



Passport Business Solutions™

Manufacturing

# Why PBS Manufacturing?

White Paper

October 2011



## Why PBS Manufacturing?

PBS Manufacturing is an ERP system designed to meet the needs of the small to medium sized manufacturing company. What makes it so well suited to this marketplace is its design approach, resulting in ease of use and affordability.

PBS Manufacturing is a modular solution, consisting of eight manufacturing modules, which allow a user to configure a system designed to meet their needs without having to purchase extraneous functionality. It is often the first real automation project for the manufacturing side of a smaller business. A base system may be purchased and implemented and subsequently added to as a company's needs change over time. PBS Manufacturing is complimented by a full suite of financial modules.

### Design Approach

Software companies providing larger ERP systems have tried to back down into the smaller companies as the mid-market has slowed its growth. Unfortunately, the design approach used for these mid market applications doesn't typically lend itself well to the smaller manufacturer.

In the smaller manufacturing company, employees tend to "wear many hats", sharing responsibility for many aspects of an operation. In a larger company, there tends to be much more specialization where an employee is responsible for a single aspect of the business.

In these larger ERP systems, the design approach assumes a company has multiple employees who can specialize in achieving particular complex tasks. The functional result is they tend to break up these tasks into smaller functions and assign each individual function to a specific employee thereby distributing the complex task over several people. Though this approach works well in the larger organization, it tends to create problems for the smaller company who finds they spend more time feeding their ERP system information which offsets time saved elsewhere.

This is where PBS Manufacturing diverges from many of its competitors. Our approach to handling these more complex tasks is to create a simple toolset that allows a single user to handle the complex task thereby allowing a single user to accomplish more. It's this approach that sets PBS Manufacturing apart from the rest.

### Modular Design

PBS Manufacturing consists of eight manufacturing modules which integrate with our back office accounting solution. Together, these provide a user with a tightly integrated business management solution that addresses everything from inventory management to materials and labor planning, job costing and financial management.

Not all manufacturers are created equally. With that in mind, not all PBS Manufacturing solutions are either. Of the eight manufacturing modules, there are core modules that every manufacturer will use. This core can actually stand on its own, providing the smaller company moving into their first automation project with a nice, basic, closed loop business management system.

This core system consists of the following modules:

## Inventory Management

Inventory Management (IM) represents the cornerstone of PBS Manufacturing. Everything else you will do in the system begins and ends with the IM module.

It's here that you will enter and maintain your Item Masters including all purchased or manufactured items. This also encompasses raw materials, sub assembly items, as well as finished goods. You will be able to categorize your Items using special sorting codes like the Item Type, Inventory Cost Category, or the Product Category. Each has a unique purpose for reporting and in the case of the Product Category, it can even help determine how you wish to flow data into the General Ledger.

Material planning rules and engineering related information will also be entered and stored in the Item Master file. Things like safety stock levels, re-order points, order min and max and order multiples can be defined. These rules can add a great deal of intelligence to the material planning (MRP) process providing you with much more useful information. Engineering revisions, document references and other similar codes will allow you to retain a great deal of information associated with a given product.

You will also begin to define costs here for purchased goods and prices for any products that you sell. You may have products that serve dual purposes as well, being both a product used in the production of another item, as well as a product that you sell. Basic customer pricing will be established in the Item Master. Though there are several special pricing schemes available in the Customer Order Processing module, it's here that you will define your standard selling price.

The information stored in the Item Master file will set up virtually everything else you will be doing in the manufacturing system. Whether it's material planning, shop floor scheduling, job costing, buying, making and selling product, it all begins here.

The IM module provides you with many great features and benefits. You may optionally apply lot or serial control to some or all of your items providing you with full traceability on these items. It provides many different ways to perform inventory transactions, allowing you to use the system in a manner that best matches your business practices. In addition, it offers tools for taking a physical inventory as well as for cycle counting. These all combine to help the smaller company who's long struggled with keeping a perpetual inventory, to do so with minimal effort.

In addition to the many tools for improving your inventory management function, the IM module goes much further. It provides you with a basic, easy to use material requirements planning tool. This is reporting that reviews supply and demand in the short term, and provides the user with a list of items requiring action. This may include items that have dipped below their re-order point, or items that have unmet requirements within a product's lead time. Unlike the Master Scheduling and MRP module, a much more sophisticated material planning tool, this report won't provide you with specific action suggestions, but will highlight areas requiring your attention to enable you to have the materials you need to meet your production requirements and customer demand.

Another key aspect of the IM module is the shop order schedules. Some environments have very simple scheduling needs, and don't require a complete Shop Floor Control solution. For those companies, we've provided the ability to enter and maintain shop orders within the IM module and the ability to print or view shop order schedules by shop order start date, due date and item. This can provide the smaller company with a tool to aid them in better managing their shop. For those requiring a more sophisticated shop floor scheduling tool, we provide a Shop Floor Control module.

## Product Definition

Where Inventory Management is the cornerstone of PBS Manufacturing, Product Definition (PD) helps to complete the foundation of the manufacturing system. It's here you will define the materials needed to produce an item, the labor steps necessary to complete the process, and then establish costs for the items you produce.

This begins with the Product Structure, another term for a Bill of Material (BOM), or also known as a formula or recipe in the chemical and food industries respectively. It's in the product structure that you will establish what materials are needed to produce your finished products. Whether you make widgets, chemical compounds, foods, or virtually any product, the product structure should work quite well for you. It supports single and multi-level bills, going down as deep as 30 levels. This should be sufficient enough to handle the most complex products one can imagine. The BOM provides the user with the ability to establish "effective" dates and component status associated with these dates. This means you can phase in a new component on a specific date, and phase out another if need be. Set it once and PBS Manufacturing handles the switchover automatically. In addition, it provides a historical view of the BOM by effective date allowing you to see how a product was made at any point in time.

The other key components of PD include Work Centers and Routings. A Work Center allows you to establish cost centers on the shop floor. More specifically, you can group together like employees or machines for costing purposes. For instance, a shop may have assembly departments, a machine shop containing two CNC lathes and a Bridgeport, and a welding area. In this instance you may opt to establish Work Centers as follows:

Work Center ID	Work Center Description	Setup Rate	Labor Rate	Burden Rate	Available Capacity
100	Assembly	\$18.00	\$18.00	120%	24 Hrs
110	CNC Lathe	\$35.00	\$20.00	120%	16 Hrs
120	Bridgeport	\$20.00	\$20.00	120%	8 Hrs
130	Welding	\$25.00	\$25.00	120%	8 Hrs

Once the Work Centers are established, Routings may be created. This will allow you to build a list of production steps that must be accomplished in order to manufacture a product. Each step will be tied to a work center, and will have an estimated time. Time may be entered for both setup, as well as actual run-time for each step. They may also be entered in hours or minutes and for run-time, can be established as time per piece or pieces per time. In other words, if you know it takes you 3 minutes to assemble a single part, you can enter it that way. If instead, you know you can machine 250 pieces in 45 minutes, you can enter it that way instead. The latter is often how labor is tracked in a machining operation. This provides you with the flexibility to establish your labor steps the way you know them and each step may differ from another in its individual approach used.

These three unique pieces of the costing puzzle can then be combined with the purchased costs in the Item Masters to define your product costs in the Item Master files for manufactured goods. This is accomplished quickly and easily using the cost roll-up tools available in Product Definition.

A very unique automation feature in PD is its ability to aid you in automating your material transactions. Specifically, you may tie materials in a Product Structure to steps in a routing. You can then opt to allow labor reporting in Shop Floor Control to automatically consume the raw materials as production is

reporting the production of one or more items on an order. This helps reduce overall manual transactions by the material control department dramatically. You may also opt to allow your labor reporting to receive your completed items (sub assemblies or finished products) on the last Routing step. The potential for automation with these features is tremendous!

As you can now see, the elements of Product Definition, when combined with Inventory Management, truly provide the foundation for all you will do in PBS Manufacturing.

## **Product Purchasing**

The Product Purchasing (PP) module provides you with a complete procurement system allowing you to bring in parts from outside vendors on Purchase Orders. The PP module supports simple Purchase Orders, Purchase Orders with multiple deliveries scheduled against them, and more complex Blanket P.O.'s.

Once entered, Purchase Orders can be printed or e-mailed directly from the application. PBS Manufacturing provides the ability to print Purchase Orders on pre-printed forms (laser or impact printers are supported), plain paper forms, or even allows you to create your own unique form overlay. This is simply an image that's superimposed on your Purchase Order as it prints. This can be used in printing to a laser printer, or even better, when generating a PDF file for e-mailing or archiving your documents.

Items may be sourced to specific vendors in PP allowing you to establish unique information for each vendor you may buy an item from. This could include unique pricing, vendor part numbers (will be visible on the PO), vendor specific lead times and more. When you choose to source your parts to a vendor, you will automatically begin tracking vendor performance statistics including information on how often they deliver late as well as how frequently you're rejecting material. All of this information is available in the Item Source displays and reports helping your purchasing experts make better buying decisions.

There is a wealth of information available in reports and displays in the PP module including expediting reports, detailed receipts and returns history, open commitments and much more to aid your purchasing department in working efficiently to supply your business with the materials they need when they need them. Use this in conjunction with the material planning tools elsewhere in PBS Manufacturing, and you're sure to improve the flow of product through your shop and reduce the time it takes to get product out the door to customers.

## **Customer Order Processing**

Customer Order Processing (CO) is where we close the loop on the basic manufacturing system. It's here you will establish special pricing, commission structures, and the controls for flow to the General Ledger as well as create quotes, enter and maintain sales orders and perform your billing functions.

There's a great deal of flexibility for establishing special pricing in CO. You can establish high level discounts based on the combination of Customer Type and Product category. In this instance, a discount percentage will be entered and automatically applied for customers who are eligible. It's literally a percentage discount off of the price established in the Item Master file.

You may also establish unique pricing for specific Customer Types and Items. In this case, you have the ability to target specific items for a customer type and can establish a unique price for this situation. This may be applied as a discount percentage or entered as the exact price you're looking to charge. You may also opt to create quantity price breaks for the customer type allowing automatic calculation of the price based on the quantity sold in the sales order.

Finally, you can create contract pricing for one or more unique customers for any and all items you sell in your database. This also provides the ability to establish quantity price breaks as previously described.

You're not limited to using one of the special pricing methods which means you should be able to accommodate your special pricing needs for all of your customers. When entering a line item on a sales order, the application will check for the most minute possibility first, special price for this customer and this item. If there's no match, it immediately checks to see if this Customer Type and Item have a special price defined. If not, it checks to see if the Customer Type and Product Category qualify. Finally, if no match is found in the special pricing, the price defined in the Item Master is applied. This all happens in the blink of an eye ensuring you're charging your customers the correct amount every time without the need to dig through complex pricing schemes on paper or in spreadsheets!

When orders are entered, you may ship to the customer's primary address, or may opt to ship to a pre-defined ship-to address for the customer. If you need to manually enter a ship-to address for a one-time delivery, you can do that as well. As you enter line items (the specific items being sold), you may opt to create shop orders (production orders) right from the sales order line by simply checking off a box. Depending on the modules you're using, this may also allow you to create a Job Master for the Manufacturing Job Costing module as well. By answering a few simple questions, you can quickly and easily create the demand (the sales order line) as well as the supply order (Shop Order) to satisfy the demand. In a make to order environment, this can be a tremendous time saver. At the same time, this is an option that may be turned off disabling this capability all together. This allows you to control how you want the system to work for your operation.

Other key aspects of the sales order include the ability to determine a scheduled ship date for an entire order, or you may opt to establish unique scheduled ship dates for each line on the order. In either case, the scheduled date and quantities required will be used when you begin to implement the material planning features within PBS Manufacturing. The end goal is to ensure you have the material you need to produce the products your customers need just in time to ship them. This aids you in improving overall customer service levels while helping you better manage your inventory which often results in carrying less inventory over time.

When a sales order is created, things like sales tax and commissions are automatically calculated by the rules you define in the application. These values will automatically be passed across to the Accounts Receivable and General Ledger modules when an order is invoiced. This eliminates the need for duplicate entries into your financial management solution.

A great deal of reporting is available in the CO module to aid you in making better decisions as an organization. This includes things like shipping schedules by scheduled ship date, customer, item or order number. It also includes bookings reports, sales analysis reports, and even a management level report highlighting bookings, backlog dollars, and on-time vs. late deliveries.

### **Closing The Loop**

The PBS Manufacturing Basic Bundle (the four modules described above), along with our flagship PBS Accounting, can provide a complete, end to end ERP solution for the smaller company trying to automate operations for the first time.

It provides tools to handle everything from managing inventory, to material planning, shop floor scheduling, procuring parts needed to produce your items, to managing customer orders. All of this flows seamlessly into PBS Accounting allowing your staff to better manage your operation and reducing the time it takes to get their jobs done. The end result is better customer service and a leaner operation

overall. Typically, the time saved implementing this solution helps the system pay for itself in a year or less and continues to pay for itself over and over again over time.

While this bundle of modules can be enough for some companies, many others require more sophisticated solutions for material planning and shop floor scheduling. Perhaps they need the ability to perform capacity planning or track actual costs against jobs. For these situations PBS Manufacturing provides the following additional modules which can be added when the initial system is purchased, or as your needs grow and they become necessary.

### **Shop Floor Control**

Shop Floor Control builds off of the basic Shop Order processing capabilities provided in the PBS Manufacturing Basic Bundle. This module adds the ability to easily create more detailed schedules and allows you to begin collecting labor against orders.

Once a Shop Order is created, it can be released either immediately, or at any point in the future, to the shop floor for scheduling. This will allow the schedule generation tool to schedule each individual operation on the product's Routing against the Work Center the task will be performed in. Literally, in seconds, a comprehensive schedule can be generated for each and every operation for each and every Shop Order that's been released. This results in the ability to view or print Work Center Dispatch Lists, or detailed operational schedules for every order on the floor. Schedules can be printed for one or more Work Centers, or for an entire department (a group of work centers tied together by a department ID).

These schedules allow your staff to see any and all operations they should be working on each day minimizing the guess work that can occur in many companies. It can help ensure the right orders are being worked on at the right time allowing you to get product shipped to your customers in a timely fashion.

Labor can then be collected against these operations in batch, on paper and entered by the administrative staff, or in real-time on the shop floor by scanning on and off of orders using our bar coded Routings. These can be printed and sent to the floor with the orders. As soon as this information is entered into the system, it's immediately available allowing your production scheduling/management team to see what's been done on any order in production in seconds. It's also quite useful for Customer Service as they too can pinpoint where an order is in the process while speaking with a customer on the phone, thus providing an up to the minute status of the customer's order.

Other reporting in Shop Floor Control includes reports for reviewing operation history. In other words, you can review the last several times you made a product and see the operation's time averages. These may then be compared to standard product Routings allowing you to make appropriate adjustments to reflect more accurate labor costs on your products.

Shop Floor Control also provides reports for tracking the time of an individual employee, and even allows you to print load reports. A load report is a basic capacity planning tool allowing you to review each work center's capacity. It takes into account all released and scheduled orders allowing you to anticipate capacity problems before they occur.

## **Manufacturing Job Costing**

The Manufacturing Job Costing module (MJ), provides you with a powerful cost management tool. It allows you to create cost estimates for each shop order on a job, and then allows you to accumulate actual costs. The reporting then allows you to review these costs before, during or after the job is completed.

A tool like this can aid you in getting a better handle on what it costs you to make your products. Many companies run on assumptions, but when they implement a tool like MJ, they find their assumptions were grossly inaccurate. By taking the guess work out of your costing, you can improve overall profitability across all products.

When used in conjunction with the Shop Floor Control module, you can reap the benefits of Manufacturing Job Costing with little to no additional effort. Jobs can be created automatically when Shop Orders are created, and cost estimates can be created automatically when you use SF to release a shop order for scheduling. The result, with no additional data entry, you're ready to accumulate actual costs and have your comparatives in place. If you choose not to review costs during the manufacturing process, and instead would like to see them once a job is complete, you may simply generate your costing reports while closing the Shop Orders in Shop Floor Control allowing you to take advantage of the MJ module with virtually no additional effort.

The costing reports in Manufacturing Job Costing will allow you to see costs broken down into categories, Material, Outside Processes, Labor, Burden and Misc. Costs. This will enable you to see not only where your variances are, but will also point to the area(s) needing review.

## **Master Scheduling and MRP**

The Master Scheduling and MRP module (MS), expands on the basic material planning tools available in the Inventory Management module providing you with a complete, comprehensive, material requirements planning (MRP) tool.

MS is a "bucketless" MRP which means we can aid you in planning right down to the day. This assists you in getting the materials you need exactly when you need them rather than in the right time frame. It's also a regenerative MRP which means it must be regenerated periodically. For some companies, this is weekly, while for others, this may occur multiple times a week. It solely depends on how dynamic of an environment you have in your organization.

The beauty of Master Scheduling and MRP is it requires very little actual data input in order to use it. Outside of creating and maintaining your planning and forecast periods, the forecasting data is all you need to maintain. MS utilizes information from other modules like Inventory Management, Customer Order Processing, Product Purchasing, and Product Definition to ascertain all of your supply and demand information.

MS will allow you to plan for actual demand:

- Requirements against Shop Orders
- Requirements against Sales Orders

...false demand:

- Safety stock
- Forecast
- Firm Planned Orders

or a combination of both actual and false demand. This allows you to automate your MRP function regardless of your approach.

While forecasting isn't appropriate for all environments, forecasting product demand can aid you in dramatically increasing your customer service levels by having products available to ship when a customer calls in with an order. Even if you're not assembling the finished product, forecasting the requirements for the finished product will enable you to have the appropriate components in stock in the event you wish to assemble to order. When you have common products with shared components, this will aid you in a faster turnaround on most orders.

The forecasting in MS allows you to create your own forecast by item or by Forecast Group. When forecasting by group, the actual total forecast will be broken down among the member items in the group based on anticipated usage for each item in the group. This allows you to forecast a specific product, or an entire product line.

Forecast is consumed by actual backlog. In other words, for any period where you've forecasted customer demand, as orders are being placed in the period, the forecast is being consumed. As an example, if you forecast the need for 100 of item XXX-123 for the month of June, you will continue planning to make 100 of XX-123 until your real orders exceed 100. Once your real orders exceed 100, they've "consumed your forecasted quantity" and you are now making solely to customer demand. This avoids doubling up on your inventory by planning to both forecast, and real customer demand as though they were exclusive of one another.

The real payoff in MS is the order action reporting. It's in these reports PBS Manufacturing will instruct your planning staff exactly what it is they need to do to meet your current demand in your system. Whether it's ordering material, rescheduling existing orders to better align supply and demand, or cancelling orders that are no longer necessary, the notifications will be available. If your planning rules are defined correctly, this can help lead to reduced inventory levels, and aid you in having the right inventory.

It's not unusual for a company to see an initial increase in inventory, with reductions coming over time. So often, companies are carrying too much of the wrong inventory. As they begin bringing in the right inventory, they can see that initial spike. Over time, as they consume or write off the wrong inventory, that's when the inventory levels and associated carrying costs begin to decline.

All of this leads to higher customer service levels. Having the material you need when you need it enables you to have customer orders shipping on-time leading to happier customers. The reduction in inventory, and associated inventory carrying costs, can also reduce the cost of doing business helping you to achieve a leaner, more profitable environment.

## Capacity Requirements Planning

Capacity Requirements Planning (CP) rounds out the suite of eight manufacturing modules within PBS Manufacturing. This module is used in conjunction with the Master Scheduling and MRP module to provide you with a complete capacity planning tool.

Where MS plans for material, CP converts that material plan to an hour and dollar plan. This means we can test our materials plan against plant capacity and then we can see if we have sufficient capacity to achieve our plan. This will be reviewed using the Detail Plan by Resource report which will highlight capacity problems on the floor. Once identified, these problems may be rectified by rescheduling orders, or by adding capacity to your operation through overtime or expanded shifts. These “timephased capacities” can be added to your CP module so your plan can be regenerated to reflect the new capacity.

Where Shop Floor Control offers you load reporting, capacity constraints based on scheduled Shop Orders, Capacity Planning provides similar information, but will include all orders from Master Scheduling and MRP which could include “suggested planned orders” to satisfy forecast, real customer orders, and safety stock requirements.

In addition to the Detail Capacity Plan, the CP module provides you with “Rough Cut Planning” tools. These tools will aid you in doing longer term planning using fictitious Resource Structures, and Rough Planned Orders. A resource structure is like a Bill of Material though it allows you to create structures that represent product lines. These will include estimated material costs and estimated labor requirements. When you create Rough Planned Orders, these will simulate demand for your various product lines. These may be entered out over time and then a Rough Plan may be generated. This will aid you in budgeting manpower over the longer term if anticipated increases or decreases in orders for product lines are realized. You may also review what it would cost to execute the plan in the event it becomes reality. This can aid you in longer term planning of your operations.

## Bringing It All Together

As you can see, PBS Manufacturing provides a complete, end-to-end business management solution that can help a smaller company:

- Reduce Inventory
- Have the right inventory at the right time
- Schedule your shop floor quickly and easily
- Improve visibility of all aspects of the operation
- Aid you in managing costs
- Increase customer service levels
- Reduce the time it takes to get the job done

When you add in PBS Accounting to manage your finances, it becomes a complete solution for managing your business. The end result is PBS Manufacturing is an investment that can pay for itself in the short term, and continue to provide dividends over the long term.

## Making It Work

Not only is the PBS Manufacturing software designed to meet the needs of a small to medium sized manufacturer, so are the professional services that make it all work. Our approach is to learn and understand as much about a manufacturer’s business processes as we can during the pre and post sales process. With this in mind, we schedule an initial implementation kick-off session, where we take the time

to listen to your viewpoints and also to share those amongst the team. We also discuss the tasks ahead and begin the process of setting goals for the project. Each of the key members of the implementation team has the opportunity to share their individual goals and concerns to help guide us through the rest of the process. In the end, we assign responsibilities for the various required tasks and begin working towards our “go live” target.

From there we install the software, perform an initial data conversion, and schedule “one on one” training with the various departments within your organization. We understand that a small company cannot afford to ship staff off to 5 training classes or deal with consultants running all over your facility for days on end. Business as usual must continue and we do not intend to disrupt that process any more than necessary to get the job done. The majority of our training is conducted via the web, in approximately one to two hour blocks. Each team member will be given basic instruction as to how enter data in the manner that they will be using their portion(s) of the system. Then they will be given some homework, and they will get back together with the trainer/consultant to review what they’ve done, answer questions and move onto to the next topic. Each session is intended to build on the prior allowing the user to digest the system a piece at a time. This leads to better retention and helps to ease the users through the process.

This approach is much less invasive than what is required from most of the “middle market” solutions, and it allows a small manufacturer to continue to conduct business mostly “as usual” during the implementation. On the average we can get this job done and bring a manufacturing company “live” on PBS Manufacturing in 30 to 50 hours of training time over an elapsed time of 60 to 120 days.

(For more information on this process, refer to the PBS Manufacturing Implementation Outline.)