Effectively Analyzing Your Inventory Investment

Jon Schreibfeder
Effective Inventory Management, Inc.
The Goal of Effective Inventory Management

“Effective Inventory Management enables a distributor to meet or exceed customers’ expectations of product availability with the amount of each item that will maximize the net profits or minimize total costs.”
Your Total Inventory

- Core Inventory
- Dead and Excess Inventory
- Speculative Inventory
Stocking a Product

Stocking a product is a commitment to have that product available in reasonable quantities.

Reasons to stock a product:

- Lead time – The customer needs it before it can be acquired from a manufacturer.
- Price – You can buy it at a lower price than your customer can.
- Quantity – The customer wants to buy one piece but it is available only in a case quantity from the manufacturer.
Core Inventory

- Stocked inventory that complies with your corporate stocking rules
  - Has had usage in “x” of the past 12 months
  - Has had usage within the past “y” months
  - Seasonal items that have had usage in specific months
  - Products that are not profitable but are needed to sell other profitable items
  - Critical repair parts or other slow moving items necessary to service a known profitable customer
Software Maintains Replenishment Parameters for Core Inventory

- Forecast future demand of products for items with recurring usage
- Determine the normal quantity sold in one transaction for items with sporadic usage
- Lead times and order cycles based on the primary source of supply
- Economic order quantities that balance the cost of the material, the carrying cost and the cost of replenishing inventory
How to Split Up The Speculative Budget

- New Stock Items – Under the control of the sales department
- Opportunistic Buys – Buying ahead of a price increase
- Critical Items – Raising the projected customer service level of a product to 99+%
Rank Your Products

Ranking is the process of determining each item’s contribution to total activity

For example:
- “A” ranked products are responsible for the top 80% of activity
- “B” ranked products are responsible for the next 15% of activity
- “C” ranked products are responsible for the next 4% of activity
- “D” ranked products are responsible for the last 1% of activity
- “X” ranked product have no activity
Some computer systems will “classify” items assigning a percentage of products to each classification.

Most computer systems will only rank by cost of goods sold.

“Best practice” is to rank both by activity (i.e. transactions or months with activity), cost of goods sold and profitability in determining what should be on your approved stock list.
### What Product(s) Would You Stock?

<table>
<thead>
<tr>
<th>Item</th>
<th>Annual Hits (Orders)</th>
<th>Annual Cost of Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>A100</td>
<td>2</td>
<td>$76,000</td>
</tr>
<tr>
<td>B200</td>
<td>4</td>
<td>$46,560</td>
</tr>
<tr>
<td>C300</td>
<td>50</td>
<td>$13,880</td>
</tr>
</tbody>
</table>

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An Alternative to the Hit (Orders) Analysis

If your computer system does not record hits, you can also identify low usage items by looking at the number of weeks or months in the past year with usage activity.

<table>
<thead>
<tr>
<th>Dec</th>
<th>Nov</th>
<th>Oct</th>
<th>Sep</th>
<th>Aug</th>
<th>Jul</th>
<th>Jun</th>
<th>May</th>
<th>Apr</th>
<th>Mar</th>
<th>Feb</th>
<th>Jan</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Would you stock this item? Why would your rank by orders and not pieces sold or used?
## Combination of Rank Analysis

<table>
<thead>
<tr>
<th>Orders → COGS↓</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>AA</td>
<td>AB</td>
<td>AC</td>
<td>AD</td>
</tr>
<tr>
<td>B</td>
<td>BA</td>
<td>BB</td>
<td>BC</td>
<td>BD</td>
</tr>
<tr>
<td>C</td>
<td>CA</td>
<td>CB</td>
<td>CC</td>
<td>CD</td>
</tr>
<tr>
<td>D</td>
<td>DA</td>
<td>DB</td>
<td>DC</td>
<td>DD</td>
</tr>
</tbody>
</table>

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## Adding Profitability (Gross Profit) to the Ranking Analysis

<table>
<thead>
<tr>
<th>Item</th>
<th>COGS Rank</th>
<th>Orders Rank</th>
<th>Profit ($) Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>D100</td>
<td>A</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>E200</td>
<td>C</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>F300</td>
<td>B</td>
<td>A</td>
<td>D</td>
</tr>
</tbody>
</table>

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Stocking Principles for Inventory

- The more times a product is sold the more reason you have to stock the product
- You are probably more willing to stock a slow moving low cost item than a slow moving high cost item
- Profitability also plays a factor
<table>
<thead>
<tr>
<th>Mo w/Sales</th>
<th>Items</th>
<th>COGS$</th>
<th>% of Items</th>
<th>12-Mo-Sls$</th>
<th>Invty $</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>437</td>
<td>$2,806,171.64</td>
<td>3.0%</td>
<td>$3,933,945.81</td>
<td>$568,206.20</td>
</tr>
<tr>
<td>11</td>
<td>212</td>
<td>$590,193.47</td>
<td>1.5%</td>
<td>$861,377.50</td>
<td>$156,183.62</td>
</tr>
<tr>
<td>10</td>
<td>228</td>
<td>$580,633.70</td>
<td>1.6%</td>
<td>$820,650.74</td>
<td>$124,416.30</td>
</tr>
<tr>
<td>9</td>
<td>208</td>
<td>$397,991.57</td>
<td>1.4%</td>
<td>$530,181.09</td>
<td>$107,104.19</td>
</tr>
<tr>
<td>8</td>
<td>214</td>
<td>$400,851.92</td>
<td>1.5%</td>
<td>$494,684.23</td>
<td>$85,289.95</td>
</tr>
<tr>
<td>7</td>
<td>243</td>
<td>$279,543.94</td>
<td>1.7%</td>
<td>$430,809.67</td>
<td>$70,863.52</td>
</tr>
<tr>
<td>6</td>
<td>289</td>
<td>$356,281.22</td>
<td>2.0%</td>
<td>$495,126.83</td>
<td>$81,752.07</td>
</tr>
<tr>
<td>5</td>
<td>339</td>
<td>$802,965.51</td>
<td>2.3%</td>
<td>$1,125,730.95</td>
<td>$70,755.77</td>
</tr>
<tr>
<td>4</td>
<td>464</td>
<td>$514,495.45</td>
<td>3.2%</td>
<td>$884,844.20</td>
<td>$87,501.92</td>
</tr>
<tr>
<td>3</td>
<td>648</td>
<td>$312,787.93</td>
<td>4.5%</td>
<td>$544,703.34</td>
<td>$81,947.82</td>
</tr>
<tr>
<td>2</td>
<td>1157</td>
<td>$471,906.21</td>
<td>8.0%</td>
<td>$768,226.42</td>
<td>$89,029.82</td>
</tr>
<tr>
<td>1</td>
<td>3309</td>
<td>$658,793.82</td>
<td>22.9%</td>
<td>$1,272,282.04</td>
<td>$154,214.95</td>
</tr>
<tr>
<td>0</td>
<td>5235</td>
<td>-$9,959.23</td>
<td>36.3%</td>
<td>$48,459.07</td>
<td>$601,187.76</td>
</tr>
<tr>
<td>New Items</td>
<td></td>
<td>$573,449.53</td>
<td>10.0%</td>
<td>$975,795.88</td>
<td>$68,022.39</td>
</tr>
<tr>
<td>Total</td>
<td>14433</td>
<td>$8,736,106.68</td>
<td>100.0%</td>
<td>$13,186,817.77</td>
<td>$2,346,476.29</td>
</tr>
</tbody>
</table>
Should Each Slow Moving Item Be Stocked in a Particular Location?

- Do customers **realistically** expect the product to be available for **immediate** delivery?
- Does the profit margin offset the high cost of carrying inventory?
- Is the item related to other profitable sales?
- Can a more popular item be sold in its place?
Types of Stocked Inventory

- The **GOOD**: Inventory that you stock that provides an acceptable return on your investment
- The **BAD**: Inventory that doesn’t provide an acceptable return on your investment, but contributes to other profitable sales
- The **UGLY**: Inventory that doesn’t provide an acceptable return on your investment, and doesn’t contribute to other profitable sales
Can You Base Profitability on Gross Margin?

- Gross Margin is defined as:

\[
\text{Sales ($)} - \frac{\text{Cost of Goods Sold ($)}}{\text{Sales ($)}}
\]

No, gross margins don’t vary as the amount of inventory increases
Is This Item Profitable?

- Annual Sales = $10,000
- Annual COGS = $6,000
- Gross Profit = $4,000
- Gross Margin = 40%

But they have a $12,000 average value of inventory throughout the year!
How to Determine if Inventory is Profitable

- Calculate the Adjusted Margin:

\[
\text{Annual Profit ($)} - \left( \frac{\text{Avg. Invty Investment ($)} \times \text{Carrying Cost %}}{\text{Annual Sales ($)}} \right)
\]

\[
\$4,000 - \left( \frac{\$12,000 \times 20\%}{\$10,000} \right) = 16\%
\]

A 40% Gross Margin but a 16% Adjusted Gross Margin!
Accumulation of all of the costs involved in maintaining inventory in your facility

- Cost of putting away stock receipts and moving material within the warehouse
- Insurance on inventory
- Rent and utilities for the portion of your warehouse used to store material
- Physical inventory and cycle counting
- Inventory shrinkage and obsolescence
- Opportunity cost of the money invested in inventory

All warehousing expenses can be divided between the cost of carrying inventory and the cost of filling orders
Carrying Cost ("K" Cost)

Annual Sum of "K Cost" Elements

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Average Inventory Investment
K Cost Questionnaire on www.EffectiveInventory.com

Effective Inventory Management, Inc.

IT'S EASY
To turn cash into inventory...
The challenge is to turn inventory back into cash!
Calculating the Adjusted Margin

Sales = $1,000  Gross Profit = $150
Gross Margin Percentage = 15%
K Cost = 20%

Average Inventory = $250
\[
\frac{[\$150 - (20\% \times \$250)]}{\$1,000} = 10\%
\]

Average Inventory = $500
\[
\frac{[\$150 - (20\% \times \$500)]}{\$1,000} = 5\%
\]

Average Inventory = $750
\[
\frac{[\$150 - (20\% \times \$750)]}{\$1,000} = 0\%
\]
How to Determine if Inventory is Profitable

The adjusted margin must be greater than Non-Inventory Related Expense Percentage (NIREP):

Annual “Non-K Cost” Related Expenses
Total Annual Sales

for the inventory to be considered profitable. The NIREP doesn’t vary within a location
Profit & Loss or Income Statement

- **Income or Sales**
- **Expenses**
  - Inventory Related (used in calculating the carrying cost)
  - Non-Inventory Related (all expenses not used in calculating the carrying cost)
- **Net Profits**
The Adjusted Margin – NIREP Comparison

- Adjusted Margin > NIREP ⇒ Good Inventory
- NIREP > Adjusted Margin ⇒ Bad Inventory or Ugly Inventory
The Adjusted Margin – NIREP Comparison

- **Bad Inventory** = If NIREP > Adjusted Margin, but item(s) can be combined with other complimentary items and the combined Adjusted Margin > NIREP

- **Ugly Inventory** = Anything that isn’t Good or Bad
A Combined Adjusted Margin for Complementary Items

- **Bad” or “Ugly” Item**
  - Sales = $500
  - COGS = $400
  - GP ($) = $100
  - Avg Invty = $500
  - K Cost% = 20%

- **Supported Line**
  - Sales = $50,000
  - COGS = $42,500
  - GP ($) = $7,500
  - Avg Invty = $5,000
  - K Cost% = 20%

\[
\frac{[$7,600 - (.20 \times $5,500)]}{\$50,500} = 12.9\%
\]
An Adjusted Margin for a Specific Customer

Use total sales and profitability for the customer and the average inventory investment for the inventory maintained primarily for that customer

Sales = $100,000  
Avg Invty = $50,000  
Profit = $15,000  
KCost% = 21%

\[
\frac{[15,000 - (50,000 \times 0.21)]}{100,000} = 4.5\%
\]

Note that the Gross Margin Percentage is 15%!
Customer Service Level

How often you have the items you’ve committed to stock, when your customers want them
Customer Service Level

Number of Line Items for Stocked Products Shipped Complete by the Promise Date

\[ \div \]

Total Number of Line Items For Stocked Products Ordered
Customer Service Level

Keys to proper measurement:

- Stock items only
- Line items shipped complete by the promise date. Not percentage of pieces
- Initial shipments only – backorders don’t count
### Service Level vs. Fill Rate

<table>
<thead>
<tr>
<th>Item Type</th>
<th>Item #</th>
<th>Ordered</th>
<th>Shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock</td>
<td>B230</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Stock</td>
<td>D348</td>
<td>100</td>
<td>95</td>
</tr>
</tbody>
</table>

- Second item:
  - 95% Fill Rate
  - 0% Customer Service Level
Typical Customer Service Goals

- Normal Stock Items – 95%
- Critical Stock Items – 98% – 99%
Analyzing Stockouts

- A valuable measurement if it is difficult to calculate an accurate customer service level
- Number of times a product was out of stock
- Total number of days a product was out of stock
- Pay particular attention to “A” ranked items
Inventory Turnover

The number of times you sell or “turnover” your average investment in inventory each year

*Every time you sell from inventory, you have the opportunity to earn a profit.* The more you “turn” your inventory, the more opportunities you have to earn profits
Explaining the Importance of Inventory Turnover

Annual Sales = $12,500  Annual COGS = $10,000
Annual Gross Profit = $2,500

January → December

$10,000

$5000

$2500

$5000

$2500

$2500

$2500
Inventory Turnover

Cost of Goods Sold From Stock Sales in the Past 12 Months

÷

Average Inventory Value
Cost of Goods Sold

- Use a “rolling 12 months”
- Measure cost of goods sold dollars. Be consistent with the cost basis (average cost, replacement cost, etc.)
- Exclude special order items and direct shipments
Average Inventory Value

- Average of the month end inventory values recorded over the past 12 months
- Average inventory value at the beginning of August, 2013 = $1,976,667

<table>
<thead>
<tr>
<th></th>
<th>Ending Invty$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug-13</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Jul-13</td>
<td>$1,850,000</td>
</tr>
<tr>
<td>Jun-13</td>
<td>$1,700,000</td>
</tr>
<tr>
<td>May-13</td>
<td>$1,650,000</td>
</tr>
<tr>
<td>Apr-13</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Mar-13</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>Feb-13</td>
<td>$1,950,000</td>
</tr>
<tr>
<td>Jan-13</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>Dec-12</td>
<td>$2,250,000</td>
</tr>
<tr>
<td>Nov-12</td>
<td>$2,420,000</td>
</tr>
<tr>
<td>Oct-12</td>
<td>$2,300,000</td>
</tr>
<tr>
<td>Sep-12</td>
<td>$2,100,000</td>
</tr>
</tbody>
</table>
Turn/Earn Index

- Combines inventory turnover with gross margins
  - High margins can compensate for low turns
  - Multiply inventory turnover by the gross margin

Inventory Turnover * Gross Margin Percentage

4 Turns * 30% Gross Margin = 120 T/E Index
6 Turns * 20% Gross Margin = 120 T/E Index
Gross Margin Return on Investment (GMROI)

Annual Gross Profit Dollars
\[
\div \text{Average Inventory Investment}
\]
or
Markup Percentage * Inventory Turnover

$500,000 \text{ Gross Profit} \div $250,000 \text{ Avg Invty} = 200 \text{ GMROI}

6 Turns * 33\% \text{ Markup} = 200 \text{ GMROI}
GMROI will always be higher than the Turn/Earn Ratio:

- Annual Sales = $2,000
- Annual COGS = $1,500
- Avg Invty = $250

Turn/Earn =
- \[\frac{($2000 - $1500)}{$2000} \times \frac{$1500}{$250} = 150\]

GMROI =
- \[\frac{($2,000 - $1,500)}{$250} = 200\]
- \[\frac{($2000 - $1500)}{$1500} \times \frac{$1500}{$250} = 200\]
Turn/Earn and GMROI Goals

- Upper 50%
  - Turn/Earn Index of 120 or a GMROI of 150

- Upper 25%
  - Turn/Earn Index of 150 or a GMROI of 200

- Upper 10%
  - Turn/Earn Index of 180 of a GMROI of 223
Percentage of Excess Inventory

Amount of Inventory in Excess of “x” Months Usage
Average Inventory Investment

*Usually no more than 5% to 10% of your inventory investment should be in excess of a one year supply.*
The Liquidation of Unwanted Inventory

- Transfer excess stock to another company location where the inventory is needed
- Reduce the price
- Offer salespeople a “spif” to sell the product
- Advertise the availability of this material to other suppliers
- Substitute the product for a less expensive item
- Return the material to the vendor
- Donate the material to a non-profit organization
- Throw it away
## Transfer Inventory to Where it is Needed

<table>
<thead>
<tr>
<th>Unwanted Stock</th>
<th>Branches That Carry the Product with Current Forecast (Green)</th>
<th>Also Discontinuing (Red)</th>
<th>Never Stocked (White)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whse</td>
<td>Product #</td>
<td>On Hand Qty</td>
<td>Invty $</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1079</td>
<td>1000</td>
<td>$144.52</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1027</td>
<td>4250</td>
<td>$134.95</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1025</td>
<td>225</td>
<td>$133.20</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1036</td>
<td>1500</td>
<td>$128.49</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1073</td>
<td>1750</td>
<td>$120.85</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1111</td>
<td>3000</td>
<td>$116.09</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1052</td>
<td>5500</td>
<td>$112.48</td>
</tr>
<tr>
<td>41</td>
<td>Prod-997</td>
<td>4000</td>
<td>$110.78</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1048</td>
<td>29</td>
<td>$98.60</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1074</td>
<td>4000</td>
<td>$98.40</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1075</td>
<td>4500</td>
<td>$98.28</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1086</td>
<td>500</td>
<td>$89.50</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1059</td>
<td>2500</td>
<td>$87.65</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1070</td>
<td>1500</td>
<td>$84.23</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1087</td>
<td>800</td>
<td>$82.69</td>
</tr>
<tr>
<td>41</td>
<td>Prod-1117</td>
<td>4</td>
<td>$80.32</td>
</tr>
</tbody>
</table>
Advertise Material to Other Suppliers

- Search the web with the words “Surplus Inventory [Product Line] :
- Some sites for liquidating industrial goods:
  - www.partsforindustry.com
  - www.excessconnect.com
  - www.industryrecycles.com
  - www.sbmac.com
New Item Questionnaire

- Who will buy this product?
- What are the estimates of usage for each of the upcoming six months?
- What is the anticipated gross margin for sales of this item?
- What affect will usage of this product have on usage of other existing stock items?
- How many month’s supply must initially be purchased? What investment is necessary?
- Where will this new inventory be stored?
- How can any unsold stock be liquidated?
Typical Sales Pattern of Successful New Item
Committee of marketing, sales, management and purchasing

How accurate has the source been in the past?

Three or more members must agree to add the product to stock inventory in that location
Keep Sales Focused On New Stock Items

- Provide salespeople with a weekly report of the sales of new stock products. For each item:
  - Item and Description
  - Sales and Gross Margin Projections
  - Actual Sales and Gross Profits
  - Current Available Quantity
  - Value of Available Quantity
  - Person requesting that the product be stocked

- Consider a budget for new inventory items
The Appropriate Measurements

- Product Ranking
- Customer Service Level
- Inventory Turnover
- Turn/Earn Index
- Gross Margin Return On Investment (GMROI)
- Percentage of Excess Inventory
- New Item Performance
The Goal of Effective Inventory Management

“Effective Inventory Management enables a distributor to meet or exceed customers’ expectations of product availability with the amount of each item that will maximize the net profits or minimize total costs.”
If you have questions.....

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