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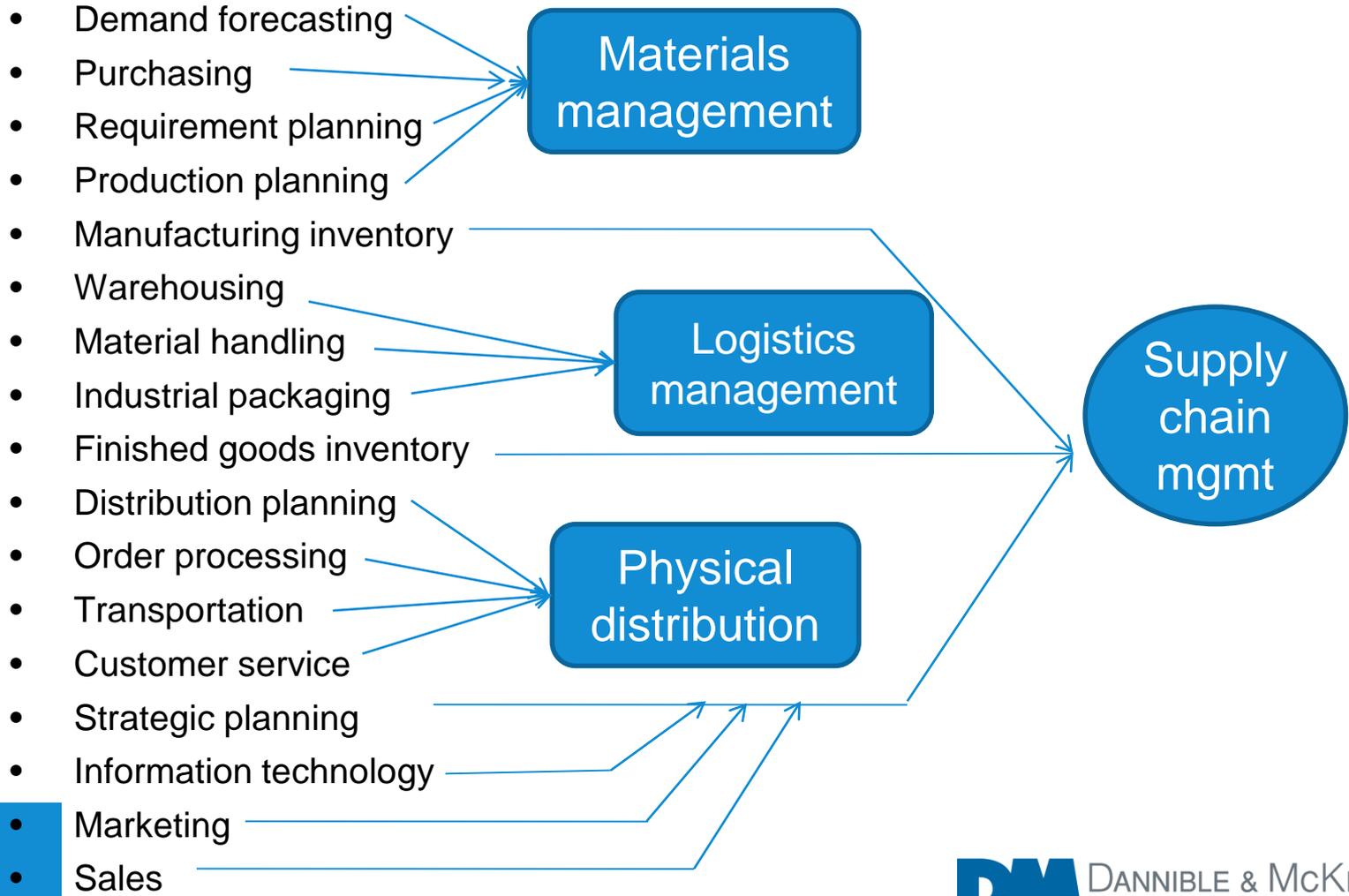
Effective Inventory Management

Introduction

- An Inventory Management System controls the flow of materials into, through, and out of a manufacturing company.
- Inventory impacts nearly every aspect of your business!
- Do you really have an inventory management system that includes procedures for purchasing, producing, organizing, monitoring, and shipping your inventory?

Elements of an Inventory Management System

- Purchasing.
- Receiving.
- Warehousing.
- Physical inventory.
- Production.
- Quality control.
- Shipping.
- And then Reordering starts the whole process again!



Financial Impact

- Costs that can fall under the umbrella of inventory management include Purchasing, Inventory Cost, Warehousing, Manufacturing, and Distribution.
- Such costs might represent as much as 70% of the operating budget!!!
- Inventory Management, by virtue of its huge collective budget, provides a major opportunity for a company to improve its profitability.
- Yet this area still often receives less focus than marketing, finance, and general management.



Detailed Inventory Management Plan

- The effectiveness of your inventory management impacts all else within your business!
- Do you have a written inventory management plan defining what you will purchase and how you will manage it?
- An inventory management plan should provide details for all aspects of your procurement process.
- The plan should be updated on a regular basis.
- Consider best practices that should be included in a plan for your type of manufacturing business.

Policies and Procedures

- Do you have documented policies and procedures in place in all key areas?
 - Policies describe what you want to do.
 - Procedures provide the details of how you will accomplish these policies.
- Are your procedures properly designed to be both efficient and effective?
- Do you assess your adherence to your documented policies and the results of performing required procedures?

Control Versus Business Policies and Procedures

- Control Policies and Procedures
 - Includes functions designed to provide internal control over financial transactions.
 - Control procedures are important to limit fraud, reduce internal errors, and identify external mistakes.
 - Examples include traditional control procedures for purchasing such as the three-way match for goods received.
 - Both policies and procedures are often documented in detail in the company's accounting manual.

Control Versus Business Policies and Procedures

- Business Policies and Procedures
 - Used to describe processes addressing the financial aspect rather than control aspect of certain functions.
 - In purchasing, an example would be obtaining competitive quotes from alternative vendors.
 - Companies may have specific business policies, but these are often not assembled in a overall document like an accounting manual.
 - Of even more significance, detailed procedures often do not accompany the business policies.

Written Plan for Inventory Management

- Should be a detailed plan that covers all aspects of inventory management.
- Must assign responsibilities to those performing and overseeing each critical function.
- The detailed plan should be a byproduct of the company's strategic plan.
- Measurable goals should be established and reporting should include comparison to these goals.

Monitor Goals and Results

- Manufacturers are better at setting goals in other areas like sales.
- Should have formal goals to be achieved in your inventory management process, including metrics for:
 - Purchasing costs,
 - Production efficiency,
 - Quality,
 - Inventory Turnover, and
 - Waste and Obsolescence.

Purchasing of Inventory

- Your written plan for purchasing inventory should answer the following questions:
 - What,
 - When,
 - Where,
 - Why (i.e. make versus buy),
 - How, and
 - How much?



What Inventory to Purchase

- Need to have Bill of Materials (BOM) that effectively details all raw materials and subassemblies needed for production.
- Information should be provided to purchasing personnel in a manner that can be efficiently used to communicate with suppliers.
- Evaluate alternative types of raw materials and their possible impact on quality and cost.



When to Purchase Inventory

- Formal process for determining reorder point.
- Small businesses are so individual and unique that no universal formula will accurately determine the precise reorder point and optimal inventory level.
- Three basic elements determine the amount of inventory a company should carry:
 - **Usage (sales) rate**
 - **Lead time** - Time spent placing an order, the vendor's production time, the shipping time from the supplier to the company's facility, and the company's production time.
 - **Safety stock**

Where to Purchase Inventory

- Should have a formal method for approving suppliers.
- Monitor supplier performance, including pricing, quality, and delivery schedule.
- Establish when quotes must be obtained from multiple suppliers and document such quotes.
- Implement controls for subsequently reviewing acquisition pricing.

Why Purchase Inventory

- Should have a formal, documented process for make versus buy decisions.
- Continually update analysis as factors change over time.
- Consider all relevant factors for purchasing, including impact on cost, quality, and the production schedule.
- Also consider factors for making such as use of production capacity, long-term investment needs, and costs by various classification, including incremental, variable, and fixed.

How to Purchase Inventory

- Most companies have policies in place for basic control procedures.
 - Use of purchase orders.
 - Approval at proper level.
 - Prenumbered receiving reports.
 - Three-way match.
- While basic, you should still follow these common best practices.
- Management must also assess adherence to these control policies and procedures.

Purchase Controls Versus Business Procedures

- Management's focus in this area is often on control procedures.
- Control procedures are critical as they can save real dollars.
- Business procedures surrounding the purchasing function can be even more critical and are often overlooked.

Purchasing Business Procedures

- Remember that along with a policy, you will need a detailed procedure.
- Make sure your procedures are efficient.
 - Some procedures are very efficient – Very little is done and many opportunities are missed!
 - Other procedures might be time consuming – Do they provide enough benefit?
- Determine how to assess performance.
 - Testing is needed.
 - You must keep score!

Purchasing Business Procedures – Best Practices

- Purchasing is tied into the overall planning and production schedule.
- Purchased materials are available when needed by production.
- Specific procedures exist for initial vendor selection and ongoing evaluation of suppliers.
- Economic order quantities are utilized.
 - Carrying cost of inventory calculated and used to manage inventory levels.
 - Costs include finance costs, insurance, property tax, storage and warehouse, and handling costs.
 - Consider potential obsolescence, the biggest cost could be from buying larger quantities to save a few percent only to write off the excess inventory a few years later!

Purchasing Business Procedures – Best Practices

- Ongoing due diligence is performed in obtaining the best price.
 - Price comparisons are regularly performed and competitive bids are obtained.
 - Consider if locking in prices might be beneficial.
 - Compare pricing of related commodities and the impact on the cost of key materials.
 - Also evaluate specifications for materials.
- Consider other non-traditional purchasing methods.
 - Use of commodity futures and hedging.
 - Auctions and other online sourcing tools.
 - Shopping globally.
- Develop a plan for supply chain management!

Supply Chain Management

- What is a Supply Chain?
 - A supply chain is a network of facilities and distribution options that perform the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.
 - Complexity of the chain may vary greatly from industry to industry and company to company.

Supply Chain Management

- Implementing a plan for supply chain management can significantly improve profitability.
 - Companies are more likely to focus on revenue when attempting to improve profitability.
 - However, it is often easier to make positive changes in supplier relationships as in that relationship, you are the customer!!
- If a large portion of the cost of your product or service is purchased from suppliers, your supply base can significantly impact your:
 - Cost
 - Innovation
 - Quality
 - Speed to market

Supply Chain Management

- How well do you know your suppliers?
 - Do you meet with them regularly?
 - Do you speak the same business language?
 - Are you a large customer or small customer for them?
 - Are they satisfied with you as a customer?
- Strategic sourcing.
 - Develop a written plan for the purchasing of your most important materials, supplies, and services.
 - The plan must involve cooperation with your suppliers.
 - You should strive for seamless supplier integration.
 - You must understand your suppliers' businesses.
 - Consider who supplies your suppliers and how this affects you.

Supply Chain Management

- Supplier development.
 - If a supplier is not performing as you would like, have you communicated this to them?
 - Have you worked with them to improve their performance?
 - Do they know your expectations?
 - Is your profitability a consideration for any of your suppliers?

Shopping Globally

- Considering only U.S. markets for purchasing is not sufficient, all companies must at least evaluate how international markets might impact their business.
- Many manufacturers have found that shopping for materials and supplies globally is worthwhile.
- Cost is the most obvious reason for the large increase in global spending.
- But, if you go this route, make sure that quality and service don't suffer from the transition.

Manufacturing Overseas

- Manufacturing overseas will add complexities that must be addressed in all areas of your inventory management system.
- A company might also consider establishing a relationship with manufacturers located overseas.
- Some manufacturers have developed hybrid relationships where they have personnel on the ground in foreign countries to work with foreign manufacturers and evaluate product quality.

Control Inbound and Outbound Freight Costs

- Depending on the nature of your product, inbound and outbound freight for purchased materials and finished product can make up 10% or more of product cost.
- Sometimes freight costs are not always seen separately as they are included in material prices for purchases or paid by customers for sales.
- Still, these are real costs and coordinating with both suppliers and customers to make the process more efficient can lead to significant cost savings.

Control Inbound and Outbound Freight Costs

- Consider using a consultant that is an expert in this area to help with an analysis.
- Evaluate use of company trucks versus common carrier.
- Undertake a proposal process or periodically obtain updated quotes to determine optimal carriers.
- Analyze not just carrier costs, but other aspects of their service that will impact the cost of your receiving, production, inventory management, and shipping processes.

Receiving of Inventory

- Receiving begins the entire process of material handling, and therefore it is critical to get things started the right way!
- Count, inspect, and verify goods to the purchase order.
 - Consider cost of inspection compared to the cost of the product and the cost of undetected errors flowing through to the manufacturing process.
 - Have established procedures for dealing with exceptions.

Receiving of Inventory

- Schedule delivery times to help improve efficiency of dock staff.
 - Assign each carrier or delivery a specific time or window of time to deliver.
 - Assign either a specific or recurring daily, weekly, or monthly schedule to arrive.
- Consider a vendor compliance program.
 - Communicates to vendors exactly how you want their product to arrive.
 - Should include specific labeling requirements, especially if there are language differences for foreign shipments!

Warehousing

- Do you have efficient warehousing procedures that support your manufacturing process?
- Don't rely on manual data entry processes - Instead use mobile computers with bar code scanners or RFID readers at the receiving dock to immediately identify products on arrival.
- Use bin locations to quickly locate products.
- Don't mix multiple SKUs in a single bin location.

Warehousing

- Can you pass the 'Temp Test'? You should be able to bring in a new hire or temporary employee and be confident that this individual is productive within a short period of time.
- Make warehouse safety a top priority - There is more to warehouse safety than compliance with fire codes and OSHA regulations.

The Production Process

- How well is inventory monitored during the manufacturing process?
- Are there effective procedures that support movement and control to create efficiencies?
- What policies and procedures do you have in place related to your manufacturing functions?
- Many companies are testing the outcomes from their manufacturing process.
- However, fewer also test their adherence to policies and procedures and the effect that this has on results.

Manufacturing Best Practices

- The plant layout is organized and efficient.
- There are not high levels of backlog or unfilled customer orders.
- There is adequate coordination of purchasing, production levels, inventory requirements, and sales.
- The company adequately monitors and has procedures in place to limit scrap and shrinkage.

Assessment of Manufacturing Effectiveness

- Even if you don't use an established quality program, you must assess the effectiveness of your manufacturing process.
- Features from established quality programs can be utilized or a company can design its own measures.
- In general, you need to consider these five things:
 - Quantity,
 - Quality,
 - Efficiency,
 - Timing, and
 - Cost, which is a product of the other four.

Assessment of Manufacturing Effectiveness

- Need to determine key metrics.
 - Assess efficiency of machines.
 - Evaluate inventory usage compared to expectations.
 - Analyze scrap losses.
 - Summarize key output data.
 - Consider other costs related to inventory movement.
- Document manufacturing procedures.
 - Test for adherence to procedures.
 - Evaluate areas for improvement.

Physical Inventories

- Periodic physical inventory counts are one of the basic elements of an inventory management system.
- Many companies conduct this physical count for the entire company at or near year-end, or more frequently (semiannually, quarterly, or monthly).
- Other companies may take physical inventories cyclically throughout the year so that, at some time (or even several times) during the year, the inventory has been counted in total.

Adequately Plan the Physical

- Generally, limited time is available to take a physical inventory, which often must be accomplished after closing, over a weekend, or during a plant shutdown.
- The physical inventory count must be accurate to be useful.
- Factors that influence the amount of planning and advance preparation a company requires include:
 - Size and type of inventory,
 - Conditions under which the inventory is kept,
 - Number of locations,
 - Adequacy of the inventory system and records,
 - Experience of the inventory-taking staff, and
 - Time available to take the inventory.

Adequately Plan the Physical

- Planning should include both the physical count and the recordkeeping aspects of the physical inventory.
- The controller (or inventory manager) should coordinate the plans in advance of the actual counting.
- A well-developed plan should include, at a minimum:
 - Organization and staffing with assigned tasks and responsibilities.
 - Detailed written instructions.
 - Schedule of critical dates.
 - Cutoff dates for shipping and receiving.
 - Dates for taking each segment of the inventory.
 - Plant, warehouse, or store closing dates.
 - Accounting activity and reporting dates.
 - Training dates.

Adequately Plan the Physical

- Design, preparation, and distribution of forms and supplies to be used.
- Detailed floor plan layouts, locating each type of inventory and corresponding control points.
- Audit requirements, both internal and external.
- Summarization process.

Prepare Physical Inventory Instructions

- The controller should prepare written physical inventory instructions and distribute them to all personnel involved in the physical inventory.
- The instructions should be written in clear, simple language.
- Following are key points that detailed physical inventory instructions typically should cover.
 - Dates and locations of physical inventory.
 - Categories of inventory to be covered.
 - Detailed duties of each person assisting in the physical inventory.
 - Special instructions for unforeseen difficulties or confusion.
 - Method of controlling and distributing cards, tags, and other inventory forms.
 - Method of completing tags and other forms.
 - Method of identifying materials.

Prepare Physical Inventory Instructions

- Key points for detailed physical inventory instructions (continued).
 - Required preinventory preparatory work (cleanup, etc.).
 - Details of counting method, including use of scales, estimates, etc.
 - Description of checking or auditing of counts.
 - Method of accounting for card or tag numbers.
 - Pricing and valuation methods.
 - Comparisons to perpetual records.
 - Treatment of obsolete, slow-moving, and other special inventory classes.
 - Procedures to follow when shipping, receiving, and transferring materials.
 - Cooperation with external auditors and other observers.

Why Cycle Count?

- Eliminate the requirement for a complete shutdown of shipping, receiving, and production.
- Identify shortages or errors more quickly after occurrence so that determining the causes is facilitated.
- Reveal damaged or substandard materials more quickly, which may preclude a production shortage.
- Provide an incentive for more accurate recording of issues and receipts because personnel know that counts are conducted more frequently.
- Avoid serious year-end adjustments and make interim financial statements more accurate.

Cycle Count Procedures

- Effective cycle counts require the same procedures used in an annual physical inventory, including instructions, assigning responsibilities, training, counting, etc.
- Cutoffs demand scrutiny to coordinate the counting of all items at the appropriate time.
- The controller should develop a system to ensure that all inventory is counted at least once during the year.
- The ABC concept should also be considered, emphasizing “A” and “B” items.
- The controller can schedule counts based on location, inventory balances, available personnel resources, or other criteria that fit the company's needs.

Cycle Count Procedures

CYCLE COUNT PLANNING CHART

Category	Number of Items	Count Frequency	Total Item Counts	Weeks	Counts per Week
A	150	6 times	900	52	18
B	80	4 times	320	52	7
C	60	2 times	120	52	3
TOTALS	290		1,340		28

Shipping

- How will you get products to your customers?
- Consider use of company trucks versus common carrier.
- Coordinate with purchasing logistics, including negotiating of quantity discounts and use of backhauling.

Shipping

- Evaluate timing of shipments to best meet customer needs while controlling costs.
- Work with customers to establish economic order quantities that will provide for efficiencies and cost savings that can be shared with the customer.
- Consider packaging methods and costs, including their impact on quality and shipping costs.

Quality Control

- In manufacturing, quality control is a process that ensures customers receive products free from defects and meet their needs.
- When done the wrong way, it can put consumers at risk.
- When customers receive quality products you will:
 - Increase customer loyalty.
 - Gain repeat business.
 - Gain new customers from referrals.
 - Maintain or improve your position in the market.
 - Improve safety.
 - Reduce liability risks.



Timing of Quality Control

- Quality control in manufacturing can be a little tricky. Often, it is done at the end of the production process, only catching defects after the fact.
- Even worse, some manufacturers may leave their quality issues to be identified by customers as explained in the returns section below!
- Effective quality control is more involved and should include two levels:
 - Operators monitor the manufacturing process and ensure that there is little variation.
 - Engineers routinely monitor the product design for issues. When a problem is found, it is immediately fixed.

Quality Control

- Who is responsible for quality?
- How do you define the quality you want in your products?
- How is quality measured?
- How do you plan for and achieve improvements in quality?
- What are costs of monitoring quality compared to costs of problems with quality?

Quality Assurance Compared to Quality Control

- Quality assurance streamlines production and helps to ensure that the final products meet the company's quality criteria. It ensures that the processes used to design, test, and produce products will be done correctly.
- In manufacturing, quality assurance approaches, like ISO 9001, help manage and improve many processes, including:
 - Acquiring raw materials.
 - Purchasing third-party components and sub-assemblies.
 - Designing and using inspection procedures.
 - Complying with production processes.
 - Responding to defects.

Implementing a Quality Control Program

- Define the quality standards for each product.
- Select the quality control method.
- Define the number of products/batch that will be tested.
- Train employees for quality control.
- Create a communication system for reporting defects or potential issues.

Create Procedures for Handling Defects

- Will batches be rejected if defected items are found?
- Will there be further testing and potential repair work involved?
- Will production be halted to ensure that there are no more defective products created?
- How will new product versions be handled?
- Identify the root cause of the defect, make any needed changes, and ensure your products are defect free.

Returns

- Evaluate why returns are occurring - Don't let your customers do your quality control!
- Establish specific procedures for all aspects of the return process, from the initial contact with the customer to processing of credit and receipt of goods.
- Analyze the true cost of returns, including freight costs, employee time, and impact on customer relationships!
- Consider whether you really want the items back or it would be better to implement a destroy in field policy.

Inventory Costs

- In addition to managing inventory quantities, policies and procedures are need for inventory costs!
- An effective cost accounting system is needed to determine the “true” cost of a product, which is critical for all manufacturers in order to:
 - Properly cost inventory for inventory management and financial statement purposes.
 - Determine sales price for products.
 - Identify money makers / money losers.
 - Discover opportunities for cost improvement.
 - Improve strategic decision making.

What Does Cost Really Mean?

- In financial accounting, the term “cost” is defined as a measurement, in monetary terms, of the amount of resources used for some purpose.
- In managerial accounting, the term “cost” is used in many different ways. That is, there are different types of costs used for different purposes.
 - Some costs are useful and required for inventory valuation and income determination.
 - Some costs are useful for planning, budgeting, and cost control.
 - Still other costs are useful for making short-term and long-term decisions.
- To most effectively use cost accounting for management purposes, you actually need to look at the same costs in many different ways!

Linking Inventory Management With Reporting

- It has been said that what gets measured, gets done. An effective inventory management system must have measurable criteria to monitor achievement of goals and objectives.
- Inventory plans should also include nonfinancial goals that need to be monitored and reported to senior management.
- Inventory Management should be part of a company's planning system that is linked in the circular pattern of strategic planning, budgeting, performance, and management reporting.
 - Quantify performance measures.
 - Create key reports.
 - Evaluate results. Inventory reports must include comparison to goals!

Conclusion

- In any manufacturing company, there are opportunities to unlock additional profitability.
- Take the time to consider your system of inventory management – A majority of your costs flow through this area!
- Make sure you have the right policies and procedures in place.
- Measurement is key - Perform ongoing assessments of performance.
- Determine which improvement projects to undertake.

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