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(C-BML) Phase 1 Specification Development
Progress: An Update to the M&S Community /
Paper 08F-SIW-005**

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Paper 08F-SIW-005, Fall Simulation Interoperability Workshop, Simulation
Interoperability Standards Organization, Orlando, FL
<http://hdl.handle.net/10945/31198>

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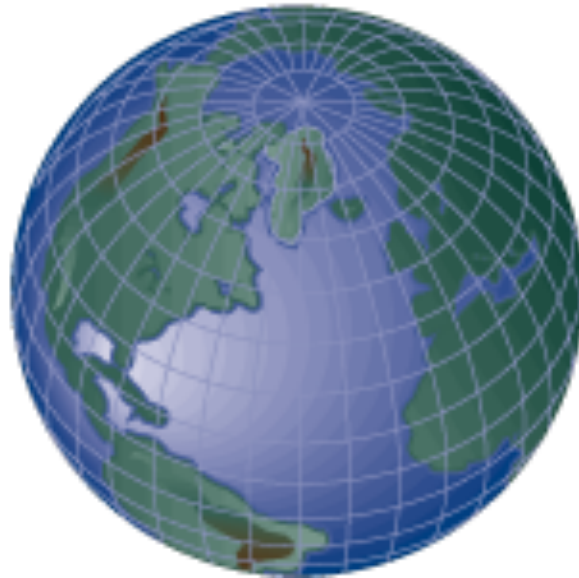
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Coalition Battle Management Language (C-BML) Phase 1 Specification Development Progress: An Update to the M&S Community



**Jeff Abbott, Curtis Blais, Saikou Diallo,
Per Gustavsson, Stan Levine, Ole Martin Mevassvik,
Eva Nero, and Chuck Turnitsa**



**2008 Fall Simulation
Interoperability Workshop**

Outline

- C-BML Introduction
- C-BML Standardization Effort
- Tiger Team Study
 - Assumptions
 - Alternatives
 - Recommendations
- Product Development Group (PDG)
Way Ahead



Coalition Battle Management Language (C-BML)

The C-BML is an emerging international standard for the unambiguous expression and exchange of plans, orders, and reports across command and control (C2) systems, live, virtual and constructive modeling and simulation (M&S) systems, and robotic systems participating in Coalition operations.

Numerous SIW papers over the past 5 years.



Basic Concepts: Three “Views” of BML

- [Information Exchange] *Doctrine* – what information and in what form, from whom to whom, when, for what purpose, by what authority, and other aspects...
 - Operational concerns – informs the next two views by identifying what information needs to be expressed and for what purpose (value proposition)
 - Earlier work has considered Ground Operations Order, Air Tasking Order, Maritime Tomahawk Launch Plan/Order, Reports
- [Information Exchange] *Representation* – means of expression of BML information for information exchange
- [Information Exchange] *Protocol* – mechanisms for transferring BML expressions across systems



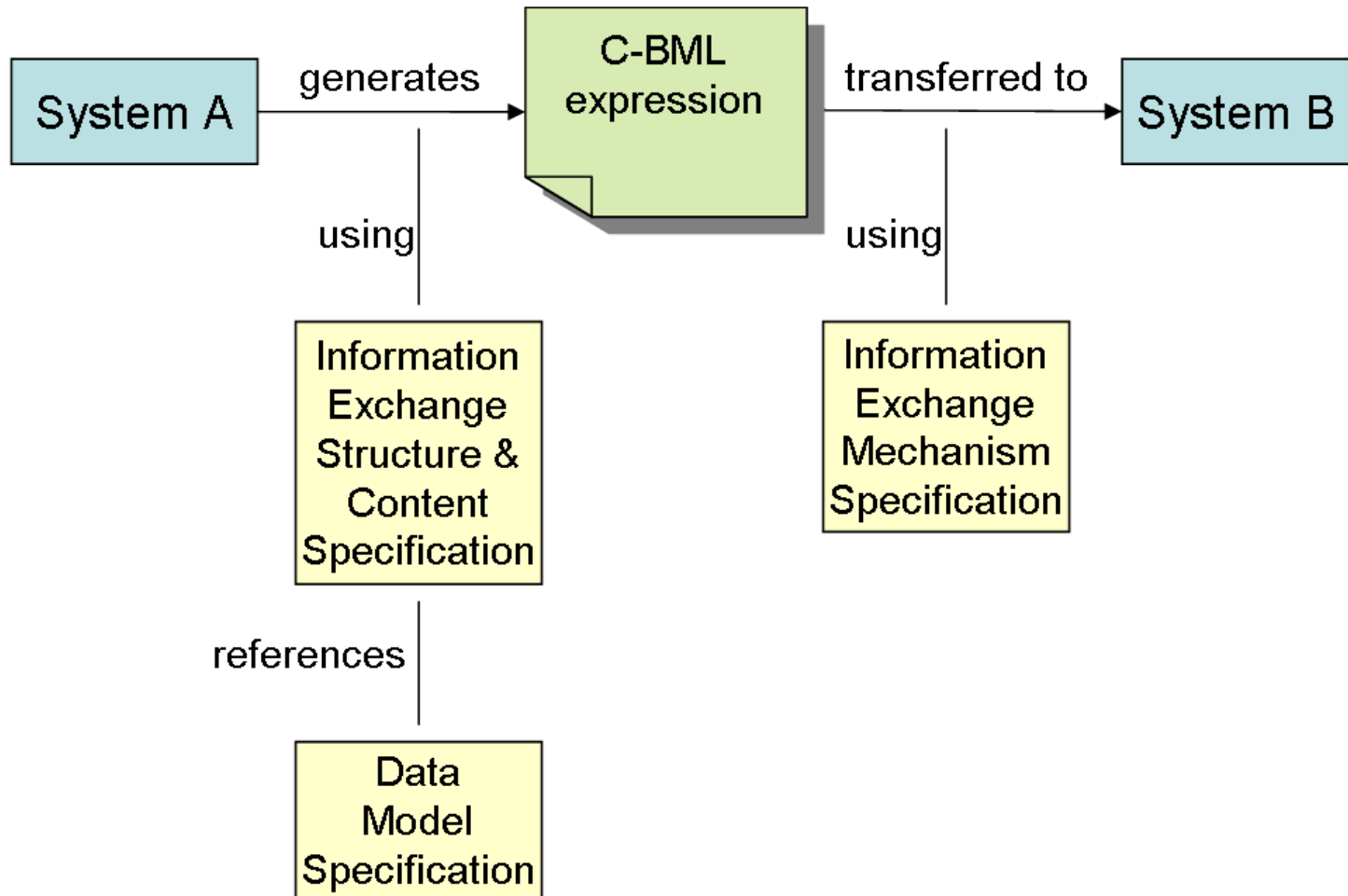
SISO C-BML Study Group

SISO Study Group (2004-2005) produced a Final Report (SISO-REF-016-2006-V1.0) recommending three development phases providing the following products in each phase:

- **Data Model**
- **Information Exchange Content and Structure specification**
- **Information Exchange Mechanism specification**
- **Guidelines**



Basic Concepts: C-BML Specification Elements



SISO C-BML Product Nomination

- The Study Group recommended a C-BML Standard be developed and delivered in versions having increased capability corresponding to each phase. The C-BML Standardization would concentrate first on a JC3IEDM-based C-BML Standard (Version 1), second on a BML Formal Grammar (Version 2), and third on a BML Ontology (Version 3). In addition, there is a need to address reports as well as orders.
- For all versions, the Study Group recommended using JC3IEDM as a basis for C-BML reference implementations and standards.
- Led to formation of the C-BML Product Development Group (PDG).



Standardization Effort: Starting Assumptions for Draft C-BML Phase 1 Specification

- Starting point for the Phase 1 Data Model specification is JC3IEDM
- Grammar is a Phase 2 specification focus (therefore, addressed in the draft Phase 1 specification only to the extent it is implicit in XML schema structures and the data model)
- Ontology is a Phase 3 specification focus (therefore, addressed in the draft Phase 1 specification only to the extent it is implicit in XML schema structures and the data model)
- Fundamental information elements of doctrinal expressions are the 5Ws (Who, What, When, Where, Why), understood to be necessary (but not sufficient) information in plans, orders, and reports across many services, nations, and organizations



Draft C-BML Phase 1 Specification: Purpose

- **Purpose – provide sufficient information to enable early adopters of the C-BML standard to construct and exchange standard information elements in plans, orders, and reports.**
- **The draft Phase 1 Specification defines the following portions of the C-BML standard:**
 - (1) **a standard data model and procedures for extending the data model;**
 - (2) **a description of basic information components of the language using XML as the specification language; and**
 - (3) **a standard approach for exchanging elements of the language specified using WSDL.**



Draft C-BML Phase 1 Specification: Intended Audience

- **Intended Audience – Software developers (specification, design, implementation, integration, and test) and standards developers in the C2 and M&S domains**
 - **Enable developers to deliver C-BML compliant software that will provide basic unambiguous consistent support for digital exchange of plans, orders, and reports information.**
 - **Enable standards developers to incorporate C-BML into related standards (e.g., MSDL)**



Draft C-BML Phase 1 Specification Review

- Version 0.09 dated 29 January 2008 provided to the C-BML Product Development Group (PDG) for review
- 64 comments received and reviewed
 - 17 editorial (1 invalid/withdrawn; 2 misunderstandings/clarified; 14 accepted as stated)
 - 20 minor technical (19 accepted for improvements to the draft spec; 1 accepted in principle but requiring the Guidelines document to fully address the comment)
 - 27 major technical (13 accepted for improvements to the draft spec; 14 need PDG decision/direction)
- Proposed resolutions were to be addressed by the PDG during Spring 2008 SIW



Draft C-BML Phase 1 Specification

Summary of Key Issues

- **Scoping of the Phase 1 Specification***
 - Extensions to JC3IEDM for Phase 1 specification
 - Grammar structures for Phase 1 specification
 - Formal semantics for Phase 1 specification
 - Expressing Reports
 - Interaction with Robotics Systems
- **Existing BML Implementations – how to address in Phase 1 specification***
- **Commander's Intent**
- **C-BML *Why* Component**
- **C-BML *What-When* Component: Temporal Aspect of Actions and Events**
- **Selection of JC3IEDM entities for Phase 1 data model***

* scoping issues



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Alternative Proposal

That the SISO C-BML Drafting Group shall be instructed to add to the Phase 1 draft a specification based on the results of the top two layers of the Ground schema from the JBML Phase 1 project in the version used by the MSG-048 in 2007 and documented on the website at <http://netlab.gmu.edu/JBML>; further:

- that this specification shall be sufficiently detailed as to provide reasonable expectation of interoperability if followed; and that
- it is expected to contain the functionality provided by JBML as modified for MSG-048; and that
- it is expected not to deviate from the JBML representation as modified for MSG-048 without a documented reason that can be evaluated by the PDG; and that
- the JBML Web Services included on the website shall be included as a reference implementation of the specification until the PDG has available some better implementation for this purpose.



Outcome: Formation of Tiger Team

- Ensuing discussions led to a motion to form a Tiger Team (TT) to analyze alternatives for the specification level.
- It was suggested that the TT start with the current three proposed levels that were voiced at the SIW:
 1. A relatively generic specification of the 5Ws; e.g., as described in the draft Phase 1 Specification.
 2. A more specific specification of the 5Ws; e.g., what the MSG-048 group has used.
 3. A higher level Domain-Specific level specification; e.g., what the MSG-048 group has used.
- The TT should also analyze combinations of the above three levels of specification. Other alternatives can be considered if information is available and if time permits.



TT Members

- **TT Lead: Jeff Abbott**
- **TT Members:**
 - **Curtis Blais**
 - **Saikou Diallo**
 - **Per Gustavsson**
 - **Stan Levine**
 - **Ole Martin Mevassvik**
 - **Eva Nero**
 - **Chuck Turnitsa**



Tiger Team Study

- Defined alternatives
- Identified evaluation criteria
- Performed and analyzed evaluation of alternatives
- Obtained feedback from key stakeholders
- Prepared Final Report (posted to PDG reflector)
- Prepared summary paper (08F-SIW-005) and presentation to inform the SISO community
- Prepared presentation to report out Tiger Team activities and findings to the C-BML PDG (Thursday, Sep 18, at Fall SIW)

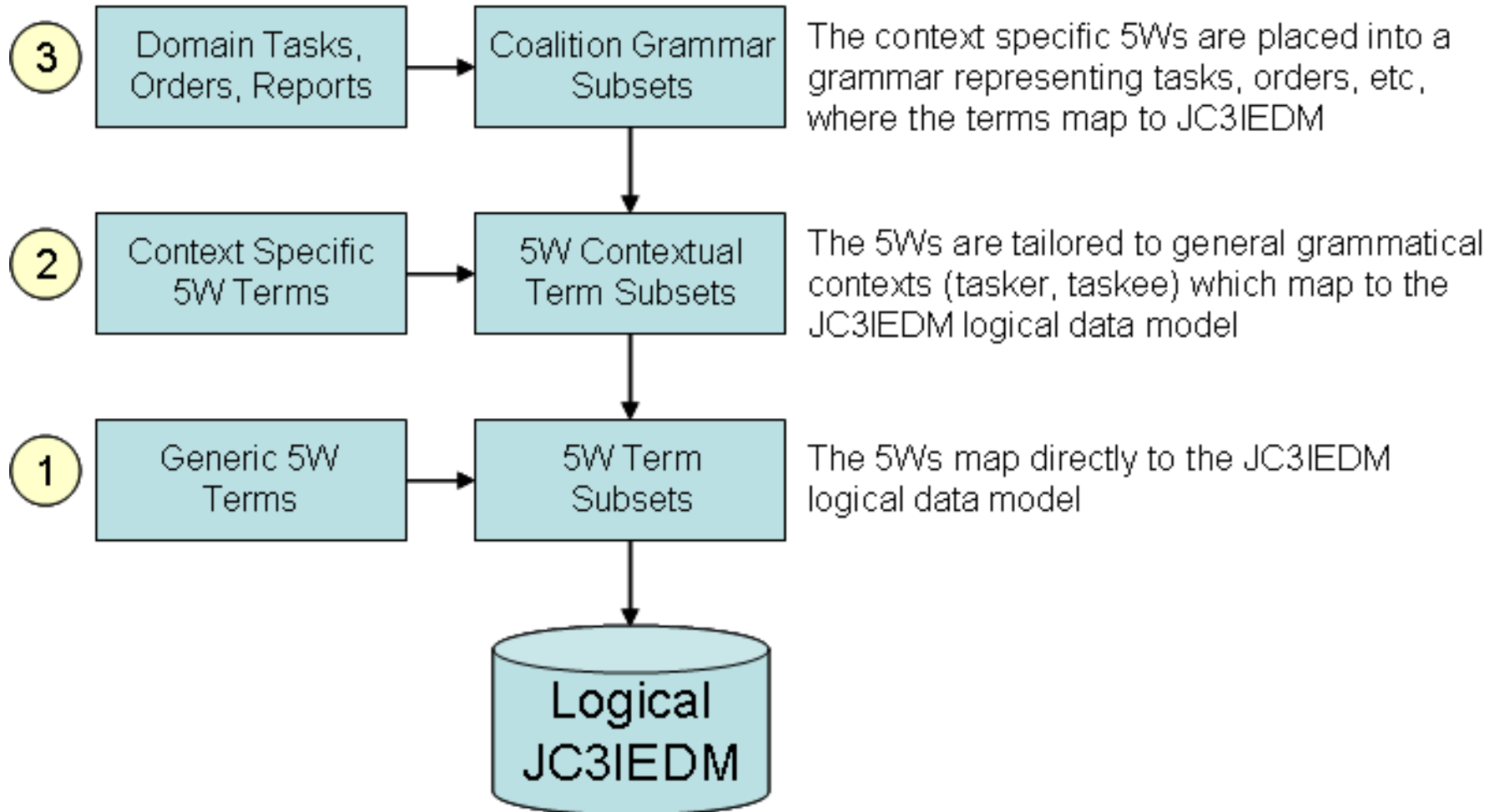


Assumptions

Assumption	Description / Explanation
JC3IEDM Extensions	All C-BML alternatives will identify any proposed (by a member of the PDG) extensions to the JC3IEDM. These extensions shall be presented to the PDG for approval by PDG vote.
JC3IEDM Compliance	All alternatives will be developed to include compliance (traceability) with the Logical JC3IEDM.



Alternatives



Recommendations

Recommendation	Description/Explanation
1. JC3IEDM Extensions	C-BML will require data model extensions beyond JC3IEDM. If a PDG member feels that extensions to the JC3IEDM are necessary then those extensions need to be proposed to the C-BML PDG with justification specific to the context of the use of JC3IEDM for C-BML purposes.
2. DG Meetings	The PDG needs to strongly differentiate between DG activities and PDG activities. DG activities should report back on status to the PDG, but not involve the PDG directly in DG work. The PDG tasks the DG as the experts in the field. PDG members who wish to be involved in drafting of the standard shall work with the DG in DG meetings to that end (ref SAC recommendation).
3. JC3IEDM Compliance	All alternatives are evaluated assuming JC3IEDM compliance has been satisfied. It is up to C-BML to evolve alternatives to the state of JC3IEDM compliance. Our stakeholders depend on our honest and objective efforts in this area.
4. Common Terms	It is recommended the DG develop and maintain a dictionary of common terms as they relate to C-BML. The PDG would act as the authority for approving the terms. These are terms beyond the data. They are terms used to describe C-BML, grammar, and the data model.



Recommendations

Recommendation	Description/Explanation
5. Tracking	Many inputs and evaluations of C-BML have been made available. These issues need to be tracked as requirements, defects, PCRs, etc in a formal mode. The lack of formal tracking implies these inputs are being ignored; as there is no concrete proof otherwise.
6. PDP	A common code of policy and procedure needs to be established between the DG, PDG, and tiger teams to ensure (1) the correct group works any given issue; and (2) to ensure C-BML activities remain in scope of PDG intent.
7. Coalition Doctrine	Identify the authoritative data sources for coalition doctrine and post those documents or links to documents on the C-BML file area (STANAG, etc). This indicates that we should stay away from doctrinal issues and concentrate on the representation of C-BML. Doctrine can be used to verify and validate that representation.
8. Reference Implementation	For whatever alternative the state of implementation beyond that implementation should be included as a reference implementation from which the next phase of drafting will begin. This is especially true for alternatives that have not matured and are still being “worked” (e.g., by the MSG-048).



Recommendations

Recommendation	Description/Explanation
<p>Selected Alternative</p>	<p>The ratings of the 3 alternatives were very close and resulted in no major differentiation at the total rating level. The selection of an alternative by PDG vote is an issue of cost, performance and schedule for the phase 1 specification. Since all alternatives have the same level of JC3IEDM compliance and extension, Technology is not the issue.</p> <p>If schedule is the priority – Alternative 1 is the lowest risk. If implementation is the priority – Alternative 3 is the lowest risk.</p>
<p>Recommended Alternative</p>	<p>The Product Nomination and Study Group reports clearly specify Alternative 1 as the minimal Phase I specification.</p> <p>It is recommended the PDG vote to include either Alternatives 2 and/or 3 in either the guidelines (use cases) of the Phase I spec as reference implementations or as an additional level of detail in the Phase 1 specification if the PDG feels that the maturity of the alternative warrants it.</p>



PDG Actions

1. Read the TT Final Report.
2. Vote (agree or disagree) on TT recommendations 1 thru 8.
3. Vote on which alternatives to include as part of the standard and which alternatives to include as part of the reference implementation(s).



PDG Vote on How to Include Selected Alternative

<p>Include as part of the specification</p>	<p>Complete XML specification and WSDL as part of the formal standard</p>
<p>Include as a reference implementation</p>	<p>Provide non-binding guidance to developers and serve as input to next phase of the specification</p>



Questions?

For more information and discussion, please attend
the C-BML Product Development Group meeting,
Thursday September 18,
Forum West 2



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NOTES

- Alternative 1 is based on the draft version of the C-BML Phase 1 Specification
- Alternative 2 is based on the expanded definitions of the 5 Ws being used by MSG-048 for their Fall 2008 Experiment
- Alternative 3 is based on the Tasking/Reports interfaces being used by MSG-048 for their Fall 2008 Experiment
- All three alternatives may need adjustment (slight to significant) in order to be compliant with the assumptions and approved recommendations 1-8.

