

Real-Time ERP / MES

Empowering Manufacturers to Deliver

Quality Products On-Time

KEN HAYES, CPIM, OCP

VICE PRESIDENT, NEW PRODUCT DEVELOPMENT

PROFITKEY INTERNATIONAL

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Real-time is a commonly used yet loosely defined buzz word in the industry. What does it mean in terms of ERP solutions and what does it take to be considered a real-time solution? For this paper, we shall define an ERP system with real-time capabilities to mean that the ERP system has the ability to update information throughout the system and across your company as the new information is entered *instantaneously*. Following the definition, an explanation into the benefits of real-time capability and the specific areas of a system where real-time is impactful will be provided.

Defining Real-Time ERP

Often with ERP systems, on-the-ground transactions might be executed at point of use, giving the impression of a real time update to the system. Downstream however, batch processes must be run to upload the effect of those transactions to the rest of the system so those effects are visible to users in other modules.

This issue becomes even more complex when dealing with third party applications. There are certainly many good arguments for partnering with ‘best of breed’ third party applications in certain cases. One example might be Sales Force Automation (“SFA”) systems. SFA allows your organization to closely track contact management and sales activities up to the point of quoting and order acceptance. These systems should integrate at some level to your ERP, most likely once the sales lead has become a customer and ongoing order and invoice activity needs to be visible from the contact management system. However, sales prospecting, telemarketing and email campaigns do not directly impact order management, inventory tracking and shop floor reporting and movement.

Scheduling and shop floor reporting, however, are two areas that are served by many third party ‘bolt-on’ systems, but each of these areas directly impact your ability to deliver on time, and it is critical that input and output to and from these systems flow in real-time *throughout the entire enterprise* for you to have a clear picture *at any moment* where jobs are, what issues exist on the floor, and what inventory shortages might impact delivery to the customer.

A third party scheduling system might allow you to adjust work center queues, view capacity and view the latest schedule data from the host system download, but changes from the front office – rush orders, expediting from the customer and sales order cancellations may not be communicated to the scheduler until the next batch download. Your scheduling staff is operating with an incomplete schedule. Changes in the third party system might be made in real-time *within that module*, but input from other modules *is not*. This disconnect from the rest of the system is only exacerbated when the schedule changes themselves are pushed out in batch mode to a third-party shop floor labor data collection system – the work center queues are now in a second order disconnect from front office order changes.

The Benefits of Integrated, Real-Time ERP, MES and Scheduling Systems

Much is made these days of the Global, Interconnected world we live in, from Social Media to Smartphones, but how interconnected is your own shop? Does purchasing know that Sales booked a bluebird, and materials are not available? Can the shop floor personnel have a schedule change at their station communicated instantly from the front office? How many separate spreadsheets does it take for you to run your plant?

Many manufacturers have implemented ERP software systems with the hope of improving their ability to deliver a quality product on-time, while maintaining manageable inventory levels. In an effort to save money, many companies purchased an entry-level ERP system that might manage inventory, or provide a particular focus for a given industry, but over time these systems have been outgrown as these companies face ever-increasing pressure to deliver on-time, improve quality and reduce prices.

A basic system that provides order processing, inventory management, purchasing and accounting functions cannot provide accurate visibility into real-time shop floor conditions and their impact on customer deliverables. Likewise, without real-time feedback from the shop floor, the organization cannot see what capacity actually is throughout the day, so new order delivery estimates are hopelessly inaccurate. To make matters worse, many companies have tried to work around these limitations by creating multiple (dozens of) spreadsheets that carry duplicated and disconnected data. This causes an extraordinary effort to answer a simple question like 'do we really have the material to make this job?'

As the demands for 'better, faster, cheaper' place more pressure on these manufacturers, the need for an up-to-the-minute view of inventory status, allocations and shop floor capacity becomes critical, as it not only ensures an accurate available to promise for the customer, it also has a dramatic impact on cash flow in the organization. Timely purchases that consider all current demand allow the manufacturer to make more efficient use of materials, while purchasing exactly what is needed at a better price.

Scheduling is more critical than ever for the small manufacturer, as charges for shipping errors and late orders can add up fast. Providing up-to-the-second dispatching to the shop floor will ensure the most efficient use of equipment, while freeing the decision makers up to deal with more pressing issues instead of running 'dispatch lists' out to the floor. Knowing the right job to process on a given piece of equipment is essential to avoid these financial penalties. In addition, providing the estimating department a real-time view of material and available capacity can mean the difference between winning and losing the job, *or winning a job that never has a chance to ship on time*. It is essential that Estimating is aware of potential bottlenecks up front.

One other important aspect of real-time ERP should include shop floor transaction handling. For instance, a real-time inventory pick system, possibly bar-coded, is a good improvement, but it still requires an operator leave their station to process the pick. By combining cellular inventory locations with part picking based on assembly flow, inventory could be updated in real-time, accurate and only require the operator to report the assemblies complete at their station – no pick would be required at all.

Functions where Real-Time Integration is Critical

Estimating / Sales and Scheduling

Today, more than ever, the successful manufacturer has to provide more than the lowest price, or the best quality. The key to beating the competition lies in total service of your customer's needs. Competition demands that small manufacturers quote accurately up front – not just costs, but delivery. If you are processing 150 – 200 quotes a month, can you hang your hat on the dates you are giving customers? An ERP system that can account for real-time shop conditions to provide 'what-if' delivery dates is essential for you to gain a competitive edge.

This type of view must consider the routings and bill of material in the what-if, load that against current shop load through the routing, and provide you an accurate Promise Date, **plus** provide visibility as to where bottlenecks **might** exist if the order is taken. Only with this data can you quickly decide if the order is doable – or tell you where on the shop floor you need to focus your attention if the what-if does not line up with the customers requirement. Even if the what-if misses your customer's date, you may very well take the order, *but it is imperative that you know where the bottlenecks will exist.*

Ideally, this what-if estimating system would be integrated all the way through to the shop floor, so that major changes that occur throughout the day (machine-down, order cancellations) can be factored into customer promise dates **as they occur**. Orders you have lost in the past because of outdated information might be won with this level of integration.

Production Planning and Inventory

Planning production orders requires accurate inventory levels to ensure production proceeds without interruption. Time-phased item availability is critical to easily see the correct sequence that inventory will be consumed in. Scheduling and dispatching decisions must be implemented in real time to maintain the correct sequence. Only when these functions are in harmony can you arrive at an accurate picture of inventory. In addition, reducing the transaction load on operators to process material issues will increase operator efficiency, while increasing inventory accuracy. This means that automatically invoking material picks based on assembly part movement can eliminate extra transactions for the operator (increased

Function Areas

- Estimating and Sales Scheduling
- Production Planning and Inventory
- Purchasing and Production Planning
- Scheduling, Front Office and Shop Floor
- Shop Floor/ Sales

efficiency), increase inventory accuracy, and provide the front office real-time inventory upon operator clock-out or quantity movement.

Purchasing and Production Planning

One of the most common problems with many ERP systems is a disconnect between Production Planning and Purchasing. Many small companies rely on spreadsheets with data extracts of job and material data (which are obsolete upon extraction) to manually line up materials for Purchasing. Often, purchases are made without the knowledge that the same item is required on multiple jobs at the same time, and multiple buyers purchase materials blind to this overlap, causing loss of volume pricing and duplication of effort.

Scheduling, Front Office and the Shop Floor

Small, make to order manufacturers live in an increasingly dynamic world. Work center dispatch lists have to be communicated throughout the shop, while schedule changes occur constantly. Estimating needs to provide your customers accurate promise dates, and Expediting needs to find the order on the floor – *Now!* Real-time shop floor reporting is a critical asset in the battle to keep up with your customer.

As the scheduler manages the machine queues throughout the day, understanding common processes that might share resources, and quickly grouping these processes can save hours a week on the floor. Having the ability to quickly move and firm schedule changes, then push those changes out to the work stations *instantly and paperlessly* can give you a competitive edge. Your ability to respond to your customers would improve dramatically.

Shop Floor and Sales / Expediting

As work is reported off of work stations and moves through the shop, only a real-time reporting process can provide you the visibility to instantly locate work on the floor. In addition, real-time reporting tied to your scheduling engine should enable you to identify jobs and processes trending out of control, *as it occurs*, instead only after the job is already late. This type of visibility is priceless in the world of make to order manufacturing.

Conclusion

In conclusion, real-time capability is an integral part of an effective ERP system. Although the term is used in varying contexts, true real-time capability means your system updates information throughout the entire enterprise instantaneously. Benefits include greater flexibility, control, and visibility for manufacturers, and it can greatly reduce wasted time and resources. The specific functions of real-time provided above will offer points of reference as you search for a system that includes real-time.

Key takeaways in these areas include:

- ✦ Estimating / Sales and Scheduling – the ability to accurately estimate delivery time, even identify potential bottlenecks *before the order is even taken*
- ✦ Production Planning, Scheduling and Inventory – Ensuring inventory is being used in the most efficient manner, *and is only pulled at the appropriate time*
- ✦ Purchasing and Production Planning – Is the company buying the right material *with a single lookup that accounts for all jobs for a material*
- ✦ Scheduling, Front Office and the Shop Floor – Have the flexibility to quickly change priority *and communicate those change electronically, in real time, out to the operator stations – no paper dispatch lists to walk out to the floor.* Work reported complete reflect in front office tracking *instantly*, while estimating can do what-if promising based on *up to the second* status.
- ✦ Shop Floor and Sales / Expediting – Find the position of any job on the floor *instantaneously*

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