ERP Connectivity – Integrating Real-Time SPC into the Enterprise

Successful manufacturers use ERP systems to manage and monitor overall operational performance across the enterprise. However, when considering the KPIs associated with quality, ERP systems are frequently configured to consider only final counts and totals, as opposed to linking corporate goals to shop floor quality performance.

WinSPC, a statistical process control software application created by DataNet Quality Systems, connects directly to production equipment on the factory floor, collecting and storing process performance data in real-time. By integrating WinSPC with the ERP system, WinSPC provides a direct linkage to this otherwise missing production data, together with analysis of process performance and product quality.

WinSPC is designed to provide a bidirectional connection between the ERP and shop floor production metrics, ensuring that standard set-ups and subsequent changes made through the ERP system flow seamlessly to WinSPC. Similarly, manufacturers can ensure that process metrics are automatically delivered from WinSPC to the ERP system for visibility and tracking of product quality.

Integration Business Value

Inbound Setup and Admin Tasks – ERP > WinSPC
- One source for administration with automatic updates between systems
- Consistent revision level control on parts, variables, spec limits, etc.

Outbound Quality Updates – WinSPC > ERP
- Quality status posted to SAP (lot disposition) for more visibility
- Reduce operator data entry errors and ensure data integrity

Use Cases

Shared Configuration Between Systems

ERP systems typically manage part number or SKU assignments from new order entry through final delivery. These product definitions contain common configuration elements that can be shared between the ERP and WinSPC. As new part numbers are generated in the ERP, updates can be passed automatically to WinSPC to eliminate redundant administration tasks and ensure consistency among systems. Additional common setup values may also be shared and linked between systems. Examples include quality characteristics, specification limits, traceability fields (tags/metadata), and more.

Live Quality Data Transfer

Quality data may be captured in either the ERP or WinSPC and updated in real-time between systems. In many cases WinSPC is deployed as an automated data collection front-end directly connecting to quality measurement systems, inspection gages, automated test equipment, and other data sources. The WinSPC graphical user interface is designed to show live quality updates for use during production to optimize shop floor processes. Raw data or summary calculations can then be populated in the ERP to provide an aggregate view of quality performance history.

Lots, Jobs, Batch # and Work Orders

Many companies use lot or batch numbers to manage and track production activity. These inputs may fluctuate frequently as products are produced in the plant. Typically these values are defined within the ERP as orders are entered or they may be manually entered by operators as products are made. WinSPC has several tools to pull lot or batch numbers from the ERP or to allow operators in production to enter these directly as data is collected.

Quality Updates & Corrective Actions

Upon completion of the quality inspection at a manufacturing operation, test data is analyzed in WinSPC in real time with the option to send a notification of inspection results, quality status (lot disposition), and/or corrective actions back to the ERP. WinSPC can communicate alarms, inspection status, pass/fail notices, corrective actions, or summary statistics to the ERP system.

Integration Options

Built-in Functionality

Several out-of-the-box configuration options are available to facilitate communication between WinSPC and an ERP. These include:

- Configurable ODBC and text file devices in WinSPC for capturing inspection data and tag values (job, lot, batch, shift, operator, etc.) from another database, text or .csv file, or other sources.
- Quick access Import/Export functions to upload new parts, variables, spec limits, etc. directly into WinSPC from a text file format.
- Alarm triggers to communicate lot disposition, quality status, alarm conditions, event context, and corrective actions back to the ERP when the SPC system detects a defect or process change/system violation.
- WinSPC reports in a PDF or HTML format directly accessible from within the ERP.

Application Program Interfaces (APIs)

The WinSPC API library consists of over 400 objects and properties that are accessible to other applications to manage and control WinSPC. All the common setup parameters and user interface options are exposed through the APIs, such as: Parts/Processes, Variables, Attributes, Collection Plans, Spec Limits, Chart Display Options, Login/Logout, Alarms and Triggers, and more. The WinSPC Open Architecture Guide defines the API properties and provides several sample applications, including:

- CREATE: part numbers, key characteristics, tag items, collection plans, and other critical tracking values.
- CONTROL: launch WinSPC by part/collection plan specific to the current job, process live data with real-time charts in a visible GUI, or run in "headless" mode in the background.
- CUSTOM: build custom UIs in other systems and let WinSPC analyze the data and generate alarms or feedback with direct communication back to the system of origin.

WinSPC Database

WinSPC manages and stores all Quality/SPC data in a MS SQL or Oracle relational database with a complete audit trail for compliance to regulatory standards. The WinSPC database is fully accessible to other systems through standard ODBC connections. A detailed database schematic and data dictionary are published for table and field definitions.

Bringing it all Together - DataNet Solution Delivery Services

With over 60 years of shop floor experience, DataNet possesses the manufacturing acumen to help you achieve your quality goals. Our Solution Delivery services are designed to quickly take your company's real-time SPC program from concept to implementation. Additionally, we offer a team of skilled programmers and engineers with the expertise you need to quickly begin integrating WinSPC with your ERP system.

Please contact your account representative for more information regarding this valuable service.

Communication Flow - SAP Example

Configuration Data

SAP

Parts
Variables
Tags

Lot History
Corrective Actions
Stats & Calculations
Events

Quality Updates

WINSPC
STATISTICAL PROCESS CONTROL

DataNet
QUALITY SYSTEMS

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