Optimizing the collaborative enterprise

ABB and partners PSE and SKYVA enable market pull supply chain management.

Today's industrial market is rapidly changing from a *manufacture to plan* (build for inventory) paradigm to the *market pull* paradigm. Such a change presupposes the ability to make near real-time collaborative decisions between internal departments, external collaboration partners and manufacturing facilities. This can be accomplished by creating collaborative supply chains in which suppliers, buyers and partners come together to conduct business – facilitated by supply chains that are synchronized and optimized to enable rapid response to dynamic market fluctuations.

The promise of optimizing the supply chain and producing a collaborative enterprise is compelling, as can be witnessed by the many leading-edge companies that are moving aggressively to reap the rewards that collaborative commerce has to offer.

ABB and its partners Process Systems Enterprise Ltd (PSE) and SKYVA International, are jointly developing and delivering dynamic real-time applications that will set the standard for complete collaborative solutions from customer inquiry to fulfillment.

ABB starts with Industrial IT vision

Industrial IT enables users to respond to dynamic market conditions by providing visibility, decision support and automated business processes throughout the enterprise. Industrial IT provides integrated product suites that share information to offer solutions to the specific problems and strategic issues identified by users.

The Industrial IT vision is founded on the premise that control, process optimization, asset optimization, decision support systems and business process automation must be seamlessly integrated to allow authorized users to access real-time information from many sources.

ABB's commitment to open standards is at the core of Industrial IT. This confidence in open standards provides flexibility and investment protection for users.

Industrial IT solutions impact productivity and profitability at many points in the supply chain. Within an enterprise, the portfolio includes:

- Inform^{IT} Enterprise Historian software for data analysis

- Produce[IT] solutions for batch production management and regulatory compliance
- Engineer[IT] tools for systems engineering
- Operate[IT] web-enabled Human System Interface
- Control[IT] controllers
- Optimize[IT] lifecycle optimization for processes and assets

A typical customer scenario unfolds as follows: Customer orders are aggregated and passed to manufacturers who examine and report their ability to fulfill the orders by checking:

- Inventory availability
- Capability to produce the item ordered (Capability to Promise)
- Availability of production and material resource to produce (Availability to Promise)
- Availability of logistics partners to deliver the product
- Profitability (Price Optimization)

Next, manufacturers plan and schedule production and purchase material to supply the product in the optimum manner and sequence. Once the sequence is set the production orders are submitted to the manufacturing facility.

For discrete processes or batch chemical processes these production orders are usually executed by a recipe or batch manager, as in Produce[IT].

Typically, for continuous processes, engineers use model-based static simulation to calculate the process parameters to produce the specified materials.

In the past, these calculations were done on a campaign basis where a plant would produce materials for inventory by rotating through a fixed set of product offerings over several weeks.

A compelling need for dynamic process optimization

The trend toward rapid market pulled production has shortened the campaign time for production cycles. In some cases, production may change daily based on market demand, supply and price considerations.

To profitably manage rapid change in large-scale process plants, daily simulation must take into account not only steady-state conditions but also dynamic data from the enterprise and the marketplace. The optimization simulation has to take into account not only the instantaneous or steady-state situation, but changes that are foreseen over short time periods. Thus, there is a compelling need for short-term *dynamic* model-based optimization (Optimize[IT]).

To implement dynamic process optimization, ABB has joined with Process Systems Enterprise Ltd (PSE), the provider of the gPROMS (general-purpose process optimization and modeling simulation) system. gPROMS was selected for several reasons. It is the only system with an industrially proven rigorous dynamic process optimization (as opposed to steady-state or static optimization) capability. gPROMS is widely recognized as the most powerful tool of its kind on the market.

In particular, the PSE solution uses a single mathematical model for static and dynamic simulation, process optimization as well as parameter estimation and data reconciliation, facilitating development of powerful and comprehensive solutions and enabling multiple returns on modeling investment. It is the most robust and numerically stable system available. This means that gPROMS solves problems that competing systems cannot. PSE's Managing Director, Mark Matzopoulos, describes gPROMS as the 'technology of the future now', an innovative, discontinuous leap in technology which establishes an entirely new category of solutions with potentially enormous benefits for the process manufacturing industries.

and suppliers immediately into collaborative processes where supply chains are synchronized and automated.

■ *Business process modeling.* This allows users to uniquely determine and manage the rules for business procedures, allowing for complete, individualized value chain execution.

■ *Private e-marketplaces or collaborative sell-side solutions* to ensure fluid operations with all market channels.

SKYVA delivers a robust, scalable platform that supports the entire supply chain – seamlessly. By delivering more than just the sale, this approach lets users manage the entire process from customer order to production planning through fulfillment and execution, thereby reducing operational costs, enhancing customer care, and improving overall supply chain management.

Collaboration spanning the supply chain

The dynamic suite of continuous process solutions (Optimize^IT) combined with Produce^IT and the Collaborative Commerce and Supply Chain Management solutions enabled by SKYVA, gives ABB a unique position in combining e-business with 'bricks and mortar' automation. Profit comes from producing real manu-factured goods and delivering them in a responsive manner to the collaborative market place. Industrial IT, PSE and SKYVA provide the necessary technology infrastructure to make the collaborative commerce vision a reality for our customers.

SKYVA extends and optimizes inter and intra-enterprise supply chains

While these enterprise systems work well, to compete in the New Economy, organizations need an innovative approach to streamline, and optimize, both inter and intra-enterprise supply chains. They are looking for dynamic, industrial strength solutions that extend the value chain beyond the enterprise to deliver improved responsiveness, throughput and profitability.

Now, working with our partner, SKYVA International, we can provide a collaborative application framework designed to automate and optimize complex, competitively distinguished business processes, by more efficiently managing the entire supply chain from customer order to fulfillment.

By allowing buyers, sellers and manufacturers to collaborate over the Internet, customers can reduce transaction costs while optimizing utilization of critical resources and improving cash flow and margins for buyers and suppliers.

The *skyva* solution provides a new approach to collaborative business process. SKYVA delivers:

■ *Collaborative supply chain management solutions,* including planning and scheduling components.

■ *Unlimited business connectivity.* Integration components for fast, unlimited connectivity – bringing buyers