

NATIONAL LEVEL STAFF DEVELOPMENT PROGRAM ON Logistics and SCM for Total Business Excellence

Supply Chain Strategy and Performance

delivered by

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Supply Chain Strategy and Performance

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4. Supply Chain Management
5. Plant Location and Distribution Centre Design
6. Demand Forecasting ; Demand Variability
7. MTO vs MTS
8. Lead Time Variability
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10. Make or Buy: EMQ VS EOQ



Supply Chain Strategy and Performance Coverage

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19. Performance Measurement
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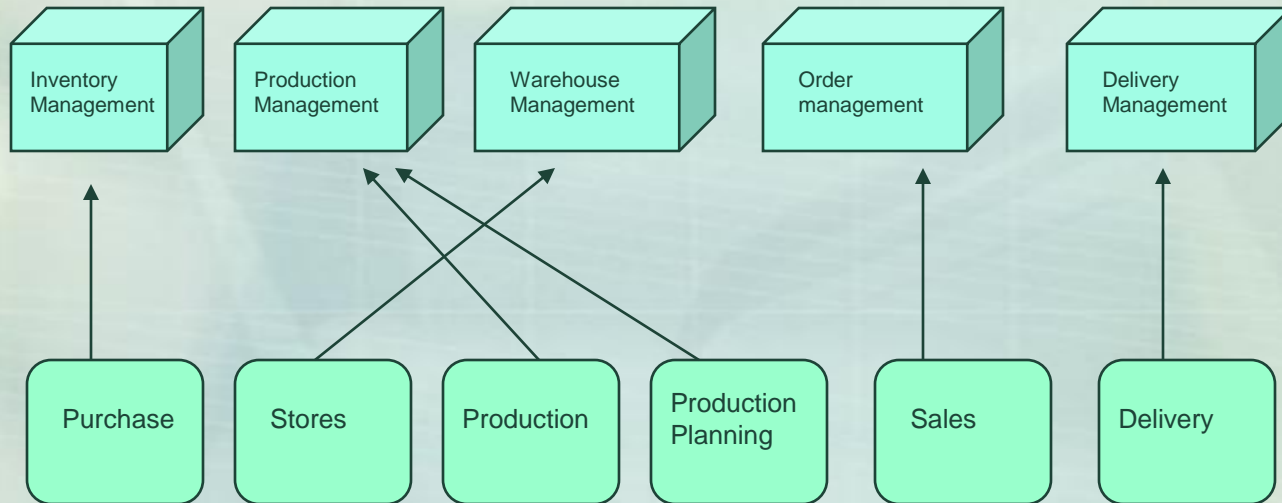
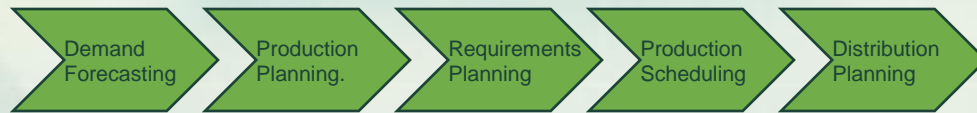
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The Functional Organization

1. Every firm is organized on functional lines such as Production , Purchase, Sales , Quality , Finance, HR etc
2. Even in a multi product firm this is common

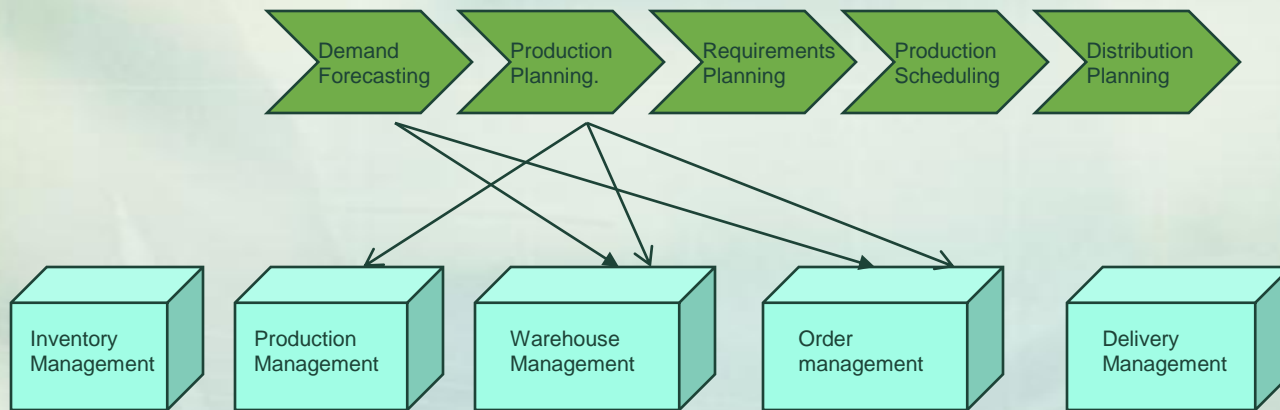
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Who is minding the Stores ?



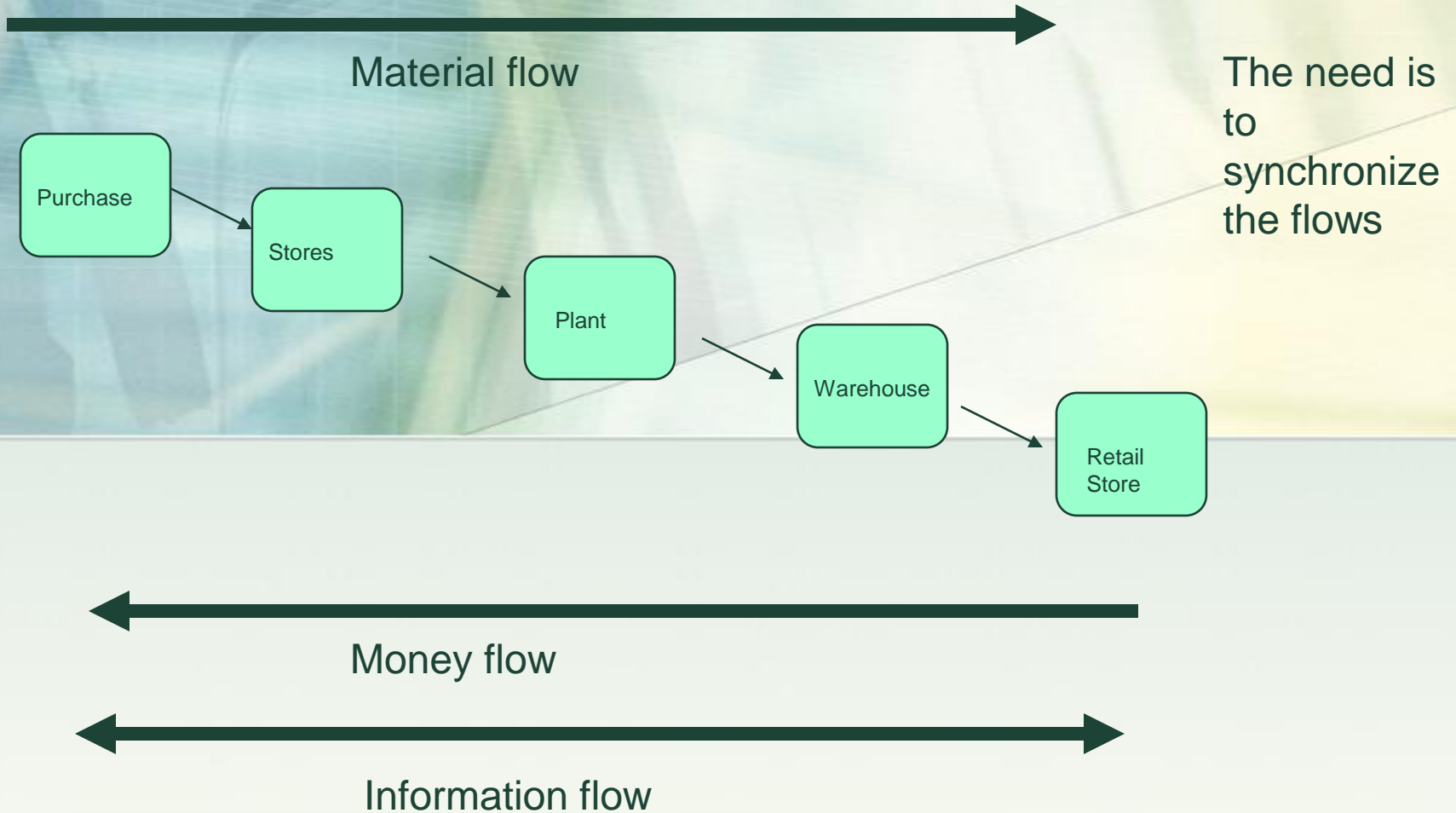
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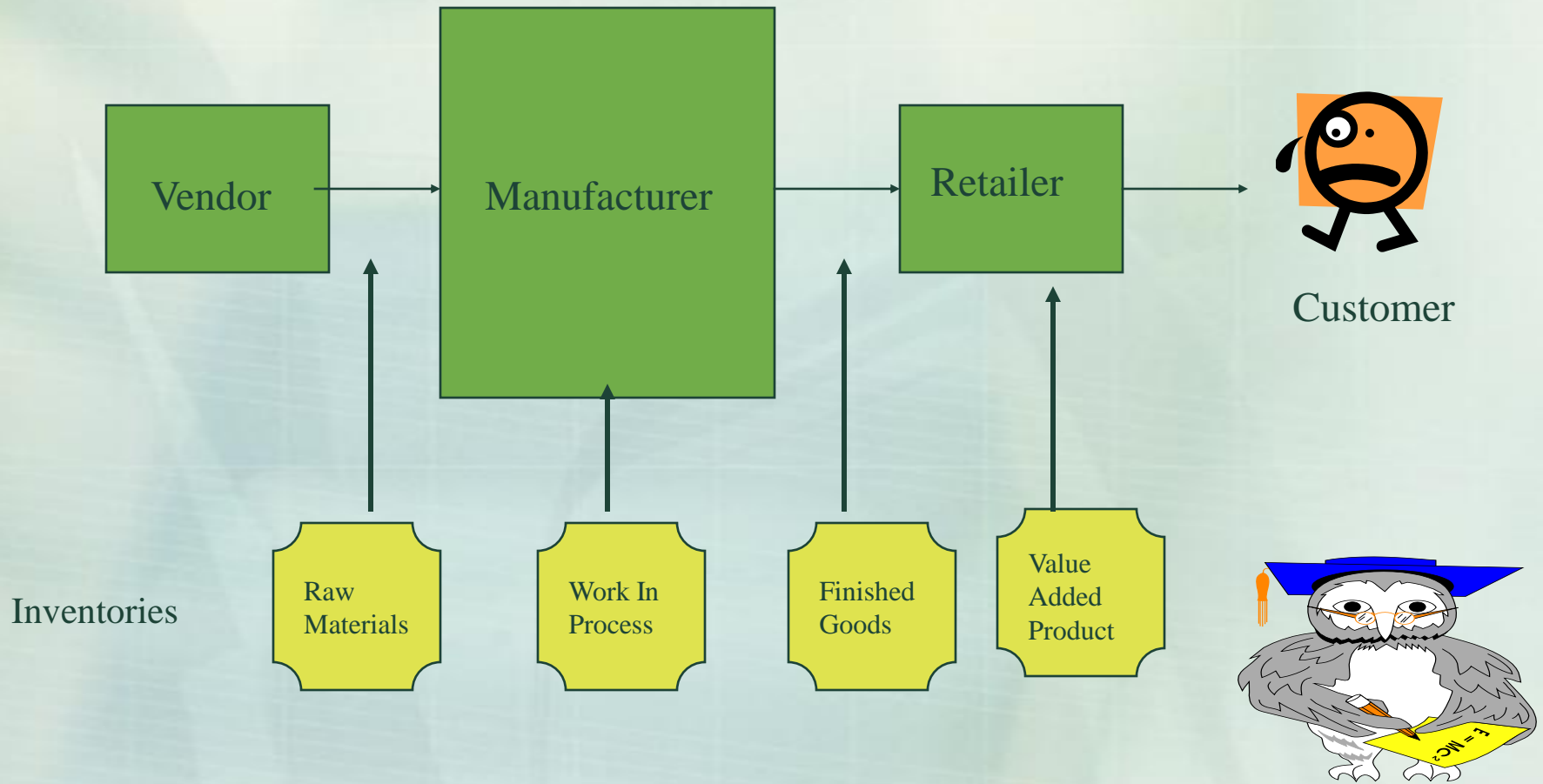


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The Flow Concept



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Customer's focus

- Order fulfilled on time
- Product containing features required
- High Quality
- Excellent post sales service
- Seamless Interactions



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Organizational Challenges:

1. Minimize Demand Uncertainty
2. Eliminate Collection issues
3. Product functionality to meet customer needs exactly
4. Minimize Inventory holdings
5. Assure high quality product
6. Ensure manufacturing efficiency

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The Concept of the Supply chain

- The Supply Chain function then calls for integrating the functional silos of a traditional organization to create a seamless interface with the Customer to satisfy the demand.



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Demand Forecasting and Demand Variability

In a competitive environment demand is not known with certainty.

When a product is offered in multiple sizes, colours or with varying features demand variability is high

Demand also varies based on type : essential versus style goods

Demand in a particular period is also affected by competitor strategies

Hence Forecasting demand becomes a complex task for most organizations

The variability in demand plays havoc in SCM

Time series and Regression Models are used for forecasting

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Whose Demand are we focused on?

Retailers, Manufacturers or vendors?

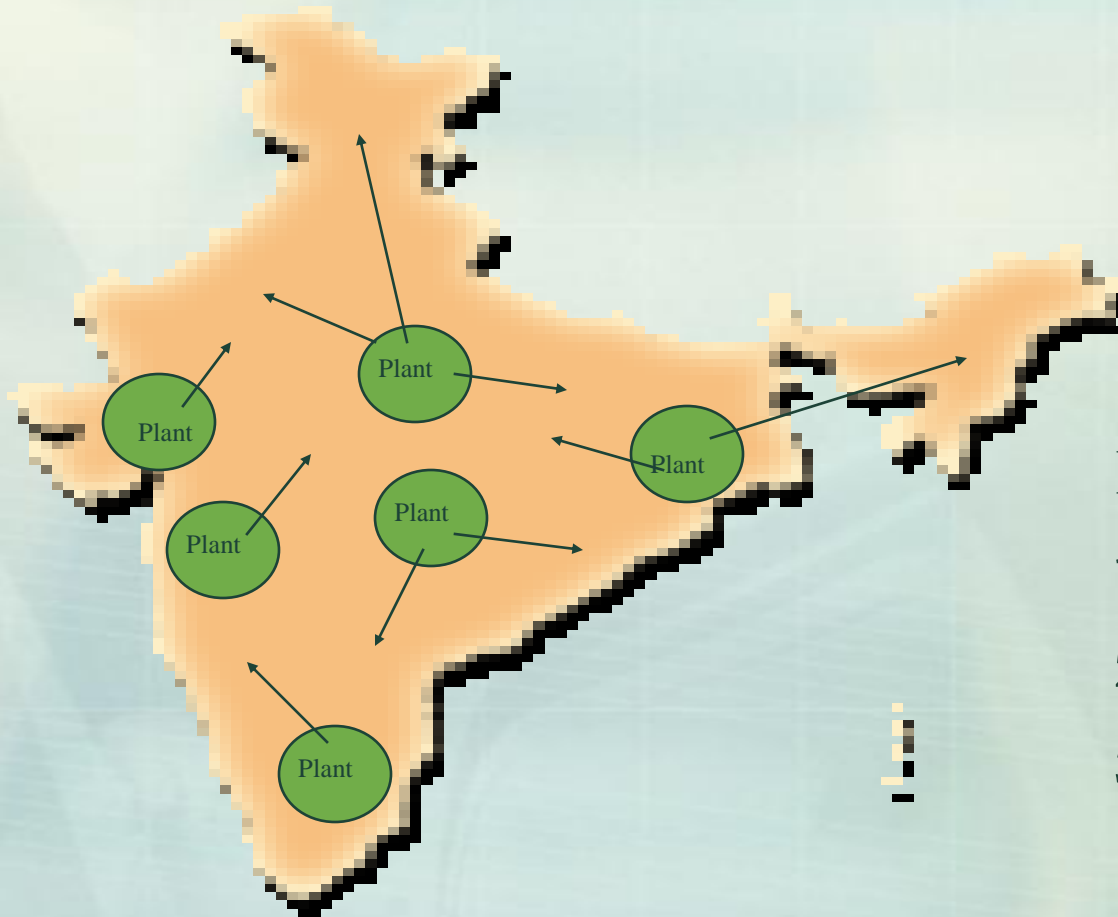
Which Demand are we focused on?

FG, WIP or RM ? Or that of the transporter ?

Does the end customer demand vary?

from time to time, region to region ? Price sensitive?

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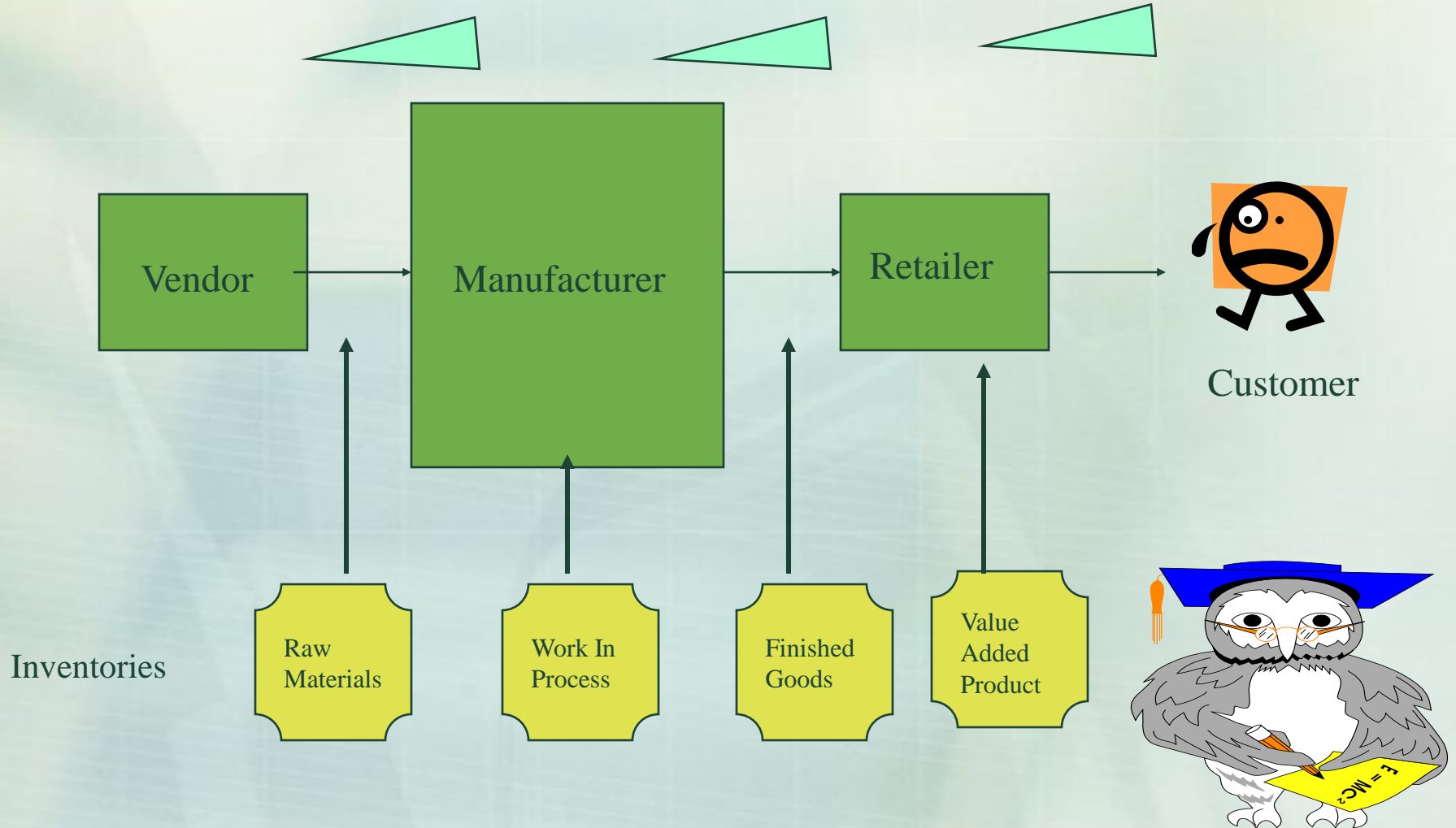


Key Decisions on

- 1) Plant Location
- 2) Plant Size
- 3) Distribution Domain

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Make to Order or Make to Stock?



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MTO vs MTS

1. Firms incur losses when sales is lost or when products remain unsold
2. Hence the desire to go with Make to Order models
3. MTO poses a big challenge for the shop floor since production schedule needs to be adjusted dynamically
4. Most goods follow the Made to Stock model.
5. Hence planning the appropriate stock level is critical

MTO is possible when the customer is willing to wait. Internet and telecommunication devices play a critical role.

EOQ,EMQ, Min and Max stock models and Dynamic Scheduling algorithms exist

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Lead Time Variability

1. Just as demand can vary from time to time so can lead time required to supply goods
2. We refer to lead time required to supply from the vendor to the manufacturer as well as from the manufacturer to distributor etc
3. Imbalance in production capacity, transportation bottlenecks, availability of raw materials and planning deficiency cause instability in lead time

It has been proven time and again that constant lead time is well manageable while variable lead time imposes severe inefficiency in a Supply Chain

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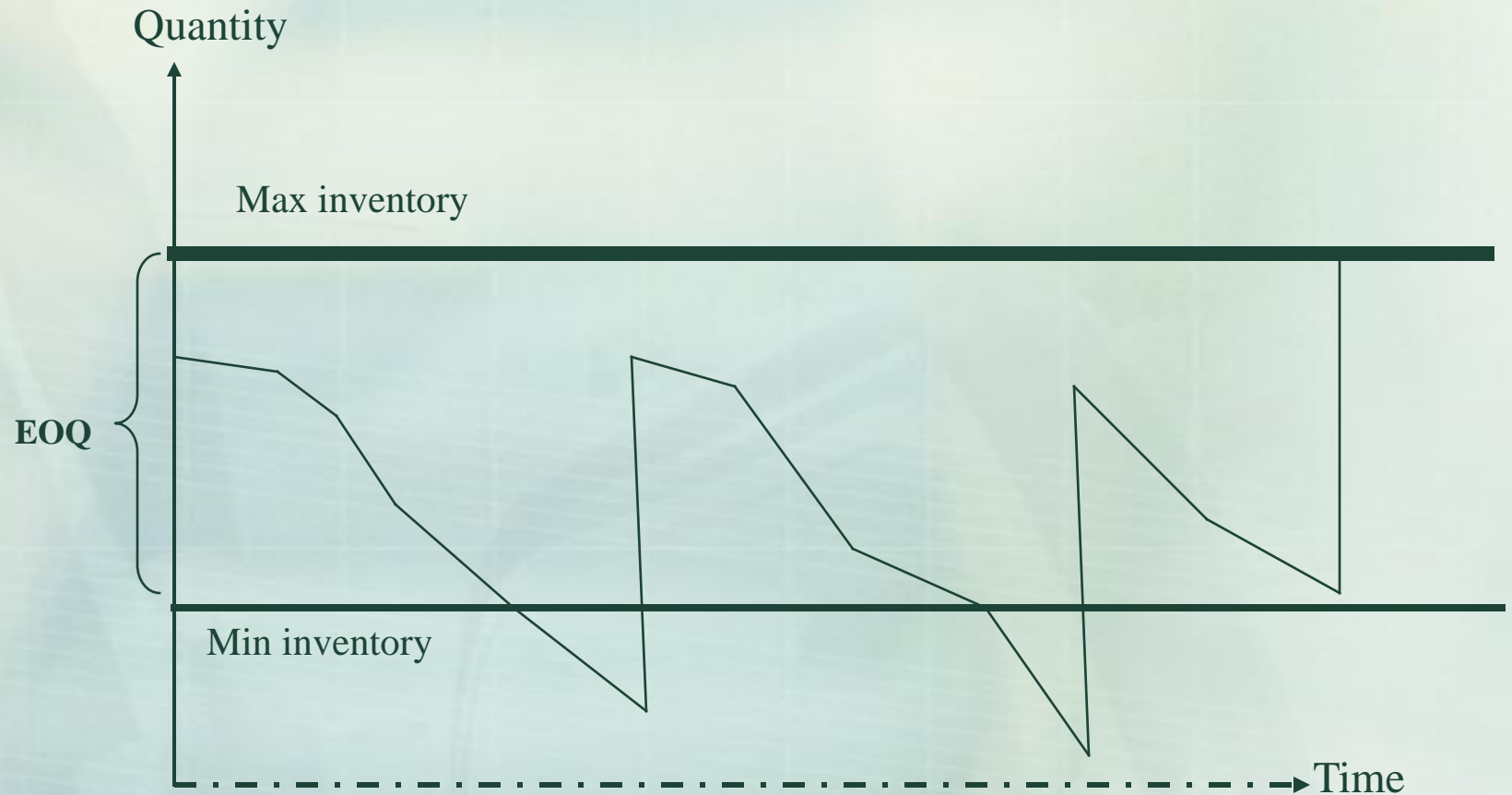
Concept of Safety Stock

Minimum stock is called the safety stock ; it has to cater to variability in demand and in delivery lead time

1. Predicting safety stock is complex
2. It has to be balanced against cost of lost sales versus cost of excess inventory carried.
3. Vital spares if not carried can bring production to a halt.

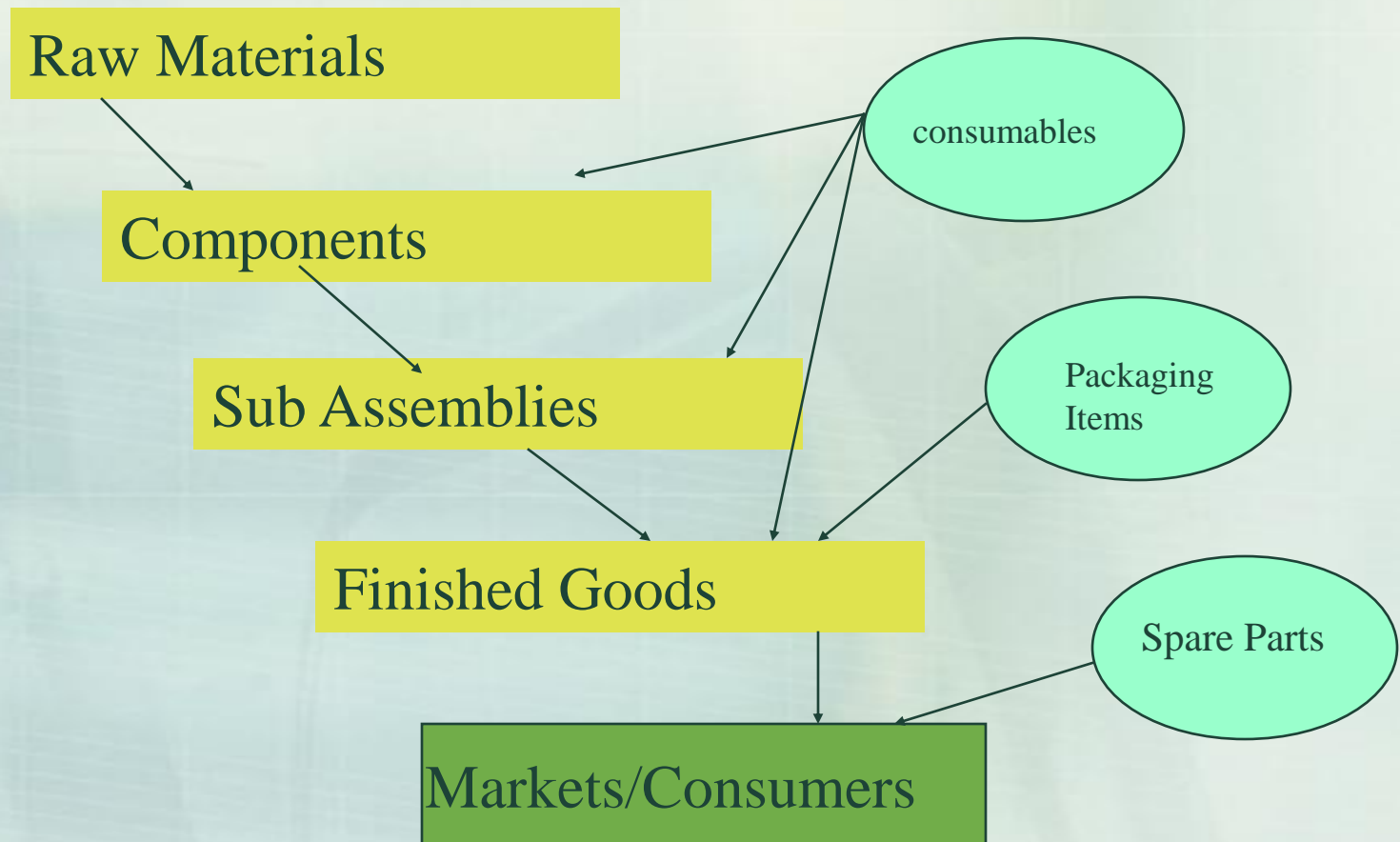
Many innovations in supply relate to minimizing the total inventory carried across the entire supply chain

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Make or Buy ?



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Make or Buy ?

- *Are there any Quality, Cost or Strategic advantages to make it ?*
- *Is it freely available?*
- *Does it require continuous technological innovations?*

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The EMQ and EOQ

1. Every firm needs to determine what to buy and what to make
2. It also needs to know what is the most economic quantity to buy or make with each order
3. Cost of ordering, inventory carrying, set up, switch over, price breaks for quantity purchased or sold, lost sales etc need to be considered in totality to determine EMQ and EOQ
4. Many a time there will be deviations from EOQ and EMQ caused by variations in demand and supply parameters; excess inventory, shortage of raw materials etc

Just in Time Delivery models have been proposed as alternatives. This is feasible where tight coupling can be established

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Tightly coupled relationships

1. The concept of Bull Whip effect demonstrates the cascading and adverse impact of forecasting demand in multiple tiers in a supply network.
2. Hence the suggestion for minimal or no forecasting
3. It calls for information visibility on demand ,production, inventory etc between all firms in the supply chain
4. It advocates for a tightly coupled relationship between each vendor and customer

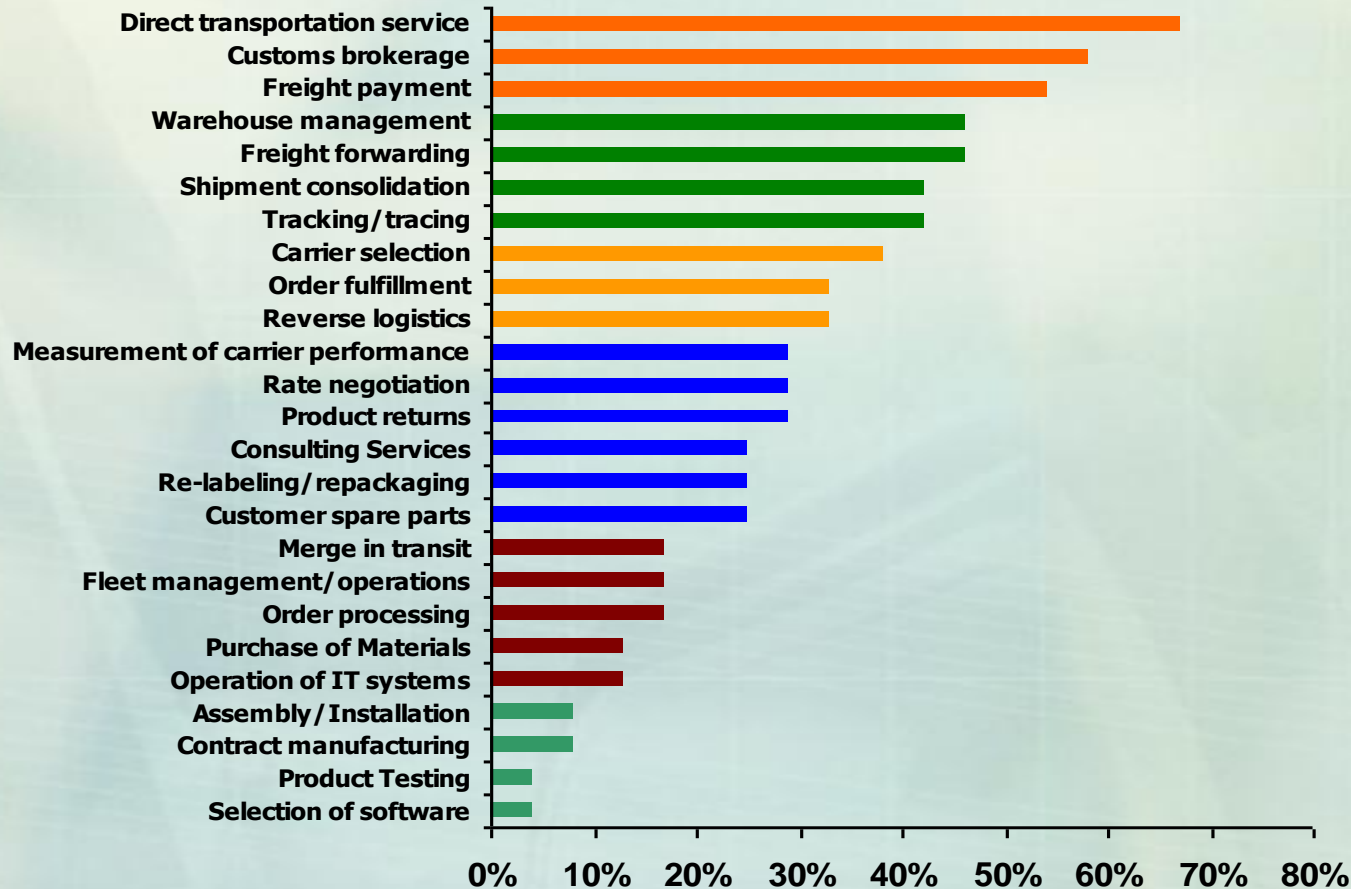
In practice this concept has met with limited success only. Most firms are vary of sharing business competitive information with others; due to fear of loss of price advantage, margin losses, undue control ,long term survival etc.

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- Vendor Buyer Relationship options
 - 1) *Tightly coupled*
 - 2) *Loosely coupled*
 - 3) *Flexible coupling*
- *Many firms fail to realize the significance of the right choice in this strategic decision.*
- *Western and Oriental firms think differently in this aspect.*

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Make or Buy of Services



Source: Northeastern University / Accenture 2004 Annual 3PL User and Provider Surveys
Slide is from Dr.A.Ravindran's earlier presentation at an IIMM Seminar

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Integration between functions within a firm

1. Knowledge about quality of raw materials supplied enables the shop floor to adjust production parameters
2. Reasons for early failures of products in the market place enables the Materials Manager to change to appropriate supplier or change the specification of raw materials ordered

MRP ERP SCM ...CRM evolution of systems ;

Computers have played a seminal role in providing information to be shared across functional lines.

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Efficient Vs Resilient Supply Chain



- *Efficiency focuses on productivity and cost savings with consistent quality*
- *Resilience deals with the swiftness and agility to respond to a market need.*



- *When the item in demand can be standardized ; is needed throughout the year the design of manufacturing and distribution facilities as well as the inventory stocking policy are geared towards operational efficiency, cost cutting etc. A lower level of inventory will suffice.*
- *If the item needed is a style or seasonal good and can accommodate individual preferences then the manufacturing facilities are designed for low volume and quick change of set up etc. But will result in higher level of inventories carried at various stages.*

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Local Versus Global Sourcing

Slide courtesy:

Dr.A.Ravindran



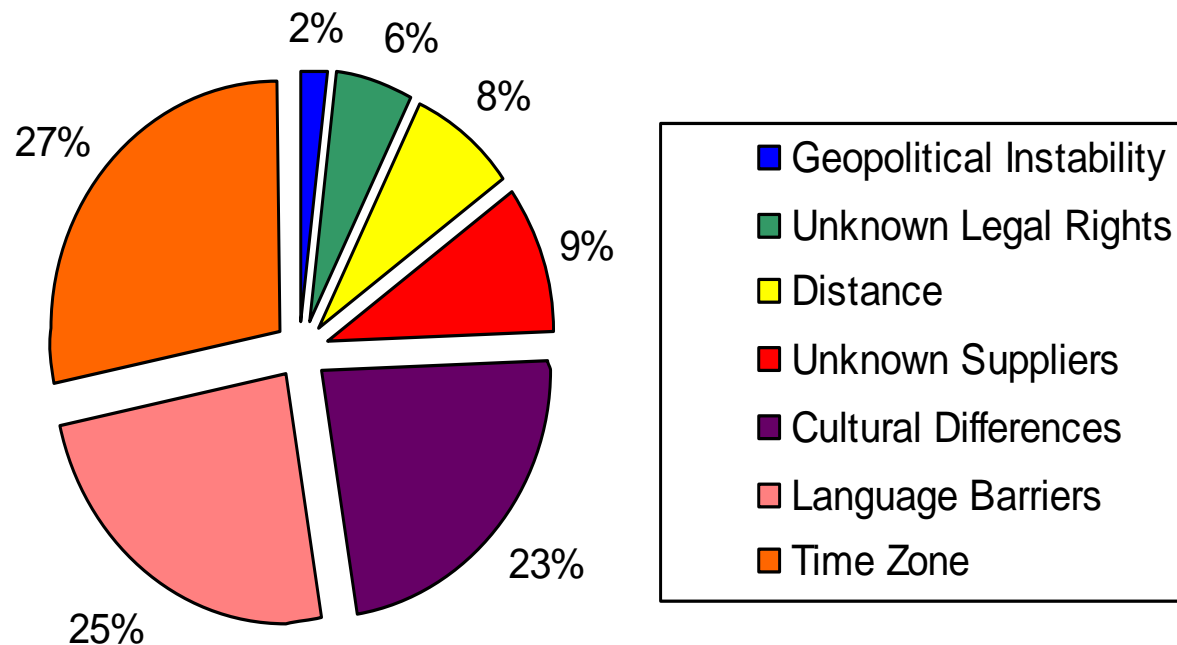
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Risks in globalization

Slide courtesy:

Dr.A.Ravindran

Top risk factors in global business operations



Source: IDC, US Customer Experiences and Best practices When Going Offshore

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Impact of logistics and transportation

- ❖ It is simplistic to assume that unit cost of transportation remains constant
- ❖ It varies from one mode of supply to another ; depends on quantity transported;
- ❖ Many a time it is a function of temporal demand versus supply for each pair of origin and destination
- ❖ Levies and taxes can play a critical role in transporting finished versus semi finished products

- **Decision issues relate to Mode of Transport, Duration of the contracts, Combined transportation of multiple goods, Loading patterns etc.**
- **Many O.R. models are available to optimize the transportation costs. But a superior model is one where all types of costs are considered in aggregation**

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The impact of internet

- ❖ Has altered the cost of information sharing dramatically
- ❖ Has made it feasible to cut down time for transmission
- ❖ Hence has lead to conversion of many batch oriented systems and decisions to real time and online
- ❖ e Procurement, customer and vendor portals, intranet based systems, online auctions have revolutionized many supply chain processes.

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Virtual Vs Brick and Mortar Store

- Internet has altered the supply chain economics
- Channels of distribution are undergoing a massive change.
- Multi channel distribution is becoming common
- Arise due to varying customer preferences as well as higher degree of sophistication achieved in product market segmentation
- Disintermediation successfully introduced in some products
- In most cases the utility and value of downstream players are getting defined sharply.

*How does one learn about the buyer behaviour through the Online Store?
Can this knowledge be leveraged to improve the stocking policy at the Brick
and Mortar Store?*

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Returned Goods Management

- ✓ No Supply Chain is complete without integrating Returns Management activities and information
- ✓ Mixed mode (internet + physical) processes have been introduced
- ✓ Facilitates proactive recall of suspected goods of inferior quality
- ✓ Wealth of information available for all upstream players to improve their efficiency and effectiveness

How does a firm design and manage this activity?

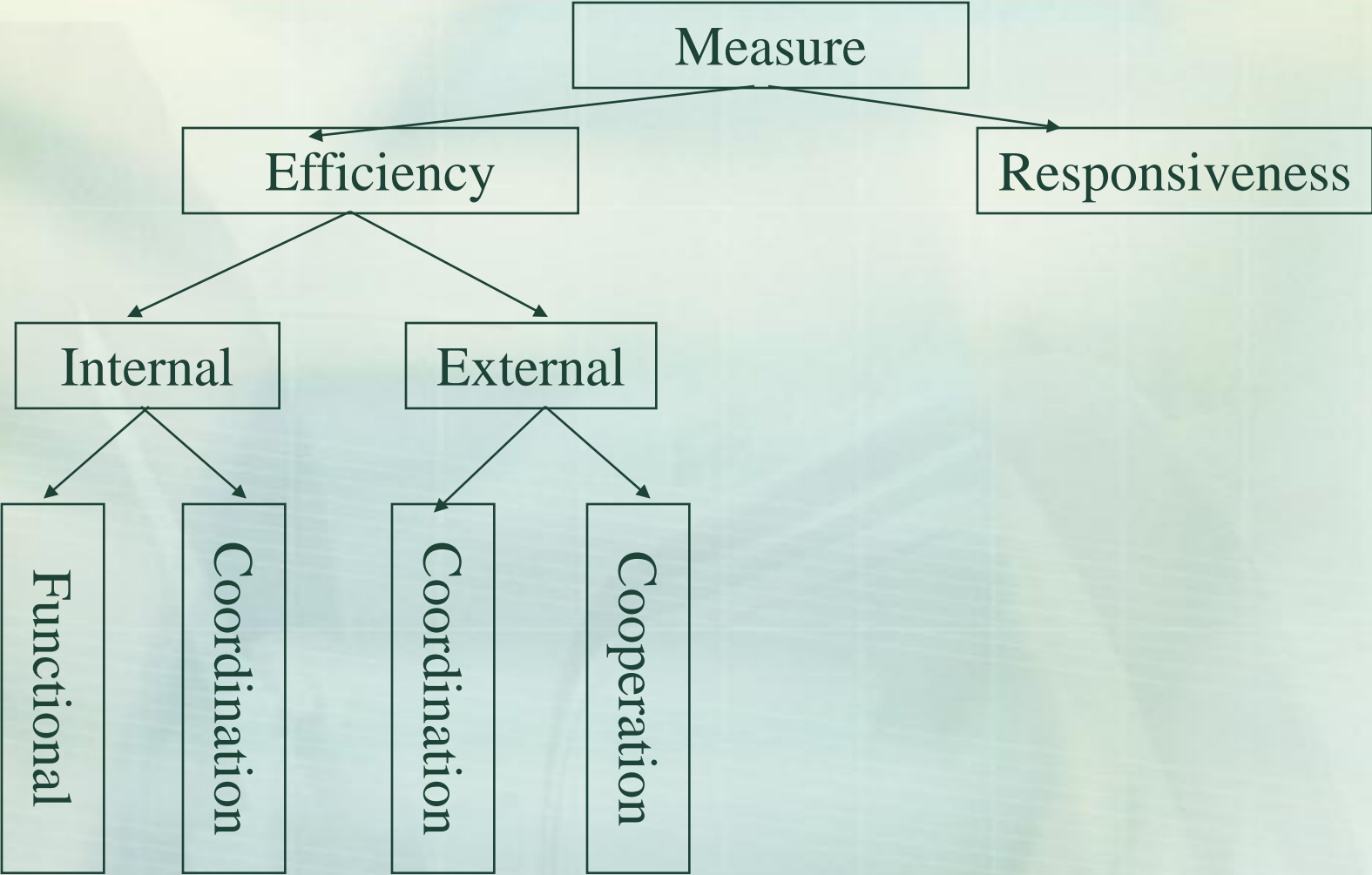
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Where is SCM headed ?

- ✓ Need to differentiate between situations calling for SC Efficiency versus Responsiveness is better understood
- ✓ Location Aware Technologies (GPS) and Status Aware Technologies (RFID) are redefining the market place
- ✓ Globalization in every aspect
- ✓ Documentation awaits the next significant revolution (Bolero.net) ; Digital Certification

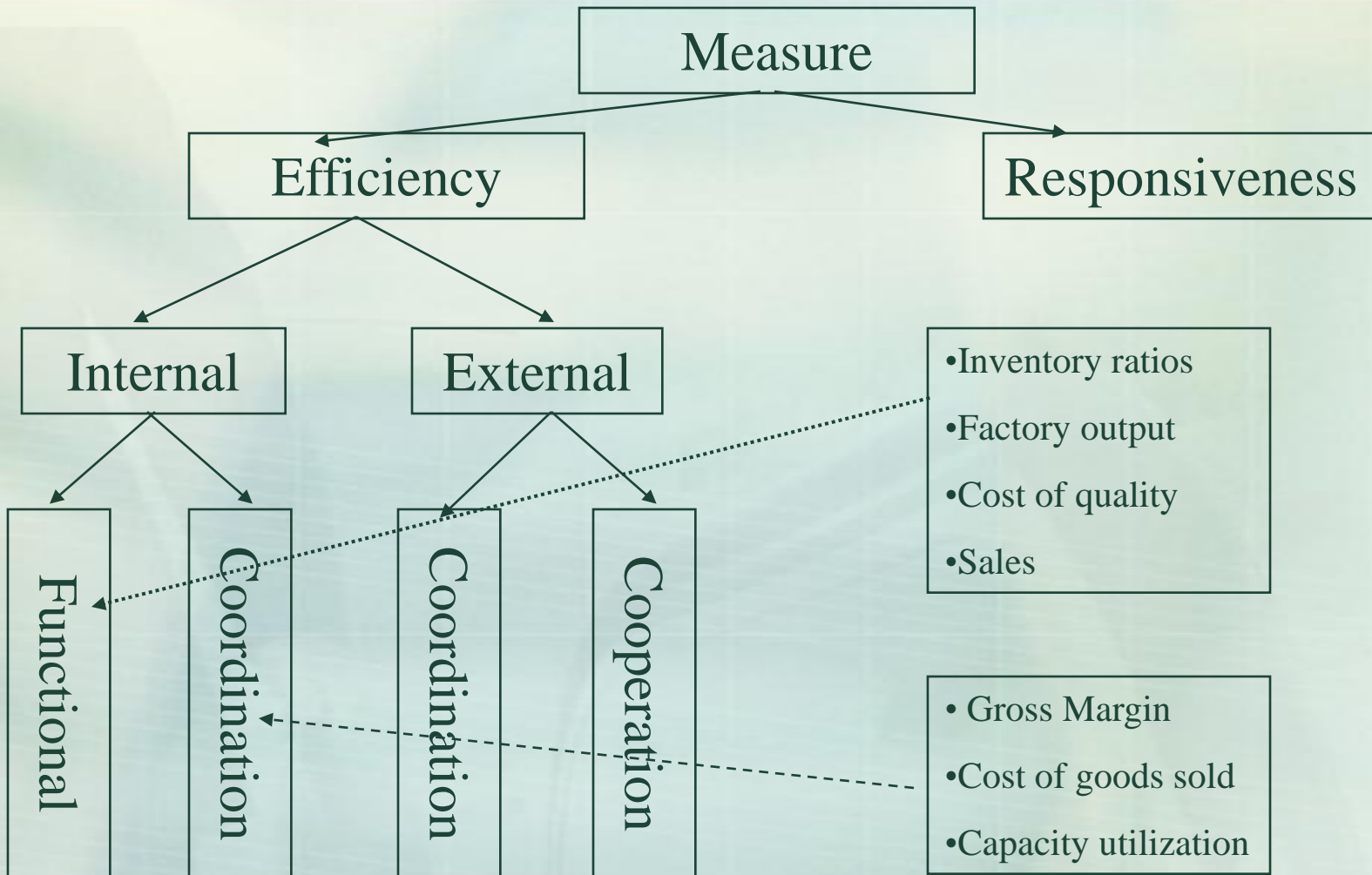
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Performance Measurement



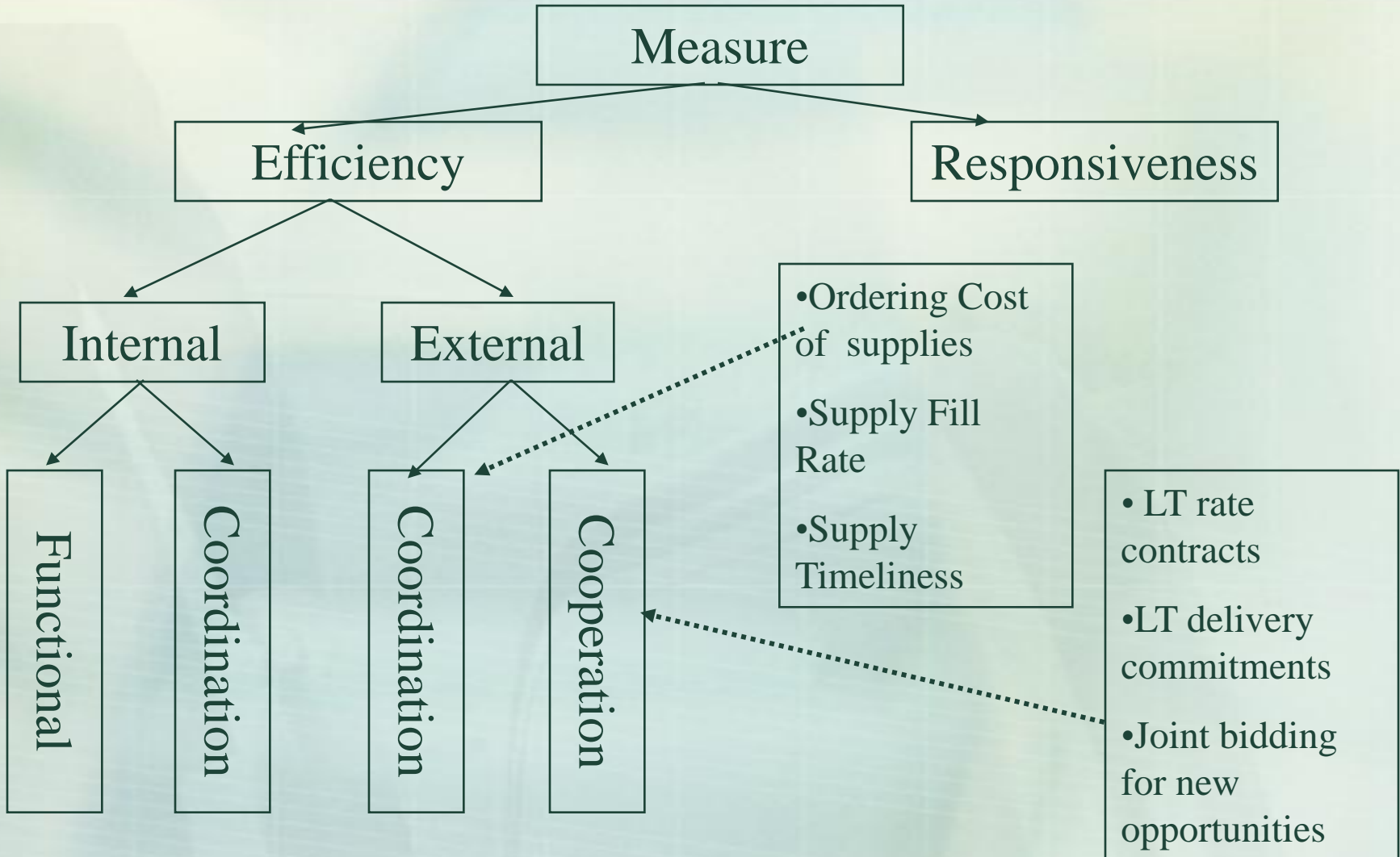
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Performance Measurement



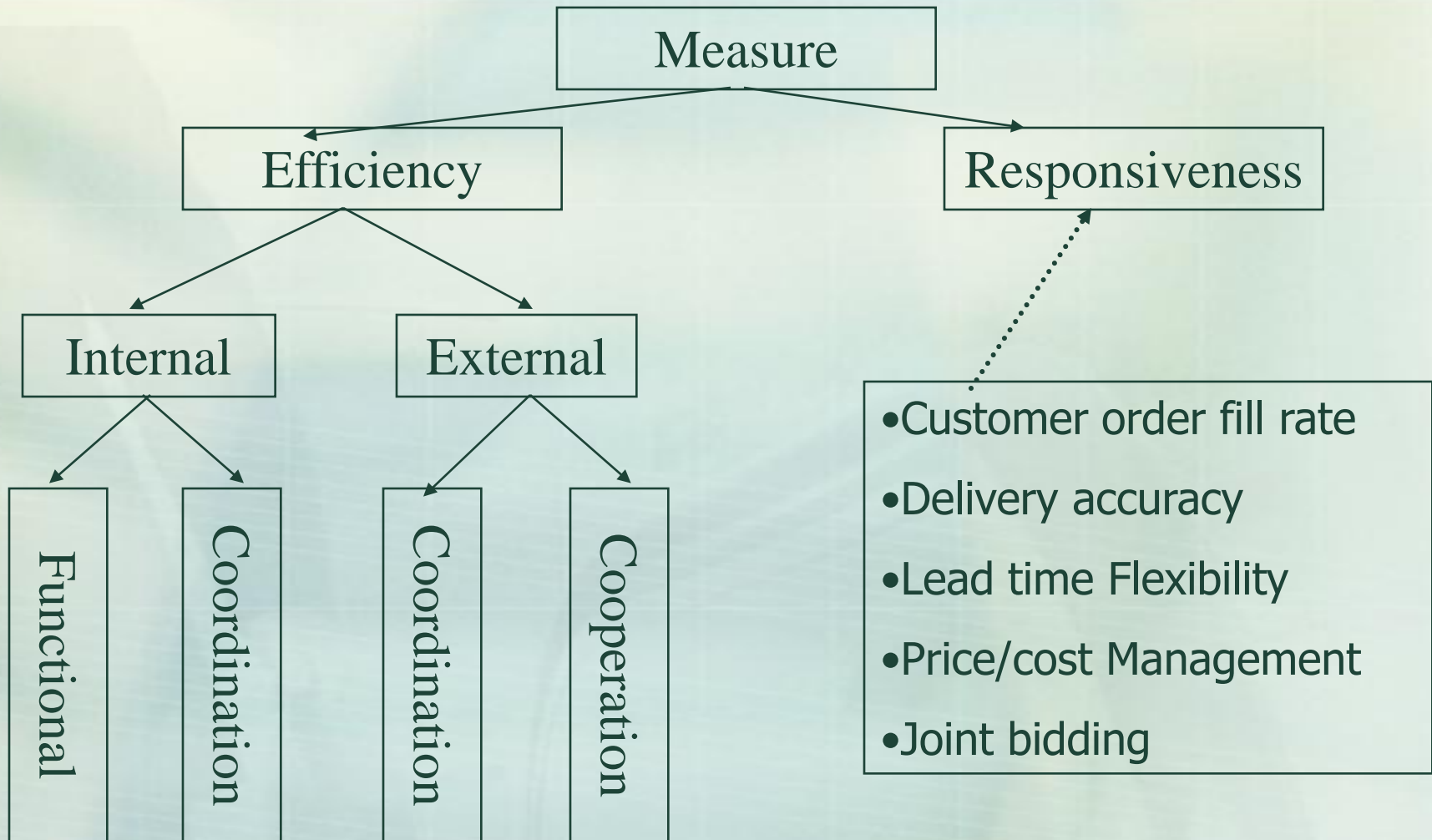
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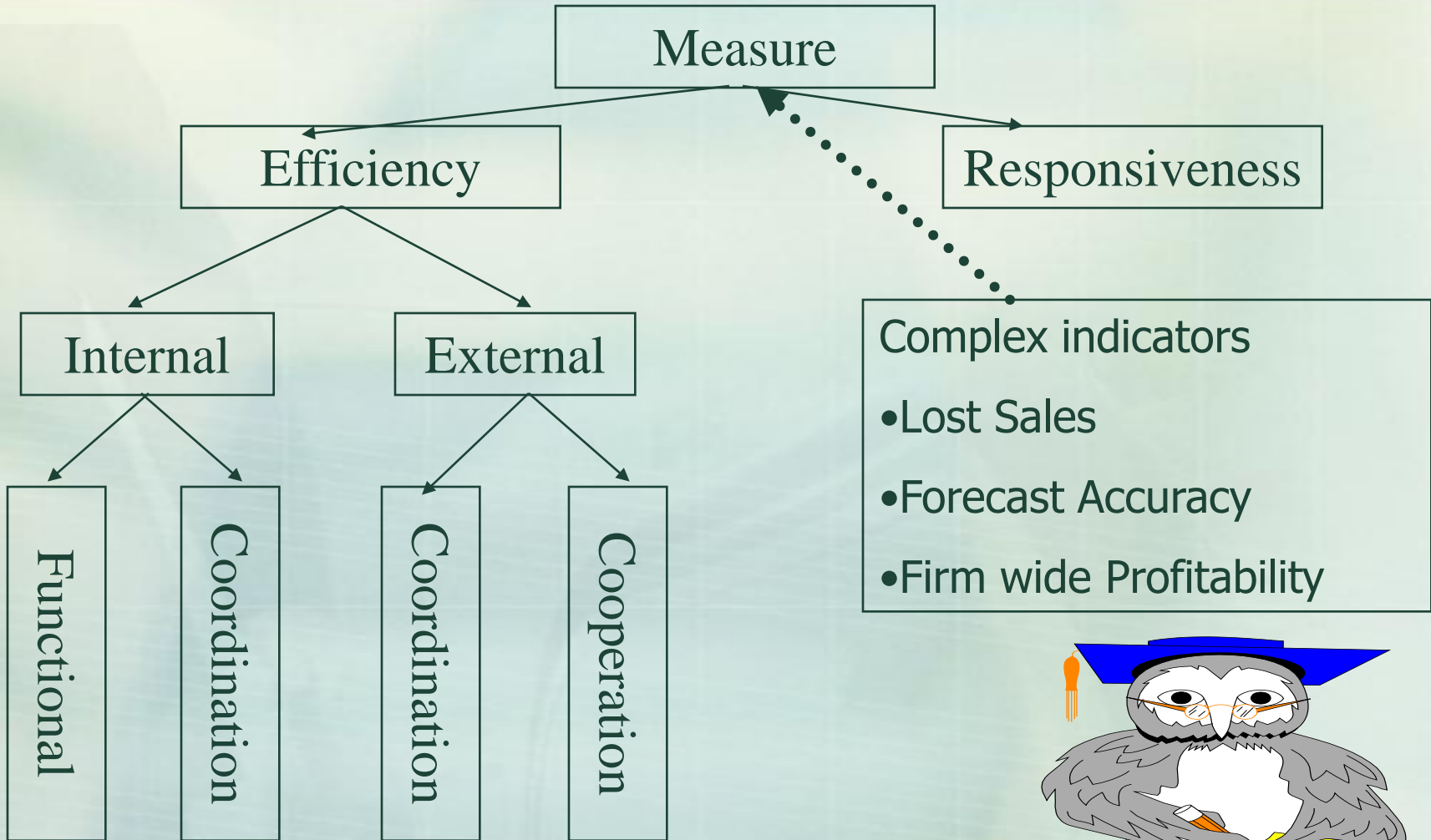
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Thanks and Best Wishes

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