Demand Driven Planning for Small Business

Demand driven planning is sweeping the manufacturing world with dramatic reductions in lead times and inventory.   DBA brings the demand driven revolution to small business.

What is Demand Driven Planning?

Demand Driven planning reacts only to firm sales orders and uses strategic stocking of key items to dramatically increase your shop throughput and reduce time to shipment. By stocking key items and eliminating tentative demand from your plan you can significantly improve the efficiency of your inventory.   Demand driven planning has been shown to reduce lead times by up to 80% and reduce overall inventory levels by 30-45% (https://www.demanddriveninstitute.com/ddmrp).

DBA takes this demand driven approach from theory to reality.   In order for this to all work you have to have a reliable and adaptable way to determine how long it takes to replenish an item.   Nobody addresses this challenge in a more straightforward and intuitive way than DBA.   By maintaining 3 core MRP Settings, including the Demand Driven stocking order policy for critical items, DBA customers are getting some of the best results in the industry.

Avoid the Bullwhip Effect

When you introduce tentative demand into your planning profile small errors in your forecasts and projections get amplified through all levels of production and become very large errors in your inventory levels. This "bull whip" effect is seen in nearly every traditional planning method and is why the industry is learning that demand driven planning is a superior approach for manufacturing.

DBA replaces forecasts, BOM explosions, blanket orders, shortage reports, and long term planning projections because all of these methods introduce tentative demand and errors that get multiplied through all levels of production   DBA has a better path forward that has safety built into the item settings instead of relying on the accuracy of forecasts and long term tentative projections.

Avoid Job Linking

Another common planning strategy is to set all BOM components as "To Order" items and attempt to manufacture using multi-level linked chains of Jobs and Purchase

Orders hard linked to Jobs.   The theory is that this approach would use less inventory by not carrying stock of any items.   In reality, this is a completely failed methodology. Hard linking of jobs, subassemblies and components is very unforgiving when your actual demand changes.   If the job chains are planned in a long-term fashion, the "bull whip" effect is especially severe.   In most cases, Job chains lead to less efficient use of inventory and higher overall inventory costs.

Job linking also leads to very poor time to shipment performance and reduces the very important benefits of stocking key subassemblies and components.   Job linking can lead to an explosion of the number of jobs and can overwhelm your operations. Instead of hard linking, DBA MRP will naturally align To Order demand when appropriate and will combine demand wherever possible. It is essential that you retain your flexibility to put a demand driven stocking order policy on key items if you have any hope to improve your shop throughput.

The Key is Replenishment Planning

Manufacturing poses a time phased planning challenge where you have to account for the total time it takes to manufacture your products and/or procure your purchased items.

We have learned over the years that the vast majority of companies that are struggling with their planning can dramatically turn around their company by focusing on three fundamental MRP settings.   DBA customers that embrace the demand driven approach are blown away by the positive results. While the settings may appear simplistic on the surface, there is real power in how DBA converts your settings into a comprehensive demand driven plan touching all aspects of your organization.

Three MRP Settings Drive the Entire System – You Must Enter:

1. **Reasonable Lead Days for 100% of your purchased items**
2. **Reasonable Job Days for 100% of your manufactured items**
3. **A clear-cut Order Policy based on lead day contribution**

- To Order = lead day contributor - You always create a Job or PO in response to demand
- Demand Driven stocking = not a lead day contributor - Your intent is to have this item on hand for immediate use in Sales Orders and Jobs

   Avoid a Hybrid Order Policy - avoid a To Order policy that you sometimes stock or that you manually stock. If you want to carry extra stock for any reason, the Item Order Policy must be Stocking.

DBA Demand Driven Innovations

DBA does many things through triggers and stored procedures that would be nearly impossible to replicate with a manual planning method. The three core MRP settings above have a profound impact on all aspects of the system.

Lead Day Calculation for your Manufactured Items - The system dynamically calculates the lead days for your manufactured items through all levels of production based on your item settings and lead day contribution order policies. The lead days for your manufactured items:

- Set time to shipment targets (SO required dates)
- Drive requirements through all levels of production
- Align purchase order supply with the planned start of Jobs
- Effect priority-based activities throughout the system

Replenishment Time Planning Period per Item - Each Item has a dynamically calculated planning period. Any changes in the lead days for your manufactured items triggers an automatic change in that item's planning period.

- Planning period action windows in MRP ensure that you are only acting only on firm demand and that you have sufficient time to replenish the item.
- Attempting to plan beyond the planning period introduces tentative demand that leads to the "bull whip" effect and many well documented negative consequences.

Self-Adjusting Demand Driven Stocking - Lead day contribution is removed by placing a Demand Driven policy on critical for-sale items, subassemblies and purchased components.

- Replenishment reorder trigger points and minimum order quantities adjust automatically to dynamic changes in the item's replenishment time or monthly demand settings.
- Lead Day Inquiry in MRP Settings helps you determine which items to strategically stock and reduce your manufacturing lead times and time to shipment

Material Allocation and Transparent Feedback – DBA dynamically allocates material system-wide based on your demand driven targets without the need for Job linking.

- Job Release – allocates supply in demand order to ensure that you have all materials in place for production.
- Dependency views in PO Schedule and Job Schedule to show where an item is needed
- Stock Status screen gives you a real time view of all demand and projected supply for an item within the context of that item's replenishment time planning period.

- Late Supply screen – provides feedback when job finish dates are later than their requirement dates.   This helps you manage your customer communications and update your Expected Ship Dates.
- Picking Manager – allocates supply in demand order to ensure that you are adhering to your time to shipment targets and companywide plan

Self-Adjusting Demand Driven Stocking

<u>Demand Driven Order Policy is not your typical stock method</u>

For the Demand Driven order policy, the goal is to have an item on hand to meet a high probability of your anticipated sales and job usage needs. The intent is to have an item on hand for immediate use in Sales Orders and Jobs thus removing it as a lead day contributor. The term for this in the demand driven literature is a decoupling point. Stocking key items (decoupling) can dramatically decrease your time to shipment, and improve your shop throughput and cash flow.

<u>Lead Day Inquiry helps you to determine strategic stocking decoupling points</u>

The DBA Lead Days Inquiry in MRP Settings provides a multi-level view of the lead day contributor components in your manufactured items.   This will allow you to strategically plan which critical subassemblies and components to stock in order to reduce your overall manufacturing lead days and time to shipment. Once you choose to stock a component, the lead days for your manufactured items will dynamically adjust through all levels of production and automatically be reflected throughout your organization.

<u>Stock has earned a bad reputation in the software industry</u>

Many companies are reluctant to carry stock citing the expense and difficulty managing their stocking levels.   The truth is that software industry has a terrible track record on providing solutions that handle inventory efficiently. Forecast based planning, BOM explosions, blanket orders, shortage reports, and excessive Job linking are all seriously flawed approaches and lead to an inefficient use of inventory. The industry even markets the notion that stock is bad and should be avoided.   This is nonsense.   You should aspire to using stocking decoupling points efficiently and you can experience dramatic improvements throughout your entire organization.

<u>Demand Driven Stocking is a Breakthrough</u>

DBA is a different kind of stocking that is always triggered be actual demand within an item's replenishment planning period action window. DBA can deliver on the

decoupling benefits of stocking key items while maintaining a lean inventory quantity on hand (see graph examples below).

Demand Driven Basics

- Enter a Potential Monthly Potential Demand value that covers anticipated usage and volatility
- Enter a Supply Days for how long you intend the supply to last
- Each item has a dynamically calculated Replenishment Time planning period
- DBA auto-calculates:
  - Daily Usage = Monthly Potential Demand / 30
  - Reorder Point = Daily Usage x Replenishment Time
  - Min Order = Daily Usage x Supply Days
- New Jobs and POs are created when your projected quantity drops below the reorder point within that item's replenishment time planning period
- If you run out of stock, the system Priority in Work Centers will get you back on track.

The logic is straightforward and transparent for all DBA users in your company. **MRP will trigger a new order based on actual sales and job demand with enough time to replenish your item before you run out of stock**. You can think of DBA as anticipatory stocking where you are attempting to have stock just ahead of your actual orders. The strength of DBA is that if any of the criteria change for any item, at any level of production, your reorder points, minimum order and stocking will automatically adjust to align with your company objectives.

Demand Driven Stocking Key Features

- DBA is anticipatory stocking - not a static stocking level
  - Get benefits of having the item on hand while maintaining lean inventory
  - Your stocking has a tight connection with your actual usage
- Does not require super accurate monthly demand settings
  - Variations in actual usage will alter the time between Jobs and POs
  - Errors in monthly demand estimates do not propagate supply
    - Jobs/POs are always triggered by real demand
    - Does not continue to make Jobs/POs without actual demand
  - Amount of Safety is under your control in your monthly demand setting
- Shortages are handled with Priority in Work Centers
  - Late Supply screen helps you track progress and communicate with customers when a shortage occurs
- Ideal for long lead day purchased items using an inbound pipeline of Purchase Orders spaced by Supply Days interval.

Demand Driven FAQs

The following data is a simplistic example to help illustrate some key principles of the DBA demand driven stocking.
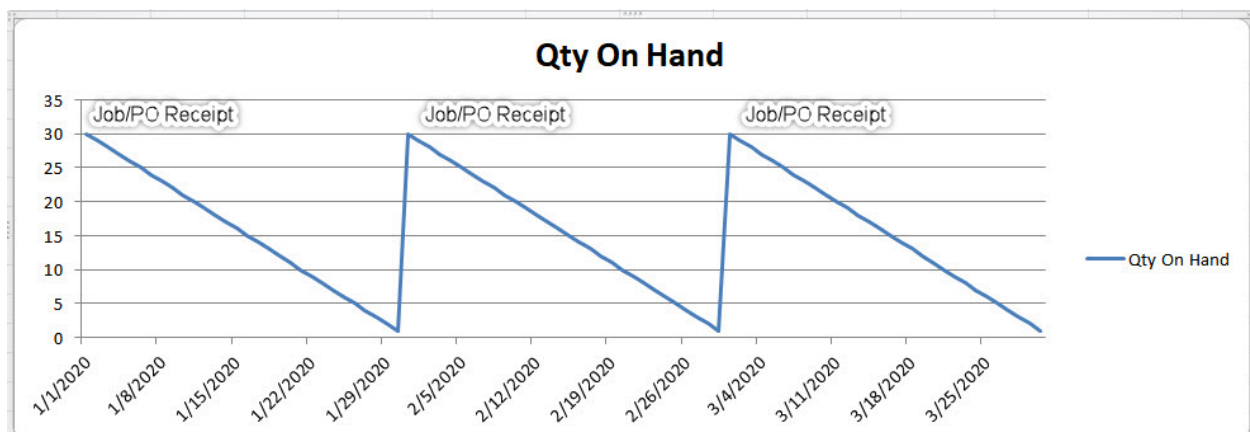
<u>Sample Item MRP Settings</u>

Order Policy = Demand Driven (Stocking)

Monthly Potential Demand = 30

Replenish Time = 30

Reorder Point = 30

Supply Days = 30

Does stocking tie up capital?

<u>DBA Reorder Point is not a Stocking Level</u>

A common mistake is for DBA users to think that the Reorder Point is a stocking level and that their carrying cost is the Reorder Point x Inventory Cost.   The reorder point is a dynamic trigger for action (Job/PO creation) in response to actual sales and job demand.   The actual quantity on hand trends well below the reorder point and trends toward zero at the back end of the replenishment planning period.

This chart above focuses on your stock on hand.   In our example, the reorder point is 30 and the replenishment time for this item is 30 days. When projected supply falls

below the reorder point a new Job or PO is created by MRP. For a Job or PO in progress it will take 30 days before it is replenished and the quantity is receipted into inventory. While the Job is in production (or PO is in transit), sales and Job issues are occurring and you can see that you are drawing your quantity on hand inventory down closer to zero toward the back end of the item's replenishment planning period. You can also see that DBA is not using a static stocking level, but is dynamically matching actual demand with your ability to replenish the item. The time phased nature of manufacturing cannot be handled by most manual planning methods and is ignored by most of the software industry.

The benefits you will receive by having this item readily available with increased shop throughput, reduced time to shipment, and increased cash flow will likely far outstrip the carrying costs of the inventory quantity on hand involved.

What happens when my actual sales and usage in Jobs differ from my MRP demand settings?

Monthly Demand settings do not need to be perfect

For the Demand Driven stocking order policy, the goal is to have an item on hand to meet a high probability of your anticipated sales and usage needs. Your monthly potential demand covers a high probability of demand scenarios. Your Supply Days setting determines the frequency of your Jobs (M Items) or Purchase Orders (P Items).

In reality, it is expected that you will have quite a bit of variability on your actual sales/usage versus your MRP monthly demand settings. DBA is very forgiving and you do not have to be exact on your settings to get very good results.

Here are a few possible usage scenarios to demonstrate the flexibility of DBA demand driven stocking:

Actual Usage = Exactly on Target with MRP Monthly Potential Demand Estimates

In our example, if you exactly sold or issued 30 units a month, your Jobs and Purchase Orders frequency would be equal to your Supply Days and would be spaced 30 days apart. The graph above shows the case of perfect uniform daily usage exactly equal to your MRP settings total monthly demand.   This would be very unlikely to occur so perfectly in reality, but it does illustrate the supply day interval.

Actual Usage Less than MRP Monthly Potential Demand Estimates

If you actually sell or issue less units of an item than your MRP monthly potential demand value you would expect the quantity on hand to last a bit longer than your 30 days supply days target. For example, your next Job or PO might be 40 days apart instead of 30.

Important Safeguard: <u>New Jobs/POs are always triggered by actual demand</u>.   Even if your MRP monthly potential demand value is much greater than your actual usage, the system will not continue to create more Jobs or Purchase Orders.   Your on-hand quantity will just last longer than your supply days target. This built in safeguard is a major improvement over forecast based systems and/or blanket purchase methods that can continue to create inventory even when actual demand lags.

<u>Actual Usage Greater than MRP Monthly Potential Demand value</u>

If you sell or issue more units of an item than your MRP monthly potential demand value, you would expect the interval between your Jobs and Purchase Orders to be less than your Supply Days target of 30 days.

<u>Actual Usage Exceeds your Stock on Hand</u>

Your goal for stocking items is to have stock on hand to cover most demand scenarios that you expect to encounter. It is still possible that your actual demand exceeds your stock on hand and you run out of stock. Maybe you got a big sale or an unexpected uptick in business (congratulations!).   In this case, MRP will create a Job or Purchase Order to meet this demand and it will set the requirement to the date where your projected quantity goes negative.   The Job or PO will show up in the Late Supply screen to help you manage your expected shipment dates and communicate your new dates with your customers. The Job will also automatically receive higher priority in all work center queues that it passes through because it will be late against its requirement date.

DBA Tip: Do your best to put in Monthly Potential Demand value that covers a high probability of your anticipated usage scenarios. The goal is to have the item on hand for immediate use in Sales Orders and Jobs.   Do not panic if you have the fortune of selling more than expected.   The system will create Jobs to fill this shortage and the system priority in Work Centers will help you get back on track automatically.

Won't DBA miss demand if I do not plan far out into the future?

<u>Long term planning and forecast based approaches are seriously flawed</u>

It is reasonable to think that the more you plan out into the future the better you can predict your stocking needs.   In reality, the longer you plan out into the future, the more uncertainty and error you introduce into your system.   This uncertainty is compounded through each level of production and leads to what is known as the "bull whip" effect, where small errors in forecasts and projections are amplified at multiple levels and the end result is a very inefficient and expensive inventory.

DBA demand driven stocking replaces long term planning, forecasts, BOM explosions, blanket orders, and shortage reports because all of these methods introduce tentative demand and errors that get multiplied through all levels of production. This "bull whip" phenomena is seen in nearly every traditional planning method and is why the industry is learning that demand driven planning is a superior approach for manufacturing.

<u>You need to move from calendar planning to focusing on your Item MRP Settings</u>

Safety is built into your item settings.   DBA dynamically maintains your replenishment time planning periods for your items that ensures that are always acting on firm demand. Eliminating tentative demand, removes the "bull whip" effect, and can dramatically improve the efficiency of your inventory. Your inventory will have purpose and be more directly tied to your actual demand.

<u>Monthly Potential Demand setting covers volatility and ensures you do not run out of stock</u>

Because DBA stocking is triggered by real SO and Job demand it will not miss items or demand. If you have a very critical item that you absolutely cannot run out of stock, you can increase your Monthly Potential Demand value. As long as your overall settings and order policies are reasonable, the replenishment time of your planned item will give you the time to make or purchase your item to cover most reasonable scenarios. In the event that you do run out of the item, the priority in the Work Center schedule will get you back on track

How do I handle long lead day purchasing?

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 to meet and adapt to your actual demand.
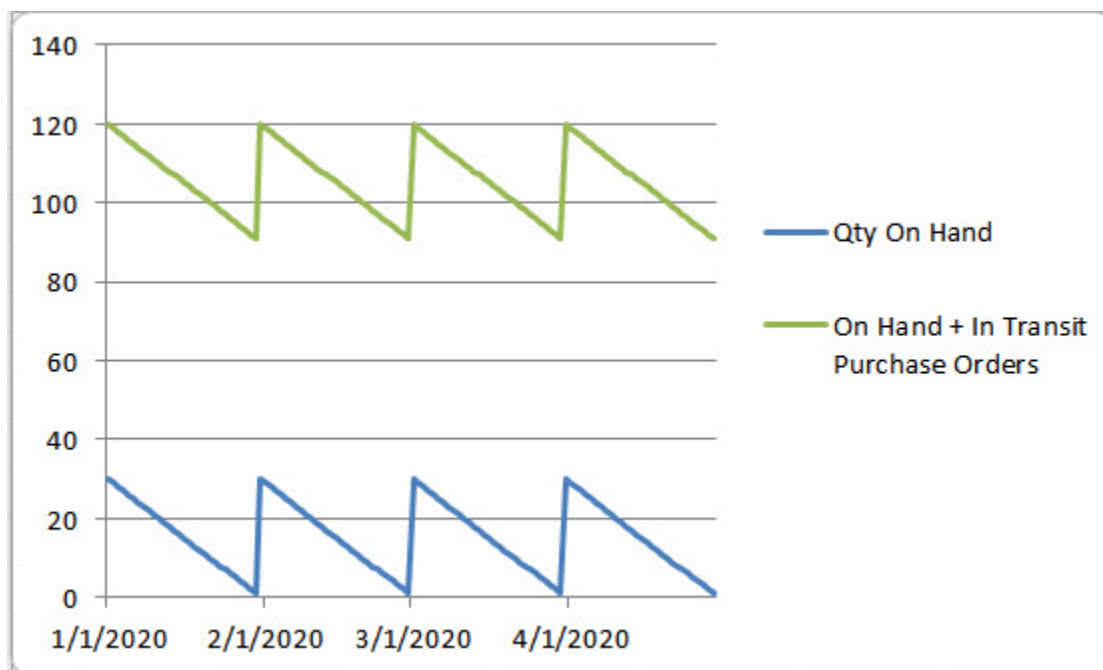
MRP Settings Example

Item Type = Purchased

Order Policy = Demand Driven (Stockiing)

Replenishment Time = 90 Days

Monthly Potential Demand = 30

Auto Calculated Reorder Point = 90

Supply Days = 30

A High Reorder Point Does Not Equal Increased Inventory on Hand

In our example, you will see that the calculated reorder point is 90 but your actual stock on hand remains very low. At any given time in our example, there are 3 inbound POs spread out every 30 days in various stages of progress. This pipeline of inbound POs helps greatly moderate the effects of any potential shortages. In manual planning methods, you can have a situation where you run out of stock and you must wait a full 90 days before you can use the component in a Job. That can be a complete disaster to your schedule. By contrast, a shortage in DBA will just be a portion of the planning period due to the multiple inbound POs at any given time.

Demand Driven order policy + Supply Days also allows you to handle long lead day purchasing with as lean of an actual quantity on hand inventory as possible. In this scenario, you can see that your quantity on hand is trending toward zero toward the back end of the supply days interval.

Does DBA offer shortage reports for planning?

We get a very high volume of requests for shortage reports from our customers. This is the dominant planning tool that many purchasing agents are familiar with. DBA does not offer traditional shortage reports because they have significant flaws and undermine the integrity of our demand driven system. The PO generation screen in the DBA MRP system is actually the ultimate shortage report and will deliver superior results to any static report.

Shortage Report Flaws

Manufacturing by its nature is a time phased activity with ongoing demand and projected supply continuously changing over time. A shortage report attempts to simplify things by removing the element of time. This is a severe compromise and cannot match the reality of your time phased supply and demand.

Another significant flaw is that a static shortage report does not have the ability to uncover your firm order demand through all levels of production. The planner will need to make in-depth analysis and projections to fill in the demand profile to make decisions on how much to buy. There is simply too much interdependent info to do this comprehensively. Small errors in these projections will be amplified through all levels of production and lead to the "bull whip" effect and result in large errors and inefficiencies in your inventory. This 'bull whip" effect is magnified significantly the further into the future you extend your planning horizon. The further you plan and project into the future, the more uncertainty you will interject into your plan.

DBA MRP PO Generation is the ultimate shortage report

DBA MRP steps you through a very structured and disciplined approach where you convert your firm sales order demand to Jobs, and then progress to convert subassembly Jobs through all levels of production, and you then proceed to PO generation. This transparent and intuitive process cannot be replicated in a static report. The PO generation screen ends with the ultimate shortage report where you know for a fact that your purchase orders are aligned with the planned start of your Jobs.

DBA MRP PO Generation Benefits:

- Acts on only firm demand for items you sell
- Generates firm Jobs for subassemblies through all levels of production
- Purchase Orders are intimately tied with the planned start of your Jobs
  - MRP PO Generation does all the work to make this the only viable shortage report needed
- Verify Supplier Sources and Prices when convert POs in the MRP PO screen
  - This will maintain your item purchase sources automatically
  - Update your estimated costs based on your default purchase prices
  - Verifying prices will improve accuracy of inventory value in the system

Common Mistake

Carrying stock for To Order policy items

It is absolutely critical that you have a clear-cut order policy decision of To Order or Stocking based on lead day contribution.   A To Order item is a lead day contributor and is always made or purchased in response to demand. There should not be extra supply that is not triggered by demand.   You must put a Demand Driven stocking order policy for any situation where you want to carry extra stock

Having a To Order policy that has stock in excess of demand will provide very confusing and harmful feedback to your entire planning system.   Because planning is time-phased and anticipatory, there are often actions being done before demand materializes. It is important that the To Order policy remains pure and is always triggered by demand.

Examples that should be a Stocking Order Policy:

- If you manual purchase items you must set the order policy to Stocking
- If you often increase the order quantities suggested by MRP for your To Order items
- Your Supplier has a minimum quantity requirement for purchase
- There is significant quantity price break for a purchased item
- When in doubt, you will be better served to use the demand driven stocking policy.

Use the *MRP > Order Policy Review* screen to review your items to ensure that your To Order items are following your planning intent.