Best Practices in Inventory Management Systems
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About the Author - Jon Schreibfeder

Jon Schreibfeder is president of Effective Inventory Management, Inc., a firm dedicated to helping manufacturers, distributors, large retailers and service organizations get the most out of their investment in stock inventory. Jon has designed several inventory management computer systems and has also served as a distribution industry “troubleshooter” for two major computer companies.

Over the past 30 years, Jon has helped more than 2,000 firms improve their productivity and profitability through better inventory management. He is the author of numerous articles and a series of books on effective inventory management, including the recently-published Achieving Effective Inventory Management – Fifth Edition and the National Association of Wholesale Distributors’ Guess Right – Best Practices in Demand Forecasting for Distributors. Additionally, Jon is a featured author and presenter for Software ThinkTank (www.softwarethinktank.com).

A featured speaker at seminars and conventions throughout North America, Latin America, Europe, Asia and the Pacific Rim, Jon has been awarded the title Subject Matter Expert in inventory management by the American Productivity and Quality
The goal of effective inventory management is to “meet or exceed customers’ expectations of product availability with the amount of each item that will maximize your organization’s net profits or minimize your total inventory investment”. This goal is very difficult if not impossible to reach without a comprehensive inventory management system. An inventory management solution should guide a distributor in making the critical decisions necessary for success:

- What products should be stocked in each branch or warehouse?
- When should each product be replenished?
- What is the most appropriate source of supply for each product (i.e. purchase from a vendor, transfer from another warehouse, or assemble in-house)?
- How much should be reordered when the stock of a product is replenished?

A good system should also monitor the distributor's progress in achieving the goal of effective inventory management by measuring:

- How are customers being serviced? That is, how often do you have the amount of a product you've committed to stock available for immediate delivery?
- Are you making money? Do your gross profits exceed the cost of maintaining your investment in stock inventory as well as your other operating costs?

Today there are literally hundreds of inventory management systems available to distributors. Some are incorporated into enterprise resource planning (ERP) systems that include sales, replenishment, general ledger, warehousing and other modules that can be used to process all of a distributor's transactions. Other packages are 'bolt-on' solutions that provide an inventory management tool set which is seamlessly connected to the distributor's ERP system. Bolt-on packages are utilized when a distributor is generally happy with his or her ERP system but would like more replenishment functionality.

Today most inventory management solutions do a good job of maintaining an accurate perpetual inventory. That is they will analyze material-related transactions and maintain up-to-the-moment stock balances of each item. But this capability alone is not enough to achieve success. In today's highly competitive business environment it is critical that you have an effective inventory management tool that provides the answers you need to the six questions previously listed.

There is no one 'best' inventory management system. Different distributors need specific features to best manage their products. The purpose of this white paper is not only to help you develop a checklist of the capabilities and features your company needs in a software solution in order to be successful, but to also be sure you have the business environment necessary to achieve effective inventory management. No matter what system you decide to implement there are some fundamental business practices that must also be in place in order for you to be successful.

**POLICIES AND PROCEDURES NECESSARY TO ACHIEVE EFFECTIVE INVENTORY MANAGEMENT**

No system can provide good information if it is fed bad data. To achieve inventory management success it is critical that the on-hand quantities in your computer system agree with what is physically on the shelf in the branch or warehouse. You must ensure that all material-related transactions are recorded in a timely manner. Ask yourself:
• Do employees sometimes remove “samples” or other quantities from stock without recording them in your computer system?
• Does it sometimes take days or even weeks for hand-written sales or work orders to be entered in your system?
• Is there an easy way to record damaged material?
• Are stock items consistently stored in their assigned location?
• Are inventory discrepancies analyzed and researched in order to discover the underlying reason and improve your company’s policies and procedures?

Best practice is to create and implement a material transaction policies and procedures guide for all employees to follow. Before implementing a new system be sure that everyone understands there are two ways of moving material in and out of your facility: your ‘approved’ right way, and the wrong way.

In many companies anyone is allowed to reorder stock items if they ‘feel’ more material is needed. It is not unusual to have two or three people reorder the same item; often basing their decisions on ‘SWG’ (i.e., scientific wild guessing), rather than system suggestions. This practice creates an atmosphere of ‘inventory anarchy’ that results in overstocking and poor inventory management. No computer system can function well in this environment. In addition to controlling the movement of inventory, success requires that you develop unbreakable replenishment policies. We suggest:

• Each branch or warehouse has an approved list of stocked items. That is a list of the products that management has committed to have on-hand to meet customers’ expectations or product availability.
• Specific individuals are assigned the responsibility of replenishing specific products or product lines in a region or throughout your organization. They will be expected to meet goals of both customer service (i.e. avoidance of stockouts) and inventory turnover. Note that assigning people to products throughout your organization rather than all items in a specific branch encourages them to move surplus inventory from one location to another in order to achieve their goals.
• Other personnel can only buy special order (i.e., non-stock) products or only the quantities of stocked items necessary to fill specific emergency orders.
• Requests for adding products to a location’s approved stock list must be approved by management.

FINDING THE BEST INVENTORY MANAGEMENT PACKAGE FOR YOUR COMPANY

Once you have implemented policies and procedures necessary to achieve effective inventory management you are ready to search for the best ‘tool set’ for your company. Individual inventory management software packages can be divided into four categories:

• ‘Accounting Systems’ that require the user to manually maintain all replenishment parameters. Replenishment parameters determine when a product will be replenished and how much will be ordered. Typical replenishment parameters included minimum/maximum stock quantities and reorder point/reorder quantity values.
Best Practices in Inventory Management Systems

- ‘Simple Replenishment Systems’ that use one or two simple formulas to calculate replenishment parameters for each item in each warehouse.
- ‘Mystery Box Systems’ that calculate replenishment parameters for each item using algorithms that are too complex for users to understand or whose actual logic is viewed as proprietary by the software company and is not available to users to study and question.
- ‘Best Practice Systems’ that calculate replenishment parameters for each item based on such factors as patterns of usage, replenishment policies and desired levels of customer service. The logic used in these systems is well documented, easy to understand and the authors are anxious for users to ask questions concerning how the system works.

Accounting Systems assume that you have the time and knowledge to manually maintain all replenishment parameters. As most distributors have thousands of stocked items scattered among several locations, in most cases accounting systems do not provide a practical solution for achieving effective inventory management. Though these systems are usually inexpensive, and as the saying goes, ‘you get what you pay for’.

Simple Replenishment Systems do not require users to manually maintain replenishment parameters for stocked items. Every week or month they will determine when to order products and how much to order based on an average of past usage as well as some other ‘hard coded rules’. Unfortunately these systems fail to recognize that different items in your inventory have different patterns of sales or usage. Even items in the same product line can sell at very different rates. Here is a diagram of sales for three different items stocked by one of our clients. They are in the same product line in the same warehouse:
Such systems are simple to understand but they lack the tools necessary to react to different sales and replenishment situations.

Mystery Box systems include a number of different complicated algorithms to handle different patterns of usage and will determine the specific replenishment method and algorithm that best addresses each item's pattern of usage. However, these systems hide the logic used to make these critical decisions from the end user. There is no way a buyer can replicate the results produced by the system on a hand-held calculator. It is easy to understand the frustration experienced by the person responsible for replenishing stock of an item when the parameters calculated by the Mystery Box system result in either an overstocking or stockout situation. And in many cases Mystery Box systems do not allow management, buyers, and salespeople to input 'collaborative' information into the replenishment process. This additional information includes anticipated changes in usage that are not reflected in past sales.

Best Practice Systems combine the best of both worlds. Like Simple Replenishment Systems they are easy for buyers to understand; all results can be reproduced on a hand-held calculator. But they also include tools to address various patterns of usage, identify unusual activity, and allow for the inclusion of collaborative information. Here is a list of the features you should consider when evaluating Best Practice inventory management systems:

1. The ability to identify and correct for unusual sales or usage activity that will probably not reoccur in the future. Unusual activity includes
   - Stockouts
   - Unusually large one-time sales or usage quantities
   - The start of a new trend

   Future forecasts of product demand are based on this ‘adjusted’ usage. After all, you want to base your forecast on what would have happened under ‘normal’ circumstances, not situations that probably won’t reoccur in the future.

2. Separate items with sporadic sales or usage from those products with recurring sales or usage. Items with sporadic usage are not sold or used on a regular, predictable basis. Items with sporadic usage should be maintained based on a multiple of the normal quantity sold or used in one transaction. In other words you don't know when you will sell or need the item, but when you do you want enough to fill an average sale or usage quantity, not the ‘average’ quantity you would sell per month (which would be insufficient to fulfill the order). Products with recurring usage can be maintained based on a forecast of the quantity that will be sold or used in an upcoming month or week.

   Note that more than 50% of the items stocked by most distributors experience sporadic usage.

3. The ability to utilize different forecasting methods for items with different patterns of sales/usage. Remember that different inventory items have different patterns of usage. When evaluating different software solutions be sure to include items with:
   - Sporadic usage
   - Seasonal usage
   - Increasing or decreasing usage
   - Other unique situations (e.g. high usage every other month) faced by your company
4. Report the actual forecast error over the past several weeks or months using each forecasting method. To calculate the forecast error we use the formula:

   • **Absolute Value of (Forecast – Usage) ÷ Smaller of Forecast or Usage**

   Superior systems will determine which replenishment method results in the lowest forecast error for each item and uses this formula to forecast future demand for that product.

5. Direct the buyer to the product line or items that need the most attention. Most buyers are responsible for thousands of inventory items. They cannot effectively function if they are buried in data and paper. Good systems continually evaluate the stock position of each item and let the buyer know when situations occur that require their attention.

6. If a company has lead times greater than 21 days then the ability to calculate forecasts and other replenishment parameters for future months and predict when inventory will need to be ordered and received in order to meet this future demand. This capability is commonly referred to as distribution requirements planning (DRP).

7. The ability to incorporate collaborative information from sales, customers and other sources into the demand forecast. Afterward assess the accuracy of the information from each source.

8. Maintain safety stock quantities based on the average deviation between the forecast versus actual sale/usage and anticipated lead times versus actual lead times recorded over the past several months. Safety stock is reserve or 'insurance' inventory maintained to protect customer service in the event of unusual usage or delays in receiving a replenishment shipment. Superior systems allow the user to adjust the safety stock quantity for each item to achieve a desired level of customer service. Typically distributors want to achieve an overall service level of at least 95%. That means that 95 out of 100 requests for products can be completely filled in one shipment with in-stock inventory. Items deemed to be 'critical image items' should have a 99% or greater customer service level.

9. If needed, a program to assemble 'kits' from other stocked items. Superior kitting systems allow a distributor to:
   • Pre-assemble kits to sell as finished goods
   • Create and customize 'build to order' kits as needed
   • Create kitted items by 'disassembling' a product. For example filling 55 one gallon containers of a product from one 55 gallon drum.

   Note that if a distributor has a multi-step manufacturing or assembly process they should examine systems that include comprehensive manufacturing requirements planning (MRP) and bill of material (BOM) modules. “Best Practice” capabilities of these modules are discussed in another whitepaper in this series.

10. The ability to evaluate vendor price breaks, free-freight requirements and other considerations to determine “best buy” purchase opportunities.

11. The ability to effectively replenish branch warehouse stock from a central warehouse or distribution center. Superior systems will guide buyers as to whether it is more advantageous to replenish a specific product with a purchase order from a vendor, transfer inventory as needed from another warehouse or assemble the product in-house.
12. Comprehensive inventory analysis including:

- Multiple Ranking of Products. Each warehouse's products are ranked based on cost of goods sold, activity (i.e. number of sales), and profitability.
- Customer Service Level. This is the percentage of line items on customer orders filled completely in one shipment by the promised date.
- Inventory Turnover. This is calculated by dividing the 'Cost of Goods Sold', recorded over the previous 12 months, by the 'Average Inventory Value' over the same period. Inventory Turnover measures the number of opportunities you have to earn a profit for every dollar you have invested in inventory. A target inventory investment necessary to achieve a desired level of customer service.
- Gross Margin Return on Investment (GMROI) or the Turn/Earn Index. These are profitability measurements. GMROI is calculated by dividing 'Annual Gross Profit Dollars' by the 'Average Inventory Value'. The Turn/Earn Index is calculated by multiplying your 'Average Gross Margin' by the 'Inventory Turnover'. These are equally good metrics that measure profitability on different scales. As a result, a GMROI will always be higher than an equivalent Turn Earn Index. When setting goals consider the following results from our user base of distributors:

<table>
<thead>
<tr>
<th>Percentage of Distributors</th>
<th>Turn/Earn Index</th>
<th>GMROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper 50%</td>
<td>1.20</td>
<td>1.5</td>
</tr>
<tr>
<td>Upper 25%</td>
<td>1.50</td>
<td>2.00</td>
</tr>
<tr>
<td>Upper 10%</td>
<td>1.80</td>
<td>2.33</td>
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- Percentage of Excess Inventory. This is the percentage of your current inventory in excess of a certain number of day’s or month’s supply. Most distributors strive to have no more than 5% to 10% of their inventory dollars invested in more than a one year supply of a product.

There are many good ‘Best Practice’ inventory management systems marketed today. Look for the one with the user interface and features that best meet your organization’s specific needs. Be sure to have the representatives of each potential system load all of the items from at least one of your locations into their system. Have your buyers and salespeople review the results. Are the calculated replenishment parameters reasonable? Are the reports and inquiries easy to use? Get everyone’s input as to which system ‘feels right’ and that ultimately produces the best results. Selecting software is a lot like getting married, you want to choose the right partner to live with!
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