



Demand Driven MRP Guide

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1 The Demand Driven Miracle

React to the Firm, Protect for the Future

A manufacturing miracle can be yours

A manufacturing miracle – high throughput, efficient inventory, and lean staffing – can be yours if you adhere to a simple planning principle. React to the firm, protect for the future.

It is our nature to visualize the future

As humans, we have an innate desire to visualize the future, which is why we love forecasts, even when they are wildly inaccurate. Most planning methods project future demand on a calendar so that it can be visualized and covered by jobs and POs. Planners fill in the calendar with sales projections, placeholder jobs, BOM explosions, job linking, blanket purchase orders, “gut feel” intuition, and other such methods, often well out into the future.

Tentative demand is an illusion

Most of the demand you see on the planning calendar looks real on paper, but it is an illusion because future demand is not knowable until it happens. All demand originating from sales projections is tentative demand that changes as it firms over time. When you fill in the calendar with planned supply to cover tentative demand, shortages and overstocking are inevitable.

Supply gets misaligned with demand as sales orders are received

As sales orders get received from customers, firm demand replaces tentative demand and differs from original projections. Jobs and POs that were created to cover tentative demand get misaligned with firm demand, which is the root cause of shortages and overstocking.

The “bullwhip effect” amplifies misalignments

When BOM explosions and job linking drive lower level demand, supply misalignments get much worse. Component quantities are typically multiples of the parent quantity, which causes a phenomenon known as the “bullwhip effect.” Like the power of a bullwhip, misalignments increase with the length of the planning period and amplify at each lower BOM level, which is how inventory easily gets out of control.

Jobs and POs require constant revisions

With calendar planning methods, jobs and POs require constant revisions to realign planned supply with demand as it firms over time. By the time misalignments are detected at upper levels, lower level jobs and POs are often already received or in

progress and it is too late to avert shortages and overstocking. Blanket purchase orders are problematic because if they are not carefully monitored and periodically adjusted, stock continues to accumulate.

Overstaffing is inevitable

Calendar planning methods are silo solutions walled off from outside scrutiny and input. When planning has no transparency, other departments are forced to devise defensive silos to get products out the door. Silo solutions benefit individuals, but penalize throughput and always require extra staffing and higher overhead cost.

Revitalize your business with Demand Driven MRP

Demand Driven MRP, which is the basis of our DBA Manufacturing software package, enables you to revitalize your small business with high throughput, efficient inventory, and lean staffing. This manufacturing miracle derives from a simple principle – react to the firm, protect for the future.

React to the firm

Instead of reacting to tentative demand, you 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

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. And if you do happen to sell or use more than your potential monthly demand rate, the system priority will automatically put the item at the top of the work center queues to get you back on track.

“Pull” planning is widely accepted as the superior method

Demand driven MRP is a “pull” planning method whereby inventory is pulled into the system by firm demand. By contrast, filling in the calendar to cover tentative demand is a “push” planning method whereby inventory is pushed onto the system. The core problem with push planning is that it is quite easy to push too much or too little, exacerbated by the bullwhip effect. Across the manufacturing world, pull planning is widely accepted as the superior method.

Gain market share with faster time to shipment

Demand Driven MRP dramatically reduces lead times with efficient inventory and high throughput. Each item is given a lead time for procurement or production and an order policy that determines lead time contribution to higher-level items. These settings enable you to plan a time to shipment strategy for gaining market share over less efficient competitors.

Eliminate silos and overstaffing

Item lead time, order policy, and replenishment settings are open and transparent and reflect a shared time to shipment strategy across all departments. An open and collaborative system eliminates the need for defensive silos and extra staff.

Revitalization is a choice

Calendar planning methods are comfortable because they enable us to see the future, but it is a costly illusion that guarantees low throughput and overstaffing. Reacting to the firm and protecting for the future with *Demand Driven MRP* is the best way to revitalize your small business and ensure its long-term viability.

2 Benefits and Features

What is Demand Driven MRP?

Demand driven planning removes tentative demand from your action plan and uses strategic stocking of critical items to reduce manufactured item lead times and time to shipment. DBA pioneered the demand driven approach for small business by providing a common sense method to achieve rapid time to shipment with efficient utilization of inventory.

Core DBA innovations include time to shipment planning for sales order required dates, strategic demand driven stocking, demand driven jobs and purchase orders, job release with allocated materials, job prioritization for balanced production flow, late supply feedback, and order picking/shipping with allocated priority.

Benefits

- ✓ Keeps you competitive with faster times to shipment
- ✓ Works for any type of manufacturing or size of company
- ✓ Logical item settings drive all manufacturing activities
- ✓ Demand driven inventory minimizes shortages and over-stocking
- ✓ Generates consistent and reliable sales order ship dates
- ✓ Generates demand-driven jobs and purchase orders in response to firm demand
- ✓ System target dates are self-adjusting without need for manual intervention
- ✓ Jobs are released to production in the correct order of assembly
- ✓ Job prioritization evens production flow to boost shop throughput
- ✓ *Late Supply* updates progress on the manufactured items you sell
- ✓ The *Picking Manager* ensures on time shipments in priority order

Features

Item MRP Settings

- ✓ Ship dates are established by *Time to Shipment* target calculated from underlying item settings
- ✓ Jobs are backward scheduled from required dates by the *Job Days* allocation for production time

- ✓ Job start dates cover calculated pre-Job *Lead Days* needed for to order components
- ✓ PO due dates are established by the *Lead Days* allocation for planned procurement time
- ✓ The *Order Policy* determines whether an item is planned to order or for stocking
- ✓ *Reorder Point* calculated from a *Potential Monthly Demand* triggers stock replenishment
- ✓ *Min Order* quantity calculated from planned *Supply Days* interval establishes order quantities and frequency
- ✓ Item *ReviewNote* handle special planning requirements during MRP sessions

Sales Order Required Dates

- ✓ *Time to Shipment* targets establish sales order line item required dates that drive *MRP*
- ✓ All settings that contribute to your *SO Required Dates* are completely transparent to all workers
- ✓ You will have a clear action plan on how to improve your *Time to Shipment* competitiveness

Job and Purchase Order Generation

- ✓ Custom to order jobs generated directly from sales order lines
- ✓ Demand driven job and PO generation within the auto-generated item planning period action windows
- ✓ MRP action windows ensure that you are always acting on firm demand
- ✓ Interdependent demand consolidated into single jobs and purchase orders
- ✓ Supplier, supplier price, and manufacturer part number can be changed during PO generation

Job Release

- ✓ Allocates on hand materials to new status jobs in planned start date order
- ✓ Jobs are released to live production when allocated materials become available
- ✓ Job finish dates are rescheduled when jobs are released to production

Job Prioritization

- ✓ Each job is prioritized based on remaining production time relative to its required date

- ✓ Work center queues are run by job priority to even out production flow and boost shop throughput
- ✓ Job labor is updated in real time as job sequences are completed

Late Supply

- ✓ Receive immediate feedback when the *Finish Date* for a for-sale dependent job is greater than the SO line item *Required Date*
- ✓ This eliminates the need for constant communication between the office and the shop regarding job progress
- ✓ The office staff can update the SO line *Expected Ship Date* and notify the customer if necessary

Picking Manager

- ✓ Stock on hand is allocated to all open SO lines in *Required Date* order
- ✓ Provides a company wide view of all sales order lines that are ready to ship
- ✓ Eliminates the need for material hoarding and excessive reliance on job linking

3 MRP Overview

 [Video - MRP Overview](#)

What is Demand Driven MRP?

Demand driven planning removes tentative demand from your action plan and uses strategic stocking of critical items to reduce manufactured item lead times and time to shipment. DBA pioneered the demand driven approach for small business by providing a common sense method to achieve rapid time to shipment with efficient utilization of inventory.

It is not a traditional forecast-driven MRP system

Demand Driven MRP is not a traditional multi-bucket, forecast-driven MRP system. It is a just in time planning system that only responds to current demand originating from sales orders. Future demand for items is handled with anticipatory demand driven stocking instead of forecast-driven explosions.

Designed for make to order and custom manufacturing

Unlike forecast-driven MRP systems, which are designed for standard products made to stock, *Demand Driven MRP* is designed for make to order and custom manufacturing as well as for making items to stock. Instead of generating lower level jobs and purchase orders from BOM explosions, *Demand Driven MRP* generates lower level requirements from actual job details, which can be customized to order.

How does Demand Driven MRP work?

Demand Driven MRP is comprised to two planning phases and three execution phases that are performed in the following sequential order.

Planning Phases

These first two phases establish your overall planning strategy for time to shipment and inventory.

1. Plan Times to Shipment for SO Required Dates

Time to shipment targets establish sales order required dates and are derived from item lead times and order policies. Strategic stocking of key sell items, subassemblies, and materials is used to reduce or eliminate lead time.

2. Plan Strategic Inventory for Stock Replenishment

Planned stock is replenished at demand-driven intervals for efficient utilization of inventory.

Execution Phases

These three phases execute that planning strategy that was established by the first two phases.

3. Generate Demand Driven Jobs and POs

Jobs and POs are generated on a daily basis in response to firm net demand originating from current sales orders. Job and PO target dates are established by item lead times within a master schedule where supply dates are aligned with demand dates.

4. Release jobs with Allocated Materials

Jobs are released to production when allocated materials become available and are rescheduled relative to the release date. The job supply date (finish date) is adjusted at job release, providing consistent and reliable feedback on progress.

5. Balance Production Flow with Job Priority

Released jobs are prioritized based on remaining production time relative to the required date. Job sequences are run in job priority order within work centers to balance production flow and ensure that all jobs meet their required dates.

How does Demand Driven MRP differ from other planning methods?

Demand Driven MRP is a complete departure from the planning methods used by most small businesses.

Daily job and PO generation instead of intermittent planning

All planning is done in advance with item settings that establish an overall strategy for time to shipment and inventory. Item settings drive job and purchase order generation, which is an automatic process that can be done daily to respond immediately to new demand. Daily generation is essential for timely feedback, increasing throughput, and reducing time to shipment.

Anticipatory stocking instead of forecast driven supply

Future demand for any item is handled with anticipatory stocking whereby a potential monthly demand rate is applied to the item's replenishment time to calculate a dynamic reorder point. Whenever net demand for the item falls below the reorder point, a job or PO is triggered to replenish stock before it gets depleted. Demand-driven jobs and purchase orders are automatically synchronized with actual demand without need for adjustments.

Demand Driven supply instead of blanket purchase orders

Purchased items planned for stocking are replenished by supply pipelines at demand-driven intervals. A monthly potential demand rate and a supply days interval combine to calculate a dynamic reorder point and minimum order quantity.

Whenever net demand falls below the reorder point, a purchase order is triggered for the net demand amount or minimum order quantity, whichever is greater. Demand-driven supply is self-adjusting with shorter intervals when demand is greater than expected and longer intervals when demand is less than expected.

Dynamic reorder point and min order quantity instead of min-max stocking level

For stocking items a dynamic reorder point and min order quantity are calculated from a monthly potential demand rate, the item's replenishment time, and a supply days interval. Whenever any of these input variables are changed, the reorder point or min order quantity is dynamically recalculated. Whenever net demand falls below the reorder point, a job or PO is generated for the min order quantity or greater that replenishes stock before it gets depleted. Dynamic replenishment planning is essential for efficient utilization of inventory.

Time to shipment targets instead of ship date guesstimates

Item lead times and order policies combine to calculate time to shipment targets for top level items, which establish sales order required dates. Strategic stocking order policies are applied to selected items to remove lead time contribution and reduce time to shipment. Time to shipment targets provide customers with consistent and reliable make to order ship dates and enable an overall planning strategy for market competitiveness.

Demand driven Jobs and POs instead of manual planning

A Job or purchase order is generated whenever net demand for an item (on hand + inbound supply + current demand) falls below its reorder point. Items planned to order have a zero reorder point and therefore a Job or PO is generated whenever new demand materializes. Within each MRP session, jobs are generated for items level by level in lowest BOM level order so that the jobs generated at each level create demand for Jobs at subsequent levels. Purchase orders are always generated last to ensure that each item has a complete job demand profile. Jobs and POs are only generated when needed in response to firm demand.

MRP Action Windows react only to firm demand in Job and PO generation

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.

Target driven scheduling instead of predictive scheduling

System target dates for sales orders, jobs, and purchase orders are based on time to shipment targets and standard lead days and job days allocations that are

consistent from one MRP session to another. Schedule dates are target dates used to prioritize job release, work center scheduling, and shipping so that activities are performed in optimal order for maximum productivity and throughput.

Short term targets instead of longer term tentative schedule

All target dates for jobs and purchase orders are within the planning period of top level items, which means that all supply dates are short term and firmly set without need for the quantity changes, date changes, and specifications changes that are commonly required with longer term scheduling.

Job release instead of manual rescheduling

When Jobs are released to live production based on material availability, they are given new finish dates relative to the released date. This automatically adjusts the job schedule to reflect actual conditions and eliminates the need for manual rescheduling.

Automatic feedback instead of constant communication between the office and shop for Job progress

The *Sales > Late Supply* screen provides feedback to your office staff to update the *Expected Ship* date (and notify customers if needed) for Jobs that are running behind schedule. When the *Finish* date of the Job is after the sales order line item requirement date, it will appear on the *Late Supply* screen.

Priority allocation instead of material hording and constant expediting

The *Sales > Picking Manager* allocates your stock on hand in *Required Date* order to ensure that you are staying on time and in priority order across all sales orders company wide. DBA can allocate a very high volume of stock on hand across all of your sales order requirement dates in priority order. This consistency of allocation is nearly impossible to replicate with a manual planning system.

4 MRP Phases

Demand Driven MRP consists of five phases performed in the following sequential order. The first two phases establish your overall planning strategy and the remaining phases execute the strategy. MRP phases are summarized below and are covered in full detail over the next five chapters.

Planning Phases

These first two phases establish your overall planning strategy for time to shipment and inventory.

1. Plan Times to Shipment

Standard lead times 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. A standard *Lead Days* is planned for purchased items and a standard *Job Days* is planned for manufactured items. Items are assigned a *To Order* or *Demand Driven* stocking order policy to determine lead time contribution. Item settings are refined as needed until *Time to Shipment* targets reflect your marketing objectives.

2. Plan Strategic Inventory

“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* rate and a *Supply Days* interval target to drive stock replenishment.

Execution Phases

These three phases execute that planning strategy that was established by the first two phases.

3. Generate Demand Driven Jobs and POs

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 within a coordinated schedule.

4. Release Jobs with Allocated Materials

Open purchase orders are tracked and expedited to ensure that jobs get released on time. Jobs are released to live production per planned start dates when allocated materials become available.

5. Run Work Centers by Job Priority

Each released job is given a calculated priority based on remaining production time relative to the job required date. Within work center queues, sequences are run in job priority order so that jobs trending behind schedule get priority over jobs trending ahead of schedule, which optimizes production flow and boosts shop throughput. Jobs with unusually large quantities get higher priority and thus experience less waiting time, which enables larger jobs to meet their target required dates.

5 Phase 1 - Plan Times to Shipment

The first phase of *Demand Driven MRP* is to plan times to shipment targets for sales order required dates.

Summary

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 all 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 all 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 Screen

(MRP – MRP Settings)

Standard time allocations and order policies are assigned in the *MRP Settings* screen. For initial setup, complete each of the following tasks in sequential order.

Tasks

1. Plan a standard Job Days for all Manufactured items

In this task you will plan a standard *Job Days* and *Run Size* for all M items.

The M item Job Days is a required MRP setting

The manufactured item *Job 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 *Job Days* must be assigned to each and every M item.

The Job Days is standard production time

The *Job Days* setting is the item's standard production time for a typical job quantity, expressed in shop days.

Job Days Purposes

Establishes job dates

The *Job Days* is accompanied by the pre-job *Lead Days*, which is automatically calculated and is the time allocated for making subassemblies or procuring materials to order before a job can be started. Together the two settings comprise the item's lead time and establish job start and finish dates.

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 lower level M item with a *To Order* policy is a lead time contributor to higher-level items.

Contributes to Time to Shipment

When a top level sell item has a *To Order* policy, its pre-job *Lead Days* and standard *Job Days* contribute to its *Time to Shipment* target for sales order required dates. This provides sufficient time for making the item to order.

Enables late job tracking and job rescheduling

The standard *Job Days* determines job finish dates for late job tracking in the *Job Schedule* screen and for job rescheduling in the *Job Control Panel - Release Jobs* screen.

Determines item planning period action windows in MRP

The pre-job *Lead Days* and standard *Job Days* (along with the system *MRP Interval* setting) determine each item's planning period action window for job 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 pre-job *Lead Days* and standard *Job Days* (along with the system *MRP Interval* setting) determine 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 *Job Days* allocation is therefore essential to maintaining an efficient inventory.

The Job Days and pre-job Lead Days are not isolated settings

The *Job Days* and pre-job *Lead Days* are not isolated settings. When a lower level subassembly item has a *To Order* policy, its lead time contributes to the lead times of higher-level items. If you give the *Job Days* a padded or inflated value, you get inflated lead times at higher levels, inflated time to shipment targets, and distorted sales order required dates. So it is essential that the *Job Days* is a realistic value that approximates actual production time.

A standard Run Size accompanies the Job Days

Each item's standard *Job Days* is accompanied by a standard *Run Size*, which represents a typical job quantity.

Run Size Purposes

Used for Job Days Inquiry calculations

The standard *Run Size* is used to calculate an estimated *Job Days* amount in the *Job Days Inquiry* (see below), which can be used as a reference to help establish the standard *Job Days* value.

Amortizes setup and fixed usage quantity cost

The standard *Run Size* is used by the cost rollup to amortize total fixed setup cost and fixed quantity component cost into a unit cost.

Job Days Entry

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

Guidelines

- Enter a realistic value that is standard production time for a typical job quantity, expressed in shop days. Production time is the total number of days between job start and job finish and includes actual processing time, work center queue time, and move time between work centers.
- Many M items have similar or identical production processes, in which case the same standard *Job Days* can be applied to multiple items.
- An approximate value based on judgment and past experience will provide good results. Standard *Job Days* values can be refined over time as you get feedback from actual results.

How can a standard Job Days apply to different job quantities?

How can a standard *Job Days* setting apply when job quantities vary from job to job? The standard *Job Days* is for time to shipment planning where the ultimate objective is to achieve consistent ship dates over time from order to order. When a job has an unusually large quantity, the job gets higher priority in work center queues, which reduces overall queue time and enables the job to meet its required date. So dates stay fixed for consistent scheduling and shop activities flexibly adapt to meet the schedule.

Never adjust Job Days for particular situations

One thing you must absolutely avoid is adjusting standard *Job Days* values on a situational basis to accommodate a particular requirement or order quantity. Doing so will disrupt date alignment within the master schedule. Use standard *Job Days* settings and the system automatically adjusts job priorities to accommodate unusual quantities.

Never pad or inflate Job Days to expand item planning periods

Another thing you must absolutely avoid is to pad or inflate *Job Days* settings in order to expand item planning period action windows. Inflated *Job Days* settings inflate higher-level lead times, and time to shipment targets, increase inventory levels, and distort sales order required dates.

If you prefer longer planning periods:

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

Planning periods are never expanded for top level items

Planning periods are never expanded for top level items because premature job generation at the top level will generate premature demand for lower items that would cause excessive inventory and introduce long term dates into what should be a firmly set target based schedule. The planning period for top level items is also ideally suited for handling blanket sales orders because it excludes demand from future required dates that does not need current action.

Use the Production Inquiry for guidance

For guidance in establishing the standard *Job Days*, click the *Production* tab to reference actual shop days for past jobs.

Use the Job Days Inquiry for reference

For assistance in establishing the standard *Job Days*, click the button in the *Job Days* field to launch the *Job Days Inquiry*, which calculates an estimated *Job Days* based on applying the item's standard *Run Size* to current work center capacity settings and routing cycle times.

CAUTION: The calculated *Job Days* will only have meaningful value if work center capacity settings are properly established.

 Shop Control Guide - Setup - Work Center Capacities

Run Size Entry

Enter a standard *Run Size* that represents a typical job quantity.

Use the Production Inquiry for guidance

For guidance in determining an appropriate *Run Size*, click the *Production* tab to reference past job quantities.

2. 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 calendar days.
- 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.

3. 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 manufactured and 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 for M or P items.

Order Policy Types

Demand Driven

Assign the *Demand Driven* order policy when you intend to maintain stock on hand for immediate use in Jobs and SOs. 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 always ordered before parent jobs can be started or when a sell item is always 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 Reviews* 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 required 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 not 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 not 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 not contribute to its own *Time to Shipment* target.

The item Order Policy is a binary 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 not 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, all 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. If 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

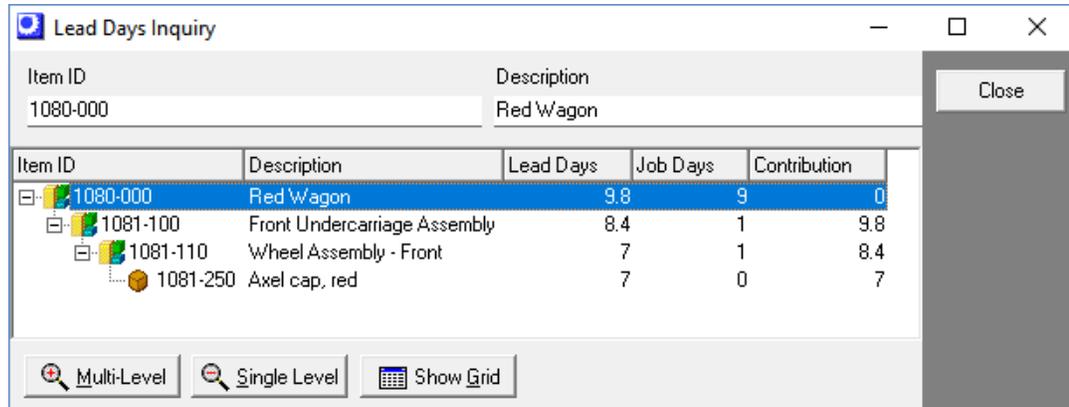
Make sure the items you stock in actual practice are given a *Demand Driven* or *Manual Reorder Point* order policy or else those items will contribute to higher level lead times, which will inflate top level *Time to Shipment* targets.

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.



Lead Days Inquiry

Item ID: 1080-000 Description: Red Wagon

Item ID	Description	Lead Days	Job Days	Contribution
1080-000	Red Wagon	9.8	9	0
1081-100	Front Undercarriage Assembly	8.4	1	9.8
1081-110	Wheel Assembly - Front	7	1	8.4
1081-250	Axel cap, red	7	0	7

Multi-Level Single Level Show Grid

Close

6 Phase 2 - Plan Strategic Inventory

Consider applying the *Demand Driven* order policy to most commonly used subassemblies and 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 the dynamic calculation 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 M and 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 for immediate use in Jobs and SOs. 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.

Link:

 [MRP Guide - Long Lead Time Planning](#)

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.

NOTE: You do not necessarily have to cover 100% of all potential scenarios. The system will automatically handle shortages with elevated priority in all work centers and provide late supply feedback.

- 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.

NOTE: The averages and standard deviation calculations are only valid on items with very regular usage patterns. Ignore these calculations for items with infrequent or highly unpredictable usage.

- 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:

Variables

Monthly Potential Demand / 30 = Daily Demand

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

Formula

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.

Link:

 [MRP Guide - Long Lead Time Planning](#)

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.

7 Phase 3 - Generate Jobs and POs

The third phase of *Demand Driven MRP* is to generate demand-driven jobs and purchase orders.

Summary

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.

Actions

1. Use the calculated SO Required Date to drive MRP and shop priorities

When entering a sales order line item, use the default SO line *Required Date* as a standard target date to drive MRP generation and shop priorities.

The SO Line Required Date drives MRP and shop priorities

The line item *Required Date* is the target demand date that drives MRP generation and determines job and picking priority. The default *Required Date* is established by the item's planned *Time to Shipment* target and thus reflects your time to shipment strategy.

Leave the default Required Date as is

Always leave the default line item *Required Date* as is so that it aligns with MRP planned job dates and provides consistent time to shipment from one order to the next over time. The only exception should be if a customer specifically requests a future ship date delivery schedule.

The Required Date is a target ship date

The *Required Date* is a target ship date that does not adjust to particular situations. Instead, adjustments are made by MRP and shop activities to meet the target date. Here are a couple of examples:

- When an unusually large order is entered for a *Demand Driven* stocking order policy item that is not covered by stock on hand, the *Required Date* stays fixed as is and does not get moved out. Instead, MRP immediately generates a job to replenish stock and the early *Required Date* gives the job high priority in work center queues to automatically expedite the job.
- When an unusually large order is entered for a *To Order* policy item, the *Required Date* stays fixed as is and does not get moved out. Instead, MRP immediately generates a job to order and the *Required Date* gives the job higher priority in work center queues to meet the target ship date.

Never move the Required Date out when past due

Never move the line item *Required Date* out when it is past due. A late *Required Date* gives the order high priority in job release, work center scheduling, and order picking. If the *Required Date* gets moved out, the order gets lower priority, which is counter-productive. Instead of changing the *Required Date*, you can freely change the *Expected Ship* date (see next action), without affecting shop priorities.

Only change the Required Date to enter a blanket sales order or by customer request

Only change the default line item *Required Date* when entering a blanket order where the customer requests a set of future shipments. In that case, enter a separate line for each shipment quantity and change the *Required Date* to correspond to the requested ship date. MRP is ideally suited for blanket orders because no action is taken against future shipments until the line item *Required Date* falls into the item's planning period action window.

The Required Date is updated with quote conversion

Whenever a quote is converted to a live sales order, each line item *Required Date* is refreshed relative to the current date to ensure date alignment with MRP job generation.

Extend Required Dates with extra shop days if needed

(*Sales - Sales Setup - SO Required Dates*)

You can extend default *Required Dates* on an across the board basis by item order policy using the extra *Shop Days* settings in the *SO Required Dates* screen. Here are examples of how the extra *Shop Days* setting might be used:

- Against *Stocking* order policy items you may wish to extend *Required Dates* by an extra shop day because orders cannot always be shipped on the same day they are received.
- Against *To Order* policy items you may wish to extend *Required Dates* by one or more extra shop days to provide additional time for one-off BOM customization or other pre-MRP activities.

Avoid frequent adjustments

Avoid frequent adjustments to extra *Shop Days* settings because it can cause newer orders for an item to have earlier *Required Dates* than older orders.

2. Use the SO line Expected Ship date for customer communications

The Expected Ship date and header Promise Date do not affect MRP

The sales order line item *Expected Ship* date and the header *Promise Date* are customer communication dates that do not affect MRP generation or job and picking priority.

The Expected Ship date accompanies the line item Required Date

The *Expected Ship* date accompanies the line item *Required Date* and indicates when the line item is likely to be shipped. The program automatically makes the *Expected Ship* date equal to the *Required Date* when a new line is created, when a quote is converted, and when the *Required Date* is modified for blanket order entry. Unlike the *Required Date*, which is a target date for MRP generation and job and picking priority, the *Expected Ship* date can be freely changed as needed.

Do not add padding or safety to the SO Required date - use the Expected Ship date instead

The SO line *Required Date* is the principle driver of MRP and system priorities. If you wish to give yourself some cushion on a delivery use the *Expected Ship* date as your customer communication date.

Use the Late Supply screen to update Expected Ship dates

Use the *Late Supply* screen to update line item *Estimated Ship* dates for sales order line items that will not meet their *Required Date* due to late supply from jobs or purchase orders of insufficient stock on hand. The *Expected Ship* date is for customer communications and can be freely updated as needed without affecting job or picking priority.

The header Promise Date can also be used for customer communications

You also have the option of using the *Promise Date* for customer communications, which is a header level date that indicates when you think the entire order is likely to ship. The *Promise Date* has no effect on MRP and can be freely changed to reflect actual conditions.

NOTE: The downside of the *Promise Date* is that it is a single header level date and cannot handle multiple SO lines with potentially multiple shipment dates. We recommend the line level *Expected Ship* date as the preferred customer communication date.

Establishing the header Promise Date

When you create a new sales order you can specify the *Promise Date* prior to line item entry or you can update the *Promise Date* after line item entry.

- If you specify a *Promise Date* prior to line item entry, it establishes a minimum *Required Date* against all the line items. This may be helpful in cases where line items have highly variable *Required Dates* and you want items to have the same target dates.
- If you leave the default *Promise Date* as is and enter the line items, you can assess line item *Required Dates* and then update the *Promise Date* to cover the latest date among the line items.

3. Generate MRP on a daily basis

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 accurate target dates

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

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.

Never delay MRP generation

The only way to achieve demand driven planning is to generate MRP on a daily basis to 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, MRP generation takes little time and should be run at least once per day.

Never generate partial or fragmented MRP sessions

Each MRP session is designed for complete generation and conversion through all job levels and conclusion with PO generation and conversion. Complete generation is essential for achieving a coordinated master schedule and uncovering your firm demand through all levels of production. Never skip levels or generate jobs on one day and POs on another.

Never delay planned job or PO conversion

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

Do not bypass MRP with manual jobs and POs

MRP generates a coordinated master schedule in which supply dates are aligned with demand dates and jobs are prioritized in work center queues relative to their 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 materials and distorting work center priorities.

Job generation and conversion

CTO jobs are generated first

In the first phase of MRP generation, jobs are generated directly from sales order lines for CTO (custom to order) items. Jobs are backward scheduled from the sales order line's *Required Date*, which was established by the item's *Time to Shipment* target and is within the item's planning period action window.

Net demand jobs are generated level by level

After jobs are generated for CTO items, MRP generates jobs level-by-level for all other manufactured items. A job is generated whenever current net demand (stock on hand + all inbound jobs - actual demand within the item's planning period) falls below the item's *Reorder Point*. The job quantity will be equal to actual net demand or the item's *Min Order* quantity, whichever is greater.

Planned start date is the target date for Job Release

As you convert Jobs level by level, the *Planned Start* date for Jobs generates the firm demand for subassemblies and purchased components. MRP aligns all components so they are available for the target release date of Jobs. DBA allocates all materials in the Job Release screen to ensure availability when your release Jobs 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 job later when the demand eventually falls into the item's action window and becomes short-term and firmly set. Demand driven planning takes no action against long-term demand because it is tentative, incomplete, and subject to scheduling and specification changes and order cancellations.

If you prefer longer planning periods:

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

Planning periods are never expanded for top level items

Planning periods are never expanded for top level items because premature job generation at the top level will generate premature demand for lower items that would cause excessive inventory and introduce long term dates into what should be a firmly set master schedule. The planning period for top level items is also ideally suited for handling blanket sales orders because it excludes demand from future required dates that does not need current action.

Interdependent demand is consolidated into single jobs

Because the job schedule is limited to short-term demand that is firmly set, there is no need to isolate demand into separate sets of multi-level jobs in case scheduling or specifications changes are needed. Consequently, interdependent (shared) demand for each item is consolidated into a single job for more efficient scheduling and production.

Job conversion should be a completely automatic process

Job conversion at each level should be a completely automatic process that goes very quickly. Unless a *ReviewNote* is specified for special instructions (see next), there is no manual intervention to be applied.

Use a Review Note for special situations

A *ReviewNote* should be used for items where the planned job must be modified for special situations. For example, a formula might be required to calculate a specific job quantity. Or perhaps the planned job must be split to accommodate machine size limitations. Assign such items a *ReviewNote* in the *MRP Settings* screen with special instructions included. During MRP generation the job cannot be converted until the *ReviewNote* has been read and confirmed as completed.

 [Using Review Notes](#)

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 *ReviewNote* that is assigned to the item in the *MRP Settings* screen. During MRP generation the planned PO cannot be converted until the *ReviewNote* has been read and confirmed as completed.

 [Using Review Notes](#)

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.

8 Phase 4 - Release Jobs with Material

The fourth phase of *Demand Driven MRP* is to release jobs to production when allocated materials become available.

Summary

Open purchase orders are tracked and expedited to ensure that jobs get released on time. Jobs are released to live production per planned start dates when allocated materials become available. Job Release is the heart of the scheduling system that moves the job planning dates from tentative to firm.

Actions

1. Expedite POs to release jobs on time

Open purchase orders are tracked and expedited to ensure that jobs get released on time.

POs are tracked in the PO Schedule screen

POs in progress are tracked in the *Purch - PO Schedule* screen. PO lines are displayed in ascending *Due Date* order so that late POs are displayed at the top of the list.

A Days Past Due value indicates a late PO

A late PO is identified by a *Days Past Due* value, which is the number of calendar days that have elapsed since the PO line's *Due Date*.

The Supply Dependencies inquiry lists delayed jobs

When a late PO is causing a delay to one or more job start dates, the icon in the *Dependencies* field becomes visible. Click the icon to launch the *Supply Dependencies* inquiry, which lists each delayed job and the number of days that have elapsed (or are expected to elapse if there is an *Expected Date*) since the job start date.

Dependent jobs cannot be released

Dependent jobs listed in the *Supply Dependencies* inquiry cannot be released to production in the *Jobs - Job Control Panel - Release Jobs* screen until the late PO is received and all other materials are fully allocated.

Expedite late POs with suppliers

It is essential that late POs are expedited so that dependent jobs can be released to production without further delay. A late PO is expedited by communicating with the supplier and applying appropriate pressure to get the PO delivered as soon as possible.

Enter an Expected date

If the supplier furnishes an updated estimated delivery date, enter that date in the *Expected* date field. This causes the *Expected* date to differ from the *Due Date*, which indicates that you have communicated with the supplier. The *Expected* date establishes a new updated supply date for the planning system.

Track POs on a daily basis

PO tracking is an essential process because jobs cannot be released and started without materials. Late POs must be tracked and expedited on a daily basis because each day a new set of POs can potentially become late and delay dependent jobs.

2. Release jobs to production when materials become available

Jobs are released to live production per planned start dates when allocated materials become available. *Job Release* converts tentative planning dates to a firm plan.

Newly created jobs are assigned New status

When a job is first created through MRP, it is assigned a *Newstatus*. It is important to distinguish *Newstatus* jobs, which are waiting to go into production, from *Released* status jobs, which are in live production. *Newstatus* jobs have tentative *Planned Start* and *Job Finish* dates, whereas *Released* status jobs have an actual *Released* date and a firm *Job Finish* date.

Never reschedule New status jobs

Never manually reschedule dates against *Newstatus* jobs because these are tentative dates that will be automatically rescheduled during the job release process. *Newstatus* job dates were established during MRP generation and are aligned in a multi-level, time-phased manner that prioritizes jobs for materials allocation in job release.

A job cannot be started without materials

A job cannot physically be started until all its required materials are on hand and are not allocated to other jobs. Job materials may include subassemblies, purchased components, and raw materials.

The Release Jobs screen allocates stock on hand

Newstatus jobs are released to live production in the *Jobs - Job Control Panel - Release Jobs* screen. Whenever the screen is launched, a batch process allocates

available stock on hand first to *Released* status job components and then to *New* status job components in *Planned Start* date order.

Jobs with a green Material icon are ready for release

When the *Material* icon is green in color, stock on hand is fully allocated to all the job's components and the job is at or past its *Planned Start* date. Such jobs can safely be released to live production because the allocation process ensures that materials will be available for issuing to the job when needed and won't be grabbed by other jobs.

Auto-Select option

You can click the *Auto-Select* button to mass-select all jobs with a green *Material* icon.

Jobs with a yellow Material icon are ready for early release

When the *Material* icon is yellow in color, stock on hand is fully allocated to all the job's components, but the job is not yet at its *Planned Start* date. If you wish to release the job earlier than planned, manually select the *Release* checkbox.

Jobs with a red Material icon must be delayed

When the *Material* icon is red in color, the job is at or beyond its *Planned Start* date, but stock on hand is not fully allocated to all the job's components. In this case job release must be delayed until allocated materials become fully available.

Material Allocation Inquiry

You can click the icon in the *Material* field to launch the *Material Allocation* inquiry, which displays all the job's components and indicates which ones have an allocation shortage. Against each component you can click the *Stock Status* inquiry to view inbound supply and other competing demand events for the item.

Each released job is given an updated Job Finish date

When a job gets released, its status changes from *New* to *Released* and the job is given an updated *Job Finish* date relative to its actual *Released* date. This process makes the master job schedule self-adjusting and ensures that all *Released* status jobs have realistic finish dates.

Jobs should be released throughout the day

Job release is not a once a day process. Whenever subassembly jobs are received to inventory in the *Job Receipts* screen, the job release process should be run so that any higher-level jobs dependent on the subassembly item can be released in timely and sequential fashion.

The “golden rule” -- never release without material

The “golden rule” of scheduling is -- never release jobs without material. Releasing jobs without fully allocated materials causes a host of problems, including corruption of the self-adjusting rescheduling process, distortion of job priority calculations, misallocation of materials, and reintroduction of inefficient “rob Peter to pay Paul” practices.

9 Phase 5 - Run Work Centers by Job Priority

The fifth and final phase of *Demand Driven MRP* is to run work centers by job priority to ensure that all jobs meet their required dates and sales orders get shipped on time.

Summary

Each released job is given a calculated priority based on remaining production time relative to the job required date. Within work center queues, sequences are run in job priority order so that jobs trending behind schedule get priority over jobs trending ahead of schedule, which optimized production flow and boosts shop throughput. Jobs with unusually large quantities get higher priority and thus experience less waiting time, which enables larger jobs to meet their target required dates.

Actions

1. Run work centers in job priority order

Work centers are run in job priority order to balance production flow so that all jobs meet their required dates..

Each job has a Required Date

Each job has a formal *Required Date*.

- In the case of a CTO job, it is the *Required Date* of the associated sales order line item.
- For all other top-level item jobs, if the job has dependent sales orders, it is the earliest line item *Required Date* among them. If there are no dependent sales orders, the job is for stock replenishment, in which case its *Required Date* was established by the item's replenish time (*Lead Days + Job Days*).
- For lower-level item jobs, if the job has higher-level dependent jobs, it is the earliest *Planned Start* date among them. If there are no dependent higher-level jobs, the job is for stock replenishment, in which case its *Required Date* was established by the item's replenish time (*Lead Days + Job Days*).

Jobs are dynamically prioritized

Jobs are dynamically prioritized relative to their *Required Date* as job labor sequences are completed. *Job Priority* is calculated as follows:

$$\begin{array}{r}
 \text{Days to Required Date} \\
 - \text{Remaining Sequence Days} \\
 \hline
 = \text{Job Priority}
 \end{array}$$

Days to Required Date is the number of shop days from today to the job's *Required Date*. *Remaining Sequence Days* is the job's total remaining setup and labor hours divided by each work center's daily capacity (*Job Hours / Day*).

The Job Priority number is a trending indicator

The *Job Priority* number is a rough indicator as to how a job is trending towards meeting its *Required Date*. A negative number indicates that the job is trending late. A positive number indicates that the job is trending early.

Work centers are run in Job Priority order

The *Jobs - Work Center Schedule* screen is used to coordinate and update shop labor activities. Each work center has a queue consisting of job sequences that are either waiting in the work center to be started or are already in progress. Job sequences are listed in ascending *Job Priority* order so that jobs trending late get priority over jobs trending early, which optimizes production flow and boosts shop throughput. Jobs with unusually large quantities get higher priority and thus experience less waiting time, which enables larger jobs to meet their target required dates.

Jobs released later than planned get top priority

When a job is released to production later than planned, a negative or relatively low *Job Priority* will be calculated, which results in the job being listed towards the top of work center queues. Top priority automatically expedites the job through the shop because it will experience less queue time than other jobs. In many cases the prioritization effect will enable the job to get back on schedule and meet its *Required Date*.

Prioritized labor keeps all jobs on schedule

When all work centers are run in *Job Priority* order, jobs that are trending late experience less overall queue time than jobs trending early. This coordinates shop labor in a balanced fashion so that all jobs stay on schedule and orders get shipped on time.

Workers update their labor as sequences are completed

Whenever a worker completes a job sequence, he or she must update job labor, which updates work center queues and *Job Priority* calculations.

Labor is updated directly in the *Work Center Schedule* screen. Click the *Labor* icon against the job sequence, which launches the *Job Labor* screen. Labor can be updated at standard or actual hours, depending on the *Hours Type* specified against each job sequence. The sequence can be flagged as finished or a completed quantity can be entered, depending on your system preference in the *Jobs - Jobs Setup - Job Labor Defaults* screen.

Workers will need access to a workstation either in the shop or along its perimeter to update labor whenever a sequence is completed. Each such workstation can be dedicated to labor entry and access can be shared by multiple workers.

All workers in all work centers must participate

Prioritized labor only works when all workers in all work centers participate in updating labor as sequences are completed. This is because labor updating in each work center updates the queues in subsequent work centers. If any worker or work center fails to participate, the queue linkages will be broken and job prioritization will not work.

Real time completions yield many benefits

Real time completions entry yields many benefits besides job prioritization. Instead of conducting tedious manual investigations, you will now know where every job stands at any given time. When finished items are received to inventory, all labor costs are fully accounted for without any need to stop and enter labor after the fact.

Job materials are issued real time

Another benefit of the *Work Center Schedule* screen is that it enables materials to be issued to jobs just before sequences are started. The *Material* icon indicates whether materials are needed and links directly to the *Job Issues* screen so that inventory can be updated in real time. The job release process ensures that materials are available, so there is no longer any need to hoard materials in advance to protect against being grabbed by other jobs.

10 Use Target Dates with Flexible Feedback

DBA is a demand-driven scheduling system that uses target required dates with flexible feedback.

How It Works

Demand-driven scheduling consists of four schedules, each of which is auto-generated by the program without need for manual intervention.

1. Sales Order Schedule

Sales orders establish the target demand dates that drive the scheduling system. The program calculates a *Required Date* for each line item, derived from the lead time and order policy settings that comprise the item's planned *Time to Shipment* target.

Item required dates are consistent over time

Each item's *Required Date* basis is the same number of days from order to order, regardless of quantity, which provides customers with consistent times to shipment. Jobs with larger quantities get higher priority in work center queues, which reduces waiting time and enables such jobs to meet their target demand dates.

Required dates prioritize order picking

Orders for an item are picked in earliest *Required Date* order so that orders are shipped in the order they were received. The *Sales > Picking Manager* screen allocates available stock on hand to sales orders in line item *Required Date* order and indicates which orders are fully or partially ready for picking.

The Expected Ship date reflects actual conditions

Each line item *Required Date* is accompanied by an *Expected Ship* date, which reflects actual conditions and can be used as the customer communications date. Unlike the *Required Date*, which is a target demand date that drives MRP and shop priorities, the *Expected Ship* date can be freely changed as needed.

Job Finish dates provide feedback for Expected Ship dates

When a job is scheduled late relative to its target required date, it provides feedback for the *Late Supply* screen, which lists dependent sales order lines that are likely to be shipped late and enables updating of *Expected Ship* dates and communication to the customer if necessary.

2. PO Schedule

DBA is a demand-driven MRP system. Purchase orders are generated in response to firm demand within each item's planning period, which is the action window for

buying the item. Future demand from jobs outside the planning period is ignored for now and is responded to in future MRP sessions.

Demand-driven inventory replaces forecasts and projections

Future requirements are planned with demand-driven stocking instead of forecasts and projections to avoid injecting longer-term, tentative, and revision-prone demand into the schedule. A monthly demand rate is incorporated into item reorder points for demand-driven stocking. POs only get triggered by actual demand, which caps and minimizes any over-stocking.

PO due dates are derived from item Lead Days settings

PO due dates are derived from item *Lead Days* settings and do not vary by quantity. This provides consistent date alignment with job planned start dates over multiple MRP sessions.

All POs are for current delivery

PO due dates are derived from item *Lead Days* settings. Demand-driven stocking eliminates longer-term, tentative, and revision-prone POs from the schedule. All purchase orders are sent to suppliers immediately upon creation and are for current delivery.

The PO line expected date reflects actual conditions

Late POs are monitored in the *PO Schedule* screen to expedite delivery from suppliers and to assess impact on dependent jobs. If the supplier furnishes a firm delivery date, the line item *Expected Date* can be updated to update the system supply date.

3. Released Job Schedule

Jobs are released to live production when allocated materials become available, which is often dependent on inbound supply from subassembly jobs and purchase orders. When a job gets released, it is given a new *Job Finish* date relative to its actual released date. The new Finish Date is a reliable supply date that automatically provides up to date feedback system wide.

Initial job dates are placeholders

Initial dates for new status jobs are placeholder dates that maintain multi-level date alignment in the master job schedule up through job release. The *Planned Start* date is the target date for *Job Release*.

Job release is when the schedule goes live

The job release process is when the schedule goes live because it is the point at which jobs begin actual production.

Job release is delayed when materials are not available

A job is only released to production when allocated materials become available. When subassembly jobs or inbound POs are behind schedule, job release is delayed for any jobs that are dependent on those materials. These items will provide clear

feedback in the dependency inquiry in the *Job Release*, *Job Schedule* and *PO Schedule* screens.

Jobs are automatically rescheduled with release

When a job does get released, it is given a new *Job Finish* date relative to its actual released date, which makes the live job schedule self-adjusting.

Job release ensures the correct order of assembly

Job release is performed multiple times per day as lower level jobs are finished, which provides supply for dependent higher level jobs waiting to be released and ensures that jobs are released and started in the correct order of assembly.

The job Finish Date reflects actual conditions

If during the course of a job it becomes apparent that the job will be finished later than scheduled, the *Job Finish* date can be manually adjusted in the *Job Schedule* screen and this will update the system supply date.

Late Supply screen improves communication between the shop and the office

When a job is running late and is released for production the finish date (supply date) is moved outward. When the finish date is greater than the sales order requirement date this job will show up in the *Sales > Late Supply* screen. This will immediately let the office know which jobs are running late and they can update the *Expected Ship* date and contact the customer if appropriate.

4. Work Center Schedule

The *Work Center Schedule* screen prioritizes production activities and is used to execute the released job schedule.

Jobs spend more time in queues than in production

A job typically spends more time in work center queues than it does in actual production. Whenever a job arrives in a work center, it competes with other jobs and must wait its turn to begin production. The *Work Center Schedule* manages this process by allocating queue time based on job priority.

Each job is automatically prioritized

Each released job is prioritized based on remaining production time relative to its target demand date. Jobs running behind schedule get higher priority over jobs running ahead of schedule

Larger jobs get higher priority

When a job has an unusually large quantity, it has more production time, which gives the job higher priority than would otherwise be the case with a normal quantity. The job will experience less waiting time in work center queues, which is how it can meet its target demand date in spite of the larger quantity.

Prioritized production expedites jobs and optimizes production flow

Prioritized production, where work centers are run by job priority, is far more efficient than ad hoc expediting done one job at a time. Jobs are efficiently expedited in coordinated fashion, which optimizes production flow and boosts shop throughput.

Materials are issued in real time

Along with real time labor updating, materials are issued as they are used by job sequences for real time inventory tracking.

Labor sequences are updated in real time

Within the *Work Center Schedule* job sequences are updated in real time to update job priorities, work center queues, and enable real time job tracking. Labor updating is facilitated by applying standard hours to completion quantities as sequences are closed.

Deploying workers and machines

Monitoring work center queues in the *Work Center Schedule* identifies bottlenecks and areas of the shop that need attention. This enables efficient deployment of workers and machines or application of overtime hours and extra shifts.

Benefits

Provides customers with consistent times to shipment

With other planning systems ship dates are established ad hoc and vary from order to order.

By contrast, DBA's demand-driven scheduling provides customers with consistent and reliable ship dates over time. Each item's sales order required dates are calculated from its planned *Time to Shipment* target and do not vary with different order quantities. Instead, job priority flexibly adapts so that larger jobs experience less waiting time in work center queues.

Eliminates constant rescheduling

Other planning methods generate longer term jobs and POs from forecast explosions. This demand is tentative and must be firmed up as actual demand materializes, which requires constant rescheduling to avoid shortages and over-stocking. Rescheduling is complex because demand is interdependent among lower level items, which causes many companies to resort to inefficient job linking to simplify the process. Because rescheduling is so time-consuming, planning sessions are limited to once or twice a week, which delays timely response to new demand.

By contrast, demand-driven scheduling only generates jobs and POs from actual demand within item planning periods, which is the action window for making or buying the item. This demand is firmly set and job dates are left as is until jobs are released to live production. MRP generation takes very little time and is run daily for immediate response to new demand.

Provides sales with feedback from production

In other systems the communication between sales and production regarding job status is inefficient and requires manual investigation. Customers are often left in the dark regarding the status of their orders.

By contrast, the *Late Supply* screen in DBA provides the sales department with feedback from production. The screen lists sales order lines dependent on jobs scheduled for late finish and enables *Expected Ship* dates to be updated to reflect each item's likely ship date.

Eliminates material hoarding

Other systems suffer from “rob Peter to pay Paul” syndrome where shop personnel hoard materials so that favored jobs can be started.

By contrast, the job release process in DBA allocates materials on hand to jobs in planned start date order. This eliminates any need for material hoarding and determines when jobs can be started. When inbound supply from purchase orders or subassembly jobs is late, release must be delayed for dependent jobs. When a job does get released, it is given a new job finish date relative to its released date, which makes the job schedule self-adjusting.

Identifies bottlenecks that need attention

In other systems the only way to know what's going on in the shop is through manual investigation. Bottlenecks easily escape detection and do not receive timely attention.

By contrast, the *Work Center Schedule* in DBA provides complete visibility of work center queues. Unusual queue sizes quickly identify bottlenecks that can be mitigated by deploying workers and machines or overtime hours or extra shifts.

Prioritizes shop activities

In other systems jobs are expedited one at a time to meet promised ship dates, which penalizes other jobs that get moved to the back of work center queues.

By contrast, the *Work Center Schedule* in DBA prioritizes shop activities so that workers always know what to run next in each work center. Jobs are run in priority order within work center queues so that jobs running behind schedule get priority over jobs running ahead of schedule. Running work centers by job priority optimizes production flow so that all jobs meet their target demand dates.

Tips for Success

Make target demand dates tight and realistic

Shop productivity and throughput increase when target demand dates push shop personnel to greater performance. By contrast, padded dates are easy to beat and encourage complacency. For best results, make item P item *Lead Days* and M item *Job Days* settings tight and realistic.

Apply safety to expected dates, not lead days or job days

If your objective is to pad ship dates with a safety factor, apply padding to line item *Expected Ship* dates, but not to item *Lead Days* or *Job Days* settings. When *Lead Days* and *Job Days* settings are padded, numerous problems ensue, including unrealistic sales order required dates, inability to track late POs, chronic early job release, and invalid job prioritization.

Never enter future jobs

Never enter future jobs to explode projected demand because it is not compatible with demand-driven scheduling. Future job projections corrupt the new job schedule with longer term, tentative supply that is highly subject to revisions. Instead, replace long term projections with demand-driven stocking whereby a monthly demand rate is incorporated into item reorder points. It is a far more efficient way to plan for future requirements because jobs only get triggered by actual demand and are firmly set upon creation.

Never enter blanket purchase orders unless required

Do not enter blanket purchase orders unless required by a supplier because they are not compatible with demand-driven scheduling. Future purchase orders corrupt the PO schedule with longer term, tentative supply that is highly subject to revisions. Instead, replace blanket POs with demand-driven replenishment whereby a monthly demand rate and supply days interval are incorporated into item reorder points and min order quantities. Each PO is triggered by actual demand, which prevents shortages and overstocking and eliminates the constant revisions required to manage blanket POs.

Never release jobs without material

Never release jobs without allocated materials because doing so circumvents the rescheduling process that is central to demand-driven scheduling and feedback.

Run work centers in priority order

When an item has different job quantities, demand-driven scheduling adapts with job priority instead of varying the lengths of jobs. Jobs with larger quantities get higher priority, which reduces waiting time in work center queues. Always run work centers in job priority order and update job labor sequences in real time.

11 Using Review Notes

MRP is driven entirely by item settings

Time to Shipment MRP is driven entirely by item settings. All workflow processes, including sales order required dates, job and PO generation, job release, and job prioritization, are automatic and self-adjusting without need for manual intervention.

Use Review Notes for special situations

There can always be special planning situations that can't fully be handled by standard item settings.

- With manufactured items, for example, a formula might be required to calculate a specific job quantity. Or perhaps the planned job must be split to accommodate machine size limitations.
- Purchased items often require active intervention prior to planned PO 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.

Use Review Notes to handle special planning situations

Any such special requirements can be documented with a *ReviewNote* that gets included with each planned job or PO during MRP generation.

ReviewNotes are created in the *MRP - MRP Settings* screen. Select the *Review* checkbox against any M or P item, then click the *ReviewNote* icon. A pop-up screen is displayed within which you can enter unlimited freeform text to document special planning instructions.

Review Notes must be read and confirmed during MRP generation

If an item has a *ReviewNote*, during MRP generation a planned job or PO cannot be converted until the *ReviewNote* is read and confirmed as completed. This provides a formal process for communicating special planning instructions.

12 Using MRP Analysis Codes

MRP analysis codes enable you to schedule periodic reviews of MRP item settings for different sets of items. They are set up and managed in the *MRP - MRP Analysis Codes* screen.

Analysis code setup

MRP analysis codes enable you to schedule periodic reviews of MRP settings for related sets of items. Against each analysis code you specify the desired frequency interval between each analysis, which can be weekly, monthly, yearly, or a custom number of days. You then assign a set of related items to the analysis code. Analysis codes are designated for M items or P items, but not for both.

Use the *Search* button to display all analysis codes for an item, all items that have analysis codes, and all items that do not have analysis codes.

Performing an analysis

Whenever you launch the *MRP Analysis Codes* screen, any analysis codes due for an analysis are listed with the *Next Analysis* date displayed in bold red. You click the *Action* button to launch the *MRP Settings* screen, which is filtered to just the items assigned to the analysis code.

One by one you can review each item's MRP settings and make adjustments as needed. After each item is reviewed, you can optionally select its *Analysis Complete* checkbox to track your progress. You can pause and return to your analysis as often as you wish.

When the analysis is completed, you click the *Action* button and indicate that the analysis is complete. The analysis gets saved to history and the next analysis date is scheduled.

Ideally suited for critical items

MRP analysis codes are ideally suited for maintaining the monthly demand settings -- *Sales* or *Usage* and *Safety Factor* buffer -- against critical items assigned to the *Stocking (Monthly Demand)* order policy, meaning items with relatively high inventory value or high strategic impact on other items. Periodic review and adjustment keeps monthly demand settings aligned with actual demand trends.

13 Long Lead Days Purchasing

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:

$$\text{Net Demand} = \text{Stock On Hand} + \text{All Inbound POs} - \text{Actual Demand}$$

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.

14 MRP Guidelines

Demand Driven MRP is a planning system that only responds to firm demand originating from current sales orders. Item lead time, order policy, and supply pipeline settings combine to generate consistent and reliable times to shipment with efficient utilization of inventory.

To ensure your success with *Demand Driven MRP*, replace your traditional planning methods with the settings and processes prescribed by these guidelines.

1. All P items require a standard Lead Days for procurement time

Without exception, all P items require a standard *Lead Days* for expected procurement time. The standard *Lead Days* establishes PO due dates, lead time contribution to higher-level items, and item planning periods, and also enables late PO tracking. For all these reasons, a realistic value is required that is not padded or artificially inflated.

Never pad or inflate standard Lead Days

Never pad or inflate the standard *Lead Days* because whenever an item has a *To Order* policy, its *Lead Days* contributes to the lead times of higher level items and progressively magnifies lead times at each higher level, resulting in severely distorted *Time to Shipment* targets and elevated inventory levels.

2. All M items require a standard Job Days for production time

Without exception, all M items require a standard *Job Days* for expected production time. The standard *Job Days* establishes job start and finish dates, lead time contribution to higher level items and time to shipment, and item planning periods, and also enables late job tracking. For all these reasons, a realistic value is required that is not padded or artificially inflated.

Never pad or inflate standard Job Days

Never pad or inflate the standard *Job Days* because whenever an item has a *To Order* policy, its *Job Days* contributes to the lead times of higher level items or to its own *Time to Shipment* target.

3. All items require a standard Order Policy based on lead day contribution

Without exception, all items require a clear and consistent *Order Policy* to determine planning intent and lead time contribution. When you assign an item a *To Order* policy, your intent is to always buy or make the item to order. You do not expect stock to be on hand and therefore the item's lead time contributes to the lead times of higher-level items or to its own time to shipment target. When you assign an item a *Demand Driven* or *Manual Reorder Point* order policy, your intent is to maintain

stock on hand for immediate use. You expect stock to be available for the majority of potential demand scenarios and therefore the item is not a lead time contributor.

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 strategic 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* stocking order policy to enable immediate shipment from stock.

4. Refine Time to Shipment targets to reflect your marketing objectives

Time to Shipment targets are calculated for all top level M items to establish sales order required dates. Each item's *Time to Shipment* target is derived from the standard lead times and order policies of the item itself and lower level lead time contributors. All *Time to Shipment* targets must be refined as needed until they reflect your marketing objectives. *Time to Shipment* can be eliminated altogether by assigning the top level item a *Demand Driven* order policy. *Time to Shipment* can be reduced with strategic *Demand Driven* order policy assignment to key components to remove them as contributors to the manufactured item's pre-job *Lead Days*.

5. Use the Demand Driven order policy for 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*.

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.

6. Purchase long lead time items with a supply pipeline

Assign the *Demand Driven* order policy to P items with long lead times. Enter a *Monthly Potential Demand* rate and a *Supply Days* interval target and the system will auto-calculate your *Reorder Point* and *Min Order* values 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.

7. Always leave the SO line Required Date as is for current orders

The sales order line item *Required Date* is established by the item's *Time to Shipment* target. Always leave the *Required Date* as is for current orders because it is an internal MRP date that is aligned with dependent job dates and provides consistent shipping priority relative to other orders. Never use the *Required Date* as a "wish date" by salespeople and never move the date out when it is past due. The only time the date should be manually changed is to enter a blanket order where the customer requests a set of future quantities and ship dates.

Use the Expected Ship date for customer communications

The line item *Required Date* is accompanied by the *Expected Ship* date, which is an external date used for customer communications. The *Expected Ship* date is updated directly in the *Late Supply* screen, which lists sales order line items that are likely to miss their target *Required Date* due to late supply from jobs or purchase orders or insufficient stock on hand.

8. Generate MRP on a daily basis to full completion

For demand driven manufacturing it is essential to generate MRP on a daily basis to full completion. Daily Job and PO generation enables MRP to respond immediately to new sales order demand or existing demand that falls into item planning period action windows. Daily generation also prevents misalignment of Job and PO dates with required dates. Complete each MRP session in full by converting all planned jobs at all levels and all planned POs to ensure complete demand profiles and date alignments. Always generate and convert jobs and POs in the same session, even when Jobs are converted by one person and POs by another.

9. Use MRP Action Windows to react to firm demand in Job and PO generation

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.

Never create future jobs

All jobs are generated through MRP in response to current net demand within item planning period action windows. Never enter future jobs for any reason because they conflict with the demand-driven architecture of the master schedule. In contrast to current demand, which is firmly set, future demand is tentative and subject to date changes, quantity changes, cancellations, and specifications changes that adversely affect interdependent items at lower levels. Instead of future jobs, you can enter sales orders with future required dates, as with blanket orders, and then MRP will only respond to current demand when required dates eventually fall into item planning period action windows.

Never create future purchase orders

All purchase orders are generated through MRP in response to current net demand within item planning period action windows. MRP will always schedule due dates based on the creation date + the item's lead day allocation. This will keep your supply tightly aligned with your target release date for the Jobs where the material is needed. MRP does not miss any demand, because all system demand is firm and in the near term.

10. 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.

11. Expedite late POs on a daily basis

Monitor late POs on a daily basis in the *PO Schedule* screen and contact suppliers to expedite delivery so that dependent jobs can be released to production without delays to planned start target dates. The dependency view in *Job Release* and *PO Schedule* view will provide feedback on material that is running late.

12. Release jobs only when materials are fully allocated

Release jobs to live production in the *Release Jobs* screen only when materials are fully allocated. The job release process is a vital MRP function that serves two purposes. First, materials are allocated to jobs in planned start date order so that jobs are started in the correct order of multi-level assembly. Second, released jobs

are rescheduled with new finish dates relative to their actual release date, which automatically updates the system with a reliable supply date.

13. Run Work Centers by Job Priority

Each released job is given a calculated priority based on remaining production time relative to the job required date. Within work center queues, sequences are run in job priority order so that jobs trending behind schedule get priority over jobs trending ahead of schedule, which optimizes production flow and boosts shop throughput. Jobs with unusually large quantities get higher priority and thus experience less waiting time, which enables larger jobs to meet their target required dates

14. Late Supply screen helps you manage customer communications

The *Sales > Late Supply* screen provides feedback to your office staff to update the *Expected Ship* date for Jobs that are running behind schedule. Items will appear in the *Late Supply* screen when their *Finish* date is greater than the line item requirement date.

15. Picking Manager helps ensure that you are shipping on time and in priority order

The *Sales > Picking Manager* allocates your stock on hand in *Required Date* order to ensure that you are staying on time across all sales orders company wide. This eliminates material hoarding, excessive reliance on job linking, and the "Rob Peter to pay Paul" strategies that most planning systems experience.