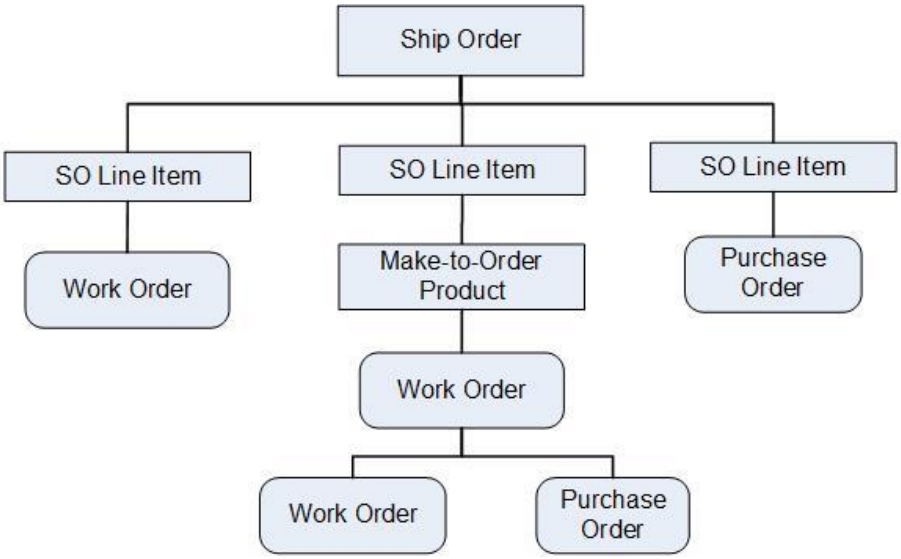
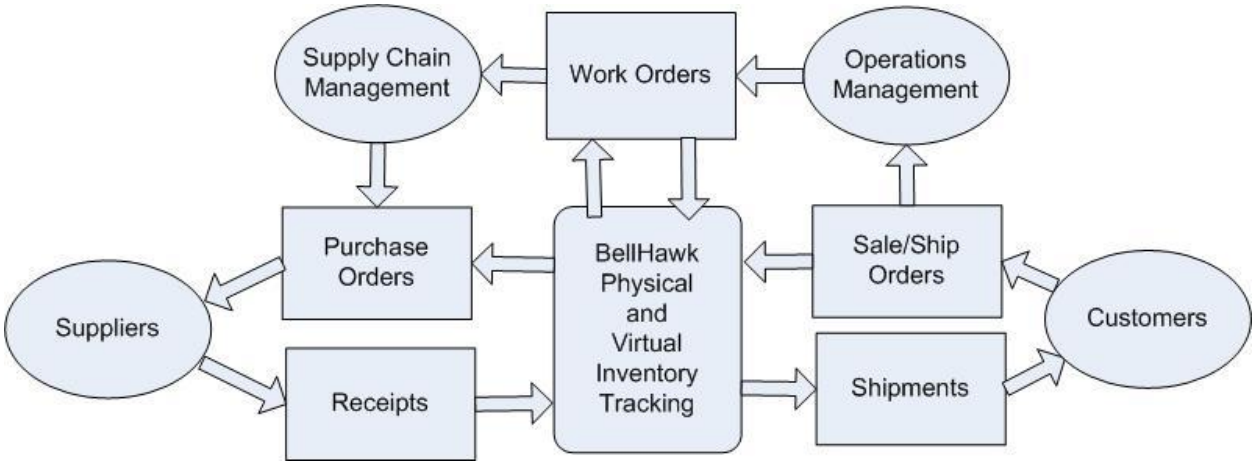
BellHawk Demand Driven Materials Resource Planning Data Sheet

The BellHawk Demand-Driven Materials Resource Planning (DRP) option, works in conjunction with the BellHawk Available Inventory Prediction module (AIP) to facilitate the creation of Purchase Orders (POs) and Work Orders in response to customer Ship Orders (SOs).



The BellHawk Available Inventory Prediction module tracks materials which are on-order, to be consumed or made on work orders, or to be shipped to customers. BellHawk AIP tracks this so-called virtual inventory in addition to physical inventory, so as to give operations managers and supply-chain mangers a real-time view of what needs to be made or ordered in response to customer orders.



Based on the data provided by AIP, managers can manually issue work orders and purchase orders. This, however, can require a significant amount of duplicate data entry, copying data from customer orders to work orders or to purchase orders. This can become especially tedious

when the SO line is for an assembly, which consists of multiple sub-assemblies, which consist of parts to be made and parts to be ordered.

DRP solves this problem by enabling the automated creation of POs and Work Orders based on the ship order lines. At the ship order line level, the user is given the option to create a work order or issue a purchase order for the line item.

If a work order is selected then the bill of materials (BOM) for the assembly or item is presented, with the option to purchase or make each part. This can be carried down recursively until only items to be purchased remain.

Item #	On-Hand	Alloc	On Order	Avail	Needed	Type	Create
P101	220	110	100	10	50	Purchased	Work Order PO
BP103	5	25	20	0	10	Made Here	Work Order PO
GR112	300	400	0	-100	50	Made Here	Work Order PO
CR39	19	0	100	119	50	Purchased	Work Order PO

At each level, the user is presented with the physical inventory quantity on hand, the amount already allocated to customer orders or to other work orders, the quantity to be purchased or the quantity to be made, and the net quantity available, along with the quantity required according to the BOM for the item to be made. The user can then choose to create a work order, if the item can be made in-house, or to order the item from a supplier, depending on the manager's make/buy decision.

If a work order is to be created, all the necessary information is copied for the item to be made into the work order, with a default quantity of the difference between that needed for the job and the quantity available. This quantity can then be modified, if needed.

If a purchase order (PO) is to be created then the item can be added to an existing open but not released PO or a new PO can be created. Again, the PO and/or PO Line data is copied automatically, thereby avoiding duplicate data entry.

At each level in this recursive process, the system suggests wanted dates for purchase orders and work orders, as well as suggesting start dates for work orders, depending on the number of days for expected delivery or production. These dates can be modified by the manager using DRP as can the importance (low, standard, rush, etc.) assigned to the order.

At each level, DRP is creating unreleased work orders and purchase orders, which can be released immediately, or left to production managers and purchasing agents to finalize, schedule and release.

Note that this process is very different from a conventional MRP (Materials Requirements Planning) system, which comes with most ERP (Enterprise Resource Planning) systems. These

MRP systems start with a several month forecast of the products that need to be produced. They then recursively compute when work orders need to be released or products ordered based on pre-stored BOMs for each item. This works very well for long-run manufacturing with predictable demand for product but does not work for short-run, quick-turn manufacturing where customer orders, and especially change orders, have lead times measured in days not months.

While most make-to-order manufacturers may have a projected aggregate demand level, the actual mix of customer orders with all their possible options and variations can vary dramatically from week to week. Often products need to be designed after the receipt of customer orders and so BOMs for products are not known ahead of time. This can make conventional MRP systems unusable in these applications.

The use of DRP differs from the use of a conventional MRP system in the following ways:

1. Each customer order is added incrementally to the materials purchasing and manufacturing plan as it occurs. There is no need for long range forecasting of demand, as if that were possible anyway in most make-to-order and quick-turn manufacturing shops.
2. We put an experienced manager in the middle of the planning and decision making process, enabling them to make incremental decisions about what to make or buy. This is in contrast to a conventional MRP system which come up with a plan according to some rules. These plans then typically need to be drastically modified to correspond to reality as time passes between when the MRP plan was produced and changes happen in customer demand and in events, such as machines going down, on the production floor.
3. DRP is an advisory system, which uses "artificial intelligence" rules to guide the user of the planning module and to automate many of their tasks. These rules can be setup in the BellHawk knowledge-base by each client by importing Excel spreadsheets that specify the rules for their business. This enables the user to take advantage of the computer to do specific knowledge-based tasks, such as recommending how much of each material to purchase. But it enables the user to take advantage of their general knowledge, such as about special quantity discounts being offered by vendors or about make versus buy tradeoffs in the decision making process.
4. Like an MRP system, BellHawk DRP does rely on having a bill-of-materials (BOM) for each assembly or sub-assembly to be made. But, in the case of DRP, these BOMs can be generated by computer aided design software after the customer order is received. Then the POs and work orders can be created in response to the imported design data. This is in contrast to conventional MRP where the BOMs for all parts need to be established ahead of each several month MRP planning run.
5. Unlike conventional ERP systems BellHawk allows the use of a generic part number that can encompass many options, sizes, colors, and finishes, that are specified at customer order or design time. This enables the use of generic BOMs to make assemblies with the options being inherited by the sub-assemblies, components, and purchased parts. This makes the use of DRP much easier for many make-to-order and semi-custom manufacturers.
6. BellHawk can also track off-cuts by length and/or width and include these in the available inventory calculations for use by DRP. This enables efficient use of off-cuts and avoids ordering or making more materials when sufficient off-cuts are in stock.

With the assistance of MilramX to do the automated data exchange, the AIP and DRP modules can be used to complement the MRP functionality of ERP systems. Here the ERP/MRP system is used to do long range materials planning and to order long-lead materials. AIP and DRP can be used to generate supplemental purchase orders for additional materials when needed, which can be included in the next MRP long range materials plan.

For those organizations that do not need to do long-range materials planning, a major cost savings that can result from using DRP and AIP is that clients may not need the ERP system's manufacturing or MRP module. Also clients may not need to incur the cost of licensing the needed "seats" to support detailed tracking of manufacturing data in the ERP system. Instead the ERP system simply becomes an accounting system, which only requires a few seats for tracking and reporting finances. In this case, all the inventory and production tracking is done in BellHawk, along with using DRP and AIP to do all the materials planning at substantially lower cost.

For more information, please see www.BellHawk.com.

