eBenefits

Industrial^{IT} solutions for the pulp and paper industry

Matthew Montague

As evident as it is that eBusiness is driving the supply chain revolution, there can be no denying that many people have a problem with the "e". Take it away and you have business plain and simple. Adding it only links business – or trade, or commerce – with industrial information technology (IT), to make it better, faster and less expensive.

ABB Industrial^{IT} is all about sharing business and production process information to create benefits for everyone. ABB's leading role in the supply chain revolution is exemplified by real-time enterprise solutions delivered recently to the pulp and paper industry.

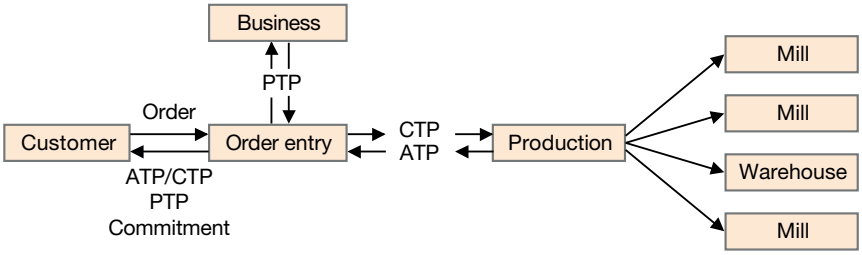
As with most revolutionary technologies, the advantage of Industrial^{IT} lies in applying it to the solution of real business problems to lower costs, increase revenues, or both. Neglecting this simple principle causes much grief when technology leads business, producing solutions in search of a problem. No one profits when a manufacturer expends scarce capital to no advantage. This is the cause of some of the recent setbacks among technology, and technology-friendly, organizations.

It is clear that the market is no longer receptive to industrial information technology solutions unless the supplier can show specific benefit from the acceleration of the supply chain and demonstrate the ability and experience needed to apply technology to that end. Since this benefit requires the application of information technology to specific business problems, determining where and how industrial IT should be implemented is a simple matter of tracing the value chain to find points of inefficiency.

The starting point: customer demand

Order entry is often the last link in the value chain to be automated. This is unfortunate since the process of accepting an order and transmitting it to the appropriate production facility has the largest eventual impact on customer satisfaction. Frequently, this is a paper

1 Real-time user interfaces allow ABB customers to query production resources and be kept fully aware of enterprise capacity and capability. Customers can make delivery commitments based on 'available to promise' (ATP) and 'capable to promise' (CTP) models. Integration with business systems provides them with a cost basis for production and delivery, enabling 'profitable to promise' (PTP).



and pencil based process, and it often proceeds heedless of inventory, production capacity or costs.

ABB creates consistent internal or external (Internet) user interfaces that allow customer service representatives, or the customers themselves, to enter orders with a minimum of error or missing information. The order information can be 'wrapped' inside a message and sent to production and enterprise planning systems to improve response to customer requirements and speed up the order-to-cash cycle.

This real-time interaction with production systems also allows ABB customers to query production resources and be made fully aware of enterprise capacity and capability **1**. Applying their organization's business rules, they can make delivery commitments based on 'available to promise' and 'capable to promise' models. Integration with business systems provides them with a cost basis for production and delivery (enabling 'profitable to promise'). Now the organization can make good on its promises to both the customer and its accountants. This first link in a demand-driven supply chain is unique in that actions here directly affect customer satisfaction – a crucial element in maintaining and increasing market share.

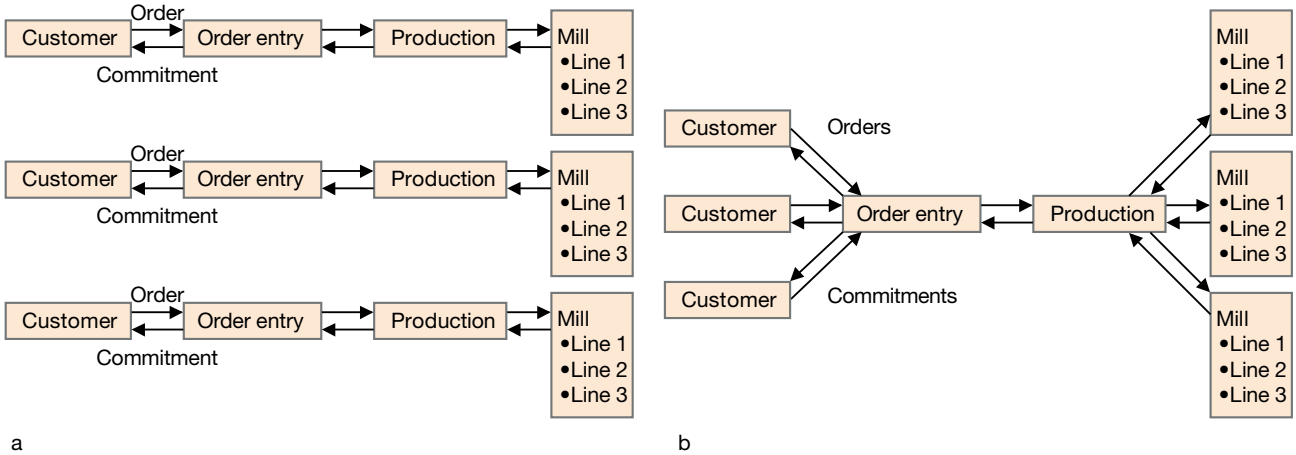
Production planning

Often, production planning occurs in 'site silos'. That is, each production facility plans and executes production without reference to the total capability and capacity of the organization. This is inherently inefficient – misallocated production costs more and reduces customer satisfaction. By integrating production systems to allow enterprise information sharing, ABB delivers the ability to allocate orders within the context of enterprise capacity and capability, reducing these difficulties and increasing the ability to serve the customer **2**.

2 Production planning

a *Before (siloed production): Order can be placed in one geography and one of three lines.*

b *After (enterprise production): Order can be placed in any geography and on one of nine lines.*



But that is not the whole story. Even when an enterprise software package does allocate production across the corporation, lack of coordination between enterprise and production facilities promotes error and inflexibility. Planning is divorced from execution.

In addition, most of these enterprise resource planning and supply chain management systems are not specific to the process industries. This results in problems in translation between theoretical models and the actual product, as well as difficulties in providing for the transition between the process and discrete production.

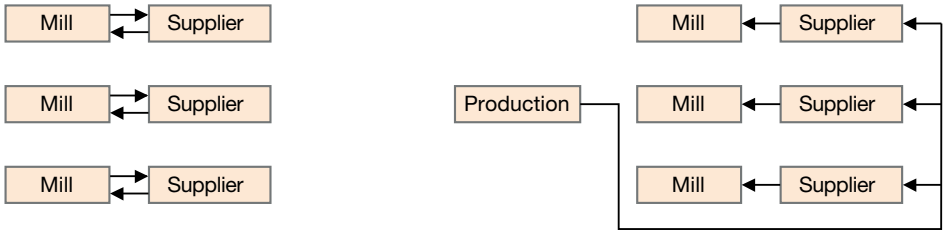
With all these points in mind, ABB integrates, for example in the pulp and paper industry, enterprise planning with mill-level execution to speed the transmission of production plans and allow quick implementation of order changes. ABB's rich industry experience, together with SKYVA's flexibility (see box), allows ABB to create systems that match industry- as well as customer-specific processes.

Suppliers

Production planning problems cause supply problems. Interaction with suppliers usually is not connected with production planning, leading to expensive excess stockpiles in one location while shortages threaten production at another. Site-specific transactions also result in inappropriate materials prices. Partnership opportunities for more responsive service and discounting are also neglected. Actual transactions are time-

ABB holds a 53% interest in SKYVA International, a premier provider of business-to-business solutions. SKYVA delivers software to automate networked core business processes within and across companies. Value Chain Convergence, a concept that unifies the Old and New Economies, enables customers to optimize the core operations of the value chain and to gain tangible sustainable competitive advantages.

SKYVA helps companies capture their competitive advantage by automating their evolving business processes across their real and virtual enterprises. With SKYVA, companies can quickly build and deploy solutions across their entire value chain while protecting their IT investment. As a result, companies can automate and optimize their buy, sell, make, deliver and customer service processes across the value chain.



3 **Electronic communication allows better collaboration by tightening the links between suppliers and production.**

Left *The old way of doing things – each mill orders its own supplies.*

Right *The new way – enterprise ordering*

consuming and expensive. Each of these factors contributes to higher materials and production costs, threatening margins and reducing the organization's ability to serve the customer.

With enterprise planning ABB customers are able to execute enterprise purchasing **3** – leading to the integration of upstream supply into production planning and to volume economies. Electronic communication tightens links between suppliers and production, allowing for better collaboration. For instance, direct integration in supplier Enterprise Resource Planning systems provides producers with information about supplier inventory levels. This information can now be used in production planning. Internet transactions replace paper and pencil, or costly electronic data interchange, to cut transaction costs by more than half. Supply is in tune with production and remains coordinated within the dynamic production environment.

Production

Actual production of goods in concert with customer requirements involves a timely aggregation of factors and processes in response to customer demand. The organization demands

A simple matter?

Following the value chain is a simple matter. However, the ability to apply technology successfully requires more than business process analysis and modeling. Three things remain:

- *Experience* in the processes to be automated to allow for variations in product characteristics, production methods and business processes.
- The *ability* to create, deliver and apply real-world, real-time information throughout the organization, from the device to the enterprise, and with suppliers and customers.
- Technological *flexibility* to adapt the solution to the needs and unique processes of the manufacturer.

ABB's extensive experience and knowledge of industry-specific production and business processes, as well as our broad and deep understanding of factory floor automation and real-time operations, combines with SKYVA's flexible technology to deliver these capabilities.

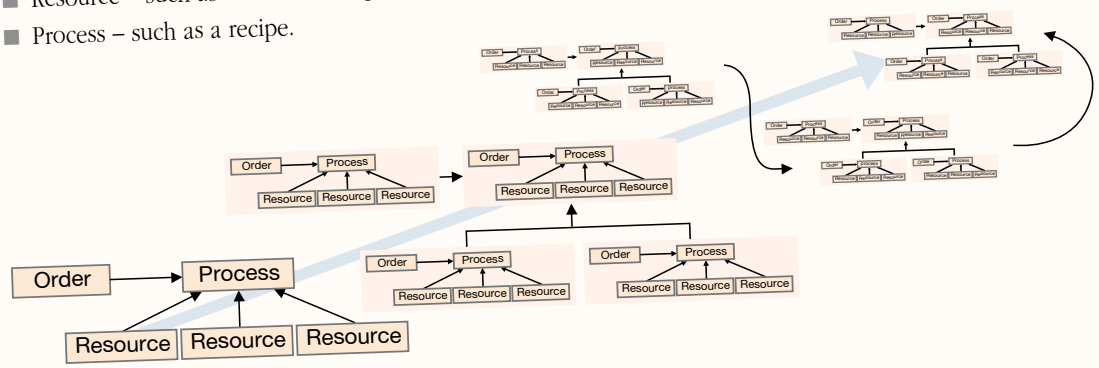
Flexibility in delivering technology is a conundrum. A very granular approach takes too long to build, deploy and modify, whereas a monolithic system will not be able to account for an end-user's specific business and production environment. SKYVA's solution is an 'object-oriented' approach that relies on three basic objects:

- Order – such as sales orders,
- Resource – such as materials or equipment, and
- Process – such as a recipe.

These are defined in terms of the customer's business and production environment, and combined to match customer requirements, much as a set of generic 'Lego®' building blocks can be snapped together to create very diverse and very complex models. The objects then interact according to the customer's rules to replicate business and production processes and automate their functions.

To speed implementation, these objects have been combined into pre-built components that model generic business processes such as order entry or production scheduling. ABB has taken these standard components and used its extensive experience to modify them to match industry needs. The components and completed solutions can be adapted easily to meet specific customer requirements or mirror new business processes.

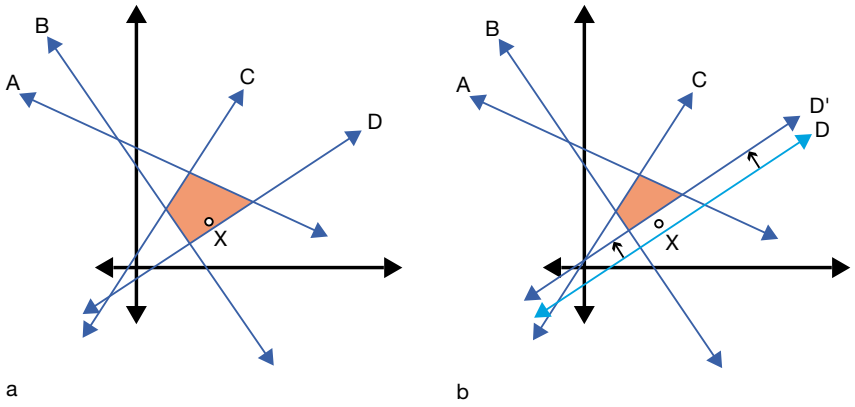
To share information, applications and systems must be integrated. That is, they must be connected electronically and have data translated from one system's format to another. ABB and SKYVA deliver a solid portfolio of integration solutions that enable applications to share information and route data between applications in accordance with defined business rules. This integration approach allows organizations to retain their legacy systems (and the investment these systems represent) while receiving the benefits of pervasive information.



that this occur within a profitable environment. Even when begun at a valid starting point, the dynamism of this set of constraints continually threatens to move actual production outside the solution set.

Excess and deficient capacity, order changes and other variables require an agility that can only be delivered by coordinated production planning and execution – that is, from the production line to the enterprise. Finally, maintenance needs must intersect with, and enhance, production planning as an active constraint – not an inert obstacle. Skillfully crafted plans and comprehensive preparations are meaningless without the ability to translate them into action and to alter them in the face of the reality of the plant floor 4.

ABB's ability to integrate all the way down to the mill floor provides enterprise planners with the real-time information critical for effective response to changing production conditions. Moreover, these responses are communicated directly to the production site, reducing waste and rework and ensuring a faster reaction to altered demand conditions. ABB makes maintenance an integral part of the production process through its object-based Industrial IT architecture to enable the monitoring of device and line status. Integrating this information with production planning reduces breakdowns and unscheduled maintenance, thus providing production planners with a more comprehensive and accurate view of their capacity and capability.



4 Dynamism

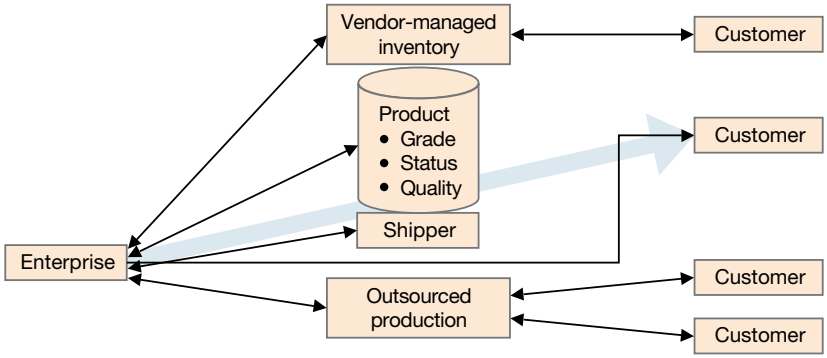
In (a) the current status, denoted by X, is well within the solution set described by the intersection of lines A, B, C and D. When D changes to D' (b), perhaps in response to a shift in energy prices, X is no longer a valid solution (eg, it has become unprofitable). Enterprise planners must be able to alter production in response, for instance by delaying production or slating it for another mill.

Delivery

The past two decades have seen such rapid advances in logistics that the overnight delivery of a package to the other side of the globe is now commonplace. This has resulted in an interesting quandary: customers now demand near-instant gratification while not expecting to foot the bill. Organizations who find themselves in this bind are seeking ways out of the dilemma. These include improving customer service and product tracking capabilities, outsourcing production and delivery, and introducing vendor-managed inventory 5.

With its Industrial IT product line and other offerings aimed at comprehensive integration, ABB supplies the common thread linking them. Manufacturers, and

5 Regardless of the means used to manage logistics, it is incumbent on the manufacturer to ensure good information.



their customers, now have accurate and timely data on order production, order location and delivery status, regardless of the information source. Finished products, produced to order, are, after all, valueless until delivered; only then can a bill be issued and revenue realized.

Application

While the past five years have seen a supply chain revolution, it was not one that was enabled by the media-driven torrent of "e" hype. It was, rather, the quieter, deeper currents represented by incremental, opportunistic applications of information technology to business and production problems which produced real value.

ABB has been very active in this supply chain revolution; for example, in the paper industry:

■ At Willamette Paper, an enterprise system efficiently allocates customer demand and production among seven mills and four sheeting facilities. The results are improved quality management, less waste and higher customer satisfaction. The mills also have improved response time and become more flexible manufacturing environments.

■ Smartpaper will install a series of ABB enterprise systems to manage customer service, quality, production planning and product tracking throughout the supply chain. The new technology delivers real-time information about the papermaking process to managers, allowing them to monitor, manage and optimize paper production.

■ Visy Paper and ABB have created a global production management and product tracking solution that will link no less than eight production sites and two corporate headquarters in America and Australia. ABB serves as solution provider in this instance, working intimately with Visy personnel on implementation and maintenance, and applying innovative financing to reduce capital costs. Visy will use ABB to serve its customers in new ways, including vendor-managed inventory and improved logistics methods and means. ABB will also enable Visy to communicate with customers and managers via the Internet.

■ ABB's energy management and optimization solution allows manufacturers to quantify energy costs as a factor of production and to link directly to energy suppliers at more than 30 pulp and paper mills in Europe. This solution provides integration with manufacturing equipment and suppliers, load allocation, shedding and forecast, and tie-line monitoring. ABB customers can now tie energy costs directly to the production of a customer order, allowing more accurate costing in a volatile energy environment. These systems control more than half the energy used in Finland!

The value chain will go on having to tighten – becoming faster, more effective and efficient, and more responsive to customer's needs, at a profit. That is what business is all about.

Author

Matthew Montague
ABB Inc.
MS 8530 650 Ackerman Rd
Columbus, OH 43202-1577, USA
matt.l.montague@us.abb.com