

Are You ETO?



The Increasing Importance of Custom (Engineer-to-Order) Manufacturers

By Thomas R. Cutler

Approximately 25% of all North American manufacturers are ETO (Engineer-to-Order), yet very few know it. They refer to themselves as custom manufacturers or manufacturers within a particular manufacturing sector.

Due to customer demand for customization and one-of-a-kind manufacturing there has been a 20% increase in ETO manufacturing. These are custom manufacturers rather than repetitive manufacturers. When counting manufacturers by process, there are grey areas including ATO (Assemble-to-Order) and BTO (Build-to-Order), however the ETO manufacturers have to confront many unique issues recently highlighted by the ETO Institute. In a recent survey conducted by the Institute, a series of key characteristics were developed to provide some sorting criteria about who is and is not an ETO manufacturer. There are some distinct advantages to ETO manufacturing, providing rationale for the increased ranks.



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ETO manufacturers build unique products designed to customer specifications. Each product requires an exclusive set of item numbers, bills of material and routings. Estimates and quotations are required to win business. As technology gains from efficient software systems ranging from ERP (Enterprise Resource Planning) to KBE (Knowledge Based Engineering) have improved for ETO manufacturers, so does the profitability margin. Products are complex with long lead times, typically months or even years. Unlike standard products, the customer is heavily involved throughout the entire design and manufacturing process. Engineering changes are a way of life. Material is purchased not for inventory but for a specific project. All actual costs are allocated to a project and tracked against the original estimate. Once complete, the product is typically installed at the customer's site. In most cases, aftermarket services continue throughout the life of the product. These aftermarket services represent an additional revenue source unavailable to the repetitive manufacturers whose revenue stream ends upon delivery of the stock item.

Estimating

As each job is unique, an estimate is necessary to produce a customer quote. In many cases estimates are constructed from previous jobs that had similar characteristics. In some industries, like manufacturing where there is a high volume of Requests for Quote (RFQ), companies use a summary where they estimate using groupings or "buckets" of labor hours and material dollars. Here they estimate at a high level before constructing a more detailed estimate. Some companies have built sophisticated Microsoft Excel templates to assist in the estimating process, and Excel is the tool of choice for most companies. Improved Advanced Planning Software (APS), scheduling components of ETO ERP systems, and highly effective engineering integration systems specifically designed for ETO manufacturers have made great inroads to improving the estimate "guessing" to accurate costing. These technological advancements have made ETO manufacturing increasingly attractive as the risk of poor projecting is greatly reduced.

Build to a project

Terminology may be different from manufacturer to manufacturer. The terms project, job and contract are sometimes used interchangeably. In some companies the term “contract” refers to the legal document spelling out the terms and conditions of the agreement. The term “project” refers to schedule of work and the “jobs” represents the individual segments of work that comprise the project. Whichever term is preferred, an ETO manufacturing company uses the project/contract/job as a scheduling mechanism and as a cost collection mechanism.

Purchasing

In some cases, material is purchased only once for a specific project. The subcontractor or supplier may be involved with the original design and specification of material. In many cases the design engineer will specify the part to be purchased. For any material purchased, the actual cost is allocated to the project. In no phase of purchasing is there as much engineering input as in ETO manufacturing. The new tools available for engineers offer precise costing, manufacturing efficiency, and contribute to the ETO desirability among North American manufacturers.

Engineering change

In an ETO manufacturing environment, engineering changes are a way of life. As the customer is heavily involved throughout the whole engineering and manufacturing process, changes to the design are inevitable. Critical to the profitability of a project is to record and monitor the changes to determine who bears the responsibility for any additional cost. Keeping these additional costs contained provides reduced risk for the ETO manufacturers.

Project management

ETO and project-based manufacturing manufacturers appoint a manager for each project. Project managers are ultimately responsible for ensuring that the project is delivered on time and within budget. Microsoft Project is the tool of choice for many companies, not only for managing the project but also for communicating status with their customers. Increasingly there is movement to technology that has improved the bottom-line project management for the ETO manufacturers.

Actual costing

ETO manufacturers use project accounting and collect actual costs rather than the standard costing method used by most repetitive manufacturing companies. All actual costs are allocated to a project and monitored against the original estimate. Monitoring actual costs against the original estimate ensures that profit margins are maintained. It is essential to know the Estimated Cost to Complete to determine what is still needed to deliver the project. The capacity to monitor the Cost to Complete is greatly enhanced by new software technology that has prompted some of the movement away from repetitive manufacturing.

Installation

Many projects require installation at the customer’s site. Once the assembly is complete, the equipment is broken down into major assemblies and shipped to the client’s location. Here the equipment is reassembled and typically goes through a certification process before acceptance by the customer. Often these on-site installations give way to other process improvements including Lean Manufacturing, Six Sigma and ISO certification. ETO manufacturers may be more attentive to the concept of continued process improvement resulting in better run, more profitable manufacturing operations.

Progressive billing

Progress or progressive billing is sometimes called milestone reporting. Due to the long lead times in the ETO world it is common business practice to receive partial payments, typically based on a percentage of the total bill, when a significant milestone is reached. This aspect of ETO drives alternative cash flow processes from repetitive manufacturers who do not get paid until the final product is delivered.

Revenue recognition

For projects with long lead times, companies may need the ability to recognize revenue based on the percentage of actual expenses incurred, rather than against final shipment of the product.

Aftermarket services

After installation and acceptance, the equipment is usually covered by a warranty. ETO manufacturers often provide aftermarket services including maintenance, repair and spare parts.

Global economic benefits

While still competitive, unlike repetitive manufacturers who are at the mercy of very low international labor costs and subject to business losses from outsourcing, this phenomenon is less likely to touch the ETO manufacturers who must engineer, build and re-engineer all at the customer's North American site. It simply cannot be produced cheaply elsewhere and shipped into North America. This aspect of ETO as a corporate strategy may be one of the prime reasons for the increased number of ETO manufacturers in the past twelve months.

As ETO manufacturing utilizes the economic advantages through improved technology; an increasing percentage of manufacturers will move to blended (both ETO and Repetitive) operations processes. The ETO statistics will be on the rise in the near future as customer demands grow.

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