



Stocktaking and inventory measurement as a means to improve profitability



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Stocktaking and inventory measurement in context

Stocktaking and inventory measurement are some of the oldest and most traditional of the manufacturing basics. They have relied for the most part upon good record keeping, diligent oversight and a back office support mentality.

More recently, the link between good stock management and company profitability has been given new prominence and stock management is now viewed as one of the primary ways in which profit can be maintained and grown within a business and customer needs can be met and enhanced.

The impact of computer systems on counting and accounting has brought new techniques to inventory measurement. The growth of logistics and supply chain management disciplines has added a new focus and emphasis on the expertise of stock management.

Management of a company's assets, whether it be people, plant, stock or buildings can be what sets apart a highly profitable company from a low profitable one, or a low profitable company from a bankrupt one. Good inventory measurement and management is now seen to be integral to profitability, pricing strategies and future investment approaches.

This duality of approaches can be seen in the comments of Dr. Muddassir Ahmed, who has the following to say about stocktaking in '*Purpose of Stocktaking or What is stocktaking?*'

www.scmdojo.com/importance-stocktaking-purpose-of-stocktaking

"In general, the keyword when understanding and implementing stocktaking and inventory checking is the word 'counting'. That is essentially the long and short of it! Stocktaking is the process of physically counting the actual physical stock and checking the numbers against the numbers you have on your books."

However, he goes on to form the link between counting and profit, giving the following reasons to undertake a stocktake:

- It increases profit while reducing loss and waste
- It provides accurate records of which products are performing well and which are not
- It ensures the assets are right on the company balance sheet
- It monitors real time stock levels and so can identify shrinkage, damage and theft
- It monitors seasonal stock and stock with expiry dates in a timely manner
- It helps to keep pricing and pricing strategies up to date with current purchase prices

This reinforces the fact that stocktaking is a fundamental means of assessing performance and profitability. In some ways the new focus on ongoing stock performance and efficiency has reduced the need for the annual or biannual stock take. A business can no longer wait five or ten months to find out that the item pricing is wrong or that some of the stock is damaged. This is a drain on efficiency and profitability and therefore needs to be uncovered as early as possible.

Scope of inventory measurement and stocktaking

Key inventory measures

Data accuracy is key to achieving best-in-class inventory management and comprehensive measurement supports data accuracy.

The inventory discipline is highly measurable and good performance can be demonstrated by a series of target measures that monitor minimum stock holdings for maximum availability. Inventory accuracy is absolutely key for achieving this.

The table below shows methods of measuring all types of inventory although the distinct application of the method will depend on the items and the business.

12 top inventory control measures	Description
ABC inventory control	The method by which stock items are classified as A, B or C, according to their value and movement and are managed accordingly. This is the basis of many key inventory performance measures
Average inventory	The average inventory level over a period of time. The period of time is a 'sampling period'. For example, daily inventory levels over a two-week sampling period, hourly inventory levels over one day, etc. The average inventory for the same total period of time can fluctuate widely depending upon the sampling period used
Book inventory	An accounting term used to refer to the value or quantity of inventory shown in the company's accounting 'books' such as an inventory control database or the general ledger. Book inventory is compared to physical inventory during audit processes for validation and to determine any variances
Critical value analysis	A modified ABC analysis in which a subjective value of criticalness is assigned to each item in the inventory depending on the end customer or on perishability for example
Cycle inventory	An inventory system where counts are performed continuously, often eliminating the need for an annual overall inventory count. It is usually set up so that A class items are counted regularly (e.g. every month), B items are counted semi-regularly (e.g. every quarter or six months) and C items are counted only once a year
Days of supply	A measure of quantity of inventory on hand, in relation to the number of days for which usage which will be covered. For example, if a component is used at the rate of 100 per day, and there are 1,585 units available, this represents 15.85 days' supply. The goal, in most cases, is to have a high turnover rate and therefore a low days' inventory. A company must balance the cost of carrying inventory and its unit and acquisition costs, with the potential of lost business and ultimately lost customers if shortages occur

First in, first out (FIFO)	The first items stored are the first used. In accounting, this term is associated with the valuing of inventory so that the latest purchase prices are reflected in book inventory. The practice of FIFO is common where products have a shelf life. It is sometimes referred to as 'first expired, first out'
Inventory accuracy	The on-hand quantity is equivalent to the perpetual balance (plus or minus the designated count tolerances). This is often referred to as a percentage, showing the variance between book inventory and actual count. This is a major performance metric for any organisation that manages large inventories. Typical minimum and best practice averages would be 95% to 99% accuracy
Inventory turns	This ratio measures how many times a company's inventory has been sold (turned over) during a period of time. The cost of goods sold divided by the average level of inventory on hand is the key metric. Operationally, inventory turns are measured as total throughput divided by average level of inventory for a given period, often measured annually
Inventory velocity	The speed at which inventory moves through a defined cycle, i.e. from receiving to shipping, or as a warehouse metric, the amount of time required to perform the processes associated with getting received items into storage Dock-to-stock cycle time is the elapsed time beginning with the delivery of goods from the supplier and ending when those goods are put away in the warehouse and recorded into the inventory management system
Number of stock outs	The situation where no stock is available to fill a customer or production order. Stock outs can be costly, including the profit lost for not having the item available for sale, lost production time, lost goodwill or ultimately a lost customer
Shrinkage	The costs associated with breakage, pilferage and deterioration of inventories. Usually pertains to the loss of material through handling damage, theft or neglect

Different approaches to managing stock

There are a number of methods of stocking used to reduce cost impact of holding excessive stock:

- A minimum/maximum stock approach is a traditional inventory management and replenishment system. The system sets a minimum inventory level which is used to trigger a re-order when the stock on hand plus what is on order is less than the minimum level set in the system. Stock is then ordered up to the maximum level.
- Just in Time (JIT) is an inventory control system that controls material flow into 'production' by coordinating demand and supply so tightly that materials arrive just in time for use, rather than sitting in stock awaiting use for days. It is an inventory reduction strategy that relies on organisational

effectiveness and predictability of supply chains to ensure that 'production' runs smoothly without costly stock outs. Deliveries are generally received in smaller more frequent lots. Zero inventory is the goal of this approach.

- Just in Time II (JIT II) is the next step, where the stock supply and co-ordination takes place actually within the 'production' facility. This becomes the responsibility of the suppliers and are termed 'inplants'. They ensure that the supply of frequently used parts is not disrupted but becomes integral to the production. This is an example of supply chain cooperation in action.
- Supplier owned inventory (SOI) covers various ways of using the supplier to manage your stock inventory. Companies may have chosen to outsource the physical management of stock in order to move inventory assets from their balance sheet.

Examples of SOI approaches include:

- Consignment Inventory. These items can be held at the suppliers or producers premises but are owned by the supplier until they are used. This reduces stock costs for the producer and makes the management, counting and condition of the stock the supplier's responsibility.
- Vendor Managed Inventory (VMI) not only does the supplier own the stock until use, but they are responsible for determining the order size and timing of stock replenishment. The goal is to increase the inventory turns and reduce stock outs. The supplier may take premises close to or at the producers to ensure seamless inventory management.
- Distributed inventory is stock that is not held in a central national warehouse but is geographically dispersed to provide a higher level of local customer service, lower overheads costs and quicker replenishment.

The cost of stock

From a financial point of view, good inventory measurement and management as part of Logistics can transform a business, it can remove cost and accelerate profitability through tight pipeline management, supplier lead time optimisation, efficient processes, advanced measurement practices and engaged customer service. Where inventory measurement and management is not delivered effectively it can increase costs and lead to inventory with long lead times, slow-moving stock, inefficient counting practices and poor customer service.

Martin Christopher 2016 5th edition 'Logistics and Supply Chain Management', says that most organisations are unaware of what the **total** cost of holding inventory actually is.

"If all the costs that arise as a result of holding inventory are fully accounted for then the real holding cost of inventory is probably in the region of 25% per annum of the book value of the inventory."

For example, if the book value of your inventory is £100,000, then the average cost of running this is £25,000, which may be more than your company's annual profit. This is often unappreciated because the costs are hidden.

Martin Christopher continues, "The true elements of inventory cost are: The cost of capital; storage and handling; obsolescence; damage and deterioration; pilferage and shrinkage; insurance; management costs."

Any reduction in these cost estimates, as a result of improved management, will result in released revenue and can form a direct contribution to business profitability as reflected in the balance sheet.

Working with suppliers, employing a skilled workforce and using advanced computer systems can significantly reduce the cost of managing inventory.

Future trends in stocktaking and inventory measurement

Warehouse management systems

WMS is a software system, often used as part of a companywide enterprise resource planning system (ERP) and designed to support and optimise warehouse functionality and distribution centre management. These systems facilitate the planning, organising, staffing, directing and controlling of resources to store and move materials inside and outside the warehouse.

They offer functionality in the following areas:



One of the functional areas of WMS is picking for production and packing for customer shipment. The WMS will produce pick paths to minimise travel distance of an order picker and increase replenishment rates. It can include zone picking, wave picking and batch picking to fulfil the requirements in the most efficient way.

WMS provides tracking of inventory levels in real time. It enables the use of RFID, AIDC and bar code scanners to make sure goods can be found easily. It can use other tracking criteria such as serial numbers or use by dates to improve inventory optimisation.

It allows inventory put-away or retrieval, often with pick to light or pick to voice technology to help warehouse operatives locate the goods.

It has a warehouse design module which enables organisations to customise workflow and picking logic to ensure the warehouse has optimised inventory allocation. It can, for example, plan bin slotting that maximises storage space and accounts for seasonal or known demand fluctuations. It can facilitate bringing the stock to the picker rather than the picker to the stock.

The reporting option in WMS allows reports to be produced on stock movement, cost of materials, fastest moving items etc. It helps to identify areas to improve and areas requiring audit. This can be done on a daily or weekly basis rather than just once or twice a year. Here the rolling stocktake has replaced the annual stocktake.

The WMS functionality has supported the growth in the e-ordering and e-fulfilment market. Full e-fulfilment companies such as Amazon and Alibaba offer an end to end solution. They receive customer made products, put them to stock in the warehouse in unique bar coded labelled positions, pick the product when an order comes in, pack them and hand them to shippers. They provide extra service such as kitting, labelling, sorting and packing. They handle returned goods and put back to stock.

A reporting tool provides reports on all aspects of stock performance. Small margins on speed of turnover or condition of stock can make the difference between a profitable or unprofitable stock line.

Termed 3PL or 4PL (third or fourth party logistics), these providers, aided by WMS, have the capacity and scale to absorb the complexities of modern web ordering and supply, the more they can stretch their inventory and stocking operation, the lower their operating overheads will be and the higher their return on investment in infrastructure. The object to them is scale, so that their assets are working as hard as they can and they can offer low overhead pricing to their customers.

Case studies

The waste of inventory

Taiichi Ohno was Toyota cars chief engineer for many years and was the innovator at the heart of the Toyota production systems which became known as 'lean manufacturing'. He identified seven barriers to improving quality which he called the Seven Wastes or Seven Mudas.

The Seven Wastes are:

- Transport
- Inventory
- Motion
- Waiting
- Over processing
- Over production
- Defects

(This can be memorised using the mnemonic TIMWOOD. Later an eighth waste was added – the waste of unused skills, making the mnemonic TIMWOODS)

The second waste is: 'The waste of unnecessary inventory'. Inventory costs money, every piece of product tied up in raw material, work in progress or finished goods has a cost and until it is actually sold, the cost is the producers. This 'waste' needs to be measured and reduced.

In addition to the pure cost of inventory, it adds to other costs. Inventory feeds many other wastes. Inventory has to be stored, it needs space, it needs packaging and it has to be moved around. It may be damaged in transportation, it may degrade while in stock, it may become obsolete. The waste of inventory hides many other wastes in the system.

Taiichi Ohno realised that leading edge inventory measurement and management is not just about looking after stock, it is a vital element in establishing efficient and profitable total supply chain management.

Inventory accuracy in retailing: Does it matter?

The ECR Group (Efficient Consumer Response group) undertook research on the problem of inventory record inaccuracy.

Based on the data shared by seven retailers in the grocery and clothing markets, covering over 90 stores and over one million SKU's, the findings confirm that for the retailers in this study, 60% of inventory records were wrong and that when the inventory records are corrected that sales can increase by 4-8%.

The inaccuracies were not always shrinkage – it was both positive and negative and sales showed an improvement when the SKU's, positively or negatively inaccurate, were corrected.

Sales improved more from stock accuracy on faster moving lines. The overall benefits were low on slow moving lines.

As one of the retailer members of the ECR shared, their board regularly pour over and inspect new ways to grow retail sales that often require big investment with high risk, yet here we have new research that shows that by just improving the accuracy of their inventory records they can drive sales, with little risk and potentially a low level of investment.

The ECR Group concluded that:

- Stocktakes are just as important as ever and should be seen as an opportunity to boost sales
- Stocktakes and their timings should be seen as a sales increasing strategy
- Counting fast moving lines more often is of more immediate benefit than counting the entire range of products equally
- The investment should be in accuracy not just counting

(Research undertaken by Yacine Rekik, Professor at Emylon Business School; Aris Syntetos, Professor at Cardiff Business School, Cardiff University; Christoph Glock, Professor at TU Darmstadt. Taken from ECR Community Shrink & OSA Group, Inventory Accuracy Webinar November 2019).

Author



Susan has worked in corporate industry within procurement for many years, undertaking everything from expediting, contract negotiation, to strategy development and large scale change management initiatives.

Susan is now focusing on project procurement, commercial training, coaching and technical authoring through her own business.

Susan is a great contributor to CIPS and has been involved with CIPS through her chairmanship of the Birmingham branch and participation in the annual Negotiation Challenge events.

Susan Randall (BA FCIPS Chartered)



[LinkedIn](#)

Further Reading

Dr Muddassir Ahmed – www.scmdojo.com

Martin Christopher – Logistics and Supply Chain Management, 2016 5th edition

Taiichi Ohno – Toyota Production Systems - CRC Press, originally published 1978

Colin Peacock - ECR Shrink Group - Inventory Record Accuracy Research Project

<https://www.linkedin.com/pulse/improved-record-accuracy-increases-sales-6-colin-peacock/?trackingId=Ec08dctzT0i4%2Bki%2B0DoY0g%3D%3D>

