Australian Government
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# Lessons in Model Reuse

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# Lessons in Model Reuse - Introduction

- Return on Investment
- Legacy Army
  - Predominately isolated, ‘Stove piped systems’
  - ‘Humans in loop’ used to transfer information
- Future Army
  - Digital Battlefield
  - Configurable for different missions
  - Integration and Interoperability

# The 'Sandpit'*

- 'Sandpit' principles
  - Model reuse from an existing pool of models
  - Reduced rigour in verification of source models
  - Rapid prototyping environment
  - Specific capability constraint (Long Range Fires)

*Q. Do et al., "*A sandpit for systems engineering and systems integration education and research,"* in Int. J. of Intelligent Defence Support Systems. , 2009, vol. 2. no. 3. Pp 246-267.

# Long Range Fires

- Capability constraint with similarities to:
  - existing functionality
  - Air and Maritime functionality
  - international capability
- Reuse
  - Weaponeering* from Air force model
    - Issues such as terminology, context

*Weaponeering is the process of determining the quantity of a specific type of lethal or nonlethal means required to create a desired effect on a given target.

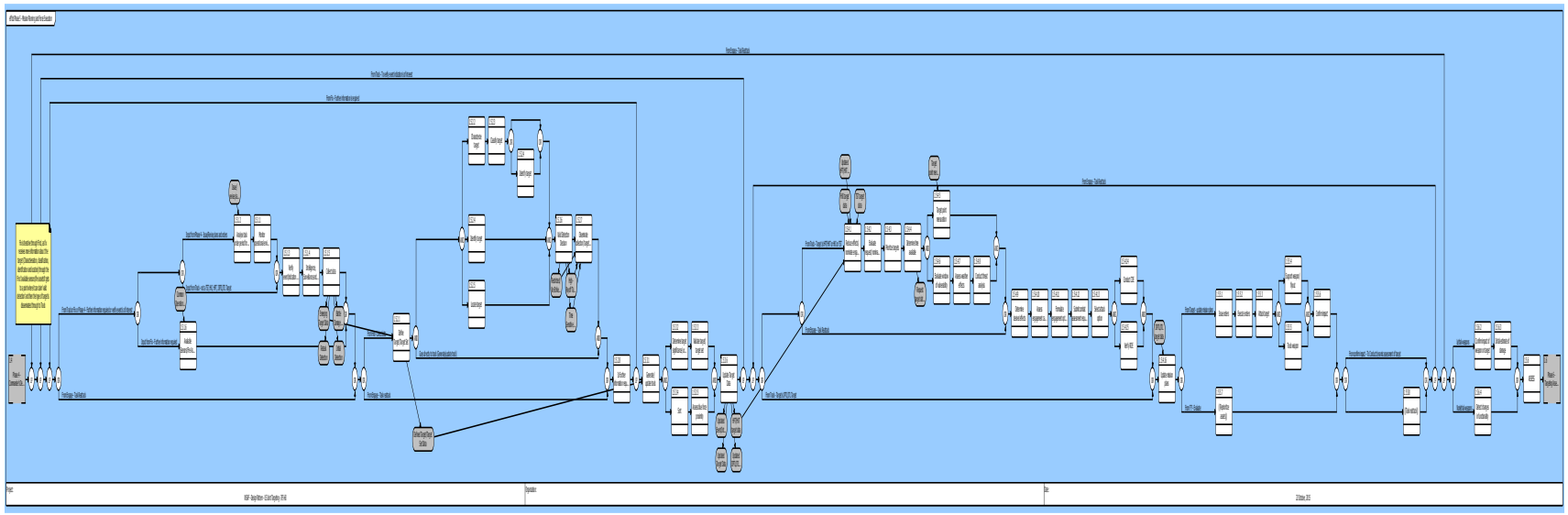
# Lessons learned

- Barriers to reuse
- Reuse types
- Reactive and proactive solutions

# Barriers to model reuse

# Reuse types

- Spectrum of reuse:
  - Full Reuse
  - Component reuse
  - Knowledge reuse



# Reactive and proactive solutions

- Leave work until later vs do upfront
  - Amount of effort vs return on effort assessment
- Example solutions vs barriers
  - Tools: choose tools that allow file import/export to other tools (proactive) vs manual movement of data (reactive)
  - Ontology: use a stable ontology (proactive) vs realign different ontologies (reactive)
  - Supporting documentation: document the development and configuration of the model (proactive) vs analysing and interpreting the model (reactive)

# Summary

- Reuse of models in military context is likely to provide a return on investment.
- ‘Sandpit’ environment provides relatively fast (initial) model development.
- Barriers to reuse need to be considered, but have solutions.
- These solutions may be reactive or proactive.
- Future work should expand on the barriers and solution space.

# Questions