Purchasing Guide

Purchasing Guide

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1   Purchasing Overview

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Purchasing spans four workflow phases

Purchasing is not its own phase within the "Total Control" process workflow. Instead, purchasing spans across four phases of the process workflow:

- POs are generated during the *MRP* phase.

- POs are received during the *Inventory Control* phase.

- PO costs are integral to the *Product Costing* phase.

- PO invoices are converted into voucher style invoices and are transferred to your accounting system during the *Financial Transfer* phase.

Item sources include suppliers and manufacturers

Each stock item is assigned to a default supplier, against which you maintain the supplier price, description, unit of measure, and conversion multiplier. Alternate suppliers can be defined as well. When an item must be sourced from a particular manufacturer part number, you can assign the item to a default manufacturer and manufacturer part number.

Item MRP settings determine PO planning

Item MRP settings determine PO planning. The *Lead Days* allocates time to account for procuring the item from the default supplier. The item *Order Policy* determines if the item is purchased to order or planned for strategic inventory. If purchased to stock using the *Demand Driven Order Policy*, a *Monthly Potential Demand* rate is entered to replenish stock and a *Supply Days* target is entered to determines how many days between purchase orders.

POs are generated by MRP

POs are generated by MRP in response to net demand from jobs and sales orders relative to stock on hand. PO due dates are time-phased so that material is available to meet dependent job start dates.

POs can be augmented manually as needed

Each set of POs generated by MRP represents a minimum action profile. After POs are generated, they can be augmented manually if needed in the *Purchase Orders* screen to fill a truck or container, meet volume commitments, or other purposes.

PO Prices are verified as POs are converted

Verify and update supplier prices during PO conversion

To ensure the integrity of the costing system, always verify and update supplier prices before converting planned POs.

Mass update your Estimated Purchased Costs based on Default Supplier Price

After any changes to your default purchase prices, you should go to the *BOM>Estimated Purchase Costs* screen and Mass Replace estimated costs using the *Default Supplier Price*. You should then go to the *BOM>Cost Rollup* screen and perform a batch rollup and apply the changes to your NEW status Jobs. It is important to actively manage your estimated purchase costs to improve your overall inventory value and cost of goods sold.

Inventory is updated at PO cost when POs are received

PO items are received to inventory at PO cost through the *PO Receipts* screen, which updates inventory value and makes items available for jobs and sales orders.

Supplier invoices are matched with POs

Supplier invoices are matched with POs in the *PO Invoices* screen so that any variances between PO cost and invoice cost are accounted for and to close POs when they are fully invoiced.

Invoices are transferred to your accounting system for AP processing

Matched PO invoices are converted into voucher style invoices and are transferred in the *AR Voucher Transfer* screen to your accounting system for AP processing.

2 Item Sources

This chapter reviews item sources, which are the suppliers and manufacturers from which you source your purchased items.

Each stock item is assigned to a default supplier

Each stock item is assigned to a default supplier, which is the supplier that will be used by MRP for PO generation. Additional suppliers can be assigned and can be swapped as needed within MRP when you wish to use an alternate supplier.

The supplier line card stores the supplier price and cross-reference info

Against each supplier you can define a "line card" record, which contains the supplier price and cross-reference information such as the supplier description, supplier unit of measure, and unit of measure conversion multiplier. The line card information gets printed on the PO for the benefit of the supplier.

The supplier price establishes inventory values

It is important that you maintain up to date supplier prices on an ongoing basis because the supplier price gets translated into the unit cost at which items are received to inventory. Items are then issued to jobs at inventory cost.

Assign a default manufacturer part number when applicable

If the item must be sourced from a specific manufacturer part number, you can assign a default manufacturer and associated manufacturer part number to the item. MRP will automatically assign the manufacturer part number to the item when POs are generated.

Purchasing by revision requires unique item IDs

The bill of manufacturing requires specific part numbers to insure the engineering integrity of each parent item. If a particular component can be purchased by revision and there is a qualitative difference among revisions, each revision must be represented by a unique item ID so that the correct revision can be assigned to the BOMs where it is used. If a component's revisions are interchangeable, meaning there is no qualitative difference from on revision to another, a single item ID can be used.

Never use descriptors to substitute for stock items

Never use descriptors, which are non-stock items, to substitute for stock items. The manufacturing process workflow and product costing are not designed to accommodate descriptors. Manufacturing planning is driven by inventory, which requires that all BOM components be stock items.

NOTE: A "stock" item does not literally mean that the item is intended to have stock on hand. It simply means that the item is <u>capable</u> of being stocked.

3   P Item MRP Settings

This chapter explains in step by step fashion how to establish MRP settings for your P (purchased) items.

MRP Setting Overview

Standard time allocations and order policies are assigned to lower level items and combine to calculate top level item *Time to Shipment* targets for sales order required dates. Item settings are refined as needed until *Time to Shipment* targets reflect your marketing objectives.

The "Big 3" MRP Settings

In our experience, the majority of companies that are struggling with MRP can remedy their problems by focusing on the Big 3 MRP settings: 1). Reasonable Job Days on 100% of their manufactured items 2). Reasonable lead days on 100% of their purchased items, and 3). A clear cut order policy decision of *Demand Driven* or *To Order*.   If the Big 3 settings are not done, you must make an immediate commitment to get these settings done completely as the highest priority.   Once the Big 3 are in place the entire system will fall in line with your objectives.

1. Maintain a Job Days allocation against all M items

A *Job Days* allocation, along with a *Run Size* that represents a typical large-size job quantity, must be maintained against <u>all</u> your M (manufactured) items. The *Job Days* is the number of shop days allocated by MRP for manufacturing the item.

2. Maintain a Lead Days allocation against all P items

A *Lead Days* allocation must be maintained against <u>all</u> your P (purchased) items. The *Lead Days* is the number of calendar days allocated by MRP for procuring the item. Make sure sufficient days are allocated to cover the entire procurement process, including potential variations in supplier delivery time and receipt processing time. Among items assigned to the same default supplier, apply consistent allocations to achieve uniform due dates on multi-line POs.

3. Use item Order Policies to plan a strategic inventory

"Strategic inventory" is a plan for reducing times to shipment using the least amount of inventory to do so. Strategic inventory is achieved by applying a Demand Driven order policy against any item you wish to have on hand to meet a high probability of your demand scenarios, accompanied by a *Monthly Potential Demand* value and *Supply Days target*.

DBA auto-calculates the following:

Pre-Job Lead Days for your manufactured items

The pre-Job *Lead Days* for each M item is calculated based on the longest *Lead Days* + *Jobs Days* among its *To Order* policy components. Pre-Job *Lead Days* set the job *Planned Start* date for Jobs to ensure that you have time to produce *To Order* subassembly Jobs and procure *To Order* purchased components.

A Time to Shipment target for your for-sale manufactured items

A *Time to Shipment* target for your top level for-sale manufactured items is calculated based on the item's own pre-Job *Lead Days* + *Job Days* + *SO Default Extra Days*.. The *Time to Shipment* target is used to establish SO line *Required Dates* that drive the MRP system demand, priorities, and material allocations.

MRP Replenishment Time Action Windows

The MRP "action window" refers to each item's planning period replenishment time. For Manufactured items, replenish time is comprised of the item's pre-Job *Lead Days* + *Job Days* allocations (+ *MRP Interval* + *Non-Shop Days* + *Extra Shop Days)*. For Purchased items, replenish time is comprised of the item's *Lead Days* allocation (+ *MRP Interval* + *Non-Shop Days* + *Extra Shop Days)*.   MRP only reacts to demand within the action window, which is firm demand. Any demand outside the action window is tentative demand that is incomplete and highly likely to change as it firms over time. Any requirements outside the action window will be responded to in a future MRP run.

> System wide settings: The *MRP Interval* reflects the typical number of shop days between MRP sessions specified in *MRP Defaults* The *Non-Shop Days* accounts for non-shop days such as weekends when the shop is not in production specified in the *Shop Calendar*. The *Extra Shop Days* are extra planning period shop days specified in *MRP Defaults*.

Replenishment Time Reorder Points

For items that you choose to stock using the *Demand Driven* order policy, a *Monthly Potential Demand* rate is translated to daily rate and it is multiplied to by the Item's *Replenishment Time* to come up with a dynamically calculated *Reorder Point*.   The basic principle of *Demand Driven* stocking is that you trigger an order with enough time to replenish the stock before you run out. This aligns your inventory with your firm demand.

DBA Innovation - Dynamic Calculations

When you change any one of the Big 3 MRP Settings, or if you make system wide changes to your *MRP Interval*, *MRP Defaults Extra Days* or change your *Shop Calendar* work days, the system will automatically perform calculations for all items

through all levels of production via system triggers. This is an incredibly powerful innovation that is unique to the DBA system.

For example, if you change a long lead day purchased item order policy from *To Order* to *Demand Driven* stocking it would remove that component as a lead day contributor in all places it is used. Now imagine that item was used in 100 different bills of material at several different BOM levels. The trigger automatically applies changes from lowest level BOM order to top level manufactured items. There would be an immediate change in M item *Lead Days*, *Time to Shipment* targets, *Replenishment Times*, and *Reorder Points* for all impacted items.

MRP Settings

(*MRP - MRP Settings*)

You must provide a reasonable Lead day allocation for 100% of your purchased items. You can enter enter your urchased items settings in the MRP Settings screen. For mass entry, you can filter the MRP by Supplier and enter Lead days against groups of items. Or you can mass assign Lead days by supplier using the *Data Import > Stock Items > MRP Settings - P Items*.

Setup Tasks

1. Plan a standard Lead Days for all Purchased items

In this task you will plan a standard *Lead Days* for all P items.

The P item Lead Days is a required MRP setting

The purchased item *Lead Days* is an integral element of *Demand Driven MRP* and is a required setting that cannot be skipped or given artificial values. Without exception a standard *Lead Days* value must be assigned to each and every P item.

The P item Lead Days is standard delivery time

The P item *Lead Days* is the item's standard delivery time, expressed in calendar days.

NOTE: If an item has variable delivery where sometimes it can be procured quickly and sometimes not, you must assign a standard *Lead Days* value somewhere between the two extremes.

Lead Days Purposes

Establishes PO due dates

The item's standard *Lead Days* establishes PO due dates, which are forward scheduled from the current date at time of MRP generation.

Contributes to higher-level lead times

A job that uses a component item with a *To Order* policy must wait until the item is procured or manufactured before the job can be started. When several *To Order* policy components exist, the one with the longest lead time determines the parent item's pre-job *Lead Days* allocation. Therefore any P item with a *To Order* policy is a lead time contributor to higher-level items.

Enables late PO tracking

The standard *Lead Days* determines PO due dates for late PO tracking and expediting in the *PO Schedule* screen, which is vitally important for minimizing delays to dependent jobs.

Determines item planning periods

The standard *Lead Days* (along with the system *MRP Interval* setting) determines each item's planning period action window for PO generation. Any demand beyond the planning period will be responded to in a future MRP session when it falls into the action window and becomes current demand.

Replenishment Time helps determine the amount of inventory you carry

The standard *Lead Days* (along with the system *MRP Interval* setting) determines each item's *Replenishment Time*. For *Demand Driven* order policy items, your *Monthly Potential Demand* value is converted to a daily rate that is multiplied by the item's *Replenishment Time* to come up with a dynamically calculated *Reorder Point*. An accurate *Lead Days* allocation is therefore essential to maintaining an efficient inventory.

The P item Lead Days is not an isolated setting

The P item *Lead Days* is not an isolated setting. When a P item has a *To Order* policy, it contributes to the lead times of higher-level M items. If you give the *Lead Days* a padded or inflated value, you get inflated M item lead times and inflated time to shipment targets, inflated inventory levels, and distorted sales order required dates. So it is essential that the *Lead Days* is a realistic value that approximates actual delivery time.

Lead Days Entry

Go to the *MRP Setting - P Items* screen and enter a value in the *Lead Days* field.

Guidelines

- Enter a realistic value that represents the item's standard delivery time, expressed in <u>calendar days</u>.

- If the item has a variable delivery time where sometimes it can be procured quickly and sometimes not, you must enter a standard *Lead Days* somewhere between the two extremes.

Never pad or inflate Lead Days to expand item planning periods

One thing you must absolutely avoid is to pad or inflate P item *Lead Days* settings in order to expand item planning period action windows in MRP. Inflated *Lead Days* settings inflate M item lead times and top level time to shipment targets, distort sales order required dates, and can lead to excessive inventory.

If you prefer longer planning periods:

Item planning periods keep inventory lean because they prevent POs from being generated prematurely before they are needed. That being said, if you feel more comfortable with longer planning periods, never pad or inflate *Lead Days* settings, which has harmful consequences. Instead, go to the *MRP - MRP Defaults* screen and use the *Planning Period - Extra Days for P Items* setting to expand all P item planning periods by a set number of days.

Never use the Manufacturer's lead time

When planning for electronic components or any item where a manufacturer part number is specified, never use the manufacturer's lead time as the standard *Lead Days* because a long lead time will have harmful consequences to higher-level lead times. When a manufacturer's part is currently not available, you will typically source an alternate part from another supplier and therefore the manufacturer's lead time is never used for actual planning.

Use the Delivery Inquiry for guidance

For guidance in establishing the standard *Lead Days*, click the *Delivery* tab to reference past delivery times.

When you have thousands of P items:

Is *Lead Days* entry practical with thousands of P items? Actually, it can go quickly because within a given supplier, the standard *Lead Days* values are typically the same or similar for most items. So even though you have thousands of P items, most companies have a small set of suppliers.

Mass entry by supplier

Within a given supplier, standard *Lead Days* values are typically the same or similar for most items. To facilitate mass entry, you can filter the screen by

Default Supplier and then apply consistent values to all items sourced by that supplier.

As an alternative to manual entry, you can filter the screen and use the *Output* tool to generate a spreadsheet for mass *Lead Days* assignment. When your spreadsheet is completed use the *Data Import - Stock Items - MRP Settings - P Items* data import utility to import the *Lead Days* values.

2. Plan a standard Order Policy for all items based on lead day contribution

In this task you will plan a standard *Order Policy* for all purchased items. Placing a *Demand Driven* stocking order policy on an item will remove it as a lead day contributor in the Jobs where it is used.

Order Policy Panel

MRP > MRP Settings > Order Policy Screen

The order policy screen can be accessed from the *MRP Settings* screen by selecting the icon to the right of the *Order Policy* column in the grid.

Order Policy Types

Demand Driven

Assign the *Demand Driven* order policy when you intend to maintain stock on hand sufficient to cover a high probability of your potential demand scenarios. You will enter a *Monthly Potential Demand* value and a *Supply Days* target and the system will dynamically calculate the *Reorder Point* and *Min Order* quantity that are used to generate demand-driven jobs or purchase orders. Because your planning intent is to have stock on hand readily available, these items are not lead day contributors in the jobs and SOs where they are used.

To Order

Only assign the *To Order* policy when a component item is <u>always</u> ordered before parent jobs can be started or when a sell item is <u>always</u> made for each sales order. These items are always lead day contributors where they are used.

NOTE: It is important that *To Order* policy items remain strictly To Order. If you intend to sometimes carry extra stock or if you want a minimum quantity for price break reasons, the *Demand Driven* order policy is recommended. You can go to the *MRP > Order Policy Review* screen to audit your *To Order* items.

Manual Reorder Point (not recommended)

This setting is for manual planners that do not use MRP for jobs or purchase orders. The planning assumption the software makes is that you intend to have stock on hand for all demand scenarios. Because your planning intent is to have stock on hand readily available, these items are not lead day contributors in the jobs and SOs where they are used.

A standard Order Policy is a <u>required</u> MRP setting

A standard *Order Policy* for each item is an integral element of *Demand Driven MRP* and is a required setting that cannot be ignored or conflict with your actual planning behavior. Without exception a clear and consistent *Order Policy* must be assigned to each and every P and M item.

The item Order Policy is for lead time planning

The item *Order Policy* is for lead time planning and determines whether the item is a lead time contributor or not.

Any item with a To Order policy is a lead time contributor

A job that uses a component item with a *To Order* policy must wait until the item is procured or manufactured before the job can be started. When several *To Order* policy components exist, the one with the longest lead time determines the auto-calculated parent item's pre-job *Lead Days* allocation. Therefore any P item or lower level M item with a *To Order* policy is a lead time contributor to higher-level items.

Any top level item with a *To Order* policy is planned to be made to order, in which case the item's standard *Lead Days* and *Job Days* contribute to the item's *Time to Shipment* target. Therefore any top level M item is a lead time contributor to its own time to shipment.

Any item with a Demand Driven or Manual Reorder Point order policy does <u>not</u> contribute to lead time

Any component item with a *Demand Driven or Manual Reorder Point* order policy will not delay the start of any jobs because the item is planned for immediate availability from stock. Therefore the lead time of any P item or lower level M item with a *Demand Driven* or *Manual Reorder Point* order policy does <u>not</u> contribute to higher-level item lead times. Changing an item's order policy from *To Order* to *Demand Driven* removes the item from higher-level item lead time calculations.

Any top level M item with a *Demand Driven* order policy is planned for immediate shipment from stock and therefore its lead time does <u>not</u> contribute to its own *Time to Shipment* target.

The item Order Policy is a <u>binary</u> choice

The item *Order Policy* is a binary choice, meaning that the item is either planned to order or for stocking, but not both. It is an "either or" decision.

- If you plan the item with a *To Order* policy, all lead time calculations are based on the item always being purchased or made to order and <u>not</u> having stock on hand.

- If you plan the item with a stocking (*Demand Driven or Manual Reorder Point)* order policy, all lead time calculations are based on the item always being available from stock on hand.

If the item has never been previously stocked

When an item has never been previously stocked, do not immediately assign a *Demand Driven or Manual Reorder Point* order policy because there will be a delay before stock is actually on hand as planned. Instead, create a manual job or PO for the item to establish an initial stock quantity. After the job or PO is received to inventory, then assign the item an appropriate *Demand Driven* order policy.

Avoid CTO job linking with standard items

When a top level M item is flagged for CTO job linking it is assigned a *To Order* policy and jobs are linked to and generated directly from sales order lines for the exact quantity ordered. CTO linking is ideally suited for one-off, custom items that are made to order and never stocked. For standard items, however, CTO linking is counter-productive and should be avoided because such items are interchangeable from order to order and subject to stocking. There is no ability to adjust CTO jobs to account for stock on hand or to consolidate demand into more efficient job sizes. Furthermore, CTO linking forces items to be made to order, even in cases where items with frequent orders could be planned with a *Demand Driven* order policy to enable immediate shipment from stock.

4. Refine Time to Shipment targets

In this task you will review and refine top level item *Time to Shipment* targets as needed to meet your marketing objectives.

Time to Shipment targets establish SO Required Dates

Top level item *Time to Shipment* targets establish sales order *Required Dates*, which drive job generation and job and shipping prioritization.

Enables a company-wide time to shipment strategy

Time to Shipment targets enable you to formulate an overall time to shipment strategy for staying competitive in your marketplace. This is a company-wide strategy because planned times to shipment and underlying lead times and order policies can be shared with management, sales, and production personnel to achieve common objectives.

How is Time to Shipment calculated?

A *Time to Shipment* target is calculated for each of your top-level M items as follows. You can click the down arrow in the *Time to Shipment* field to view the calculation variables.

To Order Policy Items

When the item has a *To Order* policy, it is planned to be made to order, in which case *Time to Shipment* is calculated from the following variables:

Lead Days
This is the item's standard *Lead Days* for pre-job time needed for procurement or production of to order materials or subassemblies.

Job Days
This is the item's standard *Job Days* for production time.

SO Shop Days
With *To Order* policy items the extra *Shop Days* enables you to extend SO line item *Required Dates* by an extra day or two.

NOTE: If you specify any extra shop days, <u>all</u> jobs for *To Order* policy items will be delayed by that number of days. Unless you purposely want a widespread delay to all such jobs, we do not recommend using this setting.

Non-Shop Days
Time to Shipment is factored by this number of days to account for weekly non-shop days defined in the *Shop Calendar*.

Stocking Order Policy Items

When the item has a stocking (*Demand Driven or Manual Reorder Point*) order policy, it is planned for immediate shipment from stock. In this case *Time to Shipment* is calculated from the following variables:

SO Shop Days
An extra *Shop Days* can be specified in the *SO Required Dates* screen against *Stocking* order policy items to add an extra day or two to account for orders that are received today, but can't be shipped until tomorrow or the next day.

Non-Shop Days
Time to Shipment is factored by this number of days to account for weekly non-shop days defined in the *Shop Calendar*.

Review and refine Time to Shipment targets as needed

In this task you should review all *Time to Shipment* targets to verify that they have realistic values and meet your marketing objectives. When you encounter a value that needs refinement, you can take any of the following measures:

Make sure standard lead times are realistic

Make sure that all your P item *Lead Days* and M item *Job Days* settings are realistic. It these lead time settings are padded or inflated, your *Time to Shipment* targets will be inflated as well.

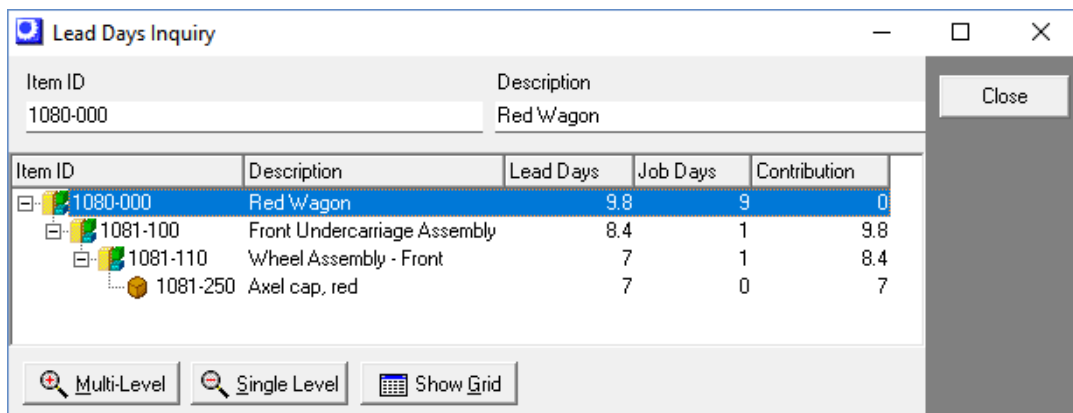### Make sure stocked items have a Demand Driven or Manual Reorder Point order policy

Make sure the items you stock in actual practice are given a *Demand Driven* or *Manual Reorder Point* order policy or else those items will contribute to higher level lead times, which will inflate top level *Time to Shipment* targets.

Eliminate Time to Shipment with strategic inventory

You can eliminate *Time to Shipment* altogether (except for *SO Shop Days* and *Non-Shop Days*) by assigning the top level item a *Demand Driven* or *Manual Reorder Point* order policy.

Reduce pre-job Lead Days by removing lead time contributors

You can reduce the item's pre-job *Lead Days* by removing contributor components. To do so, examine the item's *Lead Days* inquiry, which displays the *To Order* policy component that contributes the longest lead time. Assign that component item a stocking order policy (*Demand Driven* or *Manual Reorder Point*) to remove it as a lead time contributor. After doing so, examine the effect on the calculated manufactured item *Lead Days* and continue removing contributor components as needed.

4 Plan Strategic Invenetory

Consider applying the *Demand Driven* order policy to most commonly used purchased components.

Overview

"Strategic inventory" is a plan for reducing times to shipment using the least amount of inventory to do so. You decide which items are to be made or purchased *Demand Driven* and against those items you enter a *Monthly Potential Demand* and *Supply Days* target to replenish stock..

Reducing lead times

A To Order policy item is removed as a lead time contributor by reassigning it to the Demand Driven order policy. You can reduce pre-job Lead Days for your manufactured items by selectively removing contributor components, which enables jobs to be started earlier. Reassigning top-level M items to the *Demand Driven* order policy eliminates *Time to Shipment* altogether.

Target dates sequence and prioritize system activities

The "Big 3" lead time settings and two dynamic settings for lead time contribution determine your PO, job, and SO dates, which are perfectly aligned in the correct order of assembly. Take note that these are target dates, not literal dates, that sequence and prioritize system activities.

When items have highly unpredictable demand:

The *Demand Driven* order policy does not require a reliable or consistent demand pattern to be effective. When unexpected demand causes a shortage, MRP immediately generates new supply and prioritizes dependent jobs to get them back on schedule. When an unusually large sales order necessitates making the item to order, the *Late Supply* screen provides feedback from production, which helps sales establish a realistic *Estimated Ship* date for communication to the customer.

How to get your inventory under control

All material planning methods incur inventory because it is not practical to buy and make everything to order. The best inventory planning method, by far, is *Demand Driven MRP*, which is the basis of the *Demand Driven* order policy, a unique DBA innovation for smaller manufacturers. This simple planning method provides efficient ordering, rapid response to shortages, and eliminates overstocking.

The root cause of inventory problems

Other planning methods drive lower-level requirements from sales forecasts using linked jobs or BOM explosions. Top-down explosions cause the "bullwhip effect" where forecast errors amplify exponentially at each lower level whenever component

quantities are multiples of the parent. Like the power of a bullwhip, minor planning errors at the top quickly grow into major errors at the bottom and inventory easily gets out of control.

Breaking the bullwhip effect

Demand driven planning has no bullwhip effect because lower-level items are planned individually instead of from a top-down explosion. New supply for any given item is triggered by total net demand instead of being linked to specific jobs or sales orders.

Each item is planned for potential demand

Demand driven planning does not forecast or explode future requirements. Instead, each item is planned for a *Potential Demand* rate, aided by a monthly usage graph, which is simply a possible demand scenario, not a forecast or prediction. It is entered as a monthly amount that gets translated into a daily rate.

The *Potential Demand* rate is applied to the item's *Replenishment Time* (*Lead Days* + *Job Days* + *MRP Interval*) to calculate a dynamic *Reorder Point*, and a *Supply Days* interval target is specified to calculate a dynamic *Min Order* quantity.

> NOTE: Make sure that item *Lead Days* and/or *Job Days* allocations are realistic. Padded or inflated lead times cause high *Reorder Points* that trigger excessive inventory.

New supply is triggered by firm demand

Demand driven planning never takes action on tentative demand from forecasts or explosions, which constantly changes over time. Instead, new supply is triggered solely by firm demand from sales orders.

During each MRP session, items are evaluated in a multi-level progression so that new jobs generated at each level create demand for components at subsequent levels. Whenever net demand (on hand + inbound supply - planning period demand) falls below an item's Reorder Point, MRP generates a new job or PO for the item's Min Order quantity or actual demand amount, whichever is greater.

Reordering is timely and efficient

Demand driven planning solves the universal problems of when to order and in what quantity. New supply is ordered early enough so that remaining supply covers daily *Potential Demand* over the item's *Replenishment Time*. The *Min Order* quantity ensures efficient order sizes at consistent intervals.

You are pre-ordering for the next Supply Days interval

Like to order planning, new supply is only triggered by firm demand from sales orders or jobs. Instead of ordering for the sales order or job, however, you are pre-ordering for the next *Supply Days* interval, which eliminates lead time with relatively little inventory.

The item's *Potential Demand* rate does not require precision or constant adjustments. When actual demand is greater than the *Potential Demand* rate, the item will be reordered sooner than its planned *Supply Days* interval. Conversely, when actual demand is less than the *Potential Demand* rate, the item will be reordered later than its planned *Supply Days* interval.

Nothing can fall through the cracks

Because each item is planned individually, there is no need for SO/Job linking or BOM explosions to ensure that material requirements are fully covered. Each item's *Reorder Point* makes it impossible for any demand to somehow get missed or fall through the cracks.

Overstocking is eliminated

When inventory is "pushed" onto the system with top-down explosions or blanket POs, stock continues to accumulate unless constant adjustments are made to realign supply with actual demand. By contrast, demand driven planning "pulls" inventory into the system, triggered solely by firm demand from sales orders. Inventory for any given item can never exceed one *Supply Days* interval.

It's the best way to plan P items with long lead times

Demand driven planning takes the risk and guesswork out of planning P items with extremely long lead times. Instead of less frequent, larger orders with high inventory cost and risk of lengthy shortages, the item *Lead Days*, *Potential Demand*, and *Supply Days* settings cause multiple POs to be triggered in demand driven intervals, which moderates inventory swings and minimizes the duration of any shortages.

Tasks

1. Plan Strategic Inventory for Stock Replenishment

(*MRP - MRP Settings - Order Policy Screen*)

Settings for P items with a *Demand Driven* order policy are entered in the *Order Policy* screen within the *MRP Settings* screen, which is accessed by clicking the button to the right of the *Order Policy* field.

Demand Driven Order Policy

Select this order policy when you intend to maintain stock on hand sufficient to cover a high probability of your potential demand scenarios. You will enter a *Monthly Potential Demand* value and a *Supply Days* target and the system will dynamically calculate the *Reorder Point* and *Min Order* quantity values that are used to generate demand-driven jobs or purchase orders.

How it works

The goal of the demand driven system is to trigger a new job or purchase order with enough time to replenish the stock before you run out. The *Monthly Potential Demand* value covers a high probability of anticipated demand scenarios. The *Supply Days* target helps govern the amount of time between your jobs and purchase orders.

You enter a *Monthly Potential Demand* value and a *Supply Days* target. The system will convert your *Monthly Potential Demand* value into a daily rate. The daily rate is multiplied by the item's *Replenishment Time* to come up with the *Reorder Point* and the daily rate is multiplied by the *Supply Days* value to come up with the *Min Order quantity.*

All jobs and purchase orders are triggered by actual demand. Whenever net demand (stock on hand + all inbound supply - actual demand within the item's planning period action window) falls below the item's *Reorder Point*, MRP generates a job or purchase order with a supply quantity equal to net demand or the *Min Order* quantity, whichever is greater.

What happens when actual demand differs from my Monthly Potential Demand entry

The item's *Potential Demand* rate does not require precision or constant adjustments. When the actual demand (sales + job issues) is exactly equal to the *Monthly Potential Demand* rate then you would expect the time between jobs or orders to exactly equal your *Supply Days* interval. When actual sales/usage exceed your *Potential Demand* rate, the item will be reordered sooner than its planned *Supply Days* interval. Conversely, when sales/usage is less than the *Potential Demand* rate, your supply will last a bit longer than your *Supply Days* interval target. When you are fortunate enough to get sales that exceed your plan and you run out of stock for that item, MRP immediately generates new supply and auto-prioritizes dependent jobs to get them back on schedule. When an unusually large sales order necessitates making the item to order, the *Late Supply* screen provides feedback from production, which helps sales establish a realistic *Estimated Ship* date for communication to the customer.

When to use

Use for lean inventory planning

Use this order policy for lean inventory planning to achieve efficient utilization of inventory without shortages or over-stocking.

Use for most purchased components and subassemblies

You will want to place the *Demand Driven* order policy on all commonly used purchased components and subassemblies to have them on hand for immediate use in jobs.

Use for standard sale items

Assign a *Demand Driven* order policy to any top level M item where immediate shipment is a desirable marketing strategy or the item has frequent demand that makes it more efficient to replenish stocking at demand-driven intervals instead of making the item to each order.

Use for P items with long lead times

Assign this order policy to P items with long lead times. The *Monthly Potential Demand* rate and *Supply Days* interval calculate a *Reorder Point* and *Min Order* quantity that generate a supply pipeline of overlapping POs, each due to arrive at staggered intervals. A demand-driven PO pipeline is far more efficient than large and infrequent POs because more frequent replenishment eliminates the risk of lengthy shortages and excessive stock on hand.

Replace blanket POs with a supply pipeline

If you are using blanket POs with a set of scheduled deliveries, each such item should be assigned the *Demand Driven* order policy and the blanket purchase order should be replaced with a supply pipeline so that future POs are generated by MRP. Blanket POs are counter-productive because they require constant adjustments to avoid shortages and over-stocking when scheduled supply inevitably differs from actual demand. By contrast, MRP generates demand-driven purchase orders at self-adjusting intervals governed by our *Supply Days* target.

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Demand Driven Settings

Select the 'Demand Driven' option

In the *Order Policy* panel, select the *Demand Driven* option.

If you receive a Projected Shortage warning:

When you change an item's order policy from *To Order* to *Demand Driven*, upon saving the program checks if stock on hand is sufficient to cover one planning period of forecast demand. If not, you receive a *Projected Shortage* warning that displays the projected shortage amount. This means that you will be unable to immediately begin issuing the item from stock. You are presented with two options:

Cancel Changes

With this option you leave the order policy as *To Order* for the time being and you create a manual job to cover the projected shortage. After the manual job is completed, change the order policy to *Demand Driven*.

Ignore Suggestion and Save Changes

With this option the order policy is changed to *Demand Driven*, even though initial shortages may occur. MRP will generate an immediate job to cover the projected shortage, but that job will be late relative to its required date if any current demand exists or materializes in the near future.

1. Enter a Monthly Potential Demand value

Enter a *Monthly Potential Demand* value, which reflects monthly sales + usage in jobs. You can use past history for reference by reviewing recent trends in the *Average Monthly Trend* panel at left, view the *Monthly Trend* graph, or by reviewing monthly averages in the *Monthly Historical* tab in the lower panel.   The goal is to have sufficient stock on hand to meet a high probability of your potential needs.

The monthly rate is a general trend, not a precise forecast

Unlike a forecast, which is a precise prediction of future demand, the *Monthly Potential Demand* rate represents a general trend in demand and does not need the precision of a forecast. Enter a "ball park" monthly demand rate that covers a high probability of your potential demand scenarios.

General Guidelines

- For items with a fairly consistent usage pattern, you can review the *Monthly Trend* graph and choose a *Monthly Demand* value that covers most historical scenarios. When you enter a *Monthly Demand* value, you will see a horizontal line in the graph.

- The *Monthly Trend* data panel provides averages, standard deviations, and peak usage for trailing 90, 180, and 360 Days.   The average + 1 standard deviation covers 84% and the average + 2 standard deviations covers 97.5% of scenarios for the date ranges specified. The peak value represents the highest 30 day bucket within the 3 date range columns.

You can use the selection arrow to the right of any numeric value to auto-fill the *Monthly Demand* entry field.

- If the item does not have a consistent pattern of usage, yet you still want to carry inventory, choose a target monthly value that you wish to cover.

- If the item is new and does not have any historical data, apply a common sense monthly value that is consistent with your usage of similar items.

The Reorder Point is dynamically calculated

The item's Reorder Point is dynamically calculated as follows:

<u>Variables</u>

Monthly Potential Demand / 30 = Daily Demand

Replenishment Time = Lead Days + Job Days + MRP Interval + Non-Shop Days

<u>Formula</u>

Daily Demand * Replenishment Time = Reorder Point

If the item's *Monthly Potential Demand*, *Lead Days*, or *Job Days* gets changed, the *Reorder Point* is automatically recalculated so that it always reflects your current planning settings.

The Reorder Point is a trigger point, not a stocking level

The Reorder Point is a trigger point for job or PO generation and is not a stocking level. A trigger point has no obvious meaning in itself and should not be of concern when it has a high value. An item with an extremely long lead time, for example, will have a high Reorder Point value, but job or PO quantities are determined by actual demand and the Min Order quantity and will be a much lower amount.

2. Enter a Supply Days interval target (Calculated Min Order)

Supply Days entry

In the *Min Order* panel, select the *Calculated* option. Enter a *Supply Days* interval, which is the planned number of days to be supplied by each replenishment job or PO

For example, if you plan for a job or PO to be generated twice a month, enter a *Supply Days* interval of '15'. If you plan for a job or PO to be generated once a month, enter a *Supply Days* of '30'.

Use smaller intervals for lean inventory

The *Supply Days* interval is a powerful tool for lean inventory planning. To keep inventory as lean as possible, use smaller *Supply Days* intervals to generate smaller and more frequent jobs or POs. Smaller and more frequent replenishment minimizes stock on hand and reduces the duration of shortages.

The Min Order quantity is dynamically calculated

The item's *Min Order* quantity is calculated as follows:

Variables

Potential Monthly Demand / 30 = Daily Demand

Formula

Daily Demand * Supply Days = Min Order

If the item's *Monthly Potential Demand* or *Supply Days* gets changed, the *Min Order* quantity is automatically recalculated so that it always reflects your current planning settings.

Generates a PO pipeline for P items with long Lead Days

The *Supply Days* interval is ideally suited for P items with long lead times when combined with the *Demand Driven* order policy.   The *Monthly Potential Demand*, long standard *Lead Days,* and *Supply Days* interval calculate a *Reorder Point* and *Min Order* quantity that generate a supply pipeline of overlapping POs, each due to arrive at staggered intervals. A demand-driven PO pipeline is far more efficient than large and infrequent POs because more frequent replenishment eliminates the risk of lengthy shortages and excessive stock on hand.

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Settings provide planning logic transparency

The big benefit of a calculated *Min Order* quantity is that the settings from which it is derived – the item's *Monthly Potential Demand* and its *Supply Days* interval – are visible and transparent. This enables the planner and others in the company to be fully aware of the logic being used for inventory planning.

Review Demand Driven settings on a periodic basis

Review *Demand Driven* settings on a periodic basis to ensure that monthly potential demand rates remain valid. You can use the *MRP - MRP Analysis Codes* screen to assign and schedule sets of items for periodic review. See the following chapter for reference.

📘 MRP Guide - Using MRP Analysis Codes

2B. Manual Min Order entry option

As an alternative to the *Calculated* option, you can select *Manual* and enter a value directly in the *Min Order* quantity field to determine the minimum job or purchase order quantity.

- With M items a manual entry is typically used as an economical order quantity to generate job quantities sufficiently large enough to justify machine setups or to match quantities In with machine sizes.

- With P items a manual *Min Order* quantity may be needed when the default supplier has a minimum order policy or offers a significant quantity price break. A minimum order size can also reduce unit shipping and handling costs and can reduce the frequency and number of POs that get generated.

Enter topic text here.

5   Purchasing Long Lead Days Items

Planning for long lead day purchased items is an extremely challenging task for all manufacturing companies. Our *Demand Driven* Order Policy combined with the use of *Supply Days* to control your PO intervals is the ideal way to handle long lead day purchasing.   The supply days will create a pipeline of multiple inbound POs, each due to arrive at staggered intervals, to meet and adapt to your actual demand.

KB - How do I handle long lead day purchasing?

Plan a supply pipeline for long lead time items

When a purchased item has an extremely long lead time, such as several weeks or months, it is highly risky to generate and receive one PO at a time. If a shortage occurs, it could take weeks or months for the next PO to arrive. Such a lengthy shortage would bring all dependent jobs to a standstill.

The ideal planning method for long lead time items is to generate a pipeline of multiple overlapping POs, each due to arrive at staggered intervals. If a shortage happens to occur, it will be relatively short in duration because the next PO is likely to arrive soon and delays to dependent jobs will be of minor impact.

MRP Settings - Demand Driven order policy - Enter a Monthly Potential Demand value and Supply Days target

A PO pipeline is achieved by assigning the item a *Demand Driven* order policy. Enter a *Potential Monthly Demand value*, which combine with the item's *Replenishment Time* to calculate a dynamic *Reorder Point* that triggers PO generation. Enter a planned *Supply Days* for the desired interval between POs, which combines with the monthly demand rate to calculate a dynamic *Min Order* quantity.

The Reorder Point will have a relatively high value

An extremely long standard *Lead Days* will cause the *Reorder Point* to have a relatively high value compared to items with short standard *Lead Days*. Do not be concerned by the high value because the *Reorder Point* is a trigger point and not a stocking level.

Net Demand will also have a relatively high value

Net Demand is calculated as follows:

Net Demand = Stock On Hand + All Inbound POs - Actual Demand

Take note all inbound POs are included in the calculation, which gives *Net Demand* a relatively high value.

Actual demand triggers the next PO

The next PO gets triggered when *Net Demand* falls below the item's *Reorder Point*. So even though the item has high *Net Demand* and *Reorder Point* values, it is the difference between the two values that triggers the next PO.

PO intervals are self-adjusting

The intervals between POs are self-adjusting with actual demand. For example, if actual demand happens to be less than planned, the next PO is automatically delayed and the supply days interval becomes longer than planned. Conversely, if actual demand happens to be greater than planned, the next PO is automatically generated earlier and the supply days interval becomes shorter than planned.

6   Replacing Blanket POs with Generated POs

This chapter explains how to replace blanket POs with a forecast and supply days setting to generate demand-driven POs at regular intervals.

Eliminate blanket POs

Do not create blanket POs whereby a series of future quantities and due dates are scheduled for an item. This is a crude form of forecasting that is not compatible with the MRP design. The correct way to purchase against anticipated demand is to set the item's order policy to Demand Driven order policy and enter a *Monthly Potential Demand* rate and a *Supply Days* target so that future POs will be generated by MRP in demand-driven intervals.

If open blanket POs exist

If open blanket POs exist, each such PO should be closed out and canceled. Indicate to your supplier that the blanket PO will be replaced by individual POs from this point forward.

How to manage contract purchasing

If you contract with a supplier for a long term volume commitment in exchange for a fixed price, it is not necessary to manage this process with blanket POs. Instead, use the *Order Policy* screen to enter a *Monthly Potential Demand* rate and *Supply Days* setting so that future POs will be generated by MRP in demand-driven intervals.

The supplier price table, which is accessed from the *Sources* tab within the *Stock Items* screen, enables you to establish the fixed price along with from and thru dates that define the duration of the price contract. You can use the price notes to indicate the volume commitment associated with the price.

If there is a contract reference number, we suggest you build that number into the supplier description for the item, which is the description that prints on the PO.

To monitor actual purchases against a price contract, you can use the *PO Lines Summary* or *PO Receipts* data view, which can be filtered for a given item, supplier, and date range.

7   PO Generation

This chapter explains how POs are generated through the *MRP* screen.

Topics:

[MRP Concepts](#)

[Minimum Requirements](#)

[Running MRP](#)

[PO Generation](#)

[PO Conversion](#)

See also:

Manufacturing Efficiency Guide - Essential #2 - Generate a Master Schedule

7.1 PO Generation - MRP Concepts

MRP is used on a daily basis to generate demand-driven jobs and purchase orders.

Jobs and POs are generated through MRP

All jobs and POs are generated by the *MRP* screen. Jobs are always generated first in multi-level order so that each level generates the demand that drives subsequent levels. POs are always generated last so that purchased items have complete demand profiles.

Run MRP on a daily basis for "just in time" target dates

MRP should be run on a daily basis so that jobs and POs are generated "just in time" to respond in timely fashion to any new demand that materializes within item planning period action windows

MRP generation is a multi-level process

Each MRP run is processed in multi-level order, starting with job generation for custom to order items, followed by job generation for standard sell items, job generation for subassemblies, and ending with PO generation. The jobs that are converted at each level affect the requirements for subsequent levels.

Each MRP session is typically split by a planner and buyer

Each MRP session is typically split by a production planner and a buyer or is handled by one person who performs both roles.

The planner converts planned jobs

The production planner, who maintains item order policies and supply pipelines, M item standard *Lead Days* and *Job Days* settings, and top level item *Time to Shipment* targets, generates planned jobs and converts them into live jobs.

The buyer converts planned POs

The buyer, who maintains P item standard *Lead Days* settings, supplier line cards, and purchase prices, reviews and converts planned POs into live POs after verifying supplier selection, pricing, and manufacturer part number availability.

MRP consolidates interdependent demand

On paper a product structure is an independent set of multi-level subassemblies and purchased components, but actual demand is typically "interdependent" across multiple product structures. A parent item, subassembly, or purchased component may be needed by several sales orders or jobs at the same time. Whenever possible, MRP combines interdependent demand into a single job or PO. By consolidating

interdependent demand into fewer jobs and POs, MRP generates a simpler and more efficient master schedule that is easier to manage and execute.

MRP should be generated daily

Because sales order demand materializes on a daily basis, MRP should be generated daily to initiate jobs and POs as quickly as possible for just in time planning and to avoid introducing late days into the master schedule.

Never bypass MRP with manual POs

MRP generates a coordinated master schedule in which all dates are inter-connected and work centers are prioritized based on meeting required dates. When you interject a manually created job or PO into the master schedule, it has no relationship with other dates and disrupts the schedule by misallocating material and distorting work center priorities.

Proper use of manual POs

This rule does not mean that you never create a manual job or PO line. What it does mean is that all POs related to actual or anticipated demand must always be generated by MRP. If you need to create a PO line for other purposes, you are free to do so.

Each set of POs generated by MRP represents a minimum action profile of the items that must be ordered immediately to meet item required dates. After a PO has been generated by MRP, you may wish to augment the PO manually within the *Purchase Orders* screen to accommodate special situations. If you wish to fill a truck or container to reduce unit shipping costs, you may wish to increase item quantities or add items that will be needed in the future. If you have a minimum volume level commitment with a supplier, you may wish to increase quantities or add items to meet your volume level.

Never generate partial or fragmented MRP sessions

Each MRP session is designed for complete generation and conversion through all job levels and always finishing with PO generation and conversion. Complete generation is an absolute requirement for achieving a coordinated master schedule. Never skip levels or generate jobs on one day and POs on another.

NOTE: This rule does not mean that two people cannot participate in an MRP session. A production planner, for example, could generate the entire session and convert jobs, but could pause the session after PO generation so that a buyer could convert the planned POs after verifying supplier prices and other details.

Never delay planned job or PO conversion

When MRP generates a planned job or PO, it must be converted <u>immediately</u> in order to avoid introducing late dates into the master schedule. Never delay conversion because this defeats the "just in time" nature of the master schedule.

7.2   PO Generation - Minimum Requirements

All M items must have a Job Days allocation

Without exception, each of your M (manufactured) items must have a *Job Days* allocation in order to establish each item's planning period and to generate realistic start and finish dates within the master schedule.

> WARNING: Never artificially inflate allocations in an attempt to "trick" the planning system. Inflated allocations will have a cascading negative effect on other dates that corrupts the master schedule.

Maintain a Lead Days allocation against all P items

A *Lead Days* allocation must be maintained against <u>all</u> your P (purchased) items. The *Lead Days* is the number of calendar days allocated by MRP for procuring the item.

Bear in mind that the *Lead Days* is an "allocation" and is not the literal time it takes to receive the item from the default supplier. The allocation should take into account procurement time, receipt processing time, and extra time that may be needed to cover potential delays.

Also be aware that the allocation length may affect planned start dates for jobs that use the item. A shorter allocation may enable earlier planned start dates, but increases the risk of job delays from late POs. A longer allocation reduces the risk of job delays, but may contribute to later planned start dates.

> WARNING: Do not artificially inflate item *Lead Days* allocations because all dates are inter-connected. Inflated allocations will push out other dates in a cascading fashion that corrupts the master schedule.

Strive for uniformity within supplier

Among items assigned to the same default supplier, apply consistent allocations to achieve uniform due dates on multi-line POs. The *MRP Settings* screen can be filtered by default supplier, which enables you to focus on sets of items by supplier.

Delivery Inquiry

To get a listing of actual delivery days associated with past PO receipts, you can click the *Delivery* tab at the top of the grid.

7.3   PO Generation - Running MRP

Opening Screen

Each MRP run is identified with a session number. The opening screen displays the current session number, the date and time the session was initiated, and the number of days since the last MRP session was fully completed.

To initiate a new MRP session, click the *Generate* button. To continue an existing session that was paused, click the *Continue* button. To stop a session in progress and start a new session from scratch, click the *Regenerate* button.

MRP generation is a multi-level process in which items are assessed and processed in this order:

- Level 0 – CTO Items
- Level 0 – Sell Items
- Level 1+ - Sub Items
- Final Level – P Items

Level 0 – CTO Items

MRP generation begins by assessing your CTO (custom to order) items, which are customized for each customer order. CTO items are level '0' sell items that are never used as subassemblies in other jobs. Planned jobs for CTO items are generated directly from sales order lines in the exact quantity ordered.

Level 0 – Sell Items

After planned jobs for CTO items are converted, MRP assesses your "Sell" items, which are standard (non-customized) items that are for sale to customers. Sell items are level '0' items because they are never used as subassemblies in other jobs. Planned jobs for sell items are generated whenever net demand falls below the item's *Reorder Point* within its planning period.

Level 1+ - Sub Items

After planned jobs for sell items are converted, MRP assesses your "Sub" (subassembly) items, one level at a time. Each subassembly item is assigned to the lowest level it occupies among all the product structures where it is used as a BOM component. Planned jobs for subassembly items are generated whenever net demand falls below the item's *Reorder Point* within its planning period.

Final Level – P items

After all subassembly levels are processed, MRP assesses your purchased items. Planned POs are generated whenever net demand falls below the item's *Reorder Point* within its planning period.

7.4 PO Generation - PO Generation

Key Concepts

Time to Shipment targets generate sales order line item *Required Dates* to provide the demand that drives daily MRP generation. Jobs and POs are generated and converted level by level in response to current net demand within item planning periods relative to *Reorder Points* and *Min Order* quantities. Job and PO dates are derived and aligned from standard lead times with coordinated system target dates.

Demand Dates	Supply Dates
SO Line Required Date	Job Finish Date
Job Planned Start Date	PO Line Expected Date

React to the firm - MRP Action Windows

Instead of reacting to tentative demand, MRP will only react to firm demand. Each item has its own "action window", which covers the time it takes to make or buy the item. MRP only reacts to demand within the action window, which is firm demand. Any demand outside the action window is tentative demand that is incomplete and highly likely to change as it firms over time.

Reacting to the firm yields miraculous benefits. Planned supply is always aligned with firm demand, which eliminates the misalignments that are the root cause of shortages, overstocking, and the need for constant job and PO revisions. Each item is planned individually, which eliminates the bullwhip effect from BOM explosions and job linking that amplifies misalignments at lower levels.

Protect for the future - Demand Driven Order Policy

Instead of using inventory to cover tentative demand projections, inventory is used to protect against future demand. Each item (other than to order items) is given a value that covers potential monthly demand. The monthly potential demand is applied to the item's replenish time to calculate a dynamic reorder point. Whenever net demand within the item action window falls below the reorder point, MRP triggers a job or PO early enough to replenish stock before it runs out.

Overstocking is eliminated because new supply only gets triggered by firm demand and cannot keep accumulating. Throughput increases with consistent and efficient order quantities and run sizes. Even though the majority of items are planned for stocking, most companies experience a dramatic reduction in overall inventory.

MRP

(*MRP* Menu)

PO Generation is performed in MRP after you have generated and converted all levels of production Jobs

PO generation and conversion

Jobs are always generated first

Jobs and POs are generated in a single, multi-level process.   Jobs are generated and converted for all levels of production. MRP then aligns the purchased materials with the planned start of Jobs ensuring that all demand is properly covered and dates are aligned. The *Planned Start* date of Jobs provides the demand for subassemblies and purchased components and establishes the target date for job release.

POs are triggered by actual net demand

A PO is generated whenever current net demand (stock on hand + all inbound POs - actual demand within the item's planning period) falls below the item's *Reorder Point*. The PO quantity will be equal to actual net demand or the item's *Min Order* quantity, whichever is greater. POs are aligned with the target job release date (planned start date) to ensure material is available for production.

Long-term tentative demand is not included

Any long-term demand outside the item's planning period action window is not included in the net demand calculation. This is because there is ample time to generate a PO later when the demand becomes current and firmly set. Demand driven planning takes no action against long-term demand because it is often tentative, incomplete, and subject to scheduling and specification changes and order cancellations.

If you prefer a larger action window:

Item planning periods keep inventory lean because they prevent POs from being generated prematurely before they are needed. That being said, if you feel more comfortable with longer planning periods, never pad or inflate *Lead Days* settings, which has harmful consequences. Instead, go to the *MRP - MRP Defaults* screen and use the *Planning Period - Extra Days for P Items* setting to expand all P item planning periods by a set number of days.

Interdependent demand is consolidated into single POs

Because the PO schedule is limited to short-term demand that is firmly set, there is no need to isolate demand into separate POs for each job. Consequently, interdependent (shared) demand for each item is consolidated into a single PO for more efficient scheduling and optimal pricing.

Verify that each PO has a valid Supplier Price

The integrity of the costing system depends on each PO having a realistic *DBA Unit Cost*, which is derived from the *Supp Price*. When the PO is received, the *DBA Unit Cost* updates the item's unit *Inventory Cost*, which is the cost that gets applied to job issue transactions. Therefore your most important responsibility with PO conversion is to make sure that each planned PO has a valid *Supp Price*.

Verify Supplier selection

When generated, each planned PO is assigned to the item's *Default Supplier*. You can freely change the *Supplier* to any of the item's alternate suppliers and you can also create a new supplier line card record for the item, which includes the supplier part number, unit of measure, conversion multiplier, and supplier price.

Verify Mfgr Part No availability

If a *Mfgr Part No* is specified against the item, make sure it is available. If not, you can freely change the *Mfgr Part No* to any of the item's alternate manufacturer part numbers. You can also create a manufacturer and manufacturer part number record for the item.

Use Review Notes for special situations

Unlike planned job conversion, which is largely a completely automated process, planned POs often require active intervention prior to conversion. For example, some items may require a price quote with each purchase. Other items may require price comparison among multiple suppliers to find the best current price. Other items may require verification of manufacturer part number availability.

A formal means for conveying special purchasing instructions is to document them in a *Review Note* that is assigned to the item in the *MRP Settings* screen. During MRP generation the planned PO cannot be converted until the *Review Note* has been read and confirmed as completed.

POs can be converted by supplier

Planned POs can be converted incrementally by supplier. This enables you to focus on one supplier at a time to verify prices and supplier and manufacturer part numbers. Each set of planned POs for a supplier is converted into a single, multi-line purchase order.

Augment converted POs if needed

Each planned PO is a minimum action profile. After the PO has been converted, the PO can be augmented manually within the *Purchase Orders* screen to accommodate special situations. For example, to fill a truck or container you may

wish to increase the PO quantity or add extra items. Or you may wish to increase the PO quantity to meet a volume level commitment with a supplier.

Review actual POs and send to suppliers

After PO conversion is completed, the final task is to go to the *Purchase Orders* screen to conduct a final review of each *Opened* status PO, which is a PO that has not yet been sent to the supplier. After each such PO has been reviewed and finalized, click the *Print* button to Email or print the PO, which changes the PO status to *Printed* to indicate that it has been sent to the supplier.

Screen Details

Planned PO Generation

Planned PO generation works as follows:

- All purchased items are examined in succession for potential planned PO generation. If net demand is less than the item's *Reorder Point* and the shortfall occurs within the item's planning period, a planned PO is generated. The PO *Plan Qty* is the net demand shortfall or the item's *Min Order* quantity, whichever is greater. If the item has a *Multiple* setting, the *Plan Qty* is rounded up to the nearest increment divisible by the *Multiple* amount.

  - **Net Demand:** This is stock on hand, plus supply from all pending POs, less demand from all jobs and sales orders.

  - **Planning Period:** This is the total number of calendar days allocated by MRP for assessing net demand. It is comprised of the following elements:

    ```
      MRP Interval Days
    + Item Lead Days
    + Extra Planning Period Days
    + Non-Shop Days
    -------------------------
    = Planning Period
    ```

- The planned PO's *Required* date is equal to the earliest date within the item's planning period when projected stock goes negative. If projected stock does not go negative, it is equal to the planning period end date.

- The planned PO is forward scheduled from the current date by the item's *Lead Days* allocation and is rounded forward, if needed, so that receipt occurs on a shop day.

Review each planned PO and click OK

Review each planned PO and take any of the allowable actions listed below. After each PO has been reviewed, select its *OK* checkbox.

Filtering the grid by supplier

When planned POs are converted into actual POs, all selected lines assigned to the same supplier are included in a single multi-line PO to that supplier. In the upper panel you have the option of filtering the grid by *Supplier* so that you can focus on reviewing and converting one set of related items at a time.

Allowable actions

Any of the following actions may be taken with a planned PO:

Read the Review note

If an icon is displayed in the *Review* field, the item has a review note that must be read before you are allowed to select the PO's *OK* checkbox. The review note provides a means for conveying special instructions pertaining to planned POs for this item.

Increase the PO Qty

The *PO Qty* is the minimum quantity dictated by the item's MRP settings and is normally not subject to change. If wish to increase the quantity, you can do so through direct entry within the *PO Qty* field.

Select an alternate Supplier

Click the left button in the *Supplier* field to select an alternate supplier from a list of this item's allowable suppliers.

Add or edit the Supplier line card

Click the right button in the *Supplier* field to add, edit, or clear a supplier line card record, including the *Default* flag, *Supp Part No*, supplier *Description*, supplier *UM*, conversion *Multiplier*, and supplier *Price*.

Override the Supplier Price

The *Supp Price* field displays the price that will flow through to the actual PO. The *Price Origin* field to its right indicates the origin of the price, which can be 'Item Source' when a supplier price record exists, 'Last Cost' when there is no supplier price record and the item has a *Last Cost* value, or 'Estimated Cost' when there is no supplier price record and the item does not have a *Last Cost* value. If you wish to change the *Supp Price* on a one time basis just for this MRP run, select the *Override* checkbox and enter the new price directly in the *Supp Price* field. The *Price Origin* changes to 'Override'.

Select an alternate Manufacturer

Click the left button in the *Manufacturer* field to select an alternate manufacturer from a list of this item's allowable manufacturers.

Add or edit the Manufacturer line card

Click the right button in the *Manufacturer* field to add a manufacturer line card record, edit the *Mfgr Part No* within the line card record, or clear the manufacturer line card record.

7.5   PO Generation - PO Conversion

PO conversion

Unlike planned jobs where all the *OK* checkboxes must be selected prior to conversion, you can partially select and convert planned POs, most typically by supplier. After each set of *OK* checkboxes is selected, click the *Convert* button. All selected planned POs with a *PO Qty* amount will be converted into actual POs, consolidated into a single, multi-line PO for each supplier.

> WARNING: Never bypass planned PO conversion by setting the *PO Qty* to zero, which postpones PO creation until the next MRP run. A planned PO must be converted <u>immediately</u> to avoid introducing late dates into the master schedule. Never delay conversion because it defeats the "just in time" nature of the master schedule.

Verify and update supplier prices before PO conversion

To ensure the integrity of the costing system, always verify and update supplier prices before converting planned POs. The planned POs screen within MRP is optimized for pricing maintenance with the ability to create and update supplier price records and present review notes for special pricing instructions. The costing system depends on realistic PO prices because when a purchased item is received, its inventory cost is updated by the PO cost and is the cost basis for subsequent job issue transactions. The PO invoicing process often occurs well after actual receipt and has no retroactive effect on receipt costs or inventory costs.

> #### After your MRP Session is complete - Mass update your Estimated Purchased Costs based on Default Supplier Price
>
> If you update any prices during *MRP PO Generartion*, after your complete your MRP session, you should go to the *BOM>Estimated Purchase Costs* screen and Mass Replace estimated costs using the *Default Supplier Price*. You should then go to the *BOM>Cost Rollup* screen and perform a batch rollup and apply the changes to your NEW status Jobs. This will update the MRP Jobs that created the demand for the POs and keep your job estimated costs more in line with your expectations.

Review actual POs and send to supplier

After PO conversion is completed, the next step is to go to the *Purchase Orders* screen to make a final review of each newly created PO. After each PO has been reviewed, send it to the supplier.

Augment POs manually if needed

Each set of POs generated by MRP represents a minimum action profile of the items that must be ordered immediately to meet item required dates. After a PO has been generated by MRP, you may wish to augment the PO manually within the *Purchase Orders* screen to accommodate special situations. For example, if you wish to fill a

truck or container to reduce unit shipping costs, you may wish to increase item quantities or add items that will be needed in the future. Or, if you have a minimum volume level commitment with a supplier, you may wish to increase quantities or add items to meet your volume level.

8   PO Receipts

All purchased item inventory originates through transactions made in the *PO Receipts* screen.

Inventory Cost Overview

- Inventory value is an average cost based on receipt costs (PO Receipts and Job Receipts)

- To improve inventory value accuracy, always verify prices when you send out your POs

- Any time you update your default supplier prices, perform a Mass Replace by *Default Supplier Price* in the *BOM>Estimated Purchase Cost* screen, followed by a batch *Cost Rollup*.

PO Receipt Tips

Consider using a receiving location

Some items are subject to inspection, labeling, and other processing before they are ready to be transferred to storage locations. To accommodate this, you can create a receiving location and assign it as the default receipt location against such items. Designate the receiving location as *Transitory* so that stock in the receiving location is included in overall stock on hand, but is not available for issuing and picking. After receipt processing is completed, the *Stock Transfer* screen is used to transfer items to their storage locations.

Using dispatching

When you use dispatching, you receive items on the screen first, then you go to the *Batch History* tab to print a dispatch list that provides receipt details to assist in receiving actual stock to designated locations.

Pre-filling primary locations

You can click the *Pre-Fill* button to pre-fill the remaining quantity on each line against each item's primary location, provided that the item is not subject to lot or serial control.

When you encounter an item with a 'FIND' location

Some items, especially those with occasional or infrequent usage, may not have location assignments, in which case we advocate creating and using a 'FIND' location. When you receive or transfer an item with 'FIND' as its primary location, it means that you should find an available location and specify it as the receipt or transfer location.

Finding an allowable location

In the *Receipt Details* sub-tab at the bottom of the screen, you can click the lookup in the *Location* field to get a list of allowable locations for the item. The *Capacity* field indicates the maximum number of units that can be stored in each location. When you select an allowable location, you can click the magnifying glass icon at the bottom of the screen to view stock in that location to determine if the location is available.

If the item is needed by one or more jobs

In the *Receipt Details* sub-tab you can click the magnifying glass icon to launch the *Stock Status* inquiry for the item, which lists any jobs that may be waiting for the item. In such cases you have the option of receiving stock directly to the work center location.

If the item is subject to lot control

When an item is subject to lot control, you are required to assign a lot number in the *Receipt Details* tab. This is a manual entry. We suggest devising a lot numbering convention that provides consistency to your lot numbers. A simple method is to use two segments where the first segment is the PO number and the second segment is the date.

If the item is subject to serial control

When an item is subject to serial control, you are required to assign or generate a set of serial numbers in the *Receipt Details* tab. If automatic serial numbering is designated against the item, the next available serial number is inserted by default and the remaining serial numbers are automatically generated in sequential order.

Printing receipt labels

After the receipt batch is updated, you can go to the *Batch History* tab to print receipt labels that can be formatted to include the lot number, serial number, and PO header details. Receipt labels can be customized using the *Forms Edit* utility.

9 PO Invoices

This chapter explains how PO-related supplier invoices are entered and matched with associated POs in the *PO Invoices* screen.

The matching process closes PO lines

The matching process is the means by which POs get closed. When each line gets fully matched, its *Line Status* changes to 'Closed'. When all lines are closed, the header *Status* changes to 'Closed', which closes the PO and drops it from active screens and lookups.

Matching reviews supplier prices and balances your RNI account

The matching process enables you to review each supplier price to make sure you were charged the correct price. If not, you can contact the supplier and request a credit memo. Minor price discrepancies are common because PO prices are often approximate prices that may differ slightly from the actual price that is in effect at any given time. When a PO line gets matched with a discrepancy between the PO price and supplier price, the difference gets posted to your *Received Not Invoiced* account to keep it in balance, and the offset is posted to your *RNI Adjustments* account.

Matching optionally updates the item's Last Cost

When you change the supplier price, you are asked if you wish to change the item's *Last Cost*. Answer yes to the prompt unless the supplier price is a one-off price, such as for a rush shipment, that is not a typical price for the item. The *Last Cost* can be used to mass update estimated costs in the *Estimated Purchase Costs* screen and therefore should represent a typical price. The *Last Cost* is also used as the next PO unit cost when a purchase price record does not exist.

Update purchase prices as needed

Whenever the supplier price deviates from the PO price, we recommend that you update the item's purchase price record for the benefit of future POs. To do so, click the *Links* button and select the *Stock Items* option. Within the *Stock Items* screen, go to the *Sources* tab to update the *Supp Price*.

Mass update your Estimated Purchased Costs based on Default Supplier Price

After any changes to your default purchase prices, you should go to the *BOM>Estimated Purchase Costs* screen and Mass Replace estimated costs using the *Default Supplier Price*. You should then go to the *BOM>Cost Rollup* screen and perform a batch rollup and apply the changes to your NEW status Jobs. It is important to actively manage your estimated purchase costs to improve your overall inventory value and cost of goods sold.

Inventory transaction costs do not retroactively reflect price changes

Be aware that when you change the supplier price, the program does not retroactively apply the corrected cost to past inventory transactions. Therefore, the matching process has no effect on item inventory values or job costs.

The key to improved inventory value accuracy is to always verify prices when you send out Purchase Orders

The best way to improve your inventory costs in your system is to always verify supplier prices when you send out your Purchase Orders.   The PO Receipt value establishes inventory value and therefore the price on the PO has a direct impact on our inventory value and cost of goods sold.

10   Subcontracting POs

Subcontract services such as painting, plating, and heat-treating are performed on jobs devoted solely to performing an outside service or during the course of multi-sequence jobs. POs for subcontract services are generated as needed through the *Job Subcontracting* screen.

📹 Video - Subcontracting Overview

There are two methods for setting up subcontract services

Let's say you fabricate a part that needs to be sent out for painting. There are two basic methods you can use for setting up the subcontract service.

Subcontract BOM

The most flexible method is to set up the subcontract service with its own BOM. The BOM will consist of one routing sequence for the subcontract service and one component for the unpainted part that gets sent to the subcontractor. The BOM parent is added to all higher-level BOMs that use the painted part as a component. The unpainted part can be a manufactured item with its own BOM or it can be a purchased item. MRP will generate jobs and POs as required for the painted and unpainted parts. With th is method subcontract service jobs are purely for subcontracting with no mixing of in house and outside processes. The painted part and unpainted part can also be given their own MRP settings for maximum planning flexibility.

Subcontract Sequence

With this method you add the subcontract service routing as a routing sequence within each BOM that requires the painted part. In this case, the routing will mix in-house processes with the outside process. This method is less flexible because you must perform the subcontract service within each job it is required with no ability to make it on its own job when interdependent demand exists. It also adds to each item's calculated *Job Days* with no ability to make the painted part to a forecast to reduce lead time.

The job traveler and Next WC field help initiate action

The job traveler clearly indicates when a subcontract process is to be performed and can be used as a trigger to initiate PO generation in the *Job Subcontracting* screen. Also, within the *Work Center Schedule* screen, the *Next WC* field clearly identifies when the next work center is an outside service process.

Generate POs for Ready status sequences

All subcontract job sequences with a status of *Ready*, *Next,* or *Open* are listed in the *Job Subcontracting* screen. *Ready* status sequences are ready to be sent to the subcontract supplier for processing.

A red *Material* icon indicates when material is needed. Click the icon to launch the *Job Issues* screen, which enables the material to be issued in real time. After the issue batch is updated, a dispatch list can optionally be printed and included with the PO to provide the supplier with a list of materials.

Select the *Convert* checkbox against each *Ready* status sequence and then click the *Convert* or *Convert & Print* button to generate the PO, which changes the sequence status to *Started*. The printed PO can then be sent to the supplier and/or included with the parts.

Make sure the PO has a reasonable supplier price

Make sure that the PO has a reasonable supplier price because it is used as the unit cost that will be applied to the job. The supplier price is maintained in the BOM routing sequence and flows through to the job routing sequence.

> NOTE: Be aware that the price on the supplier invoice, which can arrive well after the PO is received, does not flow back to the job. Instead, the PO price is used for job costing and therefore must be given a realistic value.

Do not generate POs in advance

Even though *Open* and *Next* status job sequences are included in the *Job Subcontracting* screen, limit PO generation to *Ready* status sequences. This way POs are generated on a "just in time" basis consistent with all other shop control processes.

PO receiving updates the job sequence.

Receiving the PO in the *PO Receipts* screen updates the completed quantity against the job sequence and changes the next sequence status to *Ready*. When final receipt is indicated, the sequence status changes to *Closed* and the next sequence status changes to *Ready*.

Timely PO receiving is a requirement

As with all other shop control processes, subcontract service POs must be received in real time to update current sequences and downstream work centers.

11   Purchasing Guidelines

This chapter lists 11 basic guidelines that should be followed for purchasing to work properly and provide good results.

1. Never use descriptors as substitutes for stock items

Never use descriptors as substitutes for stock items. Descriptors are not compatible with manufacturing costing, MRP generation, and job release, all of which are inventory-based.

2. Maintain a Lead Days allocation against all P items

A *Lead Days* allocation must be maintained against <u>all</u> your P (purchased) items. The *Lead Days* is the number of calendar days allocated by MRP for procuring the item. Make sure sufficient days are allocated to cover the entire procurement process, including potential variations in supplier delivery time and receipt processing time. Among items assigned to the same default supplier, apply consistent allocations to achieve uniform due dates on multi-line POs.

3. Do not inflate allocation settings

Do not artificially inflate item *Lead Days* and *Job Days* allocations because all dates are inter-connected. Inflated allocations will push out other dates in a cascading fashion that corrupts the master schedule and makes it nonsensical.

4. Never bypass MRP with manual POs

MRP generates a coordinated master schedule in which all dates are inter-connected and work centers are prioritized based on meeting required dates. When you interject a manually created job or PO into the master schedule, it has no relationship with other dates and disrupts the schedule by misallocating material and distorting work center priorities.

Proper use of manual POs

This rule does not mean that you never create a manual job or PO line. What it does mean is that all POs related to actual or anticipated demand must always be generated by MRP. If you need to create a PO line for other purposes, you are free to do so.

Each set of POs generated by MRP represents a minimum action profile of the items that must be ordered immediately to meet item required dates. After a PO has been generated by MRP, you may wish to augment the PO manually within the *Purchase Orders* screen to accommodate special situations. If you wish to fill a truck or container to reduce unit shipping costs, you may wish to increase item quantities or add items that will be needed in the future. If you have a minimum

volume level commitment with a supplier, you may wish to increase quantities or add items to meet your volume level.

5. Do not create blanket or future POs

Do not create blanket or future supply POs where a series of future quantities and due dates are scheduled for an item or a group of items. This is a crude form of forecasting that is not compatible with just in time planning and the master schedule. The correct way to purchase against anticipated demand for an item is to enter a monthly demand rate and *Supply Days* interval so that future POs will be generated by MRP in demand-driven intervals.

If open blanket POs exist

If open blanket POs exist, each such PO should be closed out and canceled. Indicate to your supplier that the blanket PO will be replaced by individual POs from this point forward. Establish a *Monthly Demand* rate and *Supply Days* interval against the item so that future POs will be generated by MRP in demand-driven intervals.

How to manage contract purchasing

If you contract with a supplier for a long term volume commitment in exchange for a fixed price, it is not necessary to manage this process with blanket POs. Instead, use the *Order Policy* screen to enter an actual *Monthly Demand* rate and *Supply Days* interval so that future POs will be generated by MRP in demand-driven intervals.

The supplier price table, which is accessed from the *Sources* tab within the *Stock Items* screen, enables you to establish the fixed price along with from and thru dates that define the duration of the price contract. You can use the price notes to indicate the volume commitment associated with the price.

If there is a contract reference number, we suggest you build that number into the supplier description for the item, which is the description that prints on the PO.

To monitor actual purchases against a price contract, you can use the *PO Lines Summary* or *PO Receipts* data view, which can be filtered for a given item, supplier, and date range.

6. Do not create manual POs for long Lead Days items

Do not create manual POs to anticipate demand for items with extremely long *Lead Days* allocations. Instead, assign such items a *Stocking* order policy along with a *Monthly Demand* rate and *Supply Days* interval so that MRP can generate a steady pipeline of staggered POs at consistent intervals. Staggered POs eliminate large fluctuations in supply and mitigate the risk of major shortages because any shortages that happen to occur will be of short duration.

Example

Let's say you have an item with a 6-month *Lead Days* allocation, which equates to a 180 day planning period. Forecasted demand is 100 units per month. The program will calculate a *Reorder Point* of '600', which is the amount required to cover total forecasted demand within the item's planning period.

If you wish to generate a PO every 30 days, set the *Supply Days* interval to '30'. This will result in POs being generated in approximate 30-day intervals for a quantity of 100 each, which covers 30 days of forecasted demand. At any given time, six POs would be in progress, each due to arrive in approximate 30 day intervals. This insures a steady supply that minimizes the risk of shortages or severe over-stocking. If a shortage does occur, the next PO will arrive shortly, which minimizes the shortage duration.

7. Generate MRP on a daily basis

The most efficient way to perform just in time planning is to generate MRP on a daily basis. This way you always respond immediately to any new demand that arises. Unlike manual planning, which is time-consuming and therefore is often done only once or twice a week in lengthy sessions, daily MRP generation only takes a few minutes.

NOTE: If you ignore this rule and choose to generate MRP less frequently, such as twice a week, you must make two default settings to account for the interval time and avoid introducing late dates into the master schedule. First, set the *MRP Interval* in *MRP Defaults* to the number of shop days between MRP runs. Second, specify that same amount in the *Require Date – To Order M Items* setting in *Sales Order Defaults*.

8. Never generate partial or fragmented MRP sessions

Each MRP session is designed for complete generation and conversion through all job levels and always finishing with PO generation and conversion. Complete generation is an absolute requirement for achieving a coordinated master schedule. Never skip levels or generate jobs on one day and POs on another.

NOTE: This rule does not mean that two people cannot participate in an MRP session. A production planner, for example, could generate the entire session and convert jobs, but could pause the session after PO generation so that a buyer could convert the planned POs after verifying supplier prices and other details.

9. Never delay planned PO conversion

When MRP generates a planned PO, it must be converted <u>immediately</u> in order to avoid introducing late dates into the master schedule. Never delay conversion because this defeats the "just in time" nature of the master schedule.

10. Assign all PO lines a realistic supplier price when sending out POs

It is essential that all PO lines are assigned a realistic supplier price, which is translated into a unit cost that is applied to PO receipt transactions. The receipt cost updates the item's inventory cost and is the cost basis for any subsequent job issue or sales picking transactions.

NOTE: Be aware that any discrepancy between the supplier invoice price entered in the *PO Invoices* screen and the associated receipt cost gets posted to *Inventory Adjustments* and makes no cost correction to past inventory transactions.

13. Regularly mass update your Estimated Purchased Costs based on Default Supplier Price

After any changes to your default purchase prices, you should go to the *BOM>Estimated Purchase Costs* screen and Mass Replace estimated costs using the *Default Supplier Price*. You should then go to the *BOM>Cost Rollup* screen and perform a batch rollup and apply the changes to your NEW status Jobs. It is important to actively manage your estimated purchase costs to improve your overall inventory value and cost of goods sold.

14. Never skip PO invoice entry and AP voucher transfer

Never skip the entry and matching of supplier POs in the *PO Invoices* screen and the *AP Voucher Transfer* process. Skipping these functions ruins the PO processing workflow because PO matching is required for closing PO lines, supplier invoice entry is required to offset the *Received Not Invoiced* balance, and the voucher transfer properly updates accounts payable.

12   FAQs

Is manual PO planning a viable alternative to MRP?

DBA is not designed for manual job and PO planning. The master schedule and all its inter-connected dates can only be generated by MRP based on item MRP settings and cannot be replicated manually. Job release, which adjusts the schedule based on material availability, and job prioritization, which governs shop control, are dependent on the integrity of the master schedule.   The *Release Jobs*, *Shop Control Panel*, *Job Schedule*, and *PO Schedule* will not make sense unless they interact with an MRP-generated master schedule.

Why can't I purchase for one job at a time like I always have?

It is not efficient to purchase for one job at a time, especially when multiple jobs have shared demand for raw materials and components. When you combine your purchasing requirements, you reduce the number of POs to be generated and processed and you can qualify for the best prices. MRP automatically generates POs when needed based on shared demand among jobs and items where net demand falls below item reorder points. When items are received, the stock status inquiry clearly shows the jobs that need the item so that material can be received directly to work centers where needed.

Should I continue to use manual planning for blanket POs?

Most companies that extensively use blanket POs do so out of habit from previous systems because it is a common planning method in non-MRP systems. Blanket POs are incompatible with the master schedule and are not needed with MRP.

Blanket POs are essentially multi-bucket forecasts that are tedious to create and maintain and typically lead to over-stocking. With MRP you can replace blanket POs with a *Demand Driven* order policy and *Supply Days* setting that will trigger POs in regular supply days intervals based on actual net demand.

Why do I not always see jobs and POs generated at lower levels?

When MRP generates a top level job, it is natural to expect to see associated lower level jobs and POs generated during the same MRP session. This would be the case if all manufacturing events were to occur on the same day.

In reality, however, manufacturing events unfold over time. Any subassembly item that is required immediately will be given a job within the current MRP session. But any subassembly item that is not required at this time will be given a job in a future MRP session. That future job quantity may incorporate additional demand for the item that happens to materialize in the intervening time.

The same principle applies to purchased items. Any item that is required immediately will be given a PO within the current MRP session. But any item that is not required at this time will be given a PO in a future MRP session. That future PO quantity may

incorporate additional demand for the item that happens to materialize in the intervening time.

What determines when an item is required?   An item is only needed now when its required date falls within its planning period, which is the number of days allocated by MRP for making or buying the item.

Why can't I take action on requirements outside the planning period?

The planning period is the number of days allocated by MRP for making or buying an item and is determined by the item's *Lead Days* and *Job Days* settings. It provides sufficient time to replenish stock as needed to meet projected net demand.

Think of the planning period as the item's "action window." When net demand causes an item's required date to fall within its planning period, a job or PO must be generated to replenish stock by the required date. When a required date lies beyond the planning period, however, no action is needed because there is ample time to wait and generate a job or PO later when the required date eventually falls into the action window.

Taking premature action against future requirements is problematic because additional demand can materialize day by day as the required date draws closer to the action window. Generating a job or PO prematurely reacts to an incomplete demand profile and corrupts the "just in time" principle that keeps inventory and WIP as lean as possible.

If you expect a lower-level job or PO to be generated and it does not occur within the current MRP session, do not worry and do not intervene with any manual action. The job or PO will be generated in a future MRP session without fail and has no possibility of being forgotten and missed.

Should I run MRP less frequently to consolidate jobs and POs?

MRP is designed for "just in time" planning that relies on daily job and PO generation. Daily generation is needed because all dates in the master schedule are inter-connected in end-to-end fashion to meet required dates. Running MRP at less than daily intervals injects late dates into the schedule that cause job release delays and late shipments.

If your objective is to generate fewer and larger quantity jobs and POs, never attempt to accomplish this by delaying MRP generation. Instead, use the item *Supply Days* setting as needed to increase the size and reduce the frequency of POs or jobs.

Should I use manual planning for extremely long lead day items?

Purchased items with extremely long lead days, meaning several weeks or months, are ideally handled using the *Demand Driven* order policy and a *Monthly Potential Demand* rate in combination with the item *Supply Days* target. This is far superior to any form of manual planning because it enables MRP to generate a pipeline of staggered POs that minimizes the risks of over-stocking or shortages.

You simply enter a monthly potential demand rate of anticipated usage for the item. You then enter the number of *Supply Days* you wish to be covered by each PO. Because the item has such a large planning period because of its long lead days, the program will calculate a relatively large *Reorder Point*.

For example, let's say you have an item with a 6-month *Lead Days* allocation, which equates to a 180 day planning period. The monthly potential demand is 100 units per month. The program will calculate a *Reorder Point* of '600', which is the amount required to cover total potential demand within the item's planning period.

If you wish to generate a PO every 30 days, set the *Supply Days* amount to '30'. This will result in POs being generated in approximate 30 day intervals for a quantity of 100 each, which covers 30 days of forecasted demand. At any given time, six POs would be in progress, each due to arrive in 30 day intervals. This insures a steady supply that minimizes the risk of shortages or severe over-stocking. If a shortage does occur, the next PO will arrive shortly, which minimizes the shortage duration.

Can MRP be used for totally customized products?

There is a perception among some that MRP is only suitable for standardized products. With DBA this is not the case at all. In fact, using MRP is what makes DBA ideal for custom manufacturing of any kind, including engineering to order, remanufacturing, and disassembly.

One-off BOMs are generated in quotes and are used to customize routing, component, and output details prior to job generation. When MRP generates the job, custom details are automatically incorporated into the master schedule exactly the same as with standard products. If job details must be modified during the course of the job, this automatically affects item demand profiles and MRP will respond accordingly with additional supply as needed.

Why can't I purchase items by revision number?

The bill of manufacturing requires specific part numbers to insure the engineering integrity of each parent item. If a particular component can be purchased by revision and there is a qualitative difference among revisions, each revision must be represented by a unique item ID so that the correct revision can be assigned to the BOMs where it is used. If a component's revisions are interchangeable, meaning there is no qualitative difference from on revision to another, a single item ID can be used.