



MES vs. ERP

MES vs. ERP – is it all in the jargon?

Summary

Key Business Issues: Managing factory floor production and effective utilisation of shop-floor data

Linking shop-floor to top-floor is increasingly being recognised as crucial to securing success in the manufacturing industry. The best way to manage factory floor production and achieve the information flow desired, however, is a hotly debated matter. Vendors of specialist Manufacturing Execution Systems (MES) often claim that Enterprise Resource Planning (ERP) software is geared towards office-based tasks, such as accounting and order entry, and as such is of little value to the manufacturing department. ERP advocates, on the other hand, will often point out that the main reason for this argument is historic; ERP software has evolved, with today's solutions offering the functionality manufacturers need alongside the integration crucial for a unified, plant-wide view of production and effective utilisation of shop-floor data.

With today's competitive manufacturing environment, companies will certainly be looking at which technology can help them deliver more quickly, cheaply and efficiently to meet their customer's demands – the question is, can this be achieved through an ERP system or does it require specialist functionality that only MES provides?

Defining MES

Also known as Shop Floor Control Systems or Plant-Side IT Solutions, Manufacturing Execution Systems (MES) are defined by the Manufacturing Enterprise Systems Association as dynamic information systems that drive effective execution of manufacturing operations:

"Using current and accurate data, MES guides, triggers, and reports on plant activities as events occur. The MES set of functions manages production operations from point of order release into manufacturing to point of product delivery into finished goods. MES provides mission critical information about production activities to others across the organisation and supply chain via bi-directional communication."

For many manufacturers MES remains a confusing acronym. Although all systems are used to manage and monitor work-in-progress on the factory floor, the software varies significantly for each vertical industry and product line. Some systems, for example, provide Statistical Process Control, which allows for collection of in-process data, while others offer visual representations of projected workloads. In general, MES systems will allow users to specify when materials should be ordered, to schedule tasks against an organisation's total production capacity through advanced production scheduling (APS), which allows for visual representations of projected workloads, and offer some form of Overall Equipment Effectiveness (OEE) reporting to gauge real-time efficiency. MES can also guide workers or machines through the production process. Specialist functionality for particular process industries can include modules such as ingredient expiration date monitoring and emergency shutdown systems.

What to expect from MES

In summary, MES software aims to provide operator support, production scheduling, genealogy tracking capabilities and accurate, real-time visibility into production performance. As a result such software could deliver the following benefits to an organisation:

- Reduction of errors (and thus a reduction of waste and rework)
- Easier location of the causes of problems
- Reduction of manual entry time
- Reduced cycle-time (and thus increased yield and throughput)
- Efficient use of equipment
- Improved planning and streamlined schedules (enabling a better handling of rush orders and improving on-time delivery percentages)
- Reduced order-to-ship times
- Reduced cost of regulatory compliance

MES software centres wholly on the manufacturing aspect of a business, and as a result its functionality does not naturally extend to cover areas such as finance or customer relationship management. An MES system will, for example, tell you when an item is ready to be shipped but would not automatically handle any invoicing or update a customer's record. In order to link plant floor events in real-time with business events, Enterprise Resource Planning (ERP) or other similar software might be a better option.

Can an ERP application offer the same, if not greater, benefits within a modern manufacturing organisation?

Defining ERP

ERP software comprises a suite of modules which together automate the business administration functions of an enterprise. ERP is generally defined as integrated, multi-module application software packages designed to serve and support several business functions across an organisation:

"An ERP system is a strategic tool that helps the organisation improve operations and management by integrating business processes and helping to optimise the

allocation of available resources. These systems are typically commercial software packages that facilitate collection and integration of information related to various areas of an organisation... By becoming the central information centre of the organisation, ERP systems allow the organisation to better understand its business, direct resources, and plan for the future."*



Although today ERP is considered a desirable tool for most organisations, it has been traditionally associated mainly with discrete manufacturing companies, having originated as an extension of Materials Requirements Planning (MRP). Today, the majority of ERP systems span all the functions of an enterprise. Modules usually include financials, order processing, manufacturing, supply chain and inventory management, human resources and customer relationship management.

A truly integrated ERP system is designed to use one unified database, which enhances communication between all functions and modules. This means that, unlike traditional MES software, ERP provides enterprise-wide collaboration and real-time reporting capabilities.

As with MES software, there is a wide variety of ERP solutions on the market. "A system such as Microsoft Dynamics™ GP, for example, gives you a 360 degree view of your business," says Sally Reynolds, Marketing Manager of Microsoft Gold Partner Syscom PLC, www.syscom.plc.uk. "The integration of a system like this allows anyone within the business to pull off reports and access vital information in real time – for example, a customer service representative can talk knowledgeably to a client on the phone about their latest orders, deliveries and pricing without having to physically go to the warehouse and find the goods. This reduces duplication of efforts and ensures that customers get a faster and more professional service."

The problem in the past with ERP systems was that, despite having their roots in MRP, they provided limited functionality for the manufacturing department. "Of course today ERP systems are a far cry from what they used to be," says Sally. "Now the manufacturing modules in many ERP systems are extremely advanced, offering functionally like job costing, tool tracking and capacity planning."

"Unfortunately the misconception that modern ERP systems do little more than handle orders, stock and financials still lingers, so many manufacturers assume they need additional specialist software when an ERP solution may in fact be the best solution for them."

What to expect from ERP

By its very definition, ERP can aid management of resources across an entire business, ensuring greater efficiency, improved profitability and competitiveness.

In summary, a good ERP system could:

- Connect manufacturing operations with the entire organisation
- Reduce data input, improving efficiency and reducing manual errors
- Improve customer service
- Give an enterprise-wide view and reporting to allow for better, more informed decision making
- Improve collaboration internally as well with suppliers and customers
- Increase visibility of business operations and control costs
- Provide an effective means of translating strategic business goals to real-time planning and control

MES vs. ERP

The pharmaceutical, chemical and food industries have all traditionally been heavy users of MES software. Here the additional, specialist functionality that some MES systems provide is often beneficial – for example, recipe management capabilities, which give machine operating instructions concerning the weight of ingredients and timing of manufacturing events, and statistical process control, which can ensure variables such as temperature do not exceed set parameters, may be essential for a drug manufacturer. Many MES systems also include Advanced Planning and Scheduling (APS) which generates visual schedule boards to represent machine, material and staff availability as well as queued production runs and their due dates. This means that any planned maintenance, for example, is highlighted in a

visual format. MES traceability and genealogy tracking capabilities can also reduce the cost of regulatory compliance by providing manufacturers with a complete manufacturing record containing all the information needed to demonstrate that a process was completely successful. This concern, however, is almost exclusively limited to food, pharmaceutical and medical device manufacturers.

MES systems have not caught on in the same way in non-process industries. For businesses involved in discrete, make-to-stock or make-to-order manufacturing an ERP application can provide a wealth of functionality to manage these types of operations.

"For the most part discrete manufacturers do not need to be able to collect detailed in-process data," says Sally. "The workflow scheduling, bill of material generation and quality analysis capabilities an ERP system provides are more than sufficient. Manufacturers in these industries need to consider whether the additional functionality of an MES system may prove to be overkill in certain situations."

Moreover, organisations today recognise that company-wide integration is crucial for increasing efficiency and gaining the business insights necessary to secure a competitive advantage and maximise profitability. "Software applications that only manage one aspect of a business provide islands of information which can lead to the compartmentalisation of an organisation. Businesses with such systems often lack the information flow they expected to achieve. ERP of course gives this enterprise-wide view. Arguably, the largest benefits of MES come from using the factory floor visibility gained to improve overarching supply chain management and business strategies, so companies who do feel they need an MES system may choose to run this alongside an ERP system to gain a more comprehensive view of production."

Choose the best system for your business

There is no standard tick-list for deciding whether your business needs MES software, an ERP system or both. The key to a successful software implementation is making sure you define your requirements and what is important to your business before selecting which software would best meet your business objectives. "Check out the jargon," Sally advises. "The additional acronyms in the list of available functionality may sound impressive but you may not actually need it."

* Source: US Government