

From Integration to Interoperability

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Keywords

Interoperability, Integration, EAI, ISA-95, WBF, B2MML, AIAG, CIDX

Summary

All manufacturers are striving to lower operating costs through faster inventory turns and tightly linking production to real-time market demand. To achieve this goal, however, requires tight production to business (P2B)

We have hopes that interoperability will cut costs, lead to better decision support and more responsive business operations. However, achieving it is not easy. A standards-based roadmap is required and some of the pieces are missing.

system integration. Despite the significant investments companies have made to link these two domains, P2B integration is still too complex and expensive for most manufacturers.

Interoperability is a strategy for dramatically reducing integration time and cost, and thereby making the decision to connect systems more manageable.

Interoperability requires that a set of implementation standards be identified and implemented by multiple suppliers, and then supported by manufacturers. These steps require broad industry coordination and collaboration. Such an effort was precipitated by SAP for the process industry sector with strong support from manufacturers, production management software suppliers and standards body representatives, including ISA and World Batch Forum (WBF).

Analysis

Interoperability is difficult to define because the meaning depends on the context that is used. In a sense, it is what some manufacturers wanted when they asked for open systems. Open systems gave us a lot application programming interfaces (APIs), a good first step, but integration remained difficult. Understandably, manufacturers are now taking a strong, functional stance on interoperability, keeping the focus on the need and business justification rather than how it is to be accomplished.



Software suppliers who have to deliver interoperability really want end users to give them specific technical direction so that they will be certain to build the right capabilities into their products - a fair request. However, the answer is more complex than it first appears because multiple standards are required, and manufacturers are at different stages of integration and

Standards are essential to achieving interoperability, but standards bodies are chronically resource limited. This problem is further exacerbated by the reality that interoperability requires specifications from multiple standards bodies, and this requires industry level collaboration.

technology adoption. Interoperability must be defined on a broader scale.

Industry focused groups, such as AIAG (Automotive Industry Action Group), CIDX (Chemical Industry Data Exchange), and ad-hoc working groups are playing a key role in moving toward interoperability. They are bringing interested parties together to col-

laborate, and define interoperability simultaneously from both a function and technical direction, with an emphasis on standards.

Functional Interoperability Focuses on Need

Functional interoperability is about defining a common model that can be used by range of industries and businesses for analyzing and defining interoperability requirements. For example, in the process industries, ISA-95 models and terminologies (parts 1 & 3 especially) are useful for this purpose, with perceived value of this as prerequisite for other work growing.

The P2B Interface Moves

The roles and responsibilities of departments and divisions vary across businesses and even business units. For example, the overall production scheduling process may be distributed across departments in different ways. This variation in responsibility also influences the information that a department (or individual) needs to perform their roles, and drives manufacturers to seek "single version of truth" functionality across products.

An understanding of department and division variations is necessary to specify points of interoperability, information flows, and places where business processes are split. ISA-95 recognizes this and defines a functional model that can be used as a starting point for analysis of production management requirements by businesses and industry groups.

Supplier Product Functionality Spans Boundaries

Manufacturers are faced with a bewildering array of products with overlapping, strong, weak, missing, and extraneous functionality. They are becoming increasingly determined to map such functionality to a standard such as the models discuss above. This is not just a convenience because the boundaries between products also define points where manufacturers must be concerned about interoperability.

The lack of supplier mappings to standard function models is a frustration to manufacturers and may hinder adoption. Business cases expressed in standard functional terms rather than technical or product terms will be more effective.

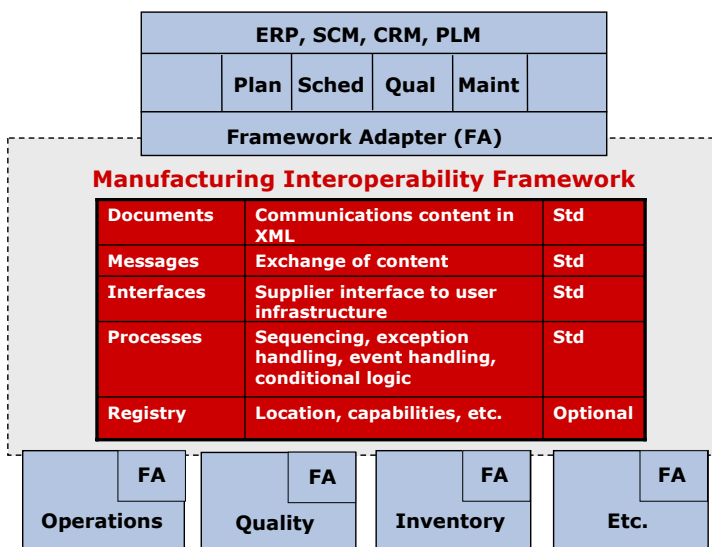
Defining the Business Case Is Difficult

All manufacturers want to define the business benefits before investing in integration, but far less are able to do it. Such justification is even more important for interoperability as it requires standardization at the corporate or division level, whereas integration can often be justified at a project level. Functional

models provide the structure for better understanding of the business case, thereby facilitating the justification of investments in interoperability.

Technical Interoperability Focuses on How

Technical interoperability is the selection of a set of integration and other standards to minimize customization, thereby reduce total cost of ownership, while accelerating payback. Standards like ISA-95 do not define implementation, and it is necessary to supplement it with specifications from other standards bodies.



Interoperability Frameworks Provide a Structure for Considering Alternative Standards

Technical interoperability frameworks help industry groups and manufacturers to develop a strategy for achieving particular functional interoperability objectives. Interoperability frameworks provide an organized way to consider and select complementary integration standards to achieve complete interoperability. Improved integration is achieved with the standardization of each element (documents, messages, etc.) and interoperability will be achieved when all elements are standardized.

When no standard is available for a particular framework element, an interim solution may be defined such as a de facto standard, with an awareness of the associated risk.

Process Industry P2B Interoperability Working Group

Recently, SAP initiated an interoperability working group to advance the adoption of standards with an initial focus on the process industries. The group includes manufacturers, production management software suppliers, and standards body representatives, and is not limited to SAP products.

During the initial 2-day meeting, this group defined two frameworks based on ISA-95 models and terminologies, and World Batch Forum XML schemas (B2MML). The group plans to address other areas of the framework as well as building a functional model, associated use cases, and product mappings. Some of the challenges are defining ways to handle necessary diversity in requirements such as integration processes and providing an effective migration for existing systems.

Recommendations

- Process industry manufacturers should consider joining other manufacturers in the Interoperability Working Group to make sure their needs and ideas are considered. This will convey to SAP and other software suppliers the requirements and level of standardization desired.
- A two pronged approach is needed to achieve interoperability. The technical side requires an interoperability framework that identifies a roadmap for reducing costs and meeting functional interoperability needs. The requirements side requires function maps and processes. Today, few standardized P2B integration processes are available, leading to significant challenges. Those with extensive P2B experience can contribute significantly to industry efforts by applying their experience to the development of function models and use cases for their industry.

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