APICS:CPIM-MODULE 5

STRATEGIC MANAGEMENT OF RESOURCES

Presented By

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Session 1

ALIGNING RESOURCES WITH STRATEGIC PLANS

Principle of Competitive Exclusion

✓ No two species can co-exists that make their living in identical way

Professor G.F. Gause (Father of Mathematical Biology)

✓ Given two species competing for same resources with out constraints, one species will, in time, displace the other

✓For the business this means Some company will extinct, while other will adept and survive

✓Without creation of a well-thought- out set of strategies company will never survive

Strategy

- The word strategy is derived from the Greek military term “Strategos” meaning “the art of general”.
- It can be define as “the plan for how to marshal and determine actions to support the mission , goals and objective of an organization”.

APICS Dictionary

Organization's Strategy components

- Development of time horizons
- Identification and evaluation of key events
- Development of a plan to create, hasten or compound a distinctive competence
- Creation of competitive advantage
- Flexibility of decision patterns
- Transformation of inputs into value-added outputs.
- Commitment of necessary resources

Type of strategies

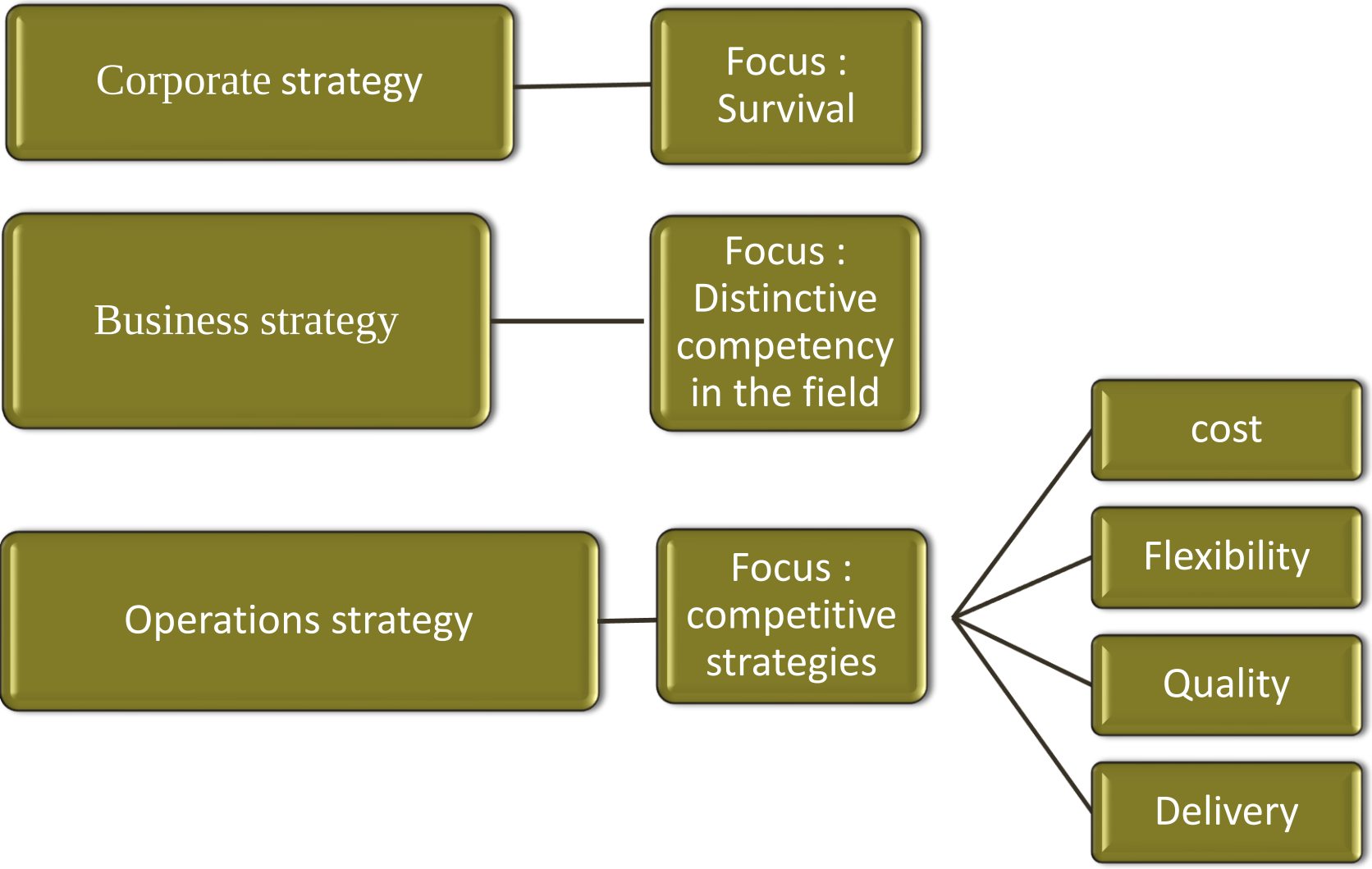
Corporate strategy

- Vision
- Mission
- Organizational objectives
- Environmental scanning
- Internal strength and weakness analysis

Business strategy

Price leader ship	• Low cost operations • Effective supply chain management • Standardized off the self product • Standardized process
Product differentiation	• High quality product • Easily adaptable process
Focus towards a particular customer	• Customized for targeted market segment • Responsive delivery and process flow

Operations strategy

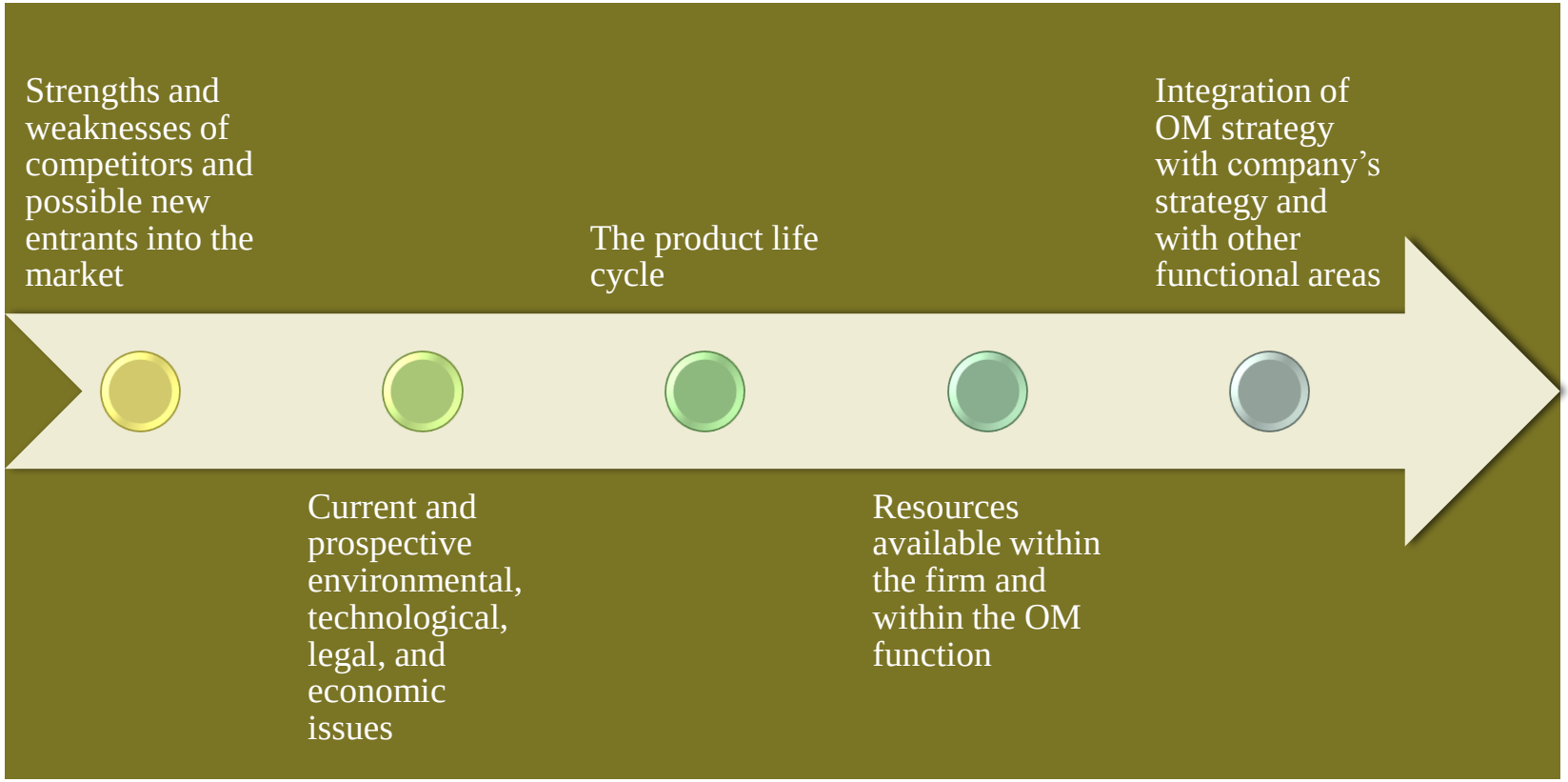


Elements of Operations Strategy

- Low-cost product
- Product-line breadth
- Technical superiority
- Product characteristics/differentiation
- Continuing product innovation
- Low-price/high-value offerings
- Efficient, flexible operations adaptable to consumers
- Engineering research development
- Location
- Scheduling

Preconditions

One must understand:




high
Global Strategy
☑Standardized product
☑Economies of scale
☑Cross-cultural learning
Examples
Instruments
Caterpillar
Otis Elevator
Transnational Strategy
☑Move material, people, ideas across national boundaries
☑Economies of scale
☑Cross-cultural learning
Examples
Coca-Cola
Nestlé
Four International Operations Strategies
International Strategy
☑Import/export or license existing product
Examples
U.S. Steel
Harley
Davidson
Multidomestic Strategy
☑Use existing domestic model globally
☑Franchise, joint ventures, subsidiaries
Examples
Heinz TheBody Shop
McDonald's Hard Rock Cafe
Cost Reduction Considerations
low
Local Responsiveness Considerations
(Quick Response and/or Differentiation)
high

Competitive advantage categories

Order winner

Characteristics that make your customer prefer you over competitor

Qualifiers

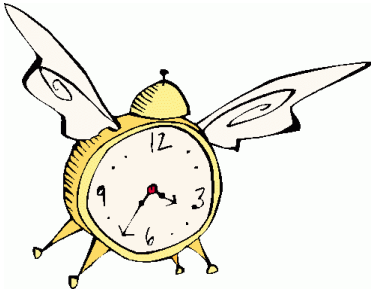
Characteristics you need to get in to the game

Nonissues

Characteristics that do not enter into the competitive picture for that market niche

A firm can compete on

Quality



Time

Price

Service

Delivery

Product Design

Flexibility

Quality

- In many markets today . the quality is increasingly considered an order qualifier or necessary condition. In some market a perceived higher level of quality may be a competitive advantage. In other words quality is required to "be in the game"
- Some common definitions are
  - Quality is customer satisfaction
  - Quality is Fitness for Use.
  - "Quality is The totality of features and characteristics of a product or service that bears on its ability to satisfy given needs."
    - The American National Standards Institute (ANSI)

      the American Society for Quality (ASQ)

Approaches to Quality

- **Transcendent quality** is an ideal , a condition of excellence .
- **Product based quality** based on a product attributes
- **User based quality** is fitness for use
- **Manufacturing based** quality is conformance to requirement
- **Value based quality** is the degree o excellence at an acceptable price

Methodology: Quality function deployments

- Quality function deployment (QFD) can be define as

" A methodology designed to ensure that all the major requirements of the customer are identified and subsequently met or exceeded through the resulting product design process and the design and operation of the supporting production management system"

More details In further slides

Quality cost

- **Internal Failure Cost:** cost associated with defects , such as error or nonconformance . that are found before delivery of the product to the customer
- **External Failure Costs :** Cost associated with defects that are found after the product is shipped to the customer
- **Appraisal Costs :** Cost incurred in determining the degree of conformance to quality requirements (non value added costs).
- **Prevention Costs :** Costs incurred in keeping failure and appraisal cost minimum (Value added Cost).

JIT/Lean system- Another Way To Achieve Competitive Advantage

- Lean is a highly coordinated processing system in which goods move through the system, and services are performed, just as they are needed,

- It is an approach to achieving manufacturing excellence based upon the continued elimination of waste.

- Important Concept Of JIT/Lean

Waste and its type

Waste is defined as activities that do not add value to the product.

Waste in Operations:

- Walking
- Searching
- Standby
- Rework
- Changeover

Waste in Layout:

- Distances traveled
- Backtracking
- Crowded Conditions
- Redundant handling

Waste in Flow of Goods:

- Overproduction
- W.I.P.
- Failure to Meet Standard Output/ Hour/ Person

Waste and its type cont.

Waste in Equipment

- Line stops
- Broken Down / Antiquated, Poor Production Yields

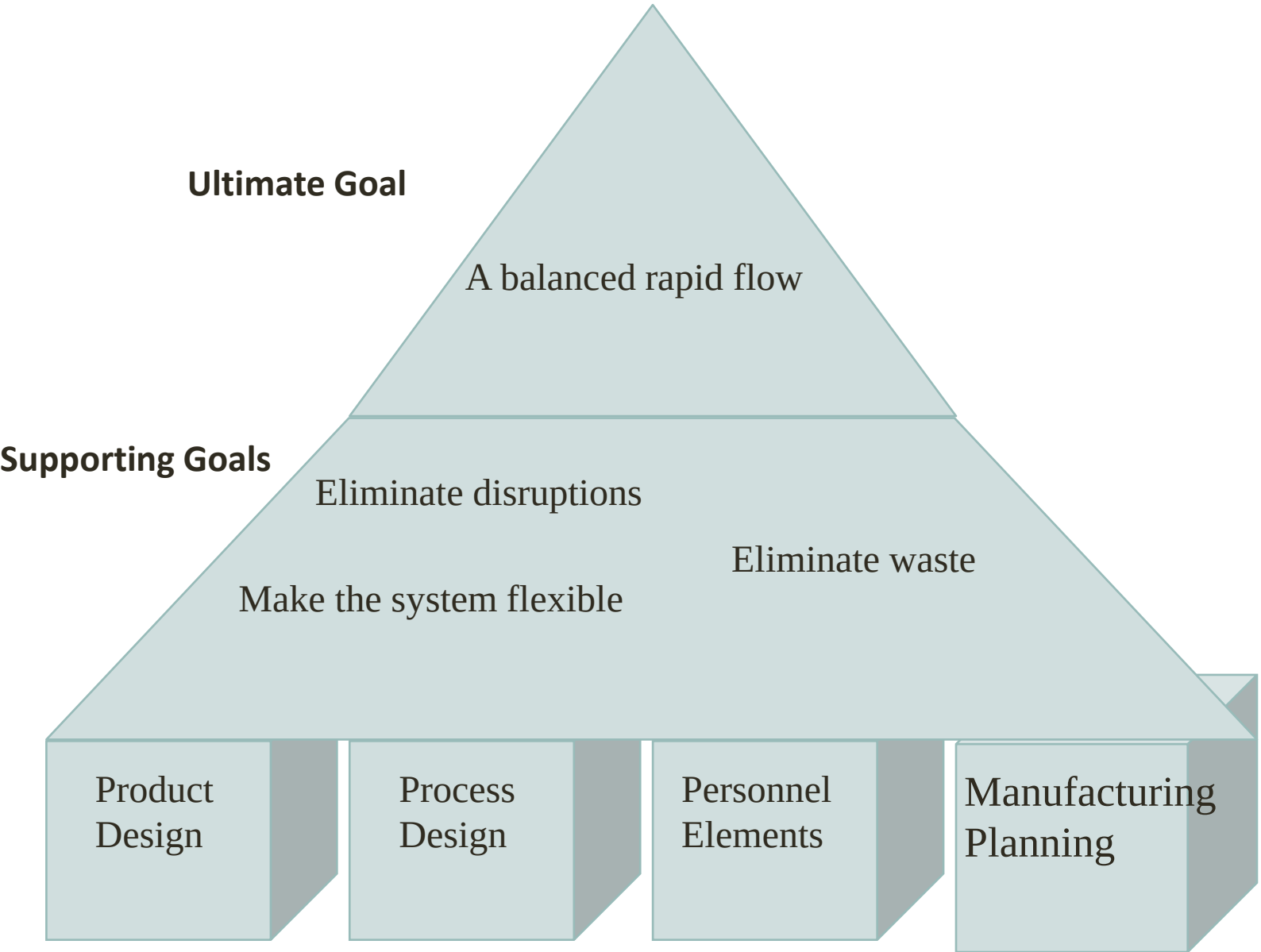
Other Waste

- Poor Housekeeping Practices
- Damaged Materials
- Improper Tools
- Not Having the Right Information

Big vs. Little JIT

- Big JIT – broad focus
  - Vendor relations
  - Human relations
  - Technology management
  - Materials and inventory management
- Little JIT – narrow focus
  - Scheduling materials
  - Scheduling services of production

Summary JIT Goals and Building Blocks



JIT Building Blocks

- Product design
- Process design
- Personnel/organizational elements
- Manufacturing planning and control

Product Design

- Standard parts
- Modular design
- Highly capable production systems
- Concurrent engineering

Process Design

- Small lot sizes
- Setup time reduction
- Manufacturing cells
- Limited work in process
- Quality improvement
- Production flexibility
- Little inventory storage

Personnel/Organizational Elements

- Workers as assets
- Cross-trained workers
- Continuous improvement
- Cost accounting
- Leadership/project management

Manufacturing Planning and Control

- Level loading
- Pull systems
- Visual systems
- Close vendor relationships
- Reduced transaction processing
- Preventive maintenance

Pull/Push Systems

Pull system: System for moving work where a workstation pulls output from the preceding station as needed. (e.g. Kanban)

- schedule work releases based on demand.
- inherently due-date driven
- control release rate, observe WIP level

Push system: System for moving work where output is pushed to the next station as it is completed

- authorize work releases based on system status.
- inherently rate driven
- control WIP level, observe throughput

Kanban Production Control System

- *Kanban*: Card or other device that communicates demand for work or materials from the preceding station
- Kanban is the Japanese word meaning “signal” or “visible record”
- Paperless production control system
- Authority to pull, or produce comes from a downstream process.

Comparison of JIT and Traditional

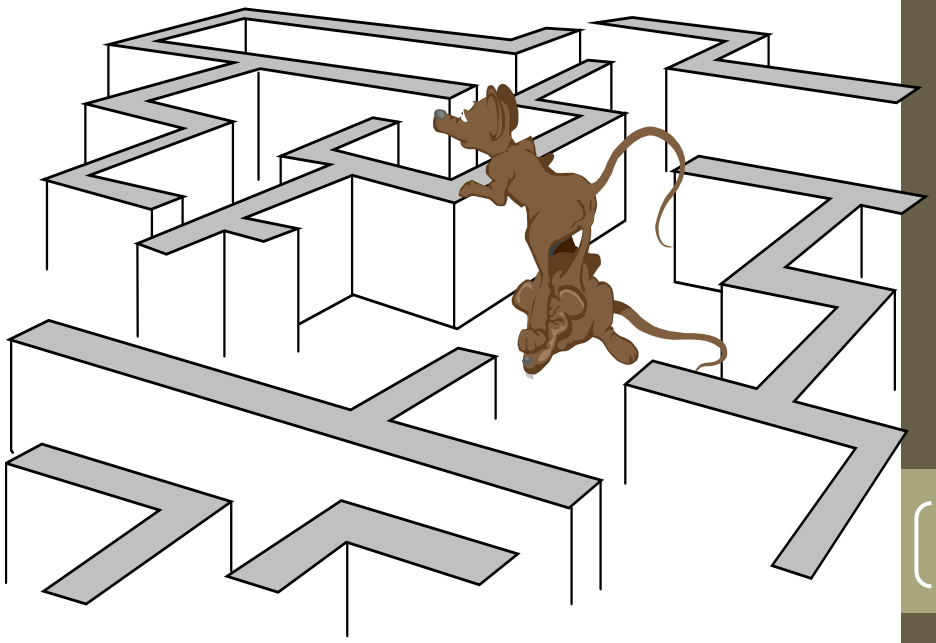
Factor	Traditional	JIT
Inventory	Much to offset forecast errors, late deliveries	Minimal necessary to operate
Deliveries	Few, large	Many, small
Lot sizes	Large	Small
Setup; runs	Few, long runs	Many, short runs
Vendors	Long-term relationships are unusual	Partners
Workers	Necessary to do the work	Assets

Transitioning to a JIT System

- Get top management commitment
- Decide which parts need most effort
- Obtain support of workers
- Start by trying to reduce setup times
- Gradually convert operations
- Convert suppliers to JIT
- Prepare for obstacles

Obstacles to Conversion

- Management may not be committed
- Workers/management may not be cooperative
- Suppliers may resist



Benefits of JIT Systems

- Reduced inventory levels
- High quality
- Flexibility
- Reduced lead times
- Increased productivity
- Increased equipment utilization
- Reduced scrap and rework
- Reduced space requirements
- Pressure for good vendor relationships
- Reduced need for indirect labor

Elements of JIT

- Smooth flow of work (the ultimate goal)
- Elimination of waste
- Continuous improvement
- Eliminating anything that does not add value
- Simple systems that are easy to manage
- Use of product layouts to minimize moving materials and parts
- Quality at the source
- Poka-yoke – fail safe tools and methods
- Preventative maintenance
- Good housekeeping
- Set-up time reduction
- Cross-trained employees
- A pull system

Session 2

CHOICES AFFECTING OPERATIONS STRUCTURE

Focus of session 2

Manufacturing operations strategy

Focus: competitive priorities

Cost Flexibility Quality delivery

Level of operation	Management function	Critical resources	Decision focus Structure	Decision focus Infrastructure
1.Top management	1.Capability building	1.Land	1.Organizational structure design	1.Organizational infrastructure design
2.General staff	2.Planning	2.Capital	2.Capacity design	2. Work force involvement
3.Functional activities	3.Fitting	3.Labor	3.Facilities design	3.Operations systems configurations
	4.Implementation	Knowledge	4.technology	
	5.Direction			
	6.control			

Critical Operation Decisions

1.Focus decision

- Process-focused strategy
- Product-focused strategy
- Customer-focused strategy

2.Product factor Decision

- Product volume , variety , profile and range
- Type of process
- Product life cycle
- Product/service matrix
- Market entry and exit timing

Strategy Choice

1.Structural decision

- Organizational structure design
- Capacity strategy
- Facilities strategy
- Technology

2.Infrastructure decision

- Organizational infrastructure design
- Work force involvement
- Operation system configuration

Product Decision

- Primary choice for firms when formulating a manufacturing operations strategy is to either adopt Process-focused strategy or Product-focused strategy or Customer-focused strategy

- **Process-Focused Strategy:**
  - Adopted by facilities with a wide range of customized products or Service at low volume
  - Production system Often referred to as a job shop
  - Best suited for complex and capital sensitive manufacturing process.

Product Decision cont.

- **Product or Service Focused Strategy:**
  - Adopted by facilities with narrow range of standardized products or service at high volume
  - Production process is often called as flow-shop
  - Factories use similar routing through the production process
  - Product are manufactured more efficiently due to similar routings.
- **Customer focus strategy:**

Focus on the customer is an essential driving force behind quality , productivity, and successful marketing . company needs to understand the customer wants , needs , no needs as well future requirements that may impact the manufacturing of products.

Product Characteristics

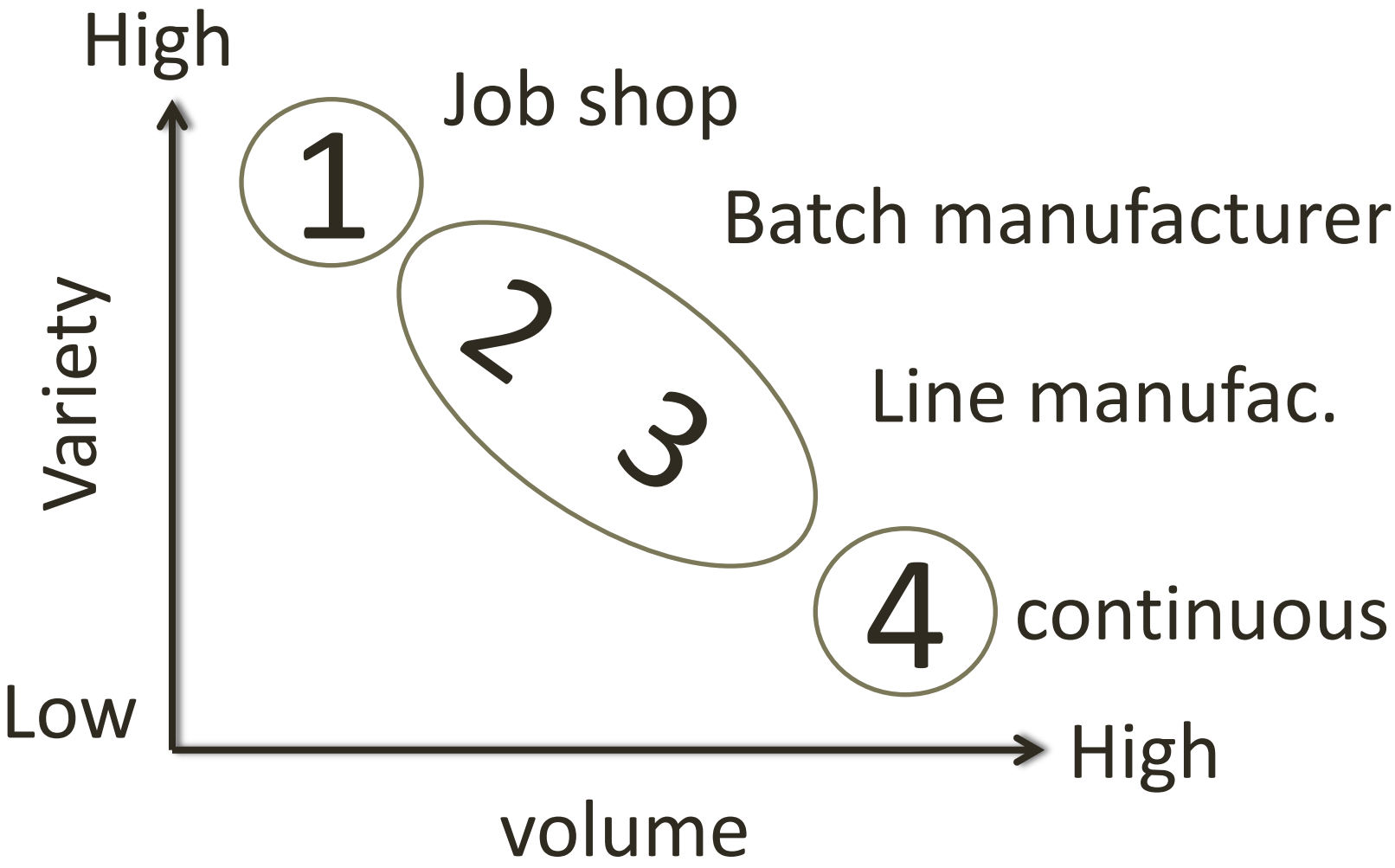
After the firm choose a Process-focused strategy or Product/service -focused strategy it need to consider several other product issues

- Product volume and variety
- Product range
- Product grouping
- Product profiling
- Product and service technology life cycle

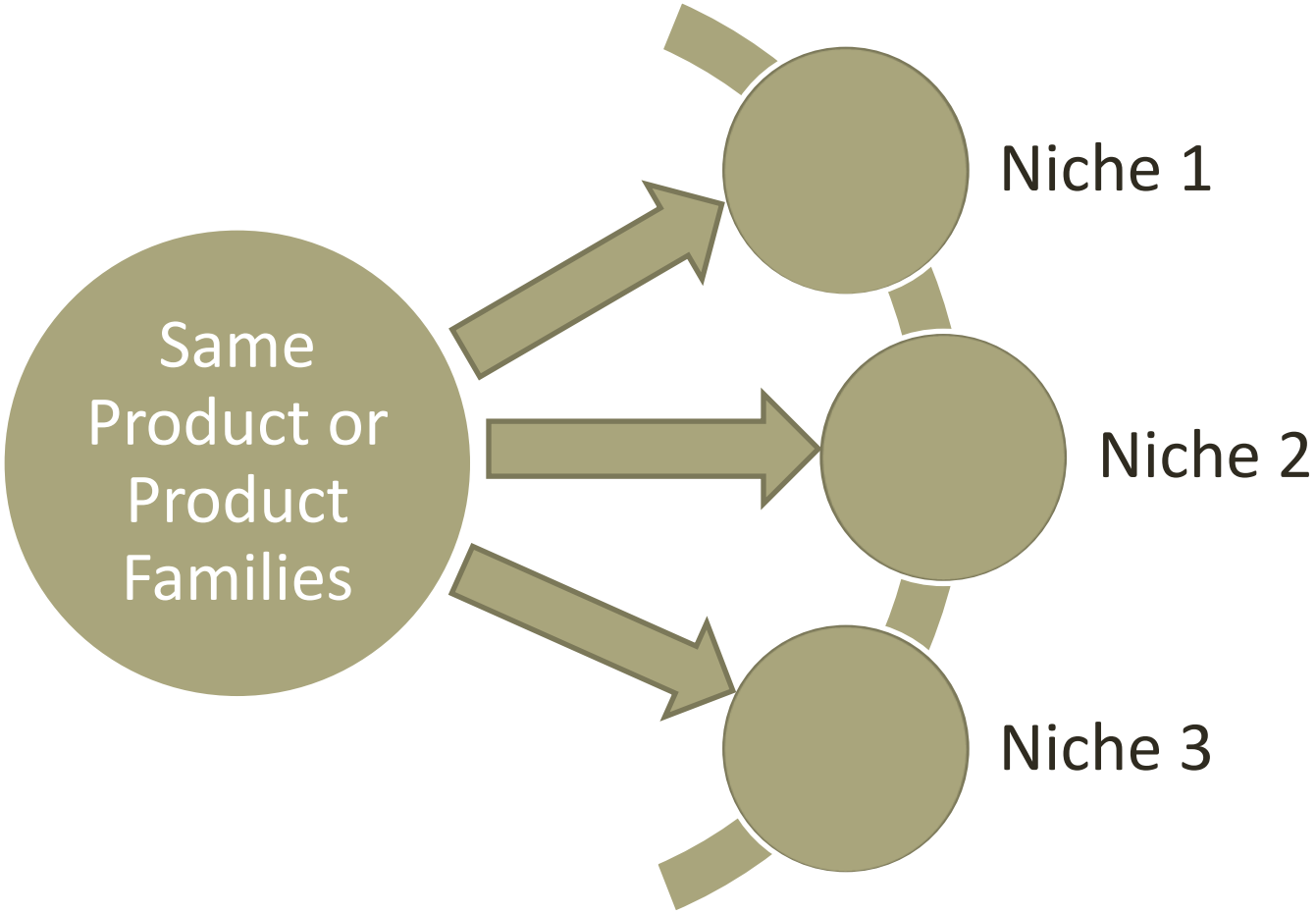
Volume And Variety

- Product volume
  - Refers to the overall quantities of a particular product or product family in a market niche
- Product variety
  - Refers to the number of end items that are possible for a product or product family

Volume And Variety Matrix



Product range

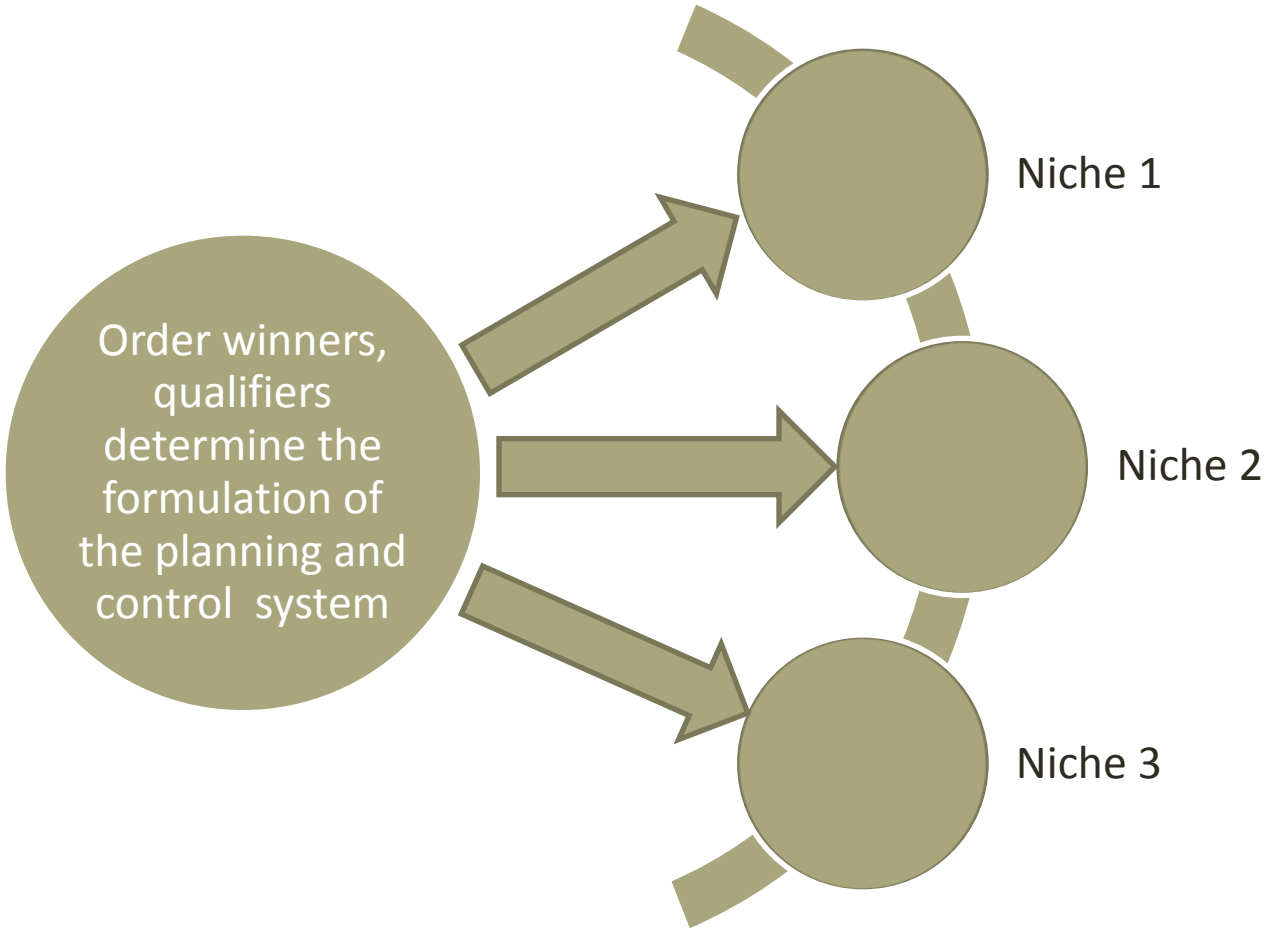


Different volumes and varieties of product will result

Product Grouping Questions

- What are the overall firm strategy and marketing strategy?
- What market niches are being served?
- What products are being sold in those niches?
- What are the order winner and qualifiers for product in each niche?
- What are the current and expected volumes and varieties for product in each niche?
- How should we create a product grouping
- What are the manufacturing strategies for each grouping?

Order Winners And Qualifiers



Product Profiling

- Product profiling seeks to determine the degree of fit between the deployment choice of the firm and the current and expected volume and varieties of products in each market niche.

Template For Product Profiling 1

	Volume and variety			
Issues	1	2	3	4
	Job shop	Batch	Line	continuous
Products and market				
Type of product	Special			Standard
Product variety	High			Low
Product volume	Low			High
Amount of change required	High			Low
Need of flexibility	High			Low
Order winners	Cost /price Flexibility Quality Delivery			Price

Template For Product Profiling 2

	Volume and variety			
Issues	1	2	3	4
	Job shop	Batch	Line	continuous
Products and market				
Type of product	Special			Standard
Product variety	High			Low
Product volume	Low			High
Amount of change required	High			Low
Need of flexibility	High			Low
Order winners	Cost /price Flexibility Quality Delivery			Price

Template For Product Profiling 3

	Volume and variety			
Issues	1	2	3	4
	Job shop	Batch	Line	continuous
Products and market				
Type of product	Special			Standard
Product variety	High			Low
Product volume	Low			High
Amount of change required	High			Low
Need of flexibility	High			Low
Order winners	Cost /price Flexibility Quality Delivery			Price

Product And Service Technology Life Cycle

- Stages of a product services
- Birth of the delivery system
- Design and process technology selection
- Design of the delivery system
- Startup of delivery system
- Growth of volume
- Stable state
- Decline and renewal of the system

Market Growth	Low	High
High	 **Question Mark**	 **Star Performer**
Low	 Dogs	 Cash Cows

Product And Service Portfolio Matrix

Product And Service Portfolio Matrix Explained

Product or services are in startup and early growth stages.

Growth of volume

Stable state

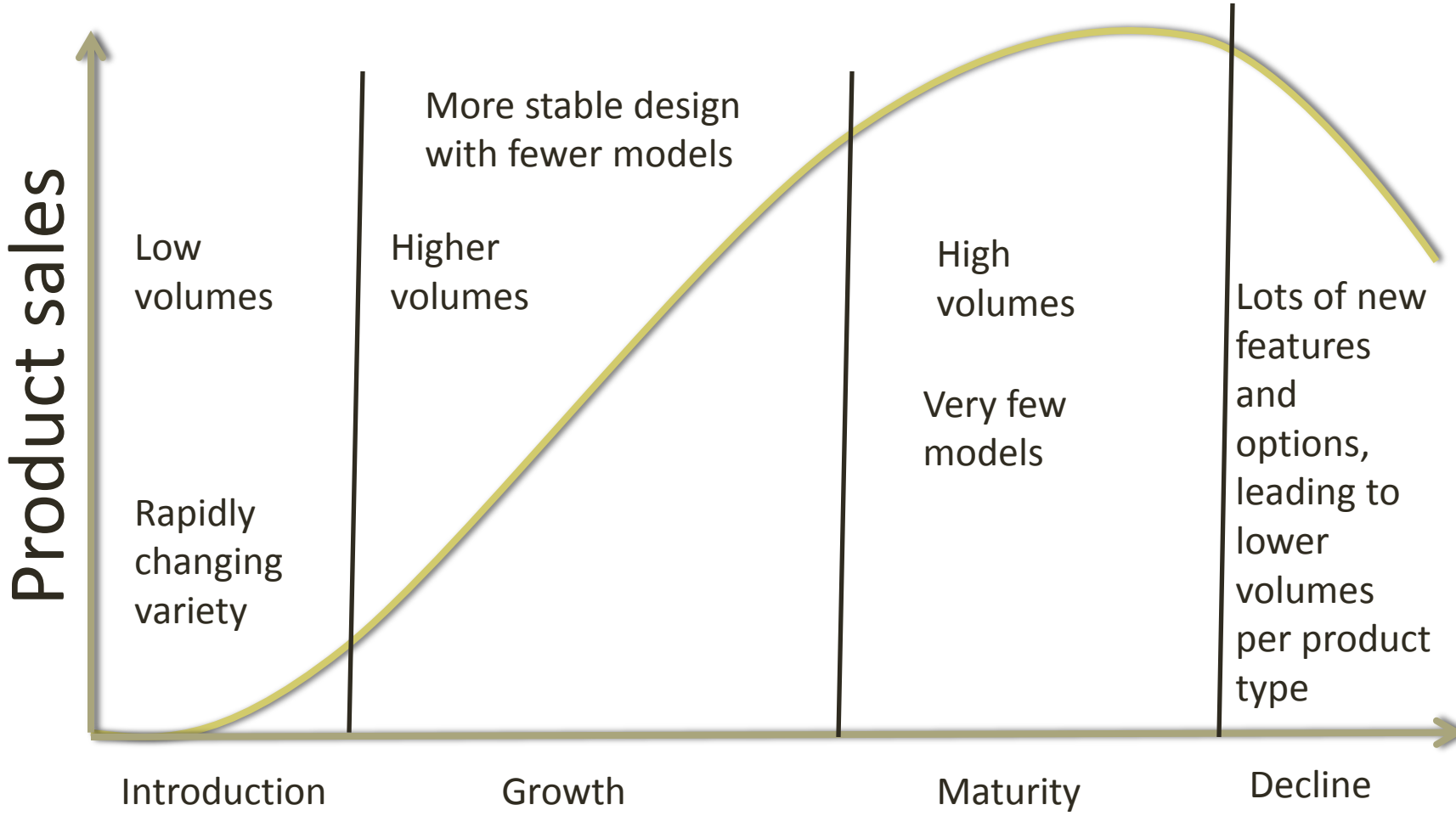
Decline and renewable stage

Exit Timing

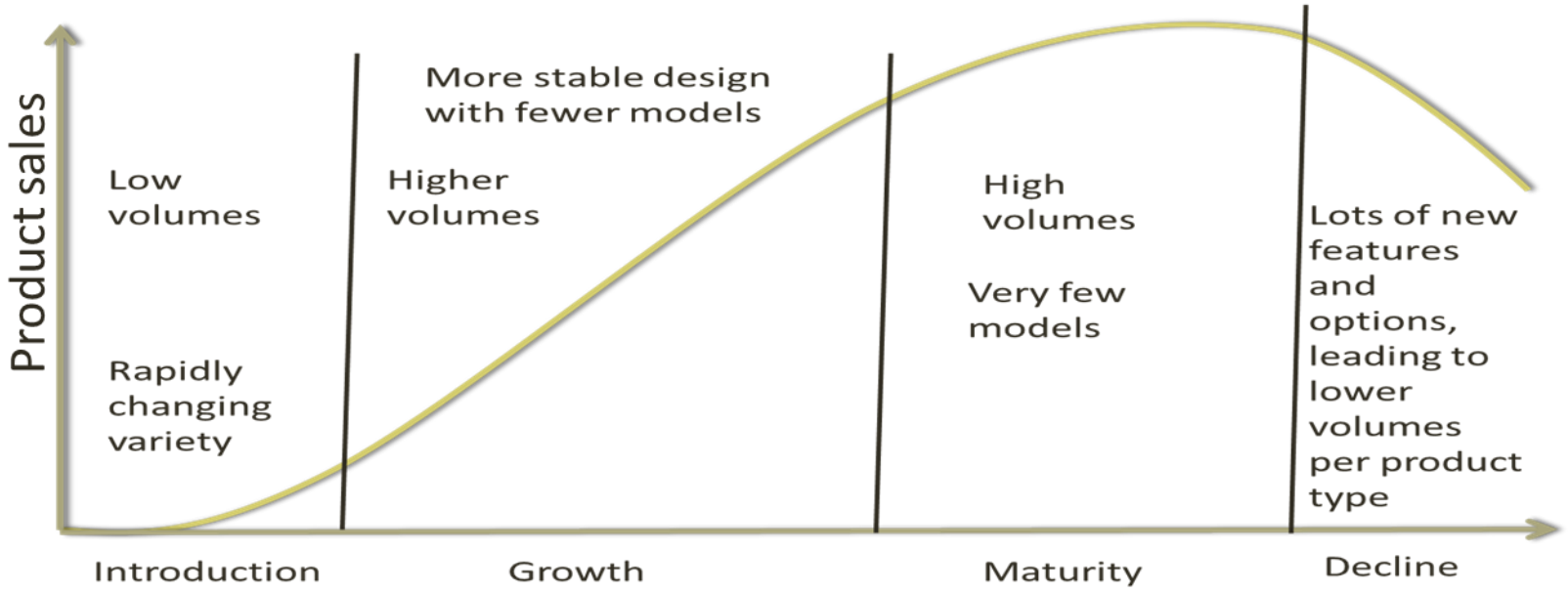
Enter Timing	Stable state	Decline and renewable
Growth of volume	**Blunder**	**Standardized High Volume**
startup	Innovative	Flexible Than Sift Towards Standardization And High Volume

Market Enter And Exit Timing

Product Life Cycle

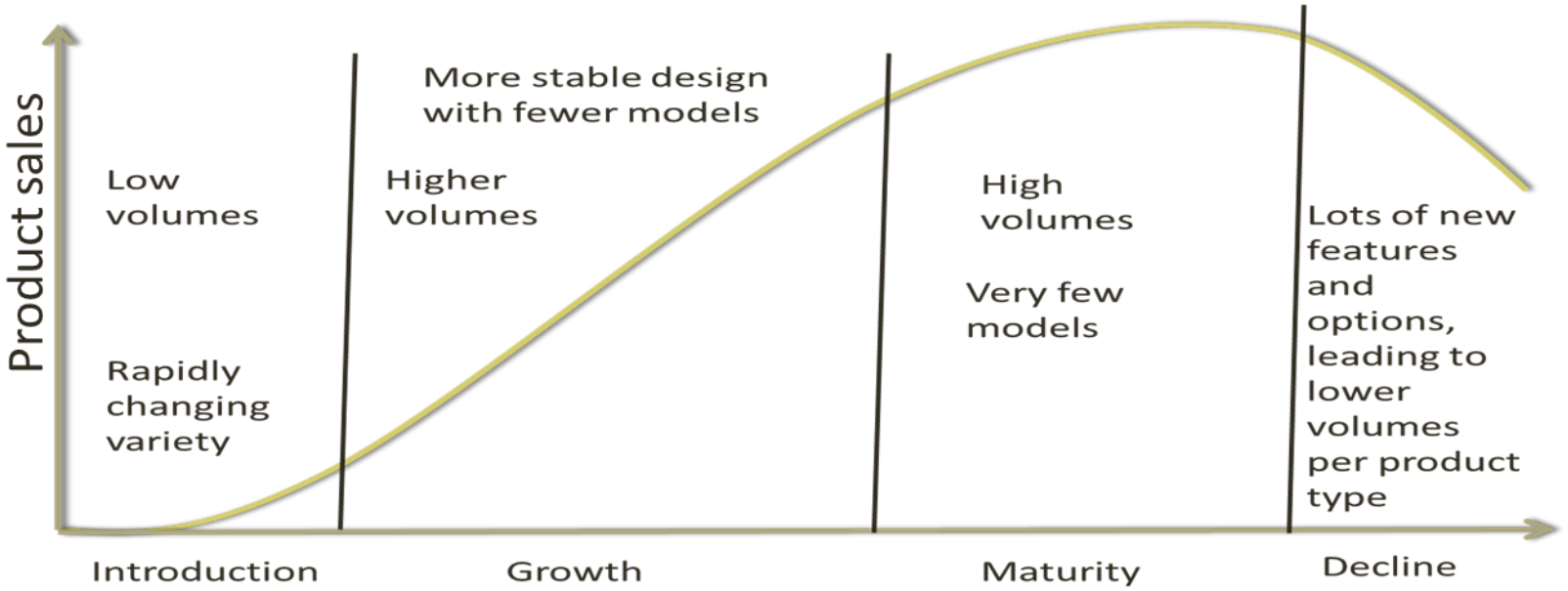


QUESTION AT INTRODUCTION PHASE



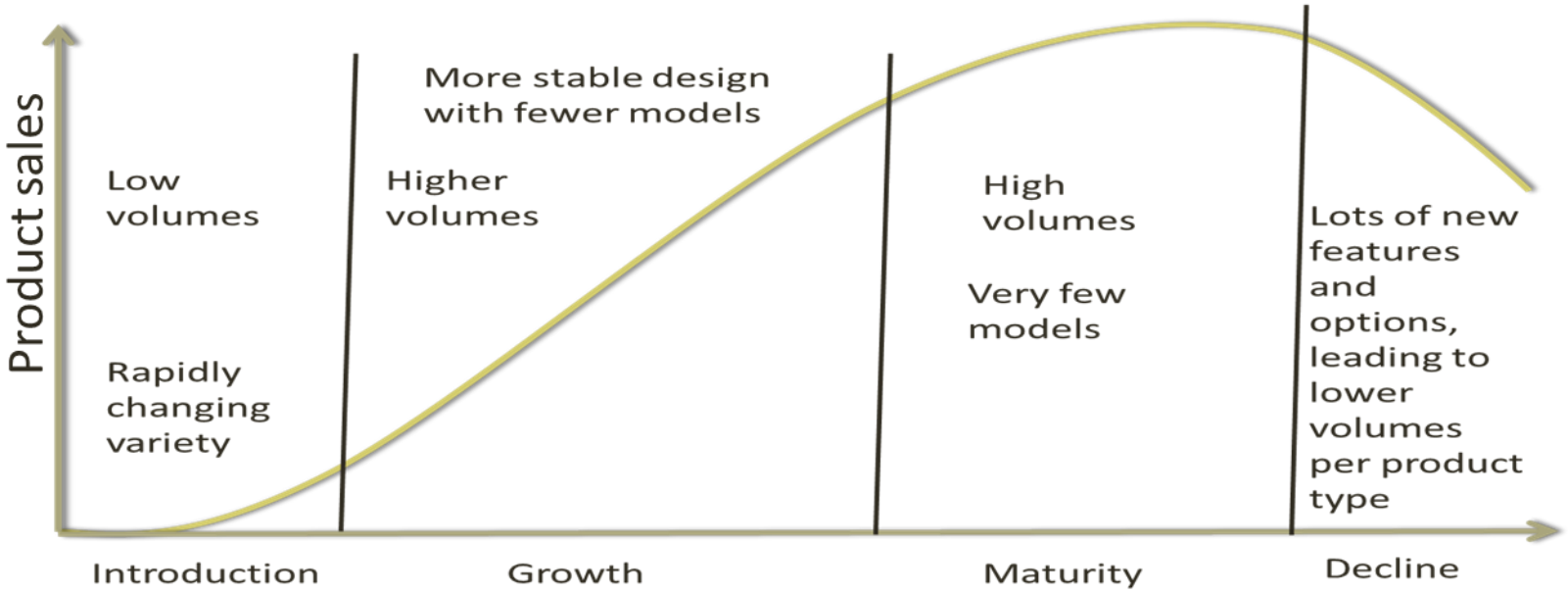
- What product and service will be offered?
- What is the design of product and service?
- What is the expected market for product and service?
- What volume and process capacities are required?
- What level of process technology is appropriate?
- What type of equipment and labor force should be selected?
- How should the production or service delivery system be organized?
- What information system should be chosen ?

QUESTION AT GROWTH PHASE



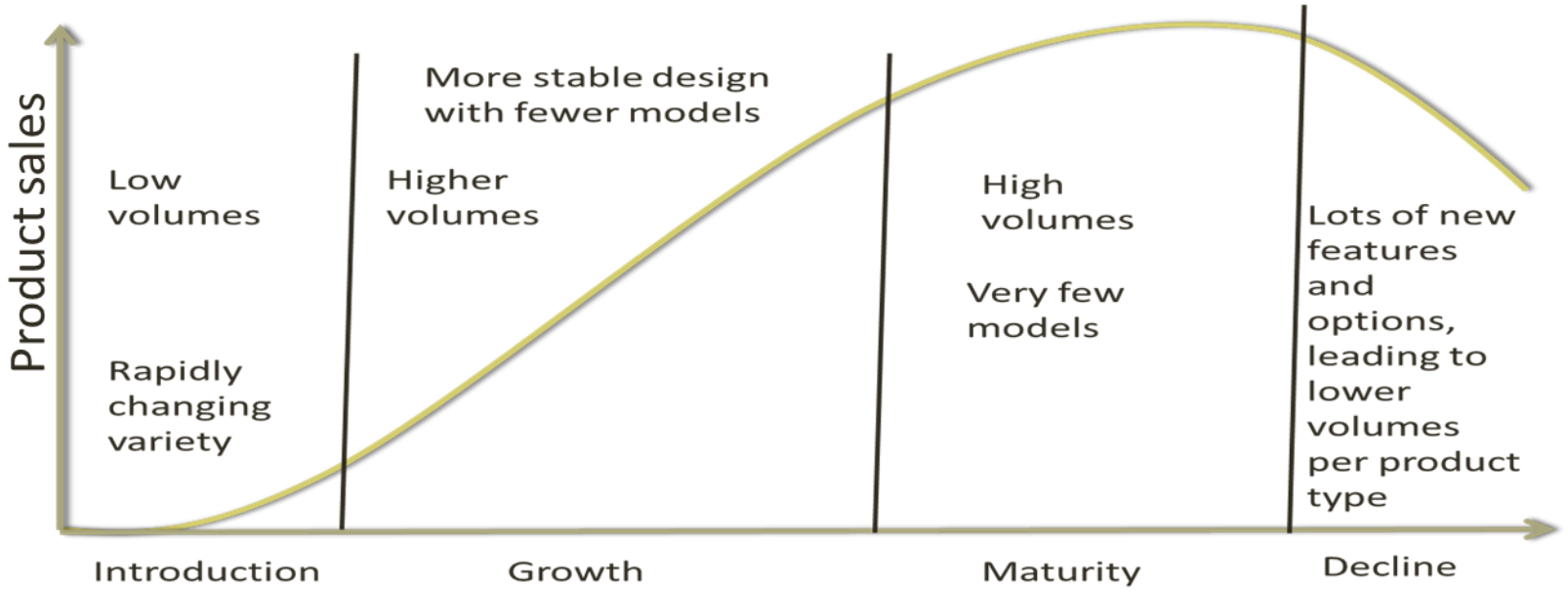
- What facilities and process upgrades are required
- How will production or service delivery be scheduled
- How will performance be evaluated
- How will distribution system be organized

QUESTION AT MATURITY PHASE



- What process efficiency are necessary?
- What product and service features are required?
- What market repositioning is appropriate?
- What follow-on product or service should be considered?

QUESTION IN THE DECLINE PHASE



- What is the salvage value of facilities ?
- How much repair part stock should be produced ?
- How can the effects on employees be minimized?
- What are the long range responsibilities for the product or service, process technology and production system residue?

LIFE CYCLE AND MANUFACTURING DEPLOYMENT

	Start-up Of Operations	Growth Of Volume	Stable State	Declining And Renewal
Product Service				
Volume	Low	Increasing	High	Declining
Variety	Unique Product Or Services	Increasing Standardization	Emergence Of A Dominant Design	High Standardization
Process Technology				
Organization	Fixed Project Job Shop	Small Batch	Line Flow Assembly Process	Line Flow Assembly Process
Innovation	High	Medium	Medium	Low
Integration	Low	Medium	Medium	High
Industry Factors				
Structure	Small Competitor	Consolidation And Fallout	Few Large Company	Survivors
Competitive Priority	Flexibility	Quality And Flexibility	Price/Cost And Delivery	Price/Cost

Focus of session 2

Manufacturing operations strategy

Focus: competitive priorities

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	5.Direction			
	6.control			

ORGANIZATIONAL STRUCTURE DESIGN

Organizational design focuses on the decision by operations

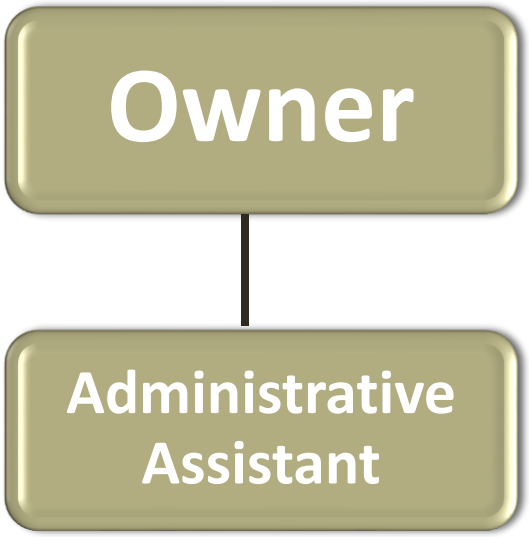
Management about the features and linkages of the organization. It has two aspects:

- Mechanisms that define the features
- Mechanism that link parts

Types of Organizational Structures

- Simple Structure
- Functional Structure
- Divisional Structure
- Conglomerate Structure
- Hybrid Structure
- Matrix Structure
- Team-Based Structure
- Network Structure

Simple Structure

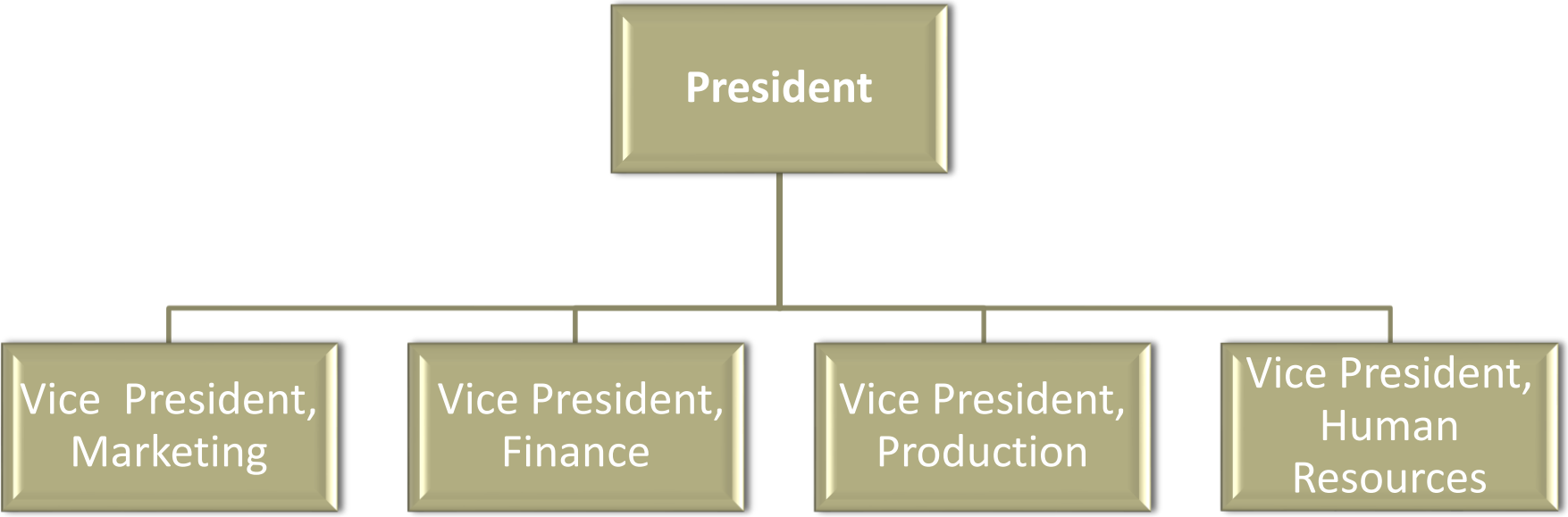


There is only one hierarchical level of management beneath the owner

Characteristics of Simple Design

- Small in size
- Less than four levels
- Little formalization
- Low complexity
- Centralized authority

Functional Structure



Characteristics of Functional Design

- Used in large organizations
- Define staff function and one organization
- Requires functional specialties
- Less centralization
- Higher formality of functional design

Divisional Structure

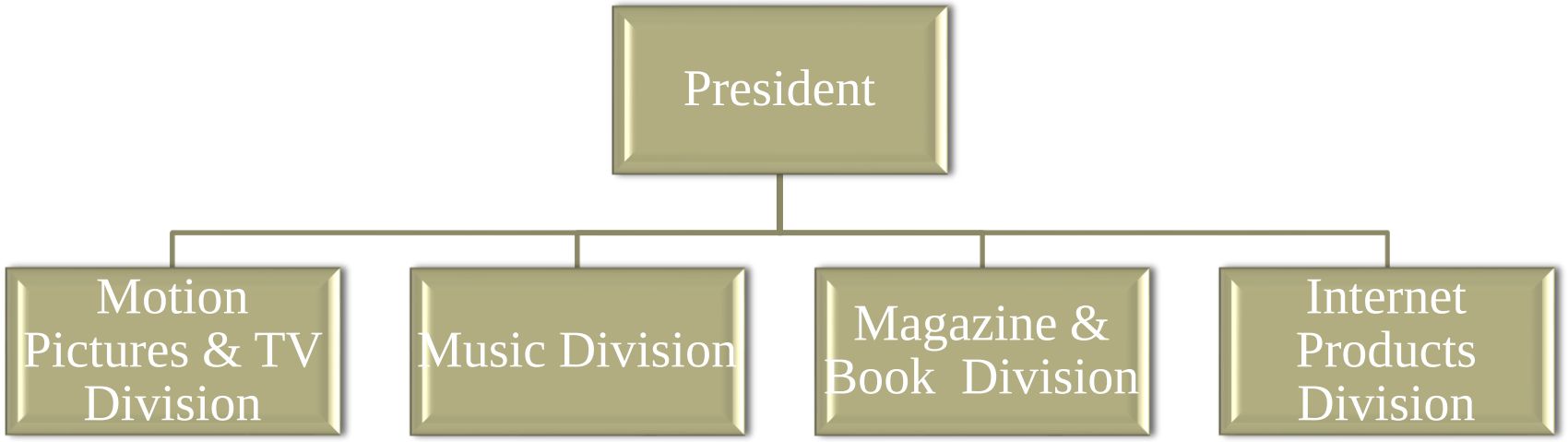
Function Product Divisions

group activities are arranged around similar products or services

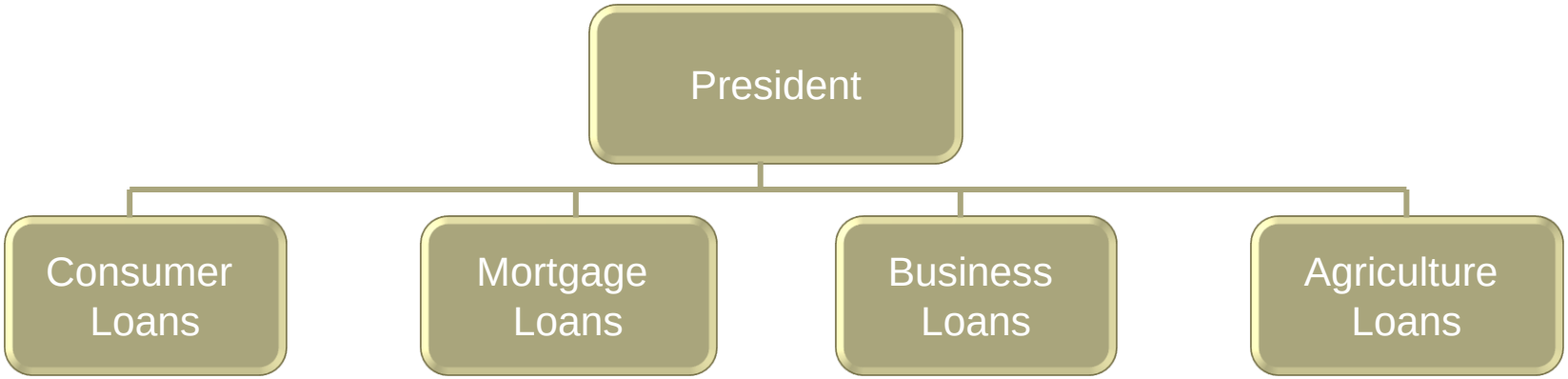
Customer Divisions
group activities around common customers or clients

Geographic Divisions
group activities around defined regional locations

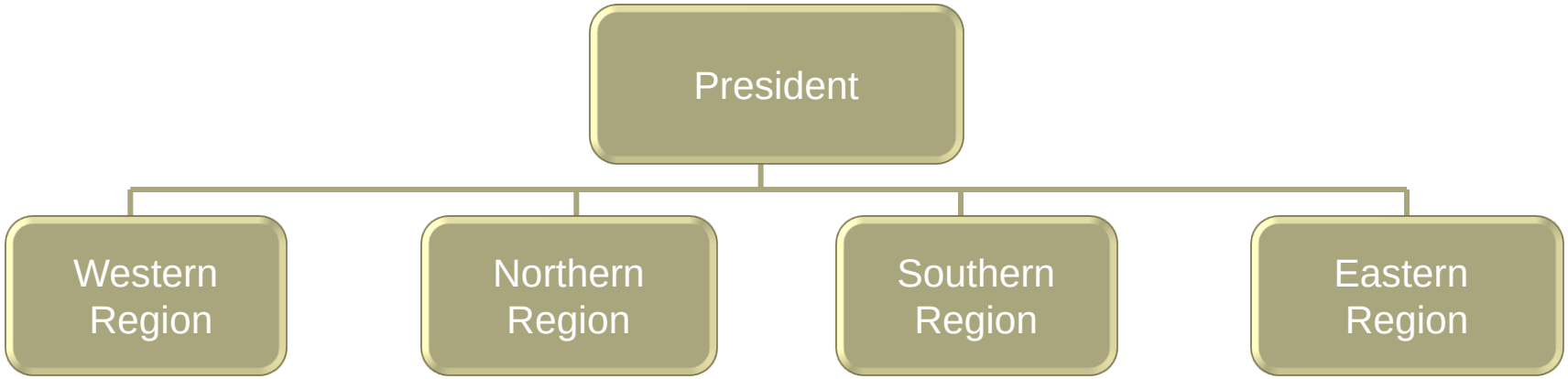
Product Divisional Structure



Customer Divisional Structure



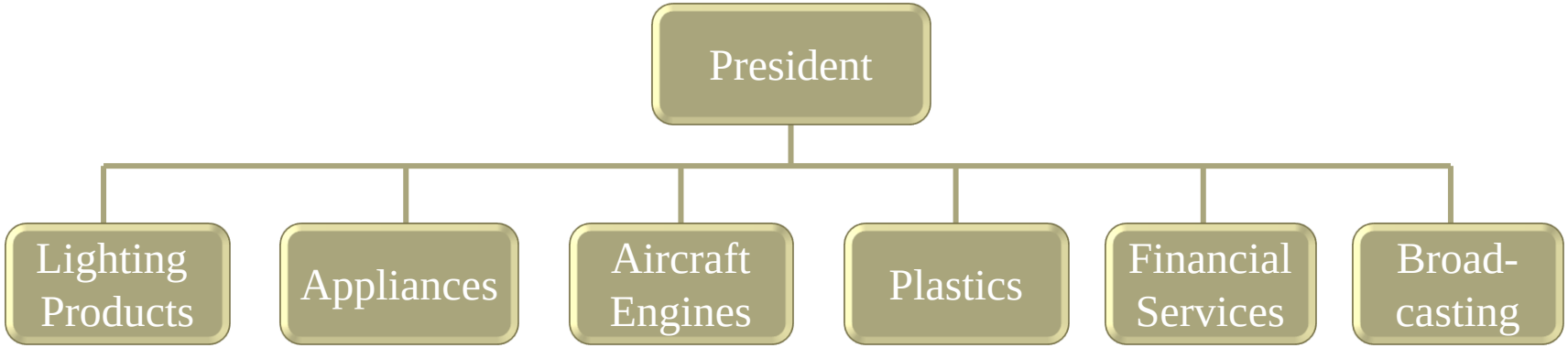
Geographic Divisional Structure



Characteristics of Divisional Design

- Great horizontal differentiation
- Made up of self-contained business unit
- Different product and services
- Differing level of process
- Different locations
- Decentralized authority
- Possibly redundant technical and administrative functions

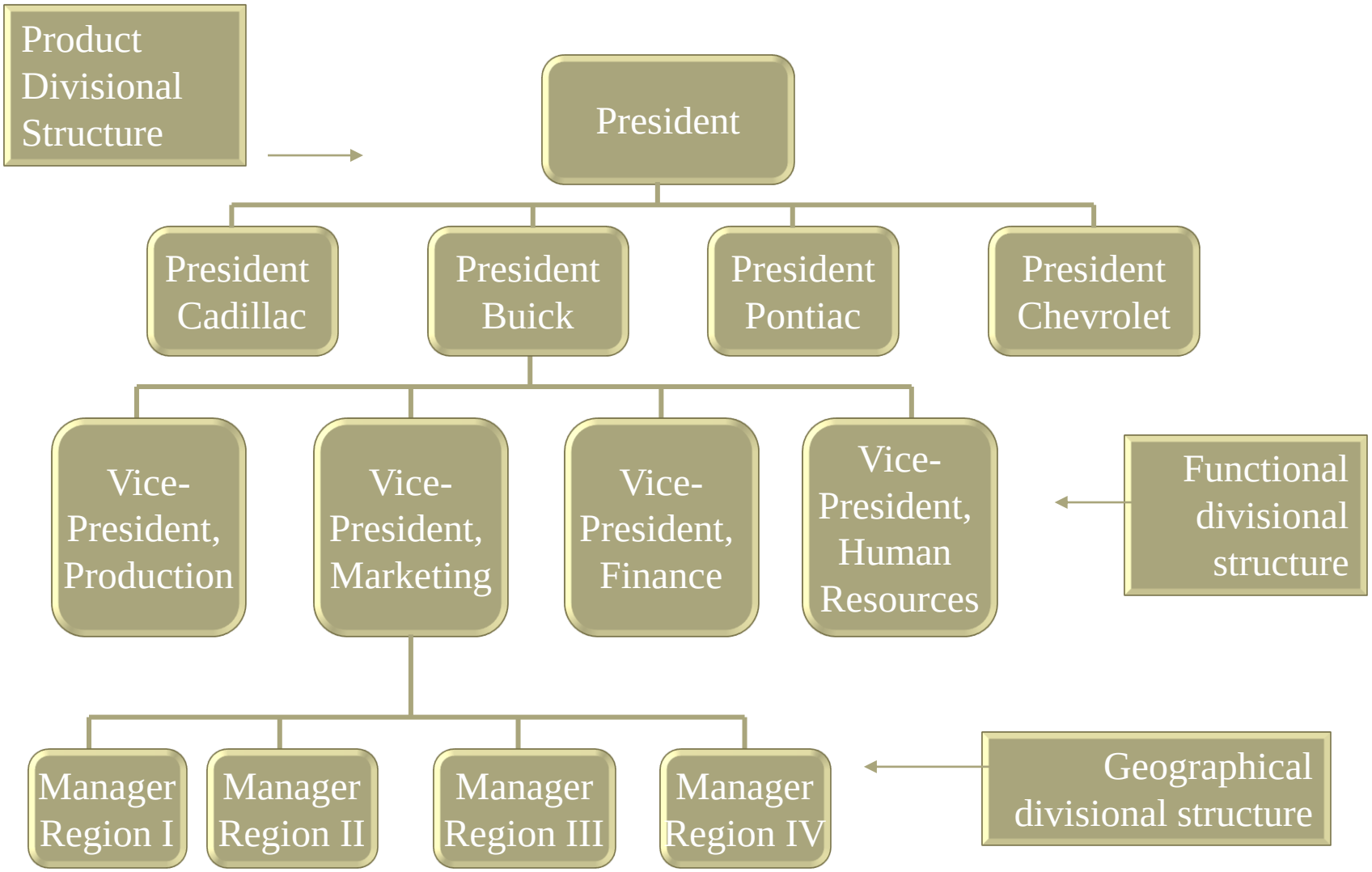
Conglomerate Structures



Characteristics of Conglomerate Design

- Little task or output dependency
- Receives resources from conglomerate
- Return revenue to conglomerate
- independently functioning groups
- Distribution of risk over several business units
- High complexity

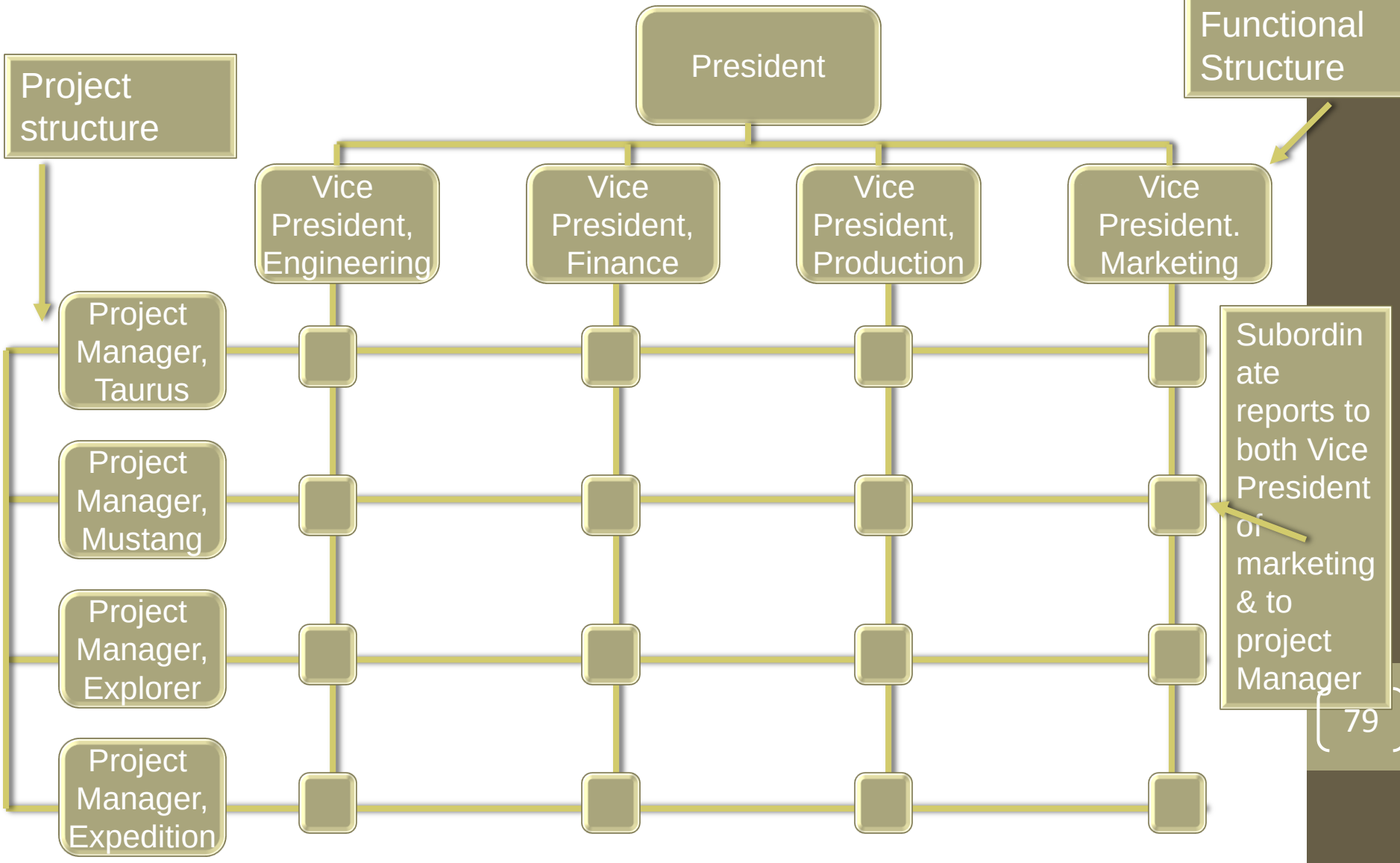
Hybrid Structures



Characteristics of Hybrid Design

- Integrated functional design
- Duality of responsibility
- Decentralization
- Very low level of formality
- Highly complex

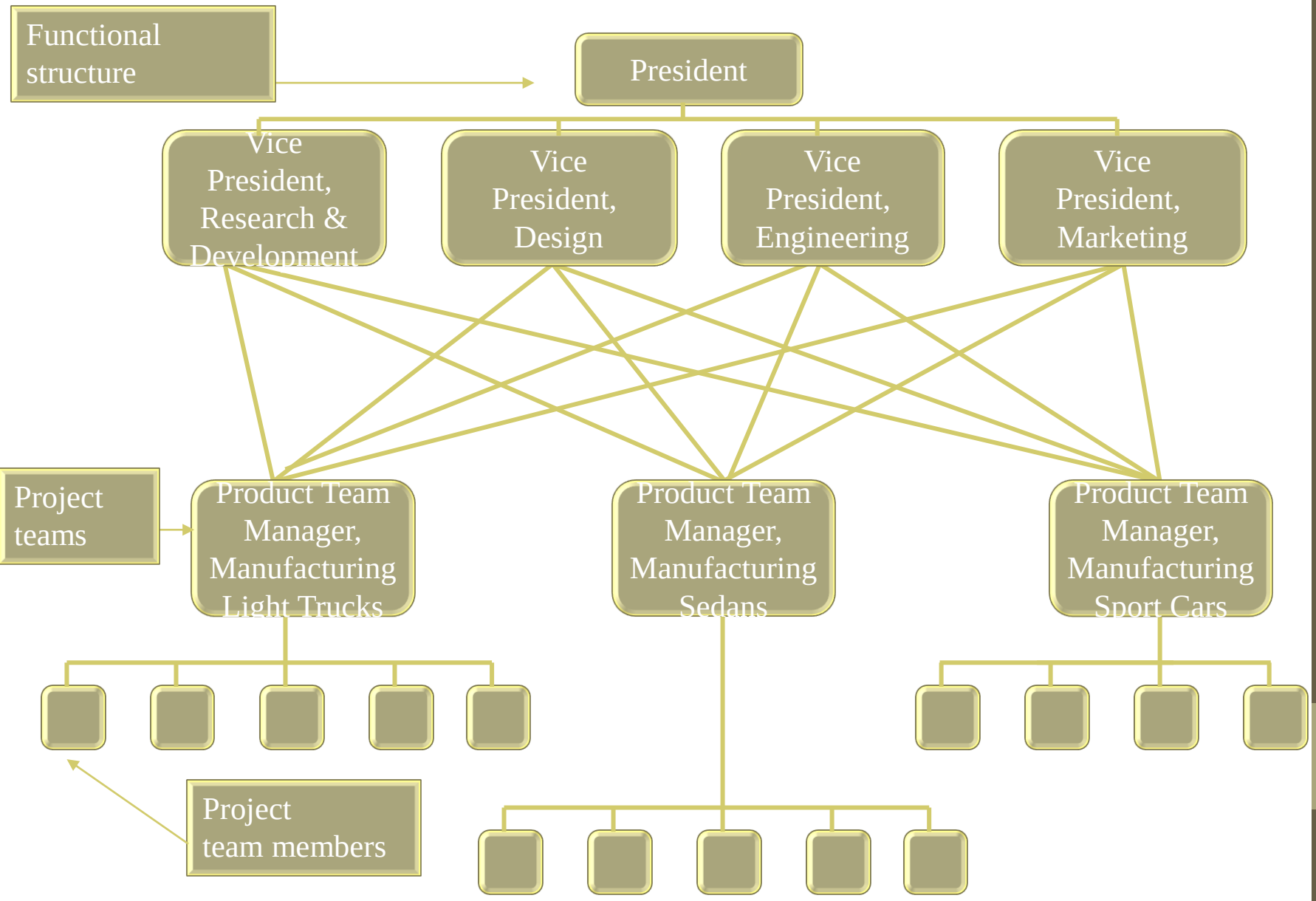
Matrix Structure



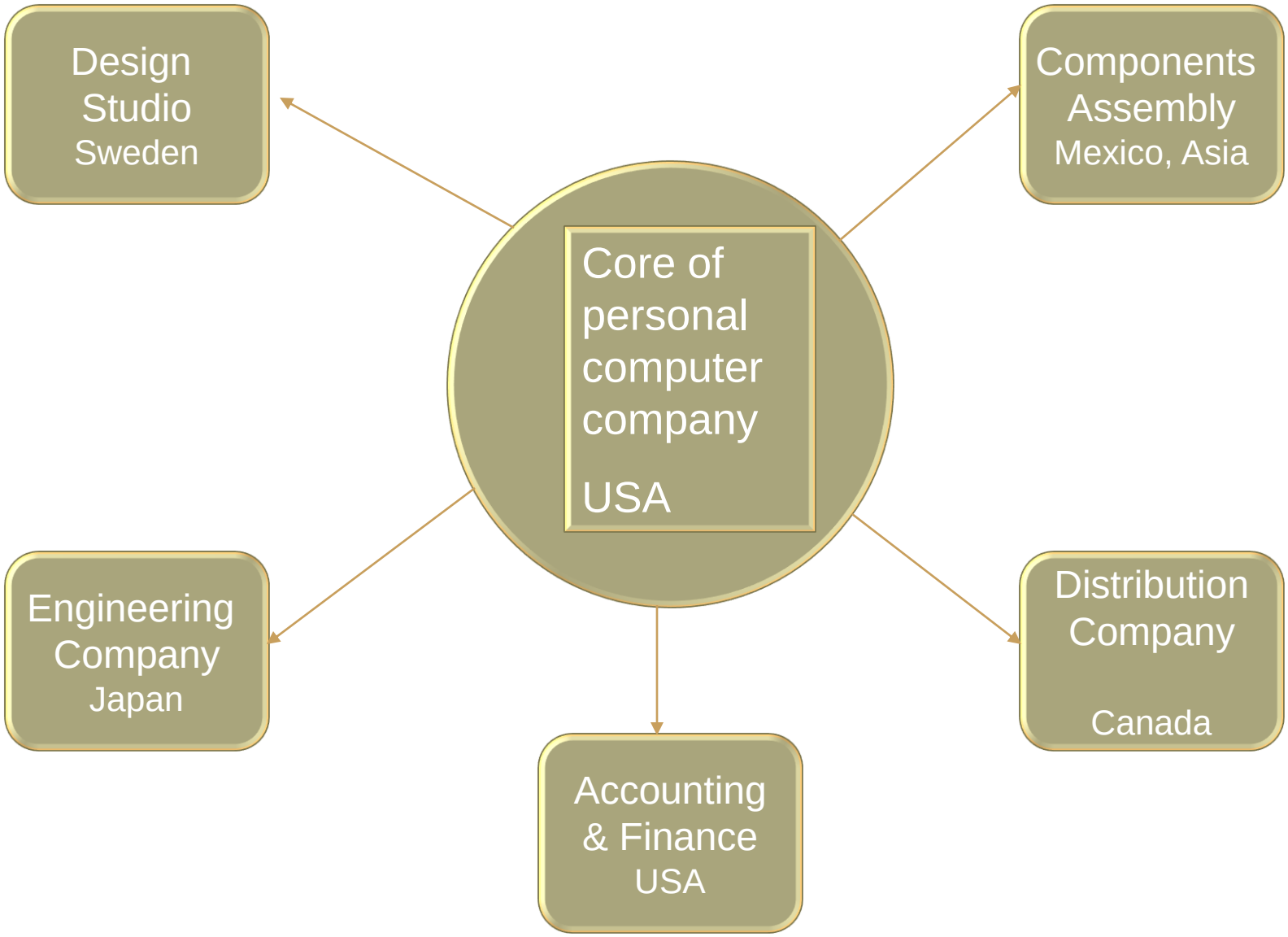
Characterstics of Matrix Organization

- Efficient use or resources
- Flexibility in conditions of change and uncertainty
- Technical excellence
- Freeing top management for long-run planning
- Improving motivation and commitment
- Providing opportunities for personal development

Team-Based Structures



Network Structure



Capacity strategy

- Capacity strategy is the process of identifying , measuring, and adjusting the limits of the transformation process to support competitive priorities such as
  - Cost
  - Quality
  - Delivery
  - Flexibility

There are three type of capacity strategies

- Lead strategy
- Lag strategy
- Tracking strategy

Lead strategy

Lead strategy: firms tries to add capacity in anticipation of increased demand. This ensure that There will be almost always be excess capacity

- Advantages
  - Excess capacity used to handle emergency orders or recover from unexpected interruption in production
  - Excess capacity can also be used to seize market share in an expending market
- Disadvantages
  - Larger cost than the firms operating with capacity close to needs
  - If market demand not expend firm need to downsize more quickly then the other firms
  - Constant pressure to manage extra capacity to reduce financial burden

Lag strategy

Lag strategy : it advocates the adding capacity only when demand patterns are obvious this means using every bit of capacity until the firm is running 100% capacity regularly

- Advantages
  - This strategy minimize the cost
  - Minimize the possibility to be caught with excess capacity in downturn or in the market that does not expend as expected
- Disadvantages
  - As firm is operating at full capacity there is no room for error
  - In case of any unexpected shut down or break down recovery to meet schedule is almost impossible
  - No capacity to cushion the shock to the internal environment

Tracking strategy

Tracking strategy : in the tracking strategy the firm tries to add capacity in small increments to follow demand pattern closely. Small increment imply decision such as adding overtime or subcontracting work.

- Advantages
  - in short run it provides the best of above mention two strategies the firm can often add sufficient capacity to accomplish the market expansion and still minimize costs
- Disadvantages
  - It is not effective in long turn
  - The need to add the bigger chunk as market grows make this strategy ineffective

Facilities decision

The four major decision associated with facilities are

- Size
- Location
- Focus
- Layout

Facility size

- The optimum size of facility depends on the tradeoffs among three dimensions of volume
  - Scope: the no. of items
  - Scale: the total annual volume
  - Vertical integration: the average no. of processing steps carried out in the facility
- Facility size is motivated primarily by vertical integration economics rather than by economies of scale or scope

Facility Location

Competitive Imperatives Impacting Location

- The need to produce close to the customer due to time-based competition, trade agreements, and shipping costs.

- The need to locate near the appropriate labor pool to take advantage of low wage costs and/or high technical skills

Issues in Facility Location

Cost factors

- Facility cost
- Taxes
- Local labor rates
- Utility cost
- Transportation coast

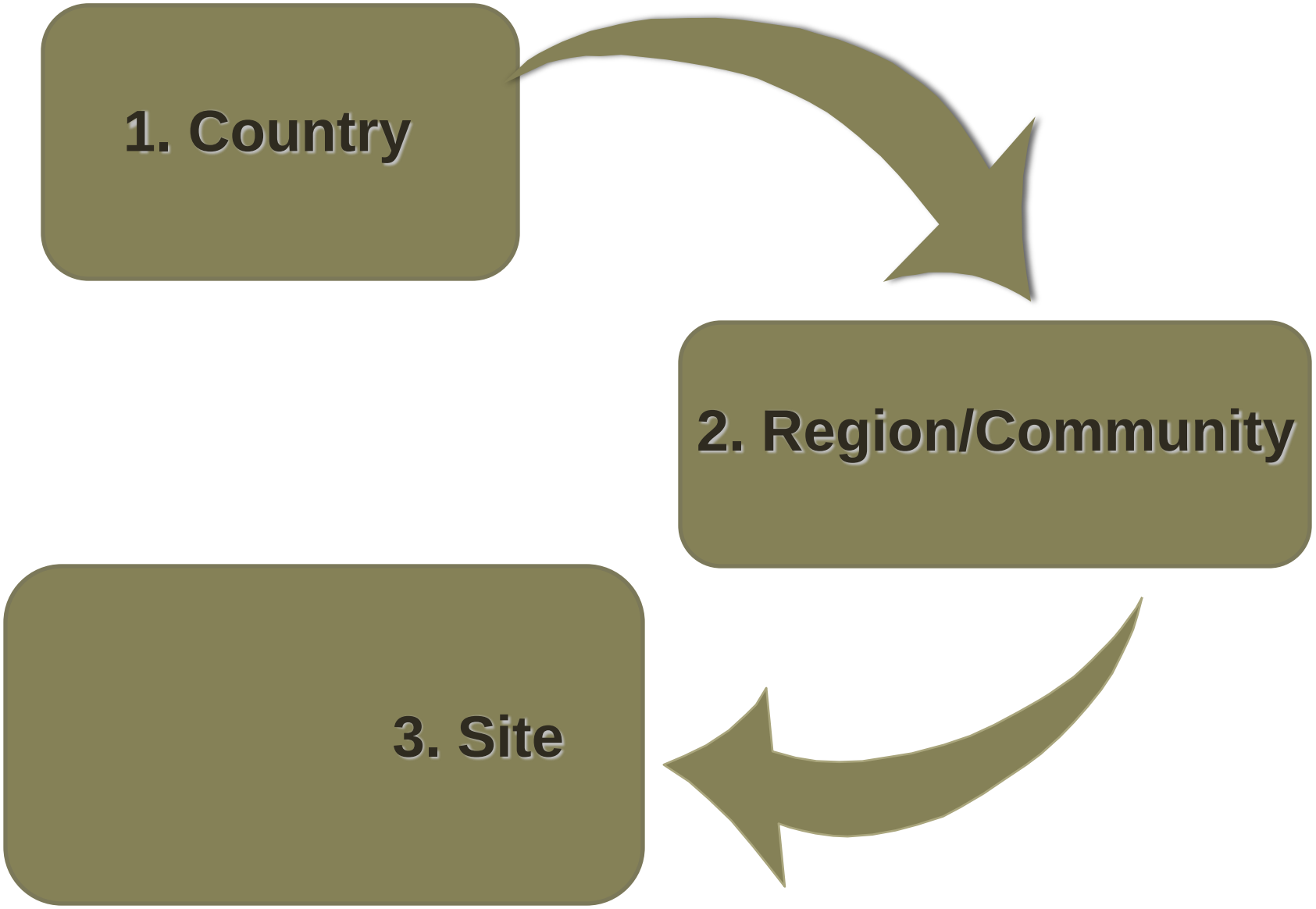
Issues in Facility Location cont.

- Qualitative factors
  - Free Trade Zones
  - Proximity to Customers
  - Business Climate
  - Political Risk
  - Government Barriers
  - Trading Blocs
  - Environmental Regulation
  - Host Community
  - Competitive Advantage
  - Infrastructure
  - Quality of Labor
  - Suppliers

Characteristics of Location Decisions

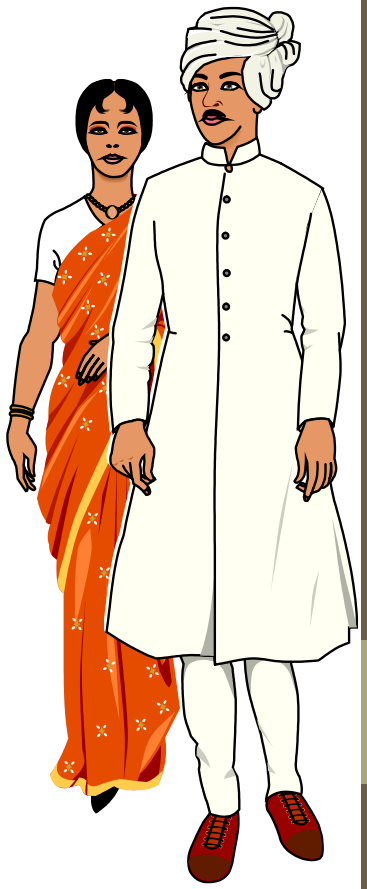
- Long-term decisions
- Very difficult to reverse
- Affect fixed & variable costs
  - Transportation cost :As much as 25% of product price
  - Other costs: Taxes, wages, rent etc.
- Objective: Maximize benefit of location to firm

Location Decision Sequence



Factors Affecting Country Decision

- Government
- Culture & economy
- Market location & size
- Labor
  - Productivity
  - Cost
  - Skills
- Infrastructure
- Exchange rate
- Incentives



Factors Affecting Region/Community Decision

- Corporate desires
- Attractiveness
- Labor
- Utility costs
- Local government incentives
- Proximity to customers & suppliers
- Land/construction

Factors Affecting Site Decision

- Site size
- Site cost
- Transportation in/out
- Proximity of services
- Environmental impact

Plant focus

The concentration of work in a plant on a limited concise manageable set of products, technologies, volume and markets precisely define by the company's competitive strategy its technology and economics

Plant focus on

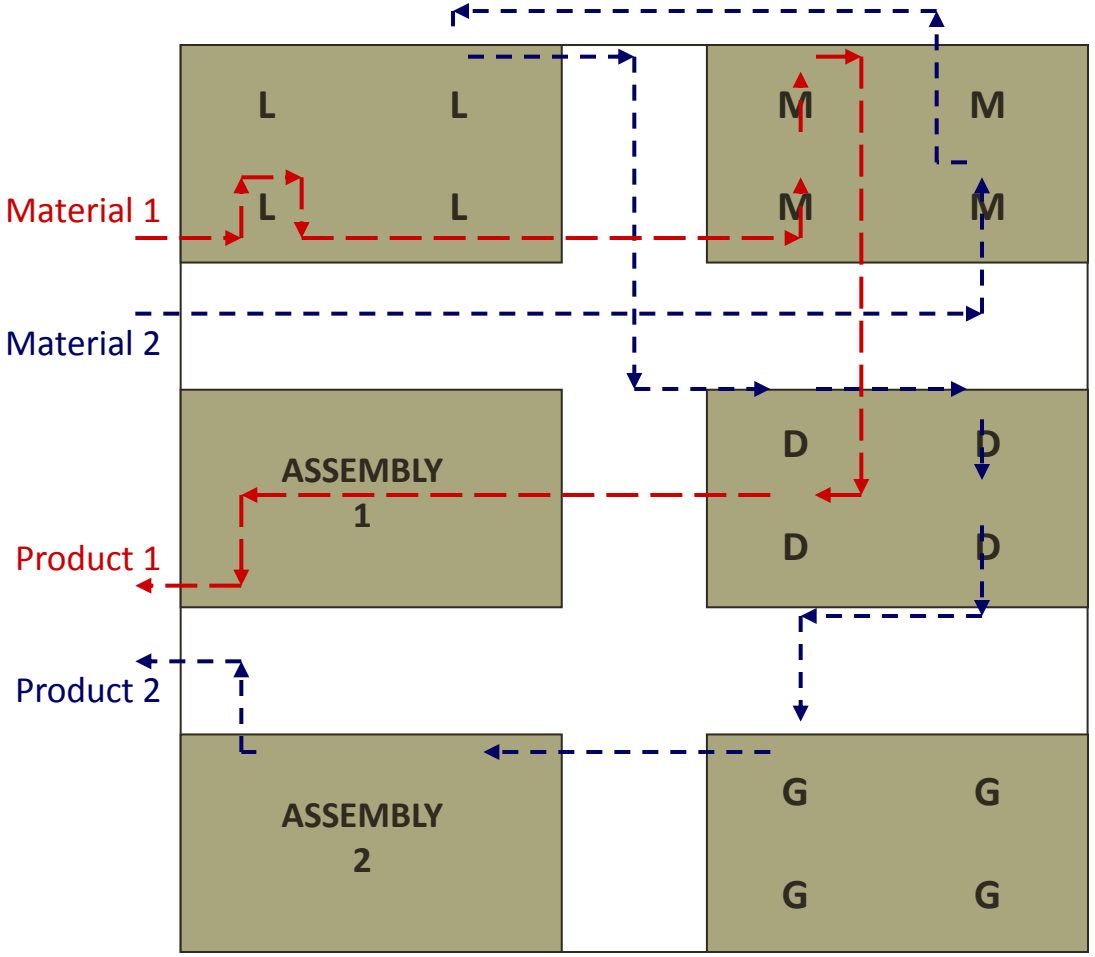
Product

Process

Customer

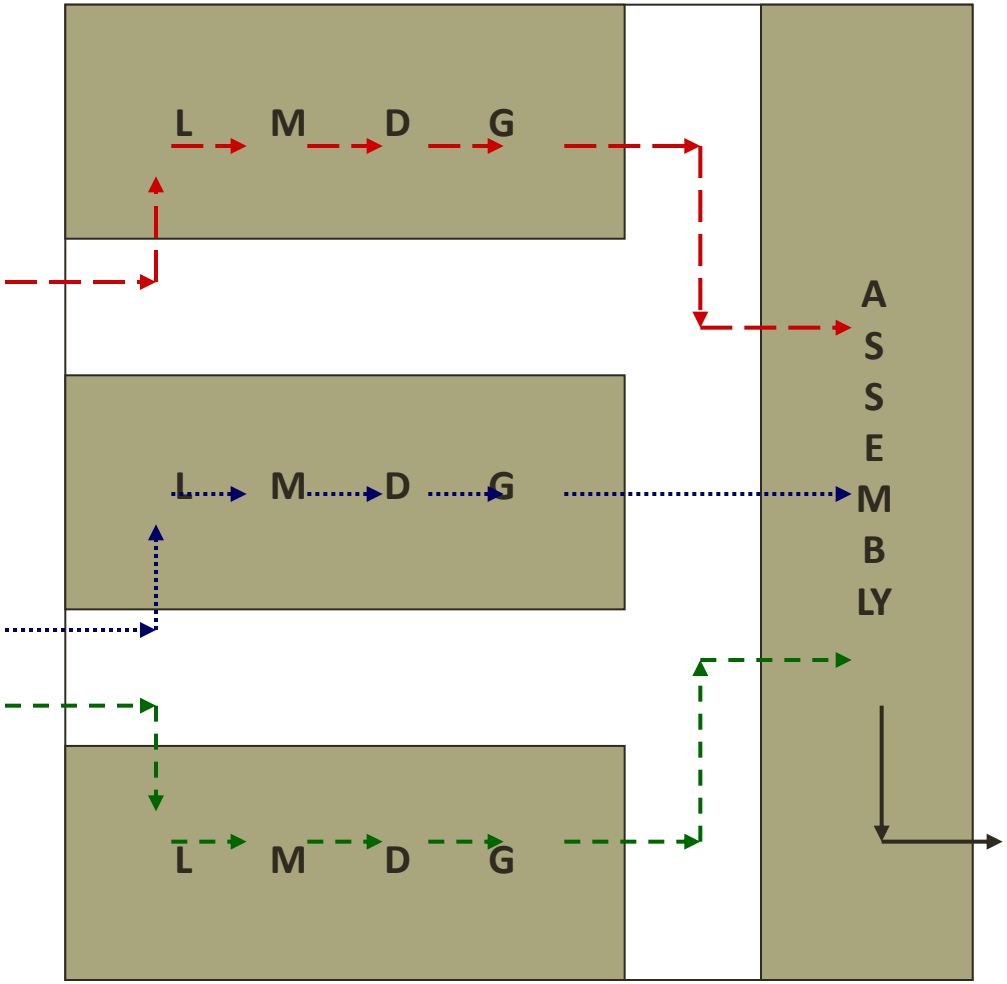
Functional Plant Layout

- Common for a large variety of products in batch volumes.
- Similar processes are grouped together.
- Inefficient: Long material transport routes from dept. to dept. Work in progress is high. Tracking of orders can be difficult.
- Advantages: Specialist labour and supervision. Flexibility as material can be rerouted in any sequence.



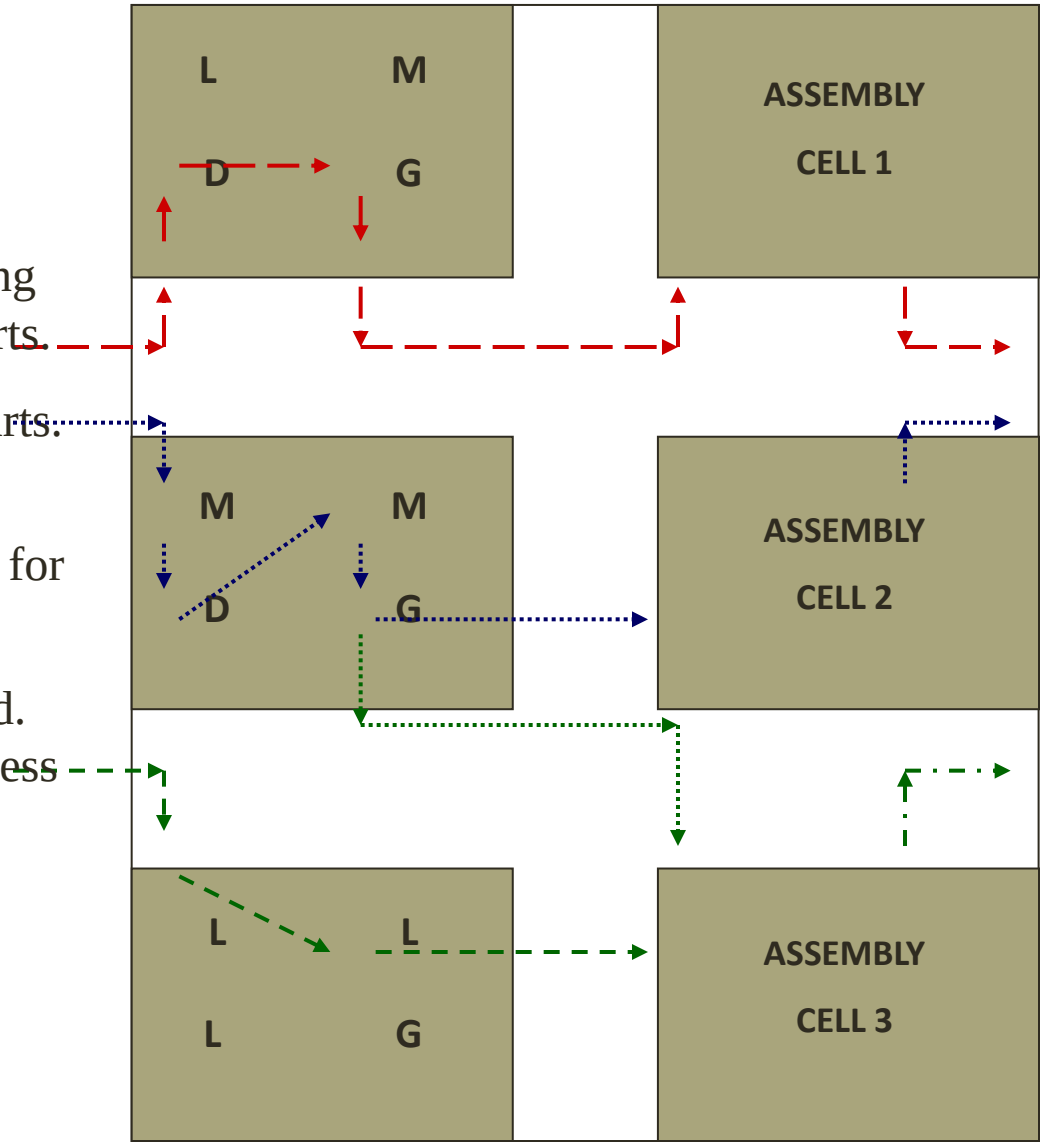
Product Plant Layout

- Mass production where variety is small and production volumes are very high.
- AKA ‘flow’ or ‘line’ layout.
- More efficient, but less flexible than ‘functional’ layout.
- Work in progress is minimised, and jobs are easily tracked.
- Investment in specialised capital equipment is high, so a reliable and steady demand is required.
- Very sensitive to machine breakdown or disruption to material supply.



Cellular Plant Layout

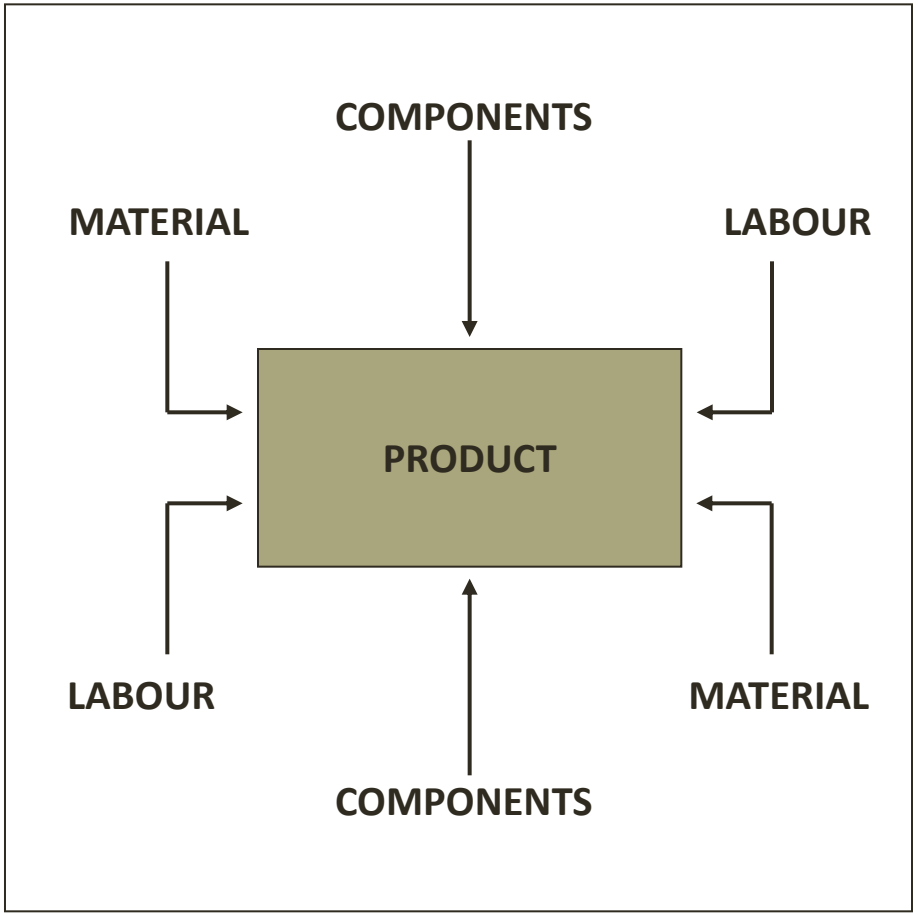
- AKA ‘Group Technology’
- Each cell manufactures products belonging to a single family.
- Cells are autonomous manufacturing units which can produce finished parts.
- Commonly applied to machined parts.
- Often single operators supervising CNC machines in a cell, with robots for materials handling.
- Productivity and quality maximised. Throughput times and work in progress kept to a minimum.
- Flexible.
- Suited to products in batches and where design changes often occur.



Fixed Position' Layout

'Fixed Position' Layout

- Single large, high cost components or products.
- Product is static. Labour, tools and equipment come to the work rather than vice versa.



Session 3

CHOICE AFFECTING OPERATION INFRASTRUCTURE

Manufacturing operations strategy

Focus: competitive priorities

Cost Flexibility Quality delivery

Level of operation

1.Top management

2.General staff

3.Functional activities

Management function

1.Capability building

2.Planning

3.Fitting

4.Implementation

5.Direction

6.control

Decision focus Infrastructure

1.Organizational infrastructure design

2. Work force involvement

3.Operations systems configurations

.Organizational structure esign

.Capacity esign

.Facilities esign

.technology

Decision focus Infrastructure

1.Organizational infrastructure design

2. Work force involvement

3.Operations systems configurations

Productivity

- Productivity is generally defined as way to measure the effectiveness of resources utilization for individuals, facilities companies and society.it is the amount of value added in the transformation process between the input and the output of the corporation

Infrastructure Decision Categories

- Workforce involvement---------
  - Number of people
  - type of people
  - degree of skill
  - degree of empowerment
- Organizational design----------
  - Vertical or horizontal
  - Centralized or decentralized
  - Matrix
  - Number of levels

Infrastructure decision categories cont.

Operation systems configuration

Quality

- Inspection: degree, type and frequency
- Process capabilities
- Type of control
- interaction with design
- Employee participation
- Top management support

Information systems

- Type of information
- Degree of access
- Degree of technology
- Types of reports

Manufacturing resource planning

- MRP II
- JIT
- order point
- Purchasing systems
- Forecasting
- Demand management
- Distribution system

Staffing Decision

- Coordinate with
- Choice of process
- Other structural decision
- Technical requirement
- Statistical process control technique
- Process improvement tools
- Managerial improvement

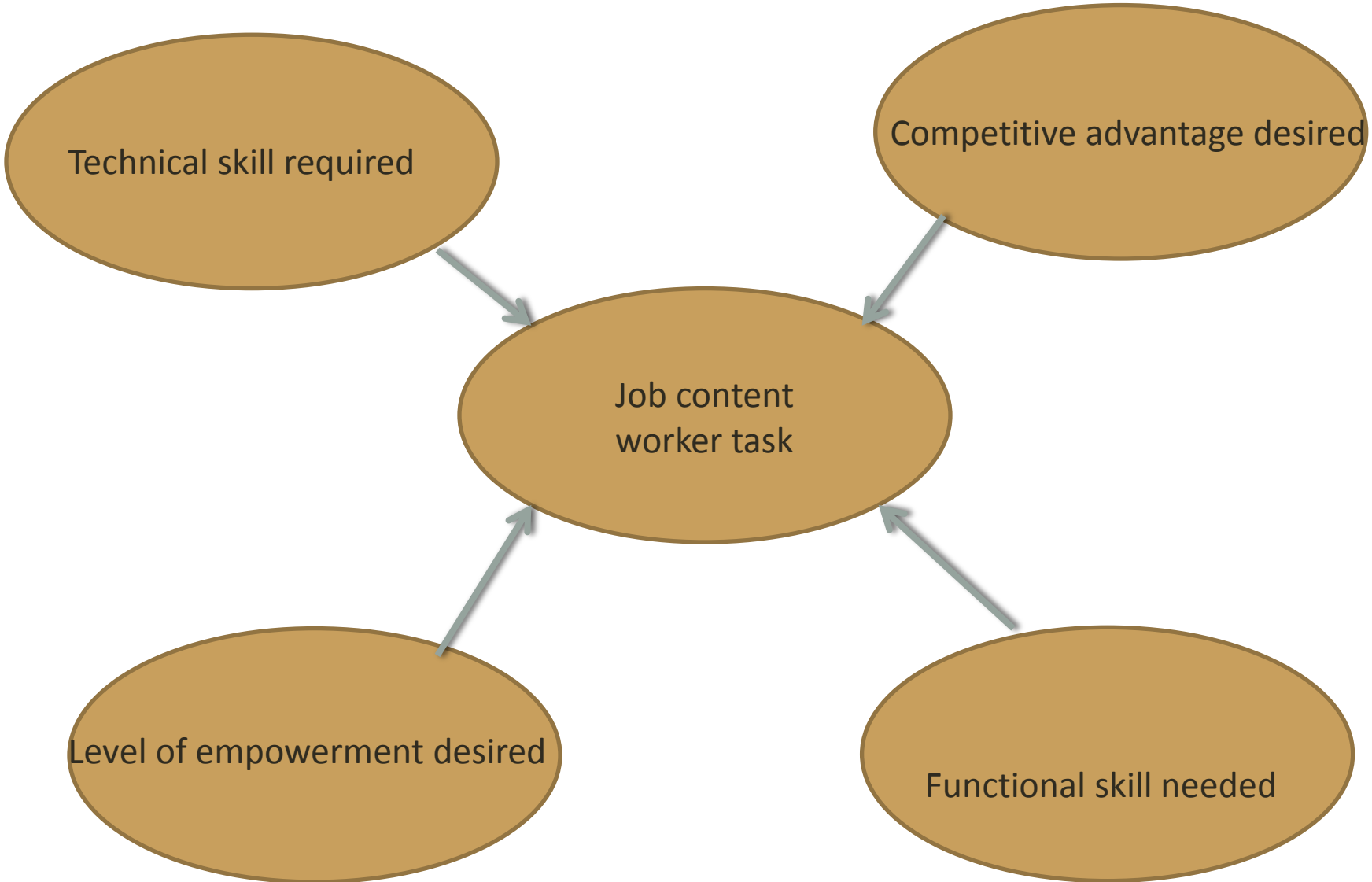
Changes in work force management

Characteristics	Traditional Materials based organization	Emerging information based organization
Strategic resources	Capital or labor	Information
Location of power	Management and as delegate staff	Technical specialists
Decision logic	Judgmental	Computational
Decisions based on	Experience opinion	Diagnosis
Distribution of power	To a few	To many
Operations	Sequential segmented	Synchronous , integrated
Strategy	Peripheral showpiece	Integrating overview
Organizational design	Tall	Flat
Knowledge location	Support staff	Line operations

Empowerment

- Empowerment is a natural extension of the long-understood and practiced idea of delegating authority commensurate with responsibility

Job content and worker task



Appraisal and reward system

- Team related peer assessment
- Team appraisals by management
- Key indicators connected to preferred behavior
- Employee stock ownership plans
- Shares of cost reductions given to worker
- Profit-sharing bonus
- Piece-work-based compensation

Suggestion programs

- Reward all good suggestions
- Encourage participation
- Implement suggestions quickly
- Allow anonymous as well named submissions
- Thank individual who contribute

Cross functional work team

- Involve work from different department
- Assembled to solve major company wide problems
- Uses standard problem-solving and project management techniques

Self Directed Work Teams

- A self-Directed work team I generally a small, independent, self organized, and self controlling group in which members flexibly plan organize, determine and manage their duties and actions, as well as perform many other supportive functions.it can have the authority to select hire, promote or discharge its member.

Job design

- A job design defined and integrates the activities of activities of an individual worker with those of other team members and with the rest of the organization. It includes job-enhancing possibilities, such as
- Job rotation
- Job enrichment
- Job enlargement

Job design process

- In a multi step process

1. Assess the work environment and the job
2. Infer the type of employee required
3. Define the responsibilities, duties and working condition of the job
4. Identify the individual job specifications
5. Hire the right organizational and personal fit

Education And Training

- Education is a process that provides the knowledge , skills and attitudes necessary to produce cause and effect understanding and support long term behavioral changes
- Training is a transfer of mechanical expertise in response and reaction to the given situation

Objectives

- Transfer of facts
- Understanding of the message
- Change in behavior
- Implementation of new technique
- Line accountability
- Peer confirmation
  continuing reinforcement
- Credibility
- enthusiasm

Type Of Skills And Knowledge

Hard skills

- Skills and knowledge directly related to business activity
- Technical or system related
- Examples
  - Concept of MPS
  - Cycle counting
  - Bar coding

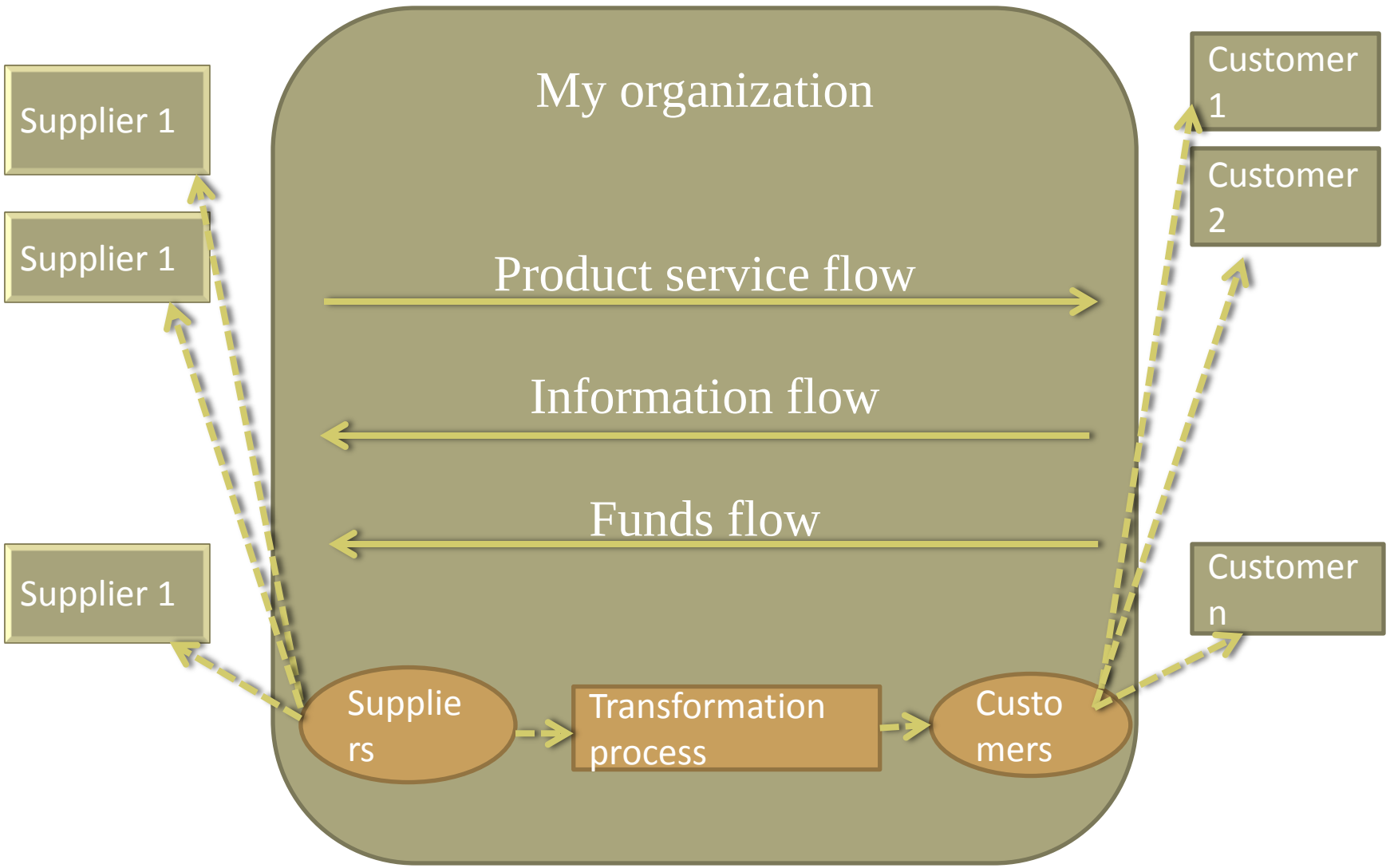
Soft skills

- Skills and knowledge used to facilitate and support the execution of business activities
- People or organization related
- Examples
  - Conduct effective meetings
  - Use decision making skills
  - Use problem solving skills

Session 4

SUPPLY CHAIN MANAGEMENT

The Supply Chain



What Is the Supply Chain?

Referred to as the logistics network containing

facilities

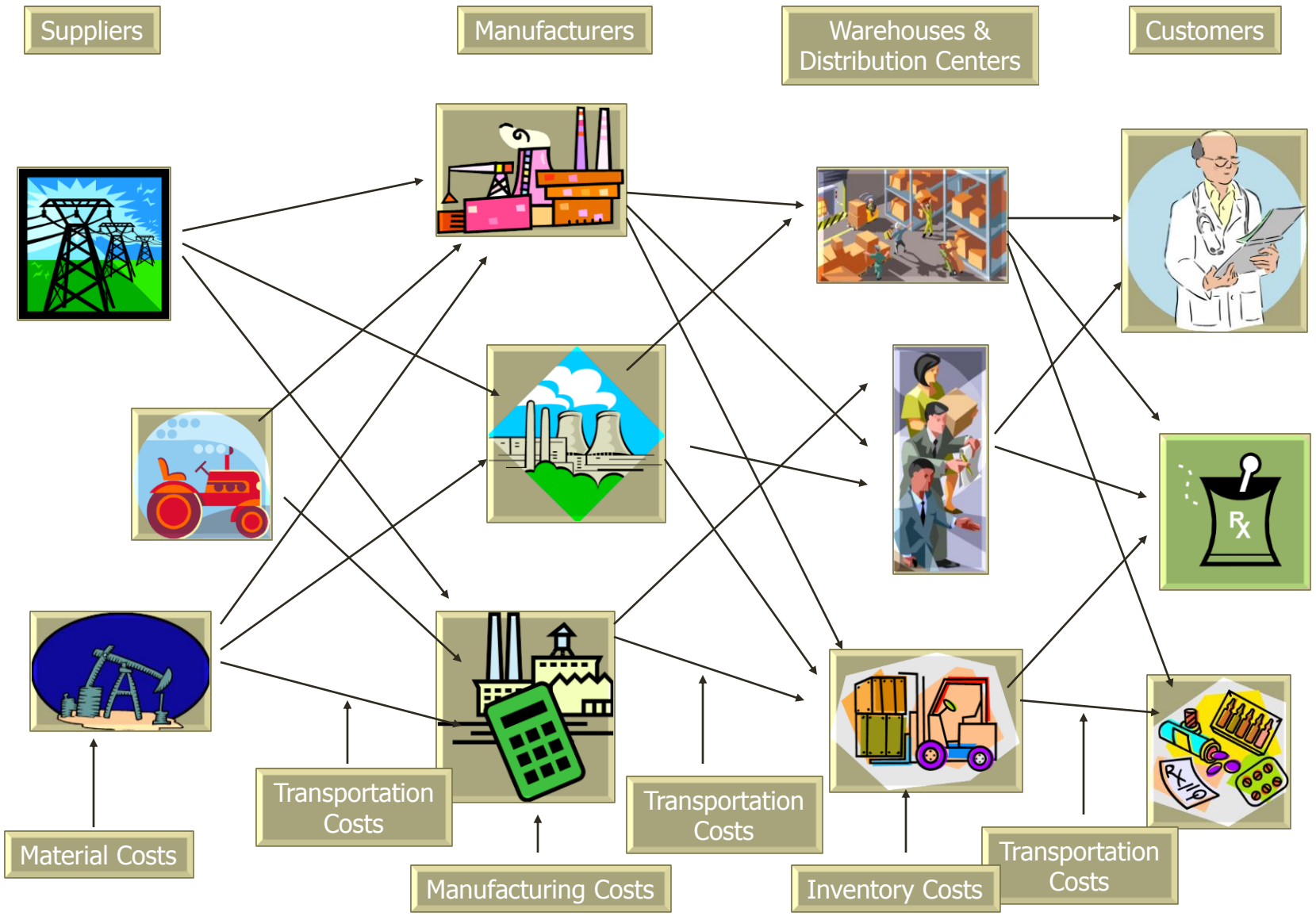
- Suppliers,
- manufacturers,
- warehouses,
- distribution centers
- retail outlets

And Inventories

- Raw materials
- Work-in-process (WIP) inventory
- Finished products

That flow between the facilities

The Supply Chain



SCM

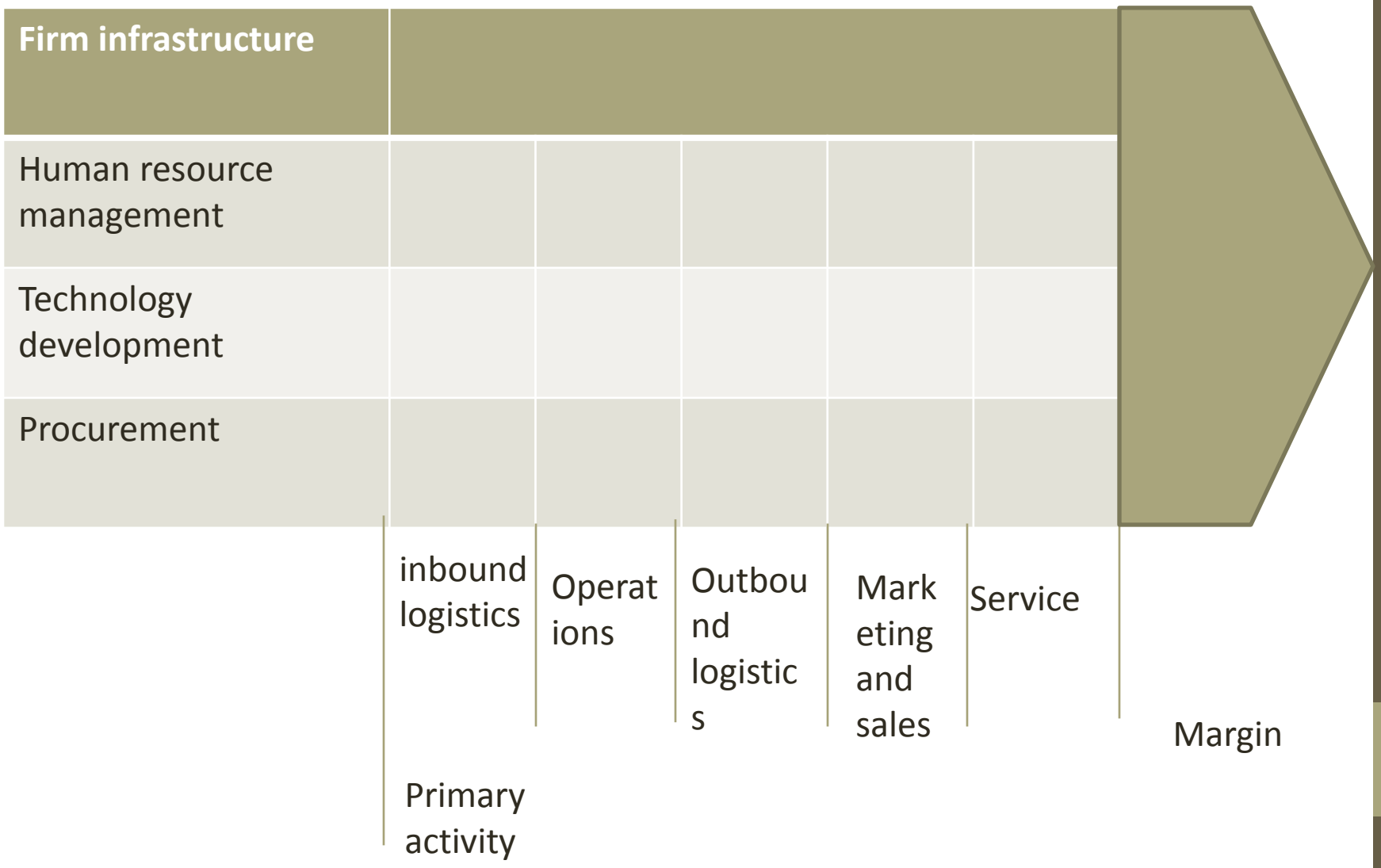
- Supply chain management(SCM) focus on managing resources to complete the following tasks
  - Meet customer requirements
  - Provide competitive advantages
  - Meet business objectives

- SCM Enable Strategy
  - Shortens product development cycle time
  - Extract every possible savings
  - Use of IT to link supply chain network
  - Quick response to final demand

Value Chain

A value chain is a process consisting of a number of related steps , with each step adding a certain value to the total outcome

Primary activity/support activity



Supply chain management includes

- Management information system
- Sourcing and procurement
- Production scheduling
- Demand fulfillment
- Cash flow
- Inventory management
- Warehousing
- Customer service
- After market disposition of packaging and materials

Look for suppliers who are the best

- Fit to meet required need and benefits
- Technology
- Practices
- Processes
- Cost structures
- Time to market

Brief History of SCM

60s-70s

- Detailed marketing strategy that focused on creating and capturing customer loyalty
- Strong engineering, design and operation function to support the market requirements
- Engineering translating customer need into product and service specification

80s

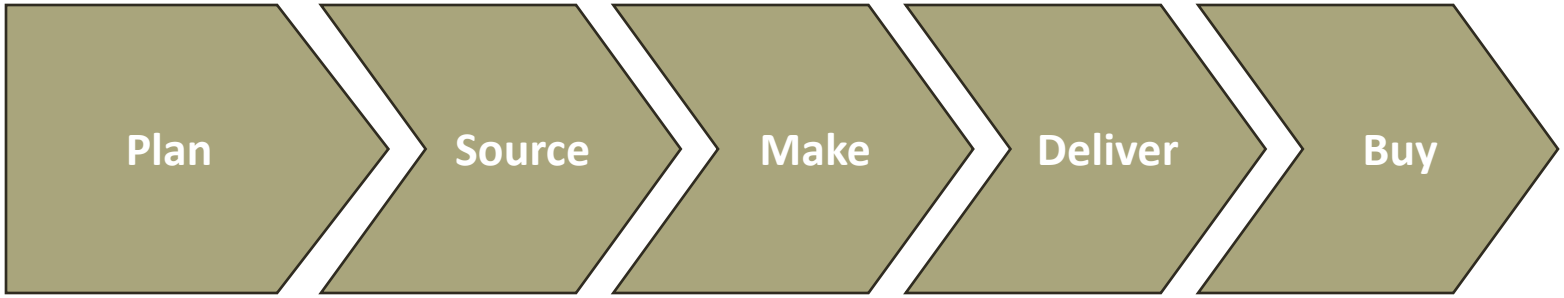
- Manufacturing organizations increasingly more flexible and responsive to modify existing products and process
- New products and process developed in order to meet ever changing customer needs

Brief History of SCM Contd.

90s

- Impact of material and service inputs from supplies on companies' ability to meet the customer needs
- Increasing focus on supply base and sourcing strategy
- New challenges: getting the products to the customer when where and how
- Logistics renaissance: development of time reducing information technologies and logistics networks
- Sharing of information between alliance members of supply chain
- Organizations involved in management of both upstream and down stream firms

Why Is SCM Difficult?



- Uncertainty is inherent to every supply chain
  - Travel times
  - Breakdowns of machines and vehicles
  - Weather, natural catastrophe, war
  - Local politics, labor conditions, border issues

- The complexity of the problem to globally optimize a supply chain is significant
  - Minimize internal costs
  - Minimize uncertainty
  - Deal with remaining uncertainty

The Importance of Supply Chain Management

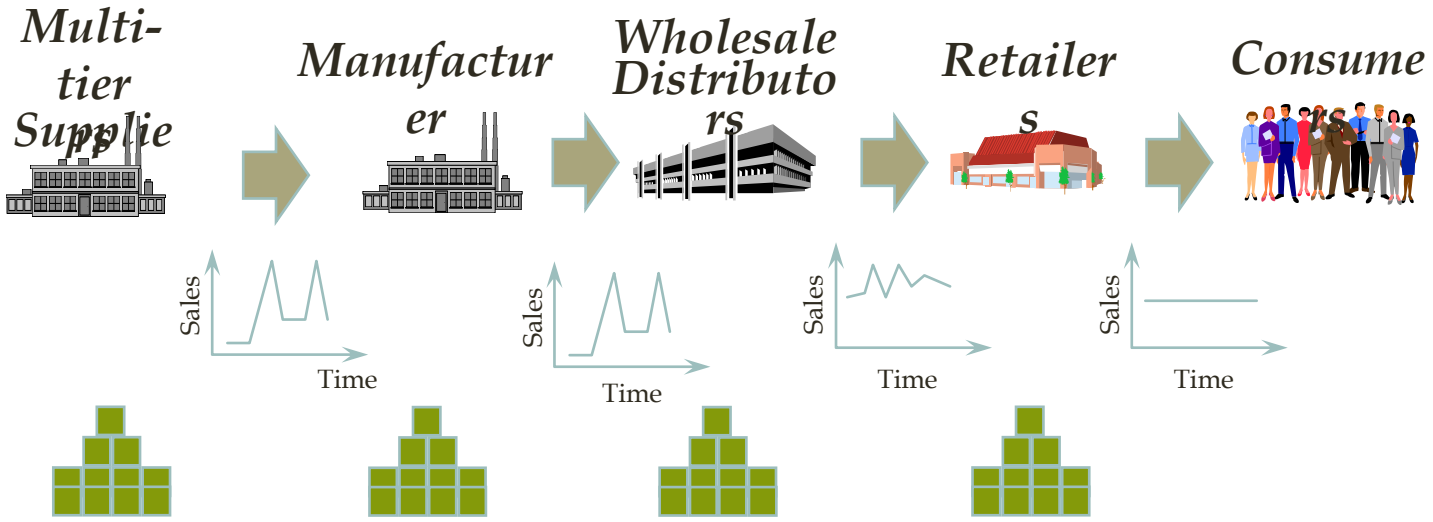
- Dealing with uncertain environments – matching supply and demand
  - Boeing announced a $2.6 billion write-off in 1997 due to "raw materials shortages, internal and supplier parts shortages and productivity inefficiencies"
  - U.S Surgical Corporation announced a $22 million loss in 1993 due to "larger than anticipated inventories on the shelves of hospitals"
  - IBM sold out its supply of its new Aptiva PC in 1994 costing it millions in potential revenue
  - Hewlett-Packard and Dell found it difficult to obtain important components for its PC's from Taiwanese suppliers in 1999 due to a massive earthquake
- U.S. firms spent $898 billion (10% of GDP) on supply-chain related activities in 1998

The Importance of Supply Chain Management

- Shorter product life cycles of high-technology products
  - Less opportunity to accumulate historical data on customer demand
  - Wide choice of competing products makes it difficult to predict demand
- The growth of technologies such as the Internet enable greater collaboration between supply chain trading partners
  - If you don't do it, your competitor will
  - Major buyers such as Wal-Mart demand a level of "supply chain maturity" of its suppliers
- Availability of SCM technologies on the market
  - Firms have access to multiple products (e.g., SAP, Baan, Oracle, JD Edwards) with which to integrate *internal* processes

Supply Chain Management and Uncertainty

- Inventory and back-order levels fluctuate considerably across the supply chain even when customer demand doesn't vary
- The variability worsens as we travel "up" the supply chain
- Forecasting doesn't help!



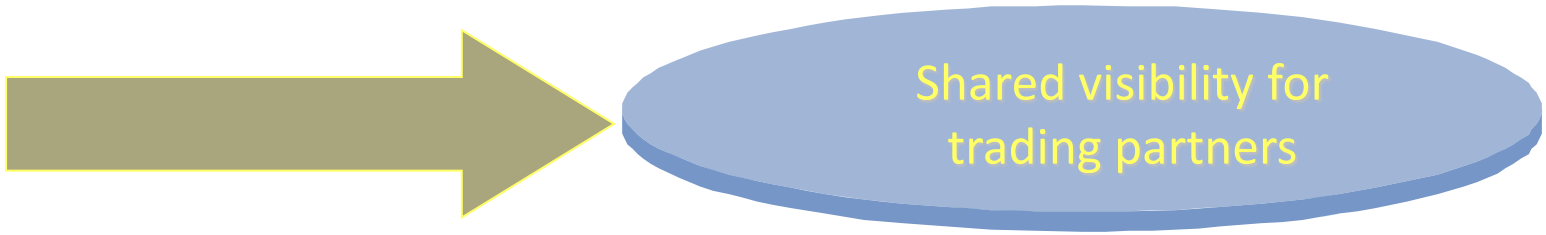
Bullwhip Effect

Factors Contributing to the Bullwhip

- Demand forecasting practices
  - Min-max inventory management (reorder points to bring inventory up to predicted levels)
- Lead time
  - Longer lead times lead to greater variability in estimates of average demand, thus increasing variability and safety stock costs
- Batch ordering
  - Peaks and valleys in orders
  - Fixed ordering costs
  - Impact of transportation costs (e.g., fuel costs)
  - Sales quotas
- Price fluctuations
  - Promotion and discount policies
- Lack of centralized information

Today's Marketplace Requires:

- **Personalized** content and services for their customers
- **Collaborative** planning with design partners, distributors, and suppliers
- **Real-time** commitments for design, production, inventory, and transportation capacity
- **Flexible** logistics options to ensure timely fulfillment
- **Order tracking** & reporting across **multiple vendors and carriers**



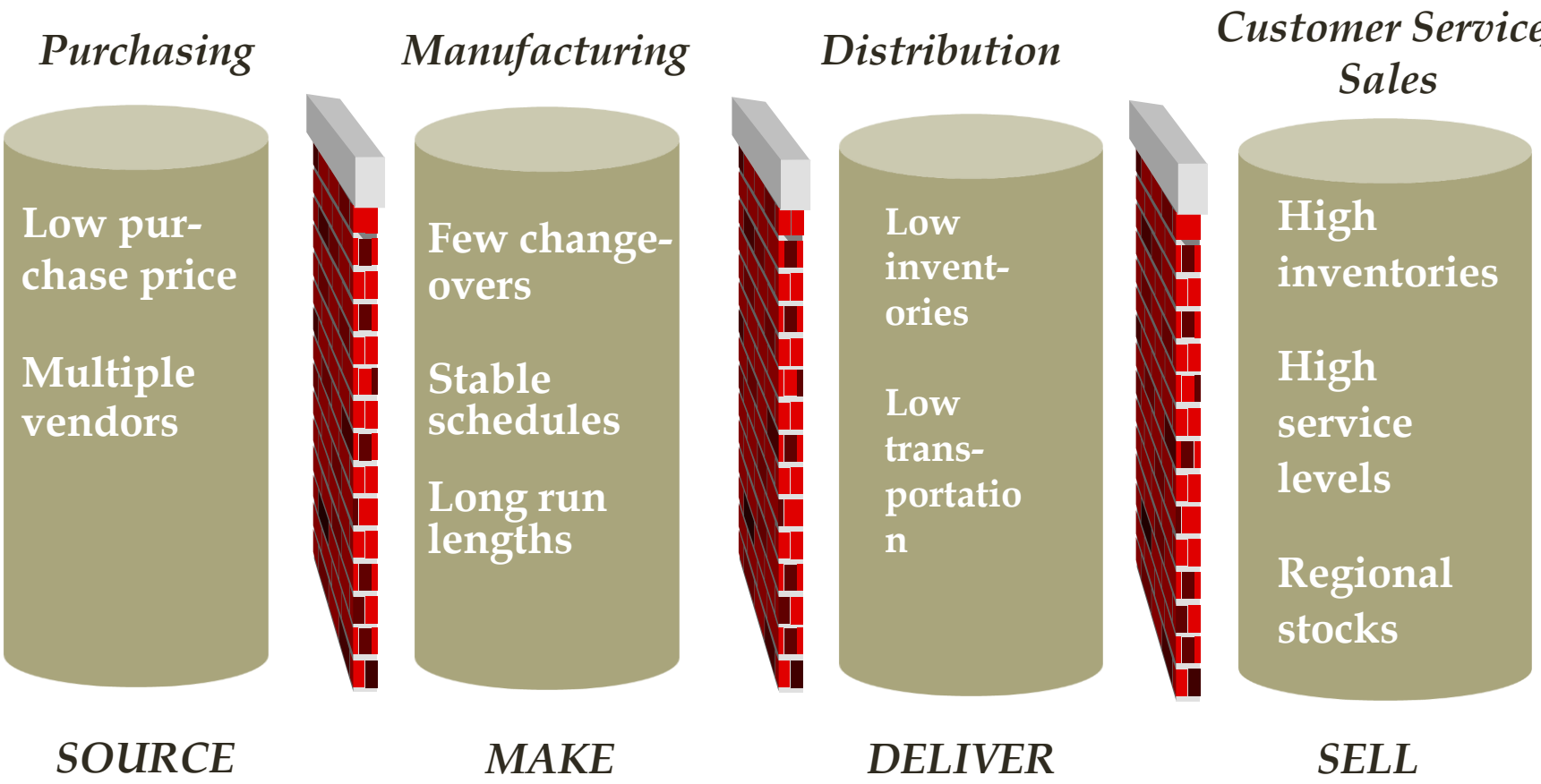
Supply Chain Management – Key Issues

- Forecasts are never right
  - Very unlikely that actual demand will exactly equal forecast demand
- The longer the forecast horizon, the worse the forecast
  - A forecast for a year from now will never be as accurate as a forecast for 3 months from now
- Aggregate forecasts are more accurate
  - A demand forecast for all CV therapeutics will be more accurate than a forecast for a specific CV-related product

Nevertheless, forecasts (or plans, if you prefer) are important management tools when some methods are applied to reduce uncertainty

Supply Chain Management – Key Issues

- Overcoming functional silos with conflicting goals



Supply Chain Management – Key Issues

Issue	
Network Planning	Warehouse locations and capacities Plant locations and production levels Transportation flows between facilities to minimize cost and time
Inventory Control	•How should inventory be managed? • Why does inventory fluctuate and what strategies minimize this?
Supply Contracts	• Impact of volume discount and revenue sharing • Pricing strategies to reduce order-shipment variability
Distribution Strategies	•Selection of distribution strategies (e.g., direct ship vs. cross-docking) • How many cross-dock points are needed? • Cost/Benefits of different strategies

Supply Chain Management – Key Issues contd.

Issue	
Integration and Strategic Partnering	•How can integration with partners be achieved? • What level of integration is best? • What information and processes can be shared? • What partnerships should be implemented and in which situations
Outsourcing & Procurement Strategies	• What are our core supply chain capabilities and which are not? • Does our product design mandate different outsourcing approaches? • Risk management
Product Design	• How are inventory holding and transportation costs affected by product design? • How does product design enable mass customization?

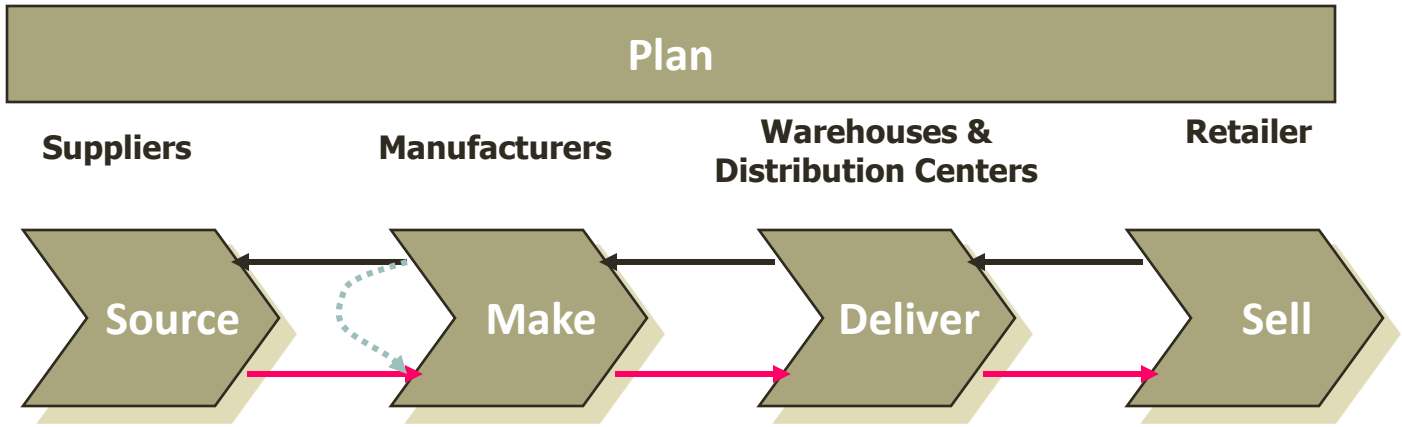
Supply Chain Management Operations Strategies

STRATEGY	WHEN TO CHOOSE	BENEFITS
Make to Stock	standardized products, relatively predictable demand	Low manufacturing costs; meet customer demands quickly
Make to Order	customized products, many variations	Customization; reduced inventory; improved service levels
Configure to Order	many variations on finished product; infrequent demand	Low inventory levels; wide range of product offerings; simplified planning
Engineer to Order	complex products, unique customer specifications	Enables response to specific customer requirements

Supply Chain Imperatives for Success

- View the supply chain as a strategic asset and a differentiator
  - Wal-Mart's partnership with Proctor & Gamble to automatically replenish inventory
  - Dell's innovative direct-to-consumer sales and build-to-order manufacturing
- Create unique supply chain configurations that align with your company's strategic objectives
  - Operations strategy
  - Outsourcing strategy
  - Channel strategy
  - Customer service strategy
  - Asset network
- Reduce uncertainty
  - Forecasting
  - Collaboration
  - Integration

Information In The Supply Chain



Order Lead Time

Delivery Lead Time

Production Lead Time

- Each facility further away from actual customer demand must make forecasts of demand
- Lacking actual customer buying data, each facility bases its forecasts on 'downstream' orders, which are more variable than actual demand
- To accommodate variability, inventory levels are overstocked thus increasing inventory carrying costs

It's estimated that the typical pharmaceutical company supply chain carries over 100 days of product to accommodate uncertainty

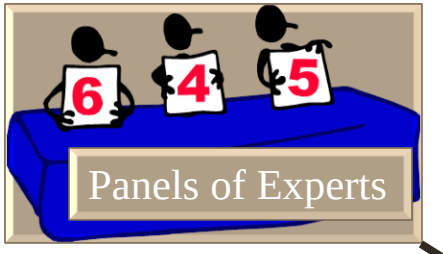
Taming the Bullwhip

Four critical methods for reducing the Bullwhip effect:

- Reduce uncertainty in the supply chain
  - Centralize demand information
  - Keep each stage of the supply chain provided with up-to-date customer demand information
  - More frequent planning (continuous real-time planning the goal)
- Reduce variability in the supply chain
  - Every-day-low-price strategies for stable demand patterns
- Reduce lead times
  - Use cross-docking to reduce order lead times
  - Use EDI techniques to reduce information lead times
- Eliminate the bullwhip through strategic partnerships
  - Vendor-managed inventory (VMI)
  - Collaborative planning, forecasting and replenishment (CPFR)

Methods for Improving Forecasts

Judgment Methods



- Internal experts
- External experts
- Domain experts
- Delphi technique

Time-Series Methods

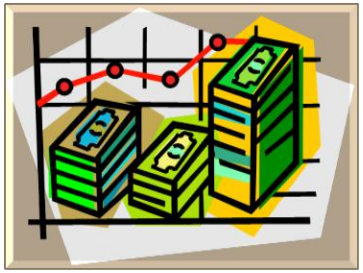
- Moving average
- Exponential smoothing
- Trend analysis
- Seasonality analysis

- Relies on data other than that being predicted
- Economic data, commodity data, etc.

Market Research Analysis

- Market testing
- Market surveys
- Focus groups

Causal Analysis



Supply Chain Integration – Push Strategies

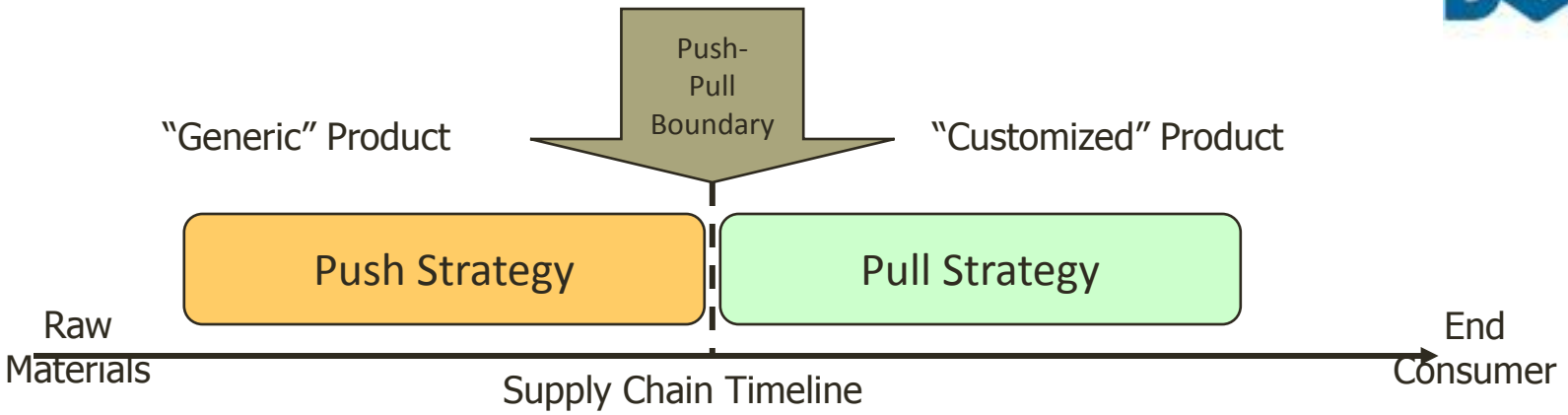
- Classical manufacturing supply chain strategy
- Manufacturing forecasts are long-range
  - Orders from retailers' warehouses
- Longer response time to react to marketplace changes
  - Unable to meet changing demand patterns
  - Supply chain inventory becomes obsolete as demand for certain products disappears
- Increased variability (Bullwhip effect) leading to:
  - Large inventory safety stocks
  - Larger and more variably sized production batches
  - Unacceptable service levels
  - Inventory obsolescence
- Inefficient use of production facilities (factories)
  - How is demand determined? Peak? Average?
  - How is transportation capacity determined?
- Examples: Auto industry, large appliances, others?

Supply Chain Integration – Pull Strategies

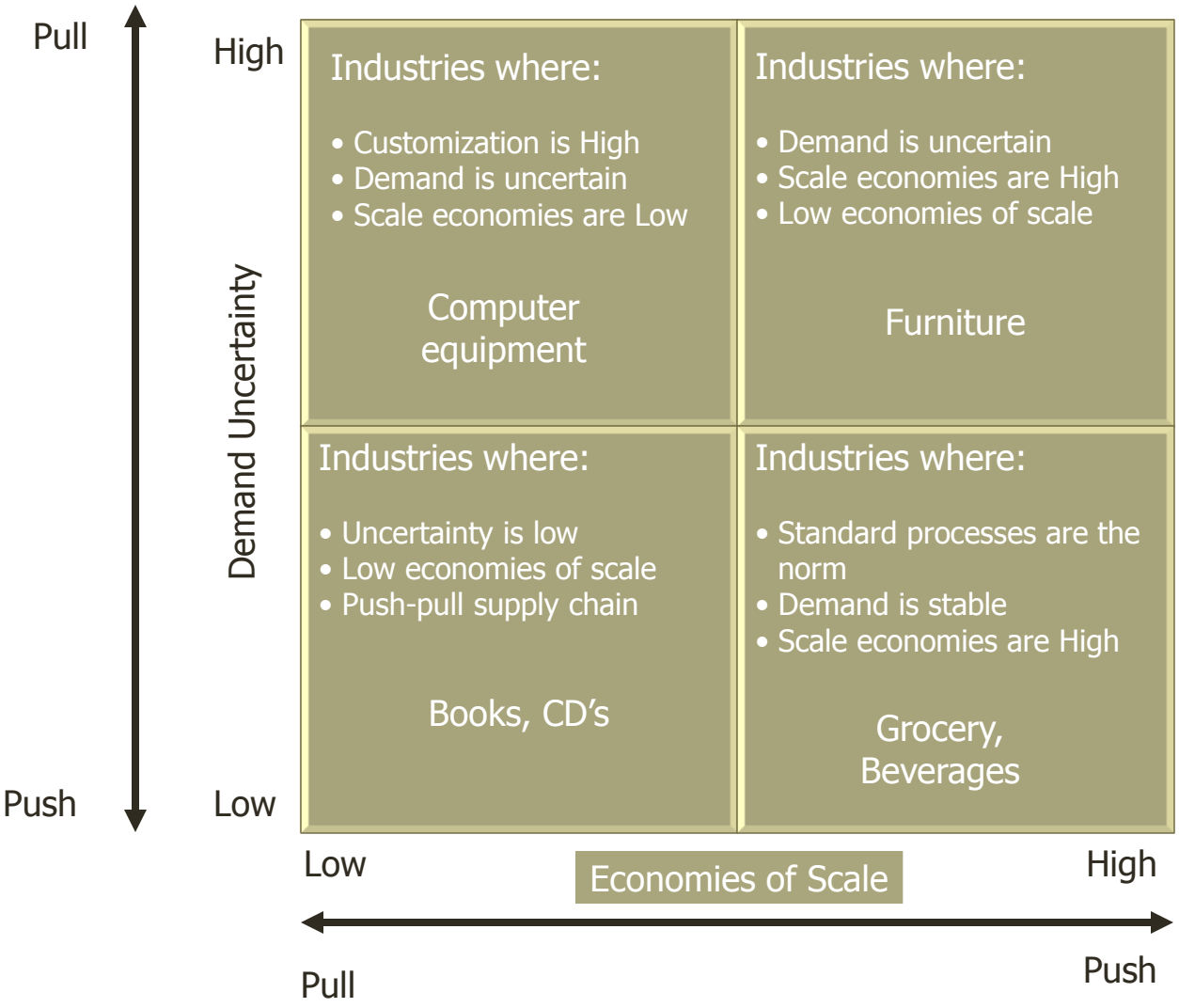
- Production and distribution are demand-driven
  - Coordinated with true customer demand
- None or little inventory held
  - Only in response to specific orders
- Fast information flow mechanisms
  - POS data
- Decreased lead times
- Decreased retailer inventory
- Decreased variability in the supply chain and especially at manufacturers
- Decreased manufacturer inventory
- More efficient use of resources
- More difficult to take advantage of scale opportunities
- Examples: Dell, Amazon

Supply Chain Integration – Push/Pull Strategies

- Hybrid of "push" and "pull" strategies to overcome disadvantages of each
- Early stages of product assembly are done in a "push" manner
  - Partial assembly of product based on aggregate demand forecasts (which are more accurate than individual product demand forecasts)
  - Uncertainty is reduced so safety stock inventory is lower
- Final product assembly is done based on customer demand for specific product configurations
- Supply chain timeline determines "push-pull boundary"



Choosing Between Push/Pull Strategies



Where do the following industries fit in this model:

- Automobile?
- Aircraft?
- Fashion?
- Petroleum refining?
- Pharmaceuticals?
- Biotechnology?
- Medical Devices?

Characteristics of Push, Pull and Push/Pull Strategies

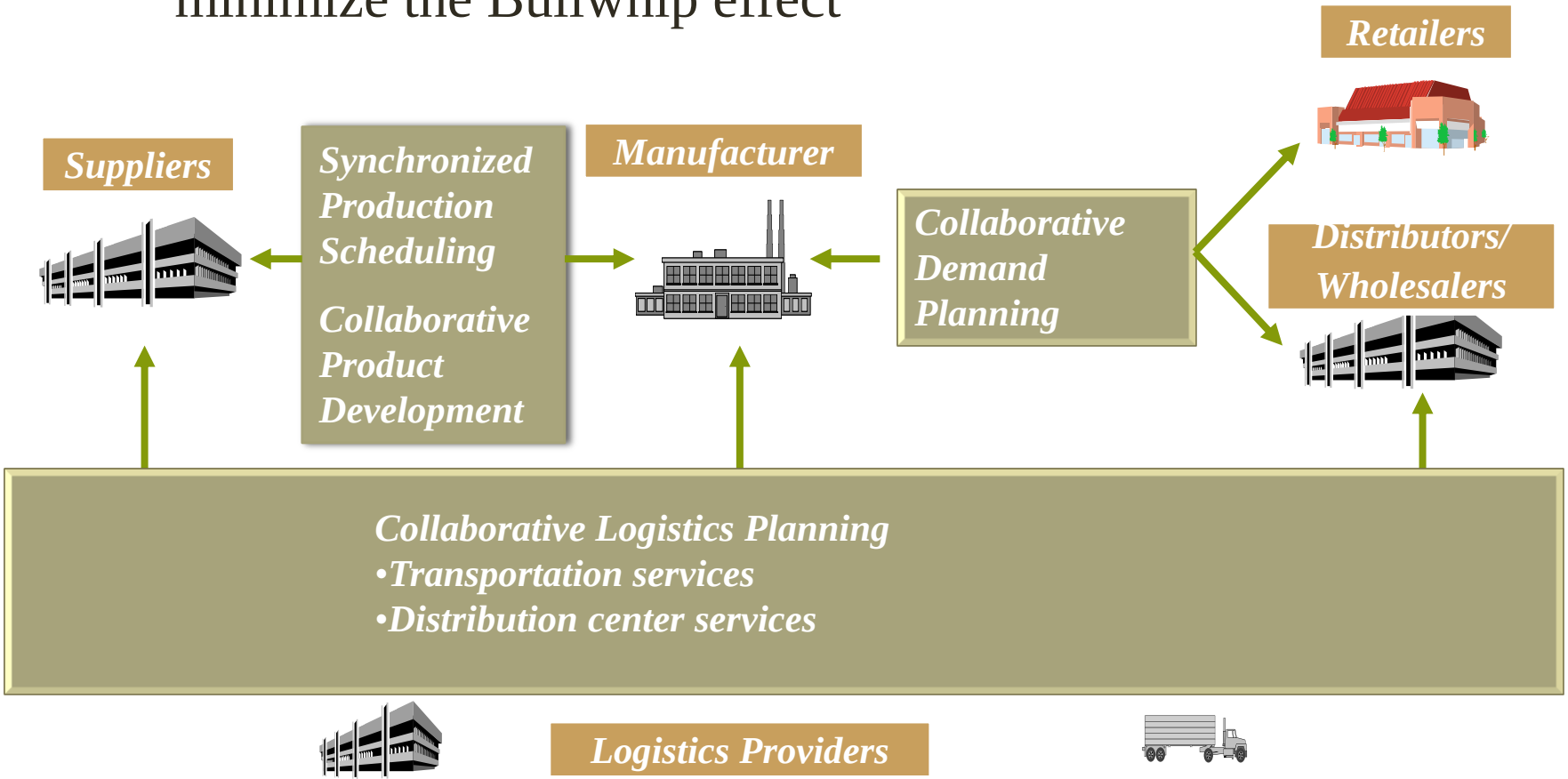
	PUSH	PULL
Objective	**Minimize Cost**	**Maximize Service Level**
Complexity	**High**	**Low**
Focus	**Resource Allocation**	**Responsiveness**
Lead Time	**Long**	**Short**
Processes	**Supply Chain Planning**	**Order Fulfillment**

Supply Chain Collaboration – What Is It?

- Many different definitions depending on perspective
- The means by which companies within the supply chain work together towards mutual goals by sharing
  - Ideas
  - Information
  - Processes
  - Knowledge
  - Information
  - Risks
  - Rewards
- Why collaborate?
  - Accelerate entry into new markets
  - Changes the relationship between cost/value/profit equation

Supply Chain Collaboration

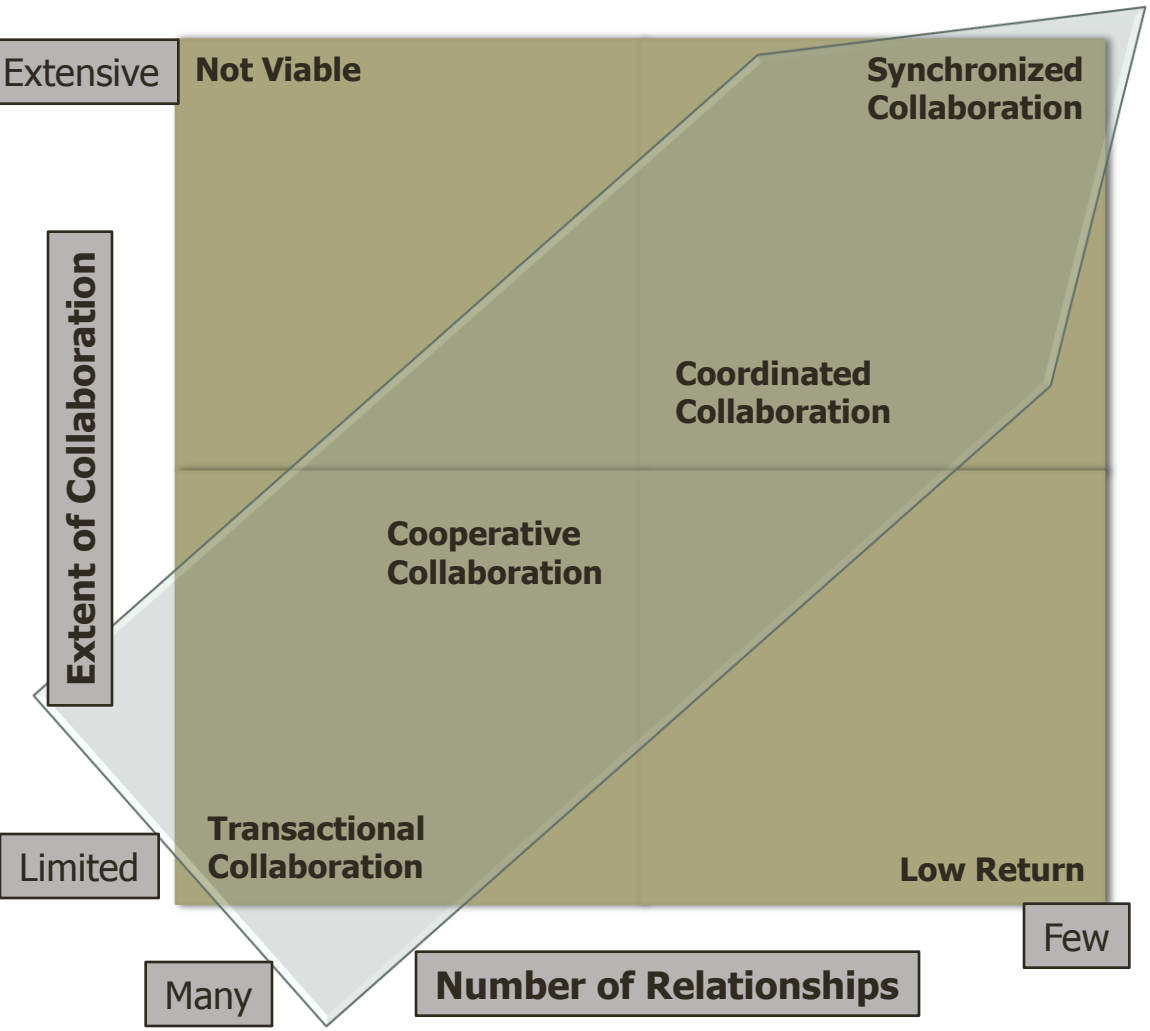
- Cornerstone of effective SCM
- The focus of many of today's SCM initiatives
- The only method that has the potential to eliminate or minimize the Bullwhip effect



Benefits of Supply Chain Collaboration

CUSTOMERS	MATERIAL SUPPLIERS	SERVICE SUPPLIERS
• Reduced inventory • Increased revenue • Lower order management costs • Higher Gross Margin • Better forecast accuracy • Better allocation of promotional budgets	• Reduced inventory • Lower warehousing costs • Lower material acquisition costs • Fewer stock out conditions	• Lower freight costs • Faster and more reliable delivery • Lower capital costs • Reduced depreciation • Lower fixed costs
• Improved customer service • More efficient use of human resources		

Supply Chain Collaboration Spectrum



- The green arrow describes increasing complexity and sophistication of:
  - Information systems
  - Systems infrastructure
  - Decision support systems
  - Planning mechanisms
  - Information sharing
  - Process understanding
- Higher levels of collaboration imply the need for both trading partners to have equivalent (or close) levels of supply chain maturity
- Synchronized collaboration demands joint planning, R&D and sharing of information and processing models
  - Movement to real-time customer demand information throughout the supply chain

Successful Supply Chain Collaboration

- Try to collaborate internally before you try external collaboration
- Help your partners to work with you
- Share the savings
- Start small (A limited number of selected partners) and stay focused on what you want to achieve in the collaboration
- Advance your IT capabilities only to the level that you expect your partners to manage
- Put a comprehensive metrics program in place that allows you to monitor your partners' performance
- Make sure people are kept part of the equation
  - Systems do not replace people
  - Make sure your organization is populated with competent professionals who've done this before