***Supply Chain Management – Logistics***

Fall 2019

🡨 Flow of Information 🡨

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| Supplier | 🡪 | Manufacturer | 🡪 | Distributor | 🡪 | Retailer | 🡪 | Customer |

🡪 Flow of Material 🡪

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| **Logistics**. | |
| ***Outline*** | ***Initial Take-aways*** |
| \*Configurations  -Direct Shipment  -Intermediate Shipping  --Warehousing  --Cross-docking  --Transshipment | *From Simchi-Levi Text, Chapter 7.*  \*The structure of distribution configurations.  -Direct Shipment. Single-channel shipping.  -Intermediate Shipping  --Warehousing. Traditional shipping.  --Cross-docking. Uses warehouses as transfer points.  --Transshipment. Shares inventory between facilities at same stage. |
| \*Transportation Modes  -Truck  -Air  -Rail  -Water  -Pipeline | \*Match modes of transportation with supply chain elements such as service levels, cost, regulations, and material requirements.  -Truck. Small loads. Short runs. Flexible. Domestic.  -Air. Small loads. Short delivery times. Expensive. International.  -Rail. Large loads. Longer delivery times. Inexpensive. Domestic.  -Water. Large loads. Long delivery times. Inexpensive. International.  -Pipeline. Continuous loads. Inexpensive. Product specific. Domestic. |

***Supply Chain Logistics – Distribution Configurations***

***Chapter 7***

🡨 Flow of Information 🡨

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| Supplier | 🡪 | Manufacturer | 🡪 | Distributor | 🡪 | Retailer | 🡪 | Customer |

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| ***Distribution Configurations*** | |  | **Objectives of Supply Chain Management** |
|  | Intermediate Shipping |  |
| Direct Shipment | Warehousing  Cross-docking  Transshipment |  | Balance “High Service Levels” with “Low Costs”  Emphasize “Continual Improvement” |

**Distribution Configurations**

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|  | Direct Shipment | | | | | | | | | |  |  | Warehousing | | | | | | | | | |  |
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|  | Cross-Docking | | | | | | | | | |  |  | Transshipment | | | | | | | | | |  |
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| **Comparison of Centralized vs. Decentralized Facilities** | | |
| *Factors* | *Centralized* | *Decentralized* |
| Optimization | Global | Local |
| Safety Stock | Lower | Higher |
| Facility Overhead | Lower | Higher |
| Retailer Lead Time | Longer | Shorter |
| Service Levels | Lower | Higher |
| Transportation Costs | Lower | Higher |

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|  | **Distribution Configurations** |  |

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|  | Direct Shipment | | | | | | | | | |  |  | Warehousing | | | | | | | | | |  |
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|  | Cross-Docking | | | | | | | | | |  |  | Transshipment | | | | | | | | | |  |
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|  | **Characteristics of Direct Shipment and Intermediate Shipping** | | | |  |
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|  | *Centralized* | | | |  |
|  |  | **Direct Shipment** | | |  |
|  |  |  | Products: | Expensive products, Custom products, Proprietary products,  Critical products |  |
|  |  |  | Conditions: | Products with low demand mean, high demand variability,  Critical lead times such as perishable items,  Make-to-order inventory strategy |  |
|  |  |  | Advantage: | Eliminates warehouse costs |  |
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|  | *Decentralized* | | | |  |
|  |  | **Intermediate Shipping** | | |  |
|  |  |  | Products: | Low-cost products, Standardized products, Staple products,  High product variety, Commodities |  |
|  |  |  | Conditions: | Products with high demand mean, low demand variability,  Low-cost sensitive items such as commodities,  Make-to-stock inventory strategy |  |
|  |  |  | Advantages: | Allows Risk Pooling,  Faster last-mile delivery to increase service levels |  |
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|  | **Direct Shipment** |  |

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|  | Direct Shipment | | | | | | | | | |  |
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|  | **Direct Shipment**  Shipments distributed directly from manufacturer to customer or retailer. | | |  |
|  |  | *Characteristics*  Eliminates Warehouses  Accommodates Critical Lead Times i.e., perishable items  Accommodates Critical Retailer i.e., high priced, custom items | |  |
|  |  |  | *Requirements*  Established communication systems throughout the supply chain |  |
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|  | **Warehousing** |  |

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|  | Warehousing | | | | | | | | | |  |
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|  | **Warehousing**  Shipments distributed from stage to stage, traditionally from manufacturer to wholesaler to distributor to retailer. For example, inventory stored at a warehouse to satisfy retailer demand. | | |  |
|  |  | *Characteristics*  Increased service level for the last-mile  Increased warehouse inventory cost  Increased warehouse facility cost  Increased risk pooling at warehouse | |  |
|  |  |  | *Requirements*  Warehouse management systems for large inventories |  |
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|  | **Cross-docking** |  |

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|  | Cross-Docking | | | | | | | | | |  |
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|  | **Cross-docking**  Shipments distributed from manufacturer to warehouses where warehouses are used as a transfer point to distribution to retailer. Specifically, no inventory is stored at warehouses. | | |  |
|  |  | *Characteristics*  Decreases manufacturer-to-retailer cycle time relative to warehousing  Lowers warehouse inventory carrying costs  Allows high product variety | |  |
|  |  |  | *Requirements*  Due to enhanced vertical integration:  Requires advanced information systems  Requires advanced forecasting capabilities  Requires advanced transportation management  Requires high start-up costs |  |
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|  | **Transshipment** |  |

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|  | Transshipment | | | | | | | | | |  |
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|  | **Transshipment**  Shipments distributed traditionally from manufacturer to wholesaler to distributor to retailer, but inventory also shared with facilities at same stage. For example, inventory stored at multiple warehouses to satisfy demand from multiple retailers. | | |  |
|  |  | *Characteristics*  Increased Virtual Inventory  Increased risk pooling by use of same-stage facility inventories | |  |
|  |  |  | *Requirements*  Due to horizontal integration of inventory between same-stage facilities:  Requires specialized communication capabilities  Requires specialized transportation capabilities |  |
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|  | Summary & Analysis |  |

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|  | Inventory  Risk Pooling | No Warehouse  Holding Costs | No Warehouse  Costs | Large Customer  Virtual Inventory |
| **Warehousing** | X |  |  |  |
| **Cross-Docking** |  | X |  |  |
| **Direct Shipment** |  |  | X |  |
| **Transshipment** |  |  |  | X |

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| ***What would be factors related to the change from one configuration to another?*** |
| Warehousing 🡪 Cross-Docking |
| Warehousing 🡪 Direct Shipment |
| Cross Docking 🡪 Direct Shipment |
| Distributed Inventory 🡪 Centralized Inventory |
| Distributed Information 🡪 Centralized Information |

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|  | Modes of Transportation |  |

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| *Mode* | **Distance** | **Size of Load** | **Overseas** | **Cost** | **Speed** |
| **Truck** | Short | Small | No | Medium | Medium |
| **Air** | Long | Small | Yes | High | Fast |
| **Rail** | Long | Large | No | Low | Slow |
| **Water** | Long | Large | Yes | Very Low | Very Slow |