Inventory Cycle Counting
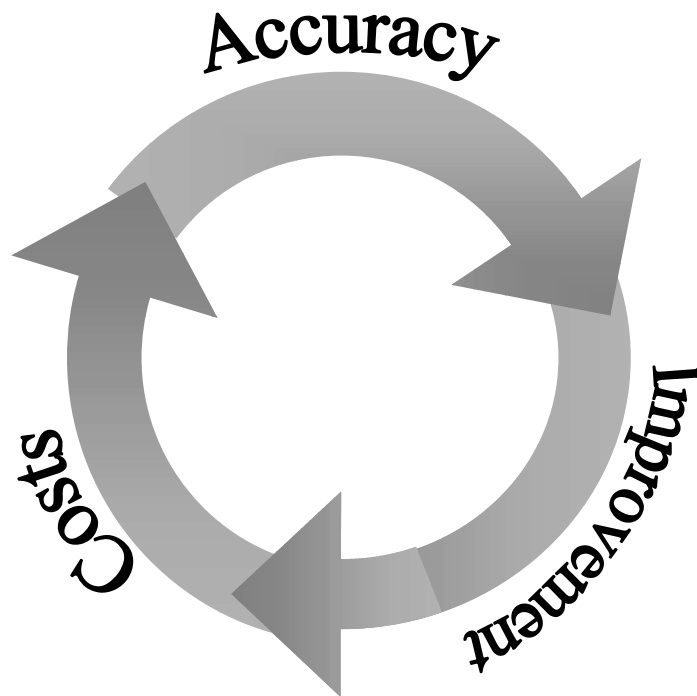
Accuracy

Improvement

Costs

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Introduction

Inventory accuracy is a critical and highly sensitive area affecting firms. Cycle counting can increase inventory accuracy to levels of 97% and better, while offering significant cost savings when compared to physical inventory counting that the majority of firms currently use. Inventory record accuracy has a significant impact on increasing levels of customer service, reducing costs, and increasing productivity. Safety stock is typically held due to inaccurate records because procurement does not trust the inventory record accuracy. When inventory is located correctly and warehouse pickers do not have to search for items, productivity is increased. Customer service increases due to more accurate stock information, less backordering, and fewer stock-outs.

The physical inventory process is one of the most widely used and commonly accepted practices to account for inventory. This process does have some drawbacks:

1. The process is unautomated and is prone to errors due to the amount of paperwork involved
2. Operations typically must be shut down for a physical inventory
3. Personnel used to take a physical count are often not trained and are unaware of stock locations, increasing room for errors in the count.
4. Temporary help (and overtime help) sometimes must be hired in order to get the physical inventory count completed within a specific time frame.

Cycle counting is the process of counting inventory items throughout the year on a schedule so that all items are counted at least once a year. The primary focus is on items that move more frequently, with less attention given to items that move less frequently. This process is much more efficient than a physical inventory, utilizes employees that are familiar with inventory and warehouse locations, and can uncover processes that produce inventory inaccuracies.

Cycle counters perform counts of SKU's (Stock Keeping Units) and record the information. This count is then checked, based on the actual record, to see if there is a discrepancy between the two counts. A tolerance level is used to see how much above or below the actual count is when compared to the record count. This tolerance level is low for fast-moving items and higher for slower moving items. When a count is taken that is outside of the tolerance level, an examination is undertaken to understand the root cause of the error so that the source of the error can be eliminated. This process has an impact on inventory records for all items through repairing the process that accounted for the inaccurate information. Under the physical inventory process, this type of investigation is impossible, and process errors are never repaired. There are numerous tools available that companies can use to automate cycle counts and increase inventory accuracy to optimum levels.

Cost of Inaccurate Records

There are built-in inefficiencies and hidden costs directly and indirectly related to inaccurate inventory records.

Excess Inventory Levels:
When inventory records are inaccurate, additional purchases will oversupply the warehouse resulting in excess inventory and a lower annual turnover rate. This excess inventory increases annual carrying cost and increases the chance for product obsolescence.

Lower Productivity Levels:
Warehouse productivity levels can be decreased substantially when pickers have to search for products instead of getting them from prime pick locations. When records are inaccurate, shortages occur. Therefore, inventory is not where warehouse-tracking systems think it should be.

Expediting Orders:
When inventory records are not accurate, product transit needs to be expedited so that sales are not missed. This process takes a considerable amount of time of purchasers, receivers, and supervisors to update records, order the product, and receive the product. These types of orders are also very expensive on both ends of the supply chain based on time and excess freight costs from expediting smaller orders.

Lost Sales:
When inventory records are inaccurate, the promised stock for customers may not be available at all, or shortages in orders may occur. These customers will either have to wait for an order to come in or get the product from a competitor, resulting in lost sales and potential loss of accounts.

Two approaches: Periodic and Cycle

There are two approaches to maintaining inventory records: periodic physical inventory and cycle counting.

Periodic Physical Inventory:
This is typically referred to as the annual physical inventory method. This approach is the counting of all SKU's within a short time frame and is typically done once a year. It usually requires a large number of employees and cannot be done while the business is operating. Some problems with this approach are:

1. Inefficient use of employees; temporary help is usually required.
2. Errors cannot be tracked and fixed because of time constraints.

3.   The operation typically must be shutdown for a physical inventory to be taken.
4.   There is little, if any, increase in record accuracy.

Cycle Counting:

The cycle counting approach is a techniques that segments inventory based on an ABC analysis and sets up a time schedule for when items should be counted throughout the year so that when the time frame of one year passes, all SKU's have been counted at least one time, with the faster moving SKU's being counted multiple times per year. This program uses people who are familiar with the warehouse, locations of SKU's, and the activities surrounded by inventory management. It is also these employees' responsibility to define inconsistencies in inventory records and trouble shoot the processes causing the errors. Cycle counting has the following benefits:

1.   Few mistakes in item identification.
2.   The ability to identify and correct record errors.
3.   The operation does not have to be shutdown during a cycle count.
4.   Fewer, more experienced people are used to perform a cycle count.
5.   There is a systematic improvement in the processes that dictate inaccurate records.

In order for a cycle counting process to be implemented, the first action to be taken is to assign a count frequency based on an inventory ABC analysis.

ABC Inventory Analysis

ABC analysis is a method of assigning and classifying SKU's. For the cycle counting procedure, SKU's are ranked from highest to lowest based on the annual sales volume at cost. The idea behind this ranking is based on the 80/20 rule, where 80% of the volume in the warehouse comes from only 20% of the SKU's. Table B is an example of an ABC analysis. "A" items account for the top 80% of sales, while "B" items account for the next 15% of sales, and "C" items account for the last 5% of sales. Typically, more that half of the items are "C" items. Understanding this analysis shows that 80% of sales or volume comes from a very small percentage of items.

ABC Calculations

Putting together an ABC analysis is really quite simple as long as the data is in a format that can be manipulated on a computer. The requirements are SKU Numbers, Units On Hand, Unit Sales for a 12-Month Period, and Last Cost per Unit. As long as this data is available, inventory on hand and annual sales can be calculated. Follow these steps:

1. Calculate annual usage, in dollars, for each SKU
2. Rank (sort) the SKUs' descending order based on annual dollar usage

Cycle Counting

3. Assign ABC classifications based on the criteria described above

The following table is an example of an ABC ranking and classification:

Item Number	SKU Number	Cummulative Percent of Items	Last Unit Cost	Quantity On Hand	Inventory Dollars	Annual Unit Sales	Annual Sales Dollars	Percent of Total Sales	Cummulative Percent of Total Sales	ABC
1	10950200	3.33%	$54.15	5,500	$ 297,825	61,040	$3,305,316.00	29.16%	29.16%	A
2	10637000	6.67%	$13.50	10,635	$ 143,573	130,060	$1,755,810.00	15.49%	44.65%	A
3	10217000	10.00%	$16.60	4,563	$ 75,746	98,322	$1,632,145.20	14.40%	59.05%	A
4	10110200	13.33%	$45.00	2,499	$ 112,455	31,990	$1,439,550.00	12.70%	71.75%	A
5	11093000	16.67%	$18.79	7,128	$ 133,930	57,022	$1,071,443.38	9.45%	81.20%	B
6	10481000	20.00%	$897.60	85	$ 76,296	1,008	$904,780.80	7.98%	89.18%	B
7	10157000	23.33%	$205.70	256	$ 52,659	2,450	$503,965.00	4.45%	93.63%	B
8	11069000	26.67%	$10.52	1,078	$ 11,341	14,140	$148,752.80	1.31%	94.94%	B
9	10061000	30.00%	$2.31	5,016	$ 11,587	46,242	$106,819.02	0.94%	95.88%	C
10	10421000	33.33%	$67.80	510	$ 34,578	1,134	$76,885.20	0.68%	96.56%	C
11	10661000	36.67%	$26.70	365	$ 9,746	2,870	$76,629.00	0.68%	97.24%	C
12	10889000	40.00%	$16.28	245	$ 3,989	2,268	$36,923.04	0.33%	97.56%	C
13	10073000	43.33%	$89.75	180	$ 16,155	294	$26,386.50	0.23%	97.80%	C
14	10097000	46.67%	$20.36	192	$ 3,909	770	$15,677.20	0.14%	97.94%	C
15	10457000	50.00%	$3.80	310	$ 1,178	4,116	$15,637.10	0.14%	98.07%	C
16	10505000	53.33%	$85.00	19	$ 1,615	182	$15,470.00	0.14%	98.21%	C
17	10205000	56.67%	$1.00	1,256	$ 1,256	15,442	$15,442.00	0.14%	98.35%	C
18	10817000	60.00%	$28.70	52	$ 1,492	532	$15,268.40	0.13%	98.48%	C
19	10925000	63.33%	$2.27	450	$ 1,022	6,678	$15,159.06	0.13%	98.61%	C
20	11057000	66.67%	$35.53	35	$ 1,244	416	$14,773.37	0.13%	98.75%	C
21	10361000	70.00%	$37.48	37	$ 1,387	392	$14,692.16	0.13%	98.87%	C
22	10169000	73.33%	$29.00	29	$ 841	504	$14,616.00	0.13%	99.00%	C
23	10553000	76.67%	$40.06	29	$ 1,162	364	$14,581.84	0.13%	99.13%	C
24	10901000	80.00%	$20.73	55	$ 1,140	700	$14,511.00	0.13%	99.26%	C
25	10685000	83.33%	$33.58	30	$ 1,007	420	$14,103.60	0.12%	99.38%	C
26	11081000	86.67%	$111.45	15	$ 1,672	126	$14,042.70	0.12%	99.51%	C
27	11165000	90.00%	$20.41	86	$ 1,750	686	$14,001.26	0.12%	99.63%	C
28	10433000	93.33%	$45.25	22	$ 996	308	$13,937.00	0.12%	99.76%	C
29	10193000	96.67%	$39.69	20	$ 794	350	$13,891.50	0.12%	99.88%	C
30	10757000	100.00%	$35.40	150	$ 5,310	392	$13,876.80	0.12%	100.00%	C
Total		**100.00%**		**40,847**	**$ 1,007,652**	**481,218**	**$11,335,086.93**			

Extension of The ABC Analysis

The ABC analysis can be taken one step further to designate items with $0 or less sales with a "D." These are items that have not moved in a year's time, and inventory managers should give consideration as to whether these items should be stocked, or what can be done to get rid of them.

Count Frequency

The true goal of implementing a cycle counting procedure is to gain better control over the inventory. Through the identification of the select few items that really count toward the majority of annual volume, it is easy to see that these items are the ones that need to have the fewest possible errors in inventory records so that when orders are received for these items, there is always enough on hand to *completely* fill an order. The real driver to counting frequency is to subject the "A" items to more counts than the "B" items, with the "C" items to be counted the least frequently of all. Here is an example of how to calculate the frequency of counts:

There are 2,000 "A" items that must be counted 6 times each per year
There are 3,000 "B" items that must be counted 3 times each per year
There are 5,000 "C" items that must be counted 2 times per year
There are 500 "D" items that must be counted 1 time per year

"A" items are counted (2,000 X 6) 12,000 times per year
"B" items are counted (3,000 X 3) 9,000 times per year
"C" items are counted (5,000 X 2) 10,000 times per year
"D" items are counted (400 X 1) 400 times per year

Therefore, there are a total of 31,400 counts to be made each year, or (31,400 / 260) 121 per day. Most experienced cycle counters can count 100 - 130 items per hour. The cycle counter must have sufficient time to be able to examine the variances in actual count versus the records to be able to pinpoint problems.

Implementing a Cycle Count Process

The best way to start a cycle counting process is to begin with a small number, or sample, of SKU's that can be monitored for results. After selecting the sample, perform cycle counts frequently to allow counters to become familiar with the process. When discrepancies are identified, have the counters identify the root causes and rectify the problem area. As accuracy increases, and employees become more familiar and productive with the process, expand the sample until the entire inventory is included in the process.

Accuracy

A tolerance level for each ABC classification should be defined. These tolerances should be based on the expected inventory accuracy levels. An example would be to

allow a 1% tolerance level for "A" items, a 2-5% tolerance level for "B" items, and a 5-10% tolerance level for "C" items. The larger the tolerance allowed, the lower the overall inventory accuracy achieved.

When To Count

It is best to perform a cycle count when the inventory is at its lowest level, i.e., a reorder is indicated. This is when the inventory is at its lowest level, it will be quicker to count, and it minimizes room for errors. Here are some guidelines as to when a cycle count should be performed:

- A replenishment order is received
- The actual inventory record has a zero or negative balance
- Reorder is indicated
- Every so many transactions

Causes of Inventory Accuracy Errors

The real issues that cycle counting discovers are errors, the causes of inaccurate records, and the elimination of systematic processes in materials movement and transactions. Finding errors during a cycle count identifies the process driven causes that account for errors throughout the materials movement process, so repairing the errors for a single item has a cascading effect on all SKU's. Here are some causes of inventory errors that a good cycle counting procedure can discover:

- Poor training of people in materials movement
- Bad units of measure
- Theft
- Obsolescence
- Poor security
- Item identification
- Adequate storage space
- Locator system problems
- Timely reporting of transactions

Summary

An effective cycle counting program has many benefits. Properly implementing a program can have a positive effect on the entire organization through uncovering process errors and inefficiencies, increasing inventory accuracy, and improving productivity. The customers also benefit because of increased record accuracy and items being in stock when they are ordered.