



Engineer to Order In Microsoft Dynamics NAV

Microsoft Dynamics NAV is a robust ERP system which is designed to handle a broad spectrum of manufacturing requirements. It includes several unique features which support engineering-to-order (ETO) manufacturing environments.

The Challenges

ETO manufacturers face business challenges that simply cannot be resolved by many ERP systems. These companies need to be able to provide accurate cost estimates to customer, manage all aspects of complex projects, deliver on time and on budget, all while keeping a close eye on cash flow. Pressure to reduce costs, shorten cycle times, and produce to high quality standards is never ending.

ETO manufacturers have most of these characteristics:

- Complex products, long lead times
- Design and build to a project or contract
- Need to estimate and quote to win business
- Uniquely design and build to customer specifications
- Need to track customer revisions
- Purchase material to a project
- Collect actual costs to a project
- Install products on customer's site
- Need to track warranty and provide aftermarket services
- Significant spare parts business

NAV provides the functionality to meet all these demands and more.

Manufacturing Environment

There are generally two different environments that can be used by an ETO manufacturer. For our purpose here we will refer to them as job shops and flow shops. A flow shop may also be a make-to-stock (MTS) mass production facility, but we will not consider that environment here. The flow shop environment we are considering would be a make-to-order (MTO) environment with a significant engineering activity prior to manufacturing.

The following table shows some of the typical differences between the two environments.

	Job Shop	Flow Shop
Product Variety	Very High	High
Product Volume	Very Low	Low
Production Equipment	General-purpose	Some specialized
Cost Accounting	Assigned to specific job	Assigned to facility or line
Material handling	Unique by project, not stocked	Some standardized material in stock

Job Shop in NAV

The job shop environment would be handled by the JOBS feature of NAV. Jobs are organized in phases and tasks. These tasks are structures to ensure accurate cost recording and tracking. Planning lines are associated with tasks to add detail about required resources, items, and ledger expenses, and show planned dates for use and invoicing.

Features of NAV JOBS:

Flexible budget structure

- Plan the phases and tasks for both time-and-materials and fixed-price jobs.
- Use automated indent functionality to create a summary or sub-tasks.
- Enter and update cost and sales budget estimates for job activities.
- Have the option to plan the contract amount independent of sales value of consumption or planned work.

Detailed job tasks

- Help ensure accurate cost recording and tracking.
- Use associated planning lines to add detail about required resources, items, and ledger expenses, and show planned dates for use and invoicing.

Integrated invoicing

- Manually define or create job planning lines to be invoiced based on rules for actual usage.
- Create invoices automatically based on job planning lines for your jobs.
- Create credit memos from job planning lines.

WIP and revenue recognition

- Select from five different methods for calculating WIP, including cost value, sales value, recognizable cost, percentage of completion, and completed contract.
- Recalculate WIP and recognition as often as necessary prior to posting.
- Use multiple posting groups in a single job so you can make detailed WIP and recognition postings in the general ledger for items, resources, and general ledger expenses.
- Have the option to exclude job tasks from the WIP calculation.

Job-specific pricing

- Set up job-specific prices and discounts for items, resources, and general ledger expenses, including using the cost-plus method of pricing. Or, if no special pricing is required, apply standard customer price and discount mechanisms.

Fixed-price project planning

- Plan and invoice fixed-price projects using Planning Line types.
- Set up specific prices for items and resources for each job, as well as for general ledger account expenses.
- Automatically suggest usage entries based on the difference between planned usage and actual usage.

Multicurrency capability



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- Plan and invoice jobs in multiple currencies with rules-based control for currency conversion, such as fixed cost for price in local or foreign currency.

Item tracking

- Track job items with serial or lot numbers, whether purchased specifically for the job or consumed from stock, using standard item tracking methods.

Integrated purchasing

- Create job-specific purchase order lines with the ability to automatically update the job ledger and make rule-based updates to job planning lines.
- Take advantage of support for item pricing and costing methods.
- Register consumption of inventory items.

Resource management

- Manage resources for planning and job execution, with support for resource capacity and availability.
- Manage resources per person or by machine and equipment.
- Maintain support for resource pricing and costing methods.

Time sheet entry

- Reduce time sheet entry time and improve control by defaulting job journal lines based on job planning lines for a job, or for a set of tasks up to a specified date.

Flow Shop in NAV

Several features within NAV provide excellent support of ETO manufacturing within the flow shop environment. Specifically these are sales quotes and simulated production orders.

Sales quotes allow for the specification of the item or items to be produced, the quantities and units of measure, planned shop dates, etc. When the quote is approved by the customer it can then be converted or copied to a Sales Order.

Simulated production orders allow for the item to be engineered without affecting the planning calendar or material requirements. Simulated production orders may be associated with sales quotes. When the sales quote is approved the simulated production order can be converted or copied to a production order. The simulated production order has all the features of a production order including a BOM and routings.

Features of NAV Manufacturing:

Production management

- Streamline made-to-order requests and simplify make-or-buy decisions.
- Modify components and operations as needed, even on released production orders.
- Plan product family orders that share the same routing for efficient build schedules.

Graphical scheduling

- Access an overview of production schedules displayed in Gantt charts and use drag-and-drop functionality to reschedule operations, with changes reflected in the relevant production order.

Order promising

- Promise orders with available-to-promise (ATP) and capable-to-promise (CTP) Manual planning
- Simplify supply planning and make decisions on an order-by-order basis by using an alternative to printed production schedules that is designed for smaller businesses.

Capacity planning

- Implement realistic plans according to incoming resource capacity demands, and redefine order modifiers and reorder policies as needed.
- Accommodate changing shop floor workloads and simplify planning with calendars.

Multiple costs

- Manage alternative costs for resources and groups that are fixed or based on an additional percentage of fixed charge, with the ability to define multiple work types.

Bills of material (BOMs)

- Tightly integrate different types of BOMs and customized definitions into manufacturing operations to improve performance while supporting time-to-market and time-to-volume objectives.
- Create, track, and process multiple versions of BOMs and routings.

Cost budgeting

- Understand item costs throughout the production process—including inventory, WIP, and cost of goods sold (COGS).
- Tighten control of closing processes, improve batch job costing, and streamline reconciliation with the general ledger.

Exceptions handling

- Make exceptions and last-minute changes to meet customer needs using action messaging, tracking, and multiple planning options.

Supply planning

- Plan from the sales order, production order, or purchase requisition, or use traditional master production schedule (MPS) or material requirements planning (MRP).
- Facilitate materials flow through the supply chain with multi-location planning.
- Update and change all materials, costs, and operations simultaneously.

Demand forecasting

- Analyze sales patterns from multiple perspectives.
- Compare forecasted demand with actual sales and consolidate and distribute demand plans with multiple stakeholders to increase collaborative planning.

Machine center allocation

- Allocate work and machine centers as capacities to streamline planning.
- Apply finite loading calculations to capacity-constrained resources to optimize machine centers and increase planning accuracy.



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Warehouse and inventory management

- Integrate manufacturing and warehousing functionality to optimize warehouse layout and space utilization, and maintain up-to-date inventory information.

Automated Data Capture System

- Collect and use accurate inventory data in real time and increase the visibility of data throughout your business to improve warehouse efficiency.
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Information compiled by Mike Heffner, PSSI, So. Bend, IN www.pssiusa.com © 2010

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