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Logistics News: Measuring Inventory Accuracy – No Clear Answer, Experts Say

Companies Use Many Different Measures – A Combination is the Right Approach, Experts Say; Financial Versus Operational Accuracy

SCDigest Editorial Staff

Everyone agrees that inventory accuracy is a fundamental measurement of distribution center performance, and one that ultimately reflects DC cost and customer service. For US companies, the stakes moved even higher with the passage of the Sarbanes-Oxley legislation, which made the accuracy of inventory levels an even more important element of corporate financial statements – and led to more "activism" on the part of the finance organization to ensure the level of that accuracy.

But just how should inventory accuracy be calculated? We did some informal networking with SCDigest readers, and found the answers were all over the map.

In fact, if you do an internet search you will find a wide variety of answers to the question on how to calculate inventory accuracy. So, when you read a press release or story such as this recent announcement that "Welch Foods improved warehouse and inventory management operations, achieving over 99% visibility and inventory accuracy," what does that really mean?

Ditto with various research reports or benchmarking services: If respondents are simply asked to supply a measure for inventory accuracy, the data is confounded if respondents are using very different measures, which they undoubtedly are.

The Council of Supply Chain Management Professionals (CSCMP) has a glossary of terms that defines Inventory Accuracy as follows:

"This is when the on-hand quantity is equivalent to the perpetual balance (plus or minus the designated count tolerances). It can often be referred to as a percentage showing the variance between book inventory and actual count. This is a major performance metric for any organization which manages large inventories."

"Every SKU/Location should be of equal important – and every error viewed as having the same weight since it points to a process error, rather than APICS old velocity/value definition."

Ken Miesemer
St. Onge

It stops short of offering any specific formulas.

A web site called **Supply Chain Metric** recommends an approach that dates back two decades or more ago from some of the guidelines back then from APICS, which focused on SKU velocity and measuring the accuracy at a SKU level. What is below is taken from that site:
"A common calculation is:

Stratify SKU's: (annual usage X standard cost):

A items= items representing the top 80% of total dollars

B items= items representing the next 15% of dollars

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C items= items representing the bottom 5% of dollars
Cycle count items (usually daily) using a random sample, within the following groupings:

A items = 4 times per year
B items = 2 times per year
C items = 1 time per year

Items considered accurate if the actual on-hand quantity matches the perpetual inventory quantity, within the following tolerances:

A items = plus or minus 1% quantity variance from perpetual balance

B items = plus or minus 3% quantity variance from perpetual balance

C items = plus or minus 5% quantity variance from perpetual balance"

Today, however, most view this as dated thinking – in part because of the challenge and cost of counting a given SKU in its totality across the distribution center. Today, most companies clearly focus on counting at a location rather than a SKU level – but with many permutations on that basic theme.

Financial Versus Operational Accuracy

One thing is clear – the financial organization has a need to ensure the financial accuracy of inventory on the balance sheet. Addressing that issue, however, may not be enough to really drive operational improvement.

Dr. Jim Tompkins, president of Tompkins Associates, agrees there are many different approaches to inventory accuracy calculation – which are often necessary.

"I am not surprised that companies are unclear on this metric. It depends upon who is asking and on the context," Tompkins told SCDigest.

He says that for the purposes of Tompkins' supply chain benchmarking consortium, the following definition of accuracy is used: Correct cycle counts (determined by a match of products, quantity and location to the inventory system) as a percentage of total annual cycle counts. (Counts should be measured by the number of storage slots counted.)

Inventory Accuracy Story Contributors

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From a financial perspective, Tompkins says what is most often used is the following formula:

- (Reported/counted Value inventory-System inventory Value)/Expected inventory value.

From an operational perspective, the following:

- Total inventory UOM Variation/Total Expected Inventory (System reported)

Also from an operational perspective, a SKU-Level Inventory Management is often used:

- Inventory Variation by SKU/Total Expected Inventory by SKU (System reported)

From a Location Management perspective, Tompkins says the definition below often used is:

- Number of locations with variances/Total locations (should be split by location type – pick, reserve, etc.). He adds that this should be done through cycle counting as well – and often includes "tolerances" that allow some small amount of error to still be considered as "accurate."

Dave Piasecki of Inventory Operations Consulting, who has written a book on inventory accuracy, says that it is with good reason that there are a number of accuracy measures in use – but that companies make a mistake focusing on just one of them.

"Every accuracy measurement is flawed in that it can't by itself show a true picture of your accuracy," he told SCDigest. "So for those in charge of making decisions related to accuracy, I suggest they regularly review several accuracy measurements."

He adds that for executives or others that require a single measure, a composite score (using a weighted average) of these different measurements can be created. The composite score can be used to track overall improvement (or lack of improvement) at a high level, "but isn't very useful in narrowing

down the nature of the problems or their impact on the operation," Piasecki added.

Ken Miesemer, a consultant at St. Onge and former Director of Distribution and International Logistics at Hershey Foods as well as past president of the Warehouse Education & Research Council (WERC), agrees that while you have to keep the financial group and auditors happy, the inventory accuracy numbers they require aren't generally enough to find DC problems and drive continuous operational improvement.

"In general, I recommend cycle counts by location, or geographic counts, an aisle or two at a time," Miesemer says. "Every SKU/Location should be of equal importance – and every error viewed as having the same weight since it points to a process error, rather than APICS old velocity/value definition."

"Aggregate case count or dollar value-based measures will inflate the numbers," Miesemer says. "Location-specific accuracy will have a lower grade but points to the process error, which is my preference.

Miesemer says that this highlights the difference between the accuracy needed for financial reporting and the needs of operations.

"Have a hundred locations each with a hundred cases, and you are off one case at each location, from a financial perspective you have an accuracy of 99%," Miesemer says. "From an operational perspective at a loca-

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tion level, you would have an inventory accuracy of 0%."

That may seem like a harsh way to measure it, Miesemer acknowledges, but he says that too often DC and logistics managers develop accuracy metrics "that will make themselves look good."

He says that in reality, each error is the symptom of a process flaw somewhere, and that by taking this strict approach to accuracy, it will usually force managers to identify what in the process or people is going wrong to cause even small absolute level errors.

He adds, however, that "it is understandable that companies measure inventory accuracy differently since their needs and environment might dictate different controls. What is critical is that whatever calculations are used must be standard within a company and across all their DCs to make the measure valuable."

He notes, for example, one of the many challenges in having any sort of overall industry standard measures that could work across industries.

He notes, for example, one of the many challenges in having any sort of overall industry standard measures that could work across industries. For instance, in the food and other other industries with "date coded" product - having the date code in the system right as well as the location and quantity may be used in the inventory calculation. That's a variable companies in other sectors don't need to worry about.

Still, in the end most companies today rely primarily on absolute errors (plus and minus) divided by the value of the inventory that was counted over a period.

That's how consumer goods company totes Isotoner does it, according to VP of Operations **Doug Baker**.

"Formally we audit twice per year based on absolute dollar variance divided by total dollar of sample size and expressed as a percentage," Baker says, adding that the company's financial group tells them each time how many locations to count.

"Informally through the cycle count process we are watching absolute and net dollar variance as well as unit variances resulting from the cycle count process. These numbers are available daily," Baker said.

Another logistics manager from the food industry, who asked not to be named, said his company cycle counts .75% to as much as 1% of locations each day." "We have about 150,000 pallet positions, and on average we count about 1000 positions per day," he said.

"The number comes from the finance group, and varies up and down depending on our level of accuracy," he added, saying company's DCs have about 10 full time cycle counters.

"Accuracy is critically important," St. Onge's Miesemer says. "I worked in a company prior to Hershey that was running only about 95-96% accurate, and it really had an impact on our line fill rates."

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