

12th ICCRTS
“Adapting C2 to the 21st Century”

Title of Paper:
A Generalized Tasking Grammar:
Formalizing Command Intent

Tracks / Topics:

- Networks and Networking
- Modeling and Simulation
- C2 Technologies and Systems

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Abstract

Command Intent is currently incorporated in a number of decision models. However, there is no well-established method of modeling Command Intent, as there is with Situational Awareness. Battle Management Language (BML) is being developed as an open standard that unambiguously communicates Command and Control (C2) information, including orders that express Command Intent. On the one hand, C2 communications (orders and reports) have to be automatically processable in order to contribute to Network-Centric exchange of information, of knowledge and of intent. On the other hand, they have to be expressive enough to convey a Commander's goals and concept of operations.

In this paper, we will argue that it is possible to develop a formal unambiguous but also highly expressive language for tasking if it is based on a formal grammar that is imbued by linguistic principles such as completeness and coherence. This also means that approaches based on the exchange of information via a data model, i.e., the Multinational Interoperability Program's Joint Consultation, Command and Control Information Data Exchange Model (JC3IEDM) cannot provide the expressiveness needed. To address this hypothesis we provide a grammar that formalizes Command Intent based on a well-known class of grammars, the Lexical Functional Grammar.

Paper Outline

- 1) Introduction
 - a. Command Intent in Network-Centric Operations
 - b. Expressing Command Intent in Current Operations
 - c. Need for Technologies that Model Command Intent
 - d. Previous work with Battle Management Language
 - e. Outline to Rest of paper
- 2) Survey of Command Intent in Decision Models
- 3) Linguistic Principles
 - a. Theories
 - b. Grammars (with emphasis on Lexical Functional Grammar)
- 4) C2 Tasking Grammar
 - a. Scope
 - b. Semantics
 - c. Grammar
- 5) Communicating within a Network-Centric Framework
 - a. Technological Constraints
 - b. Use of the C2 Tasking Grammar
 - c. Development of Tools and Services
- 6) Network-Centric Scenario
 - a. BML Proof of Principle
 - b. Grammar-based Orders
 - c. Evaluation of Command Intent
- 7) Conclusion