

# Selecting ERP Software for ETO Manufacturers

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## Selecting ERP Software for Engineer-to-Order (ETO) Manufacturers

In recent years, there has been an increase in specialized manufacturing across North America. With more repetitive manufacturing moving offshore, North American manufacturers have had to develop their roles as complex manufacturers supporting both local and global markets with sophisticated products and manufacturing processes to meet the unique needs of their clients. This type of manufacturing is known as Engineer-to-Order (ETO), and in conjunction with its unique services, the ETO organization has its own unique manufacturing needs that not all Enterprise Resource Planning (ERP) software can satisfy.

In the article *Information, Information, Information* (Business Excellence Magazine, Sept. 2007), T.R. Cutler wrote:

*"Project-based or ETO (engineer-to-order) is commonly used to describe a custom manufacturing process, yet is rarely described with real world differentiation. Few MES (Manufacturing Execution Systems) solutions are specifically focused on meeting the needs of this challenging manufacturing market. Estimating costs to maintain a decent margin is often one of the great complexities in the ETO environment. Project-based cabinet makers, for example, may have never built a one-of-a-kind item before or have to add items once they are on the production floor, and have to accurately guess all the possible costs variations."*

### ENGINEER-TO-ORDER (ETO) DEFINED:

A manufacturing process whereby finished goods are designed and built to unique customer specification.

The finished product is complex, often adhering to very specific tolerances and typically produced in low volumes ('one-offs') with heavy customer involvement throughout the manufacturing process.

ETO manufacturers are seen in such industries as aerospace, capital equipment, government contractors, etc.

Cutler pinpoints the difficulty that ETO manufacturers face when reviewing ERP software. The original development of ERP systems relied on providing a universal product that could meet the needs of the majority of manufacturing companies. The ETO segment provides additional challenges that were not addressed by these ERP developers which have led to manual processes, interfaced solutions and other disparate solutions. To remain competitive, an ETO manufacturer must have technology that can support the characteristic nature of the ETO business:

- Products designed to the customer's engineered specifications.
- Customer involvement throughout the manufacturing process; from original quote to final assembly.
- Business earned based on engineered quotations.
- Complex products that often require many subassemblies.
- Raw materials purchased with long lead times.

The challenge of ERP selection remains for these manufacturers; however systems such as Microsoft Dynamics AX are now bridging the gap in catering to the complexities that these companies face.

### Specific Challenges of the ETO Manufacturer

In determining the requirements of the ERP, it is necessary to take a deeper look at the challenges that ETO manufacturers encounter in their day-to-day operations:

- Synonymous with Project-Based manufacturing, actual costs are recorded against the specific project task/operations and then anomalies (compared to the original project quotation) are analyzed as variances.
- Customers are involved throughout the entire build, thus engineering changes surface frequently.
- Most materials are purchased direct to the project task and often require long purchasing lead times.
- The final step of a project can be the actual equipment installation at the customer's site.
- ETO manufacturers rely on skilled engineers, who are charged with project designs to meet the Customers' complex and demanding expectations. Often, the engineers' wages are costed directly to the job.

These challenges are the source of the ETO manufacturer's demand for enterprise solutions that are capable of handling their requirements. Their call for action has been met with systems that provide additional functionality that address their complex manufacturing style.

## ETO Manufacturers are Demanding More from ERP Vendors

Manufacturers have demanded change for their enterprise solutions, but only a select few ERP developers have returned with a complete solution. Enterprise software must integrate the needs of the typical ETO manufacturer while providing a flexible and modifiable system that can handle their most specific requirements.

Today's ETO manufacturer should expect their ERP to include:

- Engineering Change Management, including workflow. This should also include revision controlled transaction security, so that obsolete items resulting from engineering changes are not purchased, transacted, or consumed.
- Functionality such as % complete, revenue recognition, work breakdown structures (WBS) and scheduled due dates/milestones displayed in Microsoft Project format.
- Not only date-driven schedules, but also project task time line estimates are needed as well.
- The ability to manage materials and resources at both a Project level and a Work Order level, combined with internal versus subcontracted operations.
- Linking the ERP at a BOM demand level with popular CAD and PLM systems (single data entry minimizing human error)
- Integration and availability of alternate parts at a BOM level (minimizing inventory shortages)
- Project inventory management. Assigning a segregated "Project warehouse" where inventory transactions will be isolated within the project.
- Project Reporting that details the actual project costs as well as Time & Attendance.
- Tighter controls regarding long lead time material processing, allowing for improved material planning early in the project, and the subsequent assignment of materials to later phases as required.
- Preventative Maintenance (internal equipment) and Warranty Contracts (external aftermarket).

The ETO manufacturer must now be savvy in their ERP selection process to obtain the correct mix of features and functionality that fit their situation. ERP vendors are responding to various degrees, but the next step remains in the refinement of the selection process.

## Evaluating and Selecting the Right ERP System for the ETO Manufacturer

ETO manufacturer's unique and complex internal systems result in an ERP software requirement that is just as complex. Although nearly every ERP system claims to meet these complex needs, very few 'off-the-shelf' ERP solutions can compete.

The ERP Industry in North America consists of over 1,000 ERP systems and yet The Wall Street Journal has stated that "73.8 % of all manufacturers are dissatisfied with their current ERP systems." One of the main reasons that systems fail is that *it is nearly impossible to evaluate ERP systems by sitting through sales demos*. All sales demos are scripted to look good. Once the advanced capabilities needed by ETO manufacturers are factored into the selection process, it is no wonder the satisfaction rate is so poor.

## The Legacy ERP Selection Process

With frequent evaluation of ERP systems, the consumer will realize that all ERP systems have plenty of functionality. The amount of functionality is never the problem; the lack of ETO specific functionality is.

When evaluating these systems, the typical reaction is to send detailed multi-page questionnaires to the software companies to complete. The software vendors want to remain in consideration and are motivated to answer each question with a carefully worded, "yes we do that!" The request for information is then futile in determining the key differences between ERP products, as they will often yield a comparative series of glowing responses.

Once the questionnaires have been returned, the next step is to create a short list of vendors for sales demonstrations. However, this is also problematic. All "sales demos" are designed to look good. If "sales demos" do not appeal to the consumer, then software companies go out of business. Software vendors hire professional presenters who know precisely which keystrokes will present their software in the best light. Remember the first day you looked at the system you use now? How difficult did it seem then versus today? How many months did it take before the haze lifted and the system became second nature? Is it possible to uncover the pros and cons when you are reviewing the system for the first time – even with an 8 hour, "sales demo"? After reviewing 4 or 5 sales demos, most of the audience members are only confused.

Finally we request references from these software companies. Guess which ones they give us? What do we learn from speaking to only their very best customers?

## A Fresh Approach to Selecting ERP Systems

What is the ultimate goal when selecting a system? To make sure the system will achieve the results you expect.

In the *2010 ERP Report, ERP Vendor Analysis* by Panorama Consulting Group only 18.9% of the 1600 organizations surveyed are noted as being 'very satisfied' with their ERP selection. In addition, 55% of companies realized 30% or less of the expected business benefits. If so many businesses are not satisfied with their current ERP system and since so many utilize the same selection process as you plan to, why will your results be any different? Maybe a different process should be investigated.

**Step 1** – Justify the system purchase with a Business Case. Is your current system truly lacking the functionality required in your ETO operation? Will a new system provide you with an adequate return on investment? Converting to a new system is difficult enough. You want to be certain that the effort is warranted - or else don't do it.

**Step 2** – Document current workflows and processes (current state data stream mapping) being sure to include all ETO processes and manual operations. Question all processes in regards to why you conduct all the steps that you do. Are any redundant or not necessary? This will help you define your critical requirements while reviewing systems as well as assist in paring down your processes once your new ERP system is in place.

### **The Value of External ERP Diagnostics Services**

*Many businesses have the urge to skip these first two steps, either due to time or the costs involved. These two steps are critical to the success of your ERP implementation and the removal of them from your selection process could result in significant costs that more than outweigh the savings of avoiding them in the first place. If time is an issue, select an established ERP Services firm to walk your company through an ERP Diagnostics exercise. The end result should deliver a documented guide to be used as a basis for ERP selection including:*

- A corporate vision and project scope statement
- Diagnostic findings and success criteria
- High-Level definitions of business and technical requirements
- A statement of organization wide issues related to the implementation of a new ERP Package
- Recommendations for the ERP implementation plan

**Step 3** - Define the critical requirements that are unique to your company including specific ETO centric features. Then match to the vendors on your short list. Please note: Critical requirements only. You have to assume that all systems will have an "Aged Trial Balance". This list should not be longer than two pages. This list could include many of the ETO features listed above (Scheduling, CAD/PLM integration, QA, Revision Control, Project inventory, Actual costing, etc.)

**Step 4** – Ask this vendor to bring in the trainer you will work with after the sale is complete, not their professional presenter. Trainers have to live with their promises after the sale, and will be quite forward about what the system can, or cannot do.

Have the trainer set up the software around your requirements and enter a sub-set of your data. The intention will be to present the system as if it were live at your facility. Offer to pay for this service. Trainers are not offered to prospective clients because existing customers are paying them to implement their projects. This "proof of concept pilot" may cost a few thousand dollars, but will be far less expensive than the time-consuming step-by-step method.

Remember, the ultimate goal when selecting a system is to *ensure your company will achieve the results that you expect*. By following this simple process with emphasis on unique ETO requirements, you will increase your chances of getting the right fit for your ERP and increase your chances for future success. Why would you use any other method?

## About Business Solutions Alliance Inc.:

**Business Solutions Alliance Inc.** (BSA) marries sophisticated business and technical services with world-class enterprise suites for Canadian businesses today. Focusing on business improvement through incorporation of best practices, our team provides our customers with value-added enterprise solutions. For more information, visit our website at: [www.BSAinc.ca](http://www.BSAinc.ca).