

Network Enabled Fires - A NEC/NCW Use Case

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June 2004

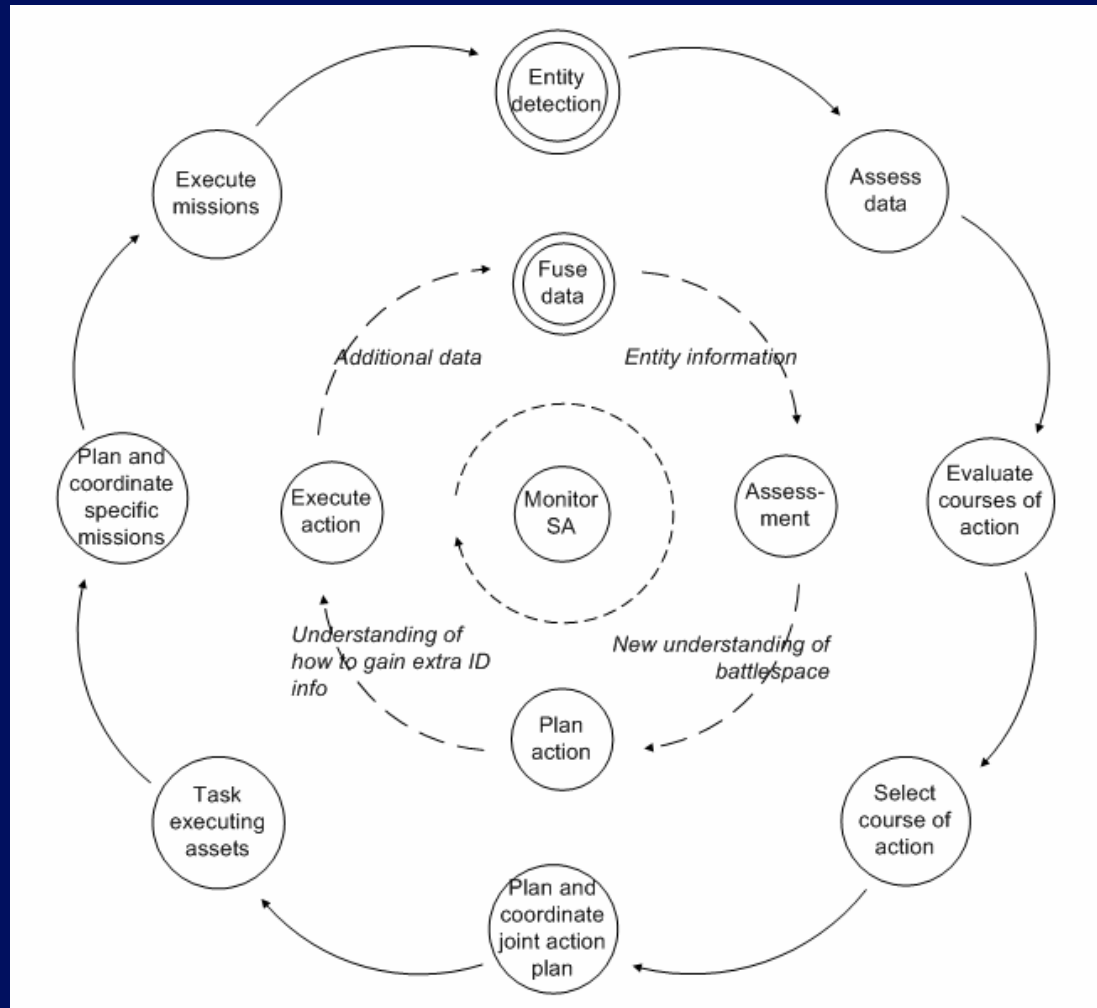
Context - What is Joint Fires?

- Fires from two or more Component Commands, coordinated to produce effects that are synchronised in space and time
 - What volume of space?
 - What period of time?
- The answers have typically been:
 - 100s of square kilometres
 - Hours (or days!)

Flexibility and Responsiveness

- Joint Fires has been lacking in the necessary flexibility and responsiveness
 - Lack of Situational Awareness within and between Component Commands hinders collaborative planning in near real time
- Land Component effects systems are now able to reach far beyond the close battle and a flexible, timely means of *integrating* these systems with air systems is more important than ever

The Central Role of SA



Cross Component Situational Awareness

- Position, Intent and *deconfliction* measures are the most important elements of SA
 - Other information is of interest within smaller, more specific communities
- Blue (and to a significant extent, Red and Grey) position and intent information is now becoming readily available
 - The challenge is to enable cross component sharing and collaborative planning (near real time construction of deconfliction measures) based on the shared information

Enabling Cross Component Information Sharing

- Interoperability must be based on a shared data model
 - Development of this model in a Joint arena will be difficult, it's important to focus on what's really needed
 - On the positive side, emerging techniques and technologies e.g. XML and associated tools, should make capturing, maintaining and implementing the data model far simpler than previously

The Deep Operations Picture (DOP)

- Sharing of Position, Intent and deconfliction information would enable production of a 'Deep Operations Picture'
 - Indicates that the picture relates to broad areas where forces are not in close contact
 - The information exchanged would be that which is relevant to C2 of Deep effects systems, which are owned by formations at, or close to, the Operational level of Command

Analysis

- Analysis of the DOP followed two related paths:
 - Benefits Modelling
 - Process Modelling

Benefits Modelling

- Structured judgement techniques were used to evaluate the benefit of the DOP concept against the following metrics:
 - Time
 - Flexibility (degree of choice in plans, assets and outcomes)
 - Co-ordination (alignment of assets in time, space and purpose)
 - Situational Awareness (degree of awareness and understanding of surrounding battlespace)
 - Optimality of Resource utilisation (Degree to which assets are optimally employed)
 - Mission success (degree to which mission objectives are achieved)

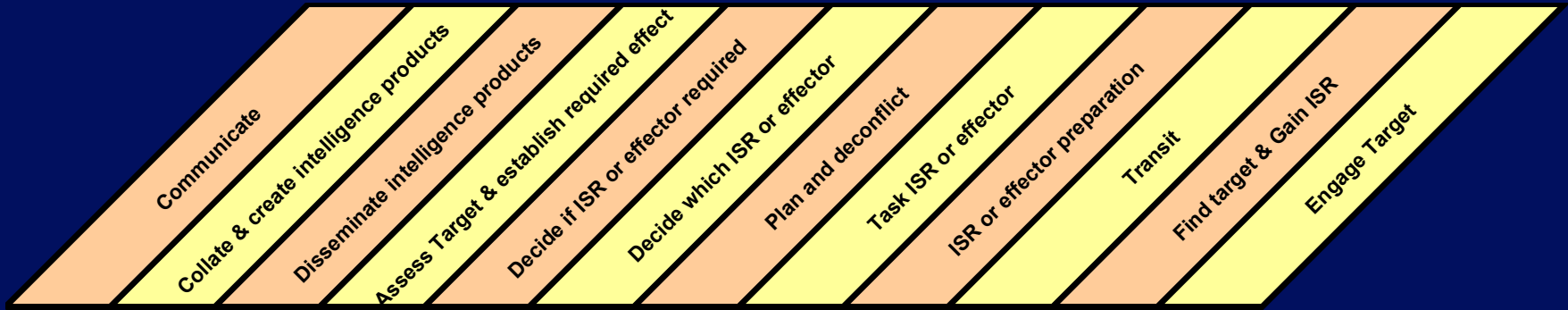
Benefits Modelling continued

- Several Joint Fires Use Cases (including a contemporary Joint Air Attack Team mission) were analysed through formal process modelling to extract salient, generic mission elements
 - Each mission element was analysed to determine how the DOP would affect the functioning of that element

Benefits Modelling continued

- Mission Elements considered:
 - Communicate
 - Collate and create intelligence product
 - Disseminate Intelligence products
 - Assess target and establish required effect
 - Decide if ISR or effector required
 - Decide which ISR or effector
 - Plan and deconflict
 - Task ISR or effector
 - ISR or effector preparation
 - Transit
 - Find target and gain ISR
 - Engage Target

Benefits Modelling Results



T++	T+	T++			T++	T+++	T+	T+	T++	T+	T+
F+	F++										
C++						C++		C++			
SA+	SA+++	SA+									
				O+	O++	O+					
									MS+	MS+	MS++

Time
 Flexibility
 Co-ordination
 Situational Awareness
 Optimality of resources
 Mission Success

Observations from Process Modelling

- Agility
 - The DOP is seen as a means of enabling real time collaborative planning between Combat Ops personnel in different components. The effects under their control can then be used in a more flexible, co-ordinated manner
- Self-Synchronisation
 - Information from the DOP, disseminated to effectors, can enable some level of independent decision making
 - This possibility was seen to only be relevant to fairly small teams with a high level of common understanding and training
- Command Structure
 - DOP production would occur across Components, as a service to other users and would be best achieved through functional command rather than command segregated along Component lines

Further thoughts...

- Transitional Epoch
 - Bandwidth v. compression techniques suggest that fully connected battlespace will not be available in this timescale
- Perhaps current NCW research will allow for a fully routed, interconnected battlespace
- Once connectivity is established we need to move up the stack - difficulties in establishing a common view (data model) of what's important highlight the importance of shared information (and then shared doctrine/procedures)

Conclusion

- The Deep Operations Picture would provide the means for more efficient use of Joint effects towards Joint ends
- The DOP concept is aimed at the 'Transitional Epoch' but still exhibits some elements of Network Centric behaviour
- This work has shown that connectivity is not the only issue - common data formats and common doctrine/procedures are essential (and probably just as difficult to achieve)