

ISO TC184 SC5 WG1 Modeling and Architecture Work program and key resources

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Manufacturing-Process Interoperability: A Different Paradigm
WG1 envisions a set of standards that enables an enterprise that is shopping for a process to be able to evaluate, on line, what it does, what it means, the information it needs, and the data it provides. If a process meets both quality and capability guidelines, and if it conforms to acceptable interface standards, the systems involved would be able to adjust, adapt, and select their parameters to establish a relationship and operate at a level of integration that is acceptable to both parties. ISO TC184 SC5 WG1 has identified the standards activities that follow as key elements of this vision.

Concepts and Rules for Enterprise Models* ISO 14258:1998
Defines "the elements to use when producing an enterprise model, concepts for life-cycle phases, and how these models describe hierarchy, structure, and behavior". Also contains guidelines and constraints for relating the real world to enterprise models through views. This latter concept is equivalent to the views of ENV 40003.

Intended audience: Standards makers and enterprise modelers.

Requirements for enterprise-reference architectures and methodologies* ISO 15704:2000 Places the concepts used in methodologies and reference architectures such as ARIS, CIMOSA, GRAI/GIM, IEM, PERA, and ENV 40003 within an encompassing conceptual framework that allows the coverage and completeness of any such approach to be assessed. The IS draws heavily on the work of the IFAC/IFIP Task Force on Enterprise Integration and on previous work from Purdue University. The conceptual framework is textual and relatively informal. It does not provide a basis for actual implementations and requires understanding of the field to apply.

Intended audience: Enterprise-modeling specialists assessing the suitability of a methodology for their needs.

Rules for Manufacturing-Process Interoperability

(NP developed for a WG1 standards project) New standard will prescribe a metamodel for determining where the necessary interoperations must occur and for describing the mediation method. This standard will contain rules for determining the simplest set of protocols necessary to negotiate and achieve satisfactory and purposeful inter-process communication. Compliant application software would be required to determine, in a standard manner and on a case-by-case basis, the method by which querying and responding processes can communicate.

Intended audience: Application-software vendors and enterprise refurbishers.

Software-capability profiles

(Complementary new standards work external to WG1) Standard will prescribe a way to represent the capability of software, not the software. The standard will specify a way for processes to query each other in the prescribed way. This proposed standard would enable the best possible inter-process or inter-application communication to be accomplished, based on the implemented capability available between the processes.
Intended audience: Application-software vendors, enterprise refurbishers, and standards makers.

Process-specification language--Rules for ontology

(Complementary standards work external to WG1) The goal of the PSL is to develop a language for specifying industrial processes. The PSL will provide a set of concepts and definitions that would allow one to describe process information, both at the enterprise level and at the shop floor level. Clear and unambiguous definition of the concepts inherent to processes is essential because different manufacturing functions may use different terms to mean the exact same concept or use the exact same term to mean

very different concepts. For this reason, the PSL is built upon a formal ontology, with all definitions of concepts captured in first-order logic, specifically the Knowledge Interchange Format (KIF). The part of PSL that is ready to be standardized now is the PSL ontology; that is, such concepts as the resource roles and activity duration.

Intended audience: System integrators and Enterprise refurbishers

Universal Enterprise-Modeling Language (Complementary R&D work by IFAC/IFIP Task Force. Objective is to standardize) UEML will provide a common language suitable for enterprise-modeling needs that could be accepted technically and politically as a universal end-user language. Therefore UEML could provide business users with a standard user interface on most of the tools for enterprise modeling, analysis, and simulation. Another goal of UEML is to provide a neutral language for universal model exchange among these tools as well as among business users.

Intended audience: Application-software vendors and enterprise refurbishers

Shop-floor-production model* ISO TR 10314 Part 1 Reference model for standardization, methodology for identification of requirements, 1991; Part 2 Application of the reference model for standardization, 1992. Technical reports that developed a simple shop-floor-production model, generic-activity model, and a methodology (a list of structured questions that could be posed) to identify possible requirements for areas of standards in support of integrated-shop-floor operations. Part 2 included a mapping of existing standards onto the model.

Intended audience: Standards makers.

CIM-systems-architecture framework for modeling* CEN ENV 40003, 1991 The basis for European work, built heavily on inputs from the AMICE CIMOSA project, provides a common-conceptual, high-level framework within which key concepts of the enterprise can be identified, documented, and shared with partners in the enterprise. Established "the cube" with its three dimensions of: Modeling level for different life-cycle stages, Generic concepts that are then specialized to a particular industry sector and then to a specific enterprise; and Views that classify concepts by four areas of concern or modeler viewpoint. Being updated by CEN TC310 WG1.

Intended audience: Comprehensive enterprise-model developers.

Constructs for enterprise modeling* CEN ENV 12204, 1996 Defines thirteen constructs that are related building blocks to be used in the composition of enterprise models, based upon inputs from CIMOSA and QCIM. Each construct is described in terms of its essential nature using a common template for definition, description, header, and body parts. Relationships between constructs, static and behavioral, are contained implicitly in these descriptions. Being extended and updated by CEN TC310 WG1.

Intended audience: Developers and implementers of enterprise models.

