

# ***Joint Battle Management Language (JBML) Project Overview***

*January, 2007*

# Battle Management Language (BML)

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- BML - an unambiguous language to:
  - Command and control live and simulated forces conducting military operations, and
  - Provide for situational awareness and a shared, common operational picture.

*Shared Semantics between C2 and M&S via a Common Tasking Description*

# Why BML Development

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- BML provides an ontology for describing military missions and tasks using the C2IEDM/JC3IEDM.
  - Ontology enables unambiguous “machine instructions”
  - Can be exploited to input C2 tasking to simulations
- The M&S Community requires a standardized approach to C2 Interoperability - BML is the bridge.
  - No common BML solution exists today. There are point-to-point solutions not compliant with Network Centric Operations. Disadvantages are:
    - Cost of developing individual languages
    - Cost of developing translations between individual languages
    - Inhibits the WarFighters ability to use tools interchangeably
    - Manual and error prone process
- BML will establish a C2 and Simulation independent interoperability capability:
  - Will enable rapid M&S-based Course of Action analysis capability
  - Automated initialization of C2 systems and simulation environments
  - C2 to Simulation information exchange

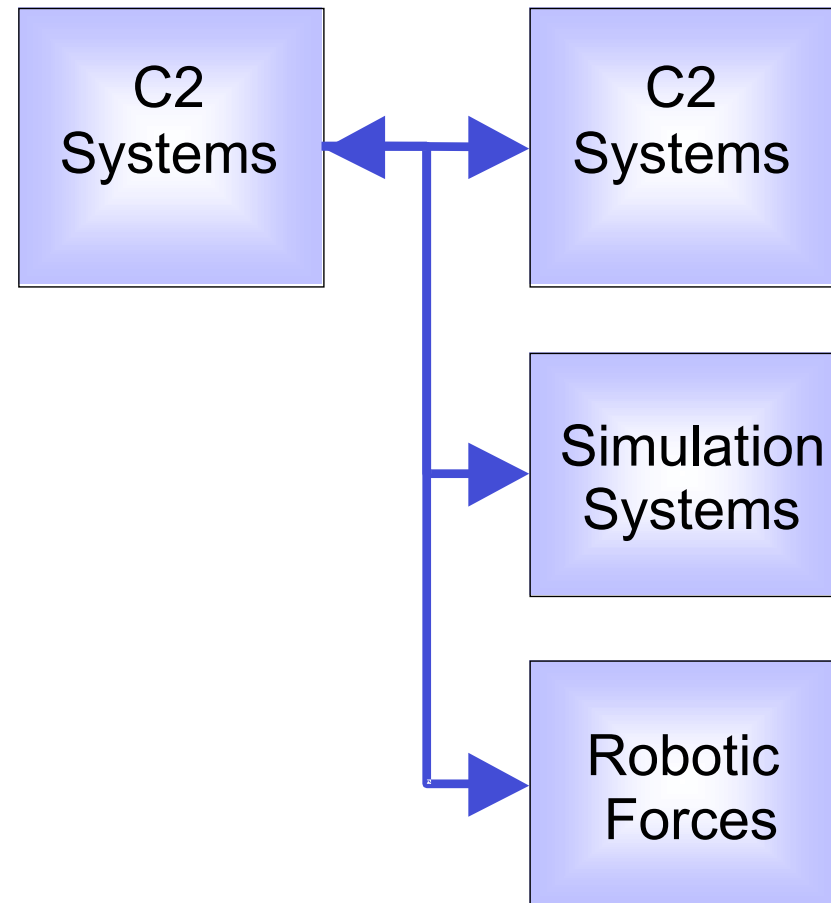
# Representation Consistency

(Of a Battle Management Language)

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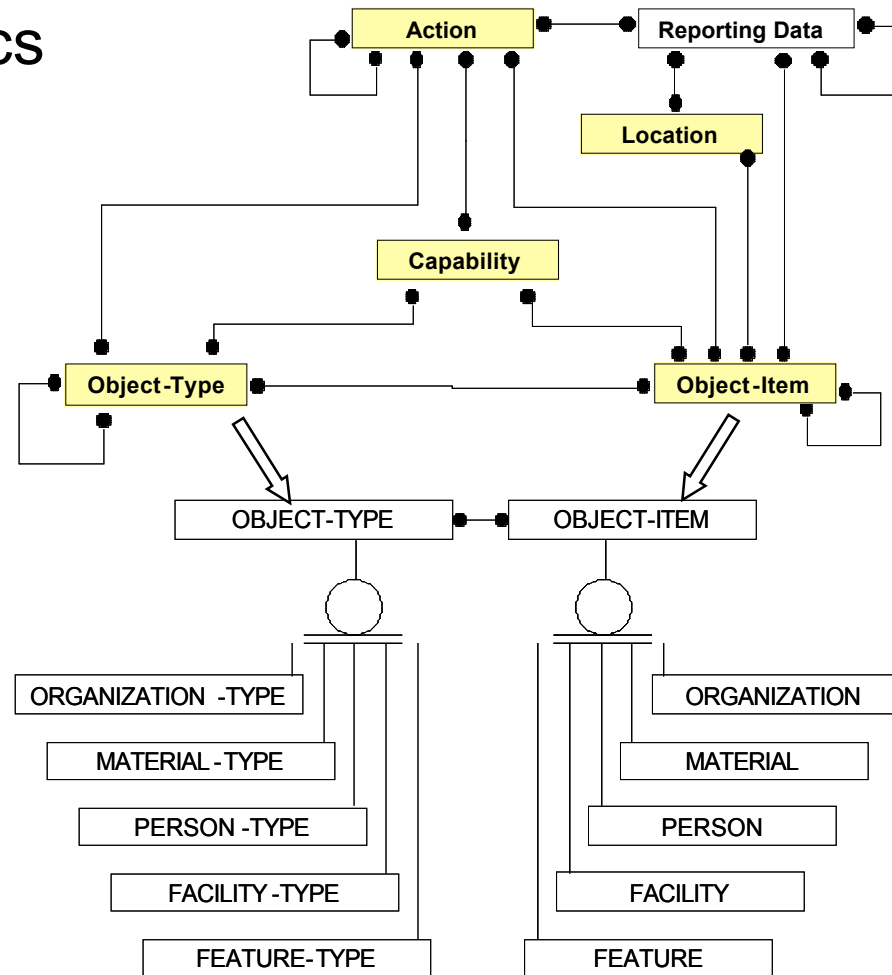
BML is being developed as a standard representation of digitized C2 information for executable plans, orders, Requests and reports

- for military units,
- for simulated forces, and
- for future robotic forces.



# Command and Control Information Exchange Data Model (C2IEDM)

- Provides Core C2 Semantics
- Comprehensive
- Very well documented
  - Tables
  - Attributes
  - Relations
- Allows and supports
  - Doctrinal extension
  - Evolution of utility



# Semantic Consistency

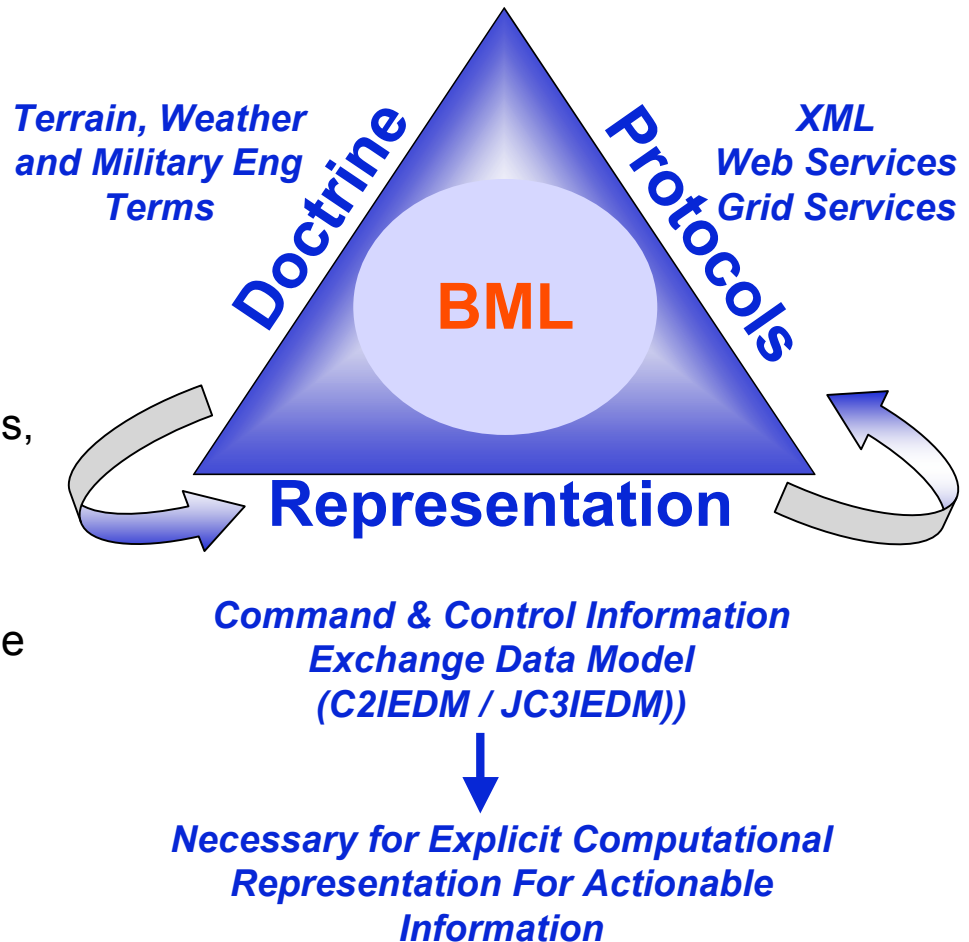
(of a Battle Management Language)

## BML is an Unambiguous Language

- Defined by the role of actionable C2 information

## Provides Unification...across

- Doctrine and terms
  - Explicit vocabulary and grammar
  - Specific context mapped to operations, missions and tasks
- Explicit Representation (2 tiers)
  - Consistent extension to the C2IEDM
    - Standard framework and exchange model
  - Computational structure
  - Both necessary and sufficient for shared, common understanding
- Protocols
  - Explicit structure for transmission / sharing



# Army BML Development (2001-2003)

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- Initial Representation of Operations Order in BML
  - Enabled unambiguous “machine instructions”
  - Can be exploited to input C2 tasking to simulations
  - Sponsored the Simulation to C4I Interoperability Overarching Integrated Product Team (SIMCI OIPT)
- Culminated in Proof of Principle Demonstration in Feb 2003
  - Demonstrated BML for a Brigade / Battalion Operations Order from an NTC Training Mission
  - Shown to Army Senior Leadership
  - Complete BML schema in the Joint Common Data Base (JCDB)
  - Used a prototype Army C2 System - CAPES and an Army Entity Level Simulation - OneSAF

# XMSF BML Development (2003-2005)

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- Phase 1 - Web Services and C2IEDM
  - Transferred to the C2IEDM from the Army's JCDB
  - Created BML "Web Services"
  - Developed Web Services Definition Language view of the Army's Operations Order
- Phase 2 - Air Operations and Coalition Interoperability
  - Developed Prototype Air Operations BML and included TBMCS and AWSIM in Demonstrator
  - Moved from OneSAF to JSAF
  - Interfaced to French M&S/C4I system APPLET
  - Demonstrated Coalition Interoperability Demonstrator to the NATO M&S Working Group in October, 2005

# Other BML Efforts

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- NATO Working Group MSG-048 FY06-08 - *NATO Initiative*
  - 8 Nations currently participating
  - Additional Nations showed strong interest
- SISO Product Groups - *International Standardization*
  - Coalition BML
    - Initiated FY06
    - Multi-National effort Co-Chaired by U.S. and UK
  - Military Scenario Description Language (MSDL)
    - Initiated FY06
    - Leveraging US OneSAF solution as a starting point
  - SISO Developing an integrated BML/MSDL solution
- geoBML - *Leveraging the C2IEDM for Terrain Reasoning*
  - TEC is using BML in it's Home Court ATO

# Joint BML

<p style="text-align: center;"><b>Project Definition</b></p> <ul style="list-style-type: none"> <li>• To lead a collaborative effort to continue core BML capability development.             <ul style="list-style-type: none"> <li>– Synchronize Service, Joint and Coalition BML activities to produce a Joint BML Specification.</li> <li>– Establish Joint Services and Coalition consensus on C2-Sim interoperability based on the C2IEDM/JC3IEDM C2 standard Data Model.</li> </ul> </li> <li>• JFCOM, JNTC: technical, funding and transition partner.</li> </ul>	<p style="text-align: center;"><b>Payoff and Risk</b></p> <ul style="list-style-type: none"> <li>• Payoff             <ul style="list-style-type: none"> <li>– Development of an International C2 Semantic Standard for both Warfighter Operation Systems and Simulations.</li> <li>– Adoption of common C2 Interface for Simulations based upon the C2IEDM/JC3IEDM C2 standard Data Model.</li> </ul> </li> <li>• Risk: Moderate - Alignment of disparate U.S. and NATO M&amp;S and C2 efforts.</li> <li>• Mitigation: Team with JNTC, ASD NII, NATO MSWG, SISO, &amp; Service specific programs</li> </ul>
<p style="text-align: center;"><b>Performers</b></p> <ul style="list-style-type: none"> <li>• Performers             <ul style="list-style-type: none"> <li>– US Army Topographic Engineering Center (Project Lead)</li> <li>– George Mason University (Prime)</li> <li>– Old Dominion University (Standards)</li> <li>– Naval Postgraduate School (Implementation)</li> <li>– JNTC/JFCOM (Joint Doctrine))</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Deliverables and Schedule</b></p> <ul style="list-style-type: none"> <li>• 1-2 months - Design Architecture.</li> <li>• 2-3 months - Design Scenario and Populate Joint BML</li> <li>• Month 3 - Project Decision Point</li> <li>• 3-8 months - Implement Proof-of-Principle Demonstration</li> <li>• 7-9 months - Conduct Demonstrations             <ul style="list-style-type: none"> <li>– I/ITSEC and Community Stakeholders</li> </ul> </li> <li>• 10 months - Joint BML Specification</li> </ul>

# BML OV-1

## C2 Domain Language(s)

