IIT KHARAGPUR

NPTEL ONLINE
CERTIFICATION COURSES

E-BUSINESS

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Week 4: Lecture 1

E-MARKETING

We are going to learn

- Role of internet in enhancing marketing efforts
- Online customer model in marketing
- Activities under marketing and information system support

Purpose of Marketing

- Planning, promotion, and sale of existing products in existing markets,
- Development of new products and new markets to better attract and serve present and potential customers.

AIDA model of marketing communication

- Attention
  - Getting the attention of a prospective customer
- Interest
  - Increasing the customers interest by demonstrating advantages and benefits
- Desire
  - Convincing the customer that product best suits to their need
- Action
  - Leading customers towards taking action for purchase

eMarketing

- Using Internet as an additional communication channel for realizing AIDA model.
- Transformation in marketing paradigm from *undifferentiated mass marketing* to *mass customized marketing*

Transformation in marketing paradigm

- Undifferentiated mass marketing (1940-50)
- Differentiated mass marketing (1950-60)
- Segment-oriented marketing (1960-70)
- Niche marketing (1970-80)
- Marketing for the individual customer (1980-90)
- Mass customized marketing (1990-)

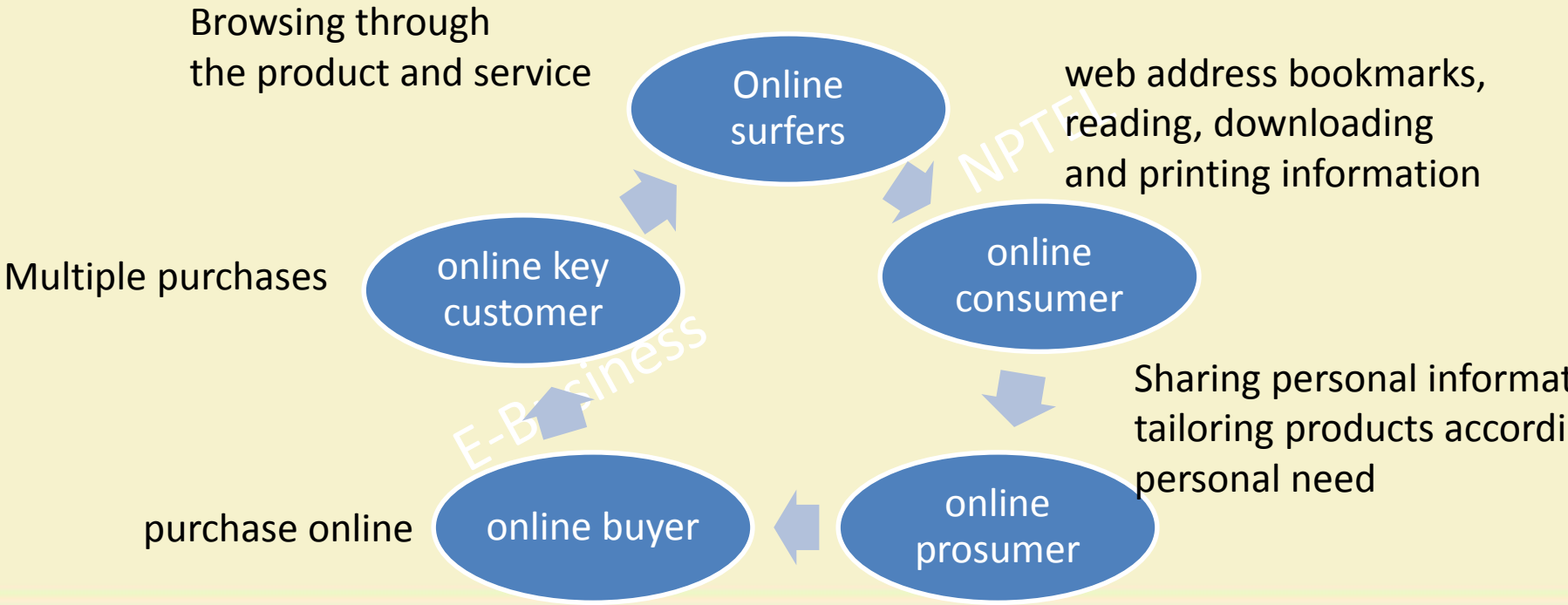
Internet as an enabler of Mass customized marketing

- Reduced cost
- Reduced time
- Higher outreach

Characteristics of eMarketing

- **Associative information acquisition**
- **Market pull and customized push**
- **Integration of customers into the creation of the value chain**
- **One-to-one marketing**
- **Ubiquity**
- **Disintermediation**

The Development Model for Online Customers



Model for Online Customers

- Online surfers
  - They visit just to get acquainted with a brands, a service or with the company. They surf aimlessly and often jump from one website to other.
  - Creating online surfers
    - Strategies for deciding a domain name
      - Independent domain for marketing or a sub domain within the company
    - Protecting the domain name
    - Publicizing the domain name

Model for Online Customers

- Online Consumers
  - A surfer becomes a online consumer if the company succeeds in establishing goal directed and repeated contact with the surfer. Consumers may keep the web address in the bookmarks, spends more time reading, downloading and printing information.
  - Strategies to build and retain online consumers
    - Creating a facility to view, feel and understand the product
      - Catalogs
      - Presentations, Video, Simulations etc.
      - Brochures downloads
      - Interactive application
    - Facility to give feedback

Model for Online Customers

- Online prosumers (producer & consumers)
  - Prosumer is a customer who would not only like to acquire only the standardized products, but also the products and services tailored according to his individual preference. They are willing to share their personal information.
  - Facilities for online prosumers
    - Facility to individualize a product and service and visualizing its effect
    - Online community formation
    - Both side feedback
  - Integration of the suggestions into the value chain

Model for Online Customers

- Online buyer
  - The customer who makes purchase online
  - Facilities for online buyers
    - Shopping cart
    - Payment facilities
    - Facilities to track delivery process
    - Maintaining customer relationship

Model for Online Customers

- The Key online customer
  - Returning online customer/ multiple purchases
  - Facilities
    - CRM
    - Encouragement of personal communication
    - Special offers
    - Satisfaction survey

Activities under Marketing

- Interactive marketing
- Sales force automation
- Sales Management
- Customer Relationship Management
- Market Research and forecast
- Advertising and promotion
- Product management

4Ps of marketing: Product, Price, Place, Promotion

Interactive marketing

- Two-way transactions
- Tools: chat and discussion groups, Web forms and questionnaires, instant messaging, and e-mail correspondence

Sales force automation and Sales Management

- Real time capturing and analysis of sales data over the internet
- Online decision support

Market Research and forecast

- New trend in data collection
  - Explicit and Implicit data
  - Structured and unstructured data
  - Large sample

Advertising and promotion

- Principles of Online Promotions
  - Push vs. pull
    - Push principles:
      - Promotion initiated by the provider
      - Customer is inundated with unsolicited information (spam)
      - Facility to subscribe and unsubscribe from a push channel
      - Customized push
    - Pull Principles
      - Demand for information is initiated by the user
      - User consciously selects or follows his associations
      - Fees may be paid by the user

Types of Promotion

- Banner advertising
- Buttons
- Nanosites
  - A new site not leaving the current page
- Microsites
  - Special designed websites
- Branded contents
  - A part of the website dedicated for the brand
- Embedded contents
  - Key word search
  - Promoted news

Targeting components for promotion

- Community
  - Customised advertisements for special virtual community websites.
- Content
  - Advertisements in the websites of other organizations related to the product/service
- Context
  - targeted only at people who are already looking for information about a subject matter

Targeting components for promotion

- Demographic/Psychographic
  - targeted only at people with a particular background
- Online Behaviour
  - Capturing the browsing behaviour through Cookies

Product management

- B-to-C models
- Interactive design
- Store locators
- Online payment

Week 4: Lecture 2

SUPPLY CHAIN MANAGEMENT – I
-THE INFORMATION FLOW

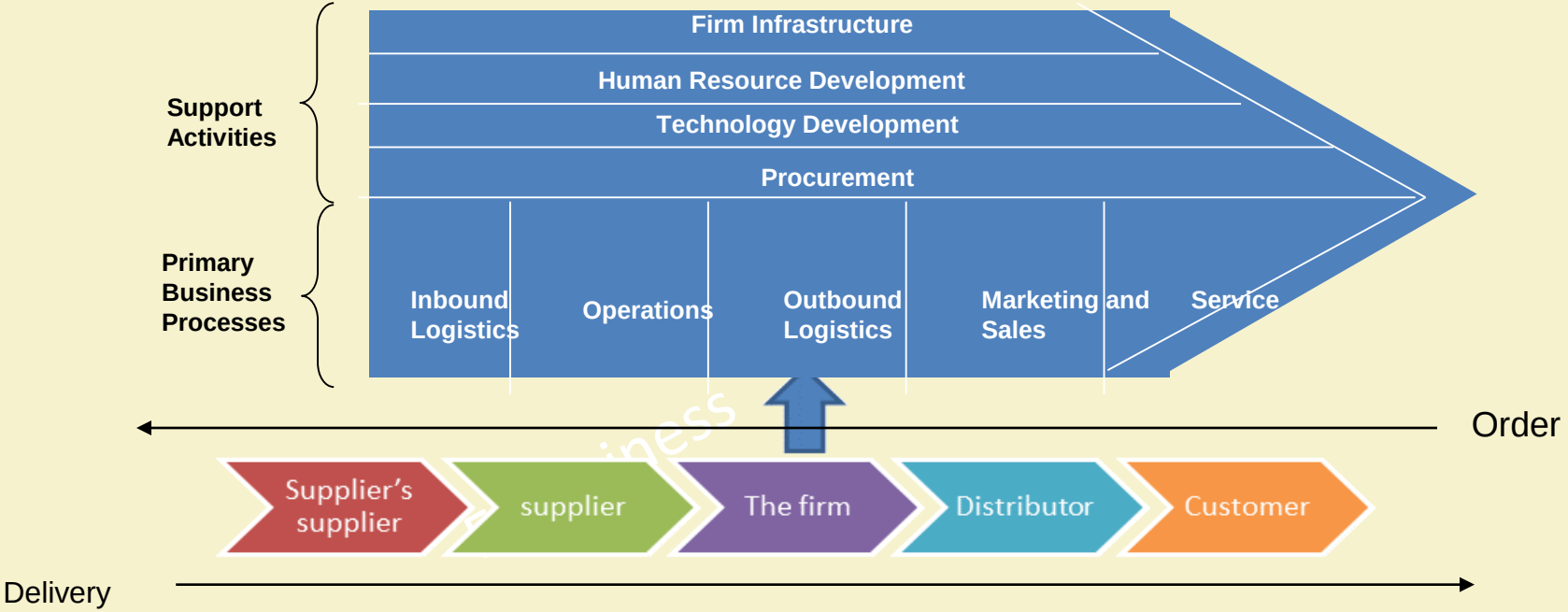
We are going to learn

- What is a supply chain
- Activities under a supply chain
- Information flow within the supply chain
- Benefits of information sharing
- What is a e-supply chain
- Objectives and outcomes of e-SCM
- E-SCM functional areas
- Implementation challenges

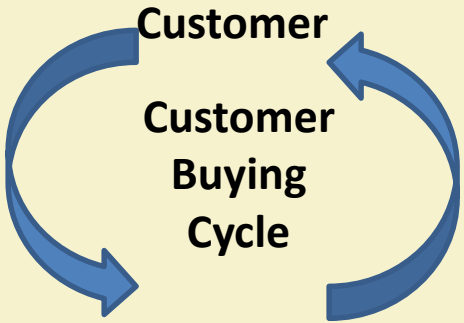
Supply chain

- A supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer.

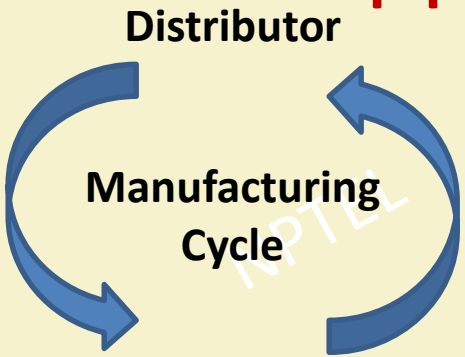
Supply chain connects value chains



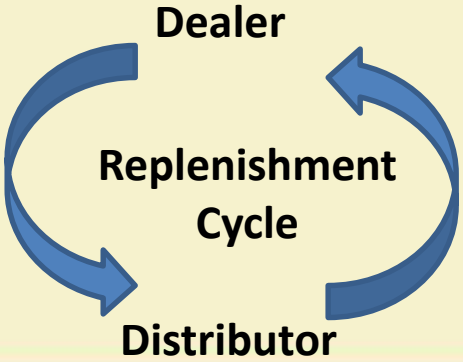
Four main cycles of the supply chain



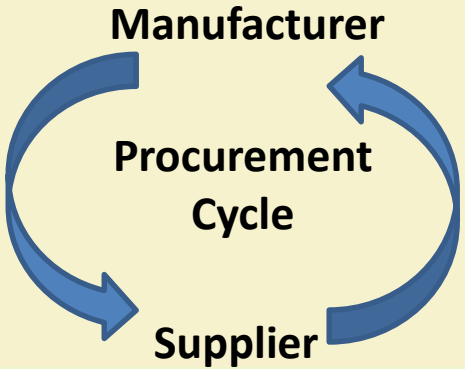
Process steps:
- Marketing
- Sales
- After-sales support



Options with the production cycle:
- On-demand production
- Just-in-time

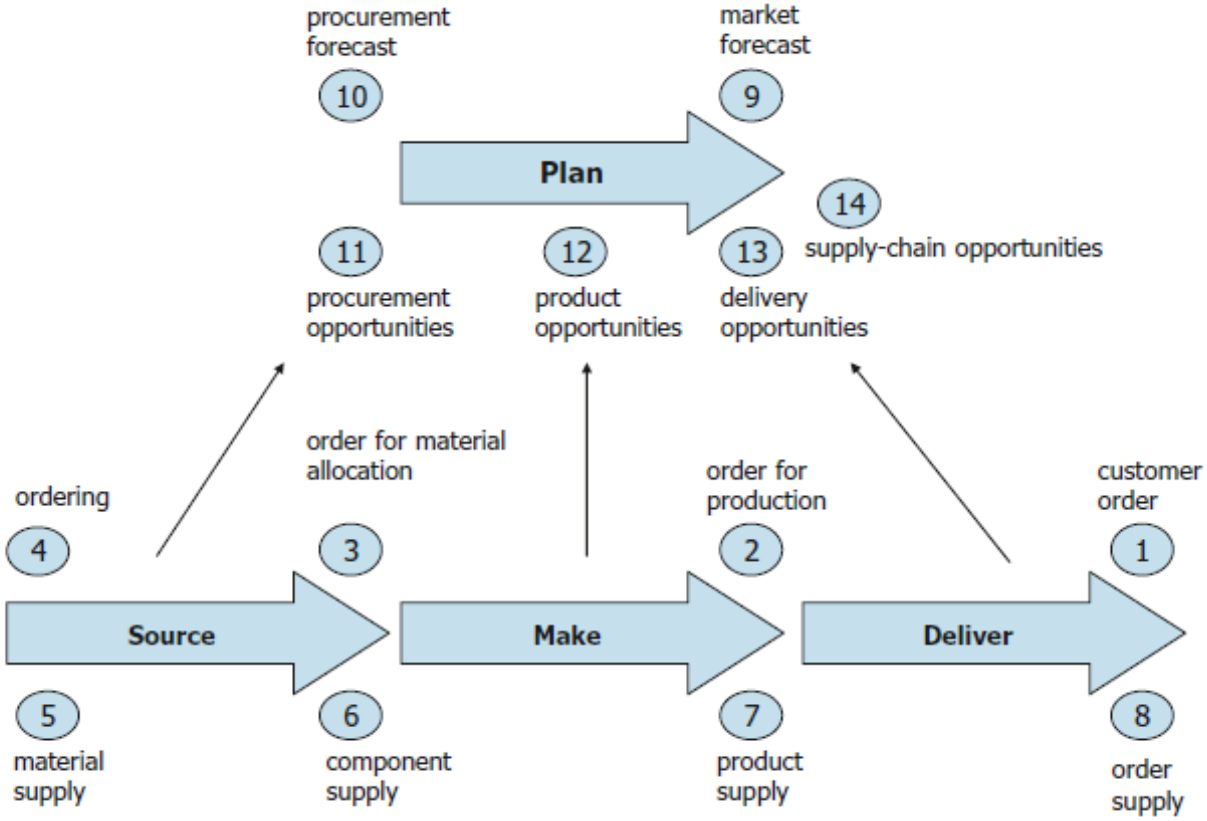


Selection of distribution logistics:
- Online distribution
- Offline distribution
- Hybrid distribution

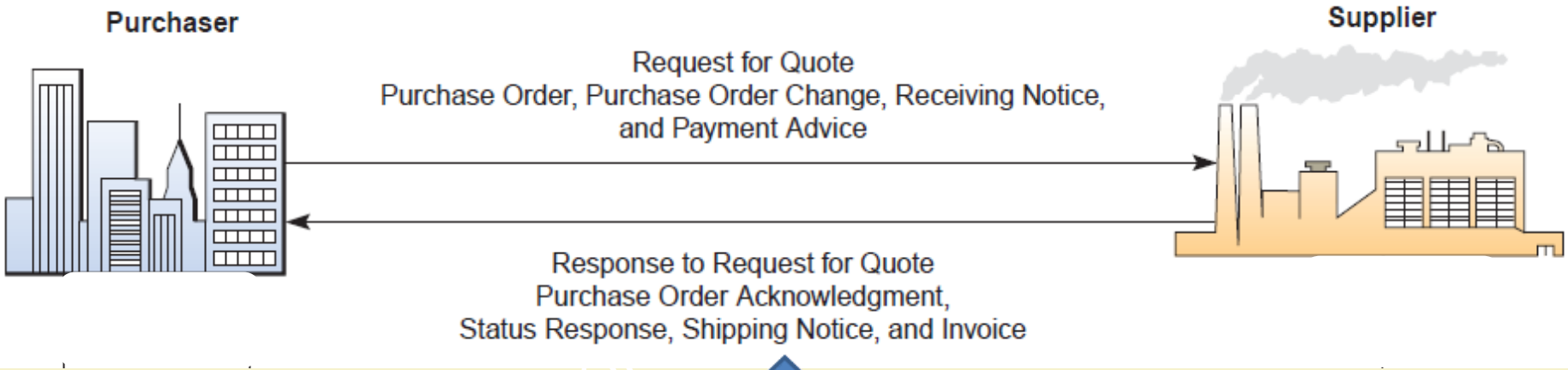


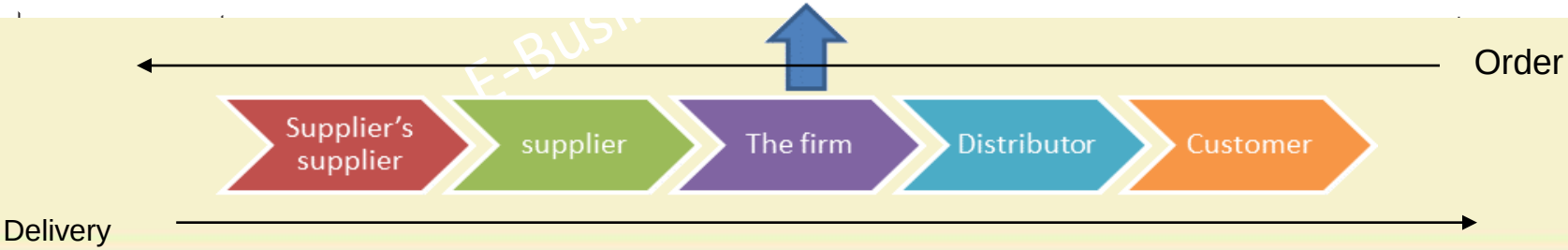
Strategies for Procurement:
- Sell side
- Buy side
- Marketplace

Supply Chain Operations Reference (SCOR) Model



Information flow within the supply chain



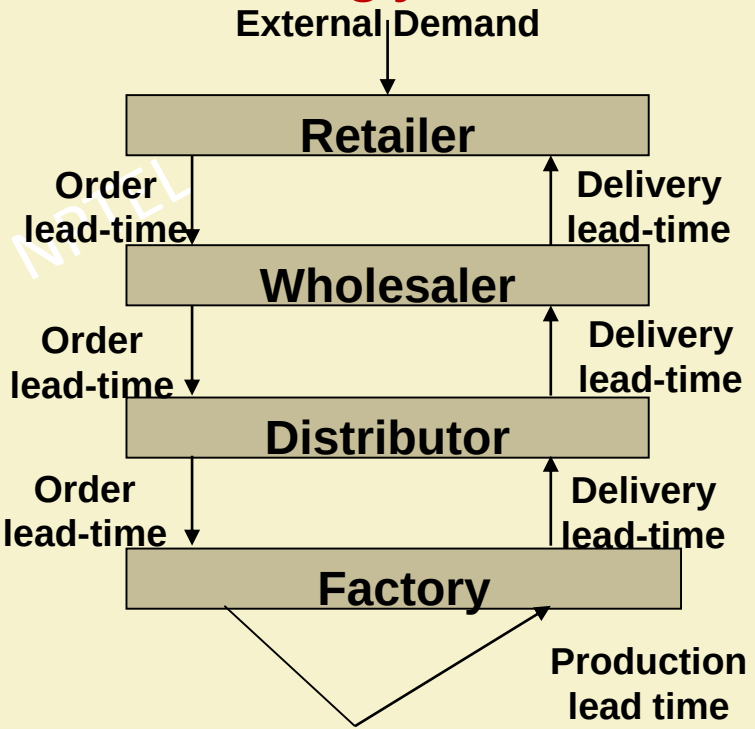


What information sharing can do

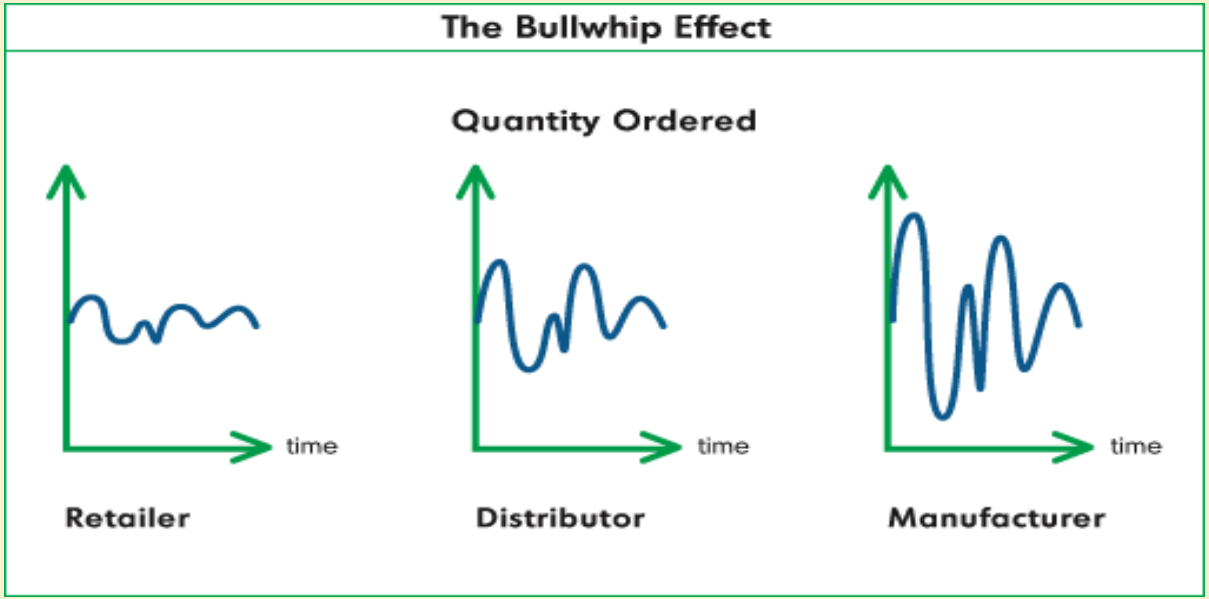
- Helps reducing variability in the supply chain
- Helps suppliers make better forecasts, accounting for promotions and market changes
- Enables the coordination of manufacturing and distribution systems and strategies
- Enables retailers to better serve the customers by offering tools for locating desirable items
- Enables the retailers to react and adapt to supply problems more rapidly
- Enables lead time reductions

Variability in the supply chain – *The Contributing factors*

- Demand forecasting
- Lead time
- Batch ordering
- Price fluctuation
- Inflated orders
- **Lack of centralized information**



Variability in the supply chain– *The Bullwhip Effect*



The increase in the variability as we travel up in the supply chain is referred to as the *bullwhip effect*

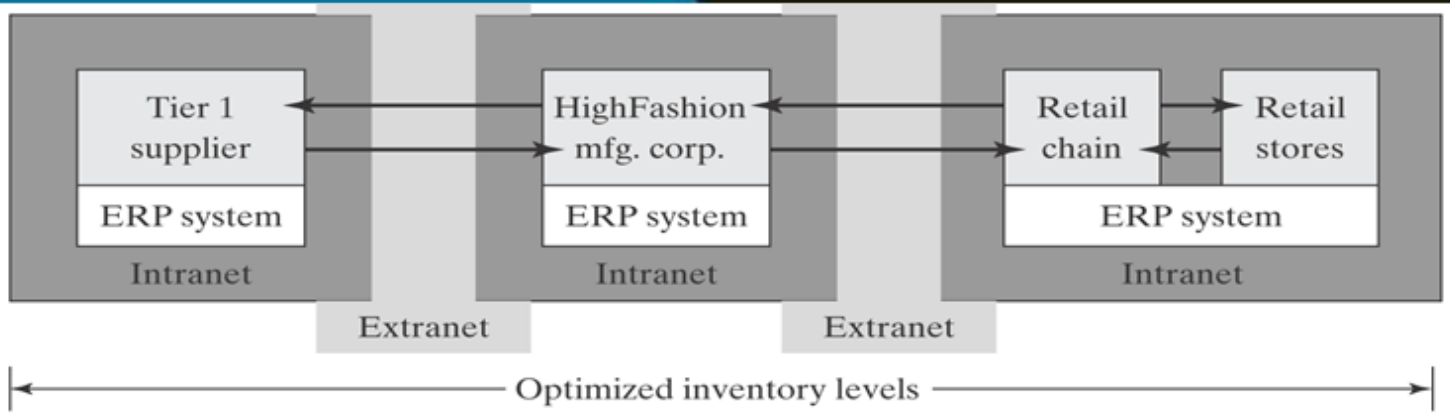
Consequences of *Bullwhip Effect*

- Increased safety stock
- Reduced service level
- Inefficient allocation of resources
- Increased transportation costs

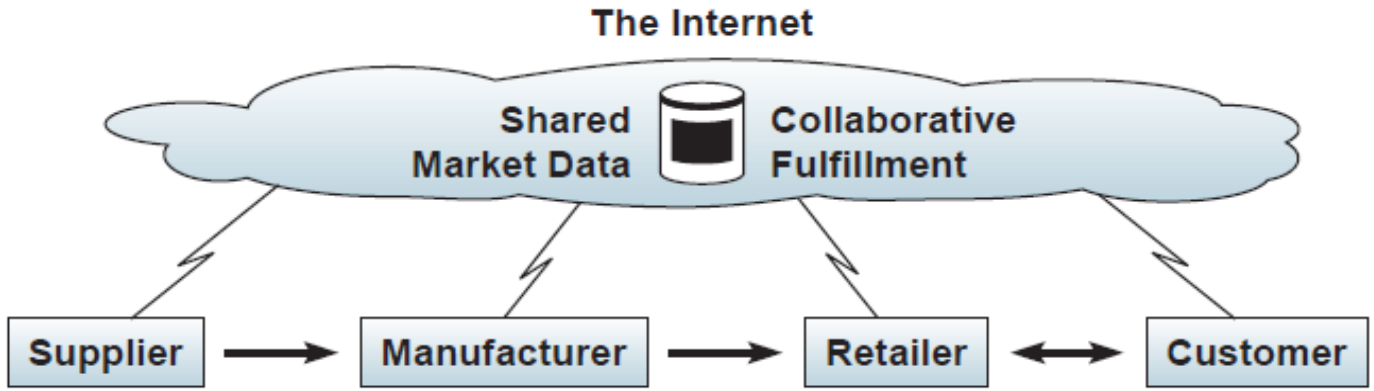
eSupply Chain

- Facilitates real-time updates across chain
  - From consumers to suppliers
  - Greater ability to fill orders
  - Better understanding of customer needs

Integrated Solution through inter enterprise collaborative system



Integrated Solution through a centralized SCM system



Objectives and outcomes to be accomplished with the interenterprise SCM information systems

Nature of activity	Objective	outcome
Strategic	Establish objectives, policies, and operating footprint	• Objectives • Supply policies (service levels) • Network design
Tactical	Deploy resources to match supply to demand	• Demand forecast • Production, procurement, logistics plan • Inventory targets

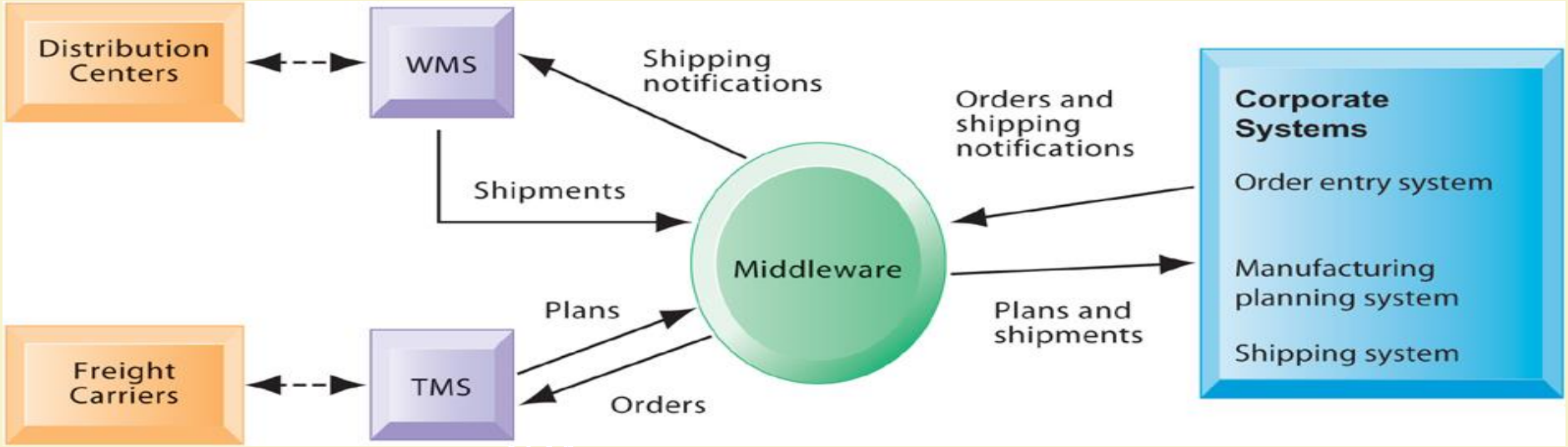
Objectives and outcomes to be accomplished with the interenterprise SCM information systems

Nature of activity	Objective	outcome
Operational	Deploy resources to match supply to demand	• Work center scheduling • Order/inventory tracking
Execution	Build and transport	• Order cycle • Material movement

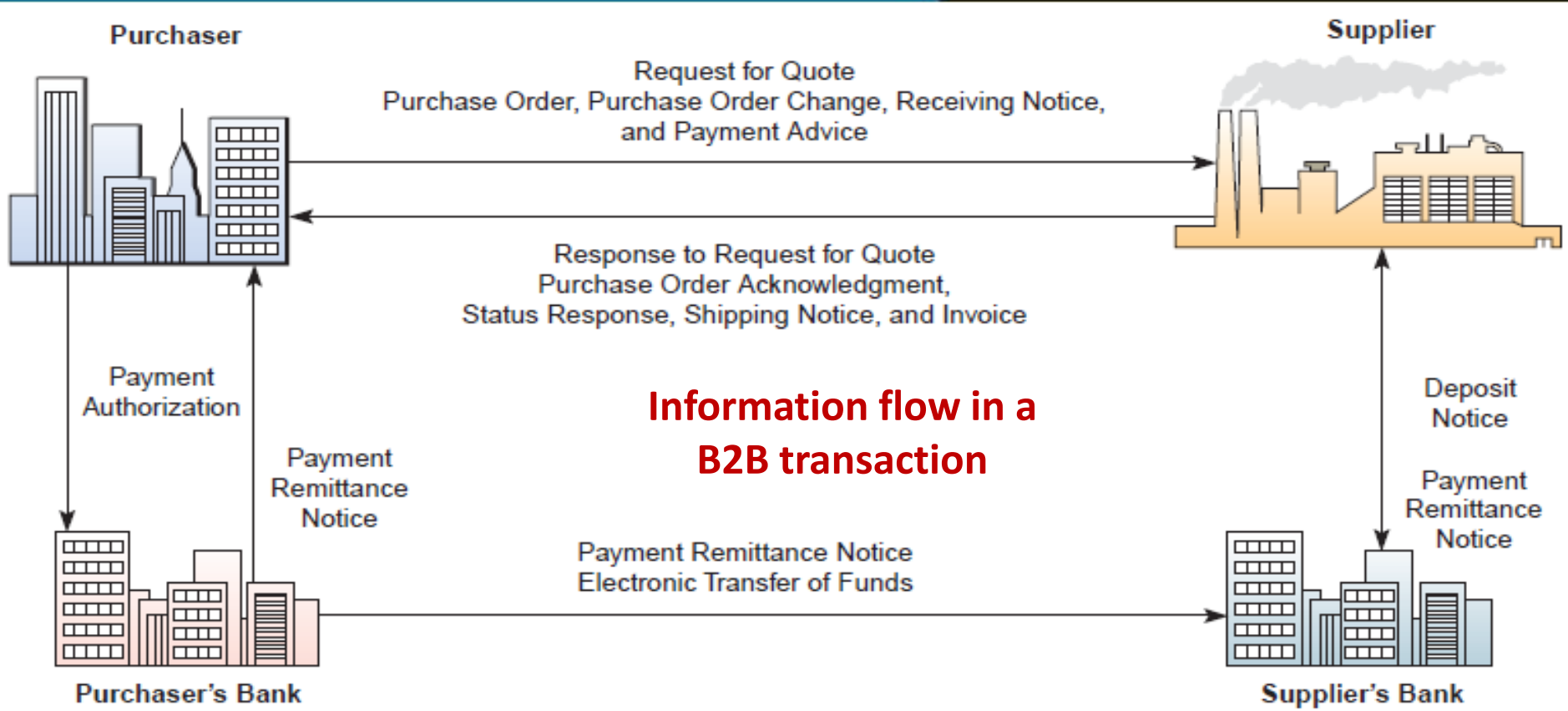
SCM Functional Processes

- Strategic Sourcing and Procurement
- Forecast and Demand Planning
- Customer Order Fulfilment/Service
- Distribution Network and Warehouse Operations
- Transportation and Shipment Management
- Production Logistics

Example of a Supply Chain Management System



Customer orders, shipping notifications, optimized shipping plans, and other supply chain information flow among Warehouse Management System (WMS), Transportation Management System (TMS), and its back-end corporate systems.


Purchaser
Supplier
Request for Quote
Purchase Order, Purchase Order Change, Receiving Notice,
and Payment Advice
Response to Request for Quote
Purchase Order Acknowledgment,
Status Response, Shipping Notice, and Invoice
Payment
Authorization
Payment
Remittance
Notice
Information flow in a
B2B transaction
Deposit
Notice
Payment
Remittance
Notice
Payment Remittance Notice
Electronic Transfer of Funds
Purchaser's Bank
Supplier's Bank

E-SCM Challenges

- Planning, selection, and implementation of SCM solutions
- Creating a real-time SCM infrastructure
- Coping with the frequent technology changes
- Coping with technology of multiple supply chain partner.
- Introduction of new supply chain partner

Week 4: Lecture 3

SUPPLY CHAIN MANAGEMENT – II
-INTEGRATION AND INTEROPERABILITY

We are going to learn

- Integration, interoperability and collaboration
- Dimensions of supply chain interoperability
- Supply chain collaboration
- Models for collaboration

Supply chain Integration

- The extent to which the firm can strategically collaborate with their supply chain partners and collaboratively manage the intra- and inter-organization processes to achieve the effective and efficient flows of products and services, information, money, and decisions with the objective of providing the maximum value to the customer at low cost and high speed

Supply chain Integration

Information integration

- Interoperability
  - Technical issues

- Collaboration
  - Managerial issues
  - Collaborative communication
  - Coordinating contract
  - Information sharing
  - Joint decision making
  - Joint knowledge creation
  - Resource sharing

Supply chain Interoperability

- Interoperability is the ability of two or more systems or components to exchange and to use the information that has been exchanged
- Interoperable systems require both the technical and semantics level interoperability.
  - technical interoperability: deals with hardware and software compatibility
  - semantic interoperability: ensures both the systems have the same understanding of different concepts.

Supply chain Interoperability

- Supply chain interoperability for Business-to-Business (B2B) integration is particularly challenging task because of the factors like
  - a) diverse information formats
  - b) large and dynamic information space
  - c) lack of standards for semantic integration of data
  - d) issues related to fast, secure
  - e) reliable data transmission

Dimensions of supply chain interoperability

- Interoperability of data
  - Two concerns
    - finding and sharing information from heterogeneous databases
      - reside on different machines with various operating systems and database management systems;
    - resolving the semantics differences that exist with the structure and contents of the databases.
      - Data exchange standards such as EDI, and XML are primarily used to solve this level of interoperability issues.

Dimensions of supply chain interoperability

- Interoperability of service
  - identifying, composing and operating together various applications that are designed and implemented independently.
  - Requires a common architectural framework that enables integration
    - CORBA (Common Object Broker Architecture) , Service Oriented Architectures (SOA), Cloud

Integration vis-à-vis interoperability

- Two integrated systems are inevitably interoperable; but two interoperable systems are not necessarily integrated

Dimensions of Collaboration

- Planning Collaboration
  - Production Planning Decision
    - What is to be produced, when to be produced, where to be produced and how to be produced.
- Inventory Collaboration
  - Ordering Decision
    - When to order and how much to order

Strategies for Supply Chain Collaboration

Planning Collaboration		Inventory Collaboration: No	Inventory Collaboration: Yes
Planning Collaboration	Yes	Type 1 Collaborative Planning and Forecasting	Type 3 Synchronized Supply Chain
Planning Collaboration	No	Type 0 Traditional Supply Chain	Type 2 Vendor managed inventory

Supply Chain Collaboration:: Making Sense of the Strategy Continuum, *European Management Journal*, *Volume 23, Issue 2*, *April 2005*, *Pages 170-181,* Matthias Holweg, Stephen Disney, Jan Holmström and Johanna Småros

The traditional supply chain

- In this model each level in the supply chain issues production orders and replenishes stock without considering the situations at either up- or downstream tiers of the supply chain.
- No visibility
- No Collaboration
- Bullwhip effect
- Most supply chains still operate this way.

Collaborative Planning and Forecasting

- In this model retailers and suppliers order independently but exchange demand information and action plans in order to align their forecasts for capacity and long-term planning.
- Visibility
- Elimination of uncertainty
- Requires right information in right time from the all the partners
- Requires development of information exchange standards that must be adopted by all the partners
- Expects undistorted information

Vendor Managed Inventory (VMI)

- The task of generating the replenishment order is given to the supplier, who then takes the responsibility for maintaining the retailer's inventory and subsequently retailer's service level.
- Full Visibility
- Information sharing
- Consignment stock
- Prioritization of VMI partners in case of shortages
- Centralized inventory decision making
- Supplier may not share the production planning information

Synchronized Supply

- Synchronized supply chain merges the replenishment decision with material planning of the supplier. Here supplier take the charge of the customer's inventory replenishment at the operational level and uses this visibility in planning his own supply operation.

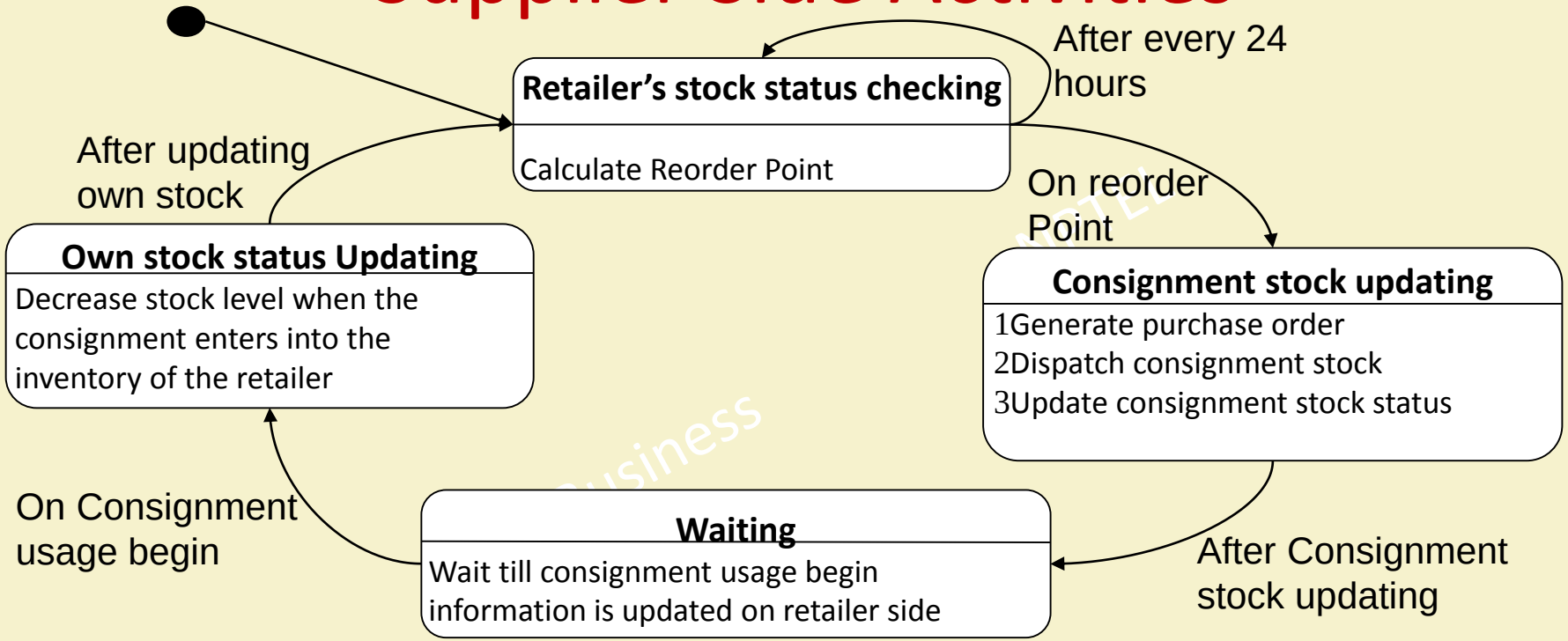
Key factors that guide supply chain collaboration strategy

Factor	Why important?
Geographical dispersion of customers and suppliers plant	The closer, and more dedicated supply is, the easier it is to implement synchronized production and inventory control.
Demand pattern of the product	The more stable the product's consumer demand, the greater the dynamic benefits of eliminating bullwhip effect and synchronizing demand and supply in the system.
Product characteristics, in particular selling periods and shelf life, as well as value	The longer the shelf life or the selling period of the product, the more sensible it is to consider collaborative practices. The more valuable the product, the more impact tighter inventory control yields

Interoperability issues during collaboration

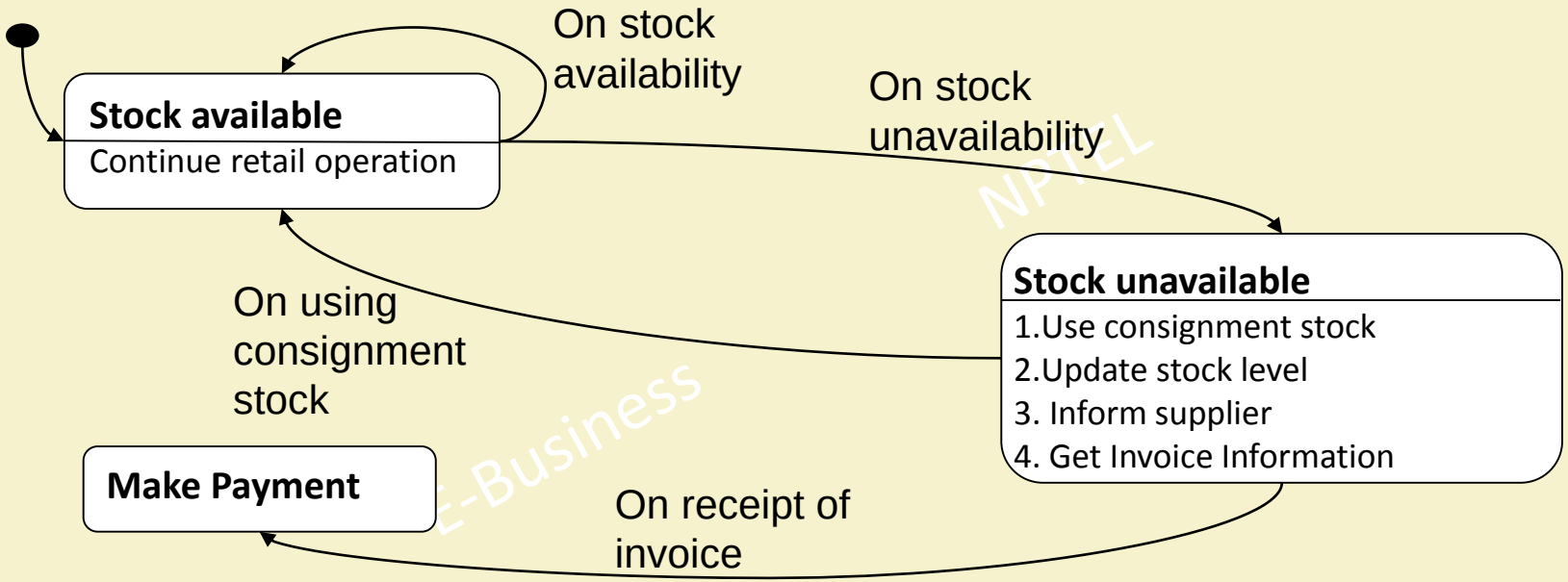
A Motivating Example:
Vendor Managed Inventory Systems

Supplier Side Activities



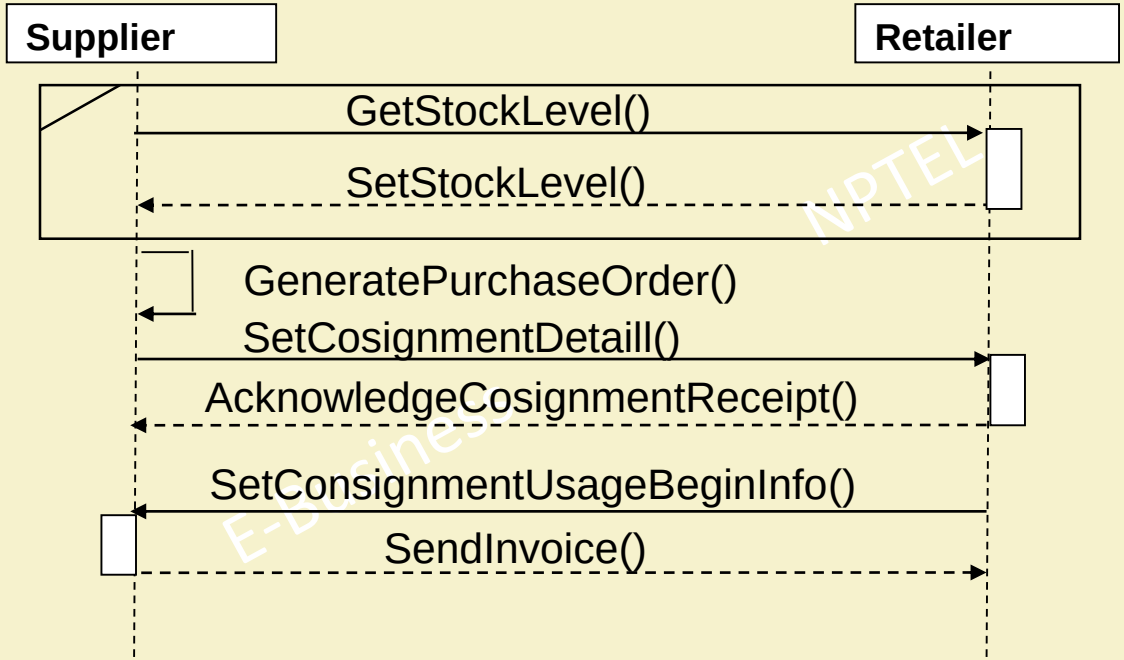
A model using state chart diagram

Retailer Side Activities



A Model using statechart diagram

Information Flow
Between a Supplier and a Retailer



Modeling information flow using an UML sequence diagram

Integration Issues in VMI implementation

- *Information Integration:*
  - The supplier is responsible for maintaining retailer's service level. Therefore, supplier's information system need to be integrated with that of the retailer's to shares POS data and inventory status.

Integration Issues in VMI implementation

- *Planning Synchronization:*
  - The supplier forecasts the demand and prepares the purchase order sends it to the retailer. The retailer may request to modify the purchase order if certain exceptions arise such as fill rate is not satisfied or retailer expects the demand to go up etc., or accepts it. This synchronization is essential to optimize the inventory level.

Integration Issues in VMI implementation

- *Workflow Coordination:*
  - The whole VMI system can be viewed as two inter related cycles: replenishment cycle and the payment cycle. Each cycle is a workflow consisting of a set of activities linked together.

Integration Issues in VMI implementation

- *Monitoring and Measurement:*
  - Monitoring of retailer and vendor activities is essential to the success of VMI processes. VMI operation consists of three flows: information flow, material flow and credit flow. Three flow are to be synchronized to make a successful VMI system. Suppose the retailer starts using the consignment stock but forgets to report it to the vendor, i.e., does not update the status in VMI system then the replenishment cycle gets disrupted.

Week 4: Lecture 4

SUPPLY CHAIN MANAGEMENT – III
-LOGISTICS AND DISTRIBUTION

We are going to learn

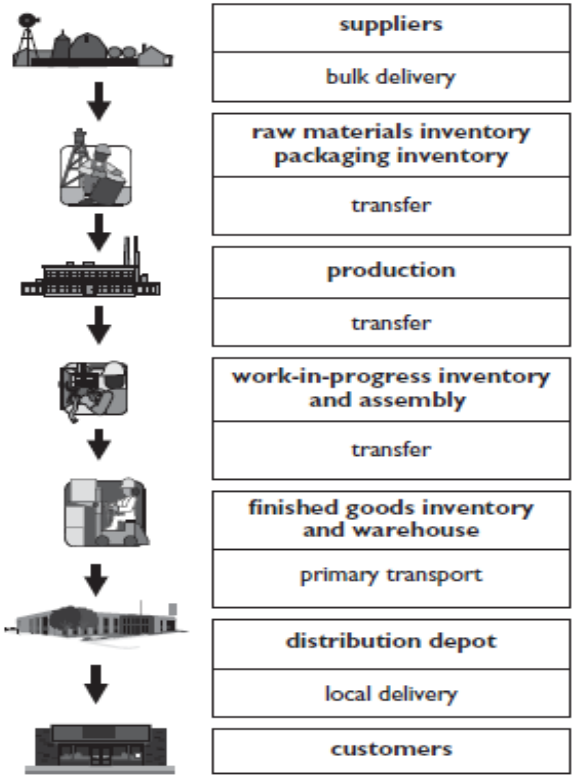
- Typical activities under logistics and distribution
- Components of a logistics information system
- Warehouse management system
- Transportation management system

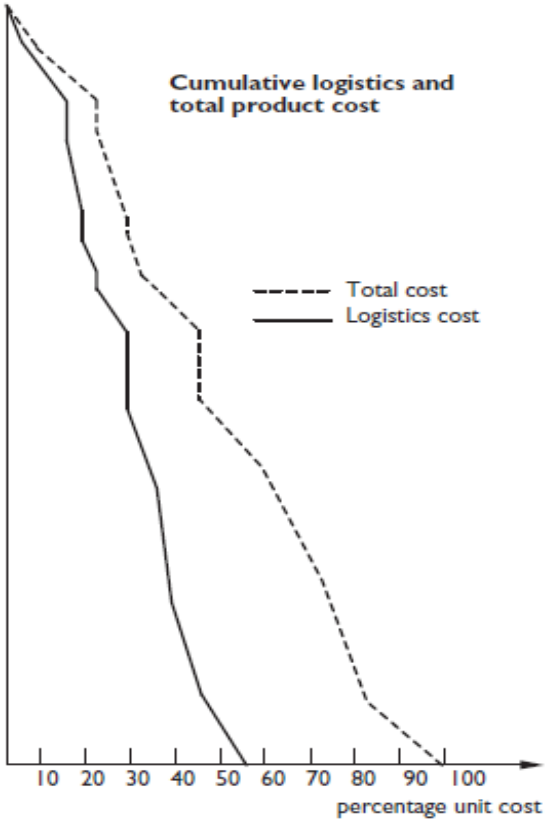
Logistics

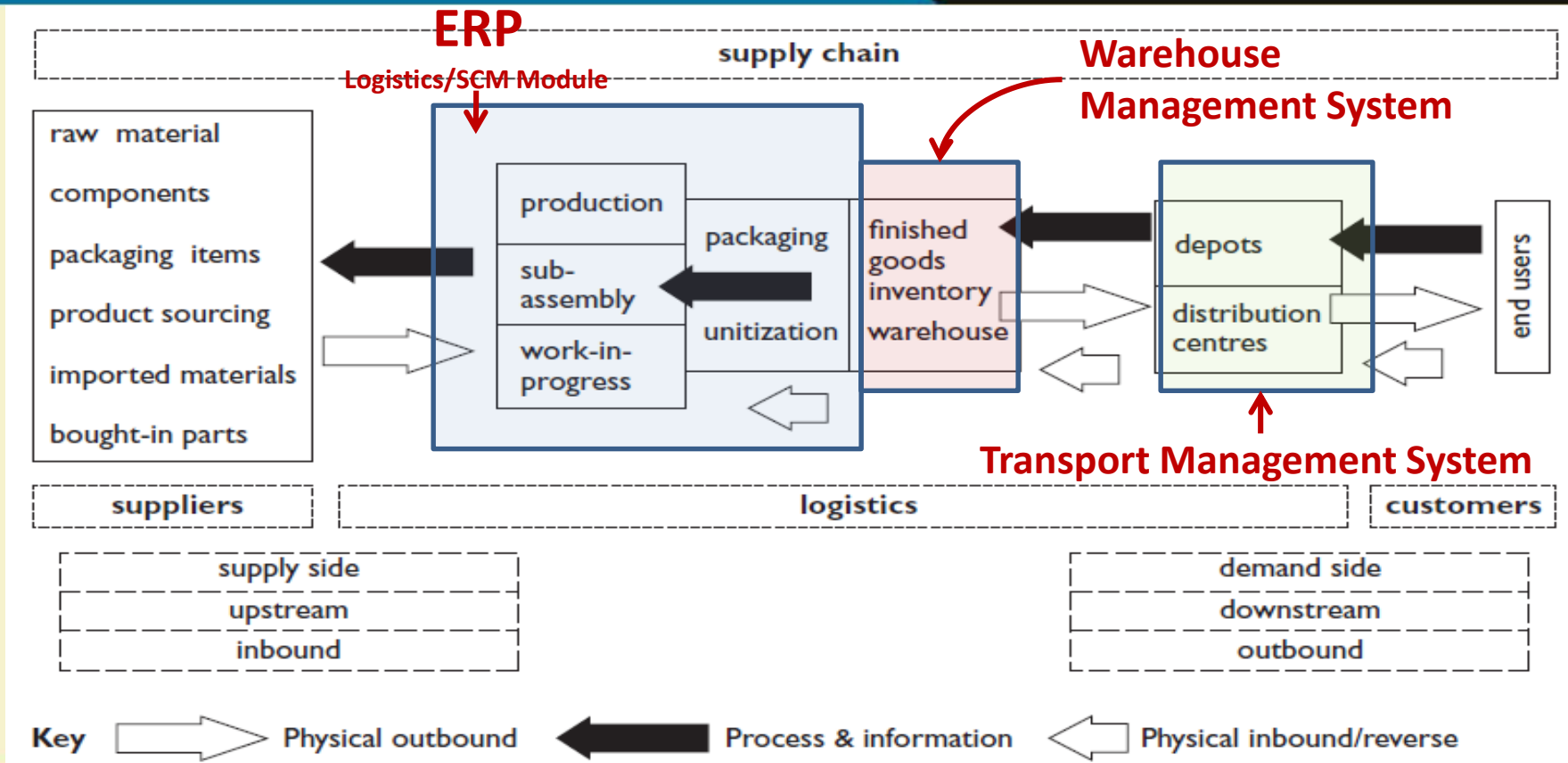
- logistics concerns the efficient transfer of goods from the source of supply through the place of manufacture to the point of consumption in a cost-effective way whilst providing an acceptable service to the customer.
- Supply Chain = Suppliers + Logistics + Customers
- Logistics = Materials management + Distribution

Rushton, Alan, Phil Croucher, and Peter Baker. *The handbook of logistics and distribution management: Understanding the supply chain*. Kogan Page Publishers

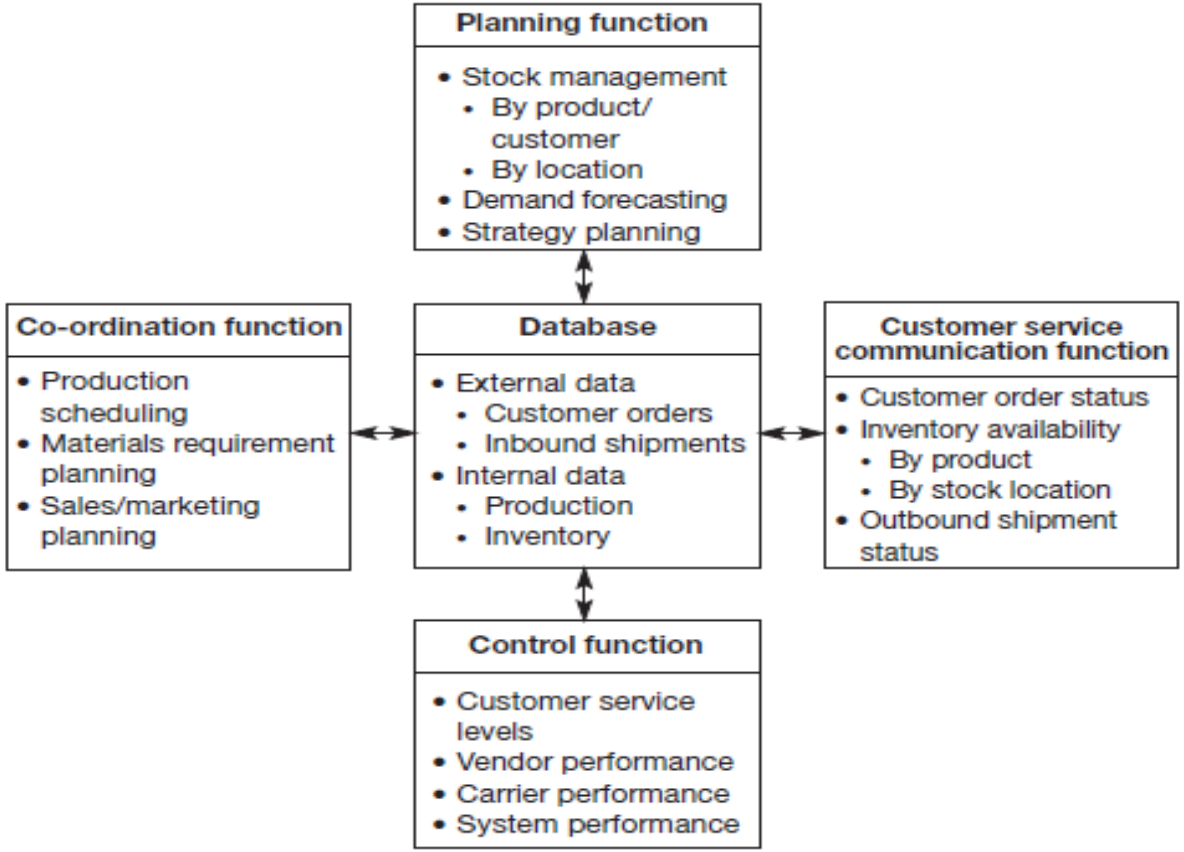
Typical physical flow of material from suppliers through to customers, showing stationary functions and movement functions






ERP
Logistics/SCM Module
supply chain
Warehouse
Management System
raw material
components
packaging items
product sourcing
imported materials
bought-in parts
production
sub-assembly
work-in-progress
packaging
unitization
finished goods inventory
warehouse
depots
distribution centres
end users
Transport Management System
suppliers
logistics
customers
supply side
upstream
inbound
demand side
downstream
outbound
Key
Physical outbound
Process & information
Physical inbound/reverse

Typical functions of a logistics information system



Christopher, M., 2016. *Logistics & supply chain management*. Pearson UK.

Warehouse management

- The management of a large distribution centre is a complex task. There may be thousands of orders received in a day, across a range of thousands of SKUs, and all requiring consolidation by individual order, packing and dispatch in possibly hundreds of vehicles.

Warehouse management system

- The WMS normally interfaces with the company's main transaction system (such as an ERP or legacy system) to access information such as purchase orders and to download customer orders.
- WMS will feed back information such as goods received and dispatched to ERP.
- The WMS is used to control all the operations in the warehouse and issues instructions to subsidiary systems, such as equipment control systems

Typical functionalities of WMS

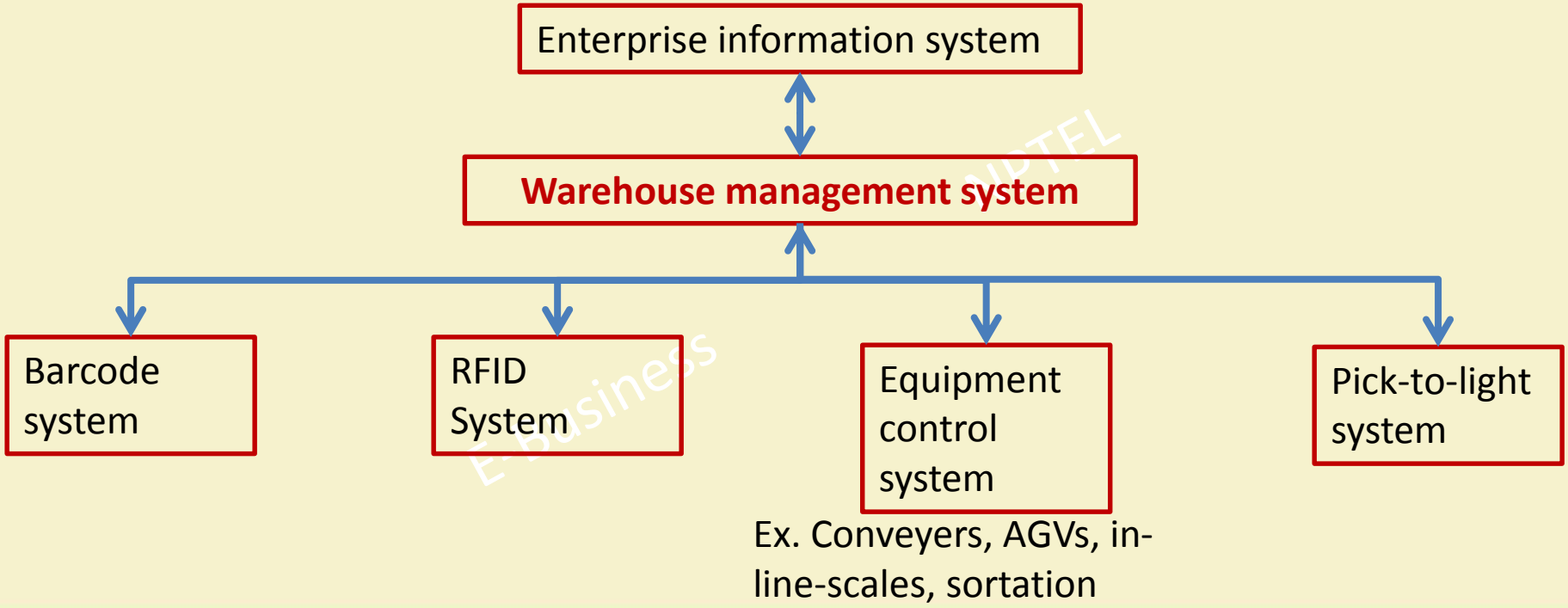
- ***receiving:*** yard planning, checking against electronic advance shipping notices (ASNs), checking for dimensions and weights, quality sampling;
- ***put-away:*** algorithms to determine the best storage location, support for all feasible storage types
- ***replenishment:*** fixed trigger point or order-based replenishment to pick locations;
- ***picking:*** pick route optimization, slotting (ie optimum location of each SKU in pick face)

Typical functionalities of WMS

- ***added value services:*** kitting, labelling, fi nal assembly (requiring bills of materials);
- ***packing:*** identification of correct carton size (by database of dimensions for all SKUs);
- ***cross-docking:*** planning, labelling and sortation;
- ***sortation:*** by various categories, such as by order, vehicle or geographical area

Typical functionalities of WMS

- ***dispatch:*** documentation, transmission of ASNs;
- ***management:*** workload planning, performance measurement, productivity schemes, modelling, billing, pallet management, customs reporting;
- ***stock counting:*** full count and perpetual inventory.
- ***Tracking goods*** by inward batch numbers



WMS and ERP

- WMS accesses information such as purchase orders and to download customer orders.
- WMS feeds back information such as goods received and dispatched
- WMS controls all the operations in the warehouse and issues instructions to subsidiary systems.

WMS and Equipment Control systems

- WMS controls all the operations in the warehouse and issues instructions to subsidiary systems.
  - WMS may issue an instruction to an AS/RS control system for a crane to move a specific pallet from a pick-up and deposit station at the end of the aisle to a particular location in the racking. The equipment control system will then direct the crane and provide feedback and diagnostics if the crane cannot fulfil this operation (eg owing to mechanical failure).

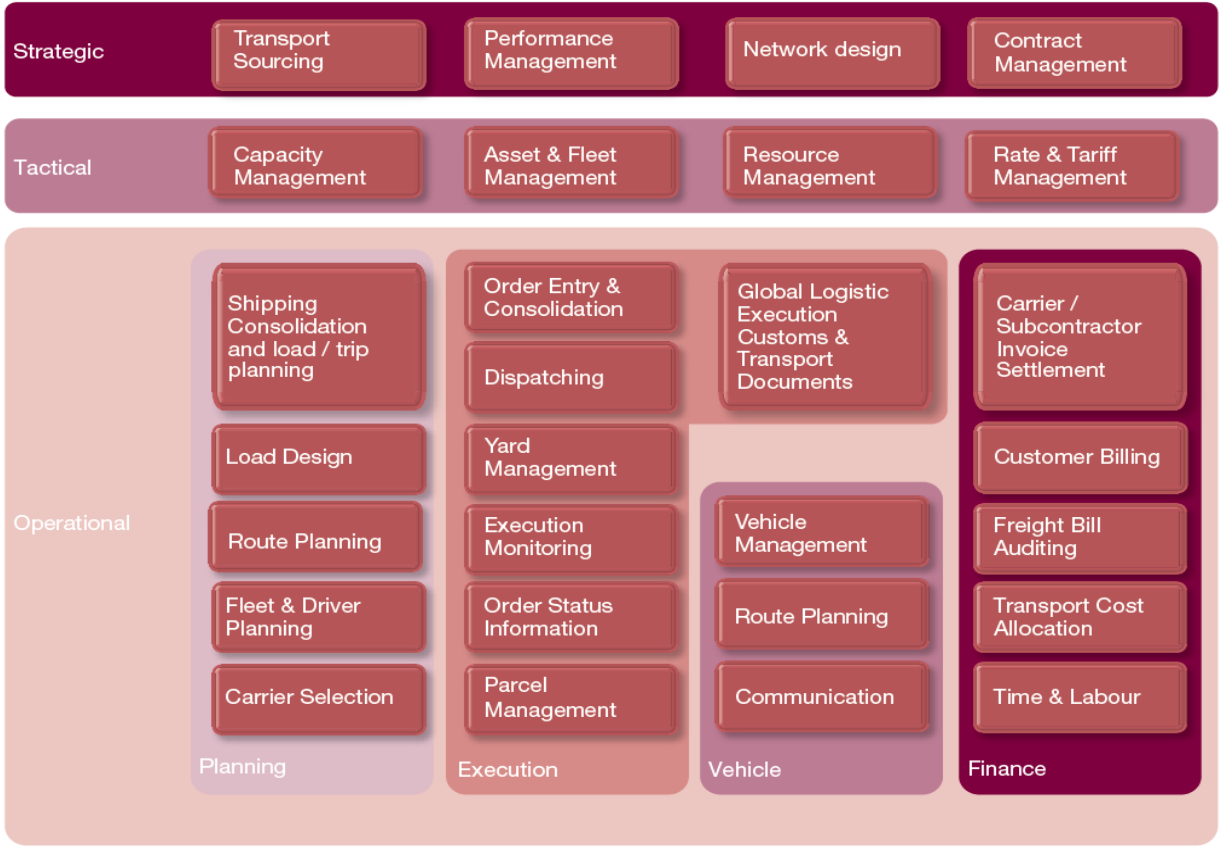
WMS and Pick-to-light

- WMS inputs the instruction to Pick-to-light system for guiding the operators
  - Pick to light is order-fulfilment technology that employs alphanumeric displays and buttons at storage locations to guide the manual "picking" and recording of items for shipment.

Automatic data capture and transmission

- Barcode
  - Line of sight technology
- RFID
  - Radio wave transmission

TMS functional reference model and domains



Transportation Management Report 2011, Capgemini Consulting, http://bambam.gmu.edu/PUBP716/Transportation_Management_Report_2011.pdf

Strategic transportation functionality

- *Transport Sourcing:* Sourcing and procurement process of transportation
- *Performance Management:* Performance of the total transportation process based on the past data (Business Intelligence)
- *Network Design:* Strategic planning to optimize the distribution network of the organization.
- *Carbon Footprint Calculations:* calculation of the CO2 footprint of the distribution network
- *Contract Management:* to manage the (transportation) contracts between the organization and its suppliers.

Tactical transportation functionality

- *Capacity Management*: The management of transportation capacity to ensure that enough capacity is available when needed.
  - Forecasting, simulation
- *Asset and Fleet Management:*
  - Management activities to control the (transportation) assets that are owned or for which longer term use contracts imply a responsibility and liability for the organization.
  - Fleet management can include a range of functions: Vehicle financing, vehicle maintenance, vehicle telematics, fuel management, and health and safety management.
  - transportation units like trucks and trailers, railcars, ships, etc.
  - management of re-usable load units like containers or pallets.

Tactical transportation functionality

- *Resource Management:* The efficient and effective deployment of an organization's own employees and hired employees when they are needed
- *Rate and Tariff Management:* Registration of transportation rates for customers and (subcontracted) carriers
  - Across the political boundaries, considering tariff and tax

Operational transportation functionality: Planning

- *Shipping Consolidation and Load/Trip Planning:* the planning of the physical loads for placement in a truck (or another transport unit, depending on the mode of transport).
- *Load Design:* Plan how the goods will be stored in the truck (three dimensional)
- *Route Planning:* Based on the created trip, the actual route is determined at the street level, taking into consideration granular geographic information.

Operational transportation functionality: Planning

- *Fleet and Driver Planning:*
  - In case own equipment is used to execute the actual shipment
    - allocates vehicles and drivers to planned loads and routes. Constraints: driving hours, the current location of drivers, equipment and the condition of the equipment.
- *Carrier Selection:*
  - transport mode selection
  - the selection of the actual carrier.

Operational transportation functionality: Execution

- *Order Entry and Consolidation:* Registration, validation and management of orders.
- *Dispatching:* The carriers or own drivers need to be informed.
- *Order Status Information:* The process used to record the information related to the pick-up/collection and delivery of shipments.
- *Global Logistic Execution/Customs and*
- *Transport Documents:* Supporting international transportation with trade compliance for import and export.

Operational transportation functionality: Execution

- *Yard Management:* This deals with the management and administration of a company's yard and the dock doors of the distribution center.
- *Parcel Management:* A mode of transport that has specific requirements for the execution. (Express parcel)
- *Execution Monitoring:* The fulfillment of a transport order is monitored and corrective actions are supported
  - Visualization and traceability

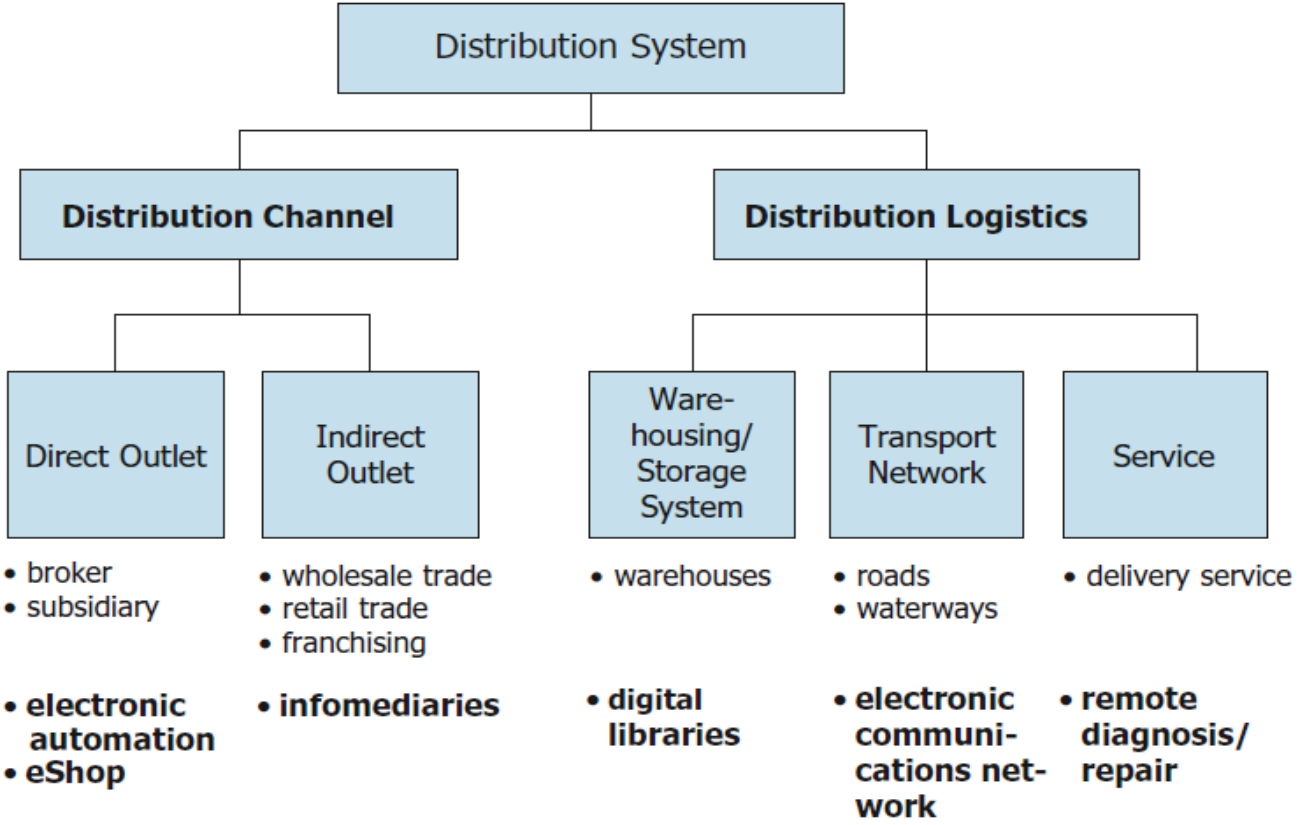
Week 4: Lecture 5

SUPPLY CHAIN MANAGEMENT – IV
-E-COMMERCE SUPPLY CHAIN

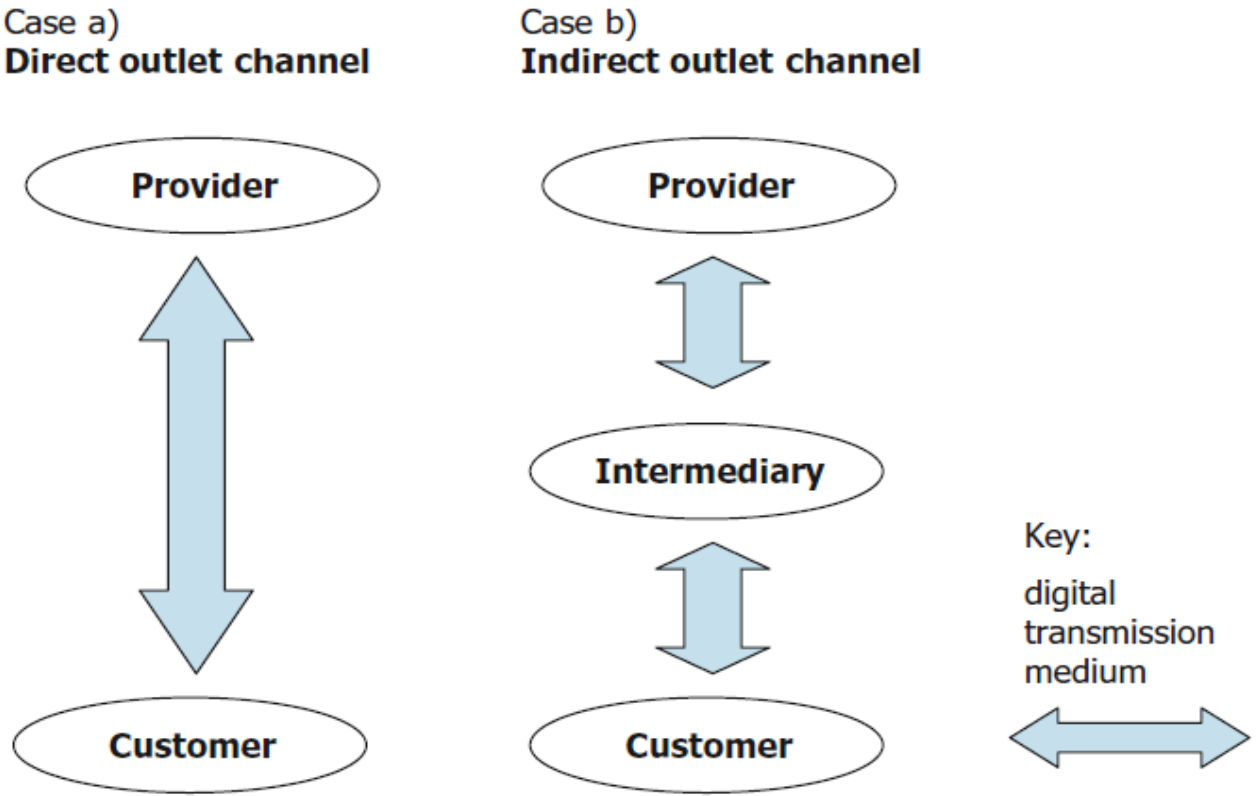
We are going to learn

- Distribution of digital goods
- Direct, indirect and hybrid distribution
- Distribution network options
- On demand production

Distribution channel and distribution logistics



Online Distribution of digital products



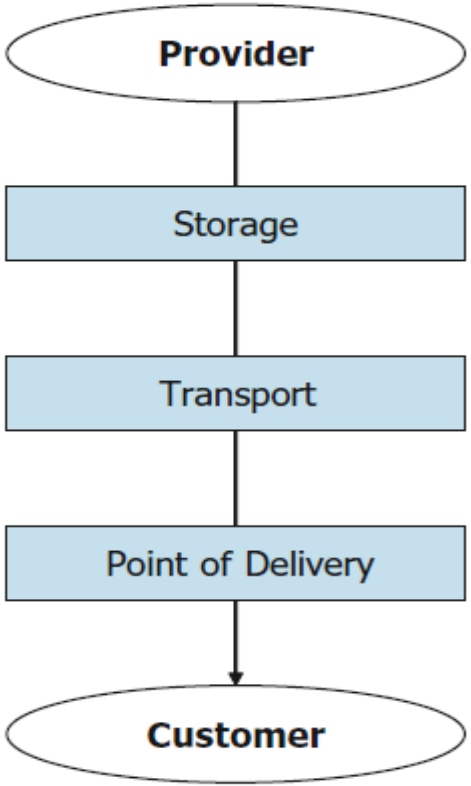
Advantages on online distribution

- The customer's wish to buy can be fulfilled immediately and at any time.
- The dealer or producer has direct customer contact
- Bottlenecks in the reproduction of the digital goods and long delivery times do not occur.
- Price and cost advantages result from the lower production, storage, and distribution costs involved.
- Niche products with low circulation can be sold more economically with appropriate organization of the distribution system.

Disadvantages

- Digital products can be copied and distributed illegally.
  - Security issues, digital watermarks
- Customers' access to digital network
- Customers have their search, decision, and purchase behavior recorded
  - Target marketing
- The distribution costs are in most cases passed on to the customer directly
- No social and interpersonal contact
  - Decrease in loyalty
- Loss of quality for compressed digital goods

Offline distribution



- temperature requirement
- place and number
- space requirement

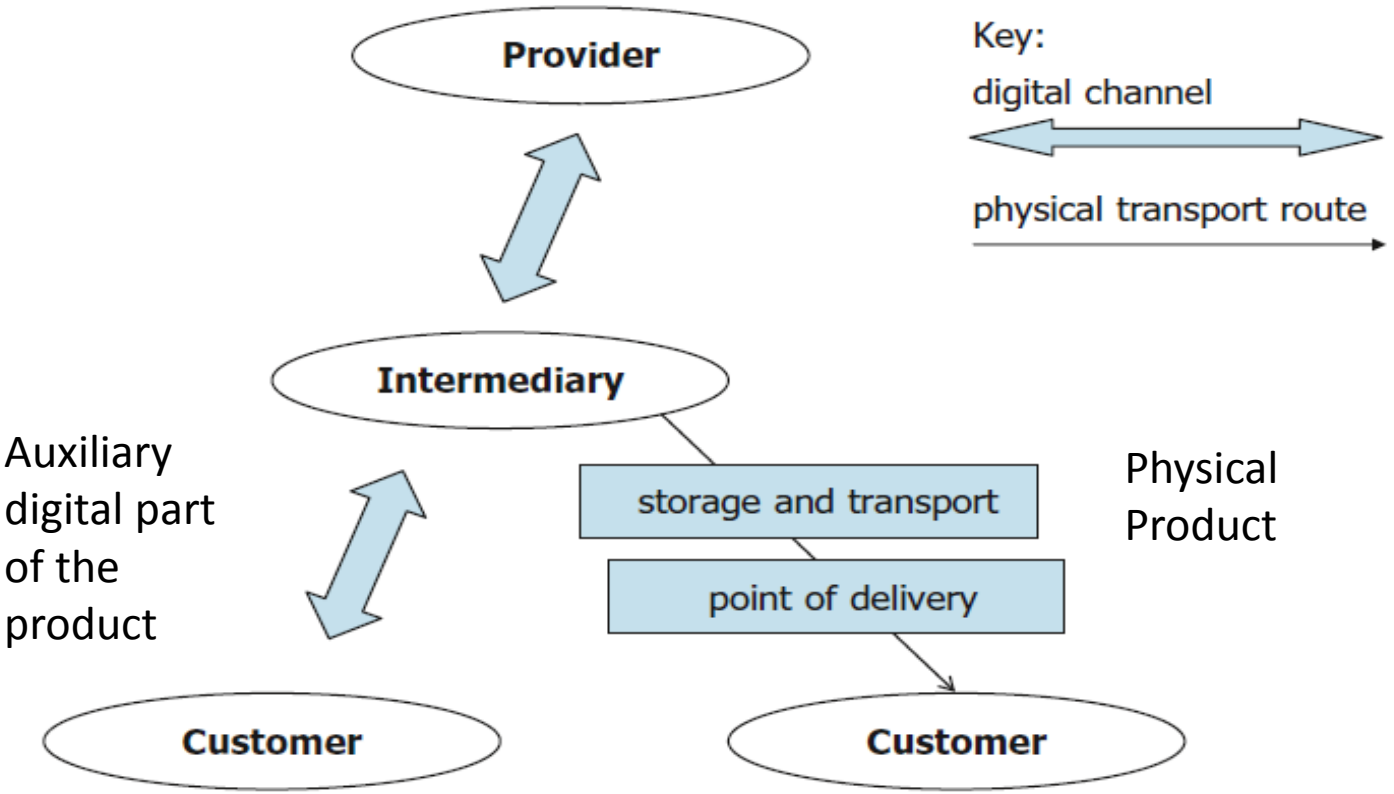
- time demand
- optimizing the routes

- delivery or collection
- time of hand-over

Key:

physical transport route

Hybrid Distribution

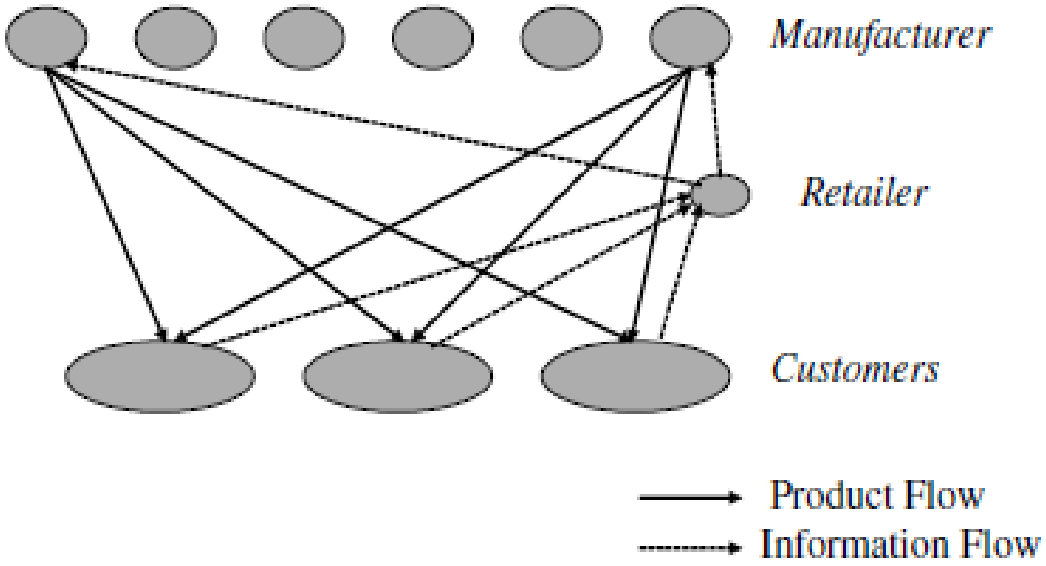


Design Options for a Distribution Network

- Manufacturer storage with direct shipping
- Manufacturer storage with direct shipping and in-transit merge
- Distributor storage with package carrier delivery
- Distributor storage with last mile delivery
- Manufacturer/distributor storage with costumer pickup
- Retail storage with customer pickup.

Chopra, S., 2003. Designing the distribution network in a supply chain. *Transportation Research Part E: Logistics and Transportation Review*, *39*(2), pp.123-140.

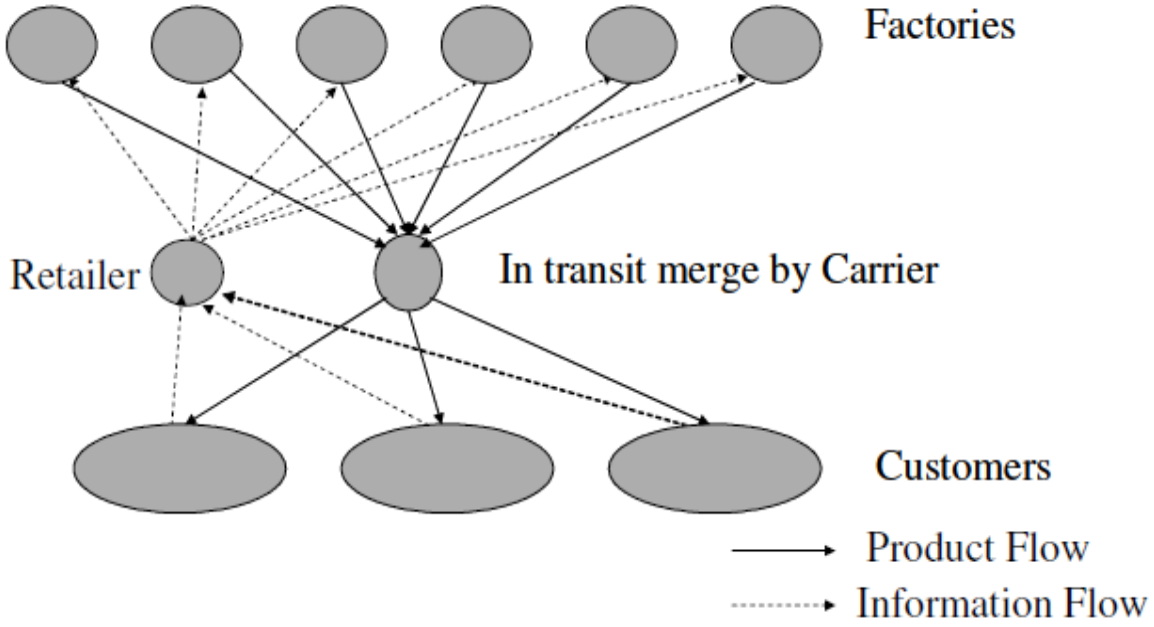
Manufacturer storage with direct shipping



The product is shipped directly from the manufacturer to the end customer, bypassing the retailer (who sometimes takes the order and initiates the delivery request)

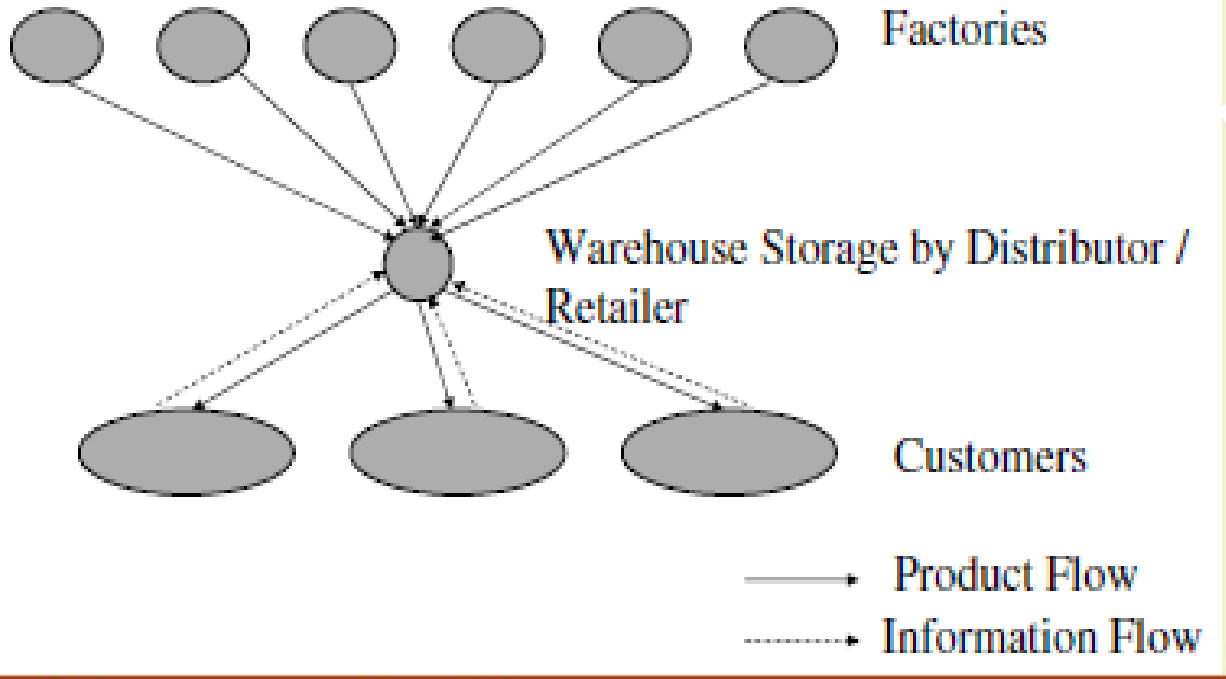
Ex. Dell, dropship by online retailers

Manufacturer storage with direct shipping and in-transit merge



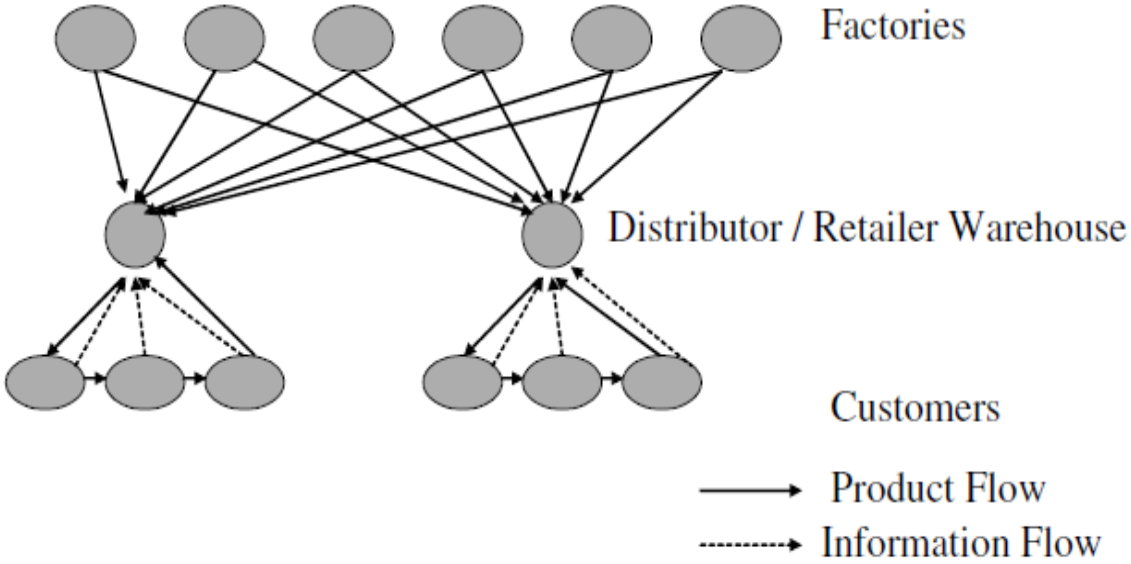
In-transit merge combines pieces of the order coming from different locations so that the customer gets a single delivery

Distributor storage with carrier delivery



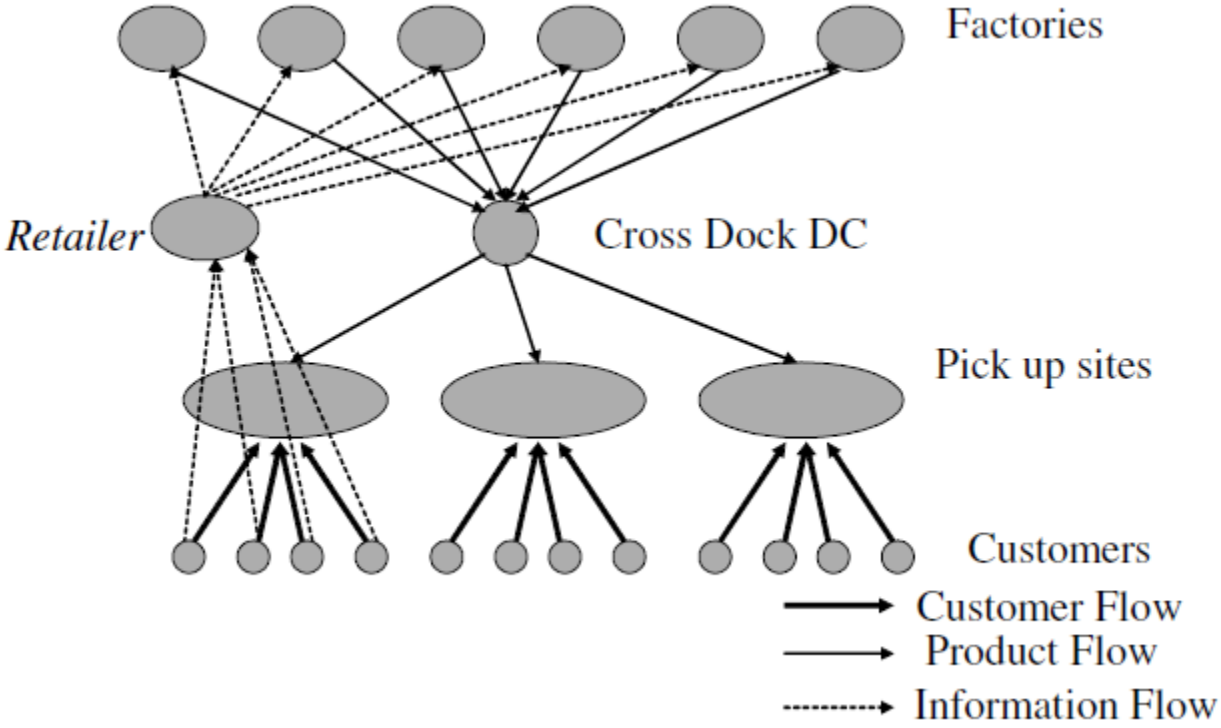
Inventory is not held by manufacturers at the factories but is held by distributors/retailers in intermediate warehouses and package carriers are used to transport products from the intermediate location to the final customer

Distributor storage with last mile delivery



Last mile delivery refers to the distributor/retailer delivering the product to the customers
home instead of using a package carrier.
Fast moving items and grocery items

Manufacturer or distributor storage with



Inventory is stored at the manufacturer or distributor warehouse but customers
place their orders online or on the phone and then come to designate pickup points to
collect their orders.

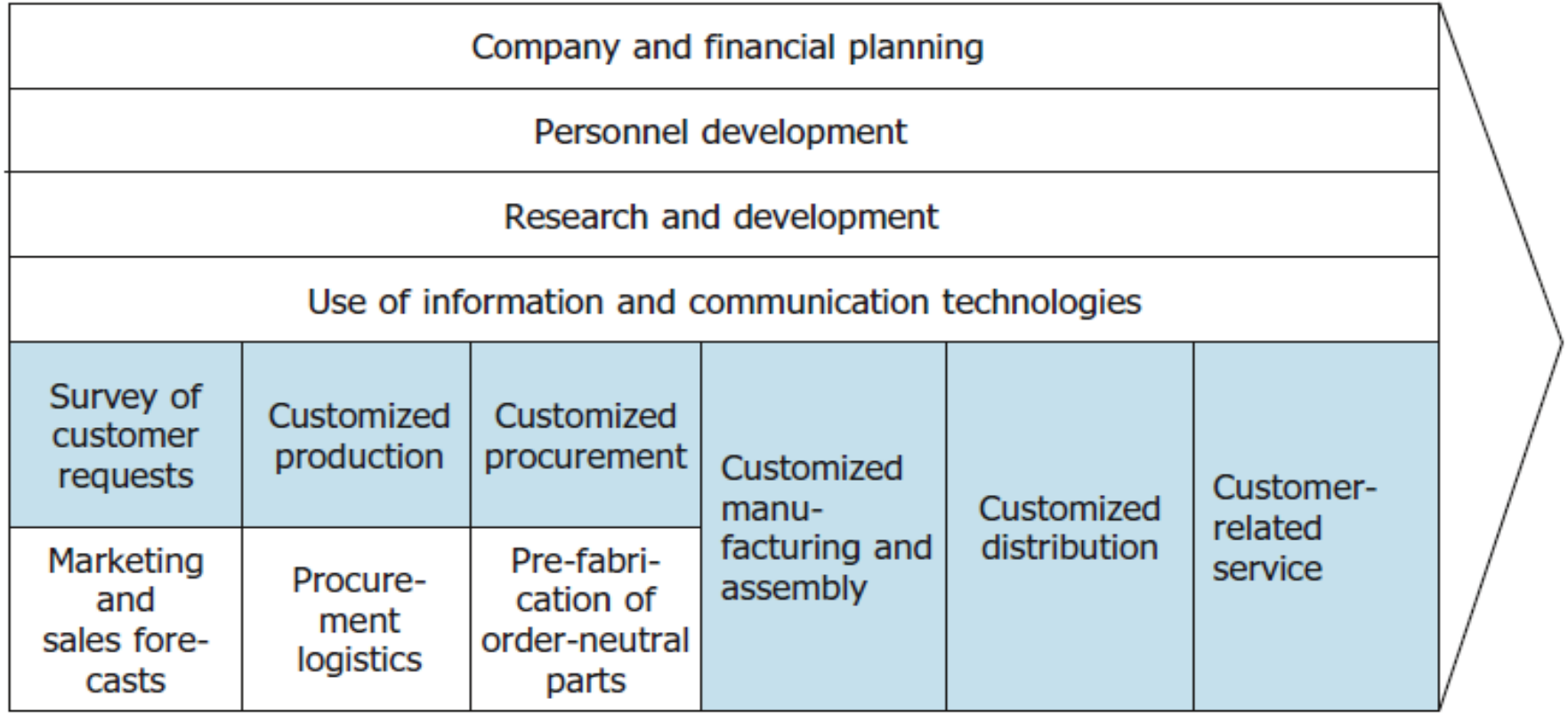
Retail storage with customer pickup

Inventory is stored locally at retail stores. Customers either walk into the retail store or place an order online or on the phone, and pick it up at the retail store

On-demand production

- On-demand production attempts to combine the advantages of mass *production* (cost leadership) with the advantages of order production (customer orientation, mass customization) for the individual customer.
- Based on concrete customer orders (i.e., on demand), an attempt is made to manufacture products and services at prices comparable to mass production.

Value chain with on-demand production



Advantages on On-demand production and distribution

- By comparing different product configurations, the customer can calculate different price models and select the optimal product configuration in terms of manufacture and delivery.
- The use of modeling, simulation, and visualization tools enables the customer to concretize and to partially specify his product idea based on given electronic product catalogs.
- After the customer's order for products and services has been distributed, an order tracking system enables the customer to follow the completion process right up to delivery.
- Customer dialog is maintained through different channels with multichannel management and is managed in the customer data warehouse in terms of updating the customer profile and computing the current customer value.
- A customer data warehouse systematically maintains the customer relationships and uses them for the entire value chain.