Information Delivery and Reporting

Information delivery and reporting - are you paying for what’s freely available?

Can you imagine what would happen if each and every vendor of industrial automation and MES solutions had their own proprietary version of SQL (Structured Query Language)? And what about communication protocols? Thankfully, the world has moved on and today we rely on standards (de facto and other) to make life more predictable. But there are still a few diehards left and reporting is one of them.

Microsoft’s SQL Server Reporting Services offering should help overcome this hurdle.

Manufacturing and mining enterprises are starting to adopt the principle of Dynamic Performance Management where traditional IT and shop floor IT are merged to provide seamless decision support throughout the organisation. This demand has increased the levels of historical data captured on the plant floor and has brought with it many challenges for the traditional Control and Instrumentation (C&I) personnel. All this information requires careful analysis and collation before it becomes useful knowledge (see Figure 1).

Reporting in the office environment has been with us for many years and has reached high levels of maturity. Today there are many structured reporting tools providing for personalisation, security, analysis, delivery and access to various data sources. In most cases these tools are selected and managed by the IT staff.
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In the automation world we still see custom ASP, MS Excel and MS Access reporting. Many automation software solution vendors charge for their own proprietary reporting packages that have snappy names and that are logically meant to increase their wealth. There’s nothing wrong with that providing these systems are implemented with due diligence with regard to IT criteria, sufficient attention to change management and a planned product life cycle. Often, though, this isn’t the case. Many reporting solutions are typically designed to address some immediate issues and lack the flexibility or resource backup necessary for a long life. Their high cost of ownership typically results in these systems being abandoned or left limping within 3 years of their implementation.

At the plant floor level, the first step of the information delivery process is to capture data in the correct context. For process industries the data context is typically time and quality data, which are typically stored in a process historian. Today’s leading historians can capture in the order of 30,000 data events per second with full VTQ (value, time and quality). This information can be used to answer questions such as: “how well is the process performing?”, “what is the equipment utilisation?”, “what tonnage of bulk material was used?”, and “what was the sequence of events that led to this record output / production stoppage, etc.?"

Typical production information requires further context with is usually based on, or linked to, the product or material being manufactured or processed. In mining this may be the sample identifier, which is the context against which all assay information is captured. In the food and beverage industry, the context may be a lot or batch identifier providing not only context but also the genealogy of the manufactured products.

A large component of MES / MIS is the historical record of the manufacturing process. Much of this information is destined for the office environment in the form of structured reports.

From the above, we can see that reporting can be split into two sections: analysis and structured reports.

**Analysis** is very dependent on the nature of the production process (discrete, continuous or hybrid). Typical analysis functions include process trending, alarm analysis, capacity utilisation and statistical analysis. Advanced process analysis introduces the requirement from expert systems and associated analysis. The audience for these systems is typically very select and operationally focused.

**Structured reporting** is typically generated from a relational database and is where the SQL Server Reporting Services solution is targeted. Seeing the gap, Microsoft released this technology some time ago but with the November 2005 release of MS SQL 2005 and SQL Server Reporting Services 2005, we will soon see this go mainstream.

Microsoft’s SQL Server Reporting Services offers a unique combination of attributes:

- **A complete platform for reporting:** Reporting Services supports the full reporting lifecycle, from authoring to delivery and ongoing management of reports.
- **Flexible and extensible reporting:** Reporting Services creates both static and interactive reports in numerous formats.
- **Scalability:** The product’s server-based design scales easily to support high-volume environments.
- **Integration with Microsoft products and tools:** Reporting Services ships as a component of Microsoft SQL Server and integrates easily with familiar Microsoft tools, such as Office, without programming and customisation. Using a single, integrated platform controls costs and speeds deployment.

### About SQL Server Reporting Services

Microsoft’s SQL Server Reporting Services, included in Wonderware’s IndustrialSQL Server real-time historian, enables organisations to transform valuable enterprise data into shared information for insightful, timely decisions at a lower total cost of ownership.

SQL Server Reporting Services is a comprehensive, server-based solution that enables the creation, management, and delivery of both traditional, paper-oriented reports and interactive, Web-based reports. An integrated part of the Microsoft business intelligence framework, Reporting Services combines the data management capabilities of SQL Server and Microsoft Windows Server with familiar and powerful Microsoft Office System applications to deliver real-time information to support daily operations and drive decisions.
Today, mainstream players such as Wonderware are incorporating Microsoft’s SQL Server Reporting Services into their products and providing this benefit to clients who now have the opportunity of using a widespread de facto reporting standard instead of a sort-lived proprietary solution. SQL Server Reporting Services is included with Wonderware’s IndustrialSQL Server historian with the result that ArchestrA solutions today typically have access to a mainstream-reporting package at no extra cost.

The inclusion of SQL Server Reporting Services with IndustrialSQL Server historian provides end-users of Wonderware solutions a professional reporting tool that benefits from Microsoft’s extensive support infrastructure. This, in turn, allows Wonderware to focus on providing analytical tools such as ActiveFactory and prevents the reinvention of an age-old wheel. Reporting is normally the end-result of an extremely expensive data collection and collation exercise on which the enterprise will base its operational and business decisions. To that degree, reporting needs to be a project on its own rather than a nailed-on addition with a dubious future.

So, before programming your next report or buying a reporting package from your automation solution vendor, check to see what technology you already have. There is a good chance that you may already own Microsoft’s SQL Server Reporting Services.

Figure 3: Trending and analysis using Wonderware’s ActiveFactory