Getting Involved in ISO Standards Development

Joining the US Technical Advisory Groups
to monitor and develop standards in
ISO/TC 184 Automation systems and integration,
ISO/TC 184/SC 4 Industrial data, and
ISO/TC 184/SC 5 Interoperability, integration, and architectures for enterprise systems and automation applications

Overview by ECCMA, ANSI appointed Administrator to
the US TAG for ISO/TC 184, ISO/TC 184/SC 4, and ISO/TC 184/SC 5

ISO Standards:

Solutions for Common Industrial and Supply Chain Data and Interoperability Problems

- Does your organization have challenges with industrial data and enterprise or supply chain interoperability? Does It encounter problems with meaning or moving data between systems or applications?
- Are you looking to improve your organization's data quality, automation, or interoperability in the processes of sourcing, manufacturing, engineering, production and delivery, maintenance and disposal of products and their associated services?
- Does your organization manufacture goods or buy or sell products and services, but have trouble sending data to or receiving data from your current or potential trading partners or even across your own organization or project teams because of different formats, definitions, applications, models, fields, attributes, languages, measurements, et cetera?
- Do you get too much or too little data on the items you are interested in buying?
- Are you looking for a method to move from manual exchange to automated requests for and replies to data?
- Are you looking for ways to cut costs and time verifying and onboarding products, services, or trading partners? Do you have duplicate organization or item records and not know how to resolve or prevent this?
- Does your organization struggle in decision making processes due to a lack of trust in the quality of the data?
- Do you struggle to find solutions to these problems or are you implementing those that were created by others but do not seem to fit your organization's or even your industry's needs?

If you answered "Yes" to any of these questions, you may be interested in getting involved in ISO through these committees:

- ISO/TC 184: Automation systems and integration
- ISO/TC 184/SC4: Industrial data
- ISO/TC 184/SC 5: Interoperability, integration, and architectures for enterprise systems and automation applications

ISO/TC 184: Automation systems and integration

Current Subcommittees and Groups	
Reference	**Title**
ISO/TC 184/SC 1	Industrial cyber and physical device control
ISO/TC 184/SC 4	Industrial data
ISO/TC 184/SC 5	Interoperability, integration, and architectures for enterprise systems and automation applications
ISO/TC 184/AG 2	Digital Twin
ISO/TC 184/JWG 21	Joint ISO/TC 184 - IEC/TC 65/JWG 21 - Smart Manufacturing Reference Model(s) linked to ISO/TC 184
ISO/TC 184/WG 6	Asset intensive industry interoperability

Scope

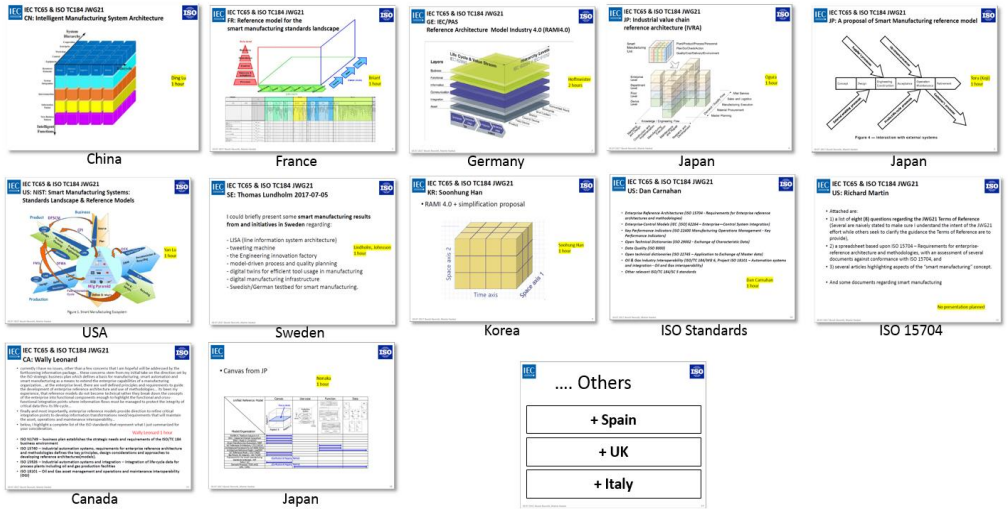
Standardization in the field of automation systems and their integration for design, sourcing, manufacturing, production and delivery, support, maintenance and disposal of products and their associated services. Areas of standardization include information systems, automation and control systems and integration technologies.

Visit the ISO site for ISO/TC 184 at: https://www.iso.org/committee/54110.html

ISO/TC 184: Automation systems and integration

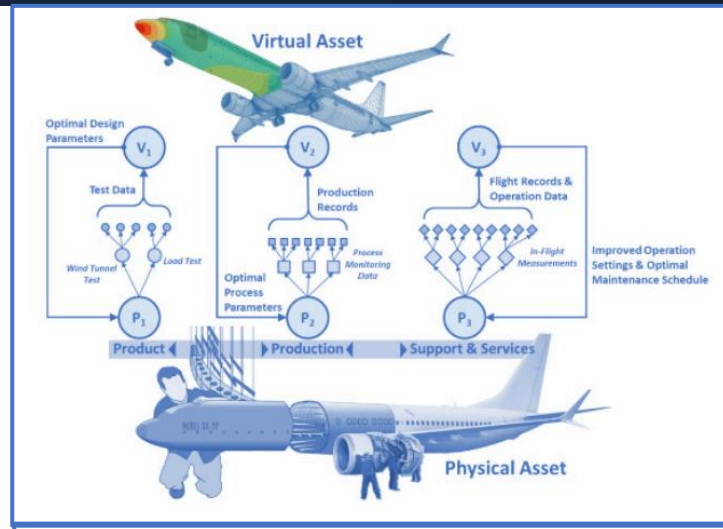
ISO/TC 184 supports digital transformation and efforts to develop exchanges between machines, data quality, ontologies, data models, and digital twins.

ISO/TC 184/JWG 21 is preparing a standardized unified Reference Model to support ISO/TC184 and IEC/TC 65 (Industrial-process measurement, control and automation) activities in Smart Manufacturing. The Reference Model will be comprised of a single model, possibly with a set of consistent and coherent sub-models, and align with the requirements of stakeholder groups, including manufacturing system users, suppliers, integrators, standardisers, and consumers of manufactured products.



Models defined in Countries and identified by JWG21

Source: Presentation by Fumihiko Kimura(ISO) and Dennis Brandl (IEC), at Joint Working Group 21: Smart Manufacturing Reference Model(s) ISO TC184 – IEC TC65, at AFNOR, Paris, France, 2023-06-07/09.

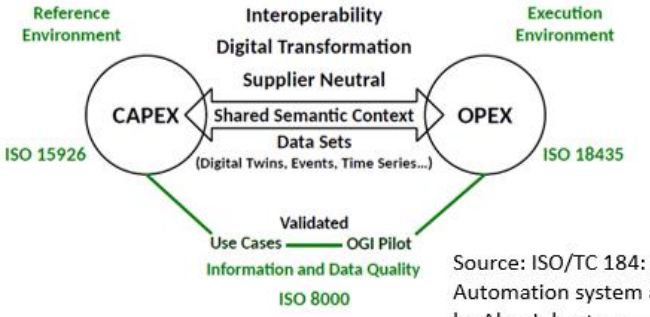


Source: AIA and AIAA, Digital Twin: Definition and Value, Dec. 2020

ISO/TC 184/WG 6: Asset intensive industry interoperability

Objective: Move From Systems Integration to Systems Interoperability and Digitalization

Oil and Gas Interoperability



Features:

- Supplier-neutral Standards
- Industry Use Case Driven
- Interoperability
- Pragmatic
- Business Focused
- Inter and Intra Enterprise
- Validated in OGI Pilot Testbed

Source: ISO/TC 184: Digital Transformation Symposium, Automation system and integration, Overview, presentation slide by Alan Johnston

Standards developed to date in ISO/TC 184

ISO/TC 184/SC 4: Industrial Data

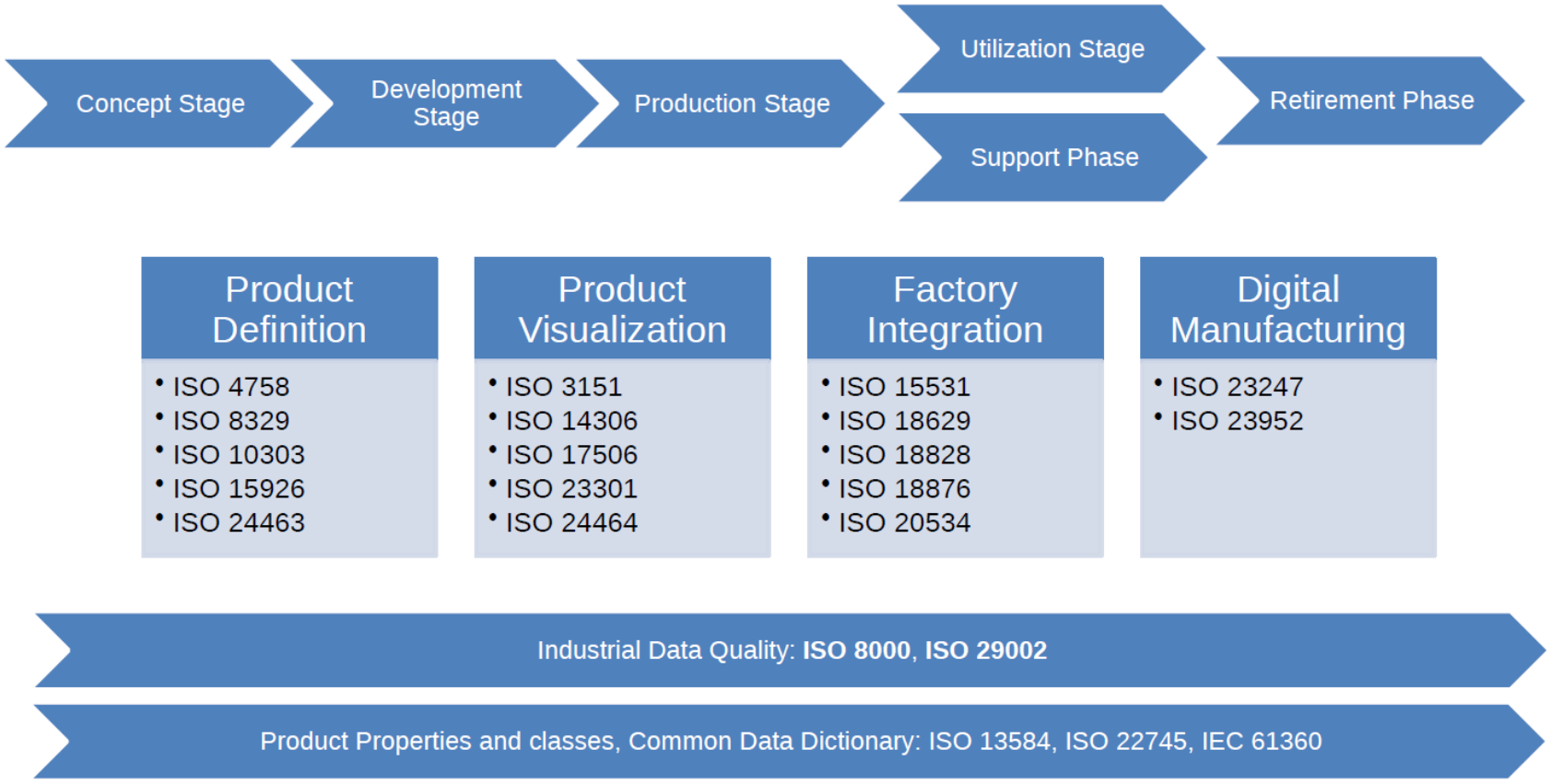
Current Working Groups	
Reference	**Title**
ISO/TC 184/SC 4/JWG 16	Joint ISO/TC 184/SC 4 - ISO/IEC JTC 1/SC 24 - ISO/TC 171/SC 2 WG: Formats for visualization and other derived forms of product data
ISO/TC 184/SC 4/JWG 24	Joint ISO/TC 184/SC 4 - IEC SC3D WG: Use of IEC CDD for ISO data dictionaries and ontologies
ISO/TC 184/SC 4/WG 3	Oil, Gas, Process and Power
ISO/TC 184/SC 4/WG 11	Implementation methods and conformance methods
ISO/TC 184/SC 4/WG 12	STEP product modelling and resources
ISO/TC 184/SC 4/WG 13	Industrial Data Quality
ISO/TC 184/SC 4/WG 15	Digital manufacturing

Scope

Standardization of the content, meaning, structure, representation and quality management of the information required to define an engineered product and its characteristics at any required level of detail at any part of its lifecycle from conception through disposal, together with the interfaces required to deliver and collect the information necessary to support any business or technical process or service related to that engineered product during its lifecycle.

Visit the ISO site for ISO/TC 184/SC 4 at:
https://www.iso.org/committee/54158.html

ISO/TC 184/SC 4: Industrial Data



Source: ISO/TC 184/SC 4: Industrial Data, Overview, presentation given by SC 4 Chair Kenneth Swope, 2023-06-30.

[Standards developed to date in ISO/TC 184/SC 4]

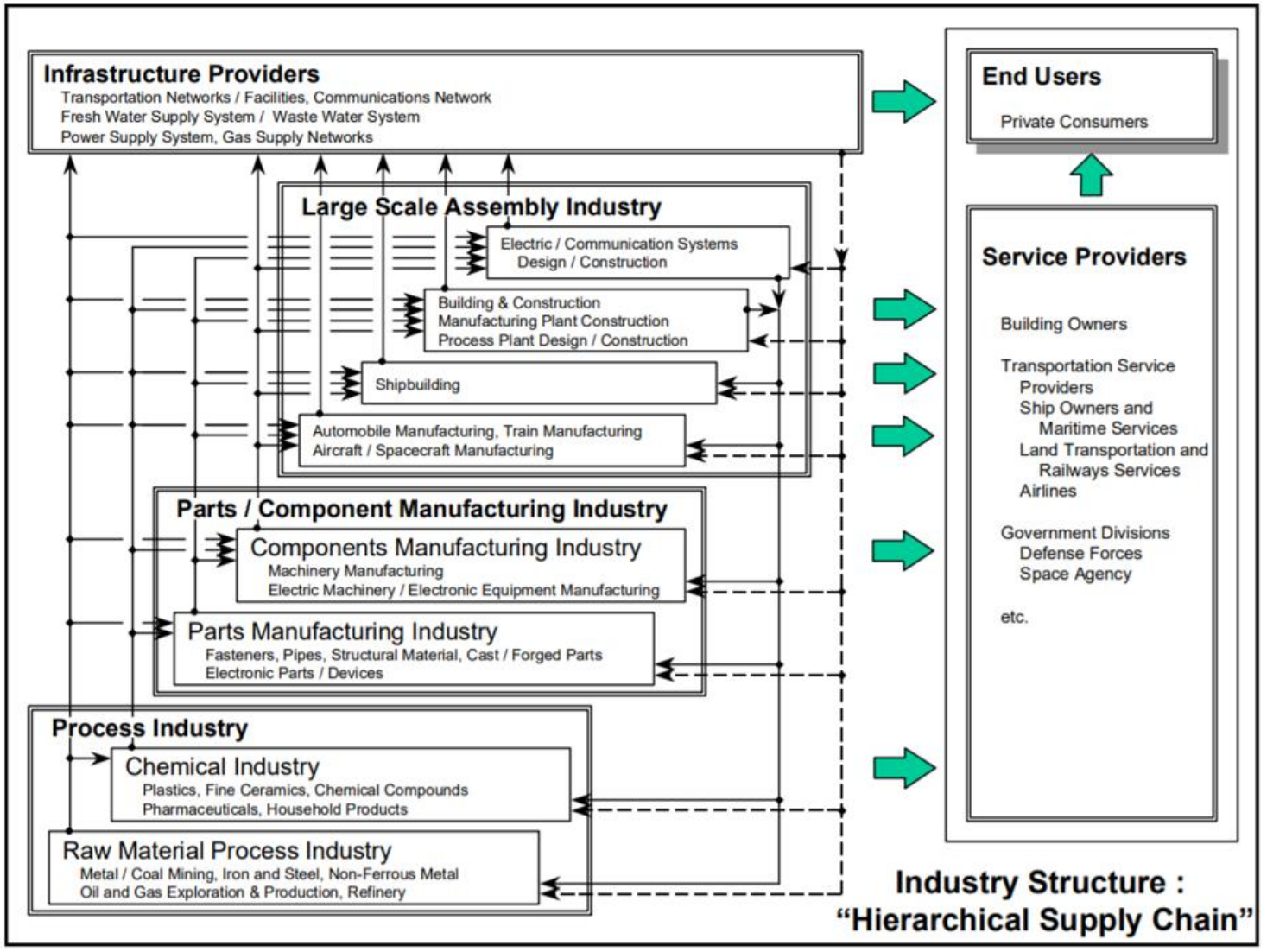
Building standards for industrial data requires a high-level framework to ensure the consistency and interoperability of the standards. The standards developed within ISO/TC 184/SC 4 are based on the premise that:

- there are fundamental commonalities between different industries;
- industrial data can be considered as a product of some industrial process and subject to generalized life-cycle activities; and
- data quality framework is used as a foundation for ensuring that data meets expectations and is fit for use.

ISO/TC 184/SC 4: Industrial Data

ISO/TC 184/SC 4 includes projects on industrial data from conception through to end user.

By specifying a standardized format for data, it is allowing internal and external enterprise systems to understand what each side is asking and sending, and what additional data is needed and how to complete the task at hand.



Source: ISO/TC 184/SC 4: Industrial Data, Overview, presentation given by SC 4 Chair Kenneth Swope, 2023-06-30.

ISO/TC 184/SC 5: Interoperability, integration, and architectures for enterprise systems and automation applications

Current Working Groups	
Reference	**Title**
ISO/TC 184/SC 5/JWG 5	Joint WG ISO/TC 184/SC 5 - IEC/SC 65E : Enterprise-control system integration
ISO/TC 184/SC 5/WG 1	Modelling and architecture
ISO/TC 184/SC 5/WG 4	Manufacturing software and its environment
ISO/TC 184/SC 5/WG 5	Open systems application frameworks
ISO/TC 184/SC 5/WG 9	Key performance indicators for manufacturing operations management
ISO/TC 184/SC 5/WG 10	Evaluation of energy efficiency and other relevant factors of a manufacturing system with respect to its environmental influence
ISO/TC 184/SC 5/WG 12	Convergence of informatization and industrialization
ISO/TC 184/SC 5/WG 13	Equipment behaviour catalogue
ISO/TC 184/SC 5/WG 14	Mass customization
ISO/TC 184/SC 5/WG 15	Model-based standards authoring
ISO/TC 184/SC 5/WG 16	Supply chain interoperability and integration (SCII)
ISO/TC 184/SC 5/WG 17	Interoperability of simulation models on different manufacturing platforms

Scope

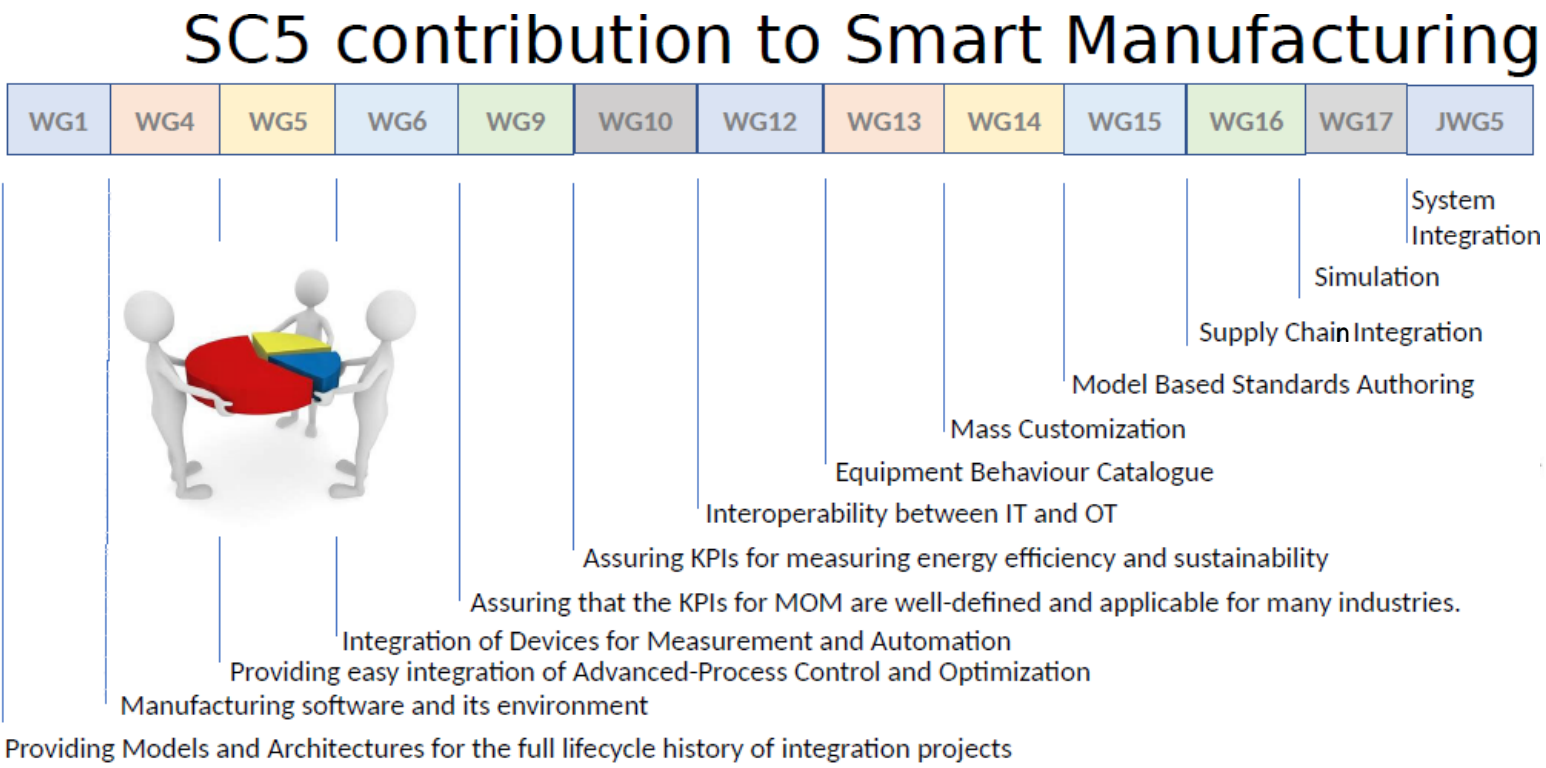
Standardization enabling the integration and interoperability of systems, applications and services for the manufacturing, engineering, and distribution domains of the enterprise and the supply chain. Applying multiple technologies to achieve integration and interoperability for these domains, these areas of standardization include:

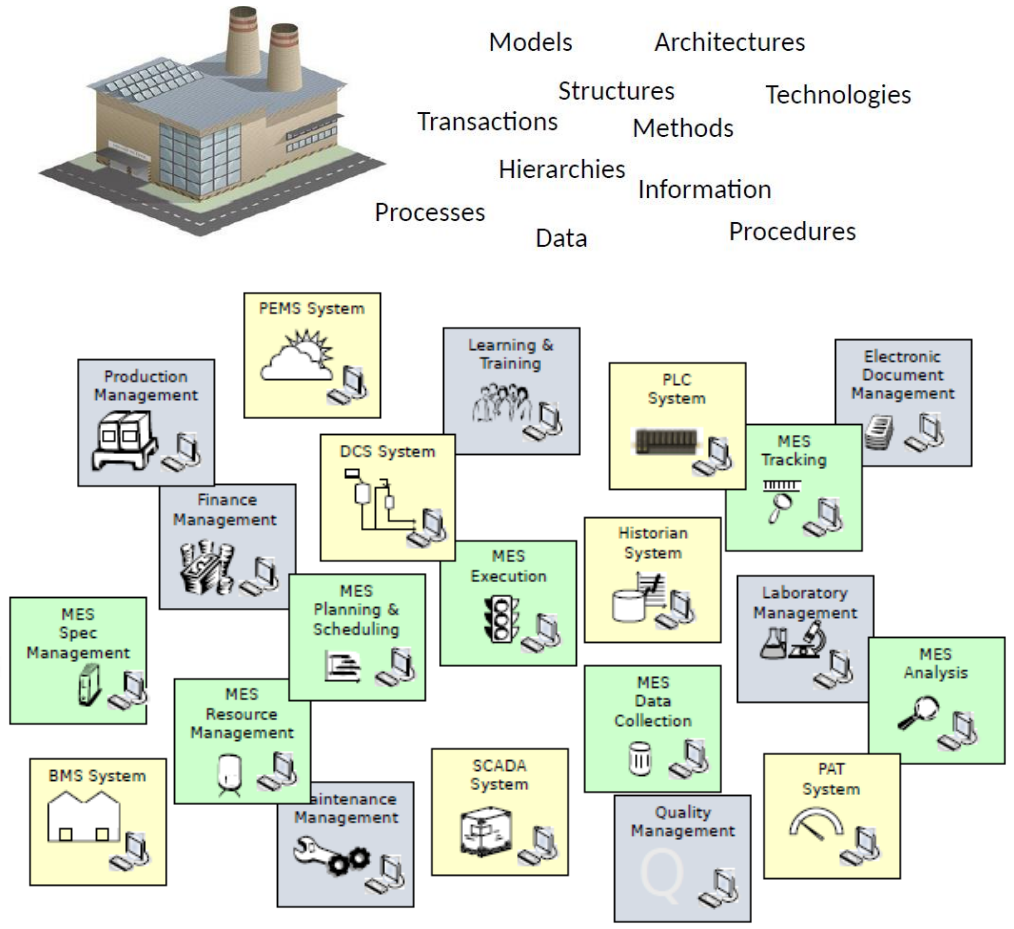
- enterprise reference architectures and methods of representing processes, resources and their applications within an enterprise;
- frameworks, architectures and methodologies for interoperability and integration of enterprise applications, resources, and services;
- integration and interoperability of software capabilities and other resources for application-specific systems across domains of an enterprise;
- interoperability of application-specific standards developed by other committees for safety, security, quality, environment, capability assessment, and simulation when used jointly in various domains of an enterprise.

Visit the ISO site for ISO/TC 184/SC 5 at:
https://www.iso.org/committee/54192.html

ISO/TC 184/SC 5: Interoperability, integration, and architectures for enterprise systems and automation applications

ISO/TC 184/SC 5 standards contribute to interoperability within and across organizations and projects, a sustainable supply chain, and smart manufacturing.





Source: Presentation, Digital Transformation Symposium: SC 5 Overview, AFNOR, France, by SC 5 Chair, Prof. Charlotta Johnsson, 2023-06-30.

ISO/TC 184, ISO/TC 184/SC 4, and ISO/TC 184/SC 5 all contribute to Smart Manufacturing.

Standards developed to date in ISO/TC 184/SC 5

Why get involved in ISO standards development?

- The value of developing ISO standards:
  - Involvement in the standards process enables one to stay updated on the latest industry trends, technologies, and best practices helping your organization to adapt and innovate, making your products or services more competitive in the global market.
  - Standardizing streamlines processes, reduces risks and costs, increases quality and safety, improves market access (examples and case studies)
  - Standards serve as a common language that promotes interoperability and compatibility between different systems, products, and services. By actively participating in standards development, you can ensure that your organization's offerings adhere to industry norms, facilitating seamless integration with other systems and enhancing customer satisfaction, as well as saving time and money by avoiding unnecessary duplication or conflict.
  - Participation in ISO gives an opportunity to ensure standards referenced in regulations, certifications, or compliance frameworks are fair, effective, and aligned with your and industry needs. Governments look to ISO standards for guidance (see, for instance, May 2023 Fact Sheet from the Biden-Harris Administration).
  - Organizations looking to promote social responsibility and contribute to the greater good will find that international standards provide effective tools to help them rise to the challenge.
  - ISO’s open, equal participation model and consensus-based standards development process brings recognition and legitimacy.
  - One of the strengths of ISO standards is that they are created by the people (from the organizations) that need them. Industry experts drive all aspects of the standards development process, from deciding whether a new standard is needed to defining all the technical content. Involvement in ISO standards development enables one to be heard but also to hear, to learn from peers around the world and gain valuable knowledge, connections, and credibility from that engagement.

How can my US organization get involved in ISO?

Join the US TAG

- US Technical Advisory Groups (US TAGs) are committees accredited by the American National Standards Institute (ANSI) whose members are eligible to participate in the technical activities of the International Organization for Standardization (ISO).
- The TAG is made up of a group of experts from the TAG members, coming from businesses, government, financial interests, universities, non-profits, and research laboratories. They have an interest in better addressing their needs through using and establishing international standards. Each TAG member assigns technical experts to participate in ISO alongside experts from around the world in writing of standards.
- Every TAG member has a say on the US position on standards and agenda items in the committees of which they are members.
- TAG members have access to standards documents at all stages of the development process from initiation to publication. TAG members provide US representation to committee and working group meetings and ensure compliance with the ANSI Guide for US Delegates to meetings ISO.
- US TAG membership is required if a US party wishes to engage in ISO standards development
- Each organization is entitled to designate one voting member (and multiple experts) to serve on the US TAG.

Why join the US TAG?
-Member Perspective

As organizations are trying to automate major parts of the organization, or make them less mandraulic, AND are slowly starting to focus on the larger issue of managing supply chains, it starts to become clear that they have to get involved in standards. For larger corporation there are two valid approaches:

1. **Use what is out there and be a follower.**
2. **Become a leader and try to shape standards towards our vision of the future.**

For decades, LM has been focused on #1. Internally, they never allowed us to be actively involved in standards, unless a huge program demanded it (and therefore our customer usually paid for it). But that has changed. We are a multi-CAD, multi-PLM, multi-MES, etc. organization (we have a single ERP solution though, which is remarkable and exceptional). We are finding that standards are the only way to bridge all this tool variability but there are many gaps in the standards. The only way to fill in the gaps, is to join the efforts. In the last few years, our budgets for standards support have grown significantly and we finally are allowed to participate. This has been a seismic change for LM and you see that slowly our organization is getting more visible.

The benefits are that we may be able to shape the end result in a way that is advantageous to us. That means we will become early adopters and out corner the competition. If you are not at the table, you may get to implement other people's best practices and that may not be helpful to us.

- Jan de Nijs, Lockheed Martin

Why join the US TAG?
-Member Perspectives

TAG members have a direct say in the development of new and revised standards. This gives companies the opportunity to influence the direction of their industry and ensure that standards meet the needs of their stakeholders.

TAG members stay ahead of the curve. TAG members get early access to information about emerging standards and issues in their industry. This helps companies stay ahead of the competition and ensure that their products and services meet the latest requirements and conform to the standards.

TAGs bring together experts from different companies and backgrounds. This is a great opportunity for companies and members to network with people who share their interests and learn from their experience.

Being a TAG member demonstrates a company's commitment to standards and its expertise in its field. This can give companies a competitive advantage and credibility in the marketplace.

There could be specific reasons why a company might want to join a particular TAG. A company that is developing a new product might want to join a TAG to ensure that the product meets the relevant standards. Or a company that is exporting its products to another country might want to join a TAG to learn about the international standards and its national standards that are required in that country.

- Dukki Chung, Rockwell Animation

The work being done in ISO is forward leaning and allows suppliers, such as ourselves, to help see the narrative for how we communicate with our customers in the changing business environment. Its benefits include business growth, engineering growth (knowledge and scoping), the ability to “control the narrative” for specifications development, and many others.

- Rocky Pinheiro, Penn Engineering

Why join the US TAG?
-Member Perspectives

By joining these committees, you can help both your own business and the US generally. Standards encode industry consensus on best practice. If the practice concerns, for example, the interoperability of products in a space where your business competes (as it does with SC 4), then your participation can help ensure that your products can conform and can interoperate in the "ecosystem" of complementary products. Your participation will ensure a deep understanding of conformance criteria; this could save you money in the long run. For the US generally, standards help us find efficient business processes, and eliminate waste.

- Peter Denno, National Institute of Standards and Technology (NIST)

As product data gets more complex and distributed across the worldwide supply chain, there is a dire need to make it interoperable to enable collaboration in design, manufacture and support. ISO technical committees help drive standards for collaboration in product development.

The benefits of joining include:

- Reduced cost of collaboration and data exchange across internal and external product development partners
- Reduced number of errors due to agreements in concepts and content of the data standards enabled by these committees.

- Jayendra Ganguli, Pratt and Whitney

TAG membership grants improved understanding of the potential impact committee decisions have on our enterprise. Additionally, the committee regularly brings forward topics for standardization, knowing in advance that new standards in an area are coming provides a competitive edge. When standards are being reviewed for obsolescence, that same knowledge can be used to recommend the retention of standards that are critical to the enterprise.

- Thomas Thurman, Principal Electrical Engineer, Rockwell Collins (Retired) & President EXPRESS Language Foundation

How to Join the US TAG

- Membership shall be open to all US national interested parties who indicate that they are directly and materially affected by the activity of the US TAG.
- A request for membership shall be addressed to the US TAG Administrator, and shall indicate the applicant's interest in the US TAG's work and willingness to participate actively and in accordance with the ISO Code of Ethics and Conduct.
- ECCMA has been appointed by ANSI as the Administrator for the US TAGs for ISO/TC 184 Automation systems and integration, ISO/TC 184/SC 4 Industrial data, and ISO/TC 184/SC 5 Interoperability, integration, and architectures for enterprise systems and automation applications, and is responsible for ensuring compliance with TAG procedures.
- There are administrative fees to join US TAGs.
- To request to join the US TAG, or to learn more, please reach out to ECCMA at info@eccma.org.

ISO Committee	Annual Fee to Join US TAG
ISO/TC 184 Automation systems and integration	$6,000
ISO/TC 184/SC 4 Industrial Data	$6,000
ISO/TC 184/SC 5 Interoperability, integration, and architectures for enterprise systems and automation applications	$6,000
Reduced fee to join the US TAG for two or more committees	$10,000 total

After joining the US TAG, ECCMA will arrange a welcome call with you and an experienced participant in the US TAG(s) you have joined. In preparation for this call and your role in ISO, you may want to review this quick reference to the ISO system and its processes for delegates and experts: MY ISO JOB - WHAT DELEGATES AND EXPERTS NEED TO KNOW