Operations as a Competitive Weapon

Year	Expected Demand	Cash Flow
0	80,000	($150,000)
1	90,000	$90,000
2	100,000	$150,000
3	110,000	$210,000
4	120,000	$270,000
5	130,000	$300,000

How Operations As a Competitive Weapon *fits the Operations Management Philosophy*

USING OPERATIONS TO COMPETE

Operations As a Competitive Weapon
Operations Strategy
Project Management

MANAGING PROCESSES

Process Strategy
Process Analysis
Process Performance and Quality
Constraint Management
Process Layout
Lean Systems

MANAGING VALUE CHAINS

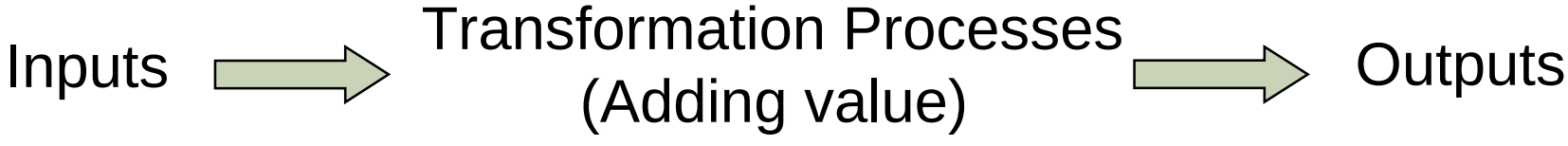
Supply Chain Strategy
Location
Inventory Management
Forecasting
Sales and Operations Planning
Resource Planning
Scheduling

FedEx

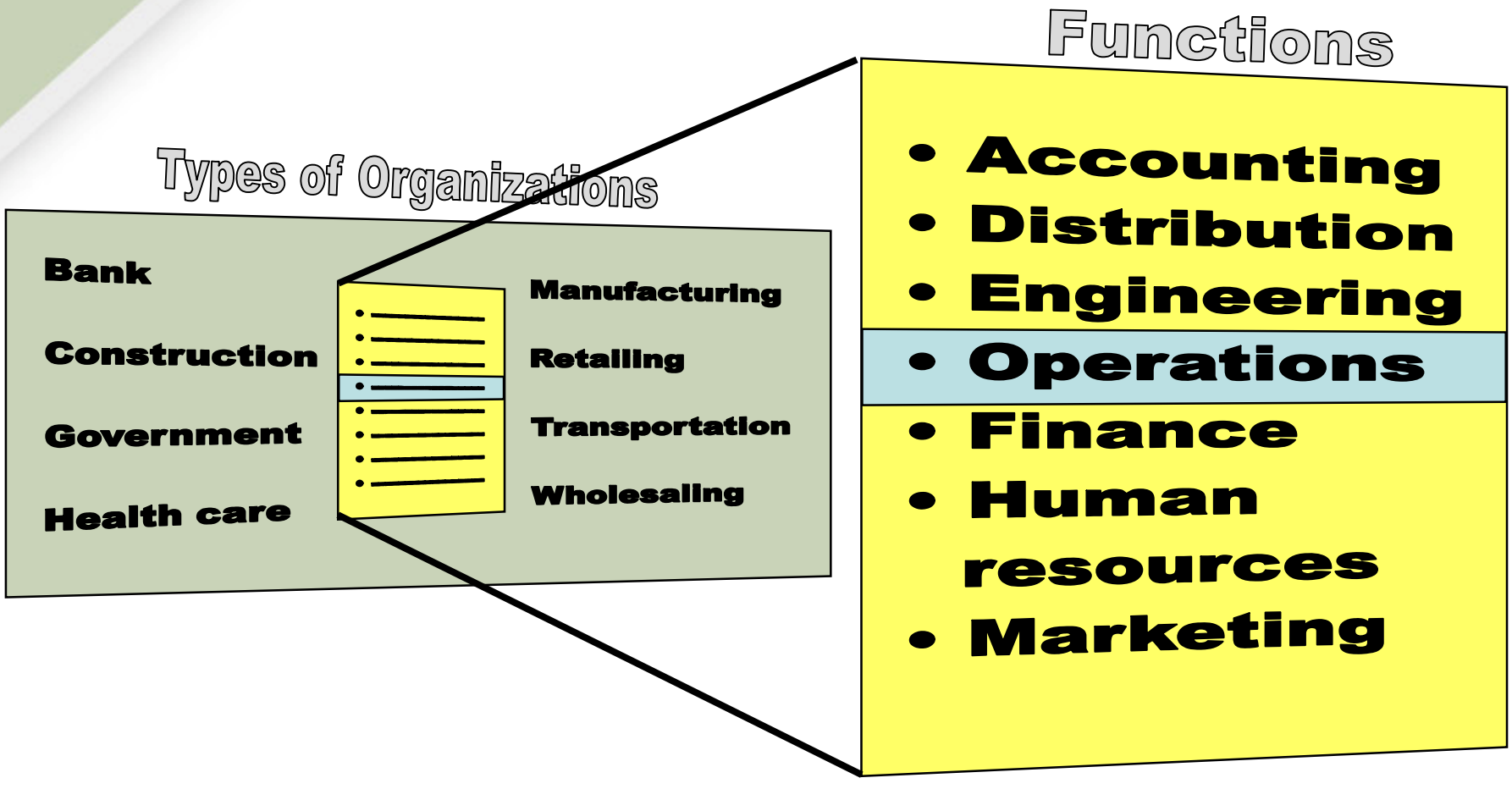
- Why are they successful?
  - Fast
  - On-time deliveries
  - Relatively low cost
  - Technology in shipment tracking

Operations Management is …

"The systematic design, direction and control of processes that transform inputs into services and products for internal, as well as external, customers."



Operations Management as a Function



Processes

- Processes should add value.
- Processes can be broken down into sub-processes, which in turn can be broken down further.
- Any process that is part of a larger process is considered a "nested process."
- Each process and each nested process has inputs and outputs.

Nested Processes

Advertisement Design and Planning Process

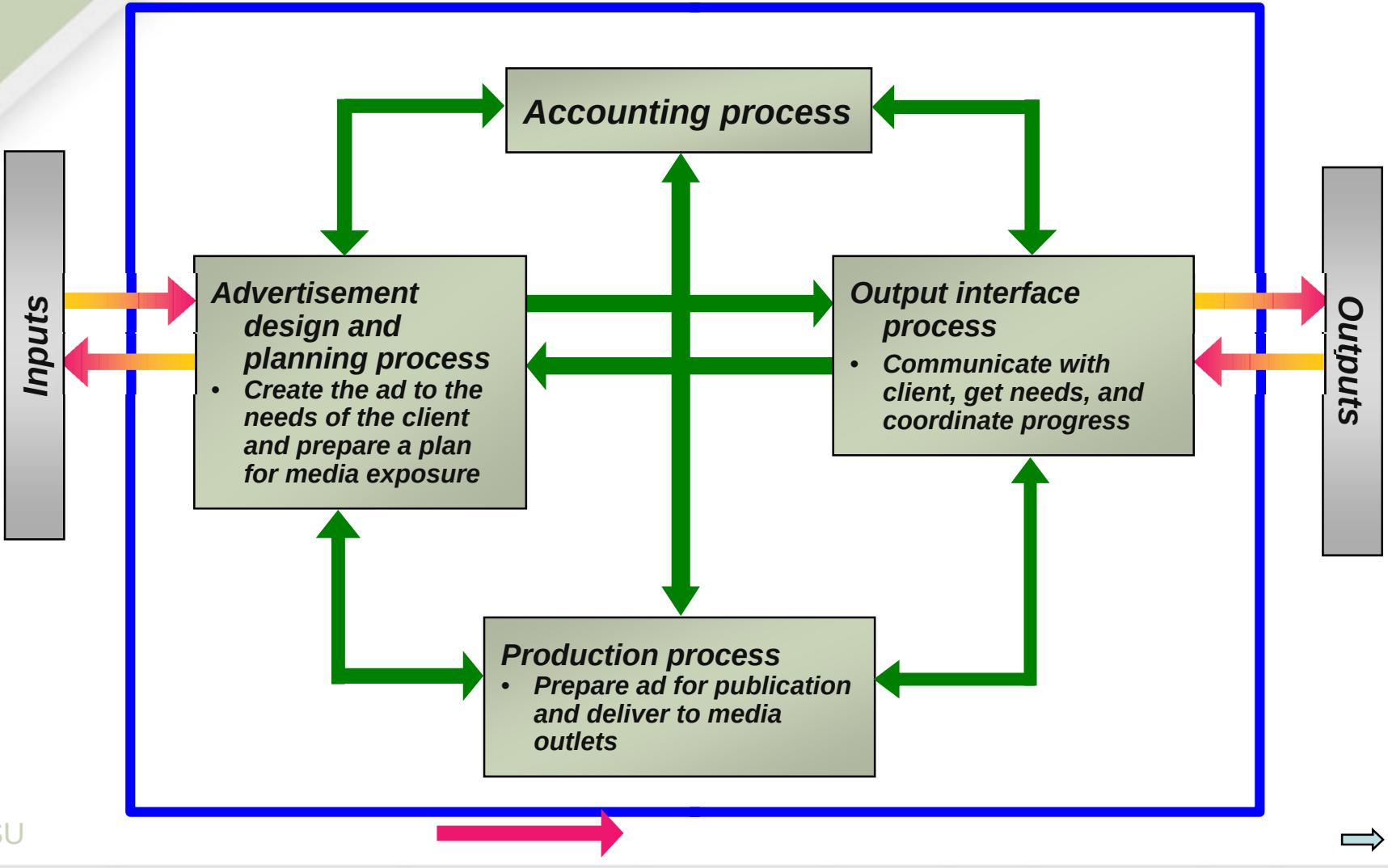
Creative design process

- Receive work request
- Assemble team
- Prepare several designs
- Receive inputs from Account Executive
- Prepare final concept
- Revise concept per client's inputs

Media planning process

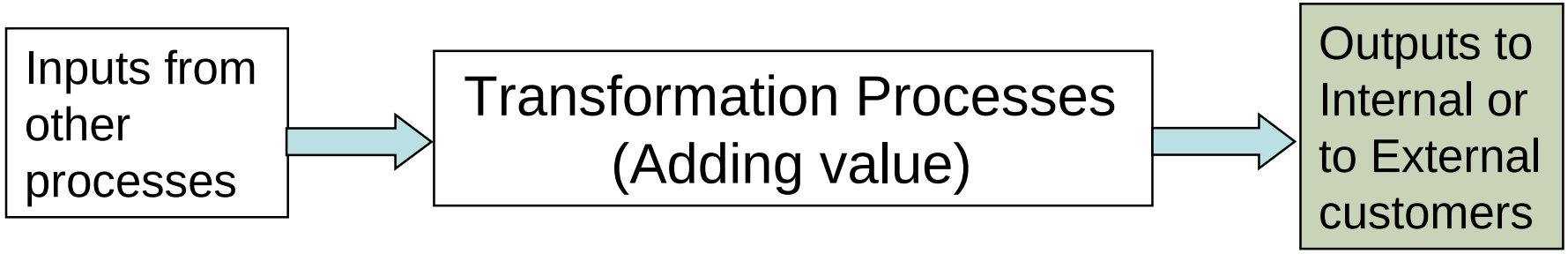
- Receive work request
- Prepare several media plans
- Receive inputs from Account Executive
- Prepare final plan
- Revise plan per client's inputs

Process View of an Ad Agency



External vs. Internal Customers

- External Customers are those who purchase the goods and services.
- Internal Customers are those who receive the output of others within the firm. They are part of the transformation process.



Service Processes and Manufacturing Processes

Manufacturing processes change materials in one or more of the following dimensions:

- Physical properties
- Shape
- Fixed dimensions
- Surface finish
- Joining parts and materials

If a process isn't doing at least one of these, then it is a **service** (non-manufacturing) **process**.

Manufacturing and Service

Goods Production

- Tangible
- Can be inventoried
- Low customer contact
- Capital Intensive
- Quality easily measured

Service Production

- Intangible
- Can't be inventoried
- High customer contact
- Labor Intensive
- Quality hard to measure

Most firms provide both goods and services.

Value Chains

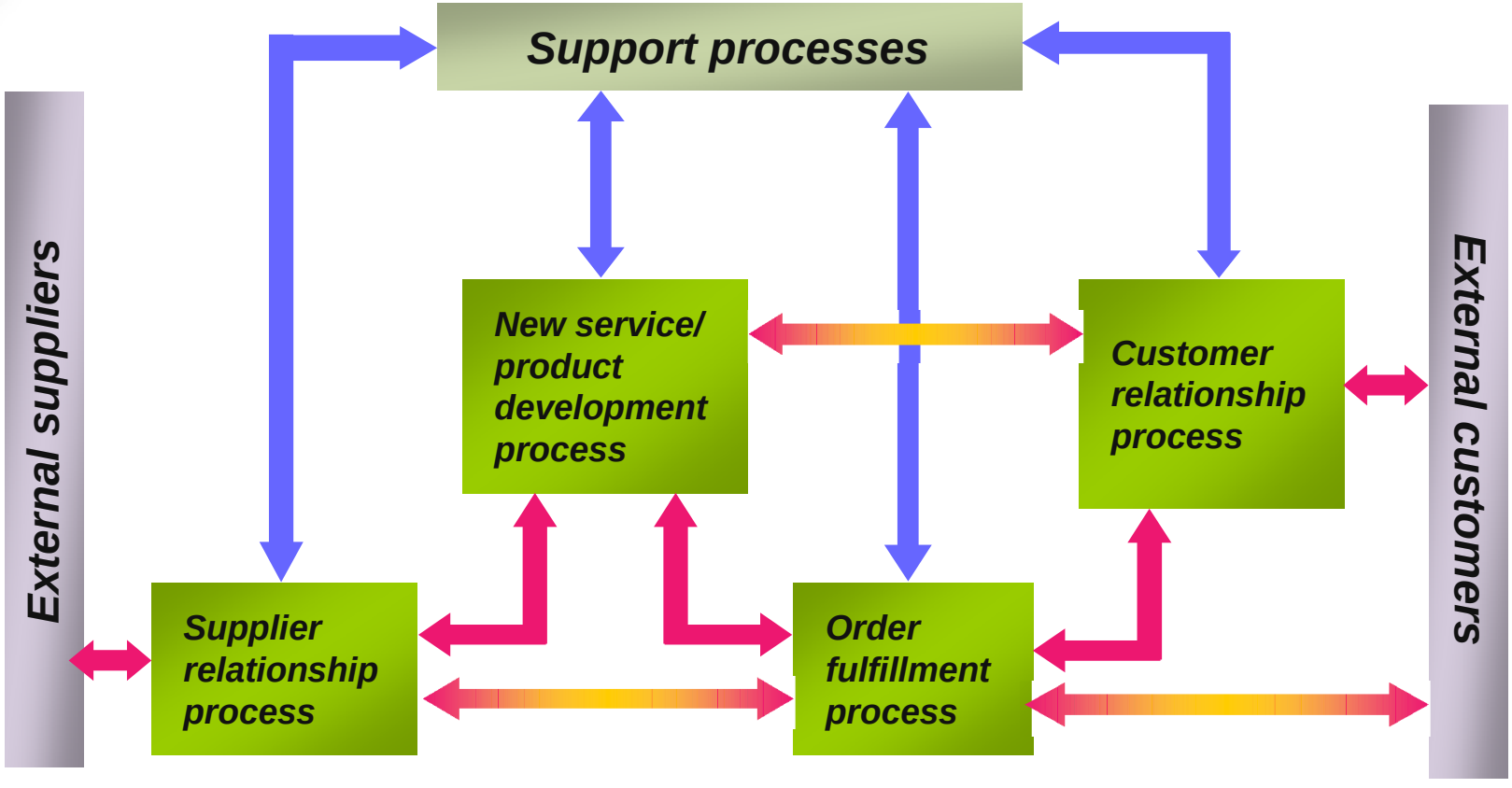
- **Value chains** are an interrelated series of processes that produce a service or product to the satisfaction of customers.
  - Value chains may have core processes or support processes.
- **Core processes** deliver value to external customers.
- **Support processes** provide vital inputs for the core processes.

Core Processes

1. **Customer relationship processes**
   - Identify, attract, and build relationships with external customers and facilitate the placement of orders.
2. **New service/product development processes**
   - Design and develop new services or products from inputs received from external customer specifications.
3. **Order fulfillment processes**
   - The activities required to produce and deliver the service or product to the external customers.
4. **Supplier relationship processes**
   - Select suppliers of services, materials and information and facilitate the timely and efficient flow of these items into the firm.

Support Processes
Internal Value-Chain Linkages

- Firms have many processes that support the core processes.



Progressive Insurance

- Grew from $1.3 billion to $11 in 13 years.
- How did they do it?
- **Operational Innovation** (Designing new processes)
  - Immediate Response Claims Handling (24 hours a day).
  - Streamlined claims processing, from 7-10 days to 9 hours.
  - Web site for agents only.
  - Web site for customer information, inquiries and routine processing.
  - Agents quickly go to scene of accident.

Operations as a Set of Decisions

Basic Decision-making Steps

(1) Recognize and clearly define the problem.

(2) Collect the information needed to analyze possible alternatives.

(3) Choose the most attractive alternative.

(4) Implement the chosen alternative.

Operations as a Set of Decisions

Strategic Decisions

- Development of new capabilities
- Maintenance of existing capabilities
- Design of new processes
- Development and organization of value chains
- Key performance measures

Tactical Decisions

- Process improvement and performance measures
- Management and planning of projects
- Generation of production and staffing plans
- Inventory management
- Resource scheduling

Productivity

- Productivity is the value of outputs (services and products) produced, divided by the value of input resources(wages, costs of equipment, etc.)

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

Productivity Calculation
Example 1.1

1. Single factor

Three employees process 600 insurance policies in a week. They work 8 hours per day, 5 days per week. Calculate the productivity in policies per hour.

$$\text{Labor productivity} = \frac{\text{Policies Processed}}{\text{Employee Hours}}$$

$$= \frac{600 \text{ Policies}}{(3 \text{ Employees})\ (40 \text{ hours/employee})} = 5 \text{ policies/hr}$$

Productivity Calculation

Example 1.1 continued

2. Multifactor

A team of workers makes 400 units of a product, valued by its standard cost of $10 each (before markups for other expenses and profit). The accounting department reports that the actual costs are $400 for labor, $1,000 for materials, and $300 for overhead. Calculate the productivity.

$$\text{Multifactor productivity} = \frac{\text{Quality at standard cost}}{\text{Labor cost + Materials Cost + Overhead cost}}$$

$$= \frac{(400 \text{ units})\ (\$10/\text{unit})}{\$400 + \$1000 + \$300} = \frac{\$4{,}000}{1{,}700} = 2.35$$

➢ These figures must be compared with performance levels in prior periods and with future goals.

Application

	This Yr.	Last Yr.	Year Before Last
Factory unit sales ($)	2,762,103	2,475,738	2,175,447
Employment (hrs)	112,000	113,000	115,000
Sales of manufactured products ($)	$49,363	$40,831	—
Total manufacturing cost of sales ($)	$39,000	$33,000	—

Calculate the year-to-date labor productivity:

	This Yr.	Last Yr.	Year Before Last
$\frac{factory\ unit\ sales}{employment}$	$\frac{2,762,103}{112,000} = \$24.66/hr$	$\frac{2,475,738}{113,000} = \$21.91/hr$	$\frac{2,175,447}{115,000} = \$18.91/hr$

Calculate the multifactor productivity:

	This Yr.	Last Yr.
$\frac{sales\ of\ mfg\ products}{total\ mfg\ cost}$	$\frac{\$49,363}{\$39,000} = 1.27$	$\frac{\$40,831}{\$33,000} = 1.24$

Global Competition

- Businesses accept the fact that, to prosper, they must view customers, suppliers, facility locations, and competitors in global terms.
- Most products today are composites of materials and services from all over the world.
- Forces that created increased global competition:
  - Improved Transportation and Information Technologies
  - Loosened regulations on Financial Institutions
  - Increased Demand for Imported Services and Goods
  - Reduced Import Quotas and other Trade Barriers
  - Comparative Cost Advantages

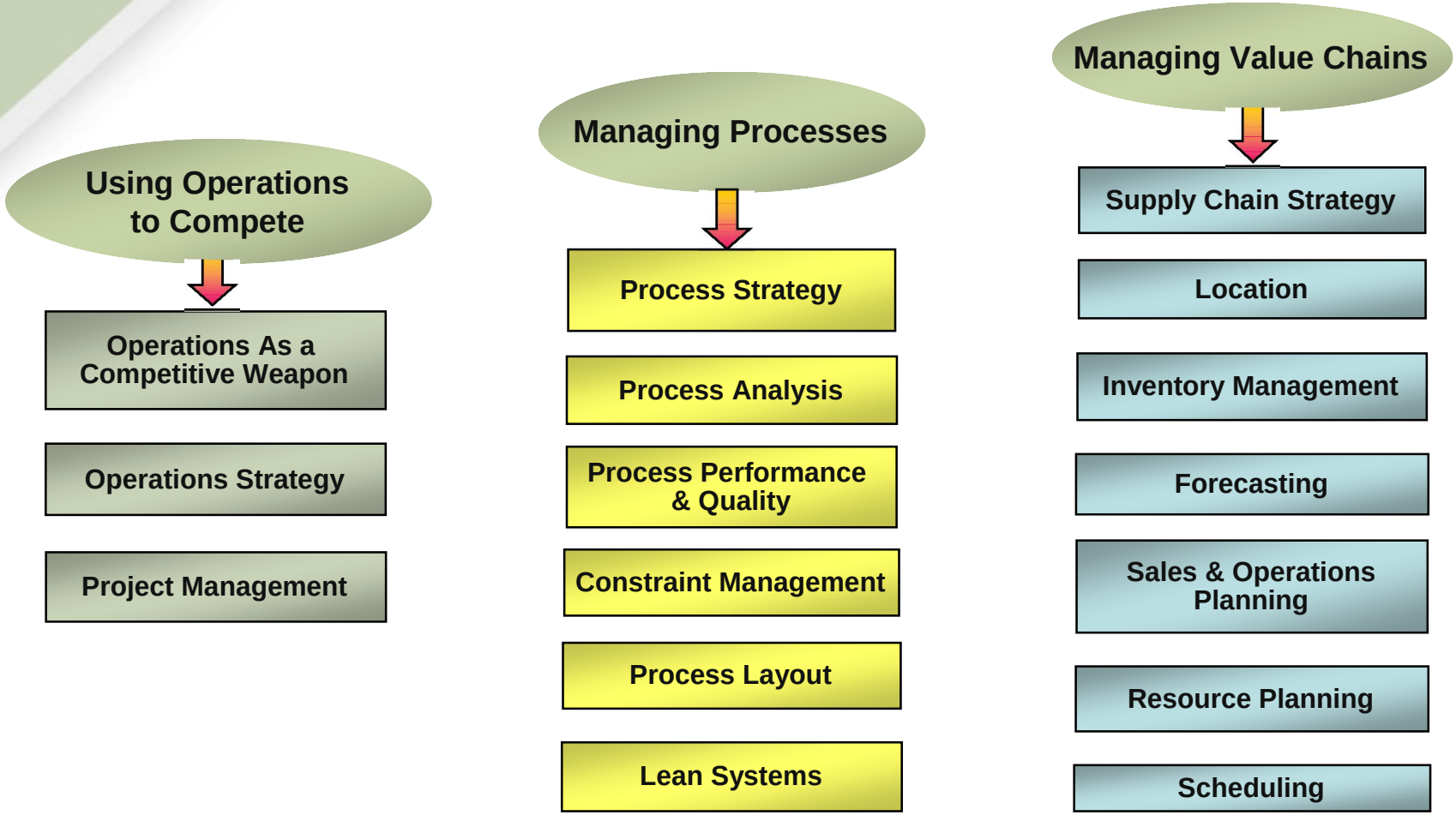
Global Competition Disadvantages

- May have to relinquish proprietary technology.
- Political risks.
- Alienate U.S. customers by sending jobs overseas.
- Lower skill levels in some areas.
- Difficulty with cross-functional coordination.
- Harder to produce products and services that can compete.

Other Challenges in Operations Management

- Rapid technological change
- Ethical issues across cultures
- Increasing diversity of the workforce
- Environmental impact issues

Addressing the Challenges in Operations Management



Solved Problem 1

a. Multifactor productivity is the ratio of the value of output to the value of input resources

$$\text{Value of output} = \left(\frac{50 \text{ students}}{\text{class}}\right)\left(\frac{3 \text{ credit hours}}{\text{student}}\right)\left(\frac{\$100 \text{ tuition} + \$100 \text{ state support}}{\text{credit hour}}\right)$$

$$= \$30{,}000/\text{class}$$

$$\text{Value of inputs} = \text{Labor} + \text{Materials} + \text{Overhead}$$

$$= \$4{,}000 + (\$20/\text{student} \times 50 \text{ students/class}) + \$25{,}000$$

$$= \$30{,}000/\text{class}$$

$$\text{Multifactor productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$30{,}000/\text{class}}{\$30{,}000/\text{class}} = 1.00$$

Solved Problem 1

b. Labor productivity is the ratio of the value of output to labor hours:

$$\text{Labor hours of input} = \left(\frac{14 \text{ hours}}{\text{week}}\right)\left(\frac{16 \text{ weeks}}{\text{class}}\right) = 224 \text{ hours/class}$$

$$\text{Labor productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$30{,}000/\text{class}}{224 \text{ hours/class}}$$

$$= \$133.93/\text{hour}$$

Solved Problem 2

$$\text{Value of output} = (52 \text{ defective} \times \$90/\text{defective}) + (80 \text{ garments} \times \$200/\text{garment})$$
$$= \$20{,}680$$
$$\text{Labor hours of input} = 360 \text{ hours}$$
$$\text{Labor productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$20{,}680}{360 \text{ hours}}$$
$$= \$57.44 \text{ in sales per hour}$$