

Chapter 3 – MSG-058 PROGRAM OF WORK

The effort described in this chapter constitutes the program of work executed by the Task Group MSG-058, which resulted in the generation of the Study work-product, i.e., recommended best-practice guidance for conceptual modeling for military models and simulations and for the structure and content of the resulting conceptual model documentary artefact.

3.1 INTRODUCTION

Significant diverse and intensive technical effort was required to meet the Task Group objective. Understanding conceptual models for military simulations requires employment of a variety of precepts, technical concepts, and existing circumstances. Generating best-practice guidance for executing conceptual modeling requires appreciation of a wide variety of academic and practical techniques for ontology creation and conceptual model specification. Finally, the creation of useful best-practice guidance requires appreciation of existing M&S management practice, and the standards and techniques associated with specification of both process and product in expected enterprise operational environments.

Elucidation of the effort conducted by the group in executing the subject study illustrates clearly the diverse technical basis for the resulting study conclusions and recommendations. Description of the activities of the Task Group, indication of their necessity or motivational rationale, and description of their intended consequences in accomplishment of the study objective, is intended to provide detailed context for interpretation and appreciation of the study results and recommendations. The effort actually executed by MSG-058 is described explicitly herein for two purposes. First, such a description is intended to demonstrate the practical means whereby the Group met the conditions set forth in the Study TAP and TOR introduced above. Comparison of the account that follows and the prescriptive guidance from reference guidance document illustrates that the ‘way of work’ is in fact compliant with guidance, complete with respect to scope of the guidance, and consistent both internally and with the intentions of the guidance itself. Secondly, the following description of the programme of work actually executed by the Group should provide implicit evidence to the reader of this report and the agent striving to follow the best-practices guidance recommended herein regarding both the quality of the effort and consequent work-product, and the significance and relevance of the subject best-practice guidance proffered below to the reader/user’s needs and interests.

The approach adopted by the Group in addressing all these foundational matters was to first identify particular topics that seemed to entail issues of significance or particular difficulty; to address each of these topics specifically; and to derive there-from concrete elements of the solution of the study problem to be manifest in study conclusions and recommendations. In all cases, the Task Group was careful to consider:

- The diversity in the existing practices and technical postures;
- Commonality in practice or in dealing with potential issues; or
- Innovative approaches considered to be auspicious but not in fact part of the experience of any of the organizations and enterprises of the respective Group members.

3.2 GENERAL DISCUSSION OF EFFORT ELEMENTS

By way of context, comments relating to scope of activity and Concept of Operations (CONOPS) of the Group’s effort, and associated transaction protocols as well as to relationships among components of the Group’s effort are introduced first.

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The effort of the MSG-058 consisted of a series of working meetings augmented with the execution of actions identified therein in the intervals between formal working meetings. The effort of each meeting was decided in advance and published as a meeting agenda. Naturally, the differential interests of the Group members and national participation suggested that one or another Group member might lead deliberation for topic areas of special interest or competency; nevertheless, all deliberations were conducted by the committee-of-the-whole, operating as a peer-group, wherein all significant decisions were made as matters of consensus across the entire Group. Group efforts were coordinated by means of collaboration workspace information technology resources, wherein, all records of meetings, decisions, actions, and collateral information, were conscientiously recorded and will be made available for inspection by interested parties in future or related efforts. The use of the collaboration environment was particularly valuable in supporting the compilation of the Group’s work-product – whose components’ authorship responsibilities were allocated to Group members based on interest and familiarity.

The schedule of Group meetings is indicated in the following figure. That illustration indicates the tactic adopted by the Group to have meetings as frequently as possible, particularly early in the program when disparate practices and complex concepts requiring face-to-face interaction for adequate resolution were at issue.

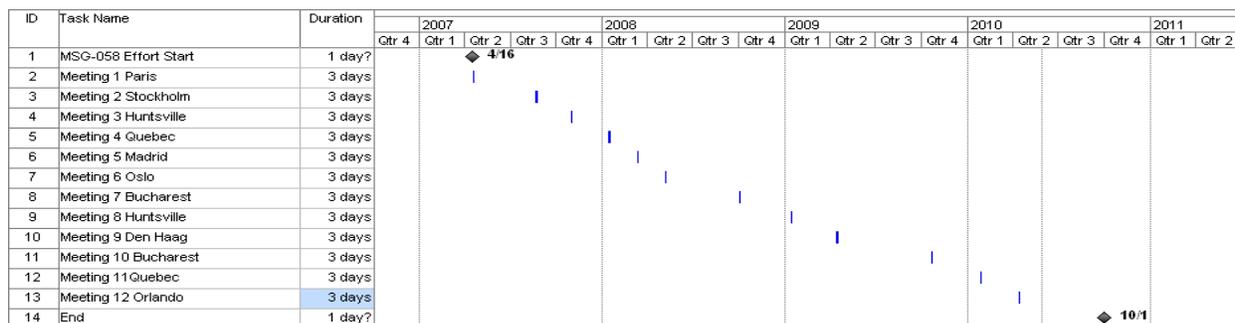


Figure 3-1: Calendar Relationship of Meeting Activities Across Which Effort was Distributed.

A rough indication of the logical and activity-flow relationships among the Group’s activities regarding topics of special import is provided in the figure following. These logical relationships and the nature of particular activities are discussed in considerable detail below.

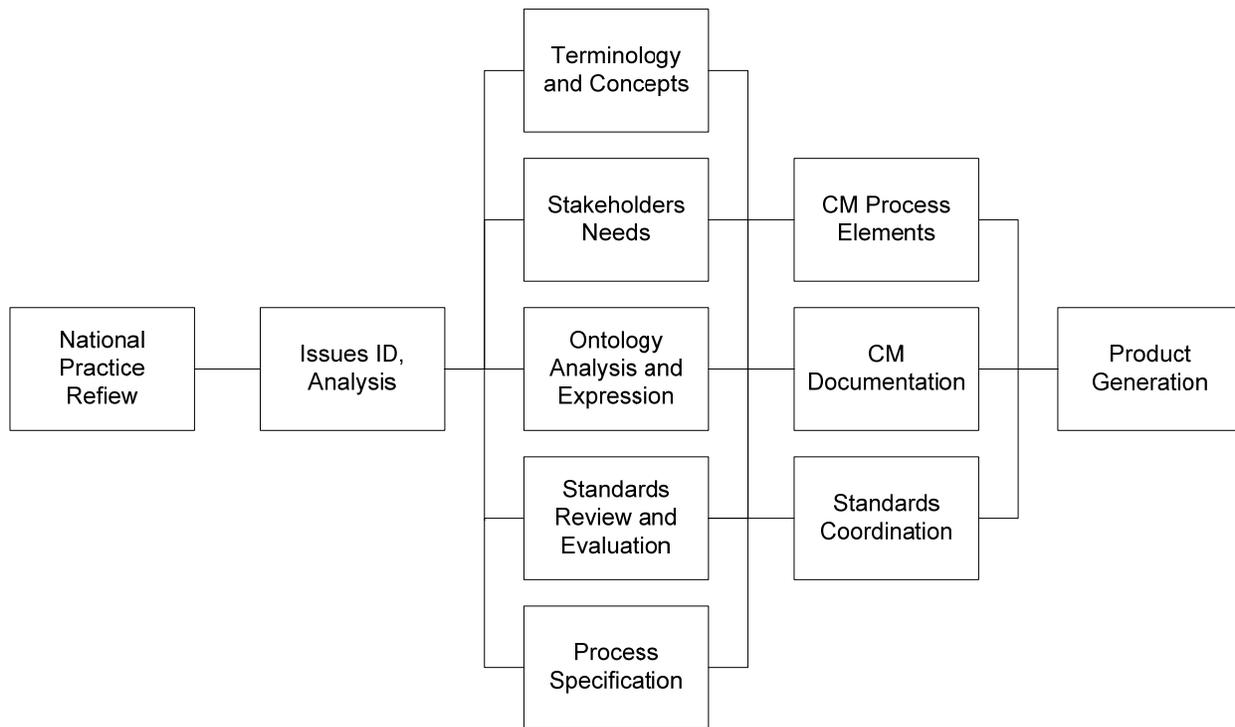


Figure 3-2: Logical and Activity Flow Relationships Among Principal Efforts Comprising the MSG-058 Effort.

Finally, the effort of the Group and its respective domains of interest and resulting meta-products is to be understood in context of the diagram of Figure 3-3 below. There, the Group executes the MSG-058 program by way of Business Process Invention. The Group product document specifies conceptual model process to be conducted by practitioner during Business Process Practice, yielding the conceptual model artefact for the specific mission space and model-simulation intended.

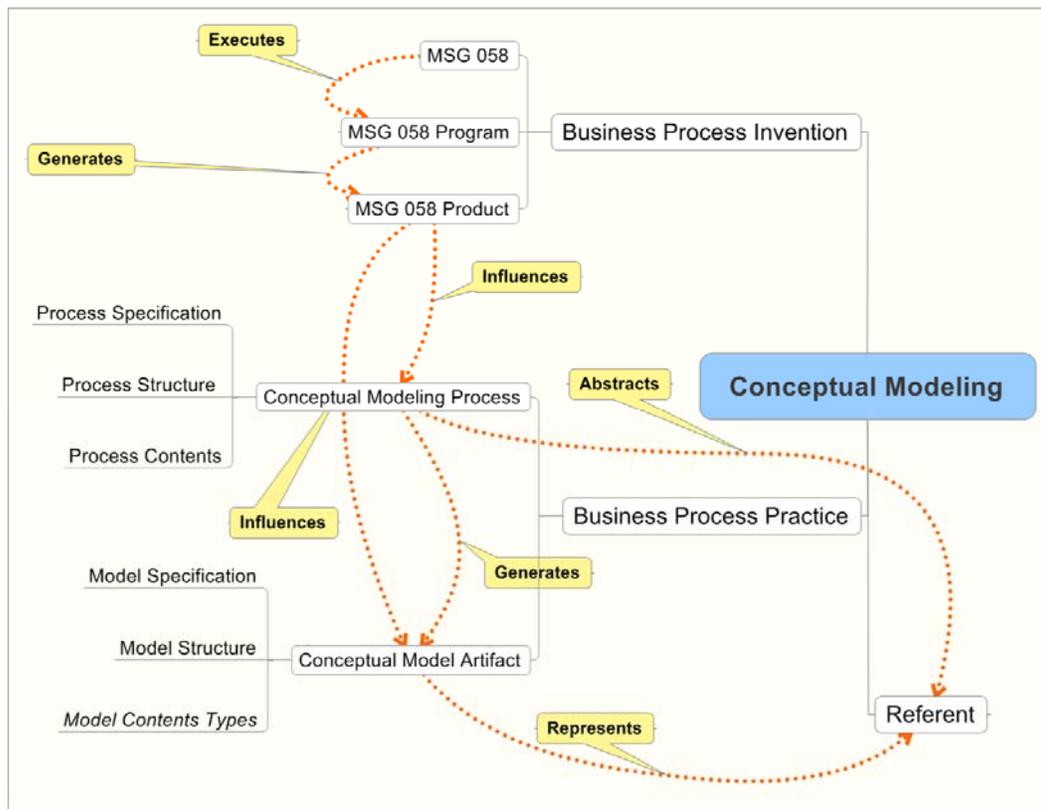


Figure 3-3: Mind-Map Style Illustration of the Scope-of-Effort and Domain-of-Interest of the MSG-058 Task Group.

Specific topic areas of effort undertaken by the Task Group included the following:

- National Conceptual Modeling Practice Expository Briefings.
- Issue Identification and Analysis.
- Stakeholders and Study Scope and Objective.
- Terminology and Concepts.
- Analytical Framework and Ontological Perspective.
- Standards Review and Evaluation.
- Process, Product and their Relationships.
- Process Specification Expression.
- Conceptual Model Process Elements.
- Conceptual Model Documentation.
- Task Group Work-Product Generation.
- Coordination with SISO for Generation of Subsequent SISO/IEEE International Best-Practice Standard.

For each topic area identified above, we will address briefly:

- Introduction and background;
- Current circumstance;
- Approach;
- Risks and risk-amelioratives;
- Relationships;
- Findings; and
- Conclusions and recommendations.

3.2.1 National Conceptual Modeling Practice Expository Briefings

Naturally, members of the Group convened to execute MSG-058 effort brought with them both their personal and their national Institutional preconceptions and practices relevant to conceptual modeling. Therefore, in order to assay the range of interests, competencies, and richness of perception and experience, the systematic review of existing conceptual models practice was considered prudent. Therefore, Task Group member's national representatives briefed in turn their respective practices for conceptual modeling, and those sample practices were compiled into the Group's collaborative environment for future reference.

As expected, the range of preconceptions and styles of operations in conceptual modeling practice proved to be exceptionally diverse. Differentials exist among presumptive academic underpinnings, scope assumed to be included in conceptual modeling, techniques for educating and documenting conceptual models and for their use within the various enterprise environments represented. This diversity, while challenging, was considered by the Group as opportunistic by virtue of its providing a constructively broad scope to the Group's deliberations and establishing a suitably broad basis of implicit requirements for any best-practice work-product developed and recommended by the Group. Consequently, potential risk in task scoping and ecumenical consideration of established preferred practices were considered to be assuaged.

Review of existing practices familiar to the Group proved a profitable initial transaction. It did in fact serve as a suitable basis for framing the work process for the remainder of the program, and particularly reinforced the sense that a consensus-based effort was prudent.

3.2.2 Issue Identification and Analysis

Pursuant the revelation of Task Group members' respective conceptual modeling practices; it was observed that a variety of topics might reasonably be specially designated 'issues' – that is, topics whose deep appreciation and consensus resolution by the Group members would likely be necessary to the successful completing of the MSG-058 effort.

The Group's approach to issue-identification and resolution is described in detail in Annex D. Significantly, however, a deliberate effort was made to identify issues related to each of four perspectives:

- 1) General and administrative conduct of the Task Group tasking;
- 2) Constraints associated with the program of work defined in the tasking guidance;
- 3) Technological considerations arising out of the subject matter entailed in conceptual modelling; and

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- 4) Considerations related to the generation of work-products necessary and sufficient to accomplish the mission of MSG-058.

In each case, actions necessary to resolve such issues, and the identification of the entailments of such resolution to technology, product, program, and meta-process for the Task Group's effort, were identified.

This approach revealed what proved to be nineteen (19) issues deemed worthy of attention in four (4) categories:

- 1) Circumstance and Analytical Context;
- 2) Intention;
- 3) Product Development and Deployment; and
- 4) Technical Considerations.

Of the total set of issues explicitly identified, five (5) topics were accorded such criticality that special work efforts were conceived and executed for their resolution and the remediation of such risks as were considered to be related thereto. In priority order, these issues were:

- Stakeholder Analysis and Context;
- Scope and Definition;
- Relationship to Standards;
- Specification of Conceptual Model Management Process; and
- Specification of Conceptual Model Artefact.

Each is addressed in the text of this report at a level of indenture no higher than two (i.e., n.m.).

Naturally, early issue identification had profound implications for the establishment of a detailed program of effort by the Group. The Task Group's approach to concern for identification and resolution of critical issues had far-reaching implications for the subsequent effort, and the work-product of which this report and its enclosed best-practice recommendations consist.

3.2.3 Stakeholders and Study Scope and Objective

In the course of the Task Group's deliberations, it became apparent that conceptual modeling must be practiced in context of modeling a simulation enterprise–scope activity. Further, it was clear that the nature of conceptual modeling shared many of the practices related to 'user-needs', and 'requirements' management practices typical of systems engineering disciplines. For both these reasons, the need to be explicit regarding the identification of stakeholder roles, their associated processes, and responsibilities was evident. At the least, the Group's expression of conceptual models best-practice would need to 'speak to' significant stakeholder communities – for which purpose, the Group needed to be appropriately sensitive to those roles.

Consequently, the MSG-058 Task Group devoted considerate attention to identifying and characterizing stakeholder roles, and to including in our analysis such use-cases as seemed prudent both to understand the implications of necessary diversity of stakeholder populations in M&S enterprise environments and to communicate successfully to all parties those entailments.

The results of this analysis are addressed more fully in Section 4.3 Conceptual Modeling Enterprise Stakeholders, below; and further explication is therefore deferred, except to emphasize the degree to which

stakeholder analysis and respect for stakeholder diversity and peculiarity are necessary conditions for understanding, let alone employing the best-practice guidance contained herein.

Regarding the study scope and objective, analysis effort addressed primarily the class of conceptual model being considered, and the analytical disciplines considered necessary and sufficient for subject models to be managed over their life cycle.

Conceptual models for simulations relating to military mission space domains were, according to the tasking guidance, the relevant scope. In fact, however, considering the breadth of the adjective ‘military’ in its own referential scope (covering most of the mission space elements considered typical of non-military mission-spaces and certainly passing well beyond simple war-fighting operations to encompass logistics, materiel management, personnel health and safety, operational security, communications, etc.), and considering how generic most of the ideas associated with conceptual models in general and the pragmatic conceptual models guidance eventually derived; the scope of applicability of the Group’s work-product is scarcely proscribed by its ‘military’ appellation.

Likewise, given the interest of conceptual model management (development, documentation, storage, retrieval, re-use, sharing, etc.), during the conceptual modeling life-cycle, together with the not incidental relationships of systems engineering (applied here to simulation systems) and enterprise-context operations across considerable institutional scope (e.g., national and NATO international); very little constraint accrued to the processes recommended, particularly with respect to requirements management and stakeholder sensitivity.

3.2.4 Terminology and Concepts

In many scientific domains, terminology is critical, see Annex I. Practitioners’ shared appreciation of the state of evolution of the field of endeavour, and their fundamental capacity to communicate, collaborate and cooperate depend upon the existence of a well-established vernacular that is shared by the community-of-practice.

Often, such terminology is available through the efforts of past researchers – especially when the discipline is mature (or simple), taught systematically, and appreciated widely across the community. Conceptual modeling is not such a discipline. While its roots in the ‘first-philosophies’ of epistemology and ontology are deep, its explicit practice in modeling and simulation is relatively new. Conceptual modeling terminology is further confounded by the overloading or multiple meanings of such keywords such as: ‘entity’, ‘model’, ‘concept’, ‘relationship’, ‘attribute’, ‘predicate’, etc. Further, the presumption of one or another conceptual technique, schema or notation leads promptly to terminological ambiguity. Finally, in an international working group doing business in English, some challenges to terminological consistency are to be expected.

The approach of the MSG-058 was, from the start, to be scrupulously precise in vocabulary usage, and to record such determinations as seem best in a lexicon that has evolved over the course of the program and that is published as Annex J to the present volume. The structure of that annex is, in fact rather a glossary than a formal definitional lexicon, in which alternative definitions, interpretation, commentary and usages are cited in hopes of communicating not only the sense of terms as used in the report text, but also to communicate to the reader the range of nuance which lexical vocabulary may, under one circumstance or another assume. In doing so, the Task Group hopes both to communicate precisely its own effort, determinations and findings, but also to share with the reader the degree to which nuance and potential ambiguity persist in a subject only lately approaching the maturity which modeling and simulation practitioners desire and deserve.

This explicit convergence on vocabulary usage, combined with the consensus-based protocols characteristic of all the collaborative effort of the Group has resulted in acceptable vocabulary consistency at least within the

context of the study. Given that the intention of NATO is to have the present work continued in context of international standards-development bodies, however, concern for lexical precision cannot be ignored. The reader is particularly referred to the Glossary, Annex J, for citations and explication of vocabulary used in the body of this report.

Continued aggressive pursuit of vocabulary and subject-matter semantic consistency in conceptual models best-practice guidance is strongly recommended.

3.2.5 Analytical Framework and Ontological Perspective

Conceptual modeling entails the abstraction of some ‘referent’ domain’ resulting in a description of that domain suitable for managing its ‘representation’ by artificial means such as by a model or simulation. Pursuing the MSG-058 TAP TOR entails assuming one or another ‘analytical frame’ from which to address consideration of this process and generation of prescriptive guidance to practitioners. This analytical frame is in effect one or another way of looking at the world. Alternatives of such frames include for instance: ontology, systems engineering, software engineering, and knowledge management; together with a wide variety of tools and techniques for pursuing explication of each frame, such as model driven architecture, Knowledge Acquisition / Knowledge Engineering (KA/KE) assets, systems engineering tools, etc.

The Task Group debated the question of an appropriate analytical frame or perspective from which to proceed, investigating closely a wide variety of options such as was manifest in the knowledge and practices of the member national participants and active individual members. Finally, the Task Group elected an ontology-based perspective, and proceeded to create a systematic process that reflected this foundational perspective, while drawing from multi-disciplinary perspectives to make the best-practice guidance familiar and pragmatically practical to the target practitioner and associated stakeholders.

In short, ‘ontology’ asks the rhetorical question: What is there? In the present context, more specific formulations might be: What do we care about, or alternatively:

- What is it necessary to represent in a model or simulation in order for the resulting product to serve its intended use; and
- What is necessary to prescribe about the simulation artefact itself for it to be likewise useful? Given this knowledge, the next question that must be addressed is: How can one select, and document the contents of such representations?

Two complimentary risks are associated with the Group’s addressing selection of analytical frame. On the one hand, failing to establish an intellectually secure frame leaves the establishment of a conceptual model a proverbial foundation of sand. On the other hand, making the proceedings and consequent product of the Group too explicitly bound to potentially abstruse academic precepts, constructs, and inferences risks alienating potential practitioners. The risk management tactic adopted by the Group was to dig deep and build on firm foundations, and to report those deliberations; but to efface such considerations from the pragmatic process guidance provided in the ‘best-practice’ prescriptive guidance in the document’s Annexes G and H.

To this effect, the subject is explicitly treated separately in Annex E – Explanation of Fundamental Concepts for Conceptual Model Frame-of-Reference. In addition, copious references are provided in Annex K – Bibliography, that document the fundamental ontological perspective upon which many of the Task Group’s deliberations were fundamentally based. Nevertheless, this analysis and exposition and the academic-intellectual underpinnings it deploys can be skipped for the sake of convenience or for lack of explicit interest

by the reader without detracting from either the comprehensibility or the utility of the concrete best-practice guidance contained herein.

3.2.6 Standards Review and Evaluation

The present document – particularly its operationally concrete and procedurally prescriptive guidance contained in Annex G – Conceptual Modeling Process Activity Description and Annex H – Conceptual Model Product Description – is itself a ‘soft’ standard, of type usually denoted ‘best-practice’. On the other hand, the analysis entailed in deriving such practice and the expression of the practice itself entails consideration of standards of a wide variety of types.

A significant effort by the MSG-058 Task Group was to review standards perceived as potentially relevant to the subject analysis and prescriptive guidance; to analyze the special significance of such candidate standards; and to invoke such standards (individually, by reference, or more often by class) in either the analysis reported herein or the procedural guidance appended.

The strategic approach of the Group was to leverage existing standards instances and standards types to the greatest extent possible in order to reduce redundancy and invoke guidance re-use wherever possible. At the same time, however, we have been scrupulous to avoid recommending specific standards when a class of standards could be cited and the choice of a particular standard left to the discretion of the practitioner.

The subject of standards is detailed in Annex F – Standards, but should be interpreted throughout as an exercise in coaching of the practitioner toward more systematic professional and productive practice commensurate with the mores of his own enterprise environment.

3.2.7 Process, Product and their Relationships

Within this document, there are two primary processes described, to be executed by one or another of two agencies, and resulting in one or another of two significant work-products. In this section, we identify briefly these processes, agents, and work-products and indicate their relationships before proceeding with more detailed descriptions in following text sections. In order to establish a perceptual frame of the set of agents, activities, and products that comprise the development of this document and its included best-practice guidance as well as the execution of that guidance and the generation of consequent conceptual models, the reader is referred to the following Figure 3-4.

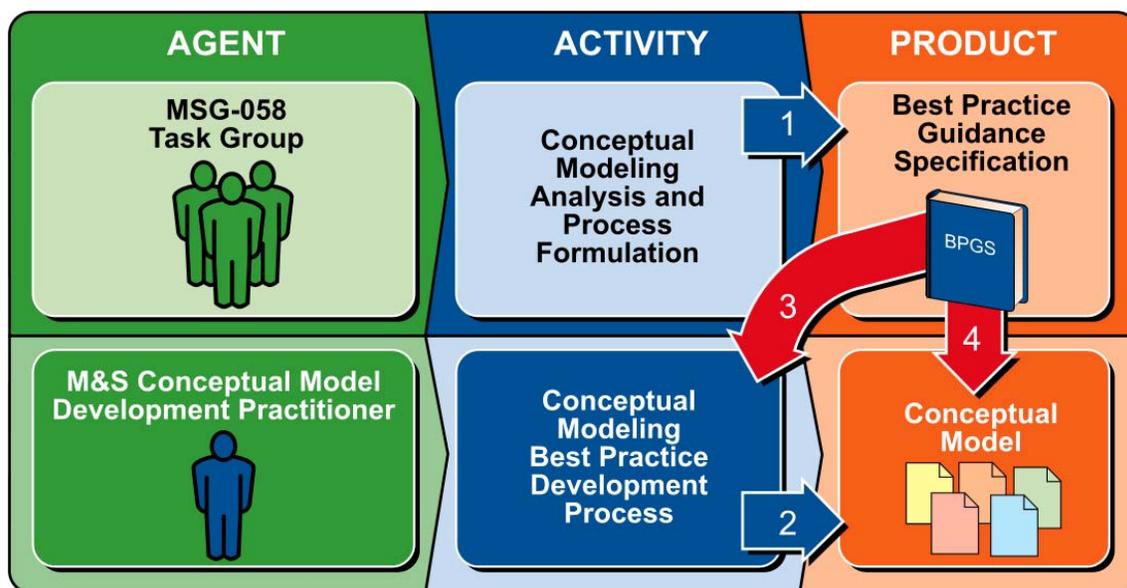


Figure 3-4: Relationships Among Agents, Processes, and Products Associated with Subject MSG-058 Effort and its Consequential Conceptual Modeling Practice.

As indicated in the diagram, the MSG-058 Task Group itself performed the activity of analyzing conceptual modeling and formulating requisite best-practice guidance. The persistent information product resulting from that activity is the best-practice guidance specification contained within this document in Chapters 5 and 6 and in the Annexes G and H. The causal relationship between this activity and its consequent resulting work-product is indicated by the blue arrow numbered 1. Subsequently, the M&S conceptual modeling development practitioner is expected to execute the prescriptive best-practice to produce the conceptual model itself. This productive result is indicated by the blue arrow number 2. Finally, the activity conducted by conceptual modeling practitioners and the work-product produced thereby are shown to be affected by the best-practice guidance specification through influence designated by red arrows 3 and 4 respectively. With this activity and influence relationships in mind, comments follow relating to process and product specification generated by the Task Group.

3.2.8 Process Specification Expression

The MSG-058 Task Group explicitly addressed consideration of the most appropriate form of specification of its guidance to conceptual model stakeholders. Process specification itself admits to a wide variety of schemas, notations, and seminal notions. Since the Group could not provide multiple alternative specifications, and chose not to endorse a single specific notational or conceptual frame for process specification, we resorted to what was held to be a generic or vanilla specification schema – without, however, falling prey to least-common-denominator information content. The meta-process specification schema employed (employed as partial graphic illustrations in the text of Chapters 5 and 6 and defined in detail in association with the Annex G wherein it is employed to communicate the recommended conceptual modeling processes) is considered to be sufficient, complete, consistent, and formally equivalent to most commonly employed process specification schemas and notations, and implementing Commercial-Off-The-Shelf (COTS) tools.

Naturally, the practitioner is encouraged to use schemas, tools, and techniques to specify the objective system processes such as constitute the content of the actual conceptual model as are deemed appropriate to the

enterprise context in which execution of conceptual modeling is to be conducted. In that way, considerations such as machine readability, COTS tools availability, and compliance with enterprise process specification standards are well within the discretion of the practitioner-agent for the benefits intended thereby.

3.2.9 Conceptual Model Process Elements

Moving from consideration of meta-process specification practiced in formulating the best-practice instructions proffered below, to the actual prescription of elements of process models considered necessary and sufficient to contain and communicate model and simulation object and process semantic content; the Task Group again, resorted to the use of nominative or generic conceptual primitives that were considered equivalently powerful as specific conventional notations and styles of object and process specification. Supporting on the one hand, object qualia such as: class membership, generalization and specialization, inheritance of attributes, membership and client server associations, etc., and on the other hand, process constructs as sequence and concurrency, causal effect, temporal synchronization, process composition and encapsulation, etc.; the notation used in the subject best-practice specification is considered likewise sufficiently general to serve all needs, and sufficiently suggestive and non-binding to be able to be implemented by the use of such specific process primitives as are to be found in typical practices and tools.

Once again, the practitioner's discretion to use such constructs and notations as are commensurate with technical, programmatic, and enterprise constraints is protected, while the sufficiency of actual conceptual models to contain necessary and sufficient information is guaranteed.

3.2.10 Conceptual Model Documentation

Consideration of the conceptual model documentation, as discriminated from both the conceptual model generation and its specific information content generated for one or another application, was a matter of particular concern to the Group. That documentation activity is yet another meta-process – that is, one of the operations by the conceptual model management practitioner whereby the conceptual model, having been abstracted from appreciation of the subject mission- and simulation-space, is made manifest in persistent, communicable, achievable, and recoverable form, that can serve as well as a reference information artefact from which model or simulation implementation may proceed and subsequently be verified. Documentation artefacts resulting from practitioners' efforts were considered to be appropriately subject to best-practice guidance; and providing instruction to practitioners on recommended structural form and general semantic content of such artefacts was felt to be a significant component of best-practice guidance.

In order to influence conceptual model artefacts generated pursuant to election and execution of best-practice guidance by conceptual modeling stakeholders, the Task Group elected to provide to the conceptual modeling practitioner dual forms of guidance (i.e., process and product) whereby one perspective addressed conceptual model development process and the other addressed the resulting conceptual model product document artefact. Having addressed conceptual modeling process elements, as described above, and having resolved to provide guidance to practitioners, the Group determined to address the characteristics recommended for the consequent conceptual model 'Product' itself, namely the document (or other form of persistent capture of the conceptual model's semantic content) expected to be generated by the practitioner in accomplishing his objective conceptual modeling effort.

Since a necessary criterion for completion of conceptual model development and use is the generation of a persistent capture of information relevant to the conceptual model development, contents, life-cycle management,

and uses, the Task Group resolved to provide necessary and sufficient guidance for the generation of such documentation. Guidance related to conceptual model product artefacts is ‘dual’ to process guidance addressed above; and the result of the pursuit of this approach is Chapter 5 and Annex G of this report. In effect, the Task Group determined that if the conceptual modeling practitioner executed the Process Guidance of Chapter 5 in this report; then there would result a documentary product whose desired characteristics are described in Chapter 6 and Annex H of this report. Product Guidance, therefore, contains specification of expected information-content and expository-structure of the resulting conceptual model documentation itself.

Throughout the Task Group’s deliberations and everywhere in its derived prescriptive guidance, emphasis of data contents over expository structure was assumed. Attention to capture of information necessary and sufficient to support the conceptual modeling facet of M&S enterprise operations of the specific M&S community of practice for which the conceptual model is intended was kept clearly in mind and made manifest to the greatest degree possible in recommended practice guidance processes prescribed below. This commitment was modulated with considerable sensitivity to avoiding too restrictive prescription of documentary practice that local or national standards could not conveniently be employed.

The Task Group concluded that by providing complimentary process and product prescriptive guidance, the prospect of successful completion of conceptual modeling practitioners’ efforts and the result of appropriate conceptual model documentation might be assured.

3.2.11 Task Group Work-Product Generation

The Task Group was well aware that the results of the effort were expected to be a documentary report serving the following functions:

- Establishing the context of the subject effort by reciting background circumstances and Task Group objectives;
- Providing a recitation of the effort of the Group sufficient to illustrate how their determinations and findings were arrived at, and establishing the credibility of the group process and consequently the relevance of its effort; and
- Capturing prescriptive guidance for M&S conceptual modeling practitioners regarding the generation and documentation of subject conceptual models commensurate with NATO M&S enterprise wants and needs on the one hand and the need for explicit guidance to practitioners occupied in conceptual model management on the other.

According to the “TERMS OF REFERENCE RTG on Conceptual Modeling for M&S MSG-058, RTG-038:”, the Task Group was to “Draft a guidance document on conceptual modeling that can be used by different stakeholders (sponsor/user, project manager, subject-matter experts, V&V agents, developers, etc.)”, with the admonition that: “The final work will be to provide a tailorable set of guidance to the M&S community on conceptual modeling” ... provided as a “Technical Report”... which final report should be a “guidance document freely available to the international community”.

The Group’s approach to the generation of this work-product was to execute the following process:

- Establish subject matter suitable for inclusion in the product;
- Agree on the expository outline deemed most clearly to accomplish the functions cited above;

- Negotiate voluntary adoption of writing assignments among the Group members according to personal familiarity with the subject matter in respective documentary outline sections, and equitable distribution of workload among the Group participants;
- Complete storyboard specifications of subject-matter exposition, including attention to elements indicated in the NATO Conceptual Model Storyboard template;
- Review in plenary the storyboards and establish consistent plan of explication;
- Draft respective sections;
- Compile and integrate full documentary report; and
- Conduct review of document by all members of the Task Group and determination of consensus support of final work-product.

While small risk was expected relating to consistency, correctness, and lucidity of explanations of the individual sections (due to conscientious record-keeping by the Task Group via its collaborative environment during effort execution and the personal and professional qualifications and competencies of the authority team), the formal composition process implemented served to ensure consistency and economic documentation of the Group effort and its consequent determinations and findings.

One significant decision was to produce one report work-product; within which the subject-recommended best-practice standard was contained. Consequently, Chapter 4 “Conceptual Modeling Best-Practice Guidance Introduction”, Chapter 5 “Conceptual Modeling Process Guidance”, Chapter 6 “Conceptual Model Product Guidance” and their accompanying Annexes G – “Conceptual Modeling Process Activity Descriptions” and H – “Conceptual Model Product Descriptions” are considered appropriate to serve as stand-alone as prescriptive best-practice guidance and to be proffered to the NATO and SISO communities for excision and publication for the reference of conceptual model management practitioners and related stakeholders.

3.2.12 Coordination with SISO for Generation of Subsequent SISO/IEEE International Best-Practice Standard

At the inception of Task Group activity, collaboration with other international standards organizations was anticipated and made explicit in the TOR tasking. In particular, the intention was to: “Foster the establishment of the [Task Group work-product] guidance document as a SISO standard.”

The desired scope of prospective collaboration was specified as “Liaison” in the Terms of Reference and should be established with the following organizations:

- MSG-054 Task Group on “An Overlay Standard for Verification, Validation, and Accreditation (VV&A) of Federations”.
- MSG-052 Task Group on “Establishment of a Knowledge Network for Federation Architecture and Design”.
- The coming Task Group IST-075/RTG-034 on “Semantic Interoperability” (Continuation of the IST group ET-040 on “Ontology fusion”).
- Simulation Interoperability Standards Organization (SISO).
- Other RTO Task Groups as required.

Means for implementing such collaboration process were left to the discretion of the Task Group and were, in fact pursued to the greatest extent allowed by circumstances, resources, and perceived probability of success of the Task Group's subject tasking. Interface was implemented by means of exchange of briefings publications of papers, and meetings at which information was exchanged on current state of effort and expectations for immanent progress.

As a consequence of this collaboration, it is expected that, as desired: "The final report should be a 'guidance document' freely available to the international community."

3.3 CONCLUSION

Based on the process model and activity of the Task Group described in the preceding sections, the contents of Chapters 4, 5, and 6 were generated, which together with their accompanying annexes, constitute the recommended best-practice guidance for conceptual modeling for Military Models and Simulations.