

# SIEMENS

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Ladies and Gentlemen,

## **Simatic IT: Not a theoretical Vision, but a proven Solution**

### **Globalization forces paradigm shift**

The evolution of the market is creating new driving forces and new requirements. The globalization of companies as well as of production processes is creating the need of new paradigms. Manufacturing is not a process that can be completed by a single entity, but extends over the border of the plant, the country and the enterprise.

New strategies and visions of customers like Collaborative Manufacturing Management, Enterprise Quality Management and Product Lifecycle Management challenge both industrial product vendors as well as system integrators.

In many cases, the enterprise is a “virtual entity”, and its value and recognition on the market, its brand value, is related to its marketing, and to the quality and standardization of its products more than to the actual company value – e.g. the plants.

We felt, that a new approach must be used as Business and Production Processes must be managed and controlled centrally, because they are part of the “assets” of the enterprise. Like in a human body, where you have a clear separation between the brain and the executing organs, we invented a clear separation between the rules of products, "the brain", and the products itself, "the organs". This takes a tremendous amount of complexity out of the components, thus making them more generic – "cross-industry" – and less subject to change. The customer therefore can rely on stable products with a smaller number of new releases. On the other hand, since the rules are made explicit, they can easily be adapted to a specific manufacturing process and to changes in that process. The combination of stable products with flexible rules makes this approach unique. It allows the customers to draw much more benefit out of the MES level than with conventional products.

### **Manufacturer Requirements**

Enterprises, plants and different areas inside each plant cannot be considered anymore as independent islands that just interact by exchanging data. Procurement, R&D, production, quality assurance and quality control, as well as sales & marketing must act together to optimise the value chain within a plant, yet, following the needs of the entire “supply chain” beyond the limits of a plant, beyond the limits of a country, and beyond the limits of an enterprise.

This leads to customer requirements which make the traditional software product approach unsustainable: Customers want to use standard products to have all the typical advantages of a standard product, but those products shall be flexible as Customers also want to have “tailored” solutions to best fit their business drivers.

Having a global perspective means that the procedures created by a central department and validated in a first plant must be spread all over the enterprise or the enterprises quickly and easily. Yet, each plant has an existing legacy, different products and already tailored applications in place that shall be integrated with the new products and solutions to save customer investment. So, gradual implementation is a need.

### **Satisfying manufacturers with products**

The traditional approach of products does not fit to such an increasing demand as the problems of companies are standard but unique.

### **Traditional Standard Products**

Traditional products contain basic functionality and rules to coordinate this functionality “inside” the product. We call them implicit rules. But the customer requires managing a “cross company” process including business and production processes. So, MES-products that are following a traditional approach, often grow outside their “borders” and become more and more complex – fatter in functions and richer of implicit rules.

Yet, they still cannot adapt to the problem, because the problem is “dynamic” and always extends. For this reason a considerable amount of integration and customisation is required. But what is worst, this activity cannot easily be replicated and reused.

## **From a traditional standard MES product – to model and components**

In fact, the process of extending “best of breed” products and standardizing “repetitive” solution is limited by the nature of the product itself.

The business model supported, today, is not built around the exchange of pure information but follows the flow of different business and production rules. It is based on the separation of basic (or even sophisticated) functionality from the “implicit” rules that are linking and coordinating this functionality, together.

The functionality remains simple and focused and independent from the area of application. The customer can focus on the business and production processes that are linking the functionality together and that are “crossing” the plant or the enterprise.

A traditional product is “product centric” which requires that it is adapted to the problem by additional application efforts. A model-based architecture is “process centric”. The right coordination of functionality solves the problem.

## **S95 – Functions and coordination**

This perspective is recognized by the new standard S95, where the focus is not only on different functionality, as was within the old MESA model, but on the “processes”, on the workflow that is required to make business successful and can be achieved by combining functionality.

## **Siemens and MES-Markt**

1997 Siemens initiated a strategic MES project, to analyze industrial market trends and customer needs. 1998 two MES focused business units were founded – I&S IT PS (industry specific) and A&D SH (cross industry) – and a common MES/Planning & Execution acquisition strategy was defined.

Beginning 2000, Siemens made important acquisitions – with Moore, Orsi Group, Tau, Chemtech, Dickinson und Compex. And 1<sup>st</sup> of Oktober 2002, Siemens reorganized its MES-activities. The entire Siemens product business will be managed as an independent new subdivision “Automation Systems – MES” within the A&D Industrial Automation Systems division. At the same time, I&S took over the sector-specific integration of MES solutions for all industrial sectors of Siemens.

### **Simatic IT – Siemens solution for S95**

With Simatic IT we are responding to this approach in an ideal way. “Explicit” business and production rules coordinate the functionality to achieve the required workflow and to create the solution.

### **What is Simatic IT ?**

Simatic IT is a system consisting of

- Framework (the technological and business process enabler of the system) and
- Components (the functional enabler of the system).

The framework includes "modeling capabilities" for plant modeling as well as for "production operations" modeling and the framework is implementing S95 architecture. Furthermore, it includes basic services like user management, data integration, etc. The framework is cross-industry.

The components include the functionality that is required by different industries. Some of them are cross-industry; others are industry specific, depending on the functionality they provide and the areas they are used.

On top of the components Simatic IT Suite Libraries provide basic units and procedures that are useful in any – or many – industries and that make it easier to implement the applications. The Industry Suite Libraries include pre-

packaged, industry specific functionality to best fit the needs of e.g. Food & Beverage and within this segment e.g. breweries.

Using the ILibraries, our certified partners, system integrators with excellent industry know how, customize them – together with the customer – to specific applications.

### **Simatic IT and its components**

Simatic IT has a number of own components covering pretty much the functionality defined by S95 but is also applicable to 3rd party products.

Some of basic components and functions are Production Modeler, MES Manager, Historian/ Plant, Unilab, Interspec, Detailed Production Scheduling, Maintegrity and Services & Adapters.

### **Simatic IT-Example: “Make-to-order Process”**

The following example will give you an idea about typical “Business and Production processes” – we call them Production Operations, and highlights the need for coordination of functionality that brings components together. We’ve chosen a make-to-order process common for various industries. The example here shows a make-to-order process within Food & Beverage industries. As you can see, executing such a simple process already requires the coordination of functionality included in six different products, at least.

There is the Detailed Production Scheduler or Production Order Manager (depending on how complex the production process is) that asks the product specification management system (Interspec) for the product specification. Once the specification is available, the Materials Manager, part of the MES concept, will assign the necessary materials. Next, the batch execution system will read from the specifications the recipe information and start dosing into the reactor. Assuming that we have to work with natural materials, slight changes in quality can happen. Therefore, a recipe adaptation might be required , based on

the results that have been derived from the sample that has been processed in the lab – with a Laboratory Information Management System (LIMS) – or in the In-Process Testing system – e.g. an in-line Near Infrared Analysis. After finishing the batch, the produced lot has to be released and booked on MES level (for tracking and tracing purposes) as well as on ERP level (for financial and planning purposes).

### **Simatic IT at Work**

Simatic IT is not a theoretical vision but it is already a proven solution!

And many customers all over the world from various industries have helped us to prove by sharing our vision and by implementing Simatic IT.