



**InduSoft RealTime Performance Management**  
*Performance Management Solutions Using InduSoft Web Studio*

*A white paper from InduSoft*



## **Abstract**

This paper discusses performance management systems and the benefits of implementing such solutions using InduSoft Web Studio and InduSoft RealTime Performance Management. Examples of industries currently using performance management systems include Food and Beverage, Chemical, Pulp and Paper, Water and Waste Water, Pharmaceutical, BioTech, Oil & Gas, and Power Generation.

## **Business Drivers**

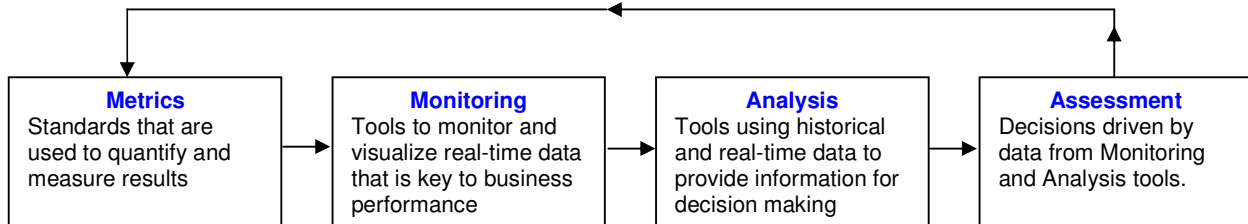
Performance management software systems are becoming an essential part of an overall business strategy for enterprises in the manufacturing and energy production industries. Businesses in these industries are employing it to drive their business toward optimal asset use and increased overall business performance. By collecting data from several different sources, such as plant-level and enterprise-level systems, information can be obtained, organized, analyzed and put into a format that leads to fact-based, data-driven decision making.

Regardless of the industry, most companies report that they realize benefits almost immediately and achieve a complete return on investment within six to twelve months. Even companies that historically spend a small percentage of their revenue on IT see performance management systems that analyze data in real time as an important component in helping to maximize their company's productivity and profitability.

InduSoft RealTime Performance Management is an *application template* that, used in concert with InduSoft Web Studio, can assist companies in quickly and inexpensively developing and implementing performance management systems. Subsequent sections explain the components that compose such systems, how they work together, and the business value they provide.

## Components of an RtPM System

The following diagram depicts the key components of a performance management system:



**Figure 1: Components of a Performance Management System**

- **Metrics**

Business and Process modeling can be used to establish key performance metrics to be monitored, and are established based on the industry need. Examples of metrics can include any or all of the following:

- Production output
- Yields
- Defect reasons
- Power consumption
- Productivity
- Performance to customer orders

- **Monitoring**

The monitoring element employs the discipline of collecting and collating data from a number of disparate sources that, like metrics, are industry dependant. Examples of data sources include

- HMI/SCADA systems
- PLCs
- DCS
- Historians
- WMS
- ERP

The accumulated data from these sources is synthesized into Key Performance Indicators (KPIs).



Once the data has been collected, it must be properly displayed. Displaying KPIs and other critical information to management and operations personnel is a vital element in the larger task of improving business performance. The information is typically displayed in a Digital Dashboard format using gauges, bar graphs, charting, and scrolling marquees for easy interpretation of the data. Event-based notification is also employed so that operations or management personnel can take appropriate and timely action when important or unforeseen events occur.

Consumers of this information should be able to access data using Web Thin Clients, a wired or wireless link, or through Digital Signage such as large LCD or plasma displays. Wireless links can be used to notify specific individuals using mobile devices, whereas digital signage displays can be used in a manufacturing facility to communicate with multiple employees.

- **Analysis**

Included in this stage are tools used for tracking metric performance using real-time and historical data, and tools for enhanced decision-making support. This analysis can include SPC analysis, financial impact assessment, and so on. The analysis model sometimes requires integration between the Performance Management and an ERP system for data on cost, revenue, and customers.

- **Assessment**

Assessment is the final element of a performance management system, and perhaps it's the most important. Collection and analysis of the data has little meaning unless it produces *actionable* information that can be used to make improvements in a company's performance. The Assessment stage uses the information from the Monitoring and Analysis stage to make critical changes to some aspect of a company's operation that will improve business results.



## **Example System Architecture using InduSoft RealTime Performance Management**

Performance management systems can vary significantly from industry to industry. Varying business objectives as well as the system components (such as automation and ERP) with which it must interface can also affect the architecture of any given performance management system. Figure 2 on page six depicts an example architecture using InduSoft RealTime Performance Management in a production environment. The example architecture includes the following elements:

- **Remote InduSoft Systems**  
This element comprises one or more HMI/SCADA systems running on separate PC(s) that have a system powered by InduSoft Web Studio software. These systems can be centrally located or located at remote sites, all connected over a network. They may interface to one or more PLCs, DCSs, RTUs, and so on for supervisory and data acquisition functions. An interface to these remote IWS systems would use a TCP/IP Client/Server communications structure to exchange data.
- **Remote non-InduSoft Systems**  
This element comprises one or more HMI/SCADA systems running on separate PC(s) that use software other than InduSoft software. An interface to these systems can be provided through OPC (OLE for Process Control) or through relational database queries.
- **Historian**  
A Historian may be used to capture large amounts of data at high speeds. If a Historian is not employed, data can be stored in a database at the HMI/SCADA system level. Access to Historian information may be required in order to perform the real-time performance management analysis.
- **ERP System**  
An Enterprise Resource Planning System may contain information that is useful for monitoring and analysis of things such as cost data, customer orders and delivery requirements, etc.
- **Real-time Performance Management Server**  
The Real-time Performance Management Server is the heart of the system. It reads data from several sources using a variety of data communication mechanisms, puts the data in a Unified Data Model that defines the data source, time-stamps the data, and so on. The server runs the Monitoring and Data Analysis tools, generates the HTML screens for visualization, and is a Data Server for Remote Viewing Stations.
- **Hi-availability Web Server**

The Web server provides HTML Web pages to Web Clients that want to access the performance management data. This may be a corporate or dedicated Web server, and can run in a redundant server mode.

- **Web Thin Clients**

This element comprises one or more PCs that have a wired or wireless connection to the Web Server.

- **Digital Signage**

Digital signage is similar to a Web Thin Client, but does not have any user navigation, such as a mouse or keyboard, and often has a rotating display (showing multiple screens, each for a limited time).

- **Wireless Stations**

This element can include PDAs and Tablet PCs running Windows operating systems such as Windows XP, Windows CE, and Windows Mobile, and which can be connected to a remote network.

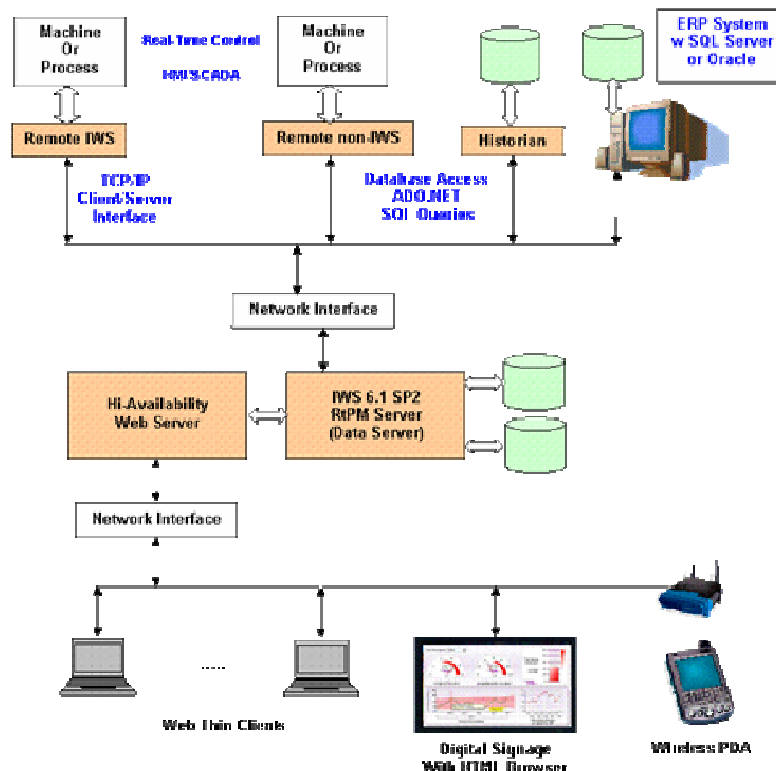


Figure 2: Example Performance Monitoring System Architecture



## **InduSoft Web Studio Advantages**

InduSoft Web Studio has many built-in features and capabilities that can be used for building RtPM solutions that are scalable, extensible, and cost-effective. These features and capabilities include

- **It runs on all Windows OS platforms**

InduSoft Web Studio applications run on all supported Microsoft Windows platforms, including Vista, Server 2003, XP, 2000, NT Windows CE, and Microsoft Mobile. A single development environment can be used to develop applications for any of these Windows platforms. For performance management applications, Windows Server 2003 or Vista is the optimum choice, especially if you are supporting a large number of Web Thin Clients.

- **It supports both Microsoft standards and industry standards**

Because InduSoft is a Microsoft Gold Certified Partner, InduSoft Web Studio supports both Microsoft and all key industry standards. These standards include

- .NET Framework
- ActiveX/.NET Controls
- COM/DCOM
- ODBC (Open Database Connectivity)
- ADO.NET (ActiveX for Data Objects)
- XML
- SOAP
- OPC Client/Server
- DDE Client/Server
- VBScript

Support for these Standards allows interaction with a wide range of other Microsoft applications, such as Microsoft Office, relational databases, and third party applications.

- **It supports redundant system operation and redundant databases**

For high-availability operation requirements, InduSoft Web Studio is an excellent choice. InduSoft Web Studio supports server-level redundancy and provides built-in redundancy for relational databases (full redundancy or store-and-forward). Web Thin Clients, Digital Signage, and Wireless PDAs automatically switch to the secondary server or secondary database if the primary device fails.



- **It provides a rich set of objects and supports third-party ActiveX and .NET controls**

InduSoft Web Studio includes a rich complement of objects and tools used to build digital dashboards. It is also a container for third-party ActiveX and .NET controls, allowing an even wider range of graphical components and functions to be added.

- **It includes a wide variety of high-speed communication drivers in addition to OPC support**

With over 200 high-speed communication drivers from which to choose, InduSoft Web Studio is able to directly communicate with a wide variety of PLCs, RTUs, and other automation devices. It can also be configured in either an OPC Client or OPC Server mode or both, for communicating with several automation software platforms.

- **It supports ADO.NET and ODBC**

InduSoft Web Studio supports interaction with a wide variety of relational databases through its ADO.NET and ODBC interfaces. Some objects have built-in ADO.NET support, allowing direct storage and retrieval of alarms, events, trend points and data without the requirement of writing special code. ADO.NET or ODBC can be used to interface to ERP systems.

- **It provides scripting support**

Both Microsoft VBScript and InduSoft Web Studio scripting language support are included. VBScript can run on both the InduSoft Web Studio Server and any Web Thin Client. VBScript supports ADO.NET, Microsoft Office Automation, XMLDOM, and a wide variety of other services.

- **It has built-in Web Thin Client support**

InduSoft Web Studio supports up to 256 simultaneous Web Thin clients, based on the license configuration. Microsoft SharePoint or other third-party Web Services are not required for Web Thin Client operations. All InduSoft Web Studio application screens can be saved in HTML format.

These Web pages can then run on the same PC as the InduSoft Web Studio runtime, or on another PC that serves as a Web server (running Microsoft IIS or another Web Server such as Apache for Windows). The runtime application serves as a Data Server, with available redundant system and redundant database support.

Data communication to Web Thin Clients can be encrypted using RC6 128-bit encryption technology for an added layer of network security. Once a Web page is selected by a Web Thin Client, any data on the Web page is automatically updated (pushed to the Web Client using Data Push technology by the InduSoft Web Studio server) if the tag value changes.





- **A secure viewer is available**

In a world with significant security threats from the Internet, it's advisable to ensure that business computing assets are used only as intended. In some cases employees need access to the Internet for business reasons, but that's not necessarily the case for all employees in all businesses. InduSoft Web Studio is a browser-based system, and the designers therefore recognized the obvious security challenges such an unprotected system can pose. The solution is a secure viewing option that doesn't allow operators unlimited network access.

InduSoft Secure Viewer, available as an add-on feature, enables operator access to all necessary business assets, but restricts operator use to those assets alone. Using it you can help to ensure that plant floor and other IT assets remain secure from both inadvertent and hostile threats.

- **It supports add-on tools**

Because InduSoft Web Studio is a container for ActiveX and .NET controls, there are several analytical tools (such as SPC) that can be easily added to an application. You can add and communicate with these tools using OPC. Data stored in the application can be passed to these third-party tools for further processing, and the results can be displayed directly by the tool or passed to another dashboard object for display.

- **It support digital signage**

Using built-in Web Thin Client and VBScript support, Digital Signage displays can be easily developed. Digital Signage can be implemented in the form of a Web Thin Client display but without the mouse, keypad, or touch screen interface that usually accompanies a Web Thin Client. With VBScript, however, the identity of the Digital Signage unit is easily obtained and the rotation of displays can be controlled by VBScript.

- **You can configure it online**

InduSoft Web Studio supports on-line configuration, which means it's not necessary to shut down the runtime in order to make a change. You can operate the development environment separately and, when you're ready, these changes will take place during the next processing cycle in the runtime.

- **It provides a rich set of development tools**

Several tools are included with InduSoft Web Studio that can be used to assist in the diagnosis of development and runtime problems such as communications with field devices, databases, and Web Thin Clients.

## Summary



InduSoft RealTime Performance Management and InduSoft Web Studio together provide a set of tools and capabilities to build flexible yet powerful performance management systems that can be implemented at a price significantly less than other competitive products. InduSoft Web Studio contains a rich set of communication drivers and interfaces to field devices, relational database connectivity, and Web Thin Client support. Using these powerful features, you can integrate both modern and legacy systems to monitor your manufacturing operations and optimize operational efficiency, boosting profitability.ere

For more information, to arrange for a demonstration, or to have a consultant determine how InduSoft can benefit your operations, contact us at 877-INDUSOFT or 512-349-0334 or e-mail us at [info@indusoft.com](mailto:info@indusoft.com).

InduSoft. Realize Your Potential.