Battle Management Language (C-BML) in NATO and Coalitions

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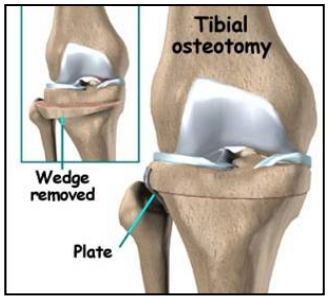
Presentation Overview

- Introduction
- Why the need for a C-BML
- National Efforts
- NATO ET-16
- NMSG 048 – C-BML
- Conclusion

Introduction

- Firstly apologies from Major Kevin Galvin.
- The diagram of the knee on the right is used not to illustrate the surgery he will need but to make the point that interoperability in many professions exists – all surgeons regardless of nationality have a common reference model.



But … in the world of Military Command and Control and Training …

- It is a different story … life was easy when the process was manual – voice, maps and written instructions were the medium of C2.
- Training was conducted in a predominantly live environment – the only requirement was for a staff officer to develop a scenario and a Main Events List.
- Interoperability requirements were much simplified. In multinational operations Liaison Officers provided the main capability to exchange data.

Increasing use of simulation

- Opportunities for live training gradually reduced for a number of reasons; environmental pressures, costs, weapon ranges and effects, operational commitments.
- New technologies provided alternative ways to train with constructive and virtual simulations employed and in the live domain Tactical Engagement Systems (TES) provided added realism

In Command and Control – the new buzzword became ‘Digitization’ and then ‘Network Enabled Operations’

- To the medium of voice was added the ability to transfer data over combat net radio for Land Forces although the Navy and Air Forces had long been using tactical data links.
- Technologically advanced nations sought to exploit this new age – The Information Age had been born and in the commercial world saw the rapid development of the Internet – a concept born out of military research conducted by DARPA in 1972.
- In the UK the Land Digitization Programme followed the lead provided by the U.S. Army and other NATO nations adopted similar programmes.
- Network Centric Warfare, Information Operations and Cyberspace were the new buzzwords.

Interoperability between C2 and Training Systems

- Whilst Combat Radio remained voice only, the interface between C2 and training systems that used new constructive and virtual simulations could be accommodated successfully by the “Swivel Chair Interface” – a means which will undoubtedly continue for some time.
- The advent of digitized C2 systems and the need to stimulate them as well as the need to initialize supporting simulations more cost effectively has led to a requirement for C2-Simulation Interoperability.
- Development of interfaces as many gathered here today will know has been an ongoing effort but not just in the USA but throughout NATO.
- In the C2 community the Multilateral Interoperability Programme (MIP) has developed the JC3IEDM for C2-C2 Interoperability. In simulation there are standards such as DIS and HLA but none were developed to provide C2-Sim interoperability.

The Operational Need for a BML in NATO and Coalitions

- So why do we need a C-BML?
  - Operations today are inherently joint, multinational and interagency.
  - Coalition operations are now at brigade level and below
  - Simulations are playing a greater role in mission preparation, Course of Action Analysis and Mission Rehearsal.
  - Military orders themselves are often large documents, unstructured and ambiguous in places.
  - Units do not have the luxury of large staffs who can translate military orders for machines.

The Need for a Common BML in M&S

- M&S requires a standardized community approach to scenario initialization and scripting.
- No common BML solution exists today – There are only point-to-point solutions.
- Point to Point solutions have inherent disadvantages:
  - Cost of developing individual languages.
  - Cost of developing translations between individual languages.
  - Inhibits the ability of military users to use tools interchangeably.
  - Manual and error prone process – "Swivel Chair" effect.
- No common solution to enable automated C2 to simulation interoperability.

National efforts to resolve the C2 to Simulation Conundrum

- Individuals nations have sought to resolve the problem.
- The USA early initiatives included Eagle BML, CCSIL, Army BML and more recently JBML.
- The UK used CCSIL in the STOW programme.
- Germany were developing Ontology based BML.
- France conducted experiments in their APLET programme.
- Denmark were developing an order specification language.
- The Netherlands were developing a training system that combined their C2 workstation with the Kibowi Wargame simulation.
- The list goes on …

Standardization Initiatives (1)

- The USA led the way with its demonstrations of Army BML which showed the potential.
- Within SISO like-minded academics, industry representatives and military personnel recognised the need for a Coalition BML. Led to C-BML Study Group in April 2004.
- In NATO under the umbrella of the NMSG an Exploratory Team was established to examine whether there was a NATO requirement and what it was in February 2005.

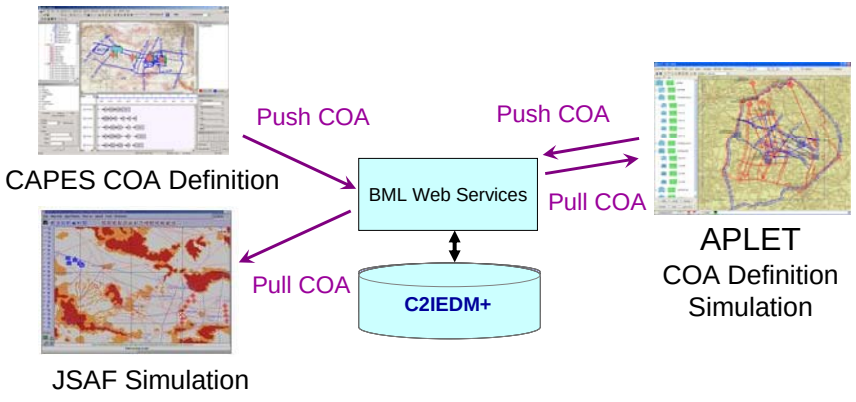
Standardization Initiatives (2)

- The C-BML Study Group led to the establishment of the C-BML Product Development Group (tasked with producing a standard) in April 2006.
- The NATO ET-16 conducted a limited demonstration for the NMSG Committee in Poland in October 2005.

NMSG ET-016 – Limited Demonstration

- Demonstration using French and US C2 systems and simulations:
  - US CAPES and JSAF
  - French APLET
- Used Web Services and C2IEDM with extensions to pass data between systems
- Military context provided by British and French military staff.
- Successful demonstration led to approval for NMSG 048

NMSG ET-016 Demonstration Architecture

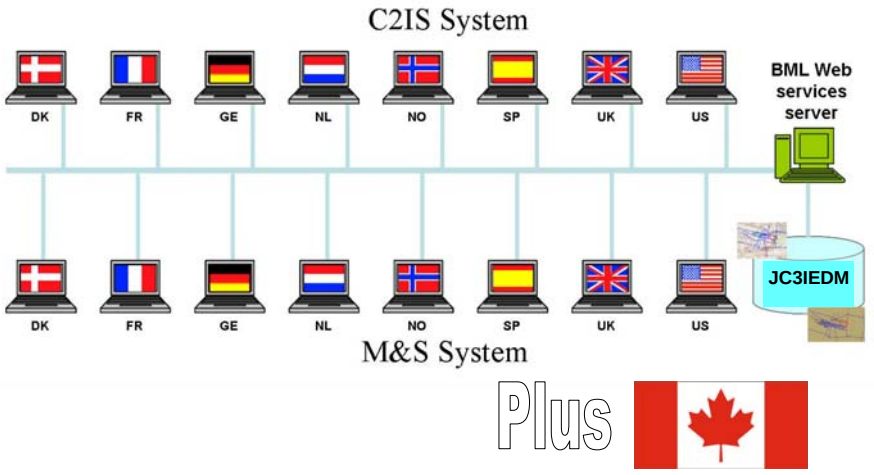


Galvin K, Sudnikovich W, De Camps P, Khimeche L, Pullen JM, Hieb MR. *Delivering C2 to M&S Interoperability for NATO - Demonstrating Coalition Battle Management Language Capability and the Way Ahead.* Proceedings of the Fall Simulation Interoperability Workshop 2006, IEEE CS Press

NMSG 048

- Established in April 2006
- Co-chaired by France and USA
- 5 meetings including this following week
- 9 Nations participating
- 3 year Programme of Work – 4 Phases
  - Substantiation of the Requirement.
  - Design for C-BML Demonstration.
  - Implementation of C-BML interface standard.
  - Conduct experimentation and assessment.

NMSG 048 Envisaged End State



Conclusion

- Successful demonstration of US JBML initiative will provide framework for SISO C-BML Phase 1 Specification.
- NMSG 048 will experiment with C-BML standard.
- However we first need to:
  - Develop a robust Phase 1 Specification.
  - Ratify the standard through the SISO process.
  - Maintain momentum and get national funding to continue development.
- Only then will the goal of C2-Simulation interoperability be achieved.