

Introduction to Global Supply Chain Management

Module Eight:

Global Warehouse Operations

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Presentation Agenda

- Warehouse operations defined
- Strategic considerations for W.M.
- Examples of Warehouse Operations
- Fundamentals of Warehouse Operations
- KPI's for the inventory management discipline

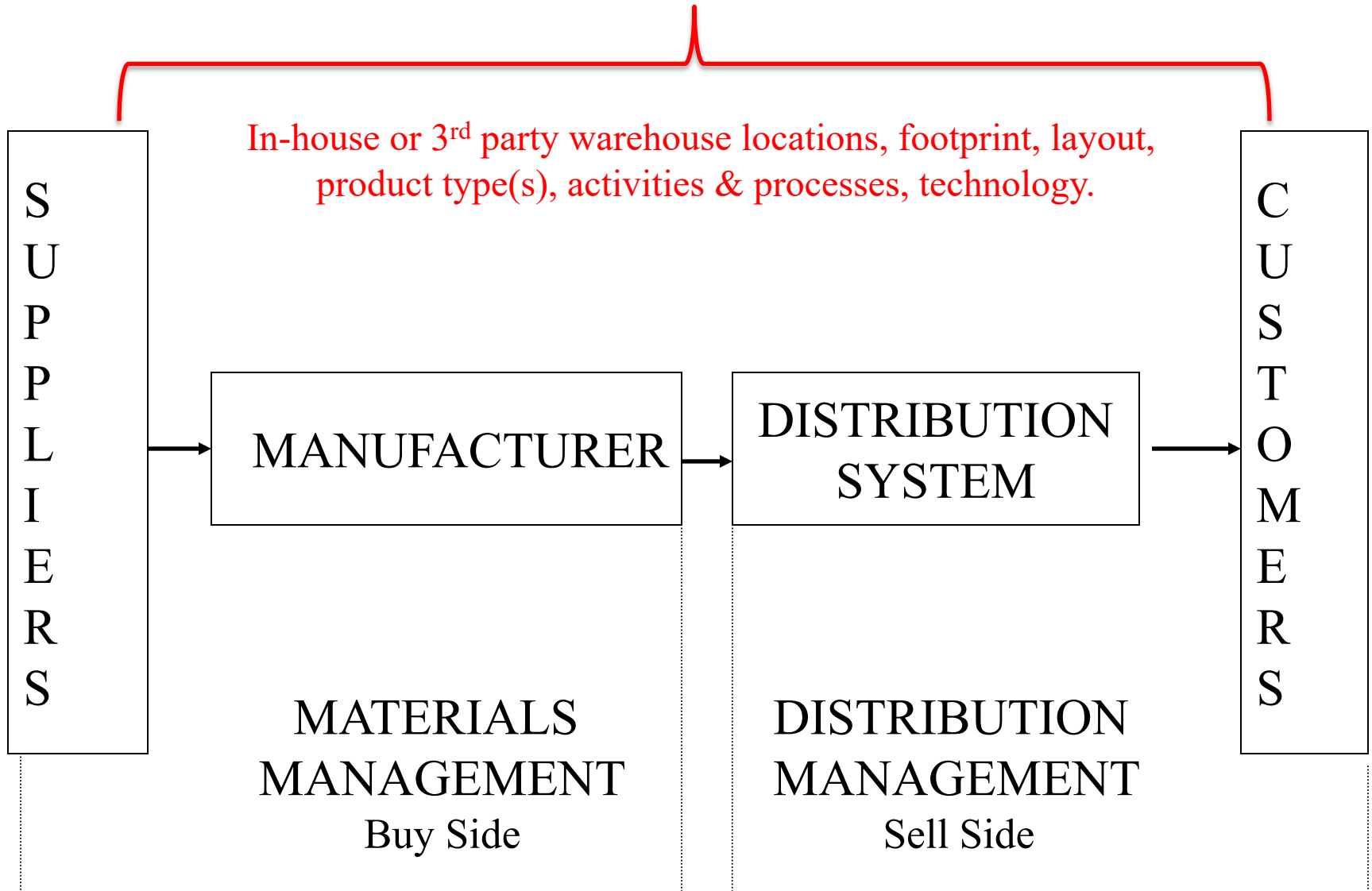
Warehouse Operations

“That part of the logistics discipline that involves the receipt, put-away, storage, retrieval, picking, preparation and/or shipping of goods from a physical site in a warehouse network. Specific types of warehouse operations will differ by industry, business model and company strategy, and be driven by the types of product being handled, as well as by the distribution/inventory management strategy that is in place.

Business model, strategy, inventory policies and product type also dictate the number of facilities in a warehouse network, the size of buildings, their layout and number of employees. Ideally, warehouse operations are linked to other S&OP functions via cloud-based technologies that maximize supply chain visibility and optimize operational efficiencies.”

-Dan Gardner, April 2015

Global Warehouse Operations: Aligning The Buy-Side & Sell-Side of SCM



Different Industries & Business Models

Determine How Warehouse Operations Are Conducted

- Retailer (brick & mortar)
- E-Commerce
- Wholesaler/Distributor
- Manufacturer (OEM)
- Tier I, II or III supplier
- Agricultural importer/exporter
- Marketer/Merchandiser

Different Types of Inventory & Operating Models Influence How Warehouse Operations Are Executed

Types of Inventory

- Raw materials
- Components/sub-assemblies
- Work In Process
- Finished goods
- Distribution inventory
- Accessories
- Spare parts
- MRO

Operating Model

- Build to stock
- Build to order
- Assemble to Order
- Engineer to Order
- Just In Time
- Vendor Managed Inventories

Global Warehouse Operations: Strategic & Tactical Considerations

- Location(s) of warehouses
 - Proximity to vendors
 - Proximity to customers
- Warehouse network structure
 - Regional Distribution Centers, satellite warehouses
- Bonded or Foreign Trade Zone
- Lease or own
- Third party (3PL) or in-house operations

Global Warehouse Operations: Strategic & Tactical Considerations

- Supporting logistics infrastructure
 - Ports/airports
 - Highway/rail access
- Footprint
 - Size & availability of land
- Product types
 - Finished goods, spare parts, perishables, high value
- Purpose
 - Long-term storage, fulfillment center, cross-dock, de-consolidation center, vendor hub

Global Warehouse Operations: Strategic & Tactical Considerations

- Building layout
 - Office space, dock doors, trailer patio, racks, bins, security cage, kitting & packaging area, et al
- Materials handling & automation equipment
- Operating profile
 - Processes for receiving, put-away, storage, picking, unitizing, etc.
- Security profile
- Labor pool
 - Union vs. Non-union
 - Shifts, hours of operation etc.

Global Warehouse Operations: Strategic & Tactical Considerations

- Cost structure
 - Per sq. ft. rent, labor, insurance, maintenance, equipment, supplies, taxes, etc.
- Technology
 - Warehouse Management System
 - Connectivity to other systems
 - Links to partner's systems
- Key Performance Indicators
 - Costs
 - Productivity
 - Customer service
 - Safety
 - Green initiatives

Global Warehouse Operations: In-House or Via Third Parties?

- In-House
 - Capital expenditure & budget
 - Lease or buy?
 - Length of lease
 - Real Estate market analysis
 - Building(s) footprint
 - Building design
 - H.R. management
 - Recruiting, payroll, training, etc.
 - Cost analysis (fixed vs. variable)

Global Warehouse Operations: In-House or Via Third Parties?

- In-House
 - Storage & materials handling equipment
 - Asset management
 - Balance sheet considerations
 - Depreciation
 - Taxes & Insurance
 - Enabling technology
 - Key Performance Indicators

Global Warehouse Operations: In-House or Via Third Parties?

- Third Party
 - Periodic bids
 - 3PL selection criteria & process
 - Financial stability of 3PL
 - Industry-specific expertise
 - Management team
 - Technological capabilities
 - Global footprint
 - Continuous improvement initiatives
 - Employee selection & training

Global Warehouse Operations: In-House or Via Third Parties?

- Third Party
 - Pricing structure
 - Cost plus
 - By pallet or carton
 - Storage vs. goods movement
 - Contractual clauses
 - Length of contract
 - Performance standards
 - Prices
 - Payment terms
 - Resource commitments
 - Standard Operating Procedures

Global Warehouse Operations: In-House or Via Third Parties?

- Third Party
 - Account Management
 - Account Manager
 - Control Tower
 - Technology
 - Connectivity with 3PL systems
 - Quarterly Business Reviews (QBR's)
 - Key Performance Indicators
 - Costs
 - Productivity
 - Customer service
 - Safety
 - Green initiatives

Examples of Warehouse Operations

Distribution Models & Warehouse Operations

- **Fast Moving Consumer Goods**
 - Used for high/volume steady demand retail-oriented products
 - “Pull” Model based on sales activity
 - Replenishment based on Point of Sale (POS) information
 - Sales “consume” the forecast
 - Requires a well developed W&D network

Distribution Models & Warehouse Operations

- **Fast Moving Consumer Goods**
 - Locations relatively close to end-user markets
 - Warehouse layout based on pallet-level unitizing
 - Combination of rack space and marshalling area
 - FMCG products located close to marshalling area
 - Multiple dock doors
 - Trailer/Container Pool

Distribution Models & Warehouse Operations

- **Cross-Dock Operations**
 - No long-term storage
 - Little, if any rack space (low ceilings)
 - Support de-consolidation of incoming ocean containers or truck trailers
 - Often times located close to ocean port operations

Distribution Models & Warehouse Operations

- **Cross-Dock Operations**
 - Dock doors on two sides of the building
 - Containers are stripped and transferred to 53' trailers for shipment to inland DC's or retail stores (goods, "cross the dock")
 - Emphasis on speed
 - Distribution "Postponement" is feasible

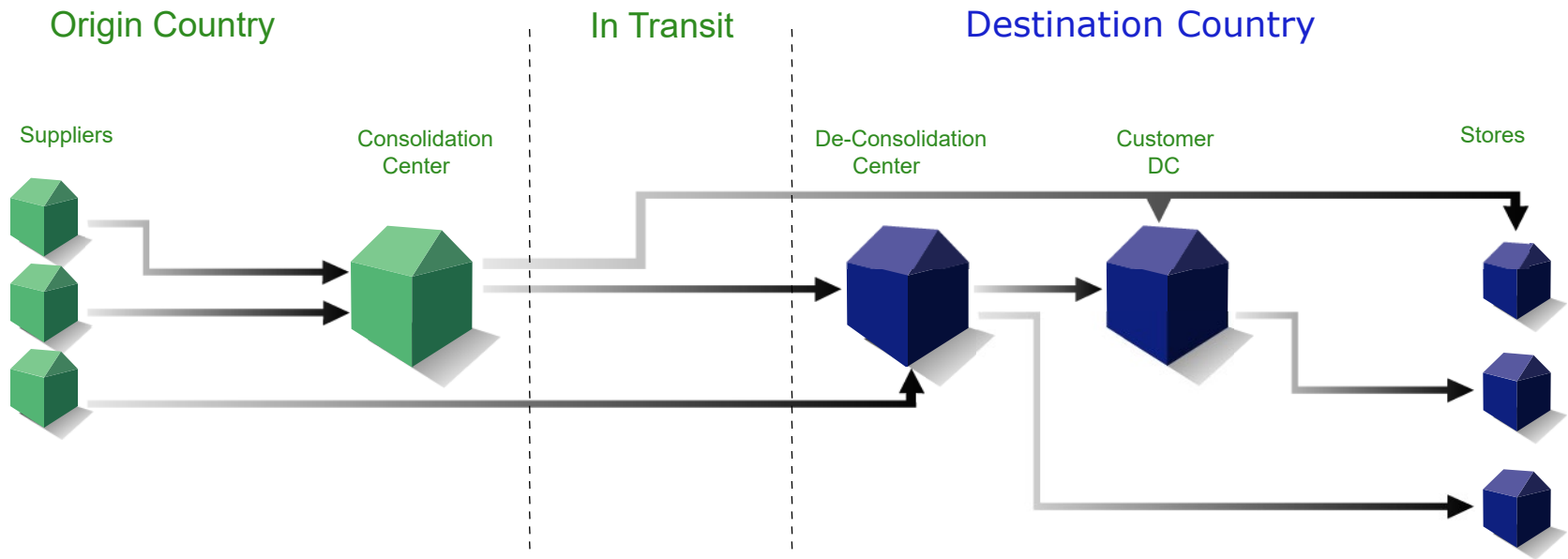
Distribution Models & Warehouse Operations

- **Vendor Hub (Buyer's Consolidation)**
 - Very popular in Asia (but also used elsewhere)
 - Used by companies with a large concentration of vendors in a given geographic area (South China)
 - Buyers place purchase orders on vendors who then deliver to the Vendor Hub
 - Goods received from multiple vendors at origin and consolidated into ocean containers

Distribution Models & Warehouse Operations

- **Vendor Hub (Buyer's Consolidation)**
 - Containers are loaded based on purchase order-specific instructions from the buyer
 - Often run by 3PL's
 - Very little storage space/low ceilings
 - Located close to ports
 - Quick turnaround

A Fashion Retail Supply Chain: Warehouse Locations & Operations



Industry: Fashion Retail

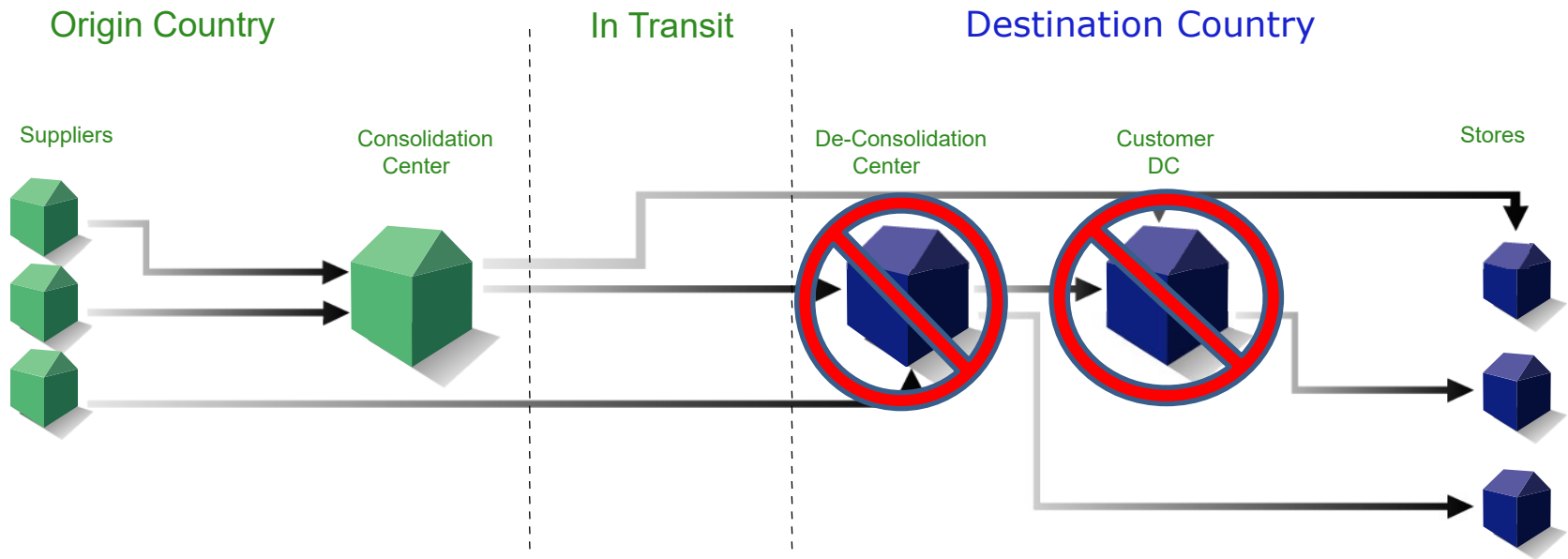
Model: Multi-Vendor Buyer's Consolidation

Warehouse Operations: Consolidation, De-Consol, finished goods distribution to stores

Eliminating Warehouses From The Network: Direct-To-Store Programs

- Used by larger retailers
- Goods received from multiple vendors at origin and consolidated into ocean containers by store-specific needs
- Goal is to eliminate the need for warehouses at destination
 - Save time & money
- Also known as “DC By-Pass”
- Goods prepared as “Retail-Ready”
- Requires advanced Enterprise Resource Planning capabilities

Direct-To-Store Programs: Eliminate Warehouses At Destination



Industry: Fashion Retail

Model: Multi-Vendor Buyer's Consolidation, Direct-To-Store

Warehouse Operations: Consolidation & Direct-To-Store shipping

Fundamentals of Warehouse Operations

- As discussed previously, warehouse operations will vary by industry, company, strategy, product profile, etc.
- The fundamentals of warehouse operations include:
 - Receiving
 - Putaway
 - Storage
 - Order picking
 - Shipping
- Integrated processes must be designed for each function
- Warehouse Management Systems help to manage processes, tasks and activities, as well as enhance visibility

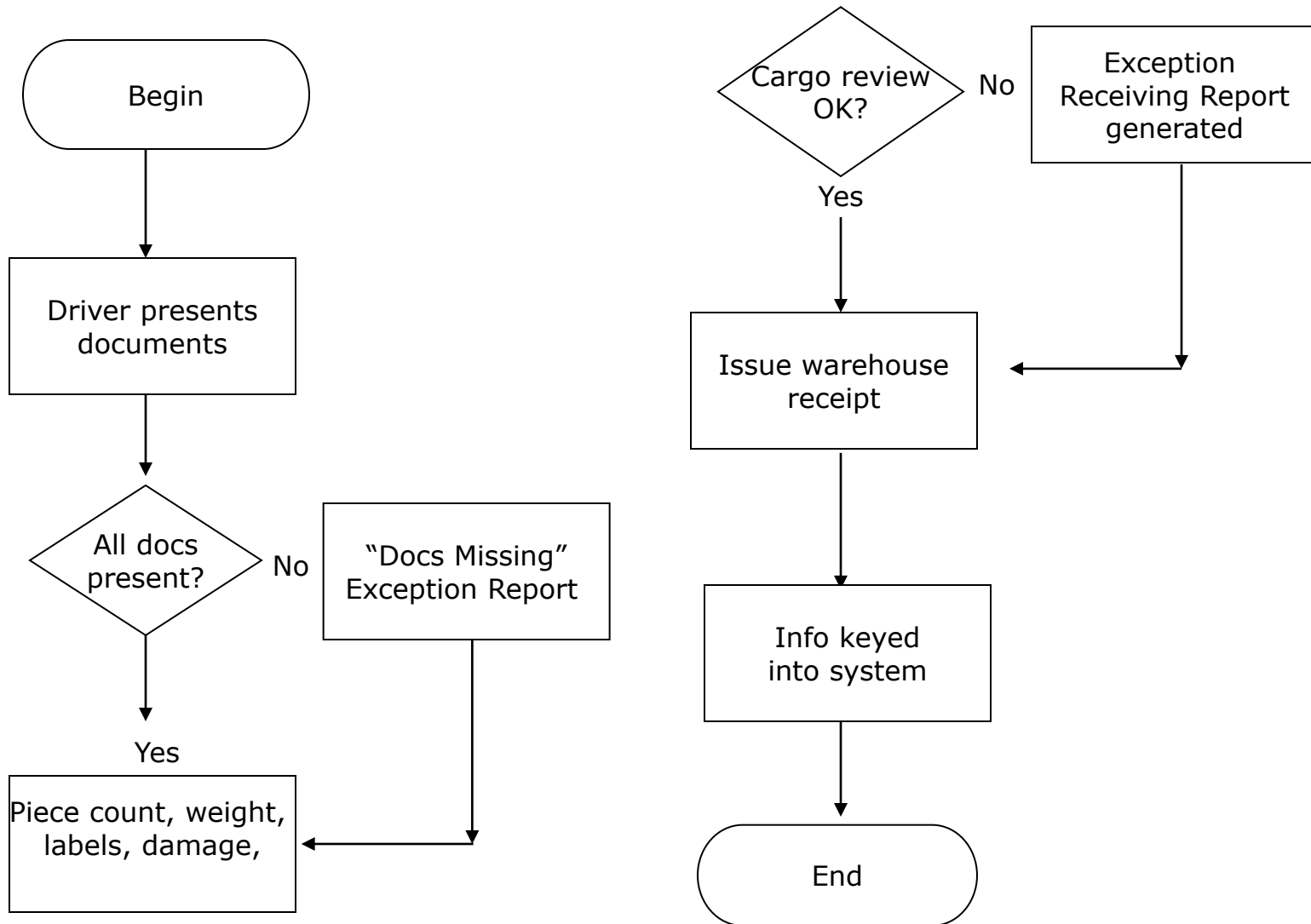
Fundamentals of Warehouse Operations: Receiving Process Considerations

- Driver check-in
- Assignment of dock door for truck arrival
- Documentation review
 - Transport document (B/L)
 - Commercial invoice/Packing list
- Cargo review
 - Piece count, proper packaging/labeling, weight, dimensions, damages, over/under

Fundamentals of Warehouse Operations: Receiving Process Considerations

- Scanned receipt of goods into system or manually?
 - Does scan match existing order in the system
 - Manual input of information into system
- Completed order receiving process
 - Issuance of warehouse receipt
- Conditional receiving process
- Cargo rejection process
- Enable Putaway activities

Manual Warehouse Receiving Process: Vendor Hub, Miami, FL



Fundamentals of Warehouse Operations: Putaway Process Considerations

- Unitization
 - Loose
 - Pallets
 - Slip sheets
 - Totes/bins
- Putaway for storage or immediate shipment?
- Direct Putaway (random location)
- Directed Putaway
- Batched Putaway

Fundamentals of Warehouse Operations: Putaway Process Considerations

- Putaway location decisions
 - Shared pallet position
 - Single product pallet position
 - High volume
 - High value
 - Hazardous Materials
 - Perishables
- Scanned or manual location identification
 - License plate

Fundamentals of Warehouse Operations: Storage Process Considerations

- Long-term, medium or short-term storage?
- Floor storage vs. pallet positions
- Merchandise stackability
- Type of location
 - Pallet position
 - Bins
 - Shelves
 - Gravity racks

Fundamentals of Warehouse Operations: Storage Process Considerations

- Storage locations by usage
 - High volume movers closest to dock doors
 - Slow movers towards the back, higher pallet positions
- Storage by ABC classification
- Storage by accounting policy
 - LIFO vs. FIFO
- Cycle counts
- Physical inventories

Fundamentals of Warehouse Operations: Order Picking Process Considerations

- Minimum order quantities
 - Pack Optimization (e.g. order by full pallet only)
- Pick task simplification
 - Stock-to-picker automation (conveyors etc.)
 - Automated sorting (carousels)
 - Shorter walking distances for pickers

Fundamentals of Warehouse Operations: Order Picking Process Considerations

- Single order picking
- Order batching
- Zone picking
- Pick sequencing
- Scanning technology
 - “Fool-proofing” of orders

Fundamentals of Warehouse Operations: Shipping Process Considerations

- Domestic vs. international shipment
- Mode of transport
 - Truck, rail, air, ocean
- Cargo characteristics
 - Fragile
 - Perishable
 - Hazardous Materials
- Voluminous vs. dense cargo

Fundamentals of Warehouse Operations: Shipping Process Considerations

- Proper packaging
- Standard Operating Procedures
 - Routing Guide
- Use of “Unit Loading Device”
 - LDC container for airfreight
 - D-Container
- Load sequencing (e.g. load plan by purchase order)

Fundamentals of Warehouse Operations: Shipping Process Considerations

- Weight or dimensional constraints
- Documentation requirements
 - Transport & commercial
- Incoterms® 2010 Rule
- Product labeling
- Cut-off times
- Security considerations

Warehouse Operations: Key Performance Indicators

- KPI's must be developed for each facet of a warehouse operation
- Ideally, KPI cover the following areas:
 - Financial
 - Productivity
 - Utilization
 - Quality
 - Cycle Time
 - Safety
 - Green initiatives

KPI's For Warehouse Operations (Receiving By Period)

- Total number of inbound receipts
- Total number of trailers received
- Number of cases received
- Total lines received
- Number/percentage of incomplete orders received
- Number/percentage of orders with documentation errors received
- Total labor costs (overtime)

KPI's For Warehouse Operations (Picking & Shipping By Period)

- Total number of outbound orders picked/shipped
- Total pallets/cases/cartons picked/shipped
- Total lines picked/shipped
- Number/percentage of non-conforming orders
- Percentage of on-time orders
- Number of back orders
- Total labor costs

KPI's For Warehouse Operations (Inventory Management By Period)

- Total number of active SKU's
- Total number of locations with correct SKU, quantity, date and lot I.D.
- Total number of locations audited
- Total warehouse damage or theft

KPI's For Warehouse Operations (H.R. & Financial Management By Period)

- Headcount
 - Permanent vs. Temporary labor
- Payroll
 - Management costs
 - Direct hours & overtime hours
 - Indirect hours paid (sanitation, security, etc.)
- New hires
- Number of incidents (accidents)

End of Module Eight

Congratulations!!!