Australian Government
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Science and Technology

RHEINMETALL DEFENCE

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# Developing Army Decision Support Tools from Problem-Solving Meta-Strategies of Tactical Experts

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# Introduction

- Tactical mission planning is a complex task
  - coordination of finite assets in time and space
  - opposing forces and intelligent enemy
  - time constraints and dynamic environment
- Commanders develop their tactical appreciation skills on courses, field exercises and operations
- How can we augment current methods to accelerate the development of tactical mastery?
- This presentation outlines a specific methodology addressing this as part of the Bright Fox project.

# Bright Fox Project

- Partnership between Rheinmetall, DST Group and the Australian Army.
- Aims to develop decision support system to assist commander appreciation during tactical planning for combat missions
- Supports Army's human performance priorities
  - Achieving a cognitive edge
  - Enhancing individual decision-making
  - Next-generation tactical training tools

# Research Questions

- What meta-strategies do experts use to synthesise Courses of Action (COAs) during tactical planning?
- How can these strategies be captured and used to support the development of tactical mastery?

# Military Appreciation Process (MAP)

- Army's doctrinal planning and decision-making tool
- Used to develop a tactical plan in response to a given situation

| | |
|---|---|
| **1. Intelligence Preparation of Battlespace** | Define battlespace environment<br>Determine enemy COA |
| **2. Mission Analysis** | Review situation<br>Identify critical facts and assumptions<br>Confirm mission |
| **3. COA Development** | Create COA concepts, develop COAs |
| **4. COA Analysis** | Test COAs (wargaming) |
| **5. Decision and Execution** | Compare COA options<br>Select COA and execute plan |

# Methodological Approach

| 1. Data Collection | 2. Data Mining | 3. Tool Creation | 4. User Testing |
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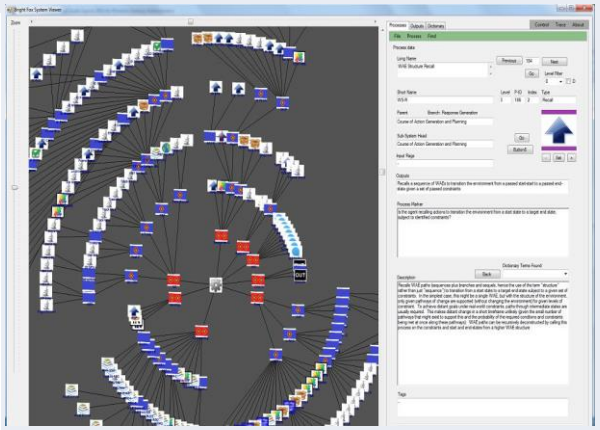
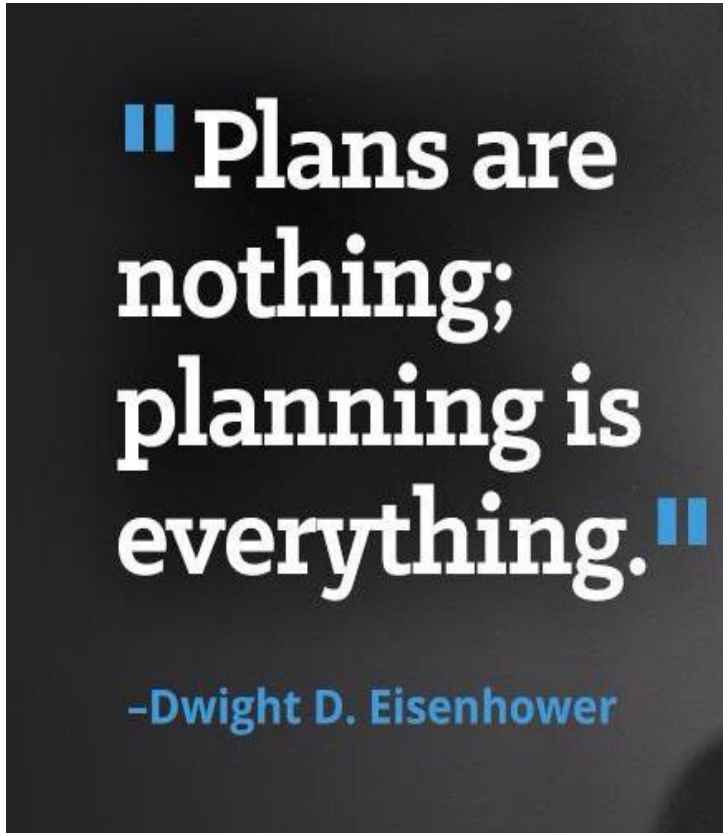
|  |  |  |  |
| Interface used to capture and code thought records of commanders during appreciation | Manual & automatic text mining techniques used to extract meta-strategies | Extracted strategies reshaped into series of prompts & questions (decision supt tools) | Decision support tools tested and refined with end-users |

# Results

- Over 6000 posts collected to date using interface with Army personnel
  - Data from top performers by grade on Army's premier tactics course (COAC 2018)
  - Data from other peer-recognised tactical experts in Army
- Unique 'higher performer' questions extracted and incorporated within a set of decision support tools
  - Tools currently paper-based; could be converted into e-format (e.g. training app)
- Initial evaluation shows use of tools leads to increase in number of:
  - distinct COA options generated per appreciation
  - branches, sequels, risk management, and battle-tracking items in developed COAs

# Conclusion

- Methodology developed for capturing run-time problem-solving data
- Meta-strategies mined from observed reasoning of tactical experts
- Preliminary set of decision support tools created and tested with Army
- Initial results promising and further testing planned with Army samples



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# Questions?

# User Interface: ‘Appreciation Dialogue’

1. Objectives
2. Resources
3. Opposing Factors
4. Projecting Future Events
5. Developing COAs
6. Making Decisions
7. Identifying Situational Observations
8. Noting Familiar Patterns
9. Generate Solution