



NPTEL ONLINE CERTIFICATION COURSES

Management Information Systems

Prof. Surojit Mookherjee

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Week 04: Customer Relationship Management

Lecture 01 :

Customer Relationship Management

- ✓ Customer relationship management (CRM) is a strategy for managing a company's interactions with its customers and sales prospects.
- ✓ Often CRM is equated with automating business processes related to sales, marketing and customer service – CRM is not just about technology
- ✓ It involves strategy and redesign of business processes with the overall goal to find, attract, and win new customers, retaining those customers and finally getting feedback from them to better design company's product and customer facing processes.
- ✓ CRM can also reduce the costs of marketing, sales and customer service.

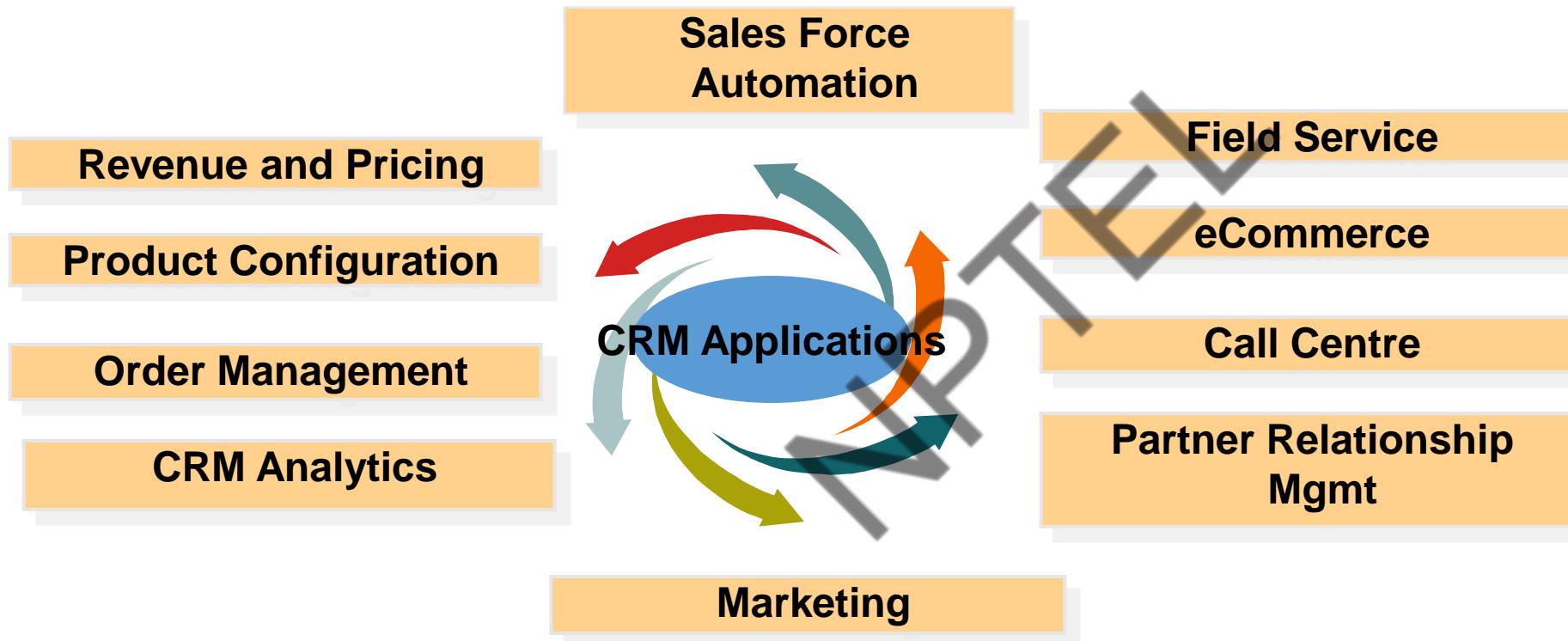
Customer Relationship Management

- ✓ CRM uses **people, processes, and technology** to gain insight into the behavior of customers
- ✓ CRM can bring together information from all data sources within an organization (and from outside the organization if needed) to give **one holistic view of customer in real time.**
- ✓ CRM allows customer facing employees from sales, customer support, and marketing to **make informed decisions** on everything from cross selling and upselling opportunities to target marketing strategies to competitive positioning tactics.

CRM Benefits



CRM Application Areas



Sales Force Automation (SFA)....

Typical areas of sales force automation applications are:

- ✓ Contact management
- ✓ Lead management / Opportunity management
- ✓ Sales forecasting and pipeline
- ✓ Sales performance management
- ✓ Territory management
- ✓ Quote generation

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Sales Force Automation (SFA)

SFA applications help sales force in their daily jobs and aimed at increasing their productivity.

With these applications sales force need not remember or store contact information of thousands of company's existing customers and new prospects.

SFA applications help them to manage new leads and sales opportunities.

These applications helps sales force in managing sales in their territory and tracking sales performance, based on which they are provided incentive / compensation.

Field Service Application

As companies need to manage a large number of mobile technicians distributed across different customer sites, Mobile solutions are increasingly becoming an important component of field service applications.

Typical capabilities of field service applications are:

- ✓ Filed service management (Utility services like Power distribution , civic amenities)
- ✓ Scheduling workforce
- ✓ Managing spares / service parts
- ✓ Mobile Solutions capability

Field Service Application

These applications typically helps in different after sales service functions i.e. helps managing installation, service, or repairs of systems or equipment

These solutions also support scheduling workforce i.e. which worker should go to which customer site and attend which type of equipment / problem based on worker's availability and skill.

Some of these after sales service activities need some kind of spares, managing reverse logistics and spare parts management and these are under the domain of these applications.

E Commerce Application

Typical capabilities of E Commerce applications are:

- ✓ eMarketing
- ✓ Campaigns
- ✓ Personalization
- ✓ Online ordering
- ✓ Online product configuration
- ✓ Online auctions
- ✓ Online exchange and return
- ✓ Online Billing and Payment

E Commerce Application

These applications help companies to buy, sell, and do other transactions over the Web.

Companies use these applications for variety of purpose like product search / browse, buying through shopping cart, product promotion, personalization, cross-sell and up-sell, product configurations, registries, multichannel ordering, customer self service etc.

Today e-commerce is becoming even more powerful with Web 2.0. It has even spread to small towns and rural areas.

Easy availability of Smart phones and Data services have played a great role in spreading the popularity of e-commerce

Call Centre / Contact Centre Application

Typical capabilities of call centre applications are:

- ✓ Predefined escalation route
- ✓ Previous records of the caller
- ✓ Support in different time zones in different languages
- ✓ Managing call assignments
- ✓ Knowledge Base
- ✓ Self service capabilities
- ✓ Workflow

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Call Centre / Contact Centre Application

These solutions provide customer support by answering different types of customer queries / calls and routing the calls to the most competent person who can handle it.

Call centre uses a variety of technologies like: local area networks (LAN), automatic call distributors (ACD), computer technology integration (CTI), Web integration, interactive voice response, voice logging and messaging, IVR/speech portals etc. Call centers today are capable of supporting complex customer interactions, such as scheduling service requests, providing technical support, and handling financial transactions.

Partner Relationship Mgmt (PRM) Application....

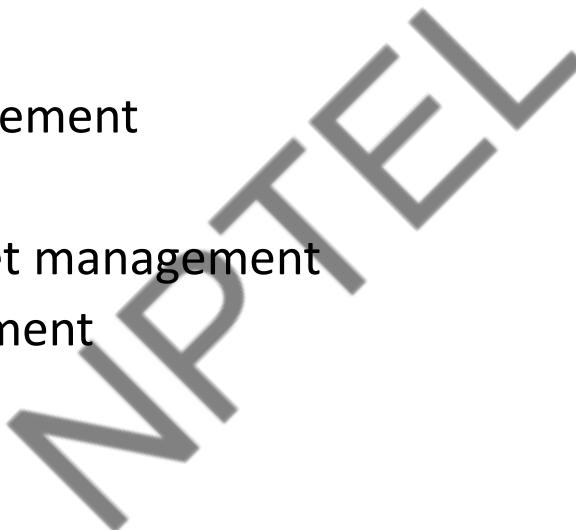
Typical capabilities of Partner Relationship Management applications are:

- Partner addition
- Distributing leads
- Partner profiling
- Managing different partner programs
- Partner opportunity tracking
- Special partner discounts and approvals
- Partner service
- Managing channel inventory / partner pipeline:

Marketing Mgmt Application....

Typical capabilities of Marketing Management applications are:

- Campaign management
- Customer interaction management
- Marketing planning
- Marketing resource and asset management
- Opportunity / Lead management
- Loyalty marketing



Marketing Mgmt Application

These applications are used by companies to manage their end-to-end process from gathering and analyzing customer data across Web sites and other channels, to planning, budgeting, to executing customer communications and measuring results / effectiveness.

It helps the enterprise identify and target its best customers and generate qualified leads for the sales team.

Marketing automation also encompasses capabilities for managing customer loyalty, lists, collateral, and internal marketing resources.

These tools support an integrated approach to marketing strategy, development, delivery, and measurement across the marketing mix.

Revenue and Pricing Mgmt Application

Typical capabilities of Revenue and Pricing Management applications are:

- Trade promotion management
- Promotions
- Pricing and promotion optimization

These applications help companies to optimize and manage prices throughout the product life cycle, including: initial pricing, promotional, and markdown or clearance pricing.

Product Configuration Application

These tools are popular for complex products and services.

These applications help customers to configure a product as per their desired specification on the web (e.g Dell Desktops)

Based on this configuration, company's sales staff can quote and generate a price proposal quickly.

These applications can automate sales and product configuration, proposal configuration, cost estimation and pricing and can compress the entire lead-to-order process.

CRM Analytics

There can be different types of CRM analytics like:

- ✓ **Sales analytics:** This allow companies monitor and understand customer actions and preferences, through dashboards that graphically display KPIs.
- ✓ **Marketing analytics** Marketing applications generally come with predictive analytics to improve customer segmentation and targeting, and tools to measure the effectiveness (ROI) of a marketing / sales promotion campaign.
- ✓ **Customer service analytics** are increasing in popularity as companies demand greater visibility into the performance of call centers and other support channels, in order to correct problems before they affect customer satisfaction levels.

Leading CRM Products

- ✓ SAP CRM
- ✓ Oracle Siebel
- ✓ Salesforce.com
- ✓ Microsoft
- ✓ Amdocs

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REFERENCES

- Enterprise Resource Planning, Rajesh Ray, Tata McGraw-Hill – Chapter 28
- Management Information Systems: Managing the Digital Firm - Kenneth C. Laudon & Jane P. Laudon



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Week 04: Supply Chain Management

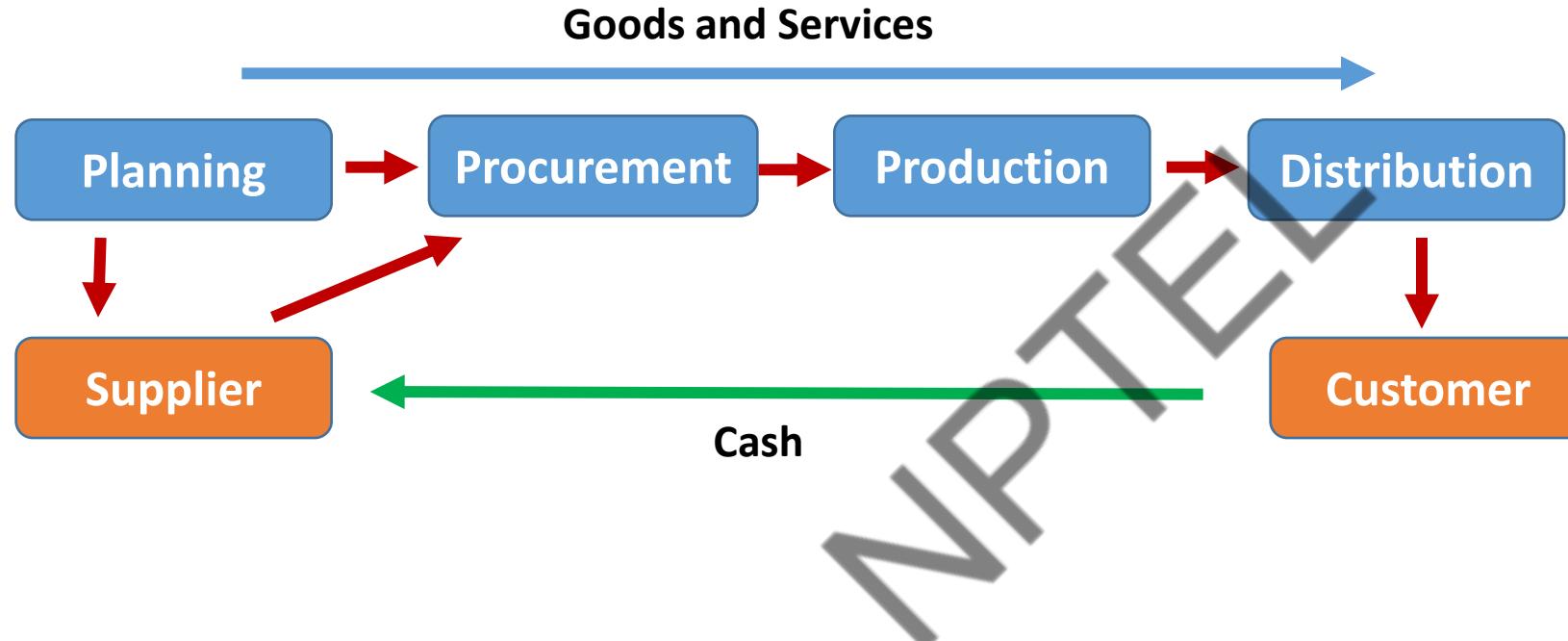
Lecture 02 : SCM – Part 1

What is Supply Chain ?

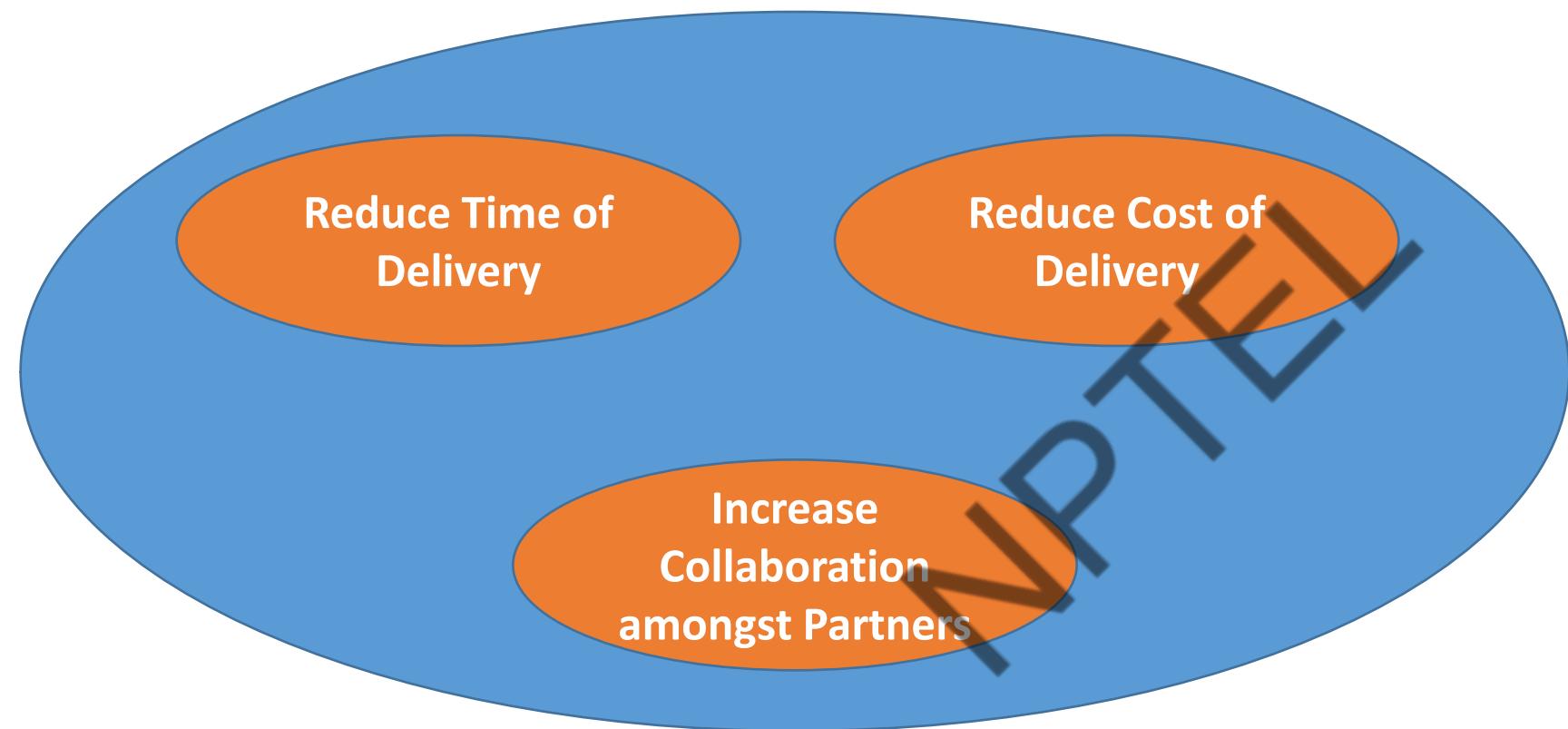
Supply Chain Management is a complete process of changing the raw materials into goods and delivering them to the end-user.

- It is a process of managing the flow of goods/ services starting from the supply of raw materials to the manufacturer until the delivery of the final good to the consumer. It involves **material flow** and **information flow**.
- SCM involves the supply and storage of raw materials, production of goods, transporting and delivering it to the end-user.
- Supply Chain is a network of individuals, resources, organizations, processes, technologies connected together to produce a product/service.

The Supply Chain Management Process



3 Key Features of SCM What it tries to achieve ?



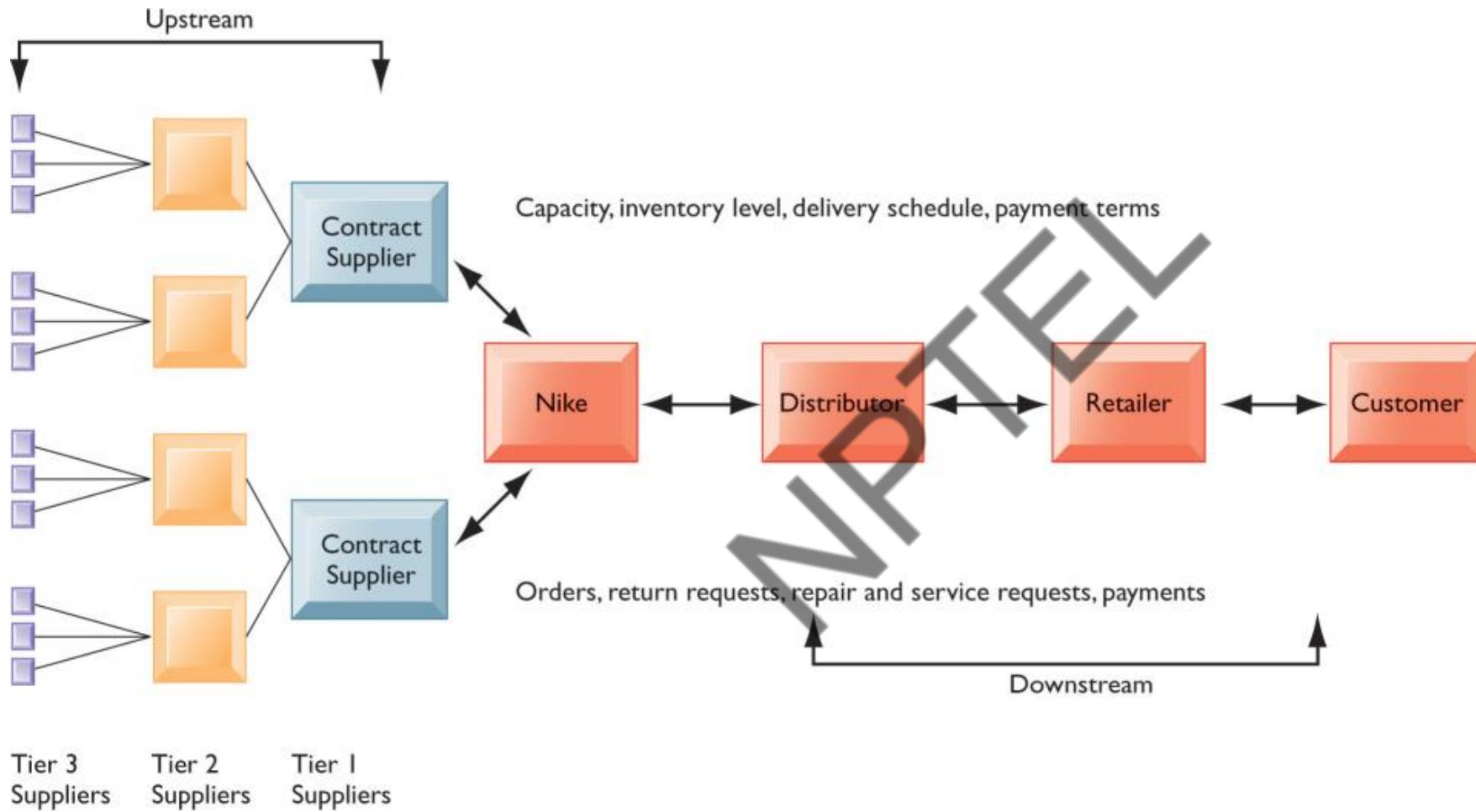
What is Supply Chain Management

- Manage a firm's relationships with Suppliers / Vendors and Customers
- Share information about :
 - ❖ Orders,
 - ❖ Production,
 - ❖ Inventory levels,
 - ❖ Delivery of products and services
- Goal:
 - Right amount of products to destination with least amount of time and lowest cost

Supply Chain is

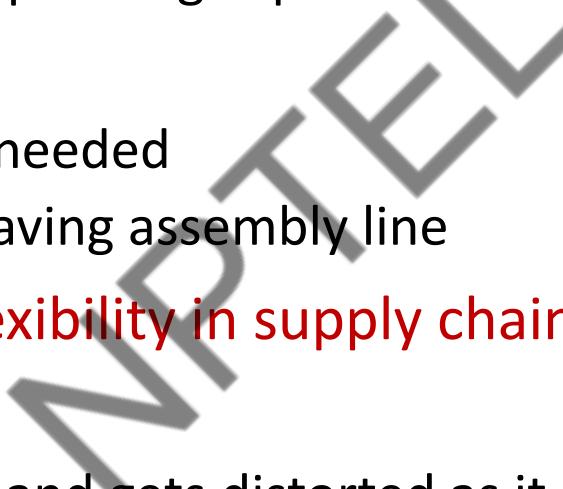
- **Network of organizations and processes for:**
 - Procuring materials, transforming them into products, and distributing the products
- **Upstream supply chain**
 - Firm's suppliers, suppliers' suppliers, processes for managing relationships with them
- **Downstream supply chain**
 - Organizations and processes responsible for delivering products to customers
- **Internal supply chain**
 - Inside the factory between stores , shop-floor and warehouse.

Nike's Supply Chain



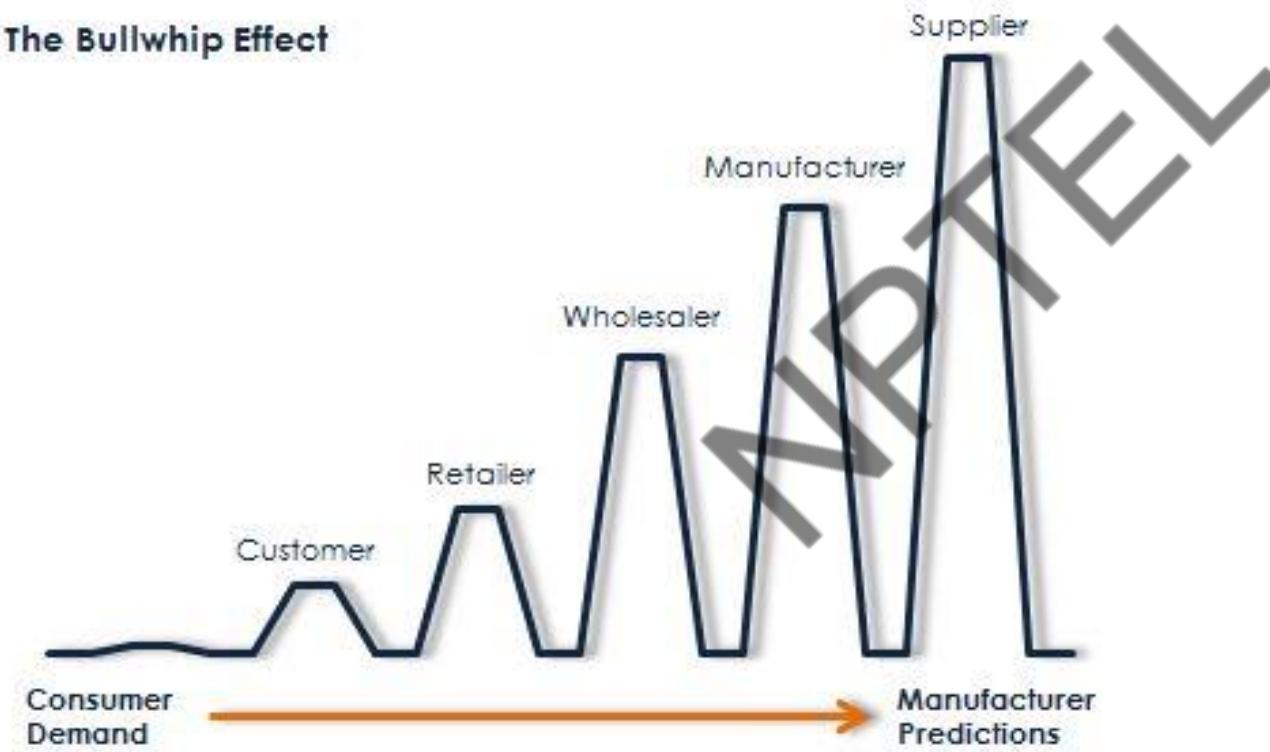
Supply Chain Management - Features

- Inefficiencies cut into a company's operating costs
 - Can waste up to 25 percent of operating expenses
- Just-in-time strategy
 - Components arrive as they are needed
 - Finished goods shipped after leaving assembly line
- Safety stock: Buffer for lack of flexibility in supply chain
- Bullwhip effect
 - Information about product demand gets distorted as it passes from one entity to next across supply chain



THE BULL-WHIP EFFECT

The bullwhip effect is the uncertainty caused from distorted information flowing up and down the supply chain.



Causes of the Bull-Whip effect

- ❖ Demand forecast updating
- ❖ Order batching
- ❖ Price fluctuation
- ❖ Rationing and shortage gaming
- ❖ Un-forecasted sales promotions
- ❖ Customers turning back sales orders

Impacts of the Bull-Whip effect

- ❖ Excess inventories
- ❖ Unnecessary costs
- ❖ Tense supplier relationships
- ❖ Stock outs
- ❖ Increased wastages
- ❖ Changes in buying patterns

Methods of coping with the Bull-Whip effect

- ❖ Improve communication along the supply chain
- ❖ Improve sources of forecast data
- ❖ Share Information
- ❖ Establish a demand-driven supply chain which reacts to actual customer orders – **Pull instead of Push system**
- ❖ Break order batches into smaller lots
- ❖ Stabilize prices
- ❖ Eliminate gaming in shortage situations

Supply Chain Management Systems

- Supply chain planning systems
 - Model To-Be supply chain based on Industry best practices
 - Enable demand planning through ERP
 - Optimize sourcing, manufacturing plans using Pull system
 - Establish inventory levels (e.g. Re-Order point planning)
 - Identify transportation modes
- Supply chain execution systems
 - Manage flow of products through distribution centers and warehouses

Global Supply Chains and the Internet

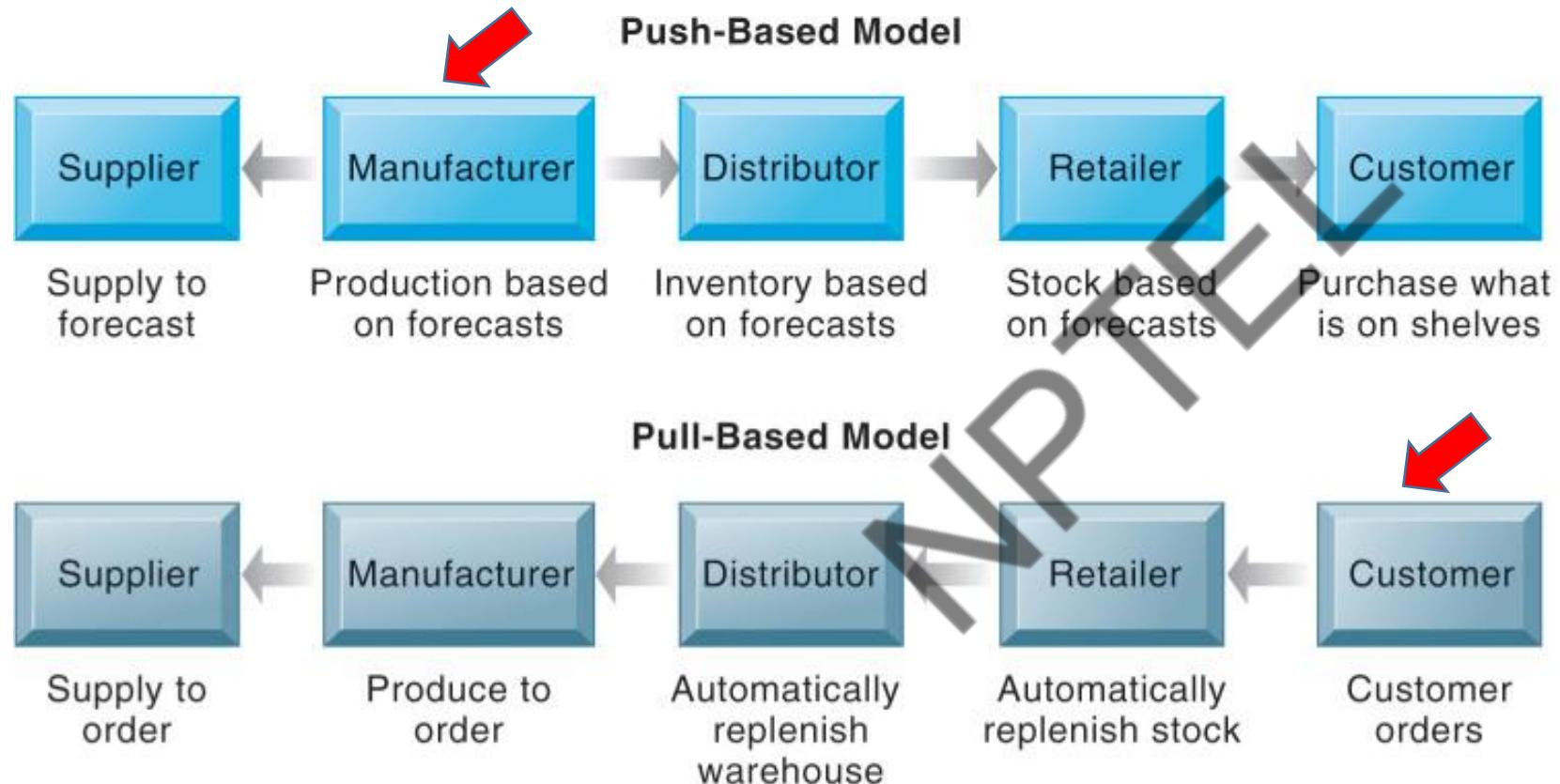
- Global supply chain issues
 - Greater geographical distances, time differences (e.g. most apparel sourced from South East Asian countries)
 - Participants from different countries
 - Different performance standards
 - Different legal requirements
- Internet helps manage global complexities
 - Warehouse management
 - Transportation management
 - Logistics
 - Outsourcing

Demand-Driven Supply Chains: From Push to Pull Manufacturing and Efficient Customer Response

- Push-based model (build-to-stock)
 - Earlier SCM systems
 - Schedules based on best guesses of demand
- Pull-based model (demand-driven)
 - Web-based
 - Customer orders trigger events in supply chain (Dell Computers)
- Internet enables move from sequential supply chains to concurrent supply chains
 - Complex networks of suppliers can adjust immediately

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Push- Versus Pull-Based Supply Chain Models



Car Manufacturers – Is it
Push or Pull based ?

REFERENCES

- Enterprise Resource Planning, Rajesh Ray, Tata McGraw-Hill – Chapter 25
- Management Information Systems: Managing the Digital Firm - Kenneth C. Laudon & Jane P. Laudon

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Week 04: Supply Chain Management

Lecture 03 : SCM – Part 2

JUST IN TIME AND LEAN SYSTEMS

JIT

Just-In-Time (JIT)

- JIT can be defined as an integrated set of activities designed to achieve high- volume production using minimal inventories (**raw materials, work in process, and finished goods**)
- JIT involves the elimination of waste in production effort
- JIT involves the timing of production resources (i.e., parts arrive at the next workstation “just in time”)

Creating the Lean Supply Chain

- What is Lean System ?
 - “A philosophy that seeks to shorten the time between the customer order and the shipment to customer by **eliminating waste**”
- Three primary elements of Lean :
 - Just-in-time Purchasing
 - Just-in-time Transportation
 - Just-in-time Production

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*“Just-in-time” is a management philosophy, not technique, and the philosophy is simple - **inventory is defined to be waste***

The Toyota Production System

- Based on two philosophies:
 - Elimination of waste
 - Respect for people

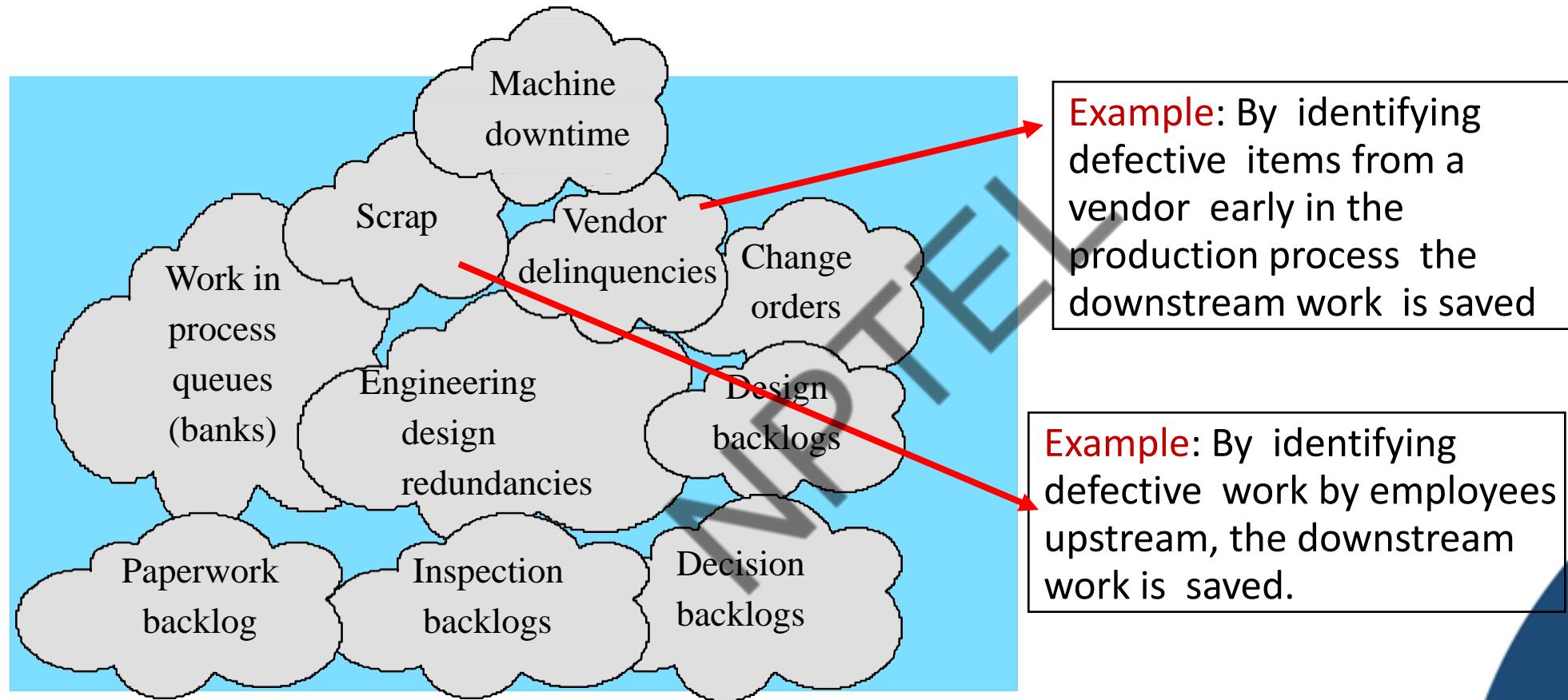
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Waste in Operations

1. Waste from overproduction
2. Waste of waiting time
3. Transportation waste
4. Inventory waste
5. Processing waste
6. Waste of motion
7. Waste from product defects

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Minimizing Waste: Inventory Hides Problems

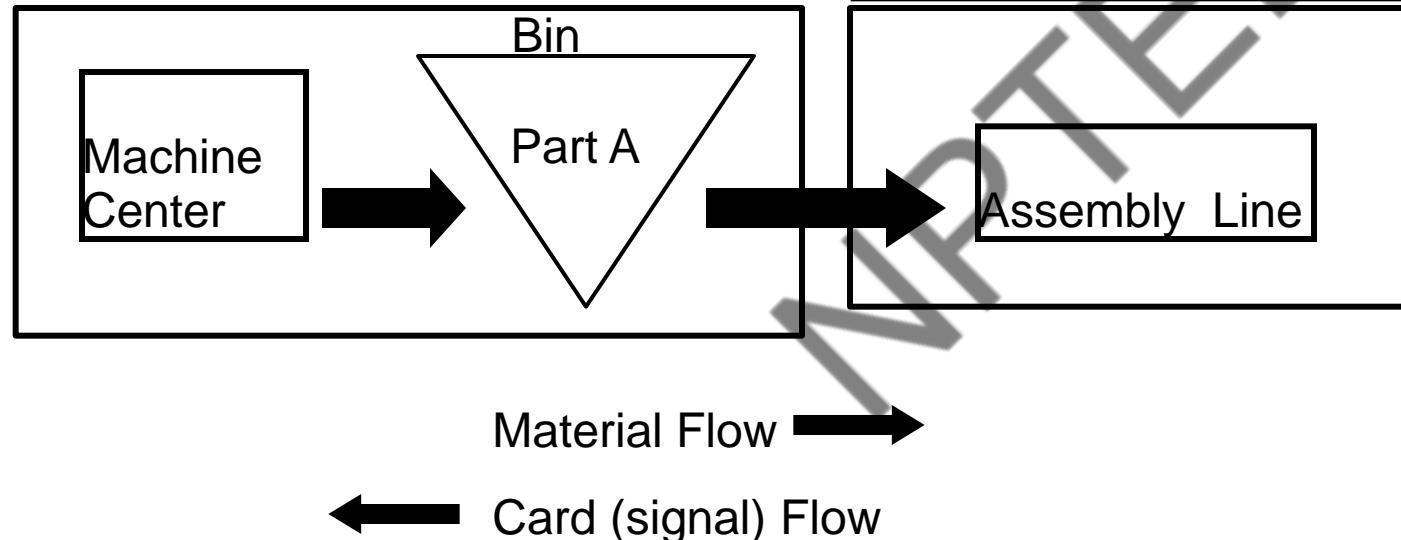


Minimizing Waste: Kanban Production Control Systems

Once the Production kanban is received, the Machine Center produces a unit to replace the one taken by the Assembly Line people in the first place

The process begins by the Assembly Line people pulling Part A from Storage

Production kanban



Determining the Number of Kanban's Needed

- Setting up a kanban system requires determining the number of kanban cards (or containers) needed
- Each container represents the minimum production lot size
- An accurate estimate of the lead time required to produce a container is key to determining how many Kanban's are required

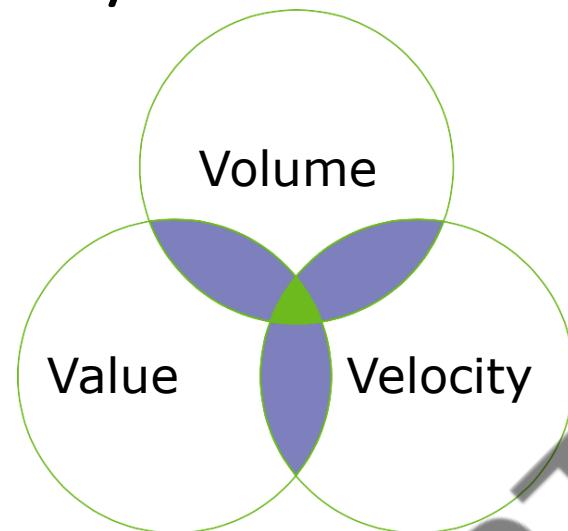
Managing Inventory Investment

Volume pertains to the amount of physical inventory a firm owns at any given time across the supply chain

Key Question: How much and what types of inventory do we own?

Key Measures: Total units, total pounds

Activities Affecting Volume: Improved forecasting techniques; supplier-provided consignment inventory



Value pertains to the unit cost and total value of inventory;

Key Measures: Total dollars; period-by-period unit value changes; ratio of sales to working capital?

Activities Affecting Volume: Product simplification/standardization

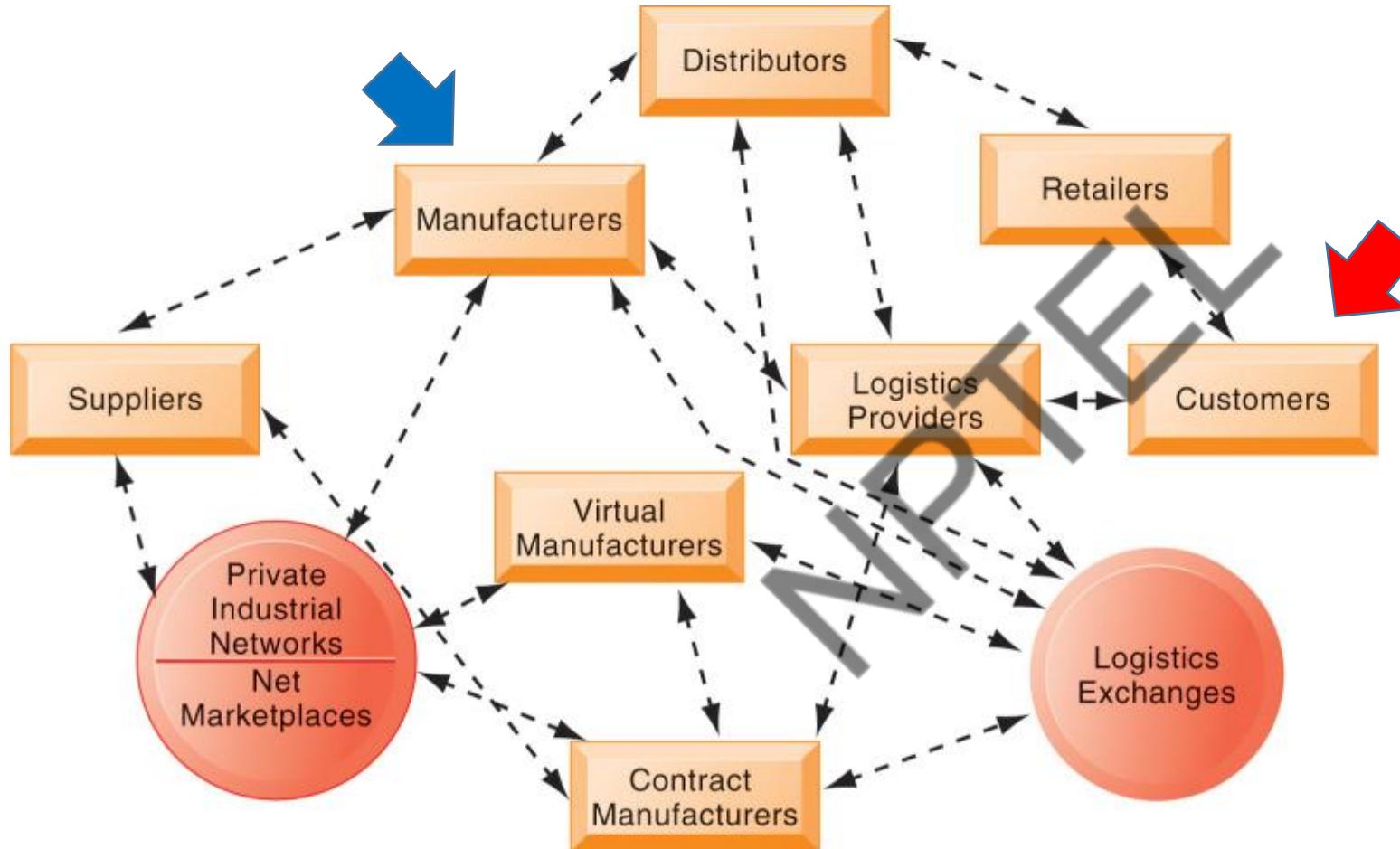
Velocity pertains to how quickly raw material/WIP become finished goods that accepted and paid by customer;

Key Question: How fast do we move inventory to the customer?

Key Measures:
Inventory turns

Activities Affecting Volume: Made-to-order production, Lean supply chain practices;

The Emerging Internet-Driven Supply Chain



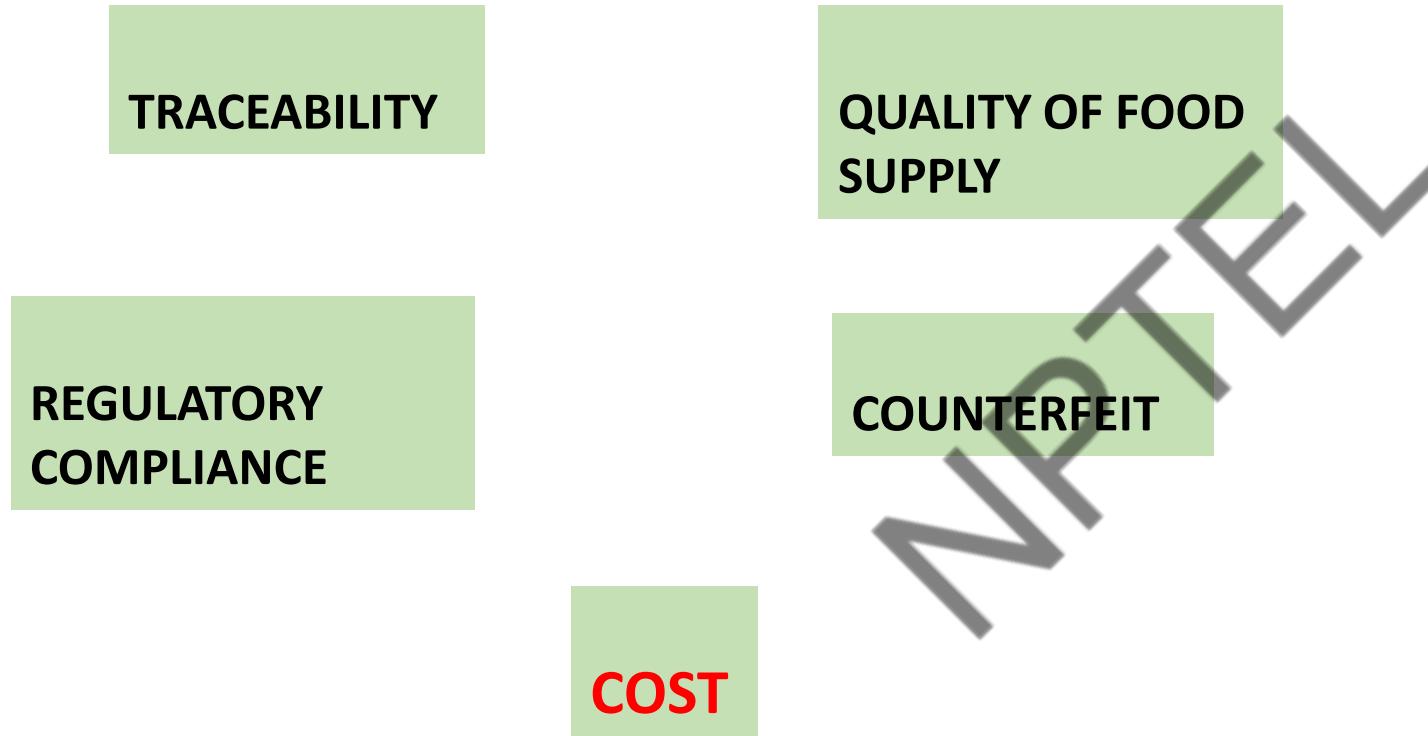
Business Value of Supply Chain Management Systems

- Match supply to demand
- Reduce inventory levels
- Improve delivery service
- Speed product time to market
- Use assets more effectively
 - (Total supply chain costs can be 75 percent of operating costs)
- Increase sales

SCM – Challenges and New Technologies

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Challenges in SCM today



Technologies and Innovations in SCM



Big Data



Robotics



Drones



Cloud Computing



REFERENCES

- Enterprise Resource Planning, Rajesh Ray, Tata McGraw-Hill – Chapter 25
- Management Information Systems: Managing the Digital Firm - Kenneth C. Laudon & Jane P. Laudon

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Week 04: Supplier Relationship Management

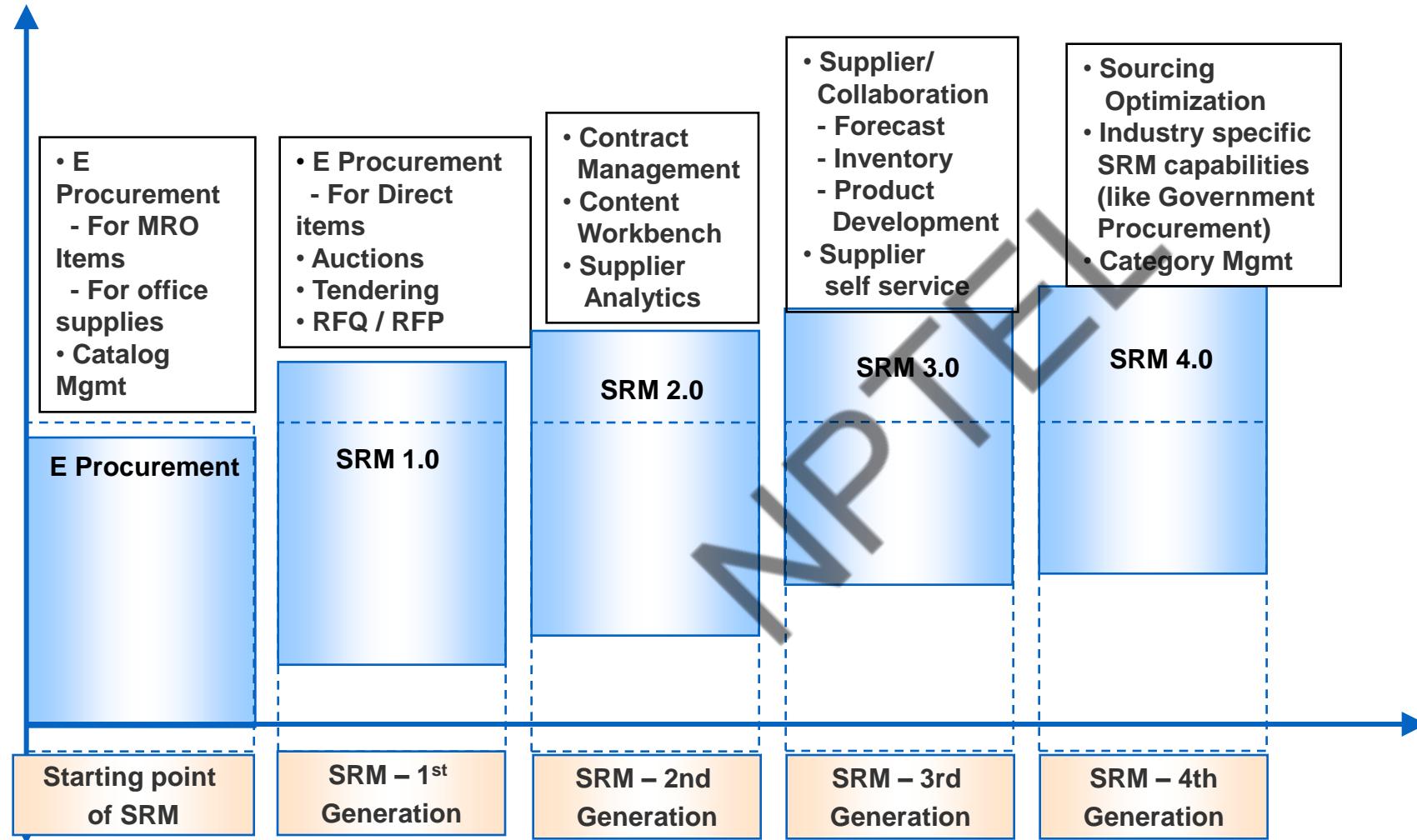
Lecture 04:

Supplier Relationship Management

Gartner defines SRM as: “The practices needed to establish the business rules and understanding needed for interacting with suppliers of products and services of varied criticality to the profitability of the enterprise

Meta defines SRM as “SRM is a system of applications that automates specific planning, scheduling, shipment, and payment processes between a manufacturer and its critical direct materials suppliers. SRM systems track both data and process- interchange flows, as well as provide the management and analytical tools to intelligently track the performance of direct suppliers based on benchmark, historical, and/or contractual conditions.”

Supplier Relationship Management – Application Evolution



SRM Vendors serve different purpose for different types of buyers



SRM – Five Important Areas

Five Important SRM areas are:

1. Electronic Procurement
2. Catalogue Management
3. Content Management
4. Contract Management
5. Supplier Collaboration

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1. E Procurement

Common technology options available for E Procurement are:

A) Electronic Shopping Cart

Shopping cart is a common e procurement technology used by employees for procurement of goods and services. Employees can create shopping cart by searching products in electronic catalogs, start the shopping process, check the procurement status at any time, confirm goods and services once that is delivered and can then enter invoice for their purchase order.

B) Procurement Card

Procurement card can be used as a payment method in E Procurement systems. P cards are credit cards offered by companies like American Express and Visa.

C) Auction

This is a suitable process for selecting the most suitable offer in case an organization deals with a large number of requests for quotations (RFQs).

A) Shopping Cart Functions

Typical Shopping Cart functions are:

- ✓ Creating Shopping Cart (Cart have advanced search capabilities like Catalogs, Favorites etc. for searching right products)
- ✓ Shopping Cart approval
- ✓ Purchase Order and Goods Receipt
- ✓ Invoice Payment
- ✓ Tax Calculation
- ✓ Availability check
- ✓ Identifying sources of supply / possible vendor for the item
- ✓ Approval preview

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B) Procurement Card Is a Win-Win for both Buyer and Supplier

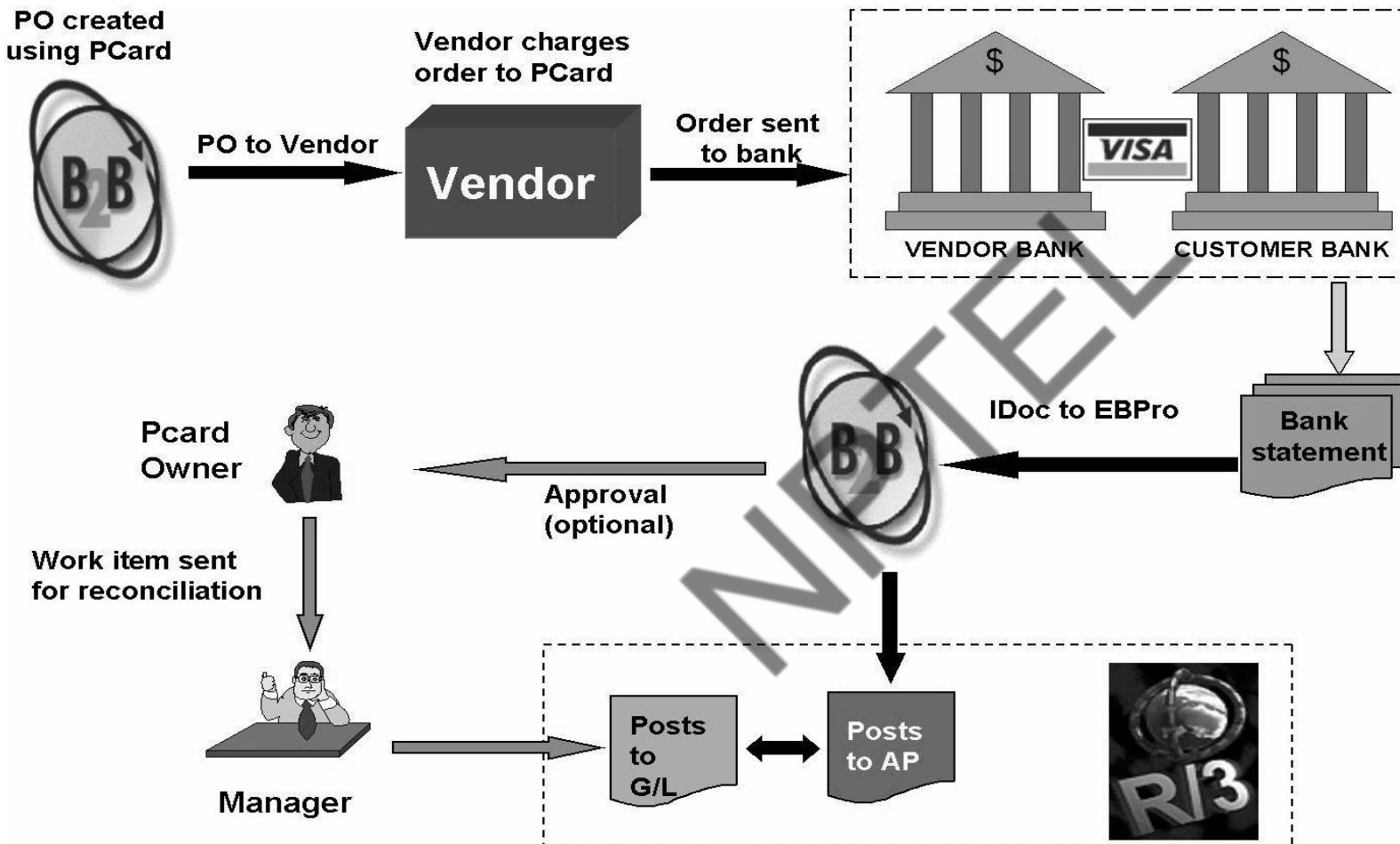
Benefits to buyer:

- ✓ Reduce cost of purchasing and payment by cutting out unnecessary administration of multiple ordering and payments to monthly one statement and payment.
- ✓ Replacing manual processes with electronic ordering, payment and reconciliation. This enables instant information sharing and processing.
- ✓ Reconciling transactions are easier as all transaction details are available on net – this help in quick reconciliation and resolve discrepancies

Benefits to supplier:

- ✓ Greater security for suppliers as here bank guarantees payment
- ✓ Low payment transaction costs as payment happens electronically

Procedure of Procurement Card with SAP.....example



C) Bids and Auctions

Types of Bids

- ✓ **Public Bids:** Here bid invitations are made accessible to potential bidders via marketplaces on the web. The bidder can reach company's web page via a hyperlink from the portal, log on to E Procurement system, and enter their bid.
- ✓ **Restricted Bids:** In this case bid invitations are made accessible to known bidders via e-mail.

Bids can also be classified as

- ✓ **Online Static Sealed Bid:** The bidders are allowed to bid only once with their price within a window of stipulated time
- ✓ **Online Dynamic Sealed Bid:** Here bidders are allowed to improve their price bids and till the hidden reserve price level is touched

2.Catalog Management

Catalog helps E Procurement in variety of ways:

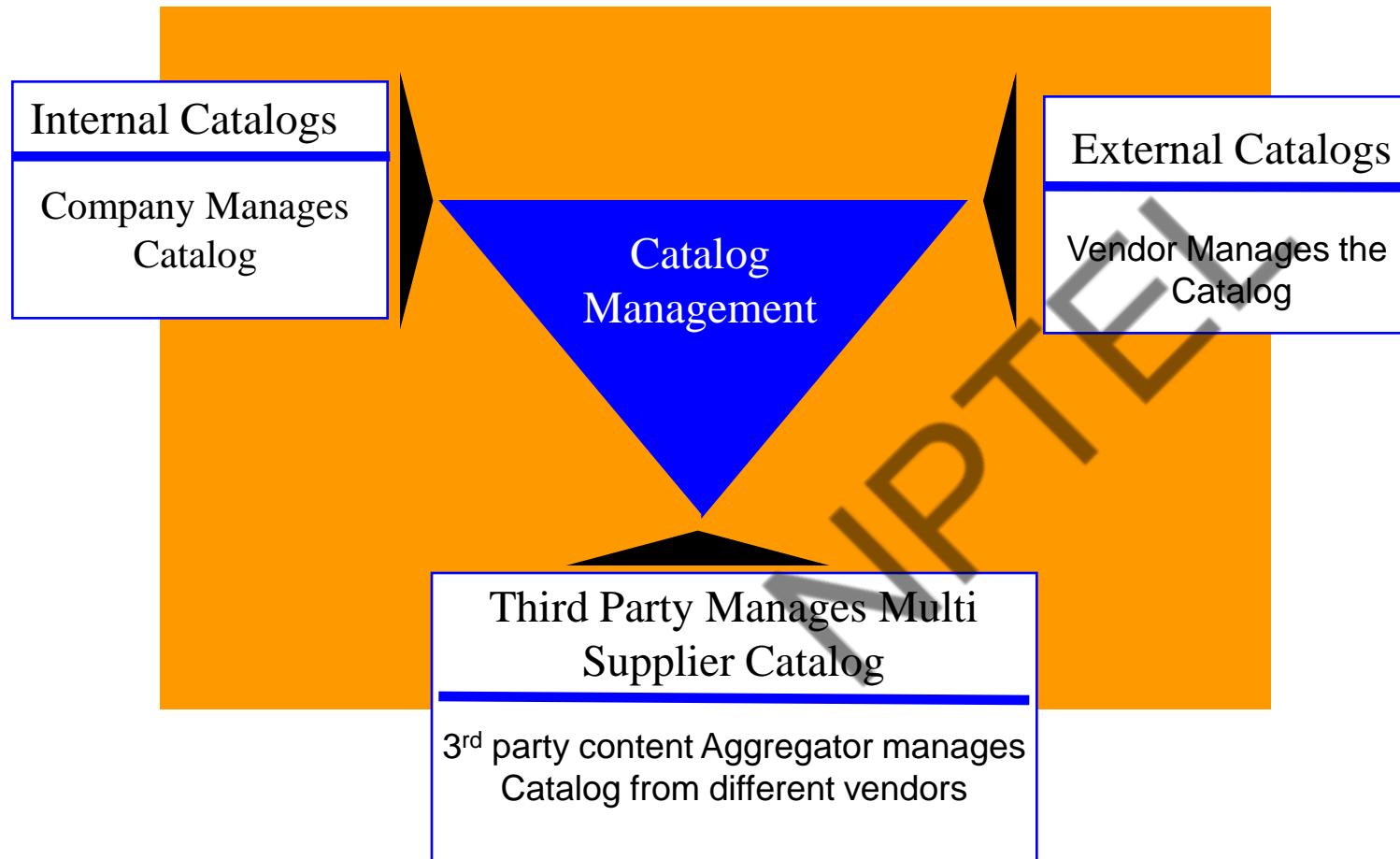
- ✓ Catalogs list all products and detailed product information including links to supplier data. Catalogs help employees to easily find the products that they require and for this they support strong search engines that can locate product based on description, product attributes etc.
- ✓ Catalogs can provide price information.
- ✓ Catalogs can also check availability from a supplier

2.Catalog Management

Three Types Of Catalogs

- ✓ **External catalogs:** Catalog is managed, updated and hosted by the vendor at his own site. This is good for the company as vendor in this case is taking all the responsibility.
- ✓ **Internal catalogs:** Catalog is managed, updated and hosted by the company at his own site. The catalog can have products of various vendors. Advantage of this is look and feel of the catalog can be controlled and is uniform for all products making it easy for employees. The obvious disadvantage is the time and cost needed for company to maintain such catalogs.
- ✓ **A third party manages the multi supplier catalog on behalf of the company:** This multi supplier catalog is managed by a third party content aggregator on behalf of the company. Advantage of this is the consistent look and feel for the catalogs from multiple suppliers. The disadvantage is the recurring expenditure that needs to be paid to 3rd party.

Catalog Management – Options



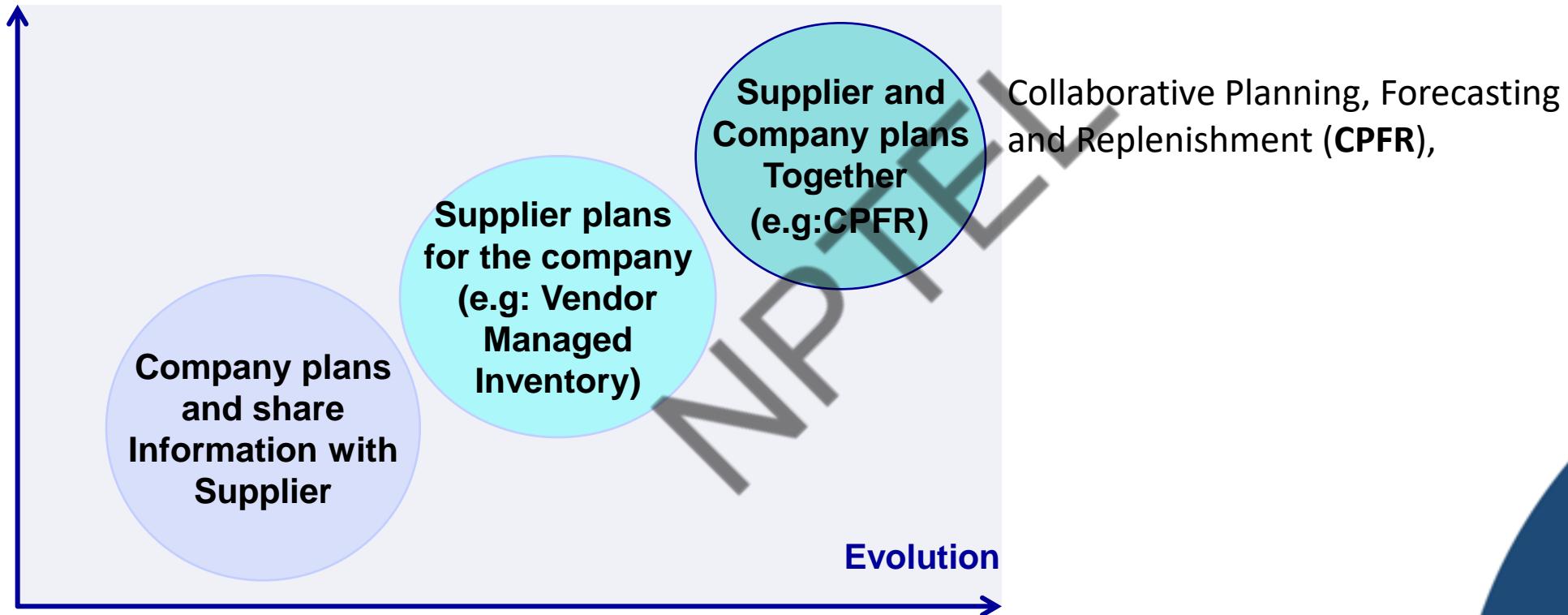
Areas Of Supplier Collaboration

- ✓ Demand / Forecast collaboration
- ✓ Inventory collaboration
- ✓ New product development collaboration
- ✓ Payment collaboration
- ✓ Logistics collaboration

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Forms of Supplier Collaboration

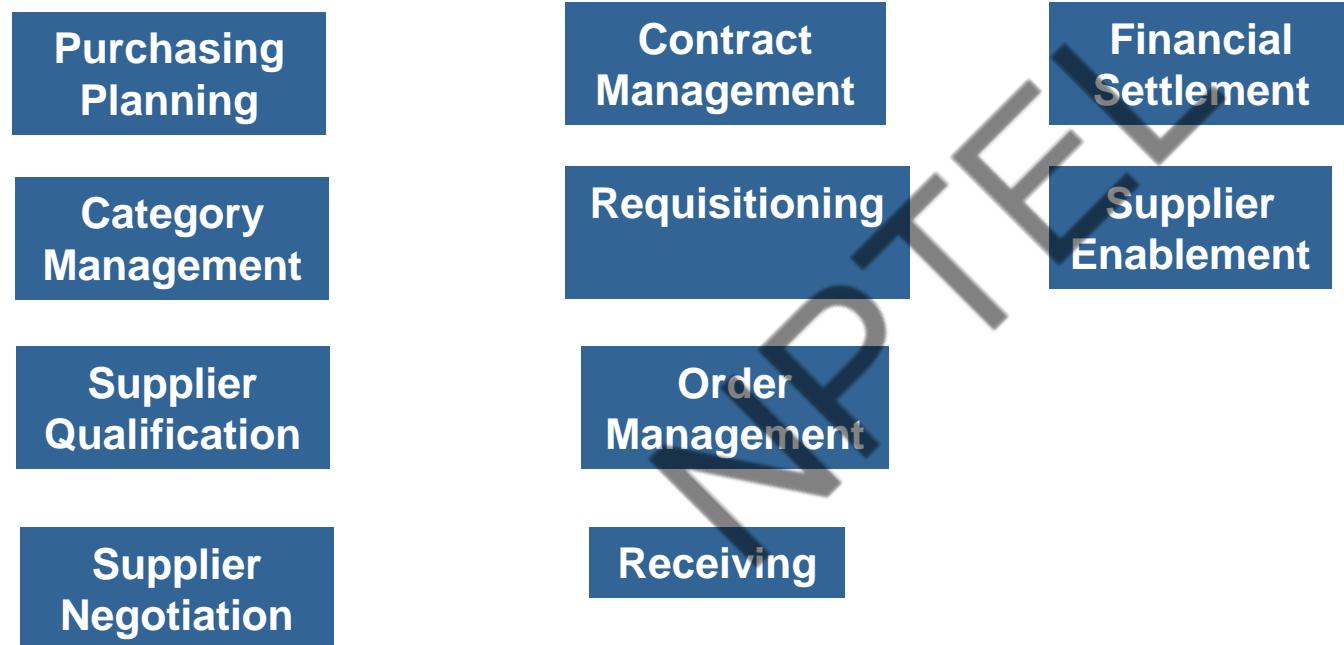
Collaboration/ trust



Technologies Of Supplier Collaboration

- ✓ **Electronic Data Interchange (EDI):** The oldest message based collaboration technology for transmitting things like Purchase order, Advanced shipping notification (ASN), Invoice etc.
- ✓ **Portal:** The company's portal give access to it's suppliers about delivery schedule, stock information, quality of receipts, rejection in case there is any, payment information etc. Supplier self service (SUS) portals are part of Supplier Relationship management solution of few ERP vendors like SAP.
- ✓ **Inventory collaboration:** Most of the ERP and SRM solutions provide features like Vendor managed inventory (VMI) for supporting inventory collaboration need.
- ✓ **Collaborative Forecasting:** ERP solutions provide advanced collaborative forecasting features in its Advanced Demand Planning solution.
- ✓ **Payment Collaboration - Evaluated receipts (ERS):** Most of the ERP solutions support ERS functionality where GR is settled automatically based on information received from Supplier and payment is released.

SRM 5.0 - Activities



REFERENCES

- Enterprise Resource Planning, Rajesh Ray, Tata McGraw-Hill – Chapter 23
- Management Information Systems: Managing the Digital Firm - Kenneth C. Laudon & Jane P. Laudon



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Week 04: Product Lifecycle Maintenance

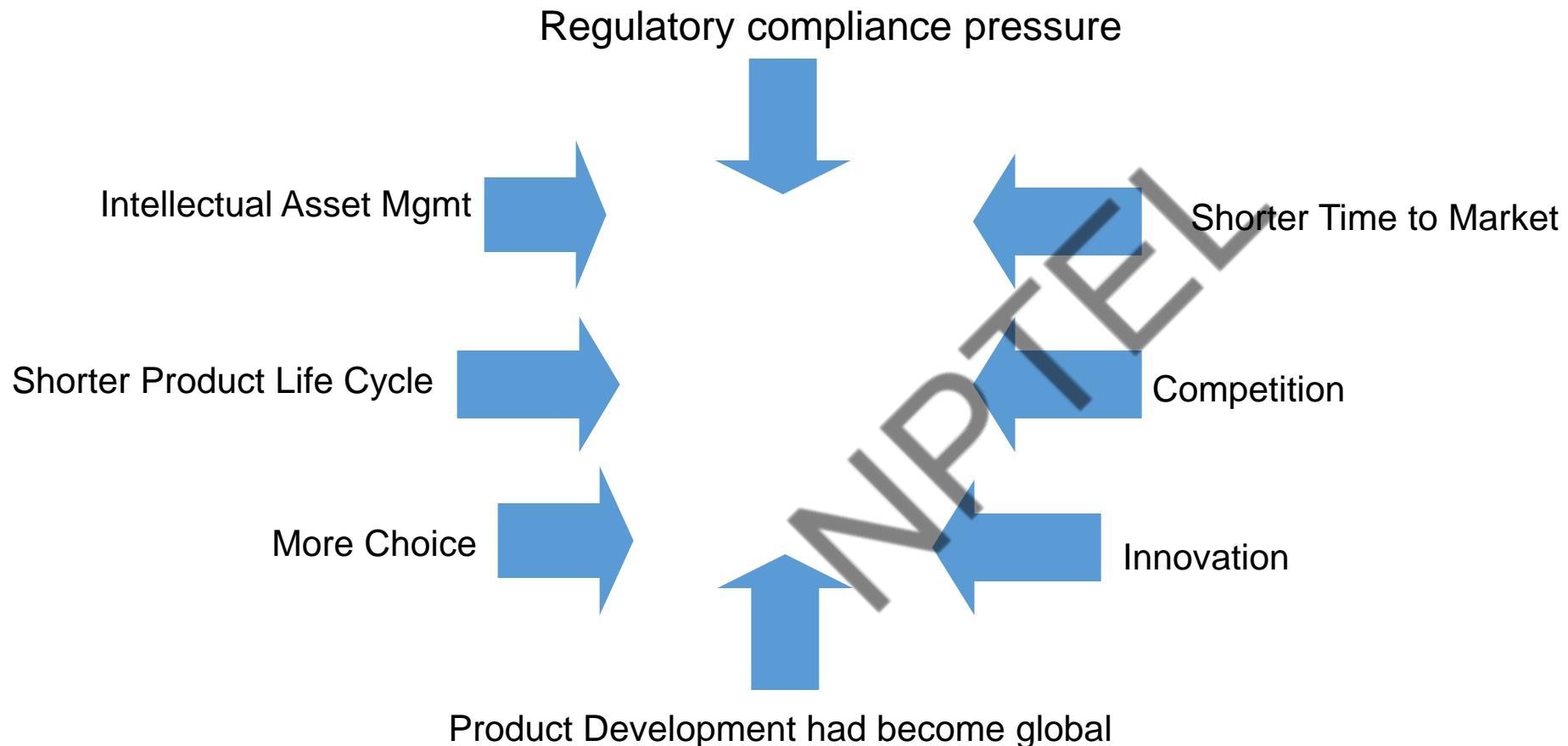
Lecture 05 :

Product Lifecycle Management

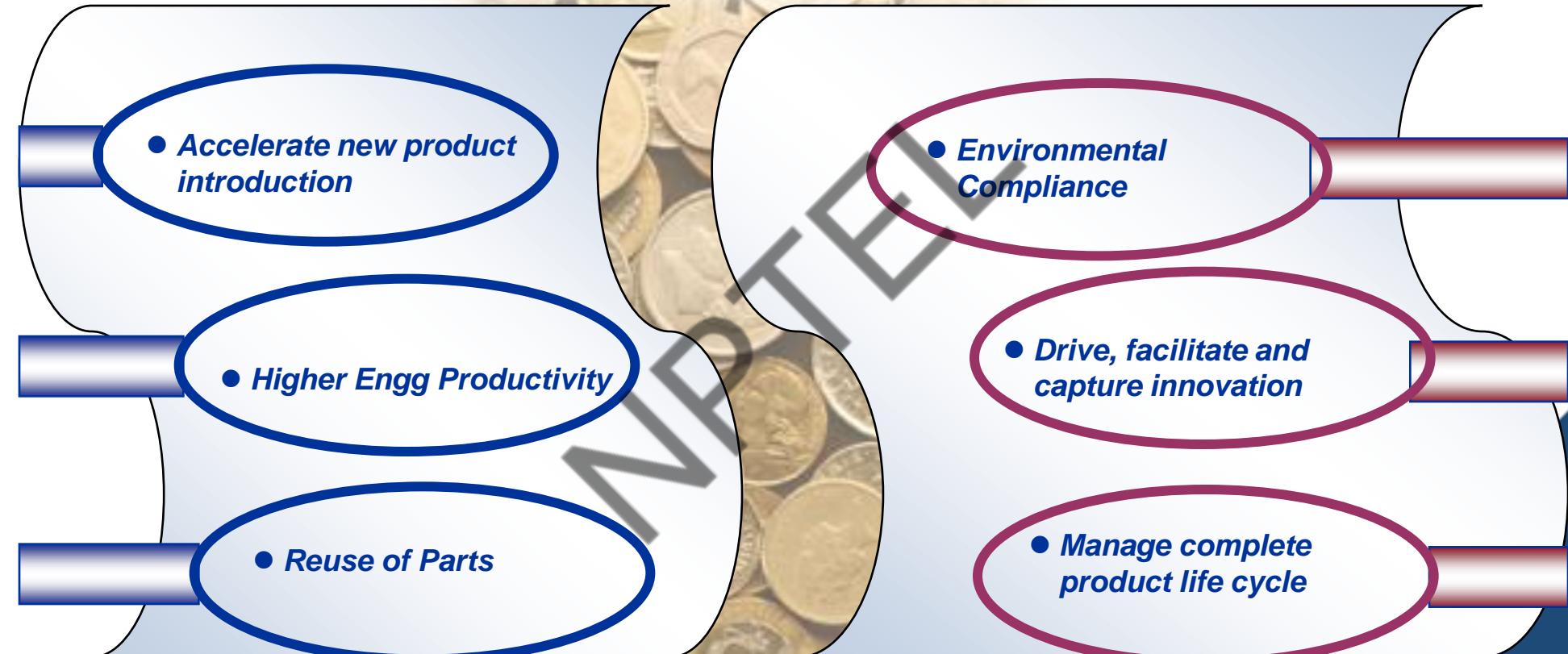
Product lifecycle management (PLM) is a new set of enterprise application that manages all data and information about a product from its initial conception to retirement.

Product lifecycle includes design, manufacturing, ensuring quality of the product through out its life cycle, ensuring product safety during its usage and finally service till the product retires from service.

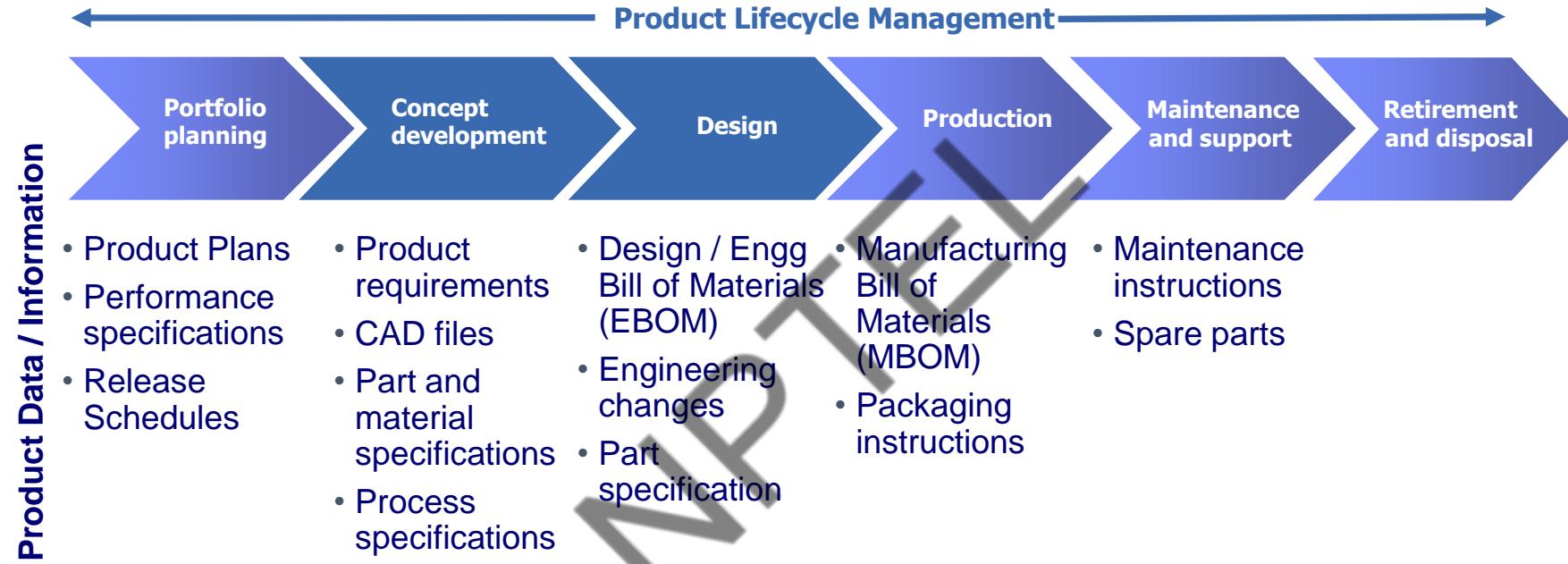
Business Drivers for PLM



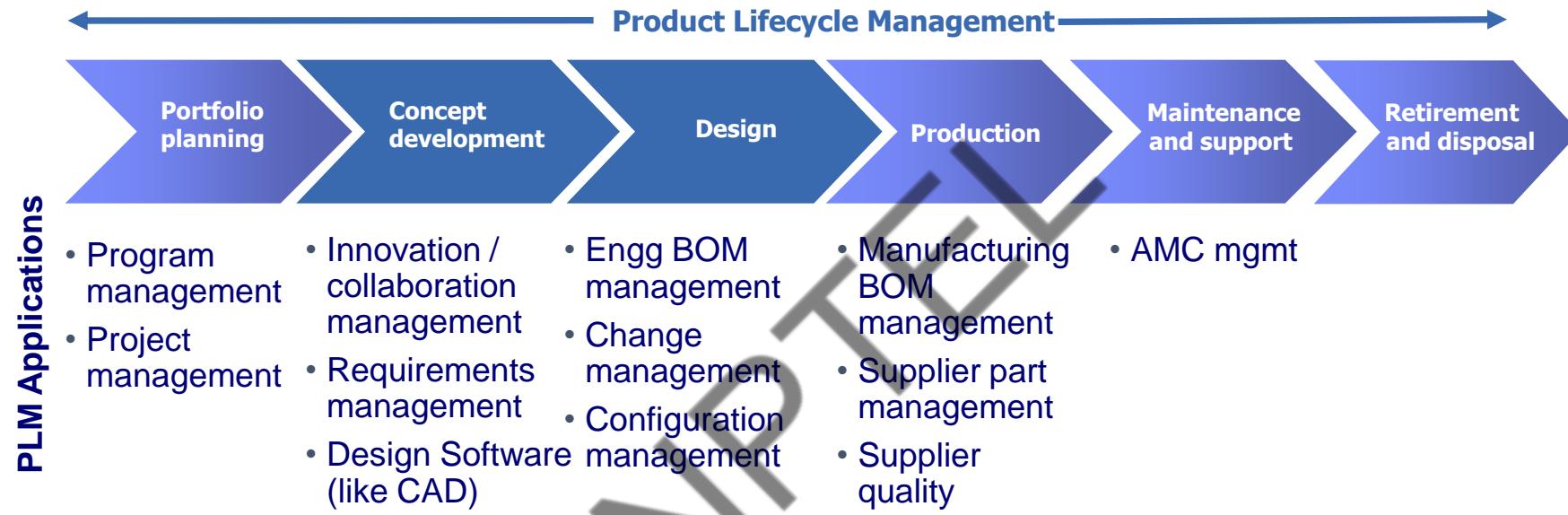
Value Drivers Of PLM



PLM: Data management



PLM need different applications to support needs of diff phases



Product Lifecycle Management Functionalities

Portfolio / Project

Portfolio Mgmt
Program Mgmt
Project Mgmt

Product Safety
Handling hazardous / dangerous goods
Environmental compliance

Integration

- CAD
- ERP

Requirement Mgmt

Product Data Mgmt (PDM)

Storing Product data in different formats
Managing BOM / Configuration / Structure
Visualization
Collaboration
Workflow
Change Mgmt

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PLM Functionality – Document Management and CAD Integration

Document Management

Historically, PLM evolved from Document Management systems (and CAD Data Management systems). The document object can have attributes, revisions, versions, lifecycle states, approvals, controlled access, check-in, check-out, view, print, stamp, mark-up, and so on. Document management capabilities can be used for any document format including PDFs, office formats, JPEG, CAD and so on.

CAD Management / Integration

PLM solutions offer out of box integration with CAD software i.e. users can access PLM functions through the CAD application interface. Some of the functions supported include

- ✓ Common parts libraries
- ✓ Check-in and check-out
- ✓ Revision and version control
- ✓ Change and Release Management
- ✓ BOM Management

PLM Functionality – Search and Change Mgmt

Search

One of the primary goals of PLM is to allow for reuse of information and that's why PLM solutions provide sophisticated search capabilities. PLM solutions can offer different types of search capabilities like:

- ✓ Basic searching
- ✓ Parametric searching
- ✓ Search along relationships
- ✓ Full-text search

Change Management

Change Management is another key function of PLM products. Change Management is the process of creating a change request (can be a functionality change), for getting it approved, doing the change, testing it and finally transmitting the change to final design / BOM.

Manufacturer Part Number (MPN)

- ✓ This is mainly for managing purchased parts.
- ✓ A manufacturer part number does not appear in company's Bill of Material.
- ✓ This linking is sometime required to quickly order a supplier a particular part and to avoid collisions when two manufacturers coincidentally use the same number for two different parts.
- ✓ MPN functionality helps in this.

Bill Of Material Management

- ✓ BOM Management capability includes building BOM structures, adding or removing parts, comparing BOMs, and managing BOM changes and transformation through their lifecycle.
- ✓ PLM systems help in transformation of a CADBOM to EBOM (Engineering BOM) to MBOM (Manufacturing BOM).
- ✓ PLM systems can manage complex BOMs through their lifecycle and configuration changes.
- ✓ PLM systems also have the ability to manage configurable options within a BOM.
- ✓ PLM systems also support BOM Cost Management through different BOM comparison.

Chapter 31: PLM Functionality - Product Visualization, Requirement Mgmt

Product Visualization

- ✓ PLM solutions provides a dynamic view of the product's 3D CAD model
- ✓ While designing, the designer can manipulate his inputs and based on that can simultaneously see its effect.
- ✓ This helps in designing in an interactive mode where he can play with lot of parameters and can always see the effect immediately.

Requirements Management

- ✓ A new product always starts with a set of requirements. Functional requirements describe product behavior. Non-functional requirements describe how well this behavior should perform.
- ✓ A PLM system can manage requirements like any other object type, linking many-to-many to each other and to other requirements. So, a requirement can have sub-requirements that go into more detail. Requirements can lead to products feature.
- ✓ PLM systems manage all requirements through revision control and change management.

Chapter 31: PLM Functionality - Program and Product Management

- ✓ A program is basically a collection of projects so there can be a program at a product level or a product family level that has multiple projects underneath. The program is used for grouping and reporting purposes.
- ✓ A project contains tasks in a work breakdown structure, with associated resources, durations, deliverables, and workflows.
- ✓ PLM project management supports integration with third-party project management tools, such as MS-Project. Sometime Program Management is also referred as Portfolio Management.
- ✓ To support Program and Project Management capabilities, a PLM system needs to add additional object types like: Program, Project, Task, Work breakdown structure, Resource, Calendars (based on location, user, and so on).

Chapter 31: PLM EHS Functionality – Hazardous Material Tracking

- ✓ PLM EHS Software manages chemical inventory systems and track chemical storage (e.g., inventory), use, and transportation throughout the supply network and end-of-life disposal.
- ✓ This solution ensures that the company meets regulatory requirements relating to product safety and to the management and labeling of dangerous goods – while at the same time protecting employees and the environment.
- ✓ PLM EHS supports dangerous goods management by enabling companies to store and manage regulatory data, classify dangerous goods, perform checks during transport, and compile and update dangerous goods documentation. This data can be automatically transferred and used for packing lists.
- ✓ For any transportation channels (road, rail, sea, or air), PLM EHS ensure that shipments comply with regulations before leaving the premises, and manage dangerous goods storage, transportation, movement, delivery, compliance and reporting.

Chapter 31: PLM EHS Functionality – Material safety data sheet (MSDS)

- ✓ PLM EHS solution lets the company collect and process product compliance data automatically, enables to document product content and regulatory or sector-specific substance lists and integrates compliance checks and analyses.
- ✓ A specification management database allows to centrally managing substance information (including product composition).
- ✓ A global label management function supports management of many different types of labels that can be printed directly from various business processes (for example, from outbound delivery).
- ✓ A Material Safety Data Sheet (MSDS) documents proper procedures for handling of hazardous materials for workers. PLM EHS software support the generation and storage of MSDS information, such as physical data, toxicity levels, health effects/risks, remedy requirements for spills or accidents, and storage guidelines. PLM systems make this information readily available to workers and downstream consumers that are exposed to these materials.

Chapter 31: PLM EHS Functionality – Environmental Compliance

Environmental compliance allows an organization to capture the materials that are used in their products and track compliance against internal and external standards.

Environmental compliance capabilities maintain several types of information like:

- ✓ What is inside a part that could be a substance of concern for environmental regulatory purposes? The view must include both on purchased parts and also about where the final product is sold.
- ✓ What are the compliance standards (for example, WEEE, RoHS, REACH) that are in effect that the Part may need to comply with?
- ✓ Whether or the Part actually meets appropriate compliance standards or not

PLM products support compliance process in variety of ways like:

- ✓ Making sure that the latest standards are known
- ✓ Managing the process and correspondence with Part suppliers on their material content for each Part
- ✓ Performing BOM analysis to check compliance at the Product level
- ✓ Tracking the countries where products are sold
- ✓ Communicating the compliance status to suppliers, customers, and regulatory bodies

Chapter 31: PLM Vendors

Some of the leading vendors in PLM space are listed below:

- ✓ CAD (Computer Aided Design) / CAM (Computer Aided Manufacturing) / CAE (Computer Aided Engineering) / Document Management vendors moving into PLM space:
 - ✓ PTC
 - ✓ UGS
 - ✓ Dassault Systèmes / IBM (IBM recently acquired Dassault Systems and another PLM vendor MatrixOne)
 - ✓ Agile Software

Leading ERP vendors building PLM solution

- ✓ SAP
- ✓ Oracle
- ✓ IFS

REFERENCES

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**THANK
YOU!**