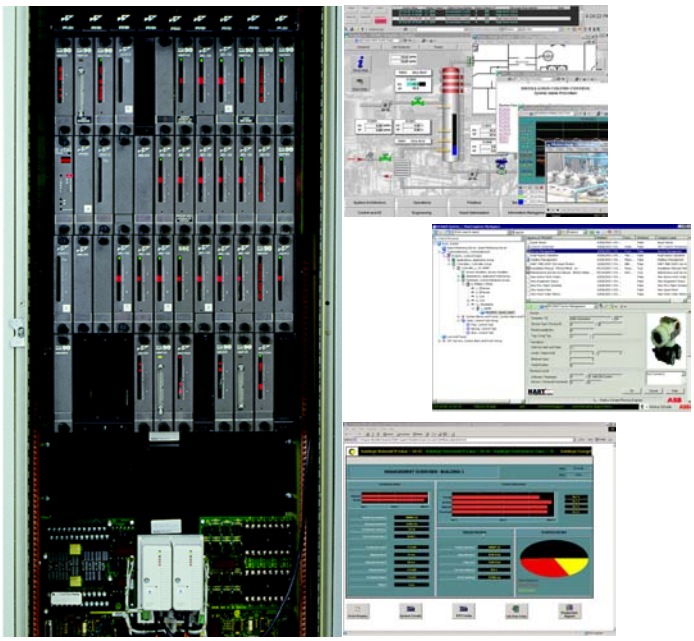
Industrial^{IT} System 800xA
Symphony Harmony

Overview

Features and Benefits

- **Extending the Return-on-Investment of Harmony Systems.** New hardware and software product releases increase operating efficiency and extend the life of installed systems. New products and programs make the decision to evolve existing systems straightforward and easy.
- **System 800xA Extends Harmony System Functionality to Achieve Greater Productivity Gains.** System 800xA extends the reach of traditional automation systems. When integrated with Harmony systems, productivity gains necessary to succeed in today's business world are achieved. System extensions include:
  - –**I/O Capability.** Significantly reduce field wiring costs with S800 I/O. Modular design allows I/O installation in close proximity to sensors, actuators, and field devices.
  - –**Asset Optimization.** Optimize plant asset availability and performance. Significantly increase process uptime and reduce maintenance costs through optimized remediation work processes and early detection of asset performance problems.
  - –**Information Management.** Improving visibility of integrated information results in effective decision making. Information Management provides pertinent information required to perform efficient planning, analysis, and actions.
  - –**Personalized User Workplaces.** Reduced time to decision and action is achieved with Process Portal personalized workplaces. Information and workplace layouts are optimized to maintenance, engineering, management, and operating personnel preferences and needs.

Industrial^{IT} enabled™



Being competitive in the market in today's business environment requires continuous productivity improvements. Traditional process control systems achieved high process availability, reliability, and process quality. Today, more is needed to be competitive. ABB has combined the Symphony™ Harmony system with Industrial^{IT}™ Extended Automation System 800xA best-in-class productivity enhancement software. System 800xA Asset Optimization, Information Management, and Process Portal personalized workplaces optimize productivity at substantial cost savings. The Harmony system provides the flexibility to implement these functions in an incremental fashion. Others promote rip-and-replace migration strategies, while ABB delivers true system evolution allowing Harmony users to build on their strong DCS foundation.

Symphony Harmony is a proven process control system for demanding applications in various industries. The wide range of Harmony references include the power generation, chemical, pharmaceutical, pulp and paper, water and wastewater, petrochemical, metal and mining, food and beverage, cement, and sugar industries. The addition of System 800xA functionality provides Harmony users with the technology and solutions needed to achieve a sustainable competitive advantage in their industries.

ABB

Extending the Return-on-Investment of Harmony Systems

ABB's pledge of *Evolution through Enhancement* (Figure 1) ensures that future advances in system technologies will extend the life cycle and the return-on-investment of the installed Harmony system. Other vendors may talk about investment protection, but ABB's proven programs are truly unique in the industry. All told, from the introduction of Network 90® in 1980, through each of the evolutionary steps of INFI 90®, INFI 90 OPEN, and Symphony Harmony, this family of systems represents the largest contiguous installed base of any process automation system in the world.

ABB continues to add traditional DCS functionality for the Harmony system. This focus has resulted in many new functions and technology updates for Harmony products including Rack I/O modules, Bridge Controllers, communication modules, Composer system configuration tools, and operator consoles. The following sections summarize the most recent enhancements to the Harmony system.

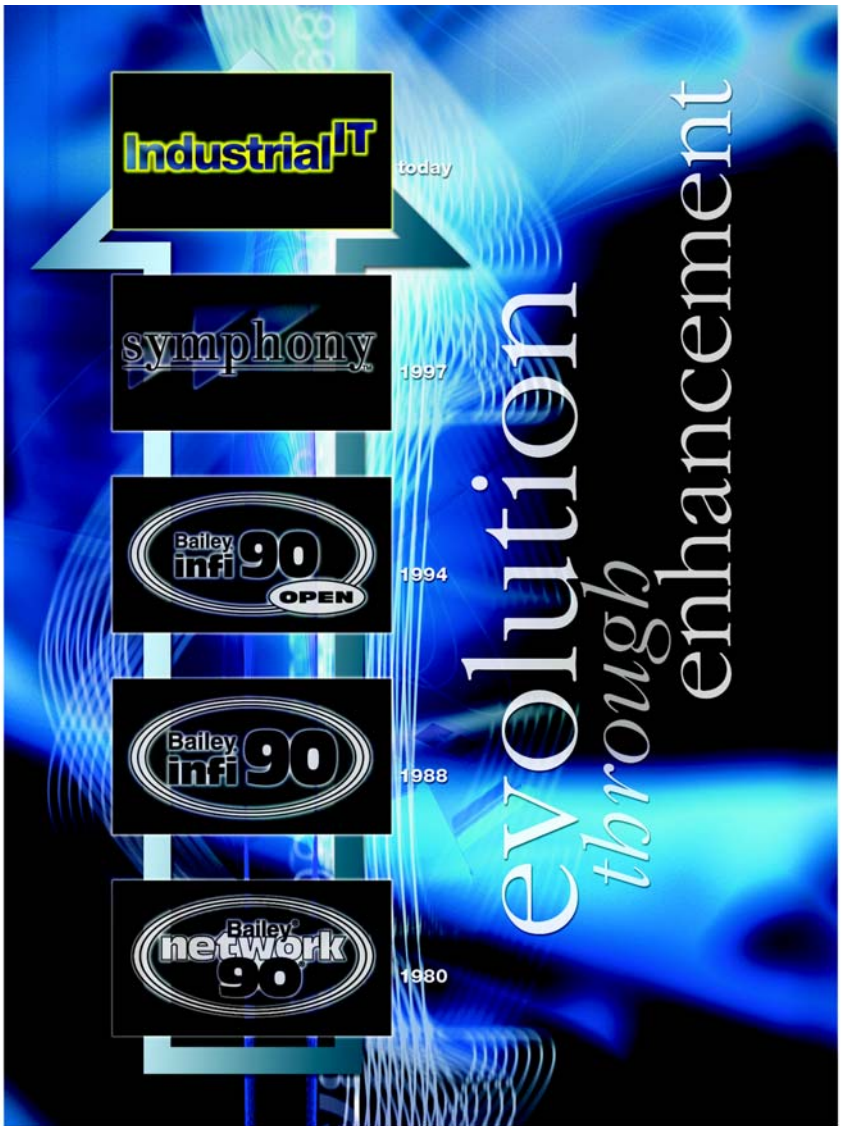


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Figure 1. Evolution through Enhancement

Harmony Control, I/O, and Communications

The Harmony Rack modules (Figure 2) have been redesigned with modern board components and surface mount technology. These redesigned modules are form, fit, and functional equivalents to the Network 90, INFI 90, and INFI 90 OPEN modules providing backward compatibility to ensure a long life cycle for Harmony systems.

The system's flagship controllers, the Harmony Bridge Controller family, have remained state-of-the-art through annual software and hardware enhancement releases. Following ABB's commitment to *Evolution through Enhancement*, the Harmony Bridge Controllers preserve existing system control logic configuration, thereby providing predictable and risk free evolution for the system's control execution environment. The Harmony Bridge Controller family supports all existing function code execution, custom user programs, and foreign device interfaces.

New communication modules have been released (INNPM12/INNIS11) that support both the Plantloop and INFI-NET communication standards. This offering allows system users to incrementally upgrade from Plantloop to INFI-NET one process control unit at a time. Also released, are INFI-NET-to-INFI-NET Remote Gateway modules. All of these communication modules are form, fit, and functional replacements for their earlier versions.

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Figure 2. Harmony Rack Modules

Engineering Tools

Composer, the engineering tool of choice for Harmony systems, provides configuration support for all INFI-NET and Plantloop communication options, controller options, graphics, and databases for all of the current operator consoles. Recent Composer feature enhancements include a View and Monitor mode that provides the ability to view control configurations with live data from any web browser application on the network (Figure 3).

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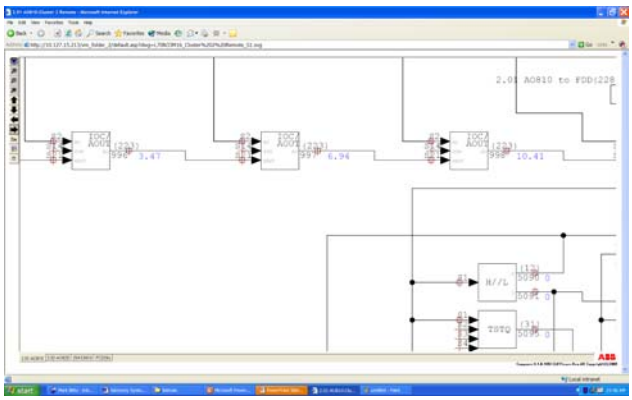

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Figure 3. Composer View and Monitor Mode

Operator Consoles

The evolution of Harmony operator consoles dates back to the early 1980s with the first Operator Interface Unit (OIU). Since that time, ABB has continued to provide console enhancements and graceful evolution to newer technology through tag database and graphics compatibility conversion services. Process Control View, Conductor VMS, Conductor NT, and Process Portal products, with annual value-added functional enhancements, represent a large and growing installed base. (Figure 4).

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Figure 4. Operator Console

Extending Harmony Functionality to Achieve Greater Productivity Gains

System 800xA, through productivity enhancing applications, extends the automation reach of the Harmony system. Integration of these functions (Figure 5) allow Harmony users to achieve the productivity gains necessary to succeed in today's business world. The fast paced global economy demands a competitive advantage, which results when a company can tap into the unused productivity of its assets to meet changing demands. Leveraging System 800xA's technology and solutions, Harmony users can achieve a sustainable advantage by performing smarter and better at a substantial cost savings.

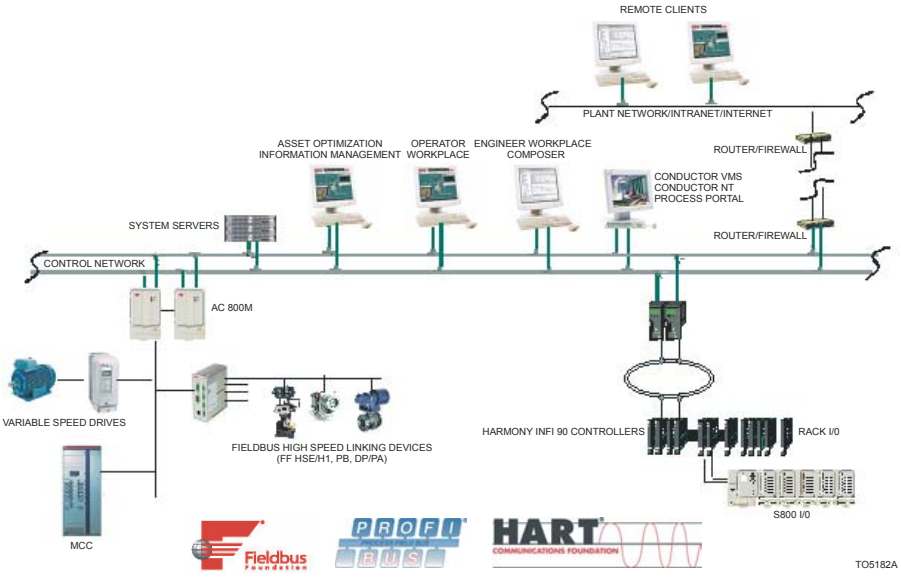

Figure 5. Extending Harmony Functionality

The following sections summarize System 800xA's productivity improvement enhancements to the Harmony system.

System 800xA Control and I/O

Expand the I/O capability of Harmony with System 800xA S800 I/O. The S800 I/O family (Figure 6) has a modular small DIN form factor footprint capable of being mounted local to the sensors in the plant.

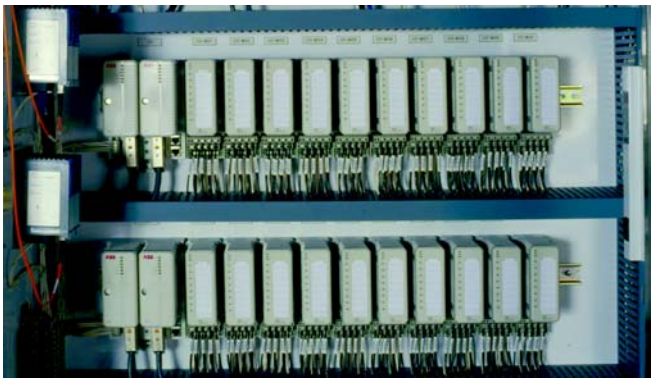

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Figure 6. S800 I/O

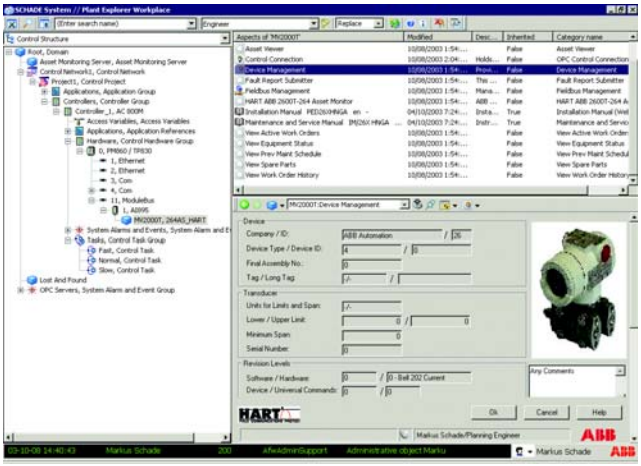
S800 I/O covers all signal types and ranges from basic analog and digital inputs and outputs to pulse counters and intrinsically-safe applications. S800 I/O supports Sequence of Events functionality that provides event time-stamping at the source with one millisecond accuracy. It connects to the Harmony Bridge Controller via the Harmony IOR-800 module and Hnet communications. Redundant communication provides fault tolerant connection to S800 I/O. Standard Composer tools provide the configuration capability for both the Harmony IOR-800 and S800 I/O. A single Harmony Bridge Controller simultaneously supports both Rack I/O and S800 I/O for simple expansions and ease of system evolution.

Powerful Harmony Bridge Controllers include a comprehensive scope of standard and industry specific functions for traditional process control. Harmony integrates System 800xA Control and I/O for extended automation control applications, such as PLC systems, motor control centers, and Remote Terminal Units. Communication options to these controllers exist at both the Harmony Bridge Controller and console level.

For more details, refer to the System 800xA Control and I/O Overview, 3BSE034989.

System 800xA Field Device Integration

System 800xA Field Device Integration (Figure 7) lowers life cycle costs through significant savings in the design, implementation, and operation of field equipment. The harnessing of untapped potential from the substantial installed base of HART® devices conforms with the ARC Advisory Group analysis that: “Users can employ many of their HART field devices with new generation automation architectures, making the migration to a new Process Automation System more economical while increasing the availability of intelligent data that has long been underutilized.”



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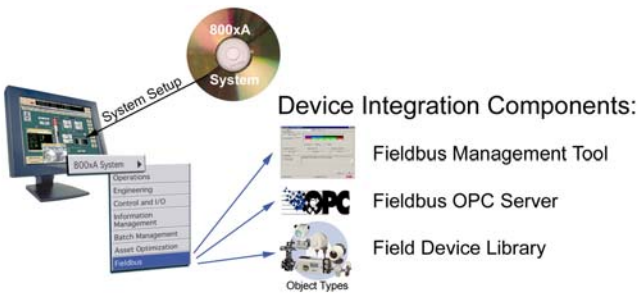

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Figure 7. Field Device Integration

Digital information from HART devices is accessed by the System 800xA Fieldbus Management tools that physically connect to HART multiplexer units. These multiplexers receive HART device data by cable connections from standard Harmony Termination Units. ABB’s HART solution supports device parameterization and remote monitoring of signal statuses and process variables as well as diagnostic information through use of device specific Device Type Managers (DTMs), which are

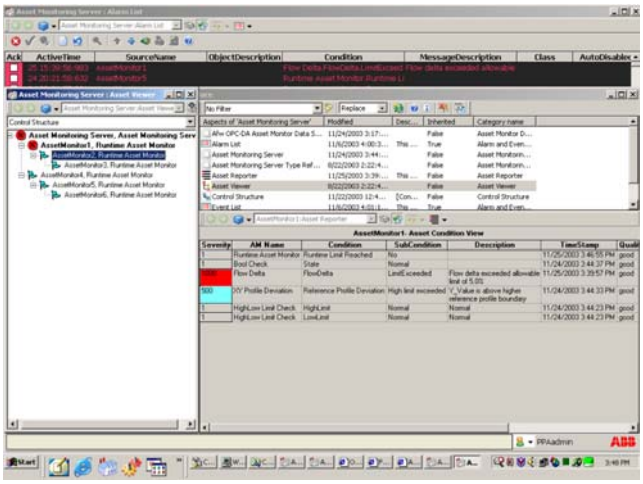
supplied by the respective device manufacturers. In addition, the tight integration of HART devices within Harmony enables improved device maintainability through asset monitoring and optimization.

Foundation Fieldbus and Profibus interfaces are available through the AC 800M controller.

For more details, refer to the System 800xA Field Device Integration Overview, 3BDD013081.

System 800xA Asset Optimization

With access to installed HART field device information, Harmony users can now take full advantage of System 800xA's Asset Optimization features. The software (Figure 8) exploits the wealth of field resident information accessible through HART/fieldbus and higher-level systems to access and document equipment conditions in real-time. These functions enable personnel to schedule maintenance accordingly. Additionally, the software seamlessly integrates plant maintenance and calibration management systems to greatly reduce the time to repair through streamlined work processes.



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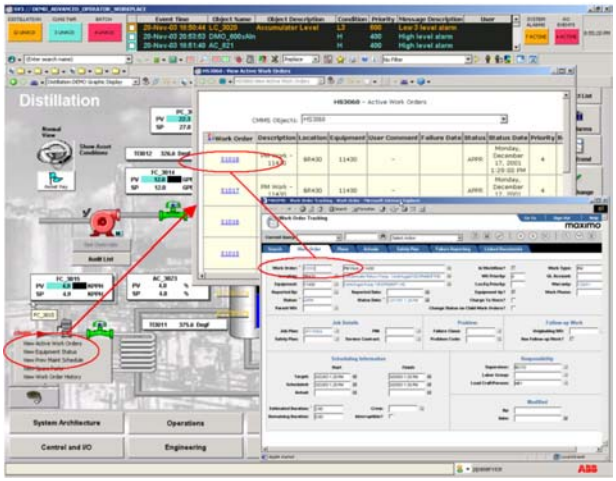

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Figure 8. Asset Optimization

System 800xA Asset Optimization highlights include:

- **Complete Asset Optimization:** Provides a higher return on all plant assets through optimized remediation work processes and early detection of failure via its single environment for engineering, operations, and notification.
- **Automatic Monitoring of Maintenance Conditions and Automatic Alarms:** Real-time monitoring of asset Key Performance Indicators (KPI) facilitates fast, reliable implementation of corrective actions.

- **Plant-Wide Adoption of Predictive and Proactive Maintenance Strategies:** Collects, aggregates, and analyzes real-time plant asset information to provide advanced warning of degrading performance and impending failure.

- **Consistent Reporting of Plant Asset Health Status:** Reporting features provide visualization of current health conditions. Analysis features provide the ability to drill down to problem root cause of failure.

- **Reduced Time to Repair through Optimized Work Processes:** Integration of disparate Computerized Maintenance Management System (CMMS) data, calibration system data, condition monitoring system data, and control system asset data provides users a single application view, leading to quick and efficient assessment of maintenance needs and status.

For more details, refer to the System 800xA Asset Optimization Overview, 3BUS092078.

System 800xA Information Management

To achieve a sustainable competitive advantage, manufacturing and businesses must be able to adapt quickly to market changes. This makes the timely collection and distribution of reliable information to the plant's decision-makers critical. System 800xA Information Management provides the ability to collect and securely store business and process data from all of your plant sources. This data can be analyzed and transformed into useful information, and presented to the plant users to improve operations efficiency and profitability (Figure 9).

System 800xA Information Management features include:

- **Intuitive Information Presentation:** Desktop displays provide managers and other plant users concise, enterprise-wide system and process information in a familiar office presentation format without leaving their office workplace. A discrete tag ticker continuously shows business KPIs providing fingertip real-time and historical information on planned versus actual production status. Tag ticker information can be supplemented with a trend display when more detailed information and status is required.

- **Automated System Actions:** Versatile scheduling options provide automatic triggers for key system actions such as process data collection, running calculations on process data, report generation, historical information archiving, and history data consolidation to provide a single plant-wide history repository, as well as system back-up functions. Scheduled actions can be based on cyclic scheduling, event-driven, time based, or performed on demand requiring minimal effort to perform repetitive system activities.

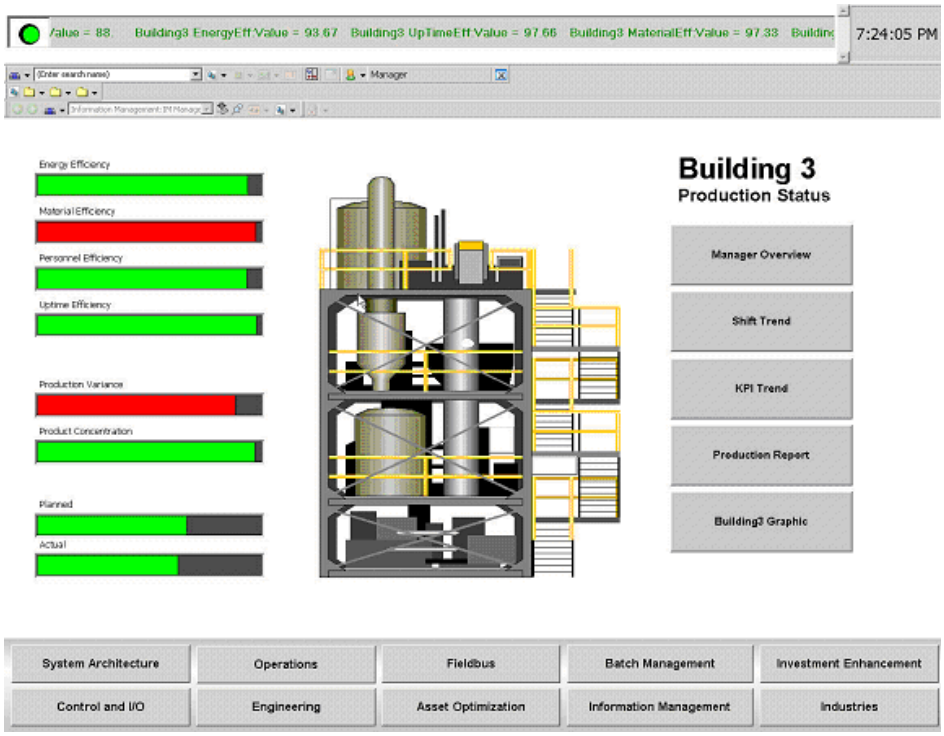

Figure 9. Information Management

- **Flexible Report Generation and Distribution:** A variety of reports are supported including Microsoft® Excel and Crystal Report™ providing very familiar, easy-to-use formats. Standard report templates are included, which offer quick report setup. These reports can fulfil plant and regulatory agency documentation requirements as well as provide powerful tools for decision-making and planning for improved operations performance.

- **Secure Historical Data Storage and Access:** Fault tolerant and distributed data configurations provide dependable data and information availability. The information is also protected by user access restrictions and offline storage. Users can be confident that electronic record keeping requirements are being met and that their decisions are based upon reliable information.

Information Management is integrated with Harmony and acts as another node on the INFI-NET control network ensuring that all process data and events are securely collected, stored, and archived. Plant users are then able to access, analyze, report, and document all Harmony data to improve plant operations.

For more details, refer to the System 800xA Information Management Overview, 3BUS092079.

System 800xA Personalized User Workplaces

Unique to System 800xA Process Portal is its ability to gather information from multiple plant sources and transform it into relevant information for a diverse set of users such as maintenance technicians, process engineers, production managers or plant operators (Figure 10).

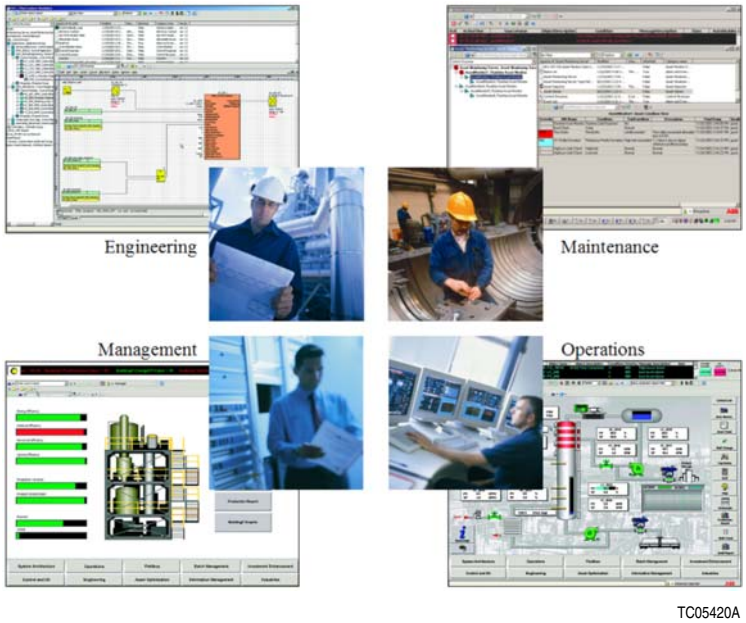

Figure 10. Personalized User Workplaces

The enabling technology for this data access, storage, and management is ABB's patented Aspect Object™ framework (Figure 11). Aspect Objects relate all plant data, the aspects, to specific plant assets, the objects. For example, aspects are informational items associated with objects, such as I/O definitions, engineering drawings, process graphics, reports, trends, etc. that are assigned to each object in the system. Aspect Object navigation presents the entire production facility in a consistent, easy-to-view fashion. This allows a single window environment to include smart field devices, asset optimization functions, information management, batch management, safety systems, and Manufacturing Execution Systems (MES) applications.

System 800xA Process Portal features include:

- **Personalized Workplaces for Focused Information Access:** Workplace layouts are adjusted and optimized to user preferences and needs with individualized menus, toolbar contents, and display locations. Operator, maintenance, engineering, and management personnel are at ease and perform their functions efficiently. Windows® management functions such as safe areas, and pinning and stacking priorities minimize operation errors.

- **Intuitive and Flexible Navigation for Fast Information Access:** Quick access with familiar web browser tools to displays and information is provided. Favorites, history lists, shortcuts, and hot buttons provide navigation through a process production facility quickly and accurately. Use of the right mouse button provides access to additional details.

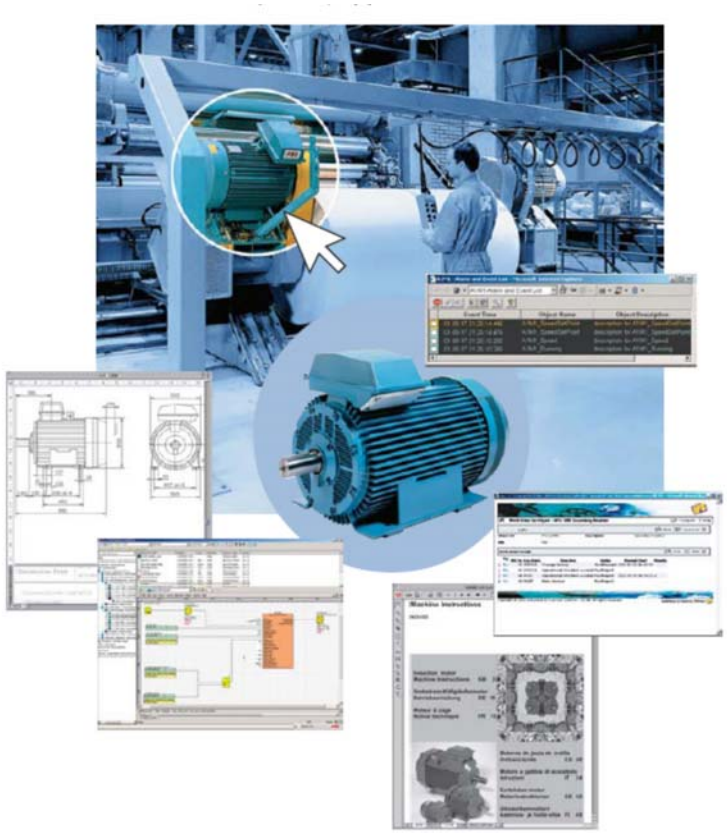

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Figure 11. Aspect Objects Platform

- **Integrated Data for Informed Decision-Making:** ABB extends the automation reach by integrating information from a wide range of ABB applications, other automation systems, and business systems into System 800xA on common displays. This single window provides users a much broader view of the facility from which to make more informed decisions.

- **Comprehensive Operator Functionality for Reliable Control:** System 800xA Process Portal provides a complete set of operator functions that include realistic process graphics with standard faceplates, superior trending capabilities, intelligent alarm and event handling, production reporting, and remote messaging.

These personalized workplaces are integrated within the Harmony system to provide users continuous productivity improvements for their installed system. These workplaces can coexist with existing Harmony operator consoles providing the option to immediately gain the added benefits of System 800xA Process Portal functionality without completely evolving the existing Harmony operator consoles. Recognizing the importance of existing process graphics with respect to operator familiarity and investment, ABB offers a graphics conversion service to those who are considering evolving their Harmony operator consoles.

For more details, refer to the System 800xA Operations Overview, 3BSE034823.

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