

An Introduction to MES

Manufacturing Execution Systems (MES) have for many years been seen as the missing-link preventing information systems from truly delivering the competitive advantage they always promised. Now with the MES concept an achievable reality, we look at how it can fit into an integrated enterprise solution and what real benefits MES can bring to organisations.

For as long as IT solutions have been available manufacturers have sought to harness their power to assist in the production process. As a result they have proliferated throughout the organisational structure, from the highest level where they've been widely adopted by senior management for enterprise wide resource planning and forecasting (ERP), down to the sharp end of the manufacturing process where they've been used to accurately control and monitor specific production plant and machinery. The subsequent development of large scale integrated SCADA solutions has allowed process specific applications to grow-up from the shopfloor, enabling the monitoring and control of enterprise wide groups of plant, facilitating better management of equipment and providing automated warning of abnormalities in the production process.

Despite these developments however, for many years there has remained an information gap caused by the different data requirements of process management and control at one end of the production process, and planning and forecasting at the other. By its very nature process management needs to work with comprehensive plant specific data in real or near real-time, while forecasting and planning typically makes use of a high volume of consolidated enterprise wide historical information, often days and even weeks after an event.

The requirement to take vast amounts of information from one end of the manufacturing spectrum, transfer, summarise, store, and ultimately process it for use at the other has up until recently made it impractical to work from what is essentially the same source data. As a result resource planning and management has largely taken place in isolation and has become overly reliant on old and potentially inaccurate second-hand information. Many organisations currently undertake strategic planning from figures transposed from weekly manufacturing reports or even monthly presentations to the board. Consequently critical decisions affecting long-term profitability are made from information that's vulnerable to entry errors and may be presented in whatever way the author wishes it to be interpreted. As American writer Mark Twain said "There are three kinds of lies: lies, damned lies, and statistics".

MES - Driving Informed Management Decisions

The advent of practical MES solutions provides the missing link between the two extremes of the production process, enabling the whole operation to work from the same source data. For the first time the shopfloor is literally connected directly to the boardroom, presenting senior managers with comprehensive real and accurate information in whatever time-frame it's required. ERP is transformed from a reactive to a proactive process, giving organisations the power to accurately manage plant wide operations in real-time, rapidly respond to changing conditions and optimise resources across an entire enterprise.



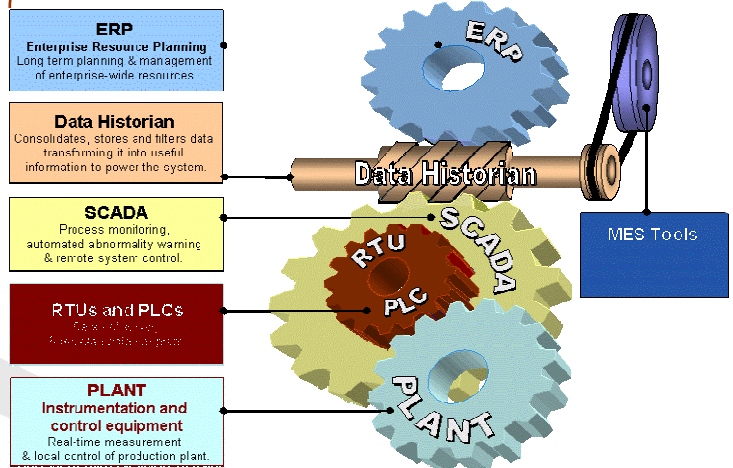
The Benefits of developing an MES Solution

By providing real information on which to base management decisions an MES solution brings with it quantifiable improvements to key performance indicators. MES can realistically deliver:

- A shorter overall manufacturing cycle.
- Lower work-in-progress inventory through detailed material control and actual cost tracking.
- Shorter customer lead times and improved on-time delivery rates leading to a lower finished goods inventory (stock).
- More accurate quality control consistent across the whole enterprise.
- Higher customer satisfaction levels through on-time delivery of products of a consistent quality.
- A more efficient use of plant across the enterprise leading to a higher return on operational assets.

To fully realize these benefits it is vitally important that the MES solution comprises the right blend of products and there is tight integration between every module in the overall information system.

The MES Information Systems Model.



The term MES is often misconstrued (and indeed presented by software vendors) as a specific set of products that bolt on top of a SCADA system. It is more accurate however to describe MES as the overall integrated information solution that delivers real operational information in a readily accessible format from which informed management decisions can be made. Specialist MES tools may be required as part of the overall solution to present specific information so it can be easily interpreted, however this can often be provided via feature rich ERP tools.

The MES solution can therefore be seen as a series of interlocking gears, each being powered by and in their turn driving different parts of the overall information machine. Like any efficient engine each cog must mesh perfectly together allowing a smooth transfer of data; any disconnect in the transmission will lead to inefficient operation, inaccurate resource planning, higher costs and ultimately lower profits. The whole system is powered from a data historian and in the course of its operation an MES solution pumps vast amounts of data up from the shopfloor to be stored here ready to power boardroom decisions. An MES historian acts as much more than just a reservoir in which to dump raw process data however. So ERP tools don't become choked with a flood of irrelevant information the historian must be capable of not only collecting, storing and retrieving large amounts of data, but also ordering and organising it into its proper context. In this way the raw data is transformed into usable information that can be easily analysed to fuel informed operational management and so drive the MES machine.

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