

Chapter 6 – RECOMMENDATIONS

The recommendations presented in this chapter are based primarily on the lessons learned in defining, preparing and executing the three experimentation events that comprised the MSG-048 Experimentation Programme. Many of the lessons learned and related recommendations emerged from the work performed during the final 2009 experimentation, but others are the fruit of many analyses, discussions and exchanges among MSG-048 members.

Many of the recommendations described in this chapter form the basis for the Technical Activity Proposal (TAP) for MSG-085, the follow-on Technical Activity to MSG-048.

6.1 C-BML DEVELOPMENT AND EMPLOYMENT

This section deals with suggested guidelines and recommendations for the benefit of software developers, integration specialists and systems architects.

6.1.1 C-BML Extensions to Other Areas

It is recommended that C-BML be developed to support air (e.g. ATO/ACO) and joint air-land operations (e.g. close air support). Similarly, there should be investigations for extending C-BML to support maritime operations.

6.1.2 Grammar

A grammar is important to ensure an unambiguous C-BML. MSG-048 recommends continued development and experimentation with the C2LG in concert with C-BML.

6.1.3 C-BML-Enabled Systems Integration

Although not specified as part of a C-BML standard, there is a need for procedures and services for the initialization of systems and run-time coordination between systems employing C-BML. The use of MSDL (discussed below) should address some of the needs for initialization. Developing and testing these procedures and services should be an important task in the follow-up TA MSG-085.

6.2 COORDINATION WITH STANDARDS BODIES (SISO)

SISO has released a first version of MSDL as a standard for initializing simulations with military scenarios and is currently working toward the release of a C-BML standard. Recent progress with respect to the SISO C-BML drafting work indicates that these standards should be used as the basis for the MSG-085 experimentation programme and possibly become a STANAG.

6.2.1 SISO C-BML

Available open-source SISO C-BML-compliant reference implementations should be considered for use in the context of the MSG-085 experimentation programme.

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6.2.2 SISO MSDL

SISO MSDL should be used and evaluated as a means for initialization of simulations in the context of the MSG-085 experimentation programme.

6.2.3 C-BML STANAG

After its first release as a standard, NATO should consider SISO C-BML and MSDL for adoption as a STANAG. However, this will require that the C-BML and MSDL standards be harmonized to provide complementary capabilities.

6.2.4 SISO

The NATO MSG has maintained a significant level of coordination with SISO through the participation of MSG-048 members in SISO PDG and DG activities. It is recommended that this coordination continue and possibly be strengthened through co-located workshops and/or meetings. SISO should also consider integrating C2LG as the basis for the C-BML grammar which is the object of phase 2 in a three-phase development plan.

6.3 COORDINATION WITH THE MIP

For C-BML to get accepted by the C2 community C-BML should be based on C2 standards such as the MIP-JC3IEDM. This brings upon the need for closer interaction between MIP and the C-BML community in order to ensure that C-BML is relevant for integration with C2 systems.

In order to ensure that standards activities such as SISO MSDL and C-BML and technical activities such as MSG-085, lead to a relevant, useful and coherent standard for C2-simulation interoperability, it is recommended that there be a closer involvement with the MIP organization. This should include fostering a closer collaboration within several sub-groups of the MIP.

6.3.1 MIP-C-BML Community Of Interest (COI)

In light of the above stated MIP-related areas, it is recommended that a dedicated MIP-C-BML COI be formed in order to ensure consistency in the approaches, to keep the MIP community informed concerning the progress of C-BML and to facilitate the transition of C-BML as it progresses toward operational deployment.

MIP-DEM Roadmap – Need to consult with the MIP concerning their plans to revamp and/or replace the MIP-DEM in order to consider how it will impact the use of the MIP-DEM as a candidate IEM for C-BML implementations.

Validate Use of MIP-JC3IEDM – Need to consult with the MIP concerning the proper use of the BML as it relates to the JC3IEDM data model and associated business rules.

Explore Possible Closer Integration with MIP – Explore the possibility of a closer integration with the MIP – e.g. C-BML becoming a possible sub-view or the use of the MIP-MDA approach to modelling. This should be done in concert with the appropriate standards bodies (i.e. SISO).

6.4 COORDINATION WITH THE OPERATIONAL COMMUNITY

The follow-on technical activity MSG-085, should establish a continuing involvement with the operational community in order to ensure the operational relevance of C-BML as it is used in the experimentation programme and toward the goal of bringing C-BML toward operational deployment. Given the high relevance of C-BML to training and the focus of NATO on training, this operational area should be among the first explored.

6.5 FURTHER EXPERIMENTATION – MSG-085

Coordination with the operational community should also include exploring C-BML deployment scenarios that leverage existing C2 system infrastructures. As specified in the TAP for MSG-085, the follow-on Technical Activity to MSG-048:

“... should investigate approaches for the deployment of C-BML capabilities with existing operational C2IS exchange mechanisms; this will be tailored to specific application domains in order to extend C2IS linkages to synthetic environment ...”

The lessons learned from the experiments conducted by MSG-048 indicated that there is a need for further experimentation on the operational use of C-BML in order to develop a mature capability.

As mentioned above, this experimentation should employ available open-source C-BML implementations, including SISO C-BML reference implementations. Furthermore, it should provide guidance to the community as to how C-BML capabilities may be successfully utilized within their programmes.

6.6 IMPROVING THE ROBUSTNESS OF EXPERIMENTAL C-BML SYSTEMS

As described in Section 4.3.4, the technical capability achieved at the end of MSG-048 was tenuous in certain areas. Before future serious operational experimentation can proceed, a consistent and sufficient technical readiness level and an acceptable level of performance in all components of supporting infrastructure and the BML extensions of the national systems should be ensured for the full range of BML capabilities.

6.7 PROMOTING THE USE OF C-BML

As an integral part of the follow-on activity, there should be an educational component that serves to inform the community as to the state-of-the-art of C-BML.

Organization of C-BML Workshops – In February 2010, MSG-048 organized a workshop on C-BML within the NATO MSG organization of the RTO. MSG-079 allowed for representatives from industry, from the research community, from the standards bodies and from the operational community to exchange ideas, experience and requirements related to future use of C-BML. It is recommended that similar workshops be organized on a regular basis by the NATO RTO to continue similar exchanges and promote the use of C-BML.

The MSG-079 represented a significant step toward fostering a better understanding of C-BML – in terms of its potential benefits as discussed in Chapter 2 and also its relationship to other related activities, such as the MIP-JC3IEDM, as discussed in Annex B. As C-BML continues to evolve, it will be important to continue this education process in order to clarify other areas; such as the need for ontologies.

RECOMMENDATIONS

