

Lecture Series: Consumer Electronics Supply Chain Management

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Lecture 2: Planning the Consumer Electronics Supply Chain

Agenda

- CE Products and Supply Chain Structure
- Planning Processes
- Information Flow across Planning Processes
- Roles
- Key Performance Indicators
- Future Trends in Planning

CE Products and Supply Chain Structure

End Product Offerings - Diverse Product Range

Digital Still Cameras



4-month life cycle

Plasma TV



Hi Tech
Low turn
High Margin

Electric Shavers



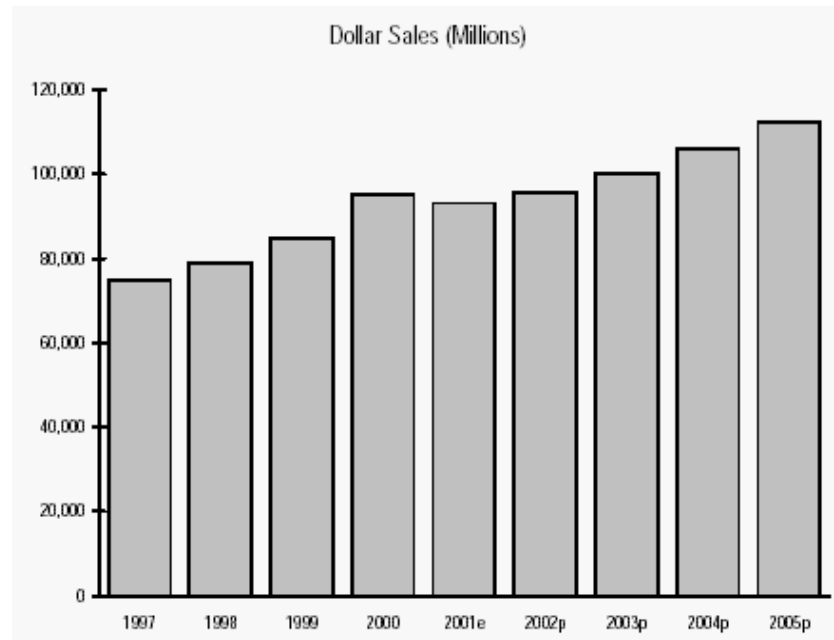
50 % sales done in December

VCR'S



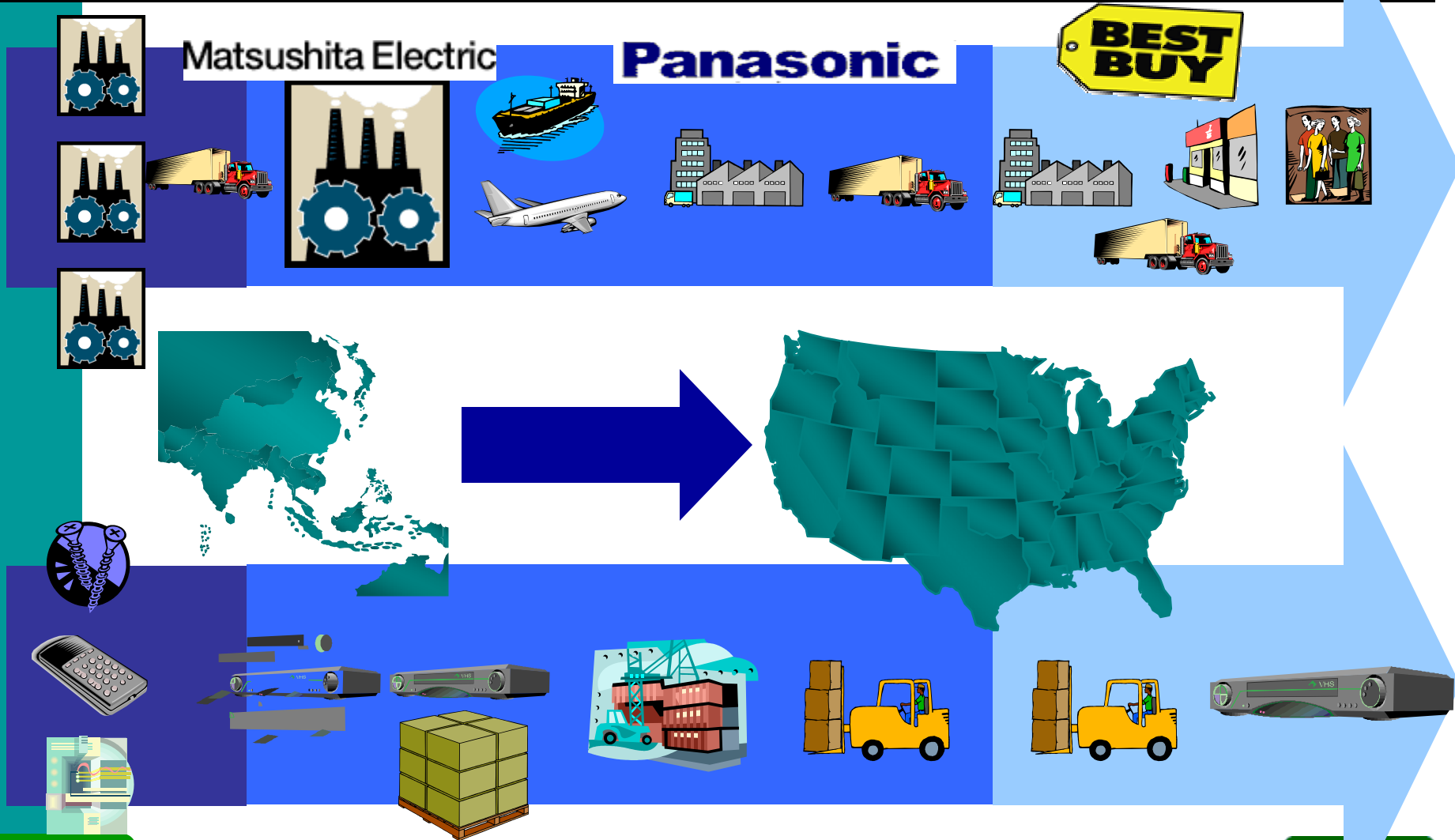
Commodity
Low Tech
High Turn
Low Margin

Consumer Electronics US Market Sales



US Consumers bought 95 billion dollars of CE product in 2002

Supply Chain for End Product



Industry Characteristics

4 month lead time

Coordination

Built to stock

Delays,
Out of stock
Overstocked

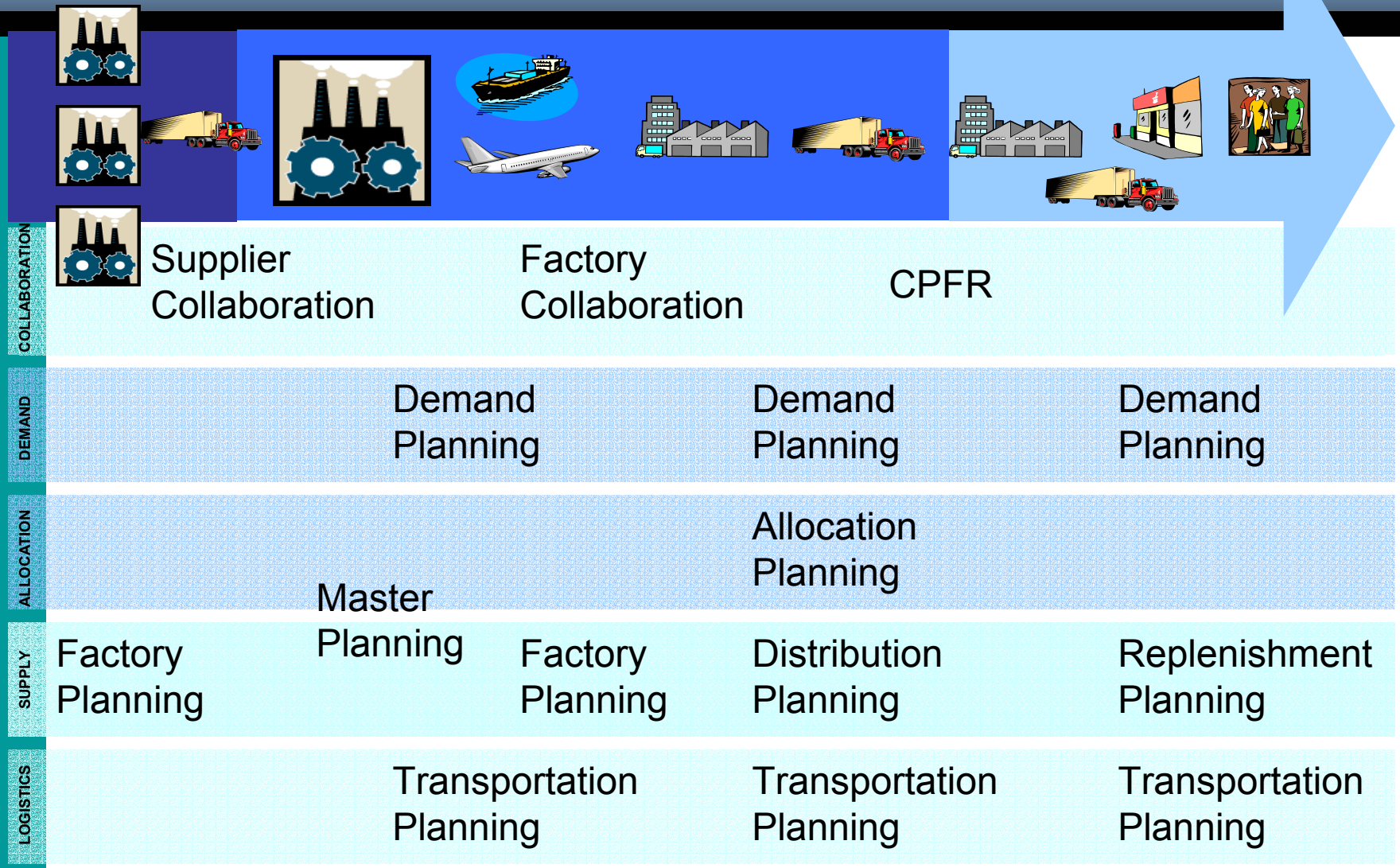
CE Industry Issues



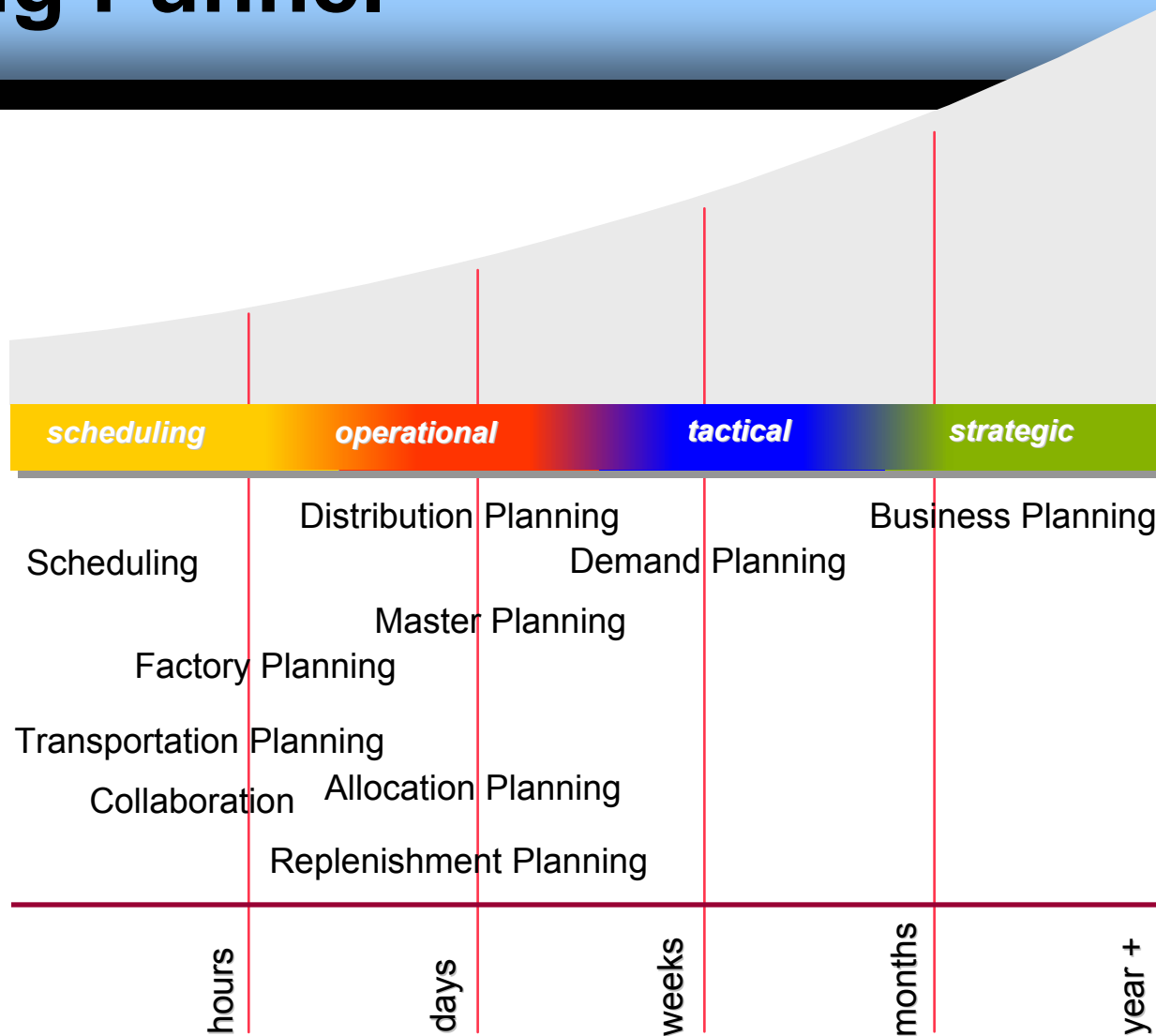
- High degree of parts customization
- Long R&D design process times
- Long lead time to create additional capacity for custom parts
- Poor customer service / supply flexibility
- Low re-use of parts
- Short component life cycles leading to service issues
- High supply risk due to reliance on custom parts
- Short product lifecycles
- High demand unpredictability, inflexible manufacturing
- Unresponsiveness to demand signals due to manual monthly planning
- Fragmented procurement across factories
- Inventory boom-bust cycle (bull-whip effect)
- Low customer service levels
- Geographically fragmented supply chain
- Margin erosion
- High spares inventory, inconsistent availability
- Stock outs
- Reducing margins
- High logistics costs
- High inventory, store level stockouts
- High promotions costs

Planning Processes

CE Industry Key Planning Processes



Planning Funnel



Demand Planning

■ Definition

- The Demand Planning process helps predict and influence future sales by customer

■ Typical constraints

- Lack of visibility into future customer needs
 - The long product lead time introduces further uncertainty
- Complex interaction between a wide array of products and brands
 - Lack of visibility to competition
- Lack of quality data
 - Availability of sales data
 - Availability of POS data

■ Benefits

- Decrease inventory obsolescence and mark downs
- Increase customer service and fill rates

Demand Planning

■ CE Industry Challenges

- Frequent Promotions and Markdowns
- Frequent new product introductions, short product life cycle
- Seasonal Demand
- Low forecast accuracy for new products, spiky demands

Demand Planning

■ Retailers

- use point of sale information to forecast their sales. They use merchandize planning to set pricing and markdowns on product.

■ Sales companies

- forecast based on shipments and historical sales, market information as well as planned promotions. They forecast across retailers in a market.

■ OEM's

- forecast across sales companies based on market analysis, business plan as well as historical shipments to sales companies.

Supply Planning

■ Definition

- The supply planning process optimizes the use of both capacity and material in order to maximize satisfying anticipated demand

■ Typical constraints

- Planning assumes fixed lead times – infeasibility
- Simplistic inventory planning leads to overstock and lost sales situations
- Distribution Space & Handling Constraints
- Manufacturing capacity constraints
- Purchasing material constraints - alter production schedules

■ Benefits

- Reduce cost of inventory, expediting
- Global coordination – sharing information across supply chain entities

Supply Planning

- CE Industry challenges – Replenishment and Distribution
 - Complex distribution network with possible alternates in fulfillment location
 - Inventory management - Safety stock vs. CSL tradeoff
 - Inventory rebalancing between DC's
- CE Industry challenges – Manufacturing
 - Discrete Part Manufacturing: Factories aligned with product lines.
 - Strategic sourcing – Supplier Selection, Scorecard and Allocation
 - Product sourcing – Obsolescence management, Part re-use, BOM grading
 - Significant Material Constraints
 - Requires Assembly coordination
 - Seasonal Build Ahead – high demand in the Christmas season
 - Manufacturing lot size

Supply Planning

- Retailers typically perform replenishment planning
 - calculate purchase from demand forecast and inventory / projected receipts
 - store level inventory deployment plan
- Sales companies perform a distribution plan
 - creates the material purchase
 - creates the Inventory deployment across warehouses
- OEMs
 - create a capacity and material feasible master plan across factories and make factory sourcing decisions
- OEM/Component supplier - Factory
 - each factory creates a material and capacity feasible production schedule and detailed material procurement plan based on its vendor allocation and preference rules

Allocation Planning

■ Definition

- Allocation planning process refers to disaggregating expected supply / commits to the customer against anticipated demand. The order promising function is an extension of allocation planning where a sales order is promised against this allocation.

■ Typical constraints

- Allocation constraints include allocating material across multiple dimensions (customer, product and time) and also account for customer demand fulfillment strategies
- Order promising constraints include accounting for real lead times to customer, accounting for alternate fulfillment locations and alternate products

■ Benefits

- Increased customer service and retention
- Increased profits
- Increased order promising accuracy – hitting promise dates in execution

Allocation Planning

■ CE Industry Challenges

- Definition clear Tier structure between customers to allocate constrained supply
 - This structure tends to get changed annually
- Different customers can have agreements on shipments within different time windows – Weekly vs Monthly commits
- Product Substitution acceptable

Allocation Planning

- Sales companies
 - create allocation plans from warehouse / Sales org to different retailers / groups of retailers
- OEMs
 - create allocation plans for allocation of finished goods between various sales companies – this is usually done as a part of the master plan
- Component suppliers
 - create allocation plans for components and capacity across various OEM's

Logistics Planning

■ Definition

- Logistics planning refers to planning of material transfer between source and destination locations
 - Selection of mode of transport
 - Maximizing container density
 - Maintaining loading constraints
 - Route selection
 - Regulations
 - Shipment tracking

■ Typical constraints

- Container size
- Stacking constraints
- Route optimization – hubs, merge in transits etc

■ Benefits

- Increased container utilization
- Reduced freight costs
- Better shipment tracking

Logistics Planning

■ CE Industry Issues

- Load building / Load Configuration – CE products have complex freight loading and configuration rules
- Transportation Mode - Multi Modal - Air freight for expediting, truck for inland transport and ship for overseas
- Limited number of carriers that have ability to deliver the product
- Distribution cost as a percentage of Total Cost is high

Logistics Planning

■ Retailers

- plan logistics from their warehouses to stores
- some retailers have negotiated product pick up agreements with sales companies / manufacturers

■ Sales companies

- plan logistics from their warehouses to retailers / smaller customers

■ OEMs

- plan logistics from factories / divisions to sales company warehouses

■ Component suppliers

- plan logistics from their plants to OEM assembly plants

Collaboration

■ Definition

- Collaboration in the process of sharing information across supply chain entities in order to better meet end customer demand
 - Collaboration workflows typically enable electronic transfer of data like forecasts, commits, purchase orders, designs etc

■ Typical constraints

- Not all supply chain entities are technologically advanced
- Not all entities can agree on sharing confidential data

■ Benefits

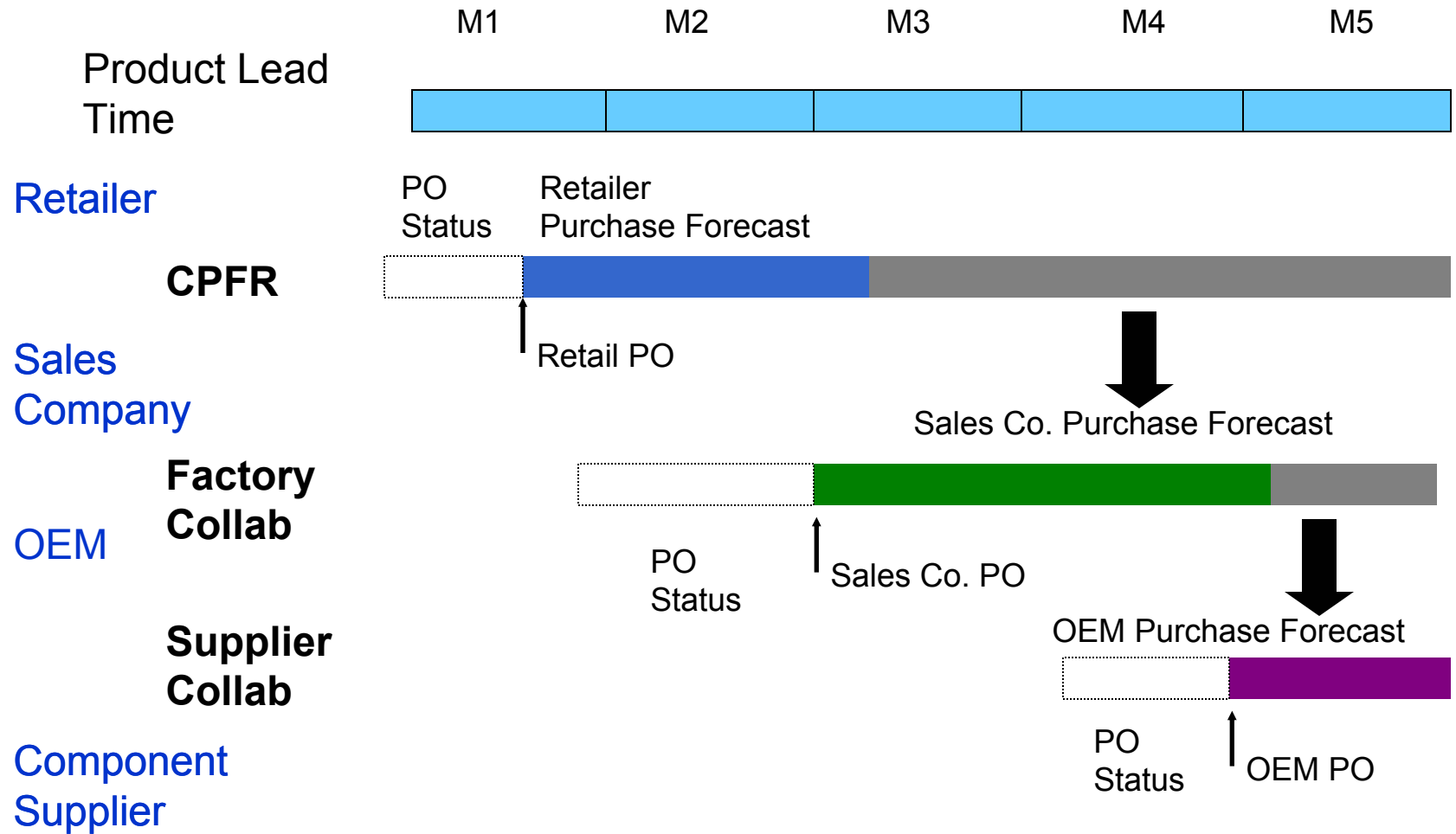
- On-time and more responsive deliveries
- Reduction in inventories through improved longer term visibility
- Reduction in costs – reduced obsolescence, better planned promotions, reduced markdowns and reduction in expedites

Collaboration

■ CE Industry Issues

- Collaborative replenishment planning for geographically separate DCs , plants
- Collaborating on demand which is over a long lead time
- Collaborating on joint promotions

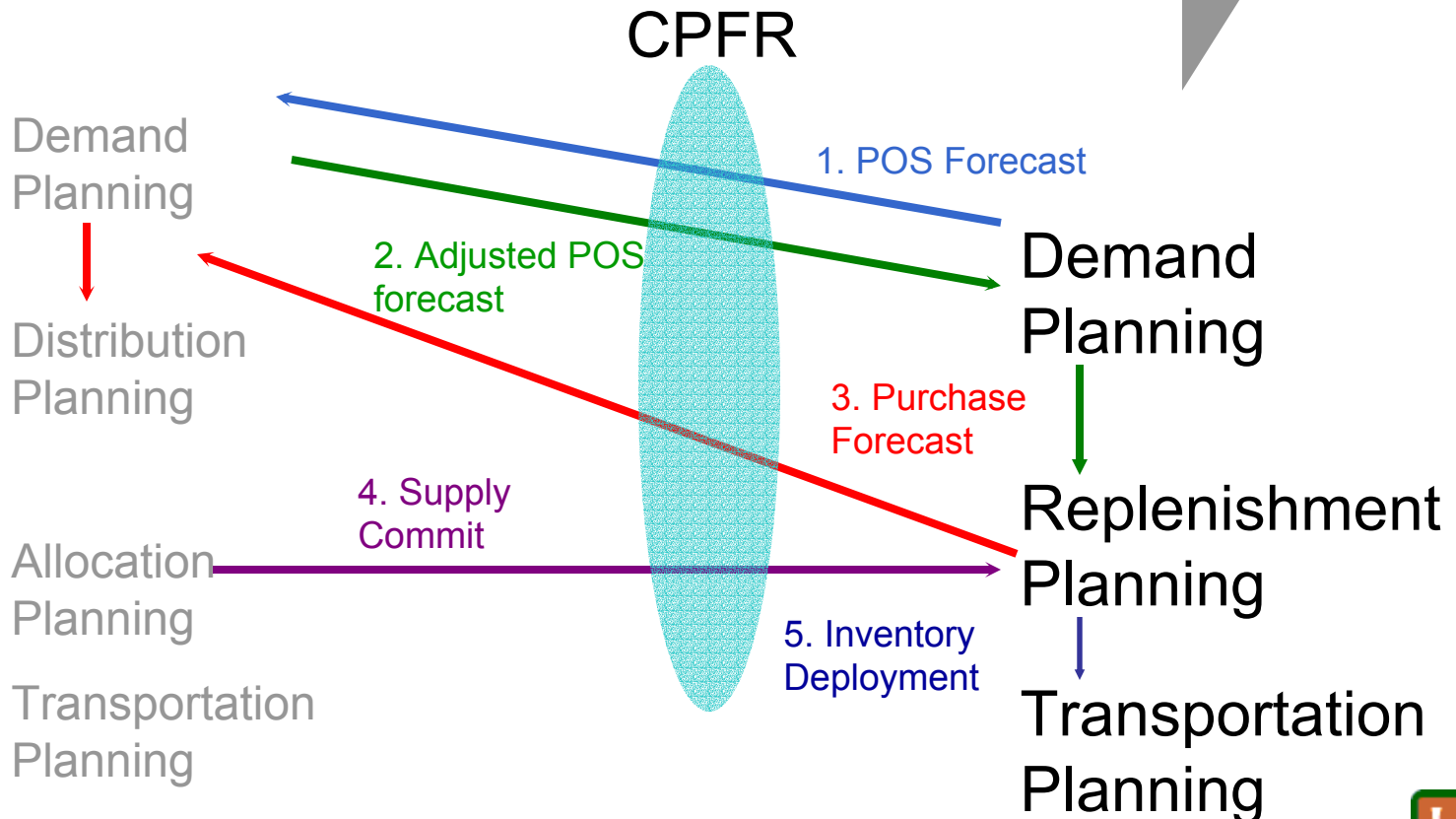
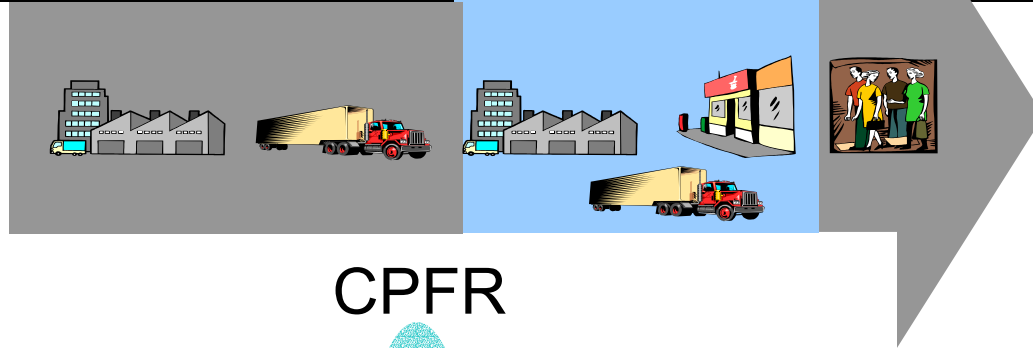
Collaboration Process



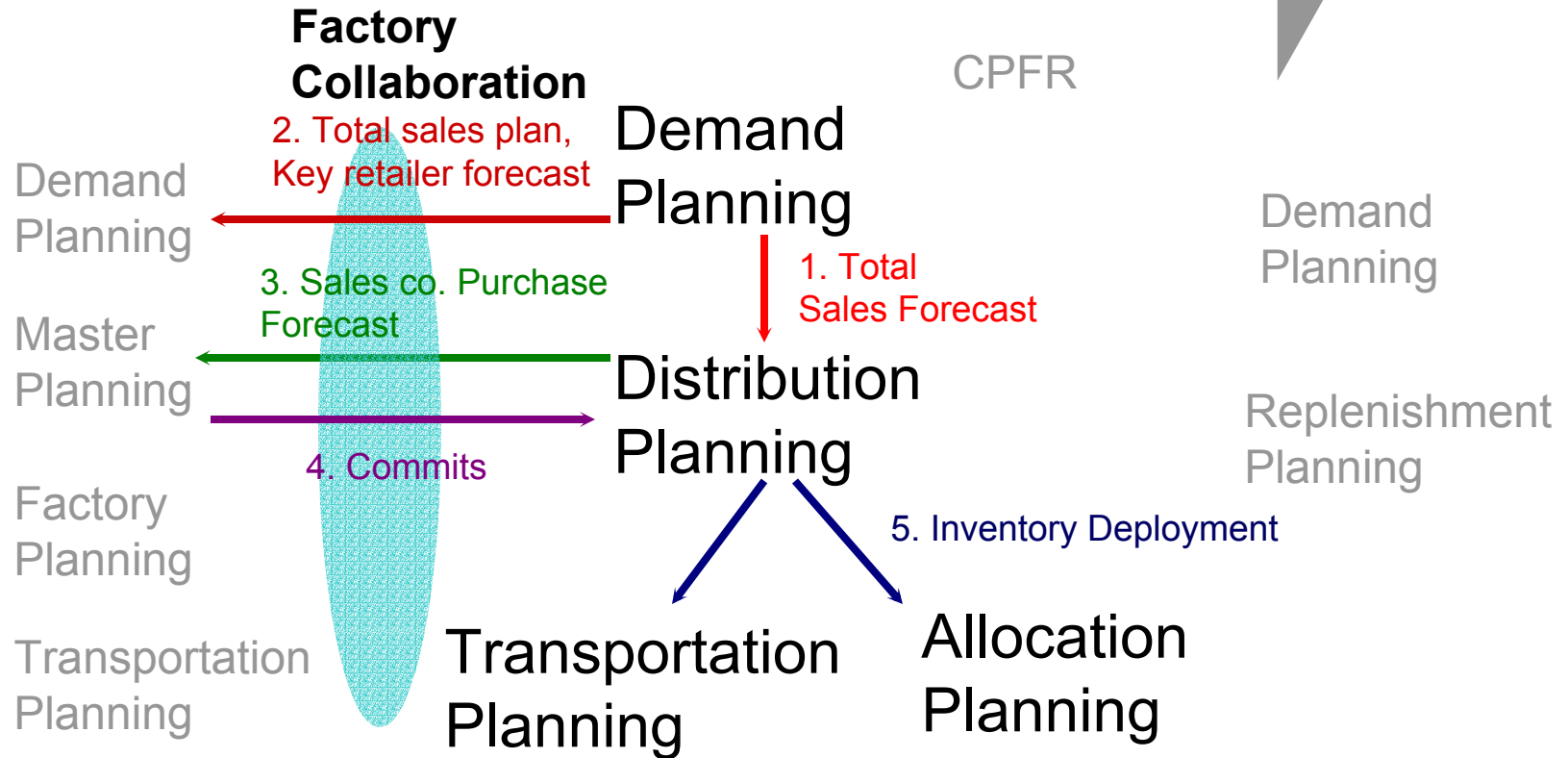
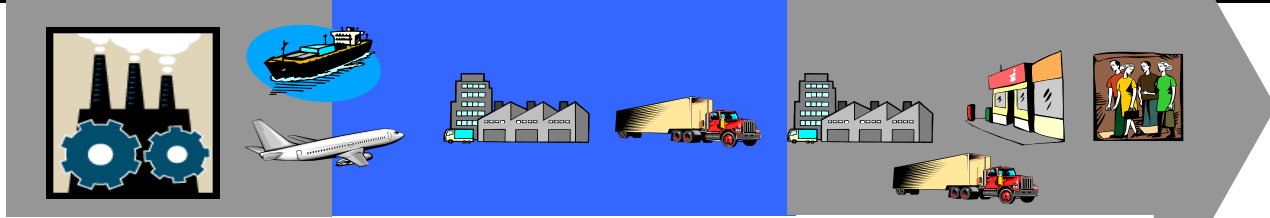
Collaboration Process is typically performed weekly

Information Flow Across the Supply Chain

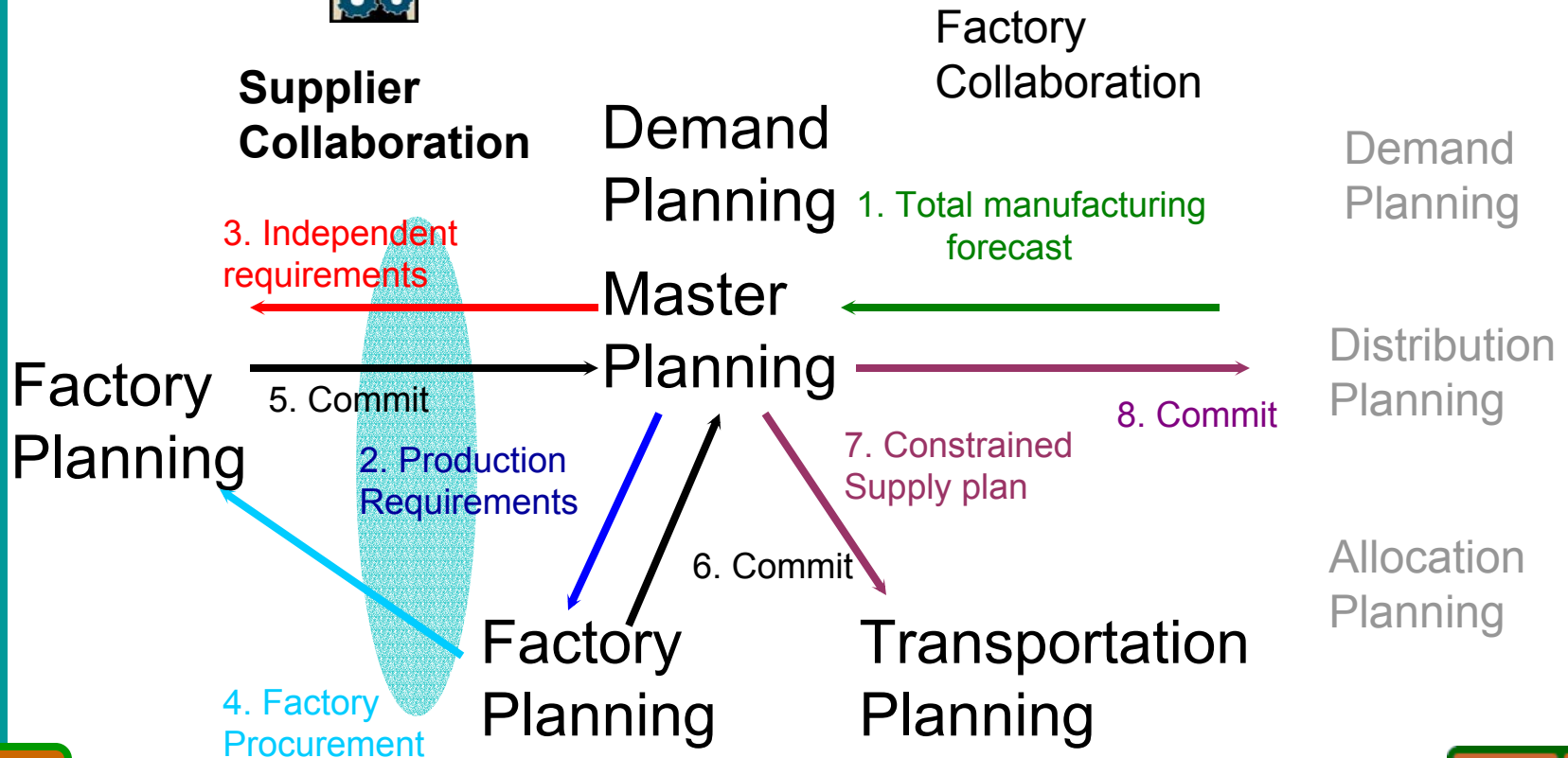
Retail Planning Processes



Sales Companies Planning Processes

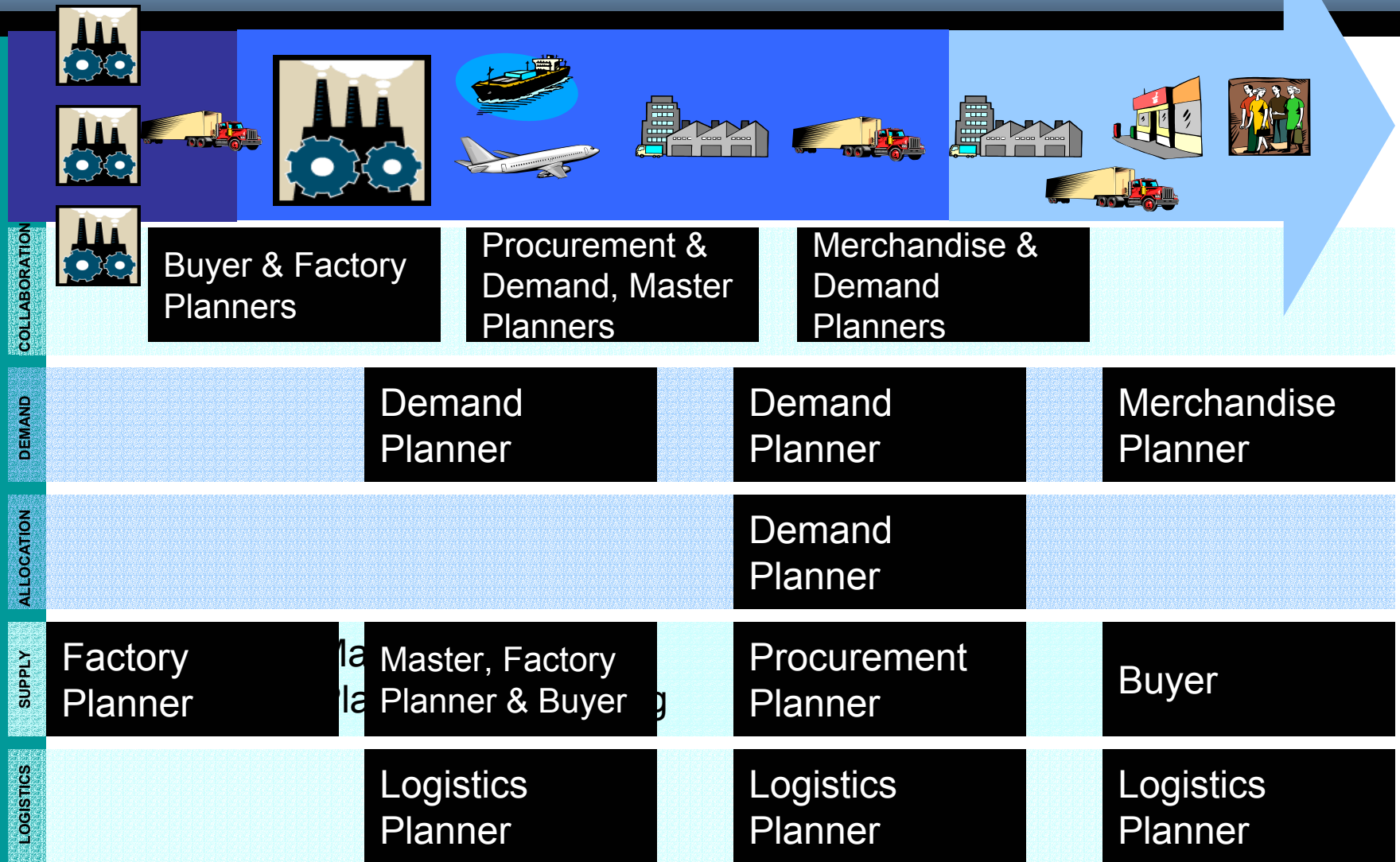


OEM's Planning Processes



Roles

CE Industry Key Planning Roles



Planning Roles – Decisions they make

■ Merchandise Planner

- Pricing decisions, demand forecasting-store level, promotions and CPFR

■ Buyer

Retail

- Replenishment at store level, create long term procurement plan, negotiate price for spot buys and inventory deployment plans, CPFR

Sales Company

- Replenishment at sales company DCs, create long term procurement plan and inventory deployment plans, factory collaboration

Factory

- Replenishment at factory warehouses, create long term procurement plan, negotiate price for spot buys, supplier collaboration

■ Logistics Planner

- Carrier/Mode selection, load consolidation configuration and routes – includes merge in transit

■ Master Planner

- High level factory sourcing decisions, high level capacity and material plan, independent buy

■ Demand Planner

- Business planning, forecasting, promotions, analysis of point of sale data, facilitate pricing decisions, CPFR

■ Factory Planner

- Create a detailed capacity and material plans, schedules at plant level, and supplier collaboration

Key Performance Indicators

Key Performance Indicators (KPIs)

- Financial KPIs are used to measure the business performance (tactical and strategic)
 - Typically by
 - Division/Corporate
 - Quarter/Year
 - Entire Customer base
- Operational KPIs are defined to monitor various planning processes (operational and scheduling)
 - Typically by
 - SKU / Product Family
 - Customer/ Customer Group
 - Week/Month
 - Can be used for scorecards

Key Performance Indicators

Supply

- Period of cover by SKU / Warehouse wrt Safety stock
- Inventory turns
- Obsolescence
- Material earliness (temporary inventory buildup)
- Safety stock shortage
- Material lateness
- Shortage - % demand fulfilled based on purchase plan
- Markdowns (\$)
- Resource utilization

Logistics

- Container utilization
- No of Empty trips
- % Expedites (Trans.)
- Number of Touches

Allocation

- Constrained Sales (\$) by month vs business plan typically at division level
- Allocated forecast (\$) vs forecast by customer
- Allocation realized – Allocated forecast with sales order received at SKU

Demand

- Forecast accuracy
 - Error in revenue forecast by customer
 - Error in revenue forecast by division / product family
 - Forecast error wrt sales order
 - 2 month forecast cumulative error wrt shipment by key product / customer
- Forecast volatility / stability
 - Waterfall chart of dollarized forecast by customer (forecasted bucket)
 - Forecast variance by month for key product / customer

Key Performance Indicators

Collaboration

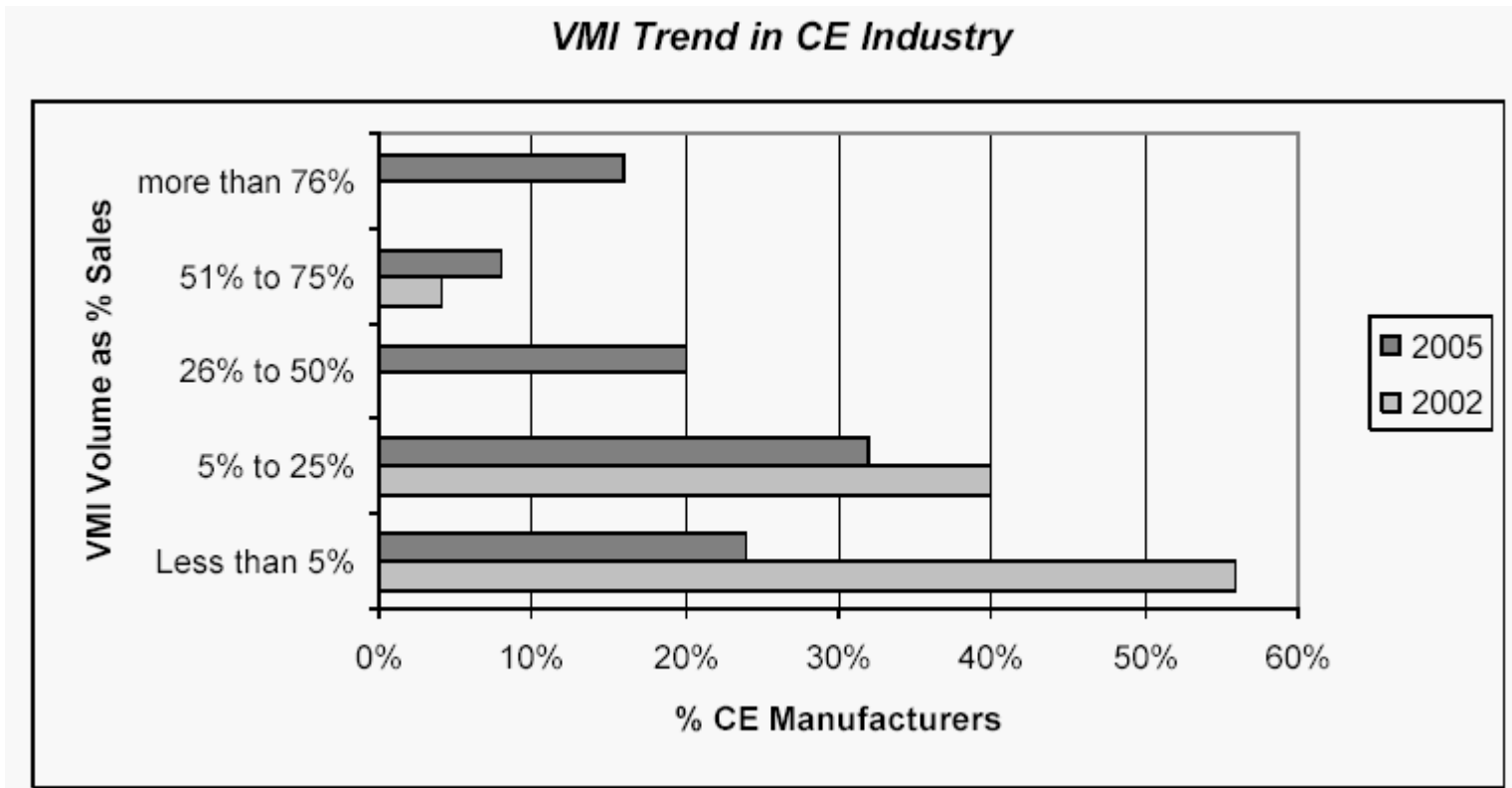
- Baseline Forecast vs Collaborative / Consensus Forecast
- Commit wrt Collaborated / Consensus forecast

Execution scorecard

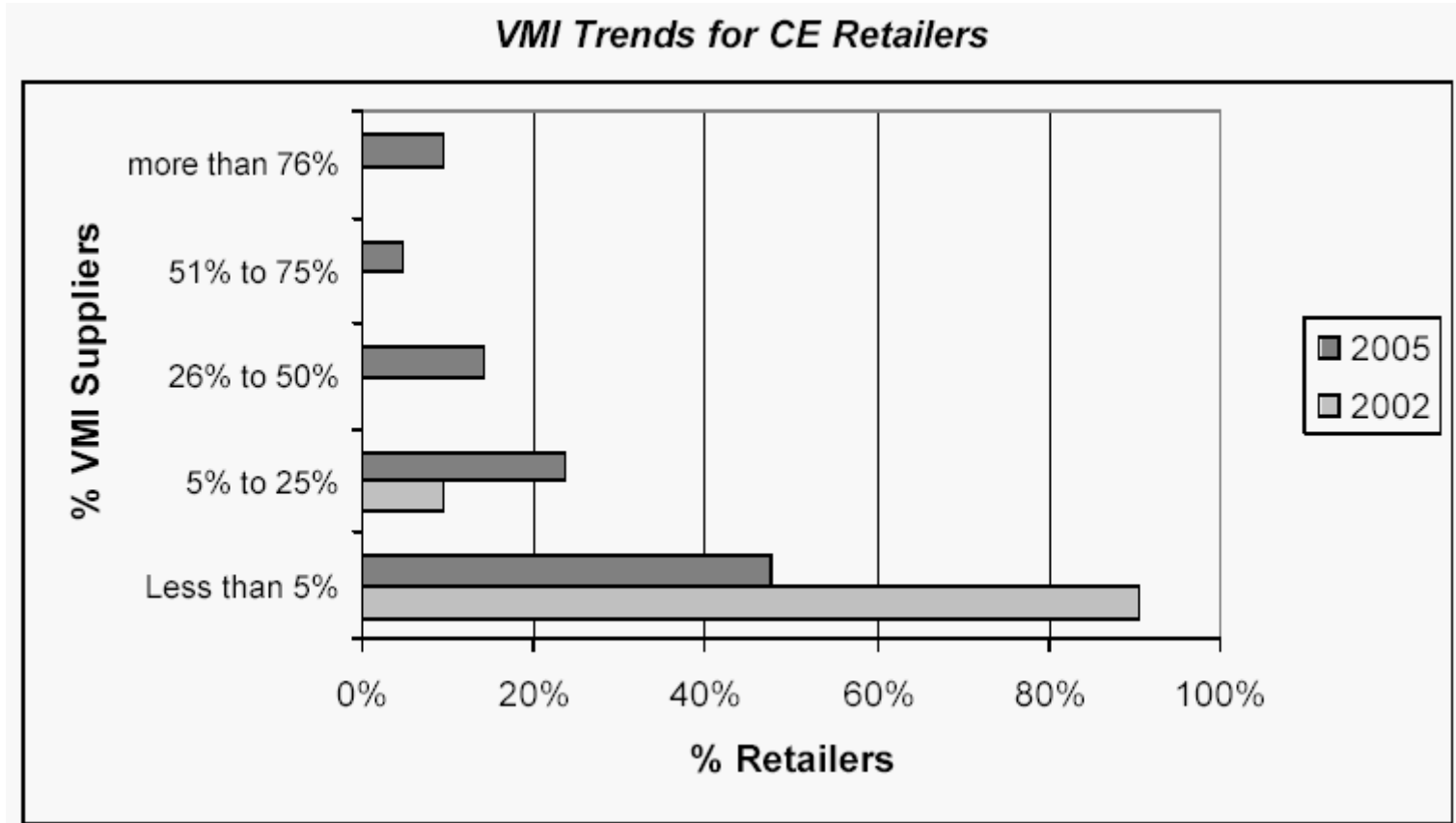
- On time delivery against PO's
- Right Quantity against PO
- Weekly / Monthly Order Delivery (measures for order cycle)
- PO lead time
- Lock Period
- Fill rate
- In stock percentage
- Mis-labeling
- Promotion order shipment (penalty for mis-shipment)

Future Trends in Planning

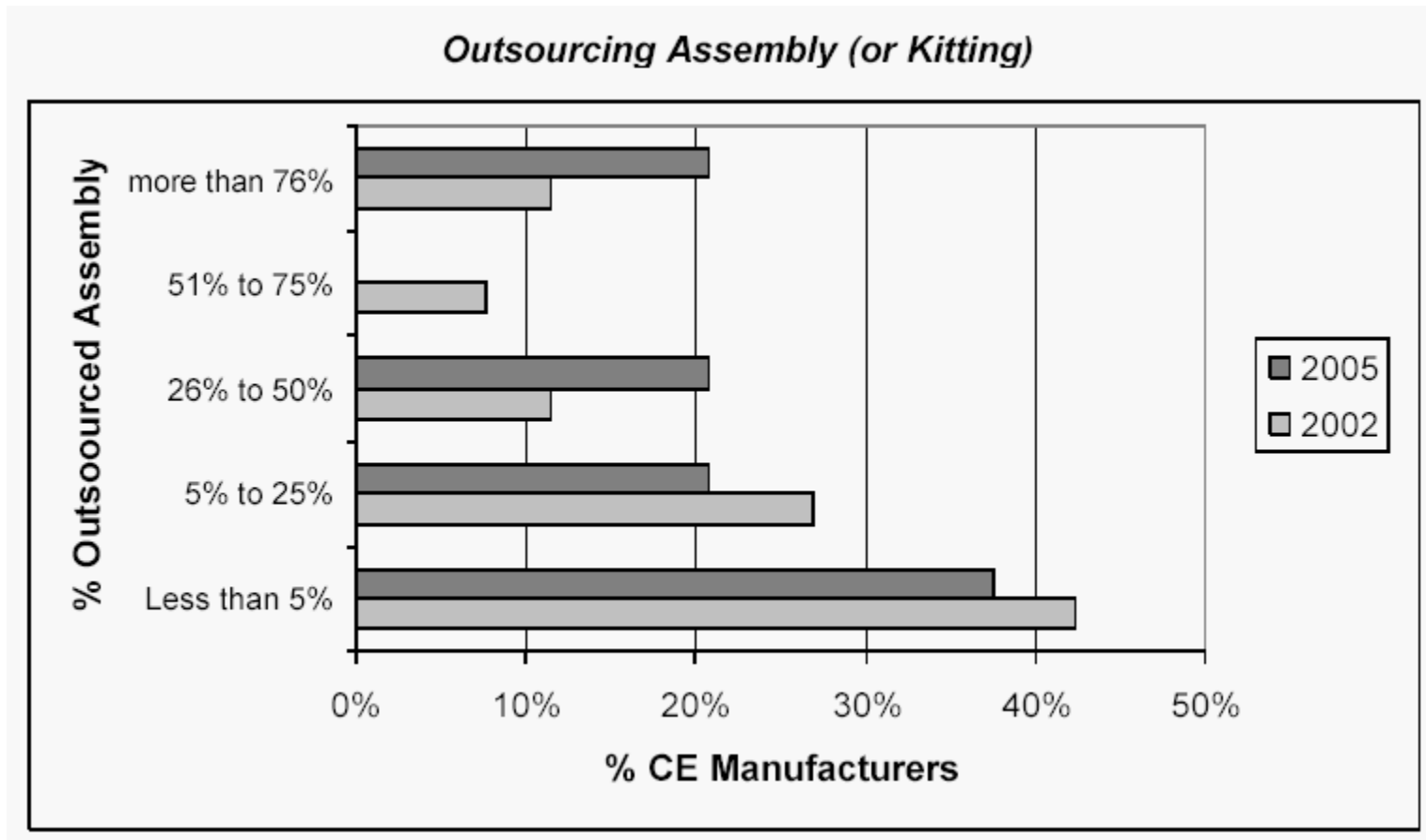
VMI Trend in CE Industry



VMI Trends for CE Retailers

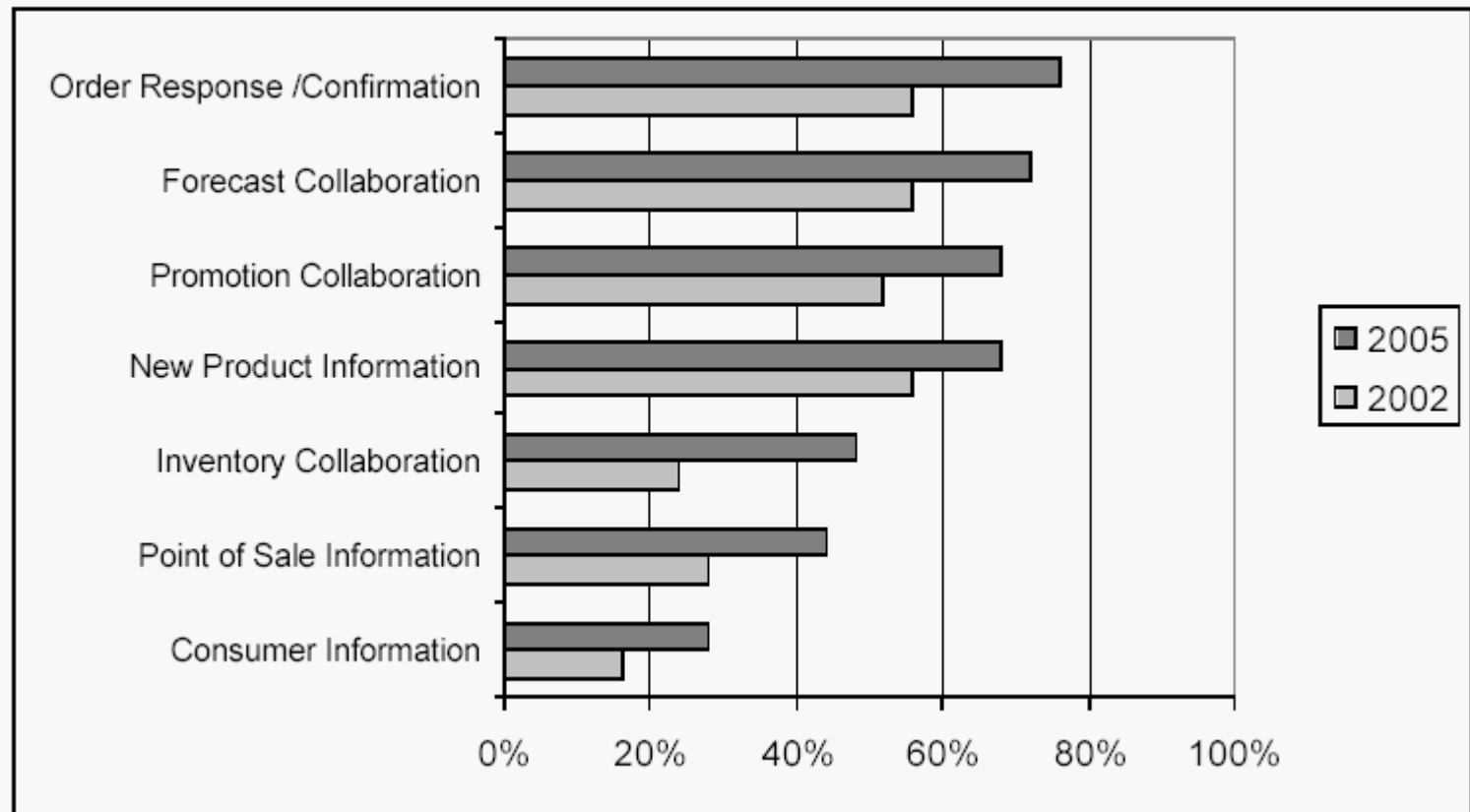


Outsourcing Assembly (or Kitting)



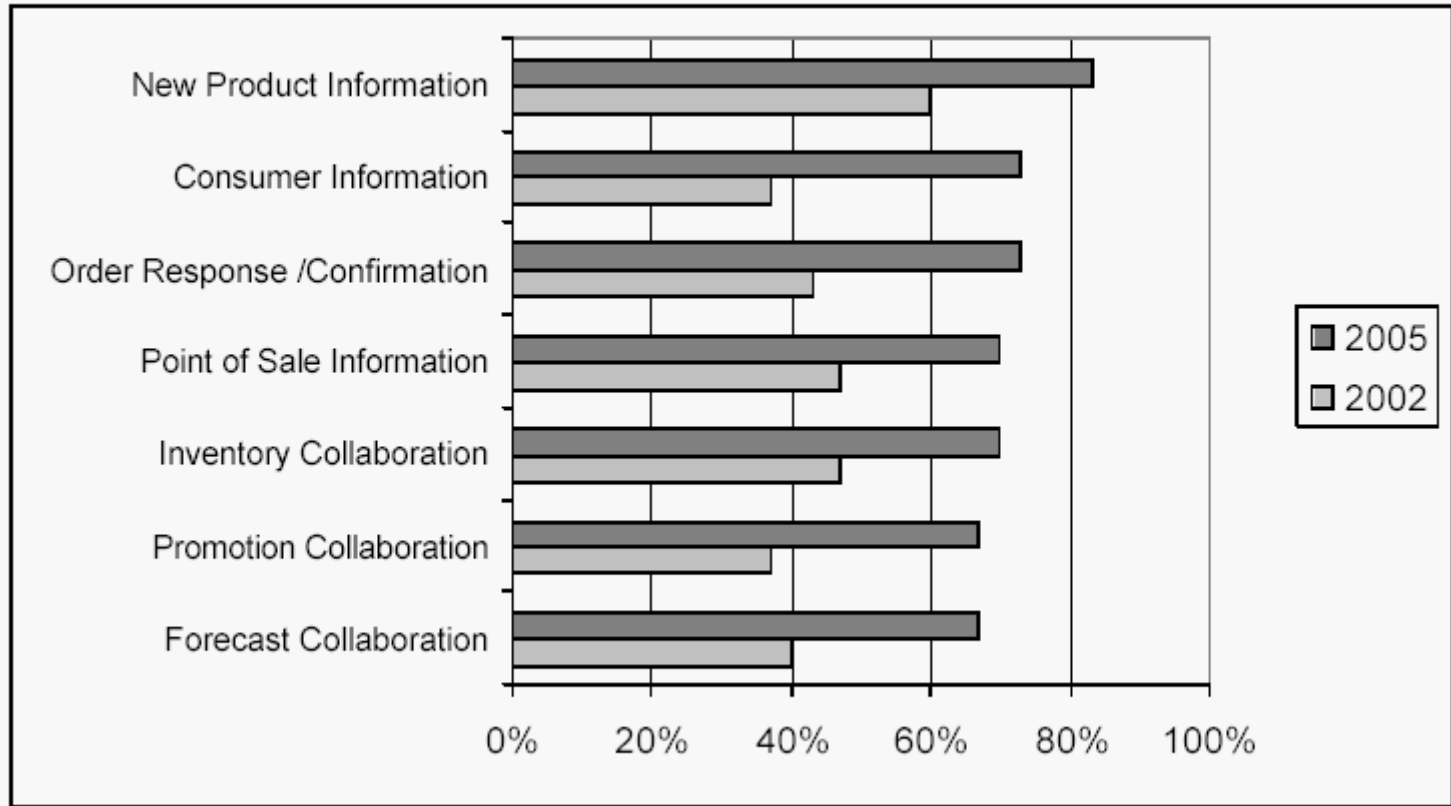
Information Sharing and Collaboration for CE Retailers

Information Sharing and Collaboration for CE Retailers



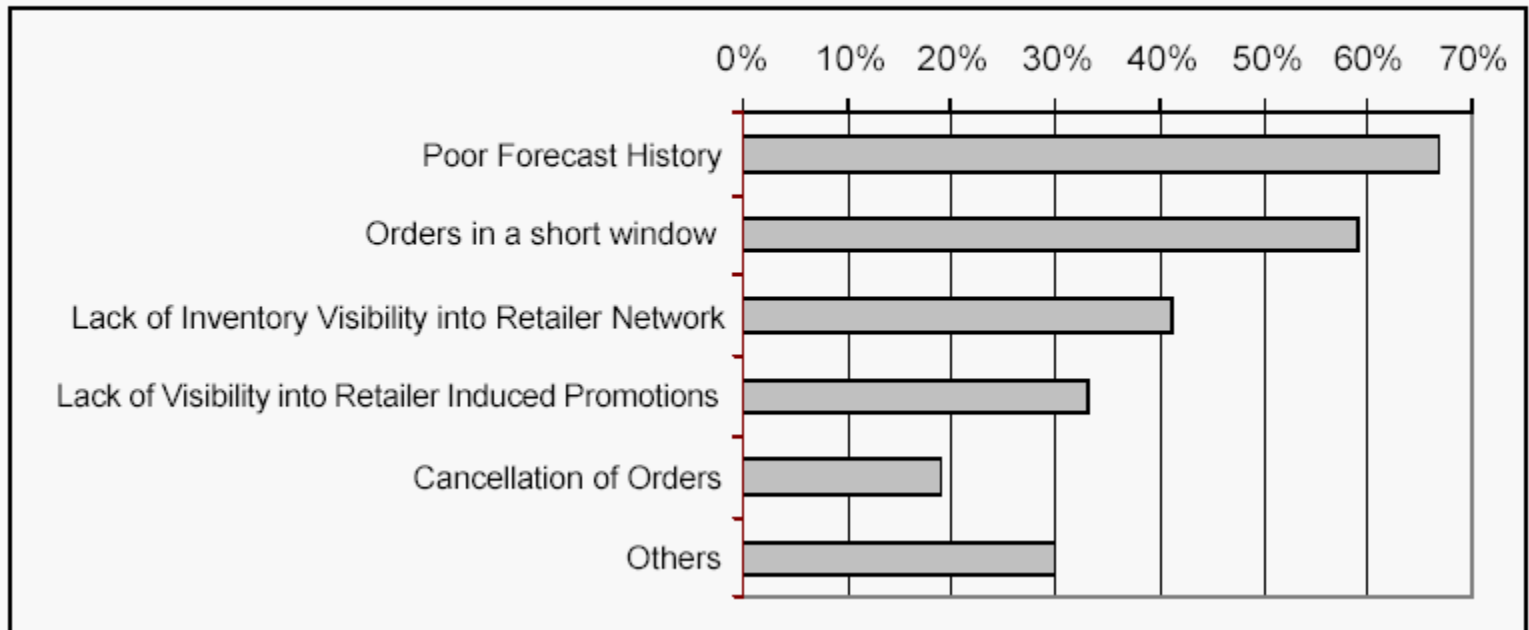
Information Sharing and Collaboration for CE Manufacturers

Information Sharing and Collaboration for CE Manufacturers



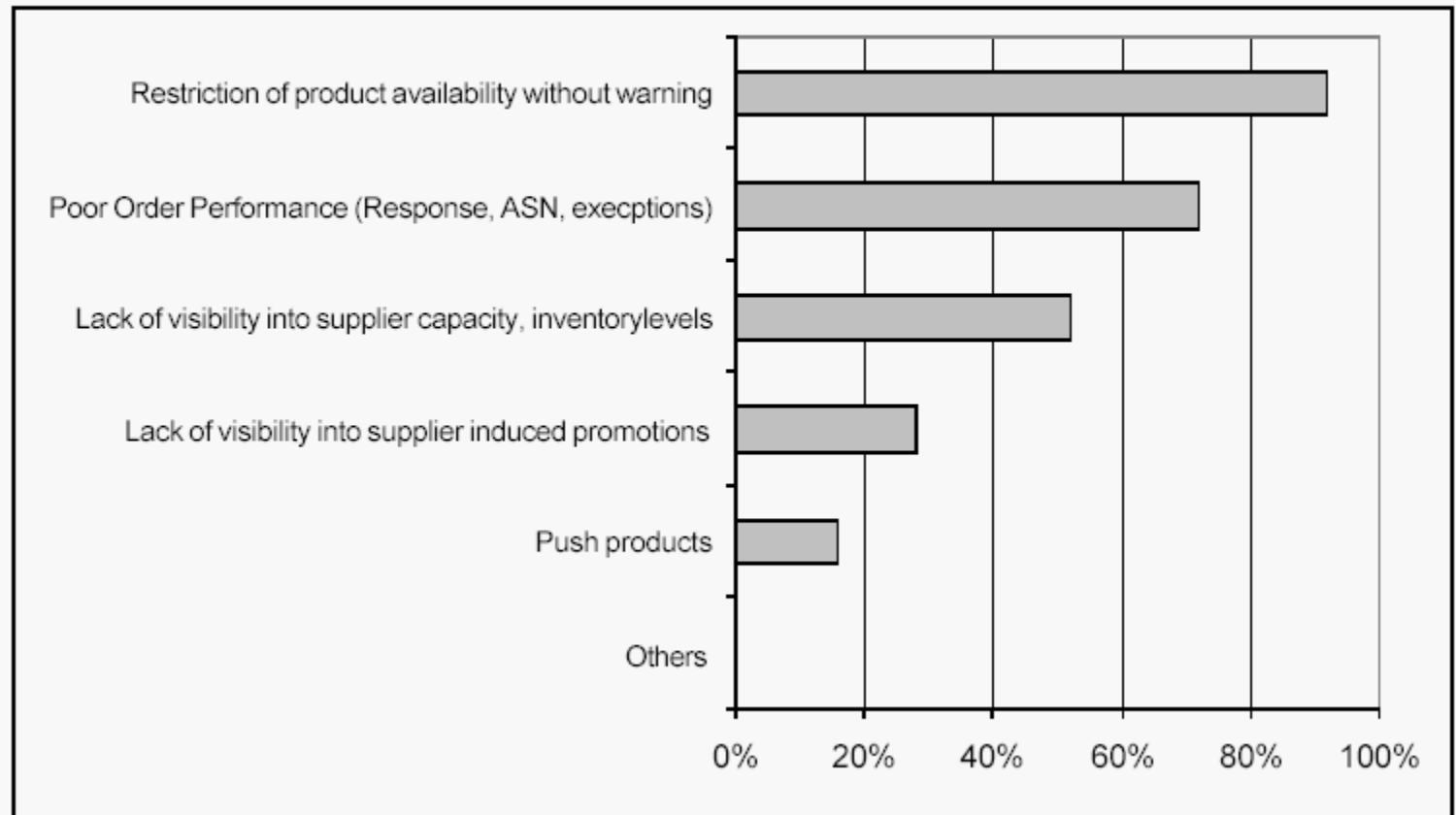
Challenges in Retailer Interaction

Challenges in Retailer Interaction



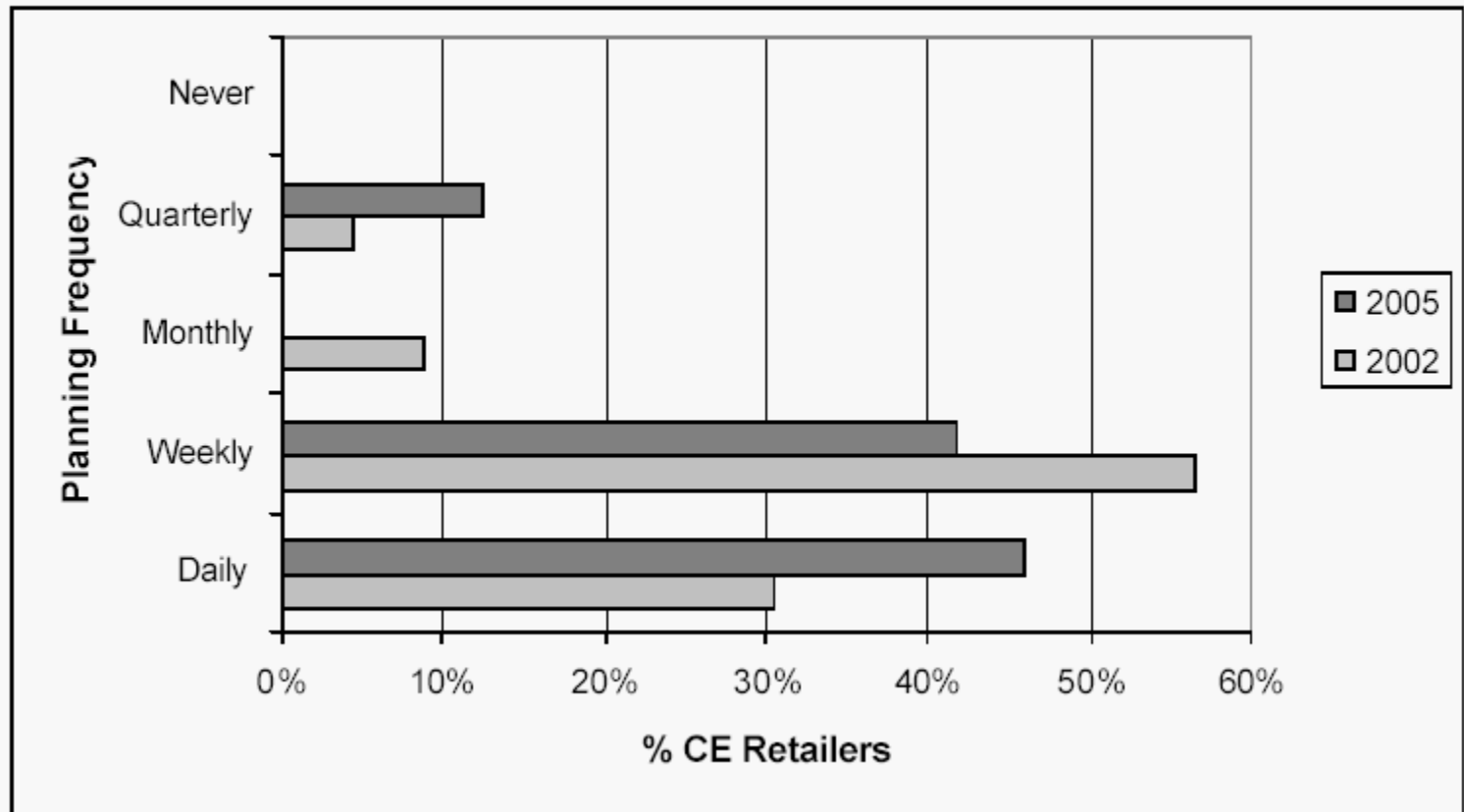
Challenges in Interaction with CE Manufacturers

Challenges in Interactions with CE Manufacturers

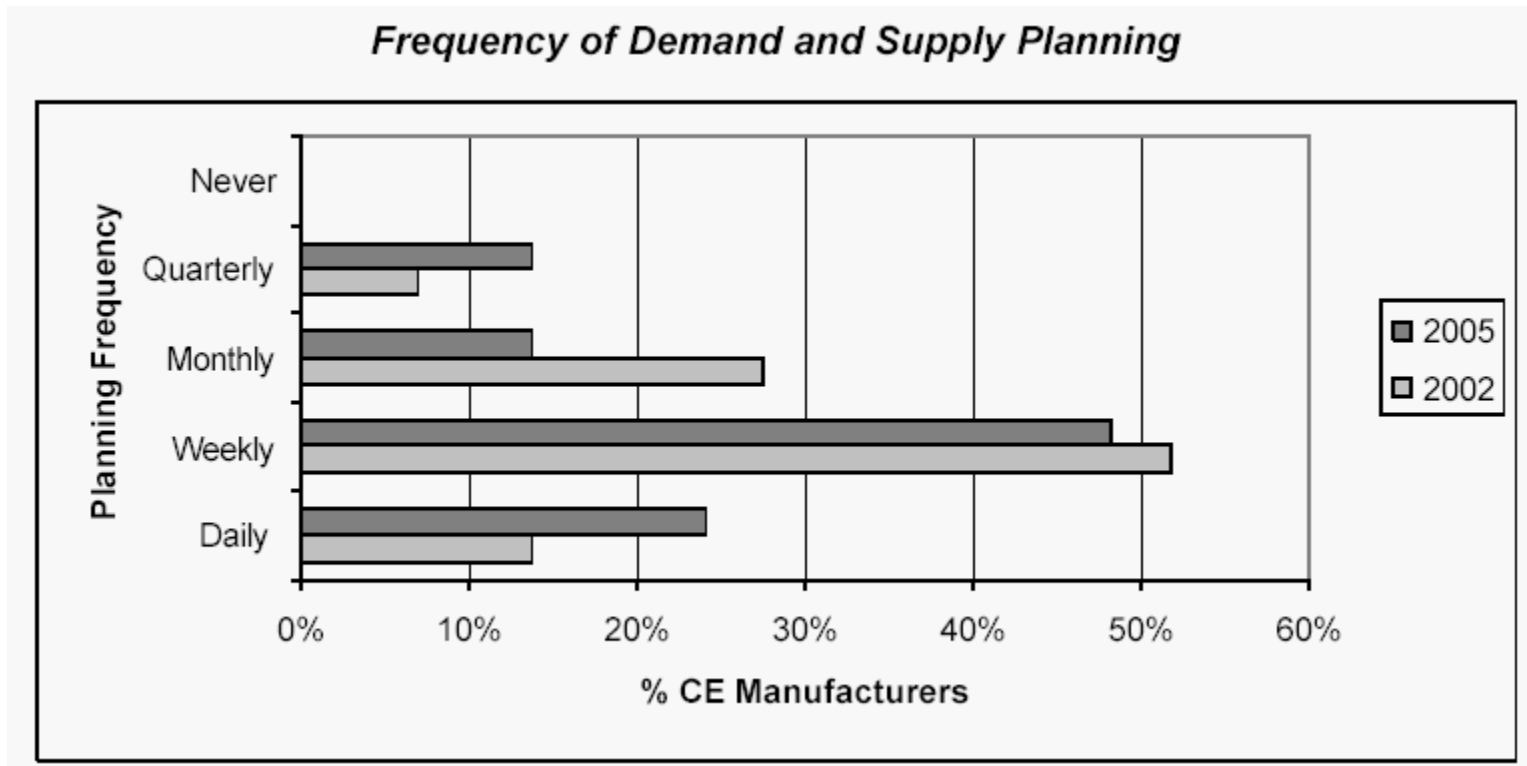


Frequency of Merchandising and Replenishment Planning

Frequency of Merchandising and Replenishment Planning



Frequency of Demand and Supply Planning



Delay in Demand Propagation

Example: Delays in demand propagation in a monthly planning cycle scenario for a simulated supply chain with 4 nodes. On average, it results in a 45 day delay in the recognition of demand change signal indicated by the Retailer. Accordingly, switching to a weekly planning scenario reduces this delay to 10.5 days substantially improving responsiveness.

