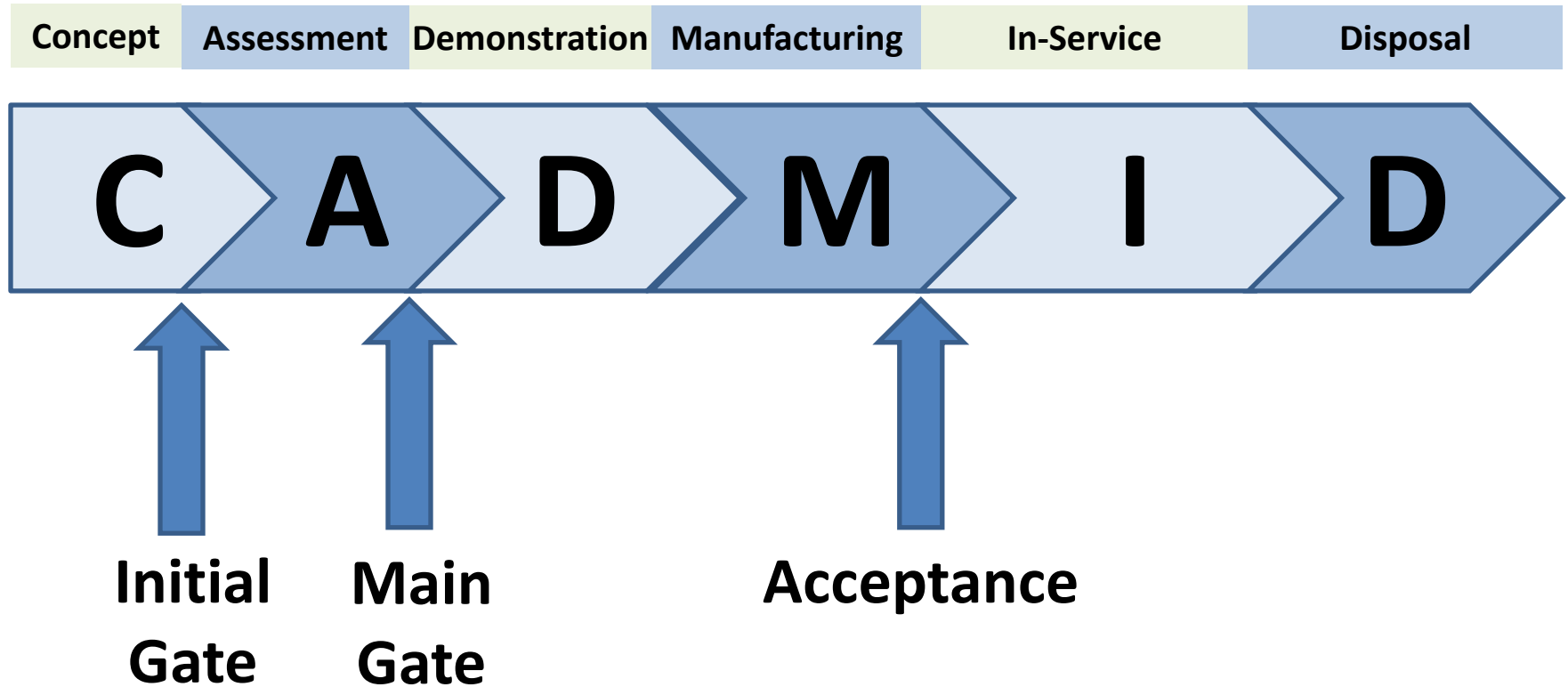
Information  
Management

Asset Management

Maintenance

Training

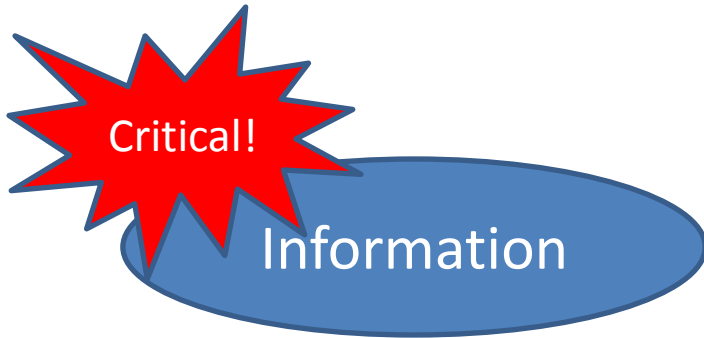
# Contracting for Availability Life Cycle



# Modelling Practices

1. Understand the customer requirements;
2. Collect data from the process (either historical data or expert opinions) and understand limitations with respect data;
3. Specify the modelling structure to the system attributes (e.g. physical representation model, neural networks, diagrams, tables, abstract models);
4. Build the assumptions list;
5. Select a numerical technique to find correlations between the parameters of the system;
6. Integrate risk and uncertainty analysis;
7. Perform a sensitive analysis of the model results in order to find drivers for improvement;
8. Validate the model against an 'unseen' data set or user appreciation;

# Modelling Techniques



- Expert Opinion

- Expert Opinion
- Analogy
- What-If Analysis
- Performance-Based Methods
- Parametric Techniques

- Expert Opinion
- Combined Top-Down and Bottom-Up Methods
- Performance-Based Methods
- **Simulation**



Less information

More information

# Opportunities for Improvement

## UK Defence Lines of Development (DLoDs):

- **T**raining
- **E**quipment
- **P**ersonnel
- **I**nformation
- **D**octrine & Concepts
- **O**rganisation
- **I**nfrastructure
- **L**ogistics
- **I**nteroperability

➤ In Uk, DLoDs must be the guidance for any military support activity.

➤ DLoDs provide a summary of the range of factors that must be considered when making decisions on capability and force structure.



# Equivalent Military Guidelines

## Australia

- Organisation
- Personnel
- Collective Training
- Major Systems
- Supplies
- Facilities
- Support
- Command & Management

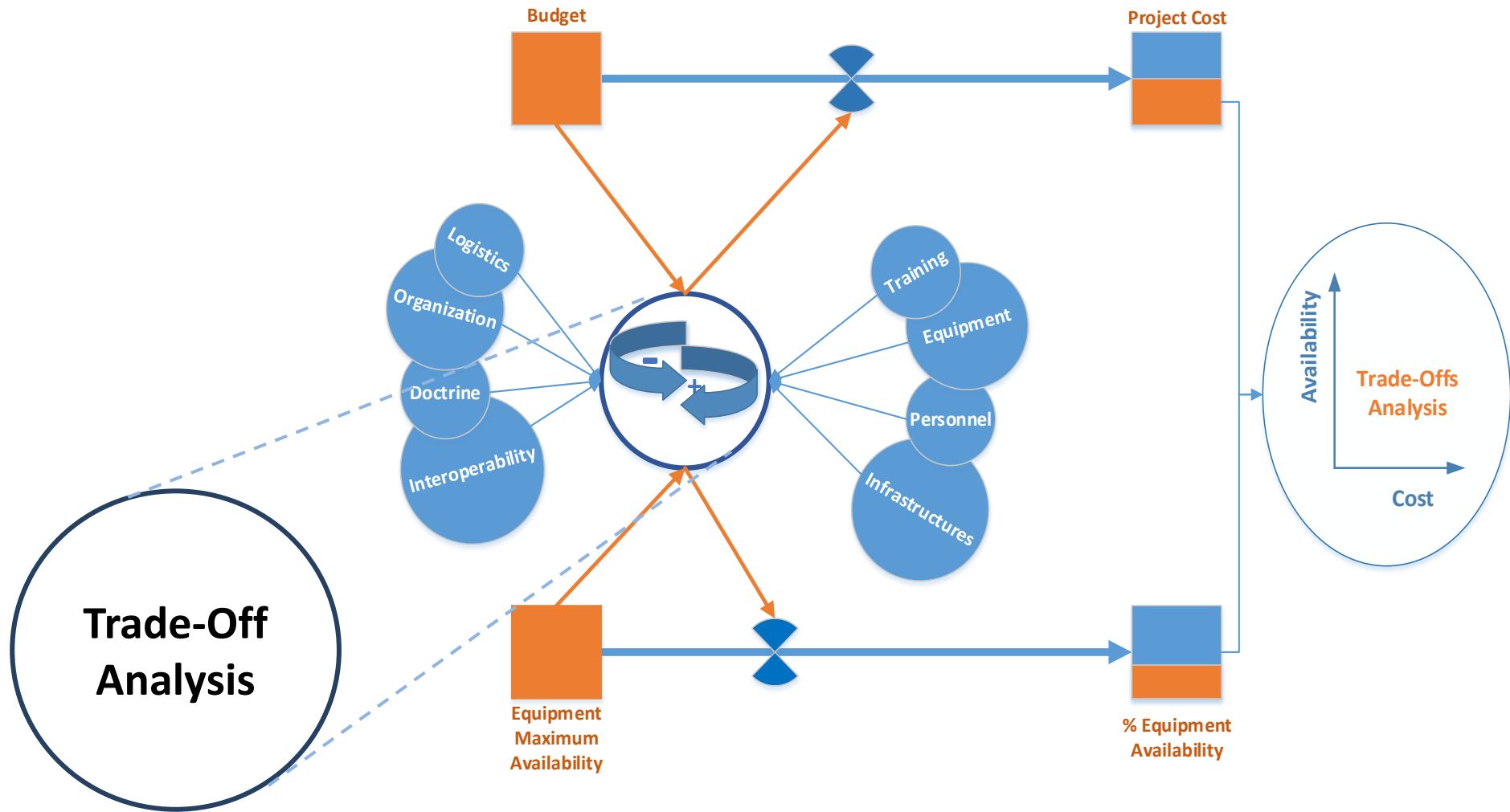
## Canada

- Personnel
- R&D/Ops research
- Infrastructure & Organisation
- Concepts
- Doctrine & Collective Training
- IT Infrastructure
- Equipment, Supplies & Services

## USA

- Doctrine
- Organisation
- Training & Education
- Materiel
- Leadership
- People

# Opportunities for Improvement



# Conclusion

- CfA is being the major contracting practice adopted by UK MoD and also other Defence Authorities;
- **Current CfA design practices need to be improved;**
- There is a need for more and better historical information;
- **Industry recognizes that more research over the DLoDs is an opportunity for improvement of the current CfA practices;**

Thank you for your attention.

Questions?

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