

**Do You Really Need an ERP System?**

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Introduction

Today, most mid-size manufacturers realize that they need an integrated solution to their manufacturing information systems needs. They need to integrate the factory-floor with the front office so that information flows seamlessly between the two. It might appear that the best approach is to simply buy one system that provides factory-floor as well as front-office capabilities. In fact this often the most expensive approach. In its place, we often recommend purchasing a good accounting system in combination with a customizable factory floor information system. We have found that this is often the least expensive approach, both in initial purchase and system lifetime operating costs.

What's Wrong with One System?

The development of all software is a set of tradeoffs between cost, ease of use, flexibility, and capability. In a manufacturing plant the tradeoffs needed for the front office software are often very different for those needed for the factory floor systems.

At the heart of all front office systems we need a basic set of capabilities that include:

- A General Ledger to track finances, including the valuation of inventory.
- Issuing purchase orders and paying vendors when the goods are received.
- Receiving orders and issuing invoices for goods shipped.
- Paying employees.

These we will call Group A for Accounting Capabilities.

On the factory floor we need another set of capabilities that include:

- Tracking the receipt of materials
- Tracking the location of materials
- Tracking the status of jobs
- Tracking the consumption of materials on jobs
- Tracking intermediate and finished goods
- Tracking scrap
- Tracking labor directly expended on jobs

- ❑ Tracking machine utilization
- ❑ Tracking shipment of finished goods

These we will call Group F for Factory-Floor capabilities.

Then there is another set of capabilities that managers need:

- ❑ Forecasting what materials to order
- ❑ Planning and scheduling jobs
- ❑ Costing and estimating jobs
- ❑ Controlling inventory, including the production of WIP and finished goods.

These we will call Group M for Management capabilities.

In a smaller or simpler plant we only need to automate the Group A and F capabilities as the Group M capabilities are done manually. In larger and more sophisticated plants we also need to automate the Group M capabilities.

Group A is common across most manufacturing plants. It is the set of capabilities provided by most accounting packages. The focus here is accuracy and precision and obedience to standards and laws. Software packages that provide Group A capabilities can be produced as standard packages that can be sold to any manufacturing plant and readily configured to its needs.

Group F is characterized by the needs of flexibility and customization. In order to make the systems easy to use by factory-floor employees, the software modules providing these capabilities have to be adapted to the specific manufacturing processes they are tracking. They typically make extensive use of barcode tracking and mobile PDA/scanners. They are often interfaced to process control equipment such as weighing scales and counters to minimize manual data entry. Software modules that provide these capabilities are designed to be easily customized. This requires a completely different set of tradeoffs in the design of the software from the Group A capabilities, where the needs of precision and accuracy run preclude easy modification of the code. You do not want book keepers modifying the code in the accounting system. Yet you need to enable manufacturing engineers to frequently modify the factory-floor tracking system as the production processes are changed.

Group M is characterized by having many business rules. Here we need to be easily able to change the rules as our business practices change. Ideally this can be done by managers without requiring the intervention of programmers, as this can delay the implementation of needed changes by weeks or months. The software providing Group M capabilities needs to have access to the data provided by the software modules performing the group F capabilities. Typically this Group M software is rules-based and has expert system and factory-floor simulation capabilities.

What we see emerge from this analysis is three very different types of software:

- ❑ Packaged accounting software
- ❑ Customizable factory floor tracking modules
- ❑ Rule based management software with simulation capabilities.

To try to combine all these capabilities in one software package is essentially impossible, because the design tradeoffs are very different. It is like trying to



combine the capabilities of many different hand tools into one integrated tool. This, in the author's experience, only results in a tool that potentially has many capabilities but in reality is good for nothing.

The biggest difference between the classes of software lies in their customizability. Accounting systems do not get customized. Factory-floor tracking systems get modified by changing their code. Management software gets changed by modifying its rules.

What About ERP Systems?

ERP systems typically combine Group A and Group M capabilities. Their vendors often also offer modules to support Group F capabilities. The major problem comes with the customization needs of the Group F and Group M capabilities. Most ERP vendors follow the business model of selling the same software to many thousands of manufacturing plants using a packaged software strategy. They make their software configurable but do not provide the source code or a true rules or simulation capability. This makes their Group F and M capabilities very hard to use and we often find these capabilities unused even though they have been purchased by an ERP customer.

Some ERP vendors do provide the source code to their systems, at least to their value added resellers, so that their systems can be customized. Unfortunately, the software is not designed to be supported as a customized software package. What typically happens is that a manufacturer buys an ERP system and then customizes that part of the system providing the Group F capabilities. The ERP vendor then comes out with new releases of the software, which would require the customizations to be redone. Typically customers stick with the old version of the ERP system so they don't have to redo the customizations. This means that they miss out on the availability of new features, such as customer relationship management (CRM) or Internet support. Eventually they need to upgrade the ERP system and pay for redoing all the customizations when the system becomes so old that it is no longer supported. Alternately they can upgrade the ERP modules supporting their Group A capabilities and their MRP planning and then integrate this with a customizable factory-floor information system to provide their Group F and some of their Group M capabilities.

Customizable factory-floor software, such as BellHawk, is designed to be customized and then upgraded and changed by the customer's manufacturing engineers as production needs change. The software is not upgraded every time the vendor comes out with a new version but rather is upgraded by bolting on new options, if needed, to the original package. This requires a very different approach to the design of the software than that used for an ERP system where all modules may be changed from one version to the next.

So What Should You Buy?

Let us assume that you are starting with a clean sheet of paper and putting in a new system to serve both your front-office and your factory-floor.

If you have a smaller or less sophisticated manufacturing plant then you can probably get by with buying an accounting system to provide your group A capabilities combined with a customizable factor-floor information system to provide your Group F capabilities. Accounting Systems such as those provided by Great Plains or SBT , when used in conjunction with a factory-floor tracking system such as BellHawk, result in a system that costs much less than an ERP system and has much better Group F capabilities.

For larger and more sophisticated manufacturing plants. You will need to add Group M capabilities. Some of these capabilities, such as rule-based planning and scheduling and costing and estimating, can be purchased as add-on modules to factory-floor information systems such as BellHawk. Other capabilities, such as long-range materials requirement planning (MRP) based on sales forecasts, require you to upgrade to an ERP system, such as Macola. Such ERP systems are still best used in conjunction with a system such as BellHawk to provide the Group F capabilities and the rule and

simulation based Group M capabilities.

So what about SAP and Oracle and other major ERP systems? Besides costing a lot of money, what are they good for? These packages are essential when you have an organization that operates many interdependent plants that feed each other. These major ERP systems can integrate the financials over many plants, each running their own version of the ERP system. This enables consolidated financial reports to be quickly produced that cover interdependent operations at a large number of plants. This would otherwise be very difficult to achieve. These systems do long-range MRP over all their plants, taking materials needed by one plant and converting this into materials to be produced by another. Again this is where these systems really justify their cost.

What these major ERP systems do not do well is support the Group F capabilities and the Group M capabilities that are contained within each plant. To achieve these capabilities, it is essential to have a customizable factory-floor information system, such as BellHawk, in each plant, working in an integrated manner with the ERP system.

If you already have an existing accounting system but need to add Group F and possibly Group M capabilities, then all you have to do is to add modules from a system like BellHawk. You do not have to change your accounting system or to buy an ERP system.

What if you brought an ERP system but its Group F and some of its Group M capabilities are not working for you because of lack of customization capability? The answer here is to continue to use the ERP system for its group A capabilities and for those Group M capabilities that you are currently using effectively. You can then upgrade this system by adding modules from a customizable factory-floor information system, such as BellHawk. This may mean that you are buying new modules that do functions that your ERP was supposed to do. It does not feel very good to buy the same functionality again but you need to do this if you are to achieve an effective integrated system. Just think, if you brought a machine that did not do what you wanted you would quickly replace it with one that did.

What about systems integration issues?

What we are suggesting is to use best-of-breed for the factory-floor and the front-office systems. This does raise the question of ease of integration between the factory-floor and front office systems.

Let us first examine the type of data passed between the systems:

- Purchase orders passed from the front-office to the factory floor
- Receipts of materials from vendors passed from the factory-floor to the front-office
- Orders and/or jobs passed from the front-office to the factory floor.
- Shipments passed from the factory floor to the front office.
- Changes to raw, WIP, and finished goods inventory passed from the factory-floor to the front-office.
- Labor, Materials, and Machine time consumed on jobs passed from the factory floor to the front office.
- New employees and material types are passed from the front office to the factory floor.

Some of the issues that come up include:

- Inventory kept in both systems. The factory floor system tracks materials in great detail, knowing where each item is and what its detailed characteristics are. The front office system needs to track aggregate inventory for valuation purposes and for MRP planning purposes.

- ❑ Bills of Material and Routes. These are needed by the factory-floor tracking system. They may be kept in the factory-floor system or imported from an ERP system with each job. If they are kept in the factory-floor system, then this system does the job costing and estimating and materials planning. This is typically what happens when the front-office system is an accounting system. If the Bills and Routes are kept in the ERP system, then this system is typically used for job costing and estimating and materials planning.

Passing data between the systems is usually performed using ODBC access to a shared set of database tables. Sometimes it is necessary to resort to the use of batch flat file transfers over network connections. These interfaces usually only take a few days to implement and typically require little maintenance when the front-office system versions are changed as the data exchanged is elemental to both systems.

There is a trend to replace the use of time clocks with non-exempt employees scanning in and out of computers on the factory floor. In this case, the factory-floor system collects and manages both direct and indirect labor data for both exempt and non-exempt employees. In this case, a flat file is exported once a week from the factory-floor as a feed to the payroll system. The payroll system may be part of the accounting or ERP system or it may be an external service, such as that provided by ADP.

Conclusions

Many plants do not need to buy an ERP system. They can achieve all the information systems functionality they need through the use of an accounting system in combination with a customizable factory-floor information system.

Larger plants may need to buy an ERP system for its MRP and CRM functionality but they will still need to buy a customizable factory-floor information system. The same applies to large multi-plant organizations that need an ERP system to integrate their financial reporting and their materials production planning.

For more information please call 1-800-747-1377, see our website at www.BellHawk.com, or send Email to sales@BellHawk.com.

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