

Industrial^{IT} cpmPlus Enterprise Connectivity Collaborative Production Management

Improving the total cost of ownership of your ERP System



Realize the true value of your ERP investment with minimal integration effort

You've invested a great deal in your ERP system.... in terms of time and money. While you may be effectively managing your business systems, you may not be using your ERP system to its full potential. As companies strive to become more adaptive in the global marketplace, the integration between plant operations and enterprise business applications brings major opportunities to improve productivity, flexibility, quality control and to reduce the order to cash cycle. Realizing these opportunities ultimately improves the return of your ERP system investment.

Even with ERP companies adopting standards like Web services and ISA-95, most manufacturers have multiple systems of varying vintages. The challenge becomes obtaining the required information while preserving the investment in the existing systems.

ABB's Industrial IT cpmPlus Enterprise Connectivity (ECS) bridge the vertical integration gap between Business and Manufacturing systems, delivering significant new opportunities to increase productivity.

The connected enterprise: from the business system to the plant floor

As with most major ERP suppliers, SAP has introduced its Web Service integration platform. Because of the complexity of ERP systems, SAP and other players have had to adopt multiple, different strategies to integrate business and manufacturing. Where the manufacturing system requirements are relatively light, with production orders being transferred from the business system and production responses being set from the shop floor, SAP positions the xApp Manufacturing Integration and Intelligence (xMII) as the interface of choice. In more complex scenarios, where interfacing to multiple modules inside of SAP is more likely, SAP positions the eXchange Infrastructure (XI) as the most suitable interface. SAP, along with other ERP vendors, has adopted the ISA-95 Enterprise to Manufacturing Integration standard for Process Industry manufacturers. While this facilitates the exchange of information in a common format (figures 1 and 3), challenges remain. ABB addresses these challenges by enhancing the communication between SAP and manufacturing systems, as shown in figures 2 and 4.

figure [1] SAP View-Simple Facilities

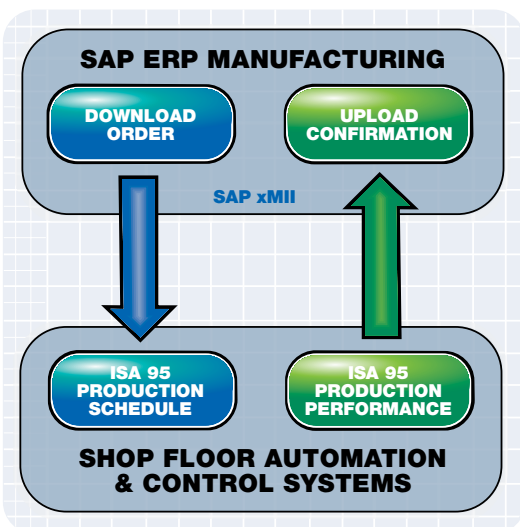
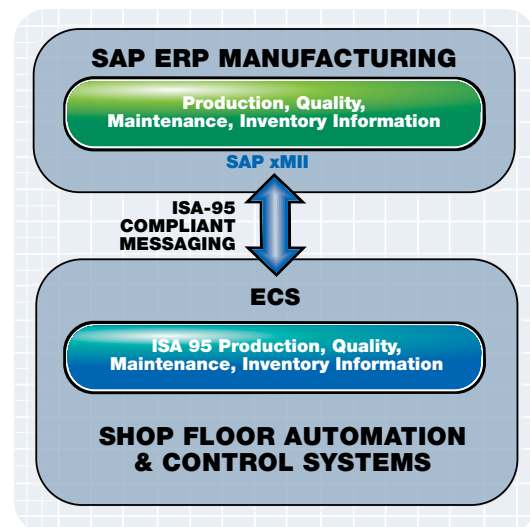


figure [2] ABB View-Simple Facilities



Make the Connection

at lower cost, **with fewer interfaces**

Apart from having to deal with the significant conceptual differences between ERP and Automation systems, perhaps one of the most prevalent challenges is dealing with the enormous installed base that exists in manufacturing today. These systems, few of which are ISA-95 compliant, have been viewed as cost prohibitive to interface to business systems. ABB's cpmPlus Enterprise Connectivity fill this gap and provides a unified framework for dealing with transactional and event driven systems in a common environment, as well as providing a complete mapping between ISA-95 messages received from xMII or XI and the requirements of the plant level systems, whether they are standards compatible (ISA-95, ISA-88), OPC connections, Open Database Connections (ODBC) or connecting to proprietary interfaces.

Additionally, with ECS, it isn't required that the SAP system be upgraded to NetWeaver or to implement xMII. ECS has been designed to connect to legacy SAP R/3 systems via more traditional SAP interfaces such as BAPI, RFC and IDoc and to a large number of other ERP systems through standard ECS interfaces.



cpmPlus Enterprise Connectivity provide a robust, easy to implement solution that is designed to fill the gaps left by ERP interconnect solutions.

figure [3] SAP View-Complex Facilities

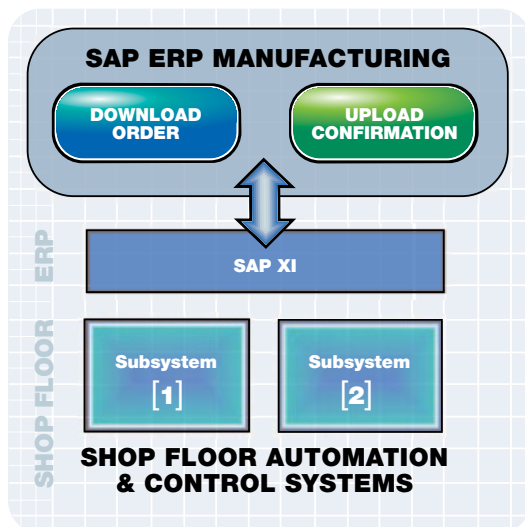
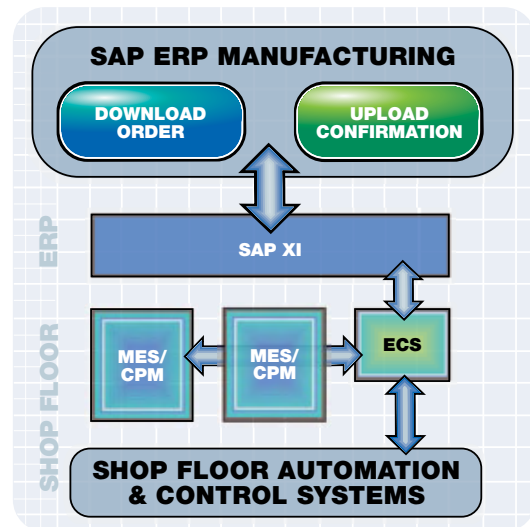


figure [4] ABB View-Complex Facilities



Manage your business

more **effectively**

Reduced Total Cost of Ownership (TCO)

ECS reduces the Total Cost of Ownership (TCO) for integration of ERP and Plant systems by using a standard product for all vertical integrations, rather than of custom developed Point to Point solutions. For example, a company with 20 production sites may need at least 50 interfaces to SAP components. SAP has stated that programming and maintenance can cost around \$20,000 per interface point; the total costs over a five year period are roughly \$5 million. With ECS, only one standard interface to SAP is required.

Improved predictability

ECS enables inventory reductions by linking the real time information about production and material consumption with ERP stock and material management tools. The ECS optimizes the production plan by producing the right products or intermediates at the right time, in the needed quantity.

cpmPlus Enterprise Connectivity also manage demand variations and increases Supply Chain flexibility through real time integration of manufacturing units with ERP production planning and work order management.

This business wide supervision, which provides notification of delays, forecasted material shortage, etc., helps to prevent bottlenecks, saving you time and money.

Lower project risk

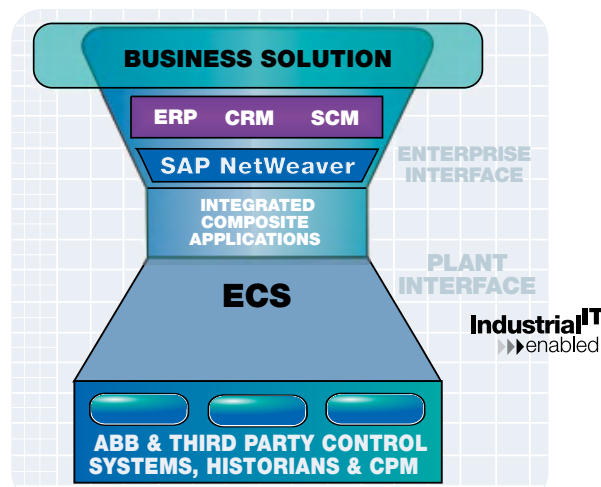
ECS has a standardized SAP certified interface that uses ISA-95, SAP's supported standard for vertical integration in the manufacturing industries. Using these standard certified components dramatically reduces project risk. This also lowers validation efforts for regulated industries.

Built in functions for failover support, message buffering and data validation ensure robust operation. Data is secure; if the connection is down or ERP system is offline for maintenance, no data will be lost.

No need to rip and replace – use what you already have

ECS works with your installed plant systems and helps you get the most value out of the investments you've already made. The integration capability of the System 800xA architecture (on which ECS is built) allows the data to reside in its original system, eliminating the need to replicate it into another historian, reducing cost and improving reliability.

ECS lowers the total cost of ownership by simplifying multiple connections into one standard interface.



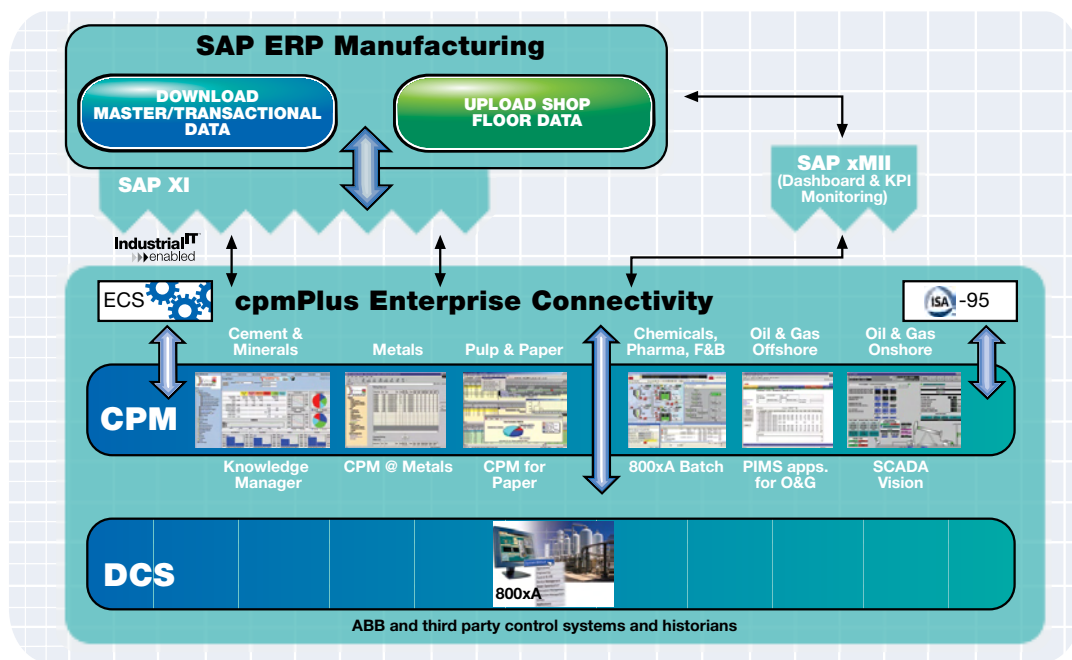
A single point interface for integrations

ECS provides a streamlined, single point interface that is suitable for enterprises of all levels of complexity. Here are a few examples of how it works:

In batch production, the Control Recipe is stored in the SAP Production Planning module for Process Industries. ECS downloads the control recipe and populates the parameters in ABB's 800xA Batch Management. During and after the batch execution, status updates and production information is sent to SAP from ABB's 800xA Information Manager. This is an ideal solution for pharmaceutical, chemical and food and beverage industries.

At April Indonesia, a large pulp and paper company, ECS is used for integration between SAP and ABB's Collaborative Production Management (CPM) system in a fine paper mill. This large integration project has three different modules from SAP (SP, PP, PM); with up to 17,000 messages exchanged between SAP and the ABB CPM every day. The ABB CPM sends status updates to SAP during production and provides a production confirmation once production is ready; then SAP creates the customer invoice. SAP also gets information from the ABB CPM to make a Capability and Availability To Promise check.

figure [5] ECS coverage over multiple industries.



In 2004 ECS was installed in ABB's production facility in Dalmine, Italy. Since then, cpmPlus Enterprise Connectivity has been the standard for connecting ABB's manufacturing facilities with SAP and is being implemented in over 100 factories worldwide.



Standard built-in tools

make the connection possible

The **ecsPlus Enterprise Connectivity** provides the basic execution functionality and generic connectivity needed to support configuration and servicing of connectors. It is fully scalable and includes event handling, transaction handling, error and application logging support and failover support. It includes an array of tools to design, configure and administer the Solution:

Process Definition Manager provides process definition, development environment, support for data mapping, event management and deployment. The support for data mapping enables easy maintenance of mapping definitions between the data in different applications. Event management provides real-time status monitoring of events as they are being executed.

ECS Connectors are ready-to-use enterprise services that provide connectivity to a wide range of packaged applications.

ECS connects to and integrates with any SAP R/3 system on the BAPI, RFC or IDoc level. It uses full SAP transactional RFC (Remote Function Call) support to enable high and simple configurability while it automatically transfers data to or from the system (figure 6).

- **Web Services Connector** provides integration with enhanced SOA applications, including SAP NetWeaver (figure 7).
- **Database Connector** is a pre-built component that can connect with RDBMS Databases.

- **OPC Connector** allows real-time applications to directly connect to business systems or Portals.
- **TCP/IP Connector** provides integration with all TCP/IP based applications, such as Web servers and mail servers.
- **XML Connector** provides processing of XML structures defined by a given XML schema.

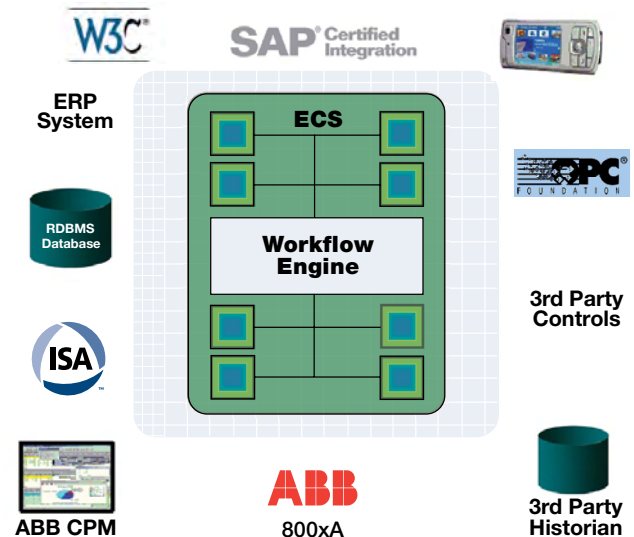
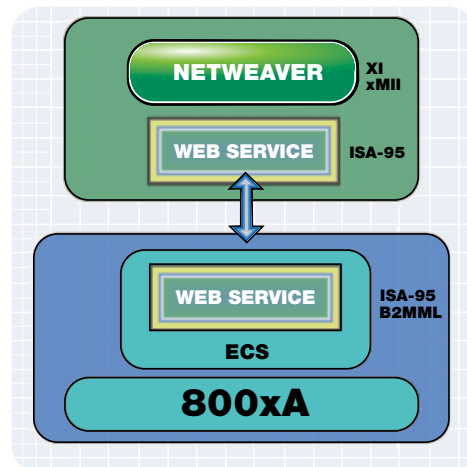
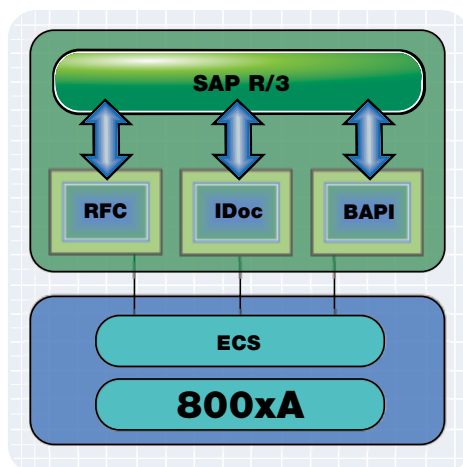


figure [6]

figure [7]



Lower your ERP's Total Cost of Ownership **with simplified system integration**

ABB's cpmPlus Enterprise Connectivity are very versatile and can be used for much more than connecting to SAP. ECS provides the capability to integrate other ERP systems, such as Oracle, or SSA. It also provides integration to any Open Database Connectivity (ODBC) based system, other Service Oriented Architecture (SOA) based solutions, Internet based solutions such as portals, eMail, instant or text messaging systems, providing a true SOA based Manufacturing Service Bus.

ECS provides the mapping of objects between manufacturing and business systems, using ISA-95 as the information structure. The resulting ISA-95 Objects are not just part of the process workflow definition; they couple the properties and aspect objects within any system or device connected to the ABB System 800xA to establish a real-time connection to the corresponding objects in the plant.

ECS provides a single, highly flexible interface. Coupled with simple, straightforward configuration, this results in:

- **Lower engineering costs**
- **Lower project risk**

- **Lower interface maintenance costs**
- **Higher flexibility**
- **Higher degree of reliable information flowing between systems**

This helps the ERP system to better utilize manufacturing information, allowing for faster reactions to changing manufacturing conditions, as well as more accurate decisions made with real-time information.

To see how ABB's System 800xA system and the CpmPlus Enterprise Connectivity option can help you improve the return on your ERP investment, visit us on the web at www.abb.com/cpm



"It provides a comprehensive approach to enterprise integration with automation systems. A user can take the product out of the box and configure a system in a reasonable amount of time, without the need for custom engineering and programming."

Larry O'Brien, *ARCwire Industry News*,
March 3, 2006



Process Automation
ABB Switzerland Ltd.
Collaborative Production Management
CH-5405 Baden 5 Dättwil
Switzerland
Phone: +41 (0) 58 586 84 44
www.abb.com/cpm
email: info.ecs@ch.abb.com

Process Automation
ABB Inc.
Collaborative Production Management
579 Executive Campus Drive
Westerville, OH 43082, USA
Phone: +1 614 818 6300
www.abb.com/cpm
email: info.ecs@ch.abb.com

Process Automation
ABB Industry Pte Ltd.
Industrial Systems Division
No. 2 Ayer Rajah Crescent
Singapore 139935
Tel: +65 6776 5711
www.abb.com/cpm
email: info.ecs@ch.abb.com

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