

Collaborative Supply Chain Planning for the Orthopaedic Industry

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Supply Chain Collaboration - Abstract

Whether you are a manufacturer or distributor in the orthopaedic industry, an integrated supply chain planning process with collaboration is a key requirement to improve customer satisfaction, speed up the time to market and improve profitability. Supply chain planning starts with a plan for customer demand, which then gets translated into a production and manufacturing plan, complemented by effective inventory management and network optimization for improved supply chain efficiencies in the long run. Traditional supply chains are driven by a halo mentality in which one function receives information from another and reacts with goods and service transfers or with more information. However, collaborative supply chains work on the basis of collective inputs from various supply chain participants including even the customer (CPFR) and the vendor (Supplier Managed Inventory and VMI).

In this session, we will discuss the key building blocks of supply chain collaboration including Demand Planning, New Product Development process, order fulfillment, manufacturing planning, integrated business planning (S&OP), customer focused planning, and a Supply Chain Score-card.



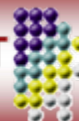
Orthopaedic Value Chain

- **Increasing Regulation**
- **Inventory on Consignment**
- **Distributor Network**
- **Constant Balance sought between stock outs and balancing supply and demand.**



Current State of the Ortho Supply Chain

- What are the big business Challenges?
 - Regulatory
 - Supply Chain Costs
 - Service needs
- What are the process pain points?
- What can be improved with the supply Chain?



Inventory Quiz

	Company 1	Company 2	Company 3
Inventories (year ending in 2007)	620K	50K	760K
Cost of Goods Sold	700K	130K	880K
Turns	1.16	2.6	1.16
Days on Hand	314	140	315



The Cost of Inventory

- The structure of the business requires on-demand service and imposes significant costs for stock-outs at the distributor/point-of-use
- The collective response is to hold higher inventories across the Value Chain at every distribution point.
 - Turns average close to 1 across the Industry
 - In-efficiencies can be hidden in excess inventory
 - Results in other efficiency and inventory handling costs, obsolescence, difficulties with recall and returns logistics



Inventory on Consignment

- Ability to ship out and manage inventory on consignment is a business requirement and provides a competitive advantage with the end consumer.

- Consignment inventory provides
 - the buffer against uncertainty in demand and supply for the provider/point-of-use customer
 - but the cost is under-written by the Ortho OEMs.

- The location of the inventory seems to have shifted from a central location to the point-of-use thus creating additional inventory management complexities.

Source: 2006 survey by Archstone Consulting

Supply Chain Costs and collaboration

- The typical Ortho OEM works with a network of small suppliers and distributors/ Agents and multitude of customers/ providers.

- Inventory costs have increased and turns have decreased in response to
 - Lack of visibility to demand and supply
 - Lack of accurate demand forecasts
 - Communication challenges



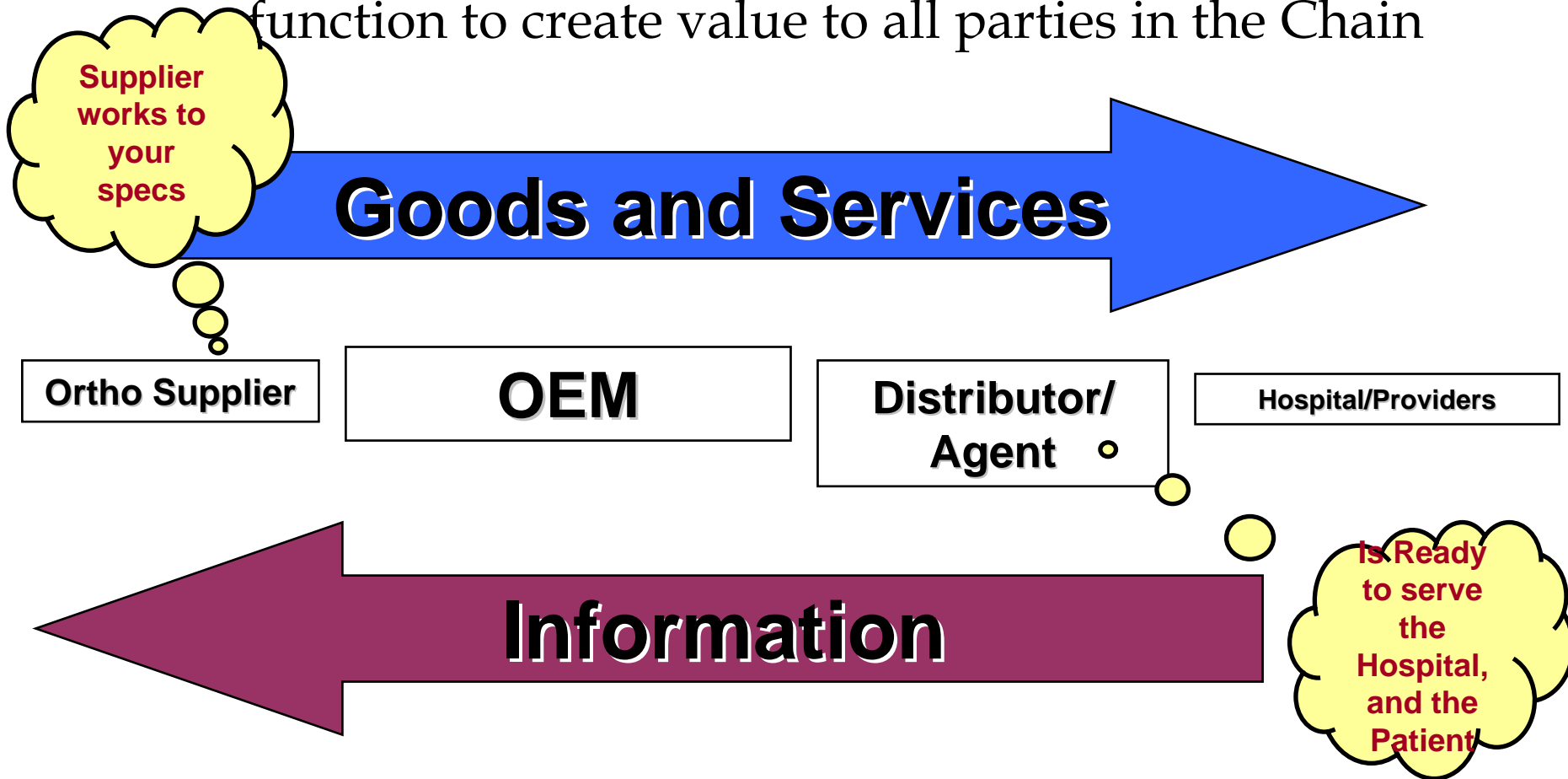
The Effective Value Chain

- Information Sharing
- Working capital optimization
- Ability to execute on-demand.



Flow of Goods and Information

Process, Organization, and Systems that holistically function to create value to all parties in the Chain



Holistic Value Chain

- Help move products to the ultimate consumer most efficiently
 - The lowest possible cycle time – rapid movement across the chain
 - The least possible traffic buffers – lower inventory and higher turns for every one in the value chain – Supplier, manufacturer, distributor.
 - Ability to serve the ultimate consumer on-demand.



Informational Value Chain

- Should provide visibility to the demand volatility and supply constraints
 - Tool/Process capability to understand critical supply constraints at the Ortho Supplier/Manufacturer so alternative actions can be undertaken
 - Ability to sense/forecast Demand volatility from the Distributor/Hospital/Care Provider
 - Inventory gaps at the distributor
 - Lost Business
 - Lost Customer/Unhappy Hospital/Care provider/Patient
- Constantly re-invents itself



Supply Chain Collaboration – Some Important Building Blocks

- Joint Planning
- Demand Forecasting
- Communication
- Measurement



Collaboration Building Blocks

What are the building blocks to facilitate collaboration across the Ortho Value Chain?

- Joint Business Planning for the future
 - Sales Volume Growth
 - Service levels, and
 - Quality metrics
- Demand Forecasting and Management
 - Sense, shape and forecast demand
 - Manage demand when faced with constraints
- Good Communication
- Measurement and Score-carding



Joint Business Planning

- To promote collaboration and create a partnership with your suppliers, it is in the best interest of the OEM to create a long-range plan between the partners
 - You may be a significant share of your supplier's business
 - Better longer-term guidance helps your supplier plan capacity
- Establish ahead of time intended growth rate, expected service levels and required quality



What is Demand Planning?

Although similar to Sales Forecasting, Demand Planning is more than just forecasting

Demand Planning = forecasting + Shared Intelligence

Demand Planning starts with a solid Statistical Forecast, and builds

- Market and Event Intelligence
- Collaboration – Internal and External
- Forecast Reconciliation – top-down vs. bottom-up forecasts



Why Demand Planning?

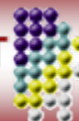
- **Forecasting is fundamental to the Corporate Planning and decision making process**
 - **Short-term Planning**
 - How much to Buy – Raw Materials
 - How much to Make – Production Plan
 - How many hands needed – Staffing Plan
 - How much to Ship to a specific Warehouse?
 - **Long-term Planning**
 - How much capacity to build next year?
 - Estimate Resource Requirements



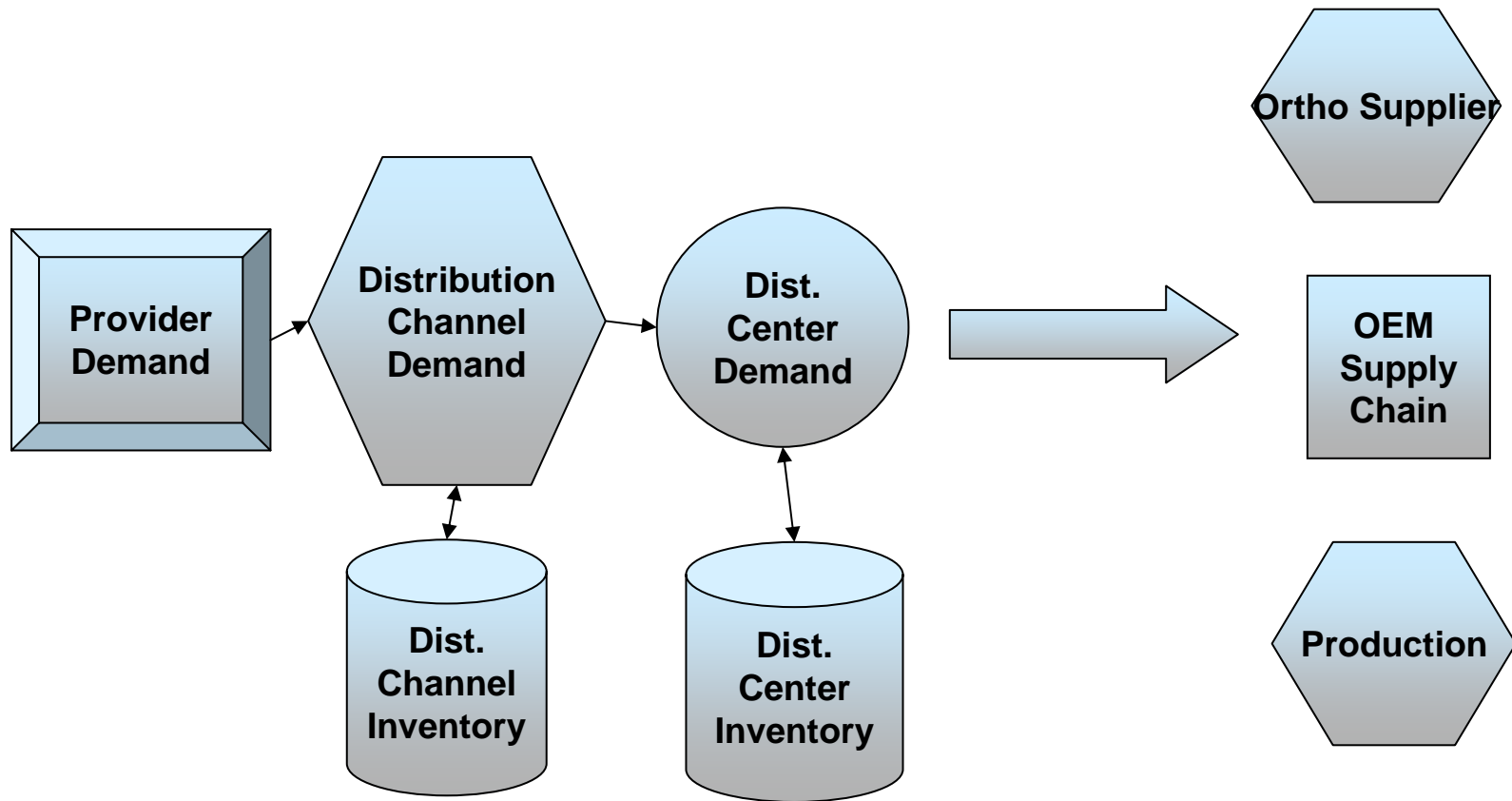
Key Components of a Demand Plan

To be effective, Demand Plans need to be

- **In relevant detail**
 - Company or Division Level
 - SKU or product line or Brand
- **Timely**
 - Lag and Lead considerations
- **Unbiased**
- **Covering the appropriate time horizon**
 - Forecasting Buckets
 - Weekly or Monthly
- **Collaborative and Consensus-based**

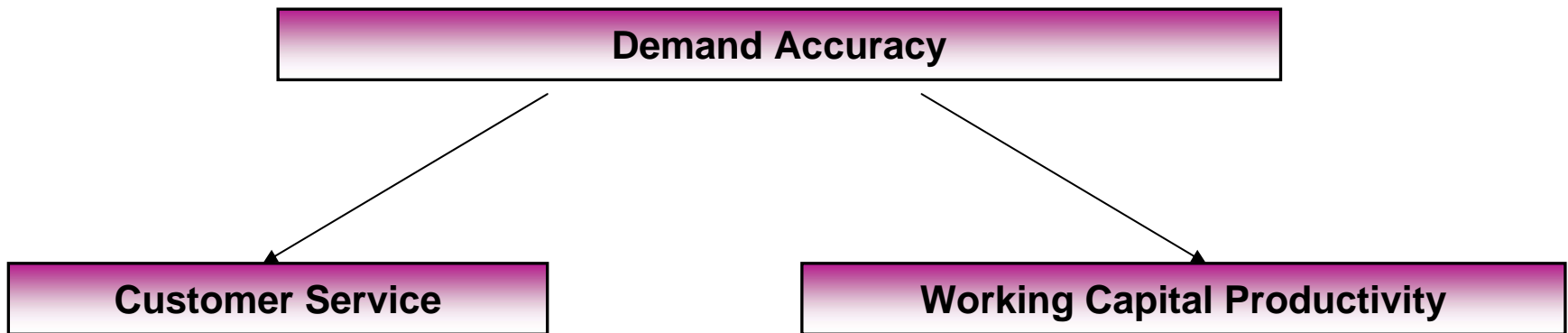


Demand Plan drives the supply chain



Economics of the Demand Plan

- Enable the Supply Chain to provide high levels of service
- Optimize the working capital resources – inventory, returns



- Thus Demand forecast accuracy feeds both key Supply Chain Objectives.
- Demand planning objectives are aligned with supply chain goals.



Communication is the test of Collaboration

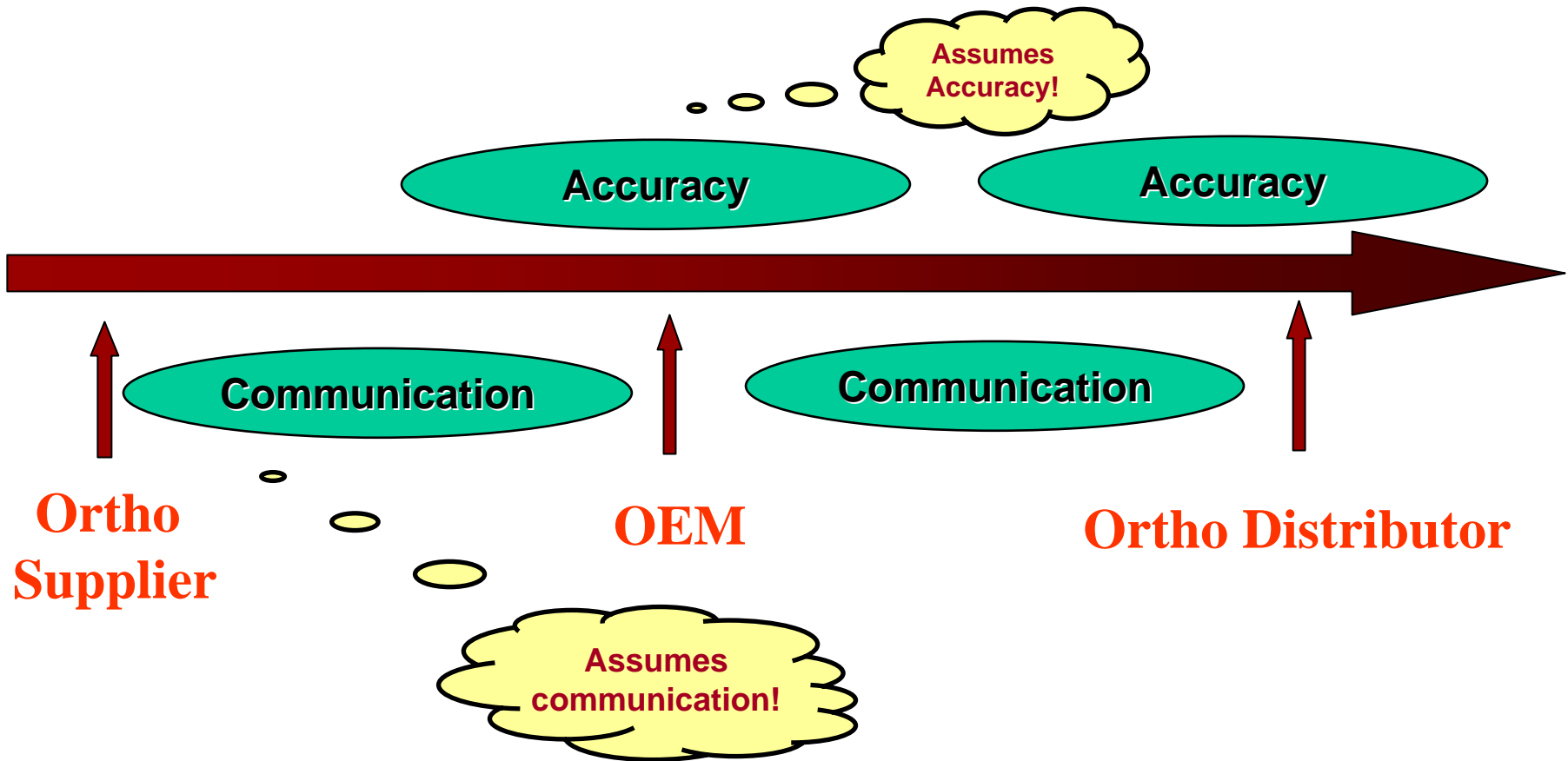
- Is there good Communication between collaboration Partners?
 - Honest and open communication
 - Frequent and timely communication
- Are they communicating the right information?
 - Forecast Content
 - Inventory Levels
 - Metrics score-cards

S&OP - Internal Communication

- Sales and Operations Planning Process is the internal communication vehicle.
- Demand Planning plays a key role in facilitating the communication between the Sales Team, Marketing and the Supply Chain
 - Creates Statistical (or time-series) Demand forecast
 - Generates information from Sales and Marketing to enrich the demand forecast
 - Establish consensus with Financial Planning and Marketing - S&OP process
 - Helps in Demand Management.



Collaborative Information Exchange



Collaboration Accuracy

- Good Forecast and bad communication
 - Collaboration accuracy = 0

- Good Forecast and untimely communication
 - Collaboration accuracy = 0

- Perfect communication and poor Forecast
 - Collaboration accuracy = 0

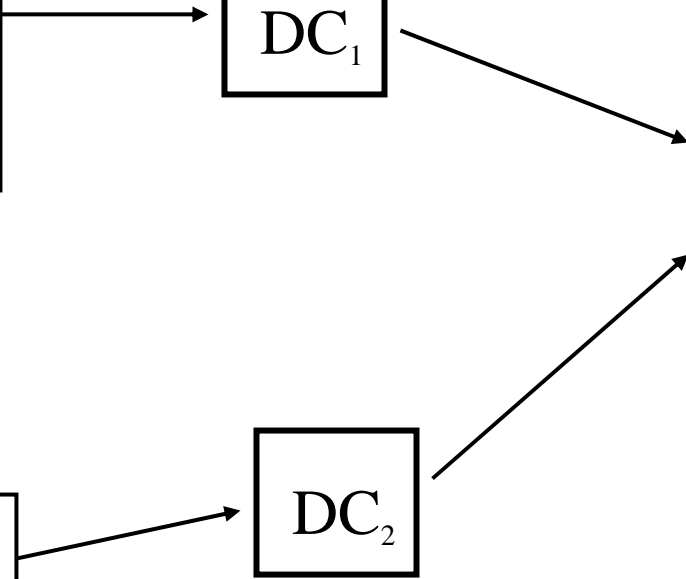
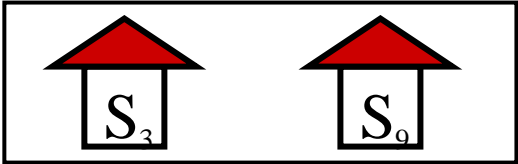
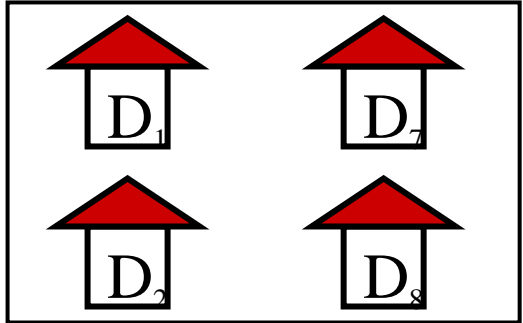
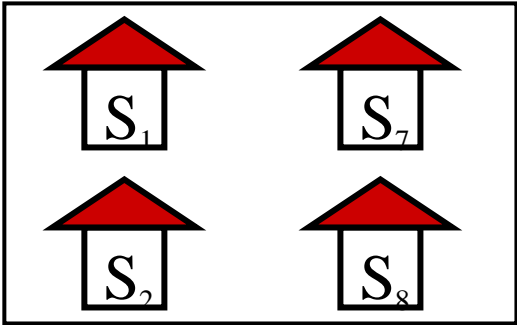


Value Network

Suppliers

OEM DCs

Distributor/Agent/
Provider



Communication Challenges

- With many small suppliers and multitude of distributors and providers, communication and the ability to aggregate and disseminate such communication can be a big challenge for the OEM
 - The Ortho Value Chain needs the infrastructure to orchestrate such communication.
 - Enable the platform for such communication to happen
 - between OEM planning and production with the Supplier
 - Sales and the Distributor/Provider.
 - The pay-off for investment in such collaboration Portal a la Walmart Retail Link to the OEMs is huge.

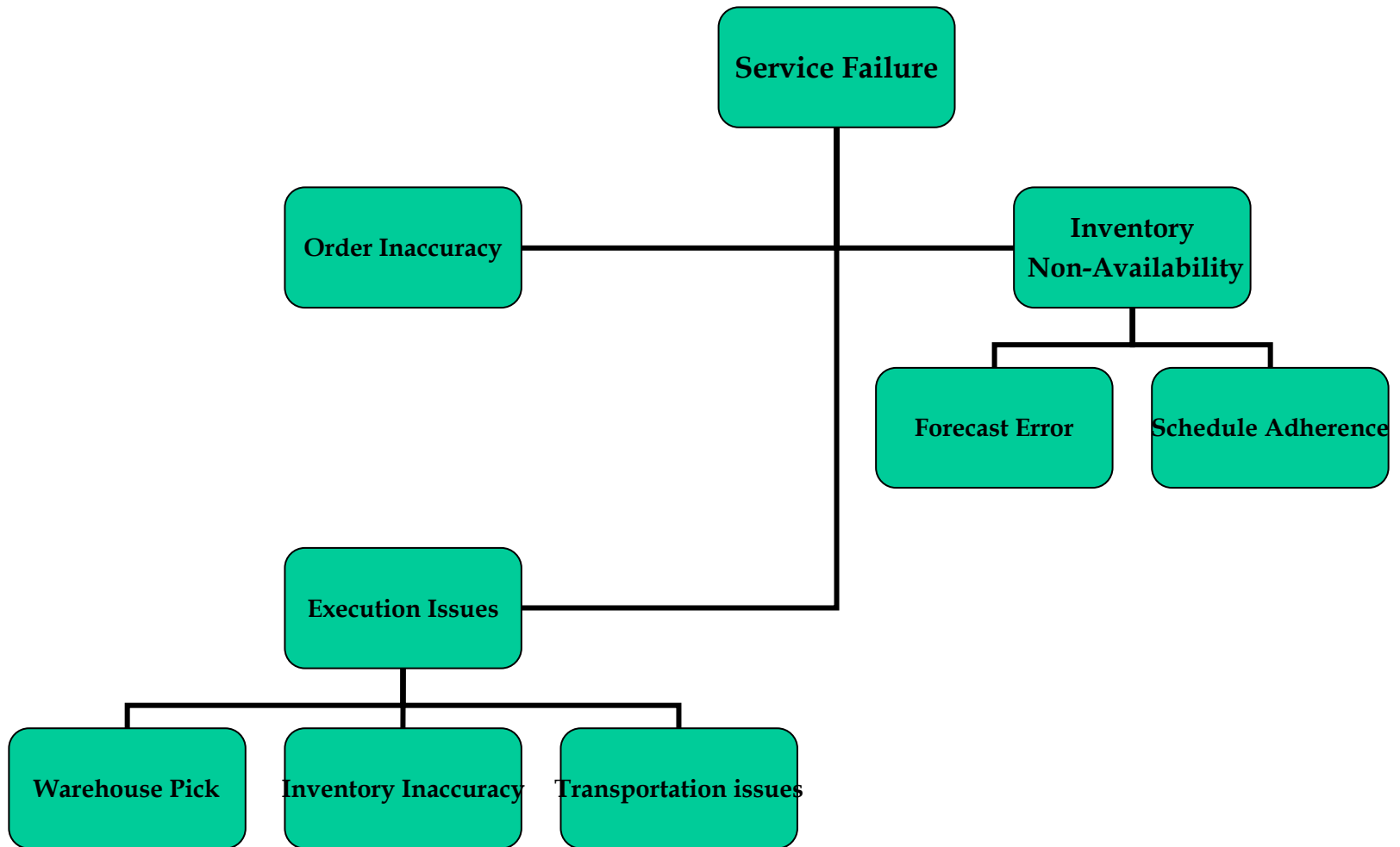


Measuring Service Levels

- The right product, right place, right time
 - Correct SKU
 - Out of the Correct DC and
 - On time.
- Components of a perfectly served Order
 - Inventory Availability
 - Order Accuracy
 - Shipping Performance
 - Transportation Performance



Decomposing service Failure



Forecast Error

- Forecast Error is the deviation of the Actual from the forecasted quantity
 - Error = absolute value of {(Actual - Forecast)}
 - $\varepsilon = | (A - F) |$
 - Error (%) = $| (A - F) | / A$
- Magnitude of the Error vs. Direction
 - The first is deviation
 - The second implies bias, if persistent



Example of Simple MAPE and Bias

	<u>Sku A</u>	<u>Sku B</u>	<u>Sku X</u>	<u>Sku Y</u>	<u>Total</u>
Actual	25	50	75	74	224
Forecast	75	0	25	75	175
Signed Error	-50	50	50	-1	49
Abs (Error)	50	50	50	1	151
Error (%)	200%	100%	67%	1%	67%
Accuracy (%)	0%	0%	33%	99%	33%
Bias (%)	-200%	100%	67%	-1%	22%



Complete Score Card should include...

- Measurements for the Distributor
 - Distributor forecast accuracy
 - Service Levels
 - Stock out Percentage
 - Inventory days on hand
 - Obsolescence
- Measurements for the Supplier
 - Schedule or Plan Adherence
 - Inventory days on hand
 - Quality Yield
 - New Product Launches
 - Inventory accuracy
- Measurements for the OEM include a combination of the above with specific emphasis on
 - Accuracy of the forecast delivered to the Supplier
 - Forecast Accuracy of the distributor demand



Collaborative Partnerships Overview

- a) **Supplier Managed Inventory**
- b) **Vendor Managed Inventory**
- c) **Portals or hosted platforms**



VMI – Vendor Managed Inventory

- Vendor Managed Inventory is a program in which
 - the supplier generates the customer's order
 - based on shared information on customer demand and inventory and upon
 - mutually agreed conditions

- Test of Collaboration
 - Information Sharing – Yes!
 - Visibility into the future – May be!



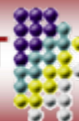
SRM and Supplier Managed Inventory

- Manage replenishment and forecasts in the OEM's system
 - OEM provides system access to the supplier for managing orders and inventory
 - Supplier has visibility to
 - Demand at OEM DC level
 - DC inventory
 - Supplier reviews info and generates order and creates the production plan

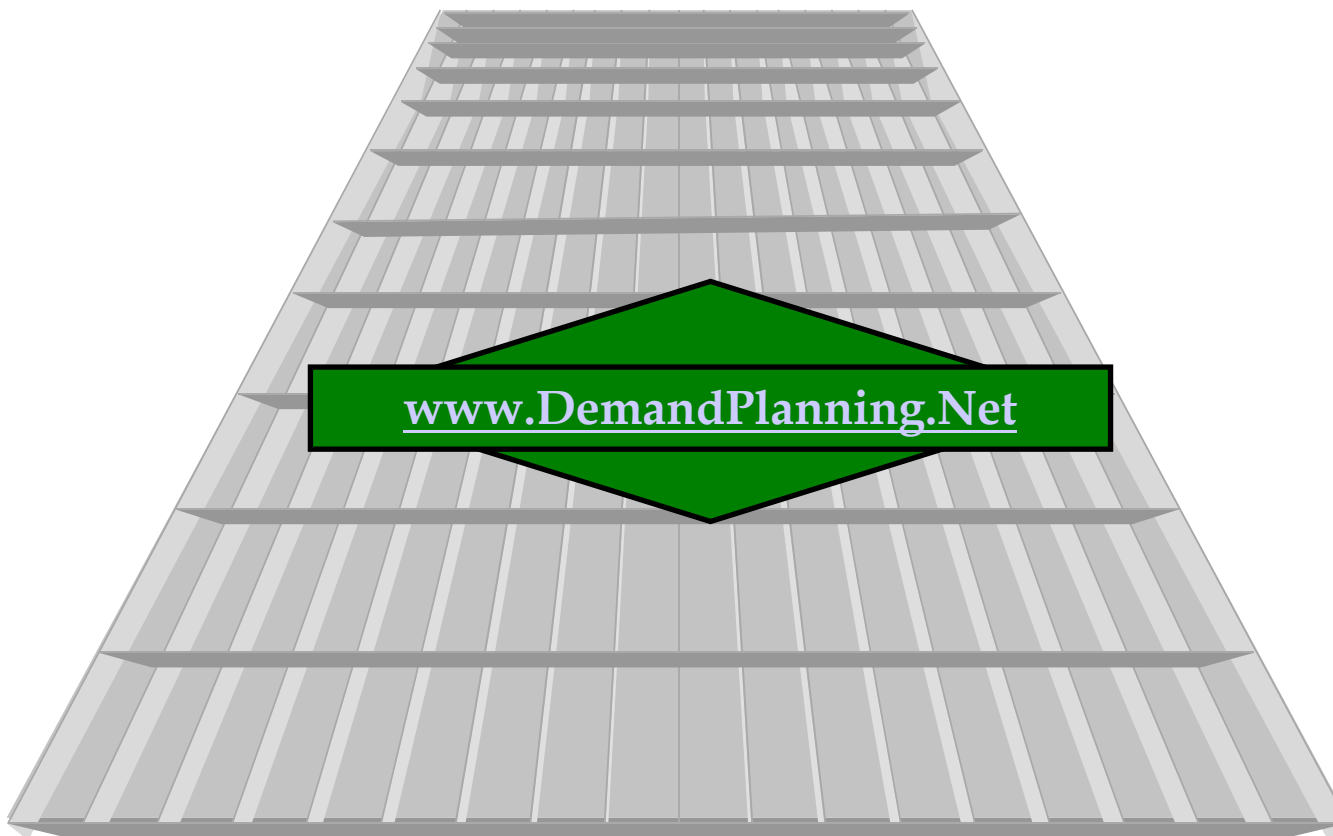


Industry Resources

- Here are a list of industry and educational resources
 - DemandPlanning.Net
 - <http://www.DemandPlanning.net>
 - http://demandplanning.net/demand_planning_training_Jul2008seminars.htm
 - <http://www.demandplanning.net/collaboration.htm>
 - VICS – Voluntary inter-industry Commerce Standards
 - www.vics.org
 - Grocery Manufacturer's Association
 - <http://www.gmabrands.com/industryaffairs/docs/whitepaper.cfm?DocID=880>



Any Questions?



Thank you!

