Dynamic Planning & Execution

Presented to KSCO 2007

1st May 2007, Waltham, MA

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Outline

- Background
- A Military Perspective of DP&E
- Conceptual Model
- Example Application Domains
- Issues & Challenges
- Conclusions

Background

- **Summation of TTCP AG1 work**

The Technical Cooperation Program

- Formed in 1957
- Aim – to **foster cooperation** in the science and technology needed for conventional national defence
- Purpose – to enhance national defence at **reduced cost**
- TTCP Nations – AUS, CAN, NZ, UK, US
- Action Group 1 formed in 2003

Action Group 1

Background (2)

- Summation of TTCP AG1 work
- **Contemporary Operating Environment**
  - **Disorder, Complexity & Uncertainty**
- **Constantly changing situation**
- **Agility required**
- **Planning & Execution processes**

A Military Perspective of DP&E

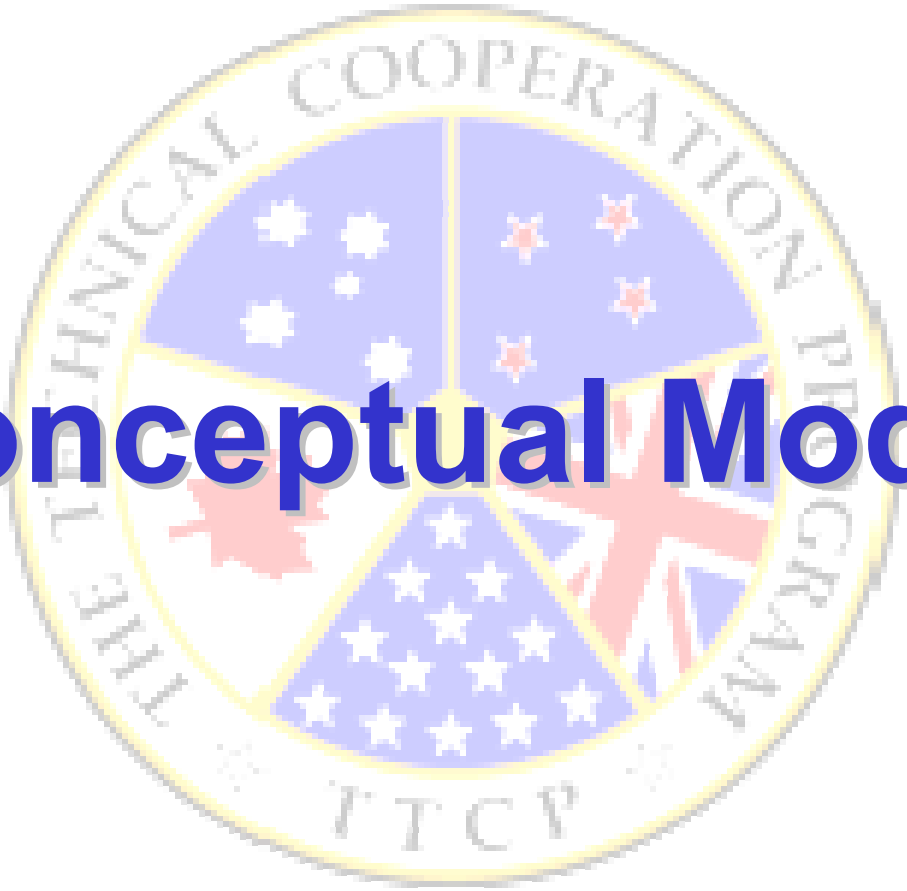
- Short Study – UK operational community
- No official definition

AG1 Definition of DP&E

“The capability to continuously develop, analyse, select and flexibly execute a robust course of action based on a commander’s evolving intent, situational awareness and capabilities.”

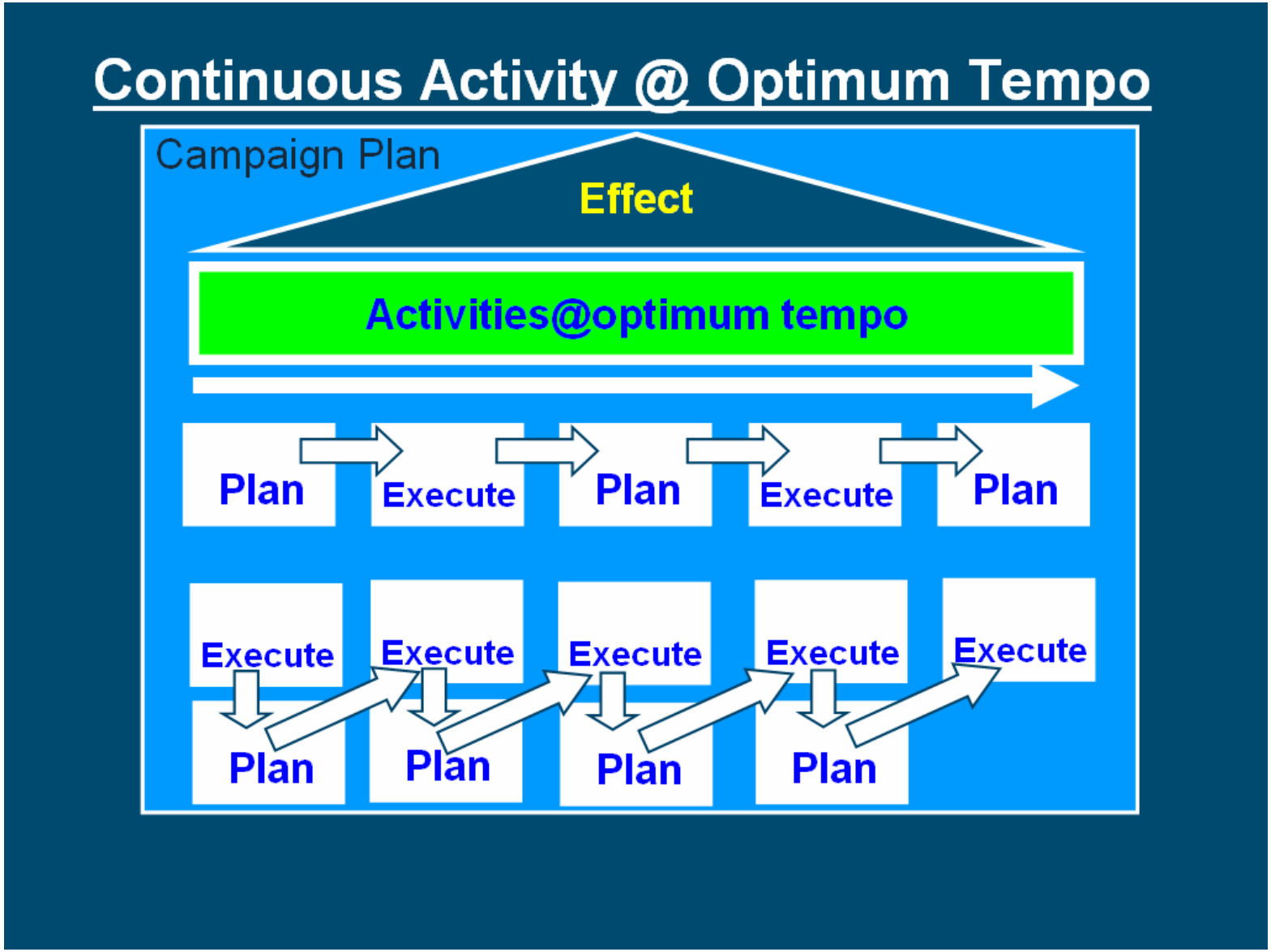
A Military Perspective of DP&E (2)

- Short Study – UK operational community
- No official definition
- **Concepts & Doctrine**
- **Recent Operational Experience**
  - **Dynamic Environment – planning time reduced**
  - **Planning process needs adaptation**
  - **Require capability to plan quickly**



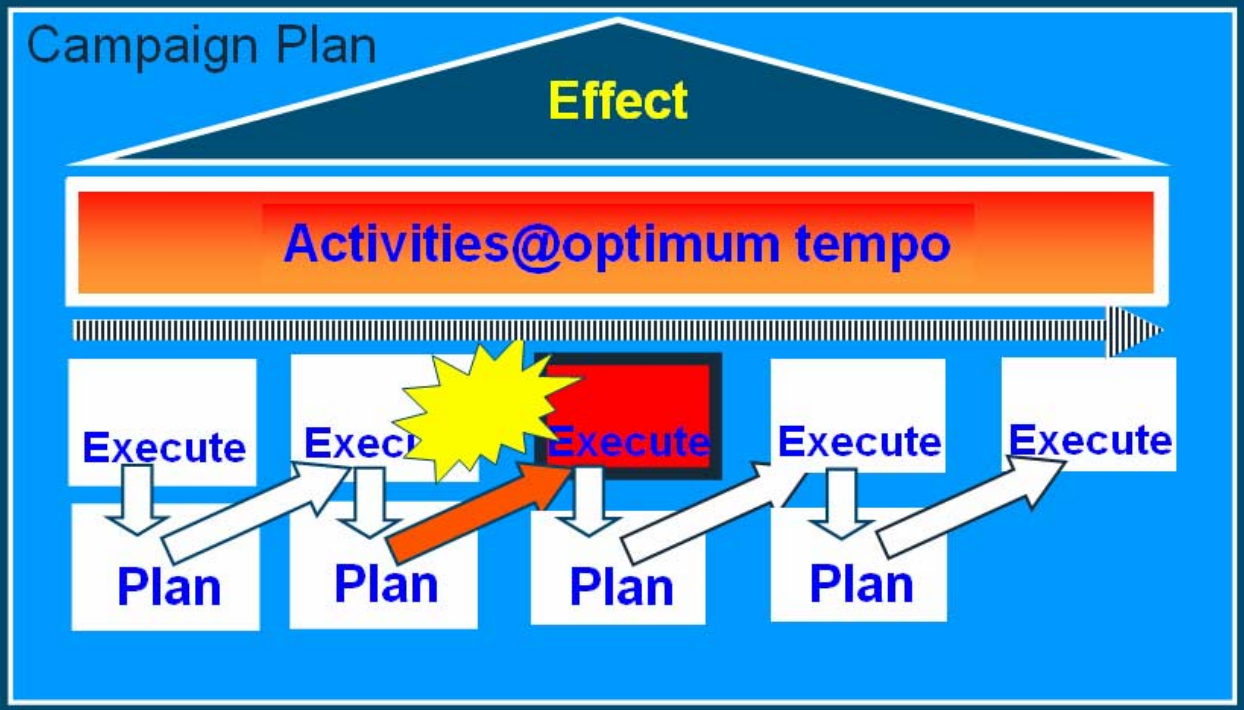
Conceptual Model

Current Planning & Execution



Change in the Situation

Continuous Activity @ Optimum Tempo?



Impact of a change in the situation

- Already alter execution – technology?
- Information exchange: J5/J35/J3
- Replanning takes time - speed
- Maximum use of ‘old’ plan
- How can technology support the human to plan quicker and better following change?

Example Application Domains

- Identify potential areas for collaboration
- Common interest
  - Effects Based Operations
  - Logistics for Agile Forces
  - Wide Area Time Sensitive Airspace Coordination
- WATSAC & DP&E

Wide Area Time Sensitive Airspace Coordination (WATSAC)

- Airspace Management/Coordination
- Resolution of conflicts
  - Deconfliction of airspace during initial planning
  - Centralised, inefficient process
- Improvements in technology
  - Near real time plan representation & coordination
  - Dynamic airspace deconfliction
  - Cooperative airborne ISR missions

Issues & Challenges

Issues central to having a DP&E capability:

- **Subjectivity**
- **Static Representation**
  - **Timeliness**
  - **Residual value**
- **Coordination**

Issues & Challenges (2)

- **Plan Representation Languages**
  - Capture context, assumptions & decision rationale
  - Link components & levels of comd
  - Facilitation of human/machine exchanges
- **Multi Agent Coordination**
  - Architectures & lack of unified framework
  - Constrained environments
  - Uncertain/open environments

Conclusions

- DP&E is not well understood
- Desirable military capability
- Richer plan representation
- Application of coordination mechanisms
- How can technology better enable us to execute plans in a dynamic environment?

Questions