

ISA-95

The manufacturing system standard that makes Manufacturing Analytics possible

Manufacturing Analytics is fundamental to managing an enterprise to run at peak performance and profitability. For management to achieve this condition, it needs an underlying data collection and management system that looks to the total enterprise. Data collected at the packaging line must be available and compatible with financial and operational data so that maximum value can be achieved.

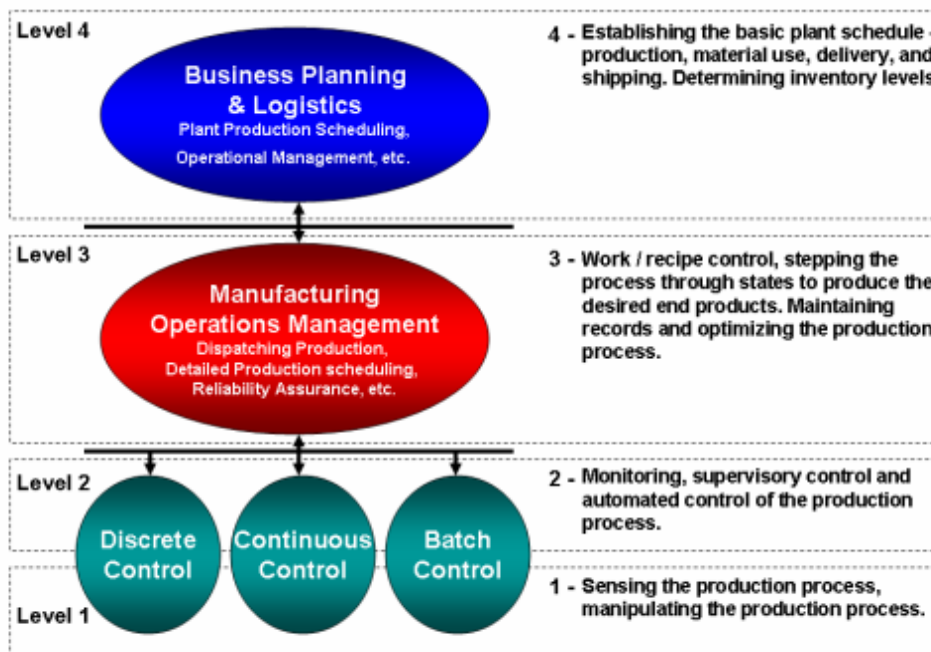
The data alone has little value to process management. It must be analyzed to convert it into actionable information and delivered to the right person to make the right decision and take the right action. Manufacturing Analytics delivers the analysis and role specific reporting. However, to be effective, Manufacturing Analytics requires a well designed set of data systems within the company that follow best practices and are compatible with one another down to the level of the individual variable definitions up to the ability to use one consistent data transfer and reporting language.

Louis Halvorsen, NWA's Chief Technology Officer, is currently serving on the ISA-95 Committee as a member of the group developing the Quality section of ISA-95 scheduled to be completed by mid-2006. NWA's participation was requested in recognition of its position as the leading supplier of SPC software to the process

The ISA-95 standard defines such a manufacturing data system. ISA-95 is the result of ongoing collaborative effort by major manufacturing systems vendors and corporate users working within the ISA (Instrument, Systems, and Analysis) Society. The committee has mapped the data sources within a manufacturing enterprise and the processes that form operation and management. At each level, they consider:

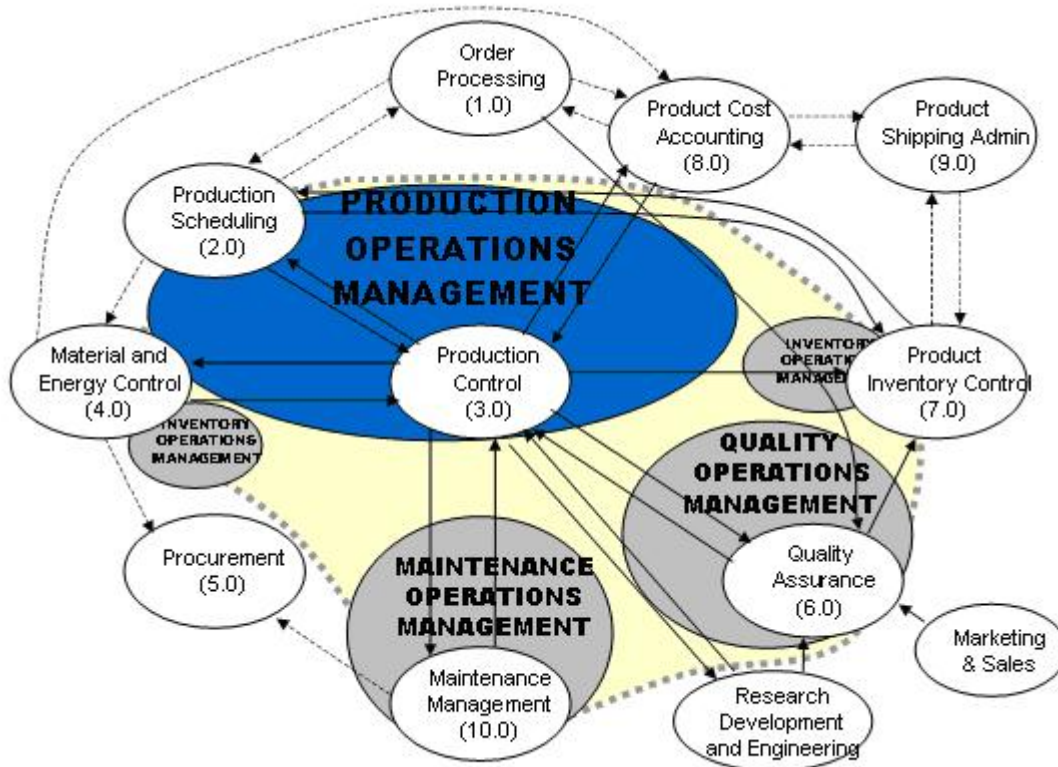
- Industry best practices
- How processes operate
- What data is required to monitor each process
- How the data is analyzed to manage that process
- What reporting is required by those operating that process and those managing it
- What information must be shared between different functional departments within the company and how it is meaningfully analyzed and reported
- How data from different sources is aggregated to produce Key Performance Indicators (KPIs) which integrate the manufacturing and business management concerns of the company

Figure 1 illustrates how ISA-95 defines the four major levels of process management with associated data collection, management, analysis and reporting.

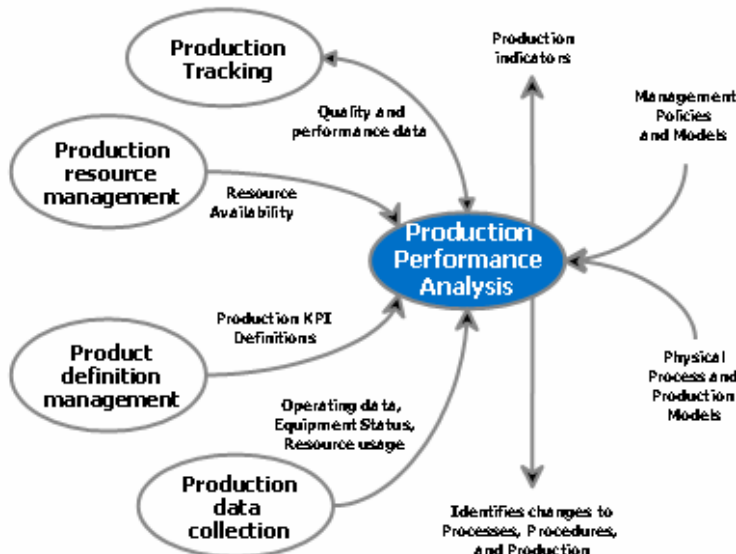


This model defines best practices design for modern manufacturing systems including MES (Manufacturing Execution System) and ERP (Enterprise Resource Planning). Companies can use the ISA-95 model as a requirements template for easier and more dependable product comparison among vendors for both initial system selection and replacement. It also defines a new reference for manufacturing operations systems that is rapidly becoming the new model for MES applications.

One can drill down in each level in the model for the detailed data structures and workflows in each section of the business. For example, the sections and interactions for Level 3, Manufacturing Operations Management, is described in figure 2.



One can drill down as far as needed in the ISA-95 model. For example, Production Performance Analysis is a component of Production Operations Management, and its components are shown in figure 3.



Production Performance Analysis interfaces with other activities within production operations. PPA also provide feedback about production to enterprise logistic systems, and includes information used to optimize production and resources. By observing the ISA-95 definitions and structures, one can expect dependable and useful analyses and reports.

Monitoring Manufacturing Operations

The standard identifies how each group shares units of data with other parts of the enterprise to integrate with the data from other departments to form KPIs (Key Performance Indicators), composite variables that integrate manufacturing and business issues.

For example, data that quality operations can provide to other parts of the enterprise includes:

- Receiving Inspection to Inventory Workflow
- Supplier rating information to Inventory Operations Workflow
- Corrective action to production tracking, maintenance tracking, and R&D/Engineering
- Gage tracking to the Maintenance Operations Workflow
- In-process inspection/test to Production tracking and execution

Robust Data Communication

The ISA S95 working group has taken a big first step to eliminate the persistent problem of integration and interoperability between business and production systems. Mapping of data between applications has historically been a root cause problem. Standardization makes useful data aggregation possible.

ISA-95 establishes useful communication between different corporate cultures, functions and departments. Every manufacturing company uses its own terminology for describing functions, activities and departments within the enterprise. When you have to work with external consultants, like suppliers of process control software, or system integrators, communication will be difficult.

Standardized variable naming and property definitions are needed to develop enterprise wide analysis. Part of the system design of an ISA-95 implementation is to standardize the name and structure of each and every variable so that meaningful analyses can be made across departments.

Also, ISA-95 specifies a standardized format for moving data and reports throughout the enterprise. This format is Business to Manufacturing Markup Language (B2MML). B2MML is a set of XML schemas based upon the ANSI/ISA 95 family of standards which has been produced by World Batch Forum's XML Working Group. NWA's SPC software uses XML for Data Set definitions and analytical output, making it easy for the products to conform to standards that incorporate XML schema such as ISA-95. NWA is contributing to the ongoing work on the Quality part of ISA-95, and when it is approved by the committee in mid-2006, NWA will fully support the standard.

Manufacturing Analytics

Manufacturing Analytics is the analytical and reporting mirror to the enterprise focus of the ISA-95 workflow and data structure. For many users these role specific reports are the primary interface with an ISA-95 compliant system.

For a complete overview of Manufacturing Analytics, see: www.nwasoft.com/ma-overview.htm

Reduce Integration Costs and Risks

ISA-95 reduces the risk and increases system design and implementation. The committee has distilled the best of vendor and end-user industry experiences and combined these best practices into a consistent set of models and terminology. This collective experience will help make your system design and integration a success and avoid the failures endemic in complex system integrations.

The discipline of standardized data structures and standardized B2MML communications not only increases the likelihood of a functioning system, it will increase the probability of a system that is organized to provide the maximum business management potential. By following the ISA-95 standard you will reap the benefits of the aggregated best practices in the industry.



NWA role in ISA-95

NWA actively supports the development and implementation of ISA-95 based manufacturing systems. ISA-95 is a prerequisite for a successful Manufacturing Analytics implementation. NWA strongly endorses the standard and Louis Halvorsen, NWA VP Product Development, is an active member of the ISA-95 committee.

Summary

ISA-95 is right and a smart way to design and build your manufacturing information systems. The ISA-95 standard defines interfaces between business functions and manufacturing operations. As a result you will collect the right data properly and organize it so that it can support good process management practices. By building an ISA-95 compliant manufacturing system, you will develop the infrastructure that enables the maximum benefit from Manufacturing Analytics.

Contact us for more information about Manufacturing Analytics

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