

WAREHOUSE MANAGEMENT

BA4055

UNIT III

INVENTORY CONTROL

Inventory control, also called stock control, is the process of managing a company's inventory levels, whether that be in their own warehouse or spread over other locations. It comprises management of items from the time you have them in stock to their final destination (ideally to customers) or disposal (not ideal).

Inventory control, also called stock control, is the process of ensuring the right amount of supply is available in an organization. With the appropriate internal and production controls, the practice ensures the company can meet customer demand and delivers financial elasticity.

Successful inventory control requires data from purchases, reorders, shipping, warehousing, storage, receiving, customer satisfaction, loss prevention and turnover.

Inventory control enables the maximum amount of profit from the least amount of investment in stock without affecting customer satisfaction. Done right, it allows companies to assess their current state concerning assets, account balances and financial reports. Inventory control can help avoid problems, such as out-of-stock

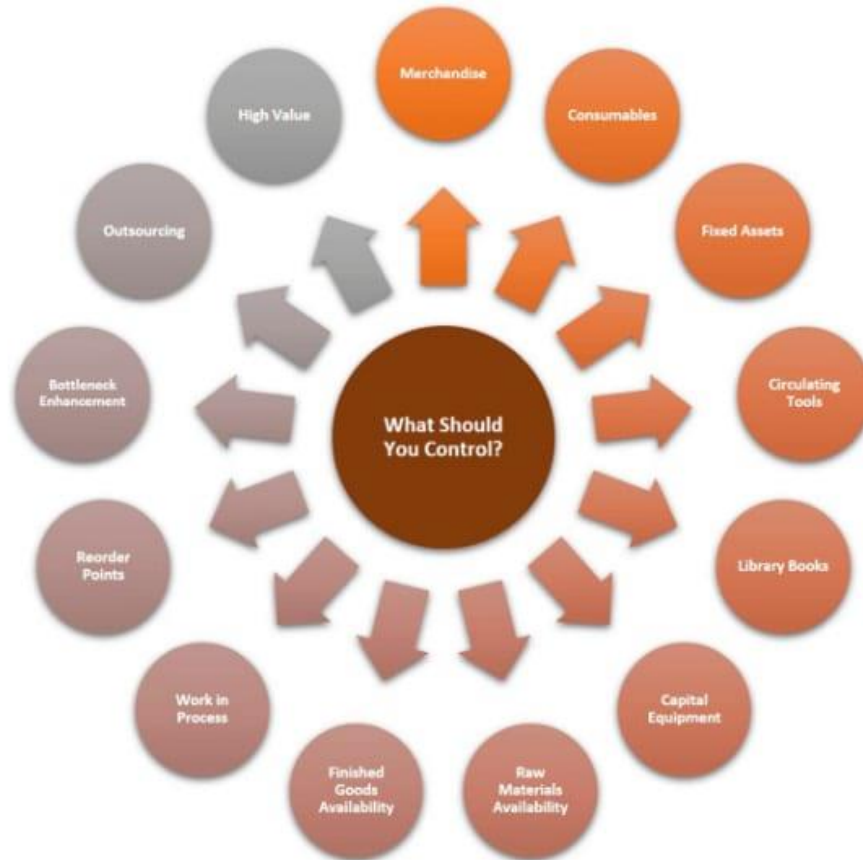
(stockout) events. For example, Walmart estimated it missed out on \$3 billion worth of sales in 2014 because its inadequate inventory control procedures led to stockouts.

An integral part of inventory control is [supply chain management \(SCM\)](#), which manages the flow of raw materials, goods and services to the point where the company or customers consume the goods. Warehouse management also squarely falls into the arena of stock control. This process includes integrating product coding, reorder points and reports, all product details, [inventory lists](#) and counts and methods for selling or storing. Warehouse management then synchronizes sales and purchases to the stock on hand.

Inventory management is a higher-level term that encompasses the complete process of procuring, storing, and making a profit from your merchandise or services. While inventory control and inventory management may seem interchangeable, they are not. Inventory control regulates what is already in the warehouse. Inventory management is broader and regulates everything from what is in the warehouse to how a business gets the product there and the item's final destination.

Inventory control practices and policies should apply to more than just finished and raw goods. The following graphic shows all the things a business might manage using these practices.

The Reach of Inventory Control: Beyond Finished and Raw Goods



This graphic shows the different aspects of inventory control in a business.

Why Is Inventory Control Important?

Inventory is one of the biggest costs of capital of any product-based business. If you look at the balance sheet of this type of company, you're likely to find that inventory makes up a large portion of current assets and uses up a lot of working capital.

Inventory control helps avoid the many costs related with buying too much inventory and the strains of going without the needed inventory. While some companies using just-in-time ordering may carry extremely small inventories, nearly any business requires some form of inventory, which is best managed through inventory control systems.

If a company can lower inventory, it may find new funds available for expansion or profits. If a company needs to carry more inventory and tight inventory control processes bring inventory levels up, the business could find higher sales, and again higher profits. Using inventory control to optimize your warehouse, stock room, supply room, or storefront is a sure way to cut costs and better manage any kind of product.

How Inventory Control Can Improve Your Business

Implementing proper inventory control procedures can help ensure a business is running at optimal financial levels and that products meet customers' needs and expectations. According to the 2015 "Global State of Multichannel Customer Service Report", 62% of customers have stopped doing business with a brand whose customer service was poor. Of those customer service complaints, frustration over out-of-stock or backordered items is high on the list.

In fact, research about convenience stores shows that out-of-stocks could cause a store to lose one in every 100 customers completely. Additionally, 55% of shoppers in any store would not purchase an alternate item when their regular product is out-of-stock. Other areas where businesses incur expenses or lose sales that inventory control practices and methods could address include:

- Spoilage
- Dead stock
- Excess storage costs
- Cost-efficiency
- Decreased sales
- Losing loyal customers
- Excess stock
- Losing track of inventory
- Losing goods in the warehouse

According to professor and author David Pyke, “Owners of small and emerging businesses would be stunned to see how much help they can get and money they can save by wisely managing their inventory. Many small businesses are not rolling in

cash, and much of their funding is tied up in their inventory. Good practices balance customer demand and management of inventory in the smartest possible ways.”

4 Ways to Control Inventory

At its core, taking stock is just the process of determining what you have and where you store it so that you can evaluate it. Not all warehouse control procedures are ideal for every business or for the varying stages of an organization’s growth and development. Some methods are too complicated, especially for smaller companies.

You should be able to use your system to track inventory levels, create orders and send out stock. Some basic systems for tracking inventory include:

1. **Manual:** Whether via a ledger or a stock book, manually logging inventory with a pen and paper is the simplest way to track what comes in and goes out. Small businesses with few items can get away with using this type of system. This system can be challenging because it is an actual record that you cannot mine and use for planning purposes.
2. **Stock Cards:** A slightly more complex method uses stock cards, also called bin cards. A stock card is a table that records the running unit price, sale price and inventory count of each product. Use individual cards for each product in

large warehouses or stock rooms. The system also tracks purchases, sales, returns and other reasons to withdraw stock, such as promotional withdrawals. You can include additional notes on the stock card, such as any problems associated with that item. For a stock card system to be effective, consistent updates are critical. You must also record unusual stock pulls; otherwise, you run the risk of inaccurate data.

3. **Simple Spreadsheets:** Many companies, especially small businesses, use spreadsheets to track inventory. Whether they use Microsoft Excel or something similar, spreadsheets are a way to start automating and electronically capturing product data. With consistent updating and basic coding, you can ensure that you have available current stock levels and statistics. Businesses quickly customize these systems to meet their needs. Since everyone who builds a spreadsheet does so slightly differently, users will need intimate knowledge of how the sheet works. This method is also thought of as manual because the only way to automatically update the spreadsheet system is by adding high-level macros or coding that connects them with other systems.
4. **Basic Inventory Software:** Simple inventory software is usually low cost and targeted to small and medium-sized businesses. This simple automation is

often cloud-based and ties into your point of sale software, so it can generate real-time, automatic stock updates. You can also incorporate analytics and reporting and run cost comparisons, create reorders, identify best and worst-selling products and drill down to order details or customer patterns. Some simple inventory management software systems can scale to more complex functionality as your business grows.

Some businesses prefer to stick to the simple systems of keeping track of inventory.

Other companies plan for growth and scaling. You could also track inventory with:

- **Advanced Software:** Designed for tracking inventory, most of these targeted software solutions can integrate with existing software, are scalable and provide analytics and templates. Advanced software is now in reach for many small and midsize businesses because it is no longer cost prohibitive.

Types of Inventory Control Systems

Inventory control and monitoring systems are accounting approaches to track the number of goods on hand. Big companies often monitor inventory across stores, warehouses and even websites. The two main systems are periodic and perpetual tracking systems.

The Periodic System vs. the Perpetual System

Periodic System							Perpetual System						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
	1 ●	2	3	4	5	6		1 ●	2 ●	3 ●	4 ●	5 ●	6 ●
7	8 ●	9	10	11	12	13	7 ●	8 ●	9 ●	10 ●	11 ●	12 ●	13 ●
14	15 ●	16	17	18	19	20	14 ●	15 ●	16 ●	17 ●	18 ●	19 ●	20 ●
21	22 ●	23	24	25	26	27	21 ●	22 ●	23 ●	24 ●	25 ●	26 ●	27 ●
28	29 ●	30					28 ●	29 ●	30 ●	●	●	●	

This graphic shows periodic and perpetual systems as a calendar.

The Periodic Inventory System

Most small businesses still use periodic inventory management because it does not require sophisticated software or inventory scanning. A [periodic inventory system](#) relies upon occasional or regular physical counts of the inventory. You decide accounting periods based on the business needs, but you don't track inventory daily or continuously. Instead, you record all purchases to a purchase account. Once you conduct the physical inventory, you shift the balance in the purchase account into the inventory account. Finally, you adjust the inventory account to match the cost of the ending stock. You can calculate the cost of ending inventory using either FIFO (first in, first out) or LIFO (last in, first out).

The challenges of the periodic system are especially apparent when performing a physical inventory count. Most normal business activities must be suspended during this time because it requires significant manual labor. Many companies hire additional staff and try to perform this outside of regular business hours, such as during a night shift. This type of system incurs more fraud because there is nothing tracking inventory between physical counts, reducing accountability between inventories, and because it is more challenging to determine where any inventory discrepancies occurred.

Your Complete Guide to Inventory Forecasting

Predict EXACTLY which products will deliver the optimal mix of profit margin and sales volume. In this free guide, you'll discover 9 crucial KPIs to track and the 8 steps to predict how much stock you need to meet demand WITHOUT obsolete inventory piling up. Download your free guide to inventory forecasting now!

[Get Your Free Guide](#) (opens in a new tab)



The Perpetual Inventory System

The [perpetual system](#) may be more expensive to implement than the periodic system due to equipment and software needs. However, the system continuously and immediately updates inventory numbers. This system calculates inventory based on sales and purchases via the point of sale and asset management software. This way, you have accurate stock on-hand accounting at all times. Perpetual tracking is the best way to avoid stockouts when your customers deplete inventory on a particular product. With a perpetual system, you can achieve minimal employee contact with the goods.

The challenges of this type of system occur when you use it without also performing physical inventories. In other words, the recorded inventory may not accurately reflect what is physically in-stock as time goes by, never mind accounting for drop shipments or inventory on order. You must account for breakage, stolen goods and loss to ensure the system is accurate. Further, errors and improperly scanned items affect the inventory records. You can handle this mathematically by applying corrections that mostly account for these things. Experts agree, though, that even though physical inventories are not common, you should implement some manual stock taking process to complement a perpetual system. You can integrate these

types of systems with supply-chain automation to make quicker decisions informed by data.

Barcodes

Barcodes can be part of either a perpetual or periodic inventory system. Some may consider the barcodes part of an inventory management system, but in truth, this is equipment that falls under your existing stock management system. A barcode is essentially a little picture with text or numbers that gets put on each stock item. The text or numbers store a large amount of information. A scanner reads that information and transfers it to a database, which tracks the parts and their locations. The system performs scans when the new product arrives and when it is issued out. Barcodes have a rapid return on investment (ROI) by lowering operating expenses once implemented, even for [small businesses](#)(opens in a new tab).

Other benefits of barcoding include:

- The elimination of manual data errors
- Faster collection of inventory information
- Automatic inventory updates
- Streamlining of documentation and reporting
- Enabling inventory movement between multiple warehouses and departments

- Easy and quick identification of minimum levels and reordering of necessary levels
- Implementing barcodes on inventory is a smart idea because they offer scalability and accuracy, even to small and growing businesses.

Radio Frequency Identification (RFID)

RFID tags are also a type of equipment that falls under an existing inventory management system. RFID tags are a type of smart tracking. RFID tags contain electronically stored information, more information than is possible with conventional barcodes. Tags can be passive or active: Active RFID tags include batteries, whereas passive tags do not have batteries. The RFID reader supplies the power for passive tags through radio waves, whereas active tags send out their radio waves. Both types of tags automatically update to identify the stock and capture any associated data.

RFID tags are an effective way to protect high-value items and products that require additional security compliance, such as pharmaceuticals. Active tags are the best course in businesses where inventory security has been an issue.

Although security is the primary benefit of RFID, other features include:

- **Remote Tag Reading:** The reading range for passive tags is approximately 40 feet, and the range for active tags is 300 feet.

- **Simultaneous Tag Reading:** The system can read several tags simultaneously so that it can check in an entire pallet of products at once.
- **Unique Tag Codes:** To track unique products, not just one type of product, you can give tags unique identification codes.
- **Constant Updates:** Without having to update the physical tag on the item, you can send it updates such as warehouse location via your active tag or by keeping the passive tag system activated.

Some challenges with using RFIDs include:

- Passive RFID tags require scanners or handheld readers.
- The cost can be prohibitive for some businesses.
- The supply chain also needs the equipment necessary for RFID tags.

If you are considering using RFID tags, they have become cheaper in recent years.

Experts say the best use of RFID tags is to place them at high-risk points close to your stock, such as at exits. Finally, for products with a limited shelf life, an RFID system can provide information to ensure quality control, such as when they were brought in and their expiration dates (if relevant).

A recent trend among small businesses is the use of QR codes, which are like barcodes, but you don't need to buy expensive equipment to read them. You can

install an app on a smartphone that reads QR codes. They also carry more information than a barcode because of their matrix-like patterns. QR codes are not active systems like active RFID tags and not nearly as expensive.

Inventory Control Methods

Inventory control methods are the ways you use your business's strengths and relationships, your expertise, formulas and forecasts to determine how much supply you keep, sell, store and order. Effective inventory control balances controlling costs and meeting customer demands.

A company's days of inventory outstanding (DIO) measures how many days a company holds stock before selling it. The DIO is an efficiency measure because product stock ties up funds. The lower the DIO the better, especially for a small business. [DIO scores have increased in the past five years by 8.3%](#)(opens in a new tab), meaning that companies have poorer inventory control practices. Additionally, there is a need to increase warehouse space, which means additional costs for businesses. This trend underscores the importance of optimizing inventory control to reduce the duration goods remain in stock, thereby minimizing capital tied up in inventory and the associated storage costs.

The Correlation Between DIO and Warehouse Space



This

graphic shows correlation. As DIO and Warehouse Space Needs increase, Inventory Control decreases.

8 Inventory Control Techniques

Ways to control stock by when or how you order goods or materials include:

1. **FIFO and LIFO:** These are methods of placing value on the products. LIFO assumes that the goods last added to the inventory are the first goods to be sold, while FIFO assumes that the goods first added to the inventory will be the first sold.

2. **Min-Max Inventory Control:** This theory sets minimum and maximum levels of stock to maintain specific items in your inventory. So, when you get to the minimum level of stock, order only enough to reach the maximum level set. Critics of this approach say that you may end up with either too many or too few products.

3. **JIT Inventory:** The just-in-time (JIT) inventory management strategy lines up the raw material order from suppliers with the production schedule. You decrease waste in the form of inventory cost because the goods are onsite only as needed. JIT can be a step in Lean manufacturing by slightly requiring JIT to incorporate what the customer wants in each product manufactured. The risk with this method is running out of stock due to inefficient suppliers, but supplier relationship management can somewhat [mitigate this risk](#).

4. **Two- or Three-Bin System:** A two- or three-bin system involves two containers of the same stock item. When one container becomes empty, you use the second container (the backup), which then identifies the reorder point (ROP). The ROP is when inventory gets down to a level that initiates stock replacement activities. The problem with a method this basic is evident in situations where there are big or fast orders. You may never be exactly sure

how much product is in stock at a given time, so you may not be able to predict whether you can fulfill a large order or quick, successive orders.

5. **Fixed Order Quantity:** In a fixed order quantity rule, you may only order a specific amount of an item at one time. With this rule in place, reorder mistakes, storage space issues and unnecessary expenses are kept to a minimum. You may link fixed order quantities to automatic ROPs.
6. **Fixed Period Ordering:** In a fixed period ordering rule, you link the replenishment of specific items to a particular interval. In this case, the order quantity is always different to compensate for customer demand.
7. **Vendor-Managed Inventory (VMI):** In this method, it's often the sales representative that manages the stock on specific products, noticing and ordering what needs replenishment. For example, a beverage company representative who performs deliveries reviews the stock and space available for their products in the store and replenishes it themselves.
8. **Set Par Levels:** When inventory drops below the par levels, your software should signal you to order more. Par levels vary by product, relative sales rates and the time to restock and require research and sound decision-making. Par levels change over time and must be reset at regular intervals. On the positive

side, having minimum levels makes your business more efficient and flexible. When new products hit the market, you can purchase them because your funds are not completely tied up in existing inventory.

Further, storage costs are lower, and if your business moves fast, having only the minimum levels of stock may be more suitable. Some challenges you may face include possibly running out of stock, when ordering the minimum could be more expensive and the variability of how well your suppliers can deliver products quickly and efficiently. You should also have a safety stock alongside your minimum inventory. Safety stock is the stock you keep in excess in case there are delays in delivery. You use this stock only in case of emergency.



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