What Makes a Good Inventory Management System

Learning Outcomes

By the end of this unit the learner will be able to:

What Makes a Good Inventory Management System

Whether you are using a manual or computerized system, it must be accurate. At the minimum, all systems should include the ability to:

- Categorize product by class, group, use, or department
- Develop product item descriptions
- List vendors (existing or potential)
- Ability to establish estimated yearly usages
- Ability to establish lead times
- Set safety stock levels
- Set order quantities
- Set reorder points
- Record receipts
- Record issues
- Record balance on hand and quantity available
- Have information captured to calculate number of turns per annum
- Establish average monthly use
- Establish maximum usage

Your system should also note such things as:

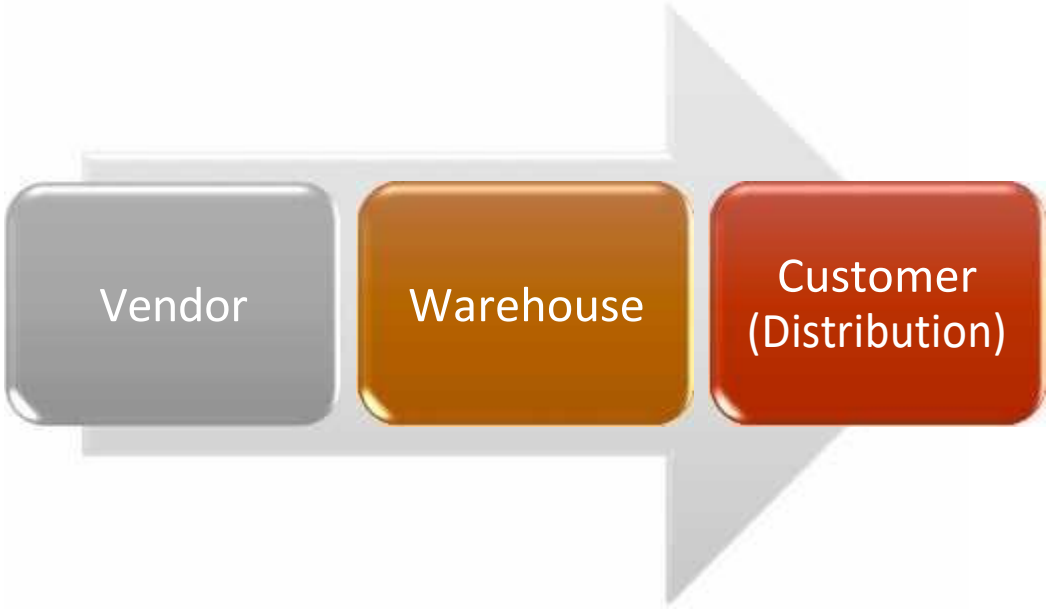
- Seasonal trends
- Your company's production fluctuations
- Placement of advance orders with suppliers to coincide with supplier's production runs
- Changes to production lines, equipment, design and/or process
- Fixed assets, such as buildings, light fixtures, shelving, and equipment that stays in the warehouse, such as pallet jacks, tractors, and safety gear

Some common inventory management systems include:

- Computer applications made specifically for inventory management
- Custom-made computer applications made specifically for a particular company
- In small organizations, spreadsheets or databases may be used

The Warehouse Inventory Cycle

There are three stages that the inventory goes through.



There are also four stages that each product should be put through.

Identifying Demand

Key Formulas
Determining Demand

One of the first steps in organizing for more effective control of inventory is classification and analysis of commodities being carried in inventory.

The father of modern inventory control classification is Vilfredo Pareto (1848-1923). He was an Italian economist and sociologist who made extensive use of math in analyzing economic problems. One of his most famous theories is the 80/20 rule – the idea that a 20% of situations dominate 80% of events.

Pareto's principle is still applicable to people and certainly to material. When applied to inventory, it means that 20% of your inventory accounts for 80% of your sales. Based on this, the ABC inventory classification system established three groupings for material items:

- A: 20% of items = 80% of annual sales
- B: 30% of items = 15% of annual sales
- C: 50% of items = 5% of annual sales

How to Calculate Order Quantities

Order quantity is determined using department forecast, usage trends, previous month's usage, and the same period a year ago. Watch for fluctuations due to season, unusual weather conditions, strikes, and material shortages. Consider hedge buying (entering into a contract to purchase goods at a particular price) if you are in a rising price market.

Basic Formula

Example

Average Usage per Month	50 units
Number of Months Supply Required	3 months
Order Quantity	150 units

Formula with Reorder Point

When preparing a purchase requisition and the quantity available is below the reorder point, the order quantity must be increased by the difference between the order point and the quantity available.

Example

Average Usage per Month	50 units
Number of Months Supply Required	3 months
Base Order Quantity	150 units
Reorder Point	110 units
Quantity Available	45 units
Difference (Reorder-Quantity Available)	65 units
Total Order Quantity	215 Units

How to Set Reorder Points

The longer the lead time (time it takes the supplier to fill your order), the greater the quantity (reorder point) you must have available when ordering. Quantities due and not yet received in stores are considered to be “available” when determining if the reorder point has been reached.

Formula

Example

Average Usage per Month	50 units
Lead Time	2 months
Safety Stock	10 units
Reorder Point	110 units

How to Set Safety Stock Levels

This process will be guided by the value management places on such things as customer service, the value of the capital tied up in inventory, and plant disruption costs due to a lack of key components. No safety stock will ordinarily be maintained if:

- Items are purchased from local suppliers under a supply agreement
- Items are always readily available
- Supplier is consistently dependable
- Safety stock is held in supplier's inventory
- Stock is held on consignment in warehouse

Formula

Example

Maximum Monthly Usage	55 units
Average Monthly Usage	50 units
Lead Time	2 months
Safety Stock	10 units

The Receiving Process

Materials received should be checked against the purchase order and the packing slip accompanying the material. The following information should also be checked:

- Consignor
- Consignee
- Purchase order number
- Item stock number
- Complete item description, including type, size, color, specification number, serial numbers, etc.
- Number of containers and number of units per container
- Total number of units received
- Number of units short or over

If items are damaged, you should also complete these steps in order to place a damage claim against the carrier.

- Verify the product damage on the delivery vehicle
- Record number of units damaged
- Prepare report stating description of the delivery vehicle, interior condition, and number of damaged cartons
- Receiver completes the report and has the carrier cosign

Here are some other tips to ensure the receiving process goes smoothly:

- Ensure communication is clear on when and who is to be contacted when there are problems.
- Review process regularly.
- Ensure that there is a clearly defined damaged goods policy with vendor.
- Create an internal damaged goods policy.

Validating Inventory

There are three ways to validate the quality of merchandise:

- 100 % accept method (accept all merchandise, no quality checks)
- Random sample method (check seven to ten percent of the merchandise for quality issues)
- 100% verification (check all merchandise for quality issues)

The correct method depends on the product you are storing, but the preferred method is the random sample method.

When quality is not met, the following procedures should be taken:

- Buyer determines if the product should be returned to the vendor or wait for vendor to pick up.
- Perform a 100% inspection of the product and separate the good quality product from poor quality product.
- The poor quality product is held in a separate holding area until it is returned to vendor.

The Put-Away Process

The process of moving inventory to the picking, manufacturing, or outbound staging areas has five goals.

Consolidate like inventory.
As discussed previously, it is far easier to track and manage inventory when it is well organized. The put-away process should include controls for ensuring that like inventory is grouped and consolidated.

Minimize travel time.
As we discussed earlier, one goal of your inventory management process should be to maximize the efficiency of resources (equipment and people). If your put-away process ensures that as much product as possible is delivered in one trip, you will reduce travel costs and leave more resources free for other purposes.

Ensure correct placement.
Product that is put away incorrectly will cost the company valuable time and resources. There's nothing more frustrating than looking at your inventory count and wondering just where those 5,000 widgets are.

Fulfill replenishments.
The put-away process must contain controls to ensure that depleted stock is replenished. If deficiencies are identified, the process should include some way of passing that information on, so that the stock can be replenished.

Fulfill security requirements.
Particular products may require special storage for security or safety purposes. The put-away process should address any of these concerns.

Maintaining Inventory Accuracy

Degree of Control

Earlier we discussed Vilfredo Pareto's ABC inventory classification system.

- A: 20% of items = 80% of annual sales
- B: 30% of items = 15% of annual sales
- C: 50% of items = 5% of annual sales

These classifications should affect the inventory control system.

"A" items require the tightest control possible, including the most complete and accurate records, regular review by top-level supervisor, blanket orders with frequent deliveries from vendors, and close follow-up through the factory to reduce lead time. Frequent audits should be done to ensure accuracy.

"B" items require only normal controls, involving good records and regular attention.

"C" items receive the simplest controls, such as periodic review of physical inventory with the notations that replenishment stocks have been ordered. Larger inventories and order quantities are maintained to avoid stock outs.

Inventory Control Methods
Inventory control is a tracking function that ensures thorough updating of inventory records. Its goal is to ensure that the right product is in the right place, is transferred at the right time to the right place, and is in the right quantity. This ensures that the inventory is in the right location and provides the lowest handling costs.

Today's hand-held and fixed-position scanning devices read barcode labels, radio-frequency waves, or voice waves with network (communication) systems that transmit data. This equipment provides accurate, online information.

This technology provides:

- Improvements in inventory tracking
- Control of the product storage and merchandise flow
- Accurate order picks
- Precise order sorting/rotation
- Delivery truck manifesting
- Loading
- Tracking activities

Product Identification Methods

The purpose of product identification (PIN) is to uniquely identify the inventory to maintain accurate records of all movements and demands.

Some types of identification standards include:

UPC

UPC stands for Universal Product Code. UPC bar codes were originally created to help grocery stores speed up the checkout process and keep better track of inventory, but the system quickly spread to all other retail products because it was so successful. UPCs originate with a company called GS1 US, formerly known as the Uniform Code Council (UCC).

A manufacturer applies to GS1 US for permission to enter the UPC system and pays an annual fee for the privilege. In return, GS1 US issues the manufacturer six-digit manufacturer identification number and provides guidelines on how to use it. You can see the manufacturer identification number in any standard 12-digit UPC code.

VICS

VICS stands for Vendor Identification Coding Standard. It is used in the retail clothing industry to allow automated receipt of goods. It is a standardized format of labels to ensure all necessary information is available to the receiving company.

License Plating

This is the process of uniquely identifying the put-away unit itself. Example: Each pallet in a warehouse will have a unique number associated with it.

Inventory Counting Methods

There are many methods of counting inventory that are useful in maintaining the accuracy of your inventory. Below are the most common techniques.

Random Counts

The Quality Control department usually does this. The process would be to take a product and count all locations of it to bring inventory accuracy into line.

Cycle Counts
Cycle counting is used to maintain the accuracy of inventory of the period between fiscal inventories. Cycle count can be broken into categories (such as location based or product). The facility manager may also be required to count high value, dangerous, or controlled goods in a specific time frame.

Fiscal Count
This is the formal counting of all goods in the control of the organization. This can occur with the end of the company's year to allow the closing of the books. It is the actual comparison of book inventory to the actual inventory. This is usually audited by an external organization.

Recounting
Fiscal counts usually require the recounting of certain locations. There are certain criteria that can be used to limit the need for recounting.

- If the first count is equal to the actual count, do not recount
- If the recount is equal to previous count, do not recount
- If the recount is equal to any of the previous counts, do not recount

The Outbound Process

The outbound process typically consists of three stages.

Picking Process
The picking process is to satisfy a customer order, manufacturing requirement, or a need for goods within the organization. This process will be determined by the business requirement specific to your organization. However, we've listed some common processes below.

Pick to Fill
This method allocates enough inventory to completely fill the order.

Pick to Clear
This method also allocates enough inventory to complete fill the order but taking into consideration the disbursement of inventory in the warehouse. The goal of this method is to clear as many locations as possible.

Pick Closest
This method is used when the speed of delivery is important. It considers the closest inventory to the desired end destination.

Pick Furthest
This method is used to optimize the travel time of the picker.

Best Fit
This method is used to reduce product handling. Allocation will be based on the largest number of units available to be picked, usually where pallet, carton, and individual units are available to be picked.

Lot Picking
This method is used in environments that have the requirement of filling the orders with as few lots as possible. Usually this is used in the pharmaceutical manufacturing warehouses where products have the possibility of recall.

Order Leveling
This is the process of partially filling demand for a larger number of orders, rather than a few customers not receiving any of their order. This method can be used when a limited amount of inventory is available and there are numerous requests against it. This will need to be considered carefully in the context of customer service and the level of service required.

Packing Process
The packing process is the preparation of products for shipping. This may include following standard operating procedures for your company, special requirements for your customer, or health and safety regulations.

This process will be specific to your organization. The following is a list of things to consider in evaluating your packing process.

- Are you repeating a sorting process that could be resolved by pre-packing goods?
- Are there special timing, conditions, or packaging required? Can this be reduced or eliminated?
- Are you sending air?
- Are you sending half-filled containers? Can you consolidate goods into fewer containers?

Loading and Shipping Process

The loading and shipping process involves the preparation of documentation and goods for the transportation to the customer. This includes the physical loading of the transportation vehicle and interaction with the service provider. Each organization has a unique method of handling the loading and shipping process.

Some things to consider in your loading and shipping process include:

- Is there a packing list required for each carton?
- Are shipping labels produced for each carton or pallet in a timely matter?
- Is the manifesting process timely?
- Is consolidation/sorting of orders required before loading?
- Is it possible to pre-load the transportation vehicle?
- Can shipment sit on the loading dock overnight?
- Is pick-up timely?
- Are you sending less than a truckload or a full truckload?
- Is tendering possible?
- Are you required to use specific carriers?

Industry Trends

In this day of computerized systems, it is easily possible to facilitate inventory arrival to the warehouse as you need it. Many large organizations, in the desire to reduce the cost of carrying large amounts of inventory, are participating in agreements with their suppliers. These agreements are designed to give suppliers a view into the forecasted demand of their customers and plans to meet that demand. Cooperation is the key to the success of these agreements.

Cross-Docking

Cross-docking is the organization of inbound inventory to be ready for distribution to the customer without the need of preparation or storage within the warehouse facility.

The supplier's understanding of the requirements facilitates this type of receipt. Without the supplier's participation, it is difficult to accomplish this process. This process is very cost effective due to the reduction of handling costs.

Third-Party Warehousing

Third-party warehousing is when an organization farms out the warehousing and distribution process. An external organization enters into an agreement to distribute a product by a set of rules, usually called a service level agreement. This service level agreement outlines the expectations of the organization.

Just-in-Time Completion

With the world becoming a smaller place, the Just-In-Time (or JIT) inventory system has become more and more popular. As the name indicates, this system involves getting inventory in just in time to deliver it. This reduces handling time and storage costs. However, companies using this system run the risk of not receiving the inventory in time and losing sales or upsetting customers if goods are delayed or unavailable.

Online Access

Many companies are offering customers online access to ordering, which includes providing the customer with timeframes for delivery. For example, customers can go to their favorite bookstore online, select their purchases, and then determine whether the items are in stock for customer pickup, or receive a delivery date for items coming by courier or mail. This allows companies to house their goods in warehouses that are located in inexpensive areas (separate from their) storefronts and reduce warehousing costs. It also facilitates outsourcing telephone customer service. Companies can also order their materials this way, using purchase order and electronic systems that facilitate their own just-in-time receipt of materials.

Further Reading:

- ✓