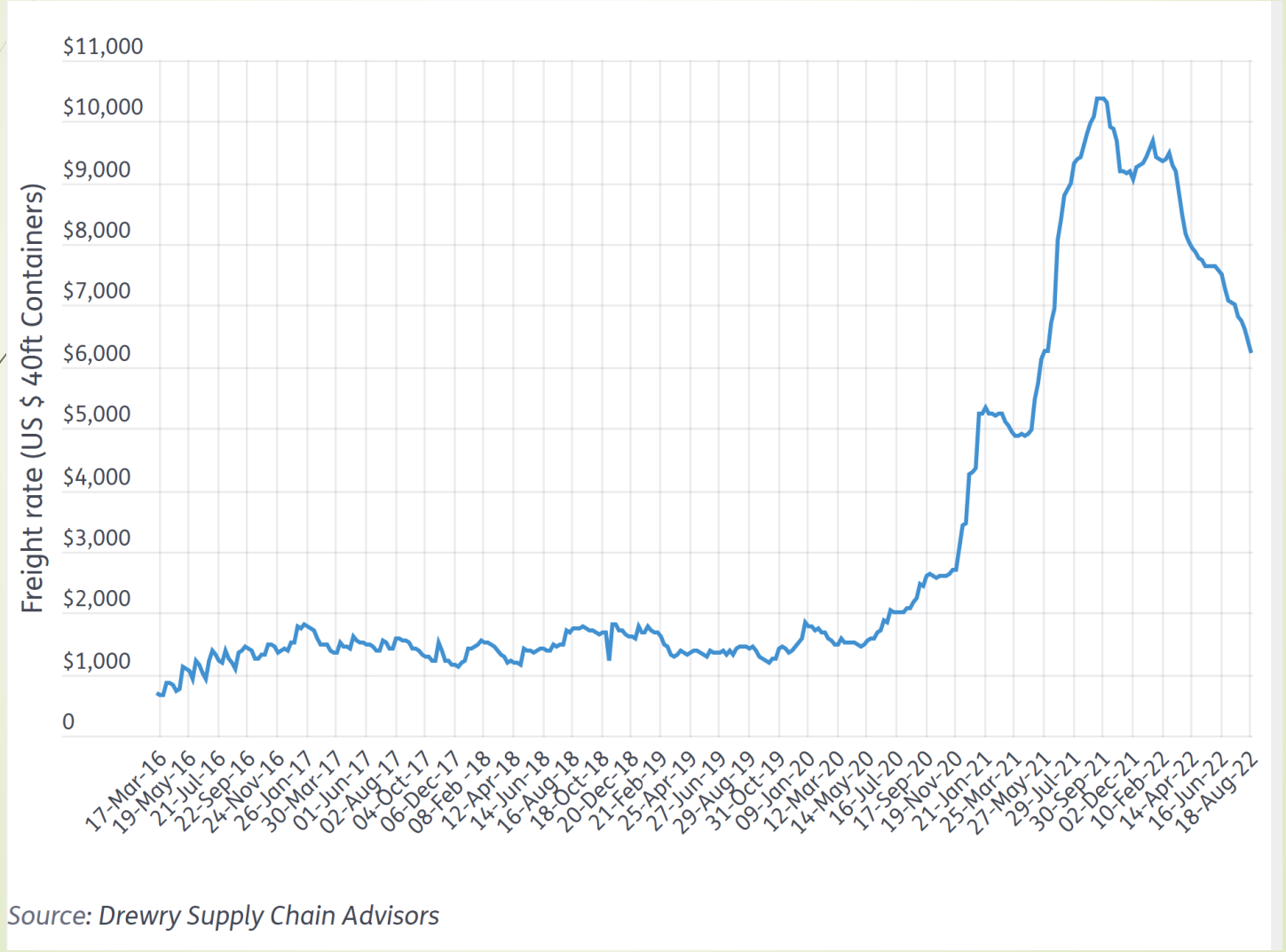
GLOBAL LOGISTICS

Frédéric Gauthier

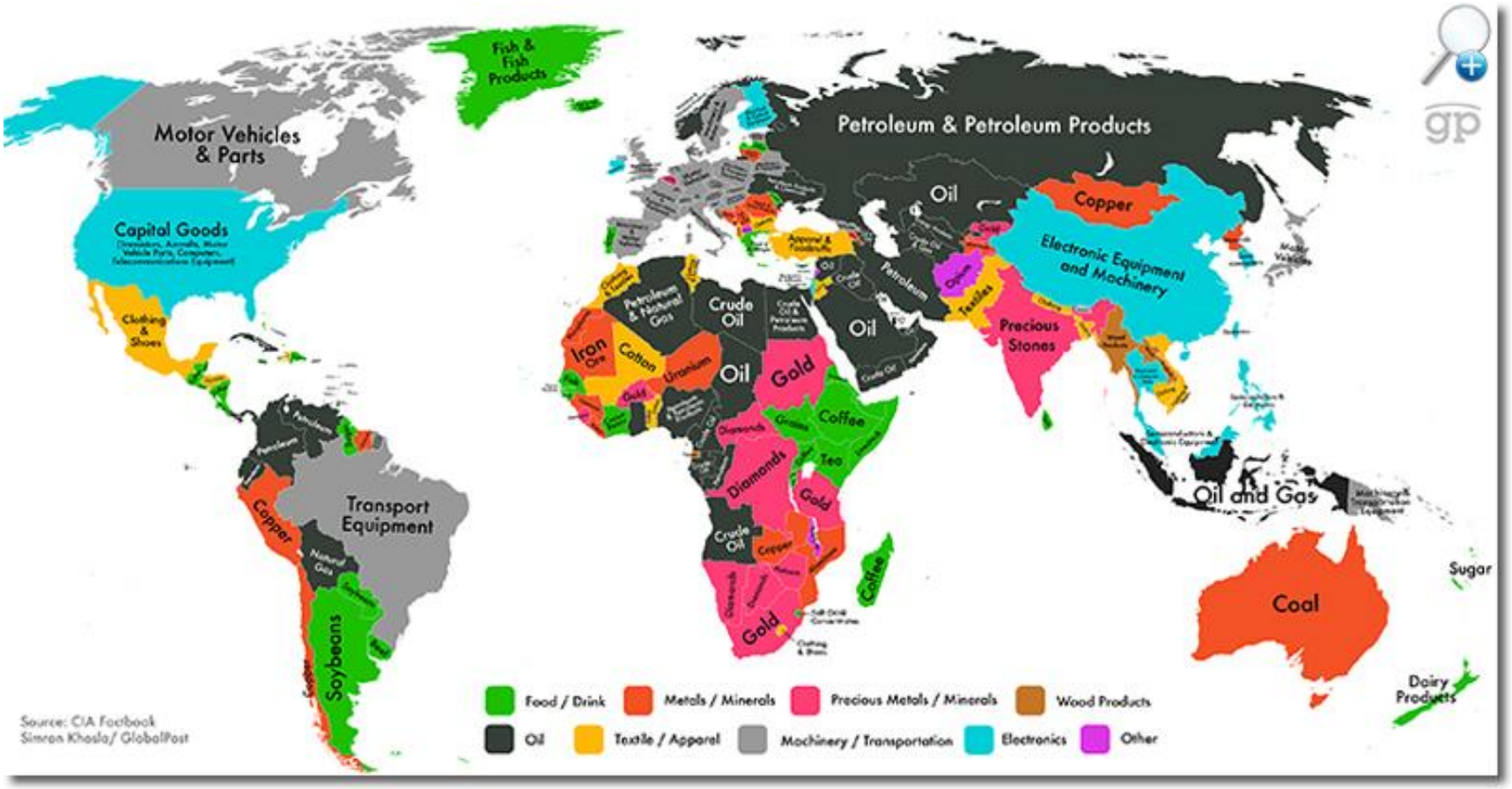
PART 1 – INTERNATIONAL LOGISTICS SCOPE

- For ages
  - Physical flows
  - From order information and financial flows
- Within the company
- Supply chain
- Worldwide

Sea freight rates evolution

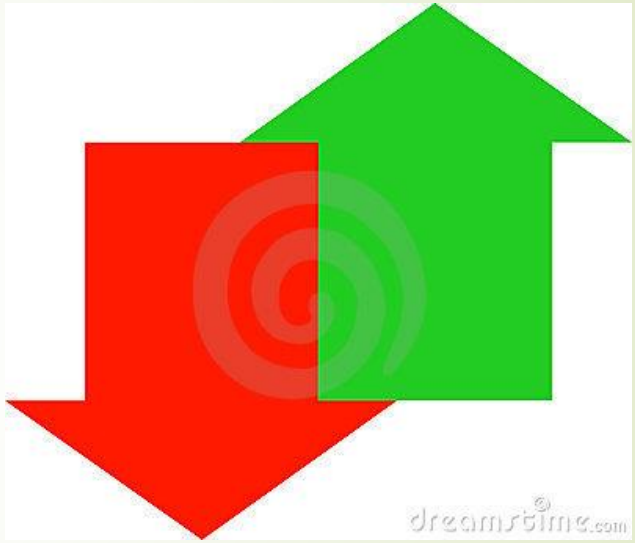


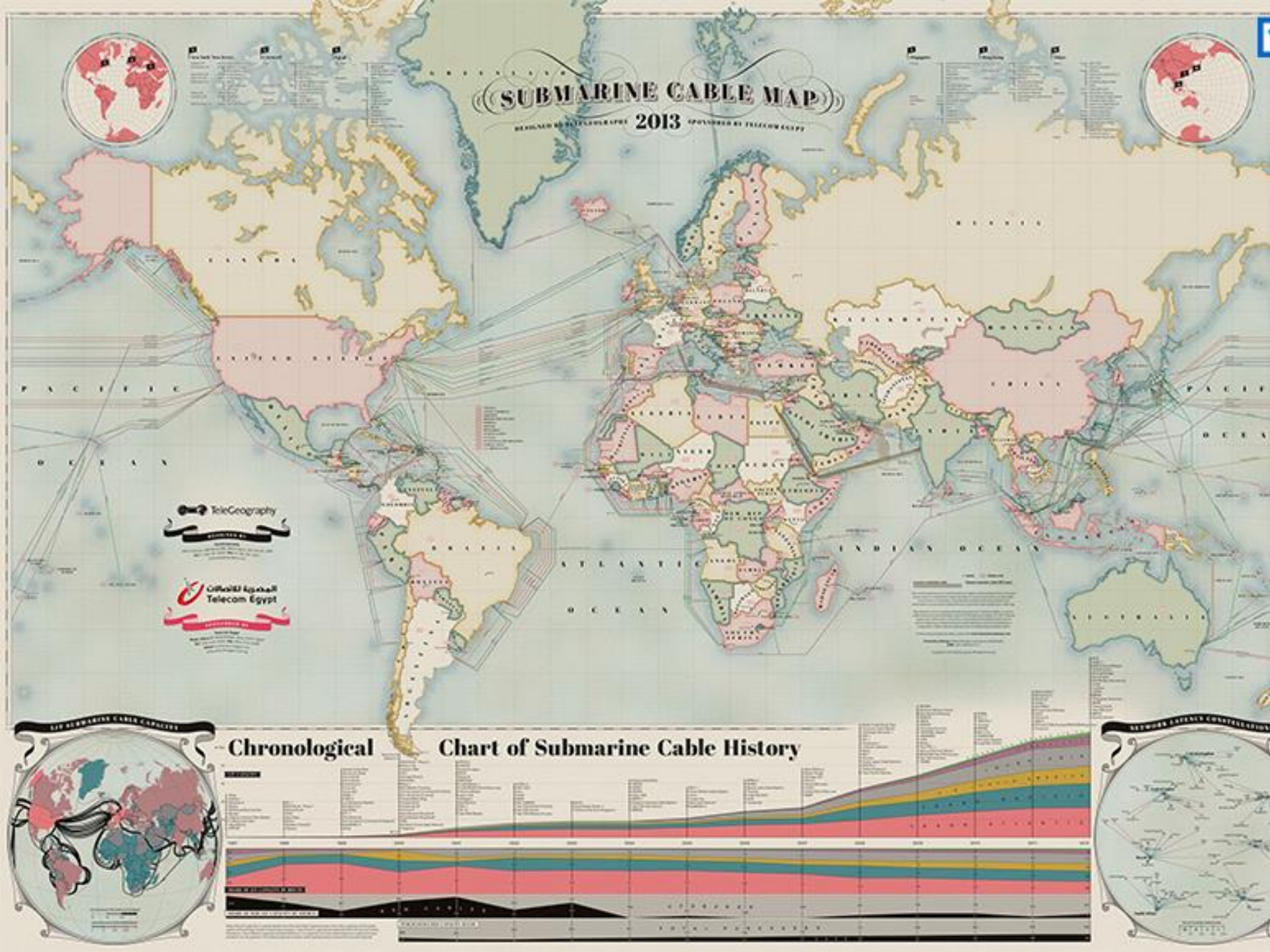
Source: Drewry Supply Chain Advisors


Fish & Fish Products
Motor Vehicles & Parts
Capital Goods
Clothing & Shoes
Petroleum & Petroleum Products
Oil
Copper
Electronic Equipment and Machinery
Precious Stones
Textiles
Petroleum & Natural Gas
Crude Oil
Iron Ore
Cotton
Uranium
Gold
Coffee
Tea
Diamonds
Oil and Gas
Transport Equipment
Natural Gas
Soybeans
Coal
Sugar
Dairy Products
Source: CIA Factbook
Simran Khosla/ GlobalPost
Food / Drink
Metals / Minerals
Precious Metals / Minerals
Wood Products
Oil
Textile / Apparel
Machinery / Transportation
Electronics
Other

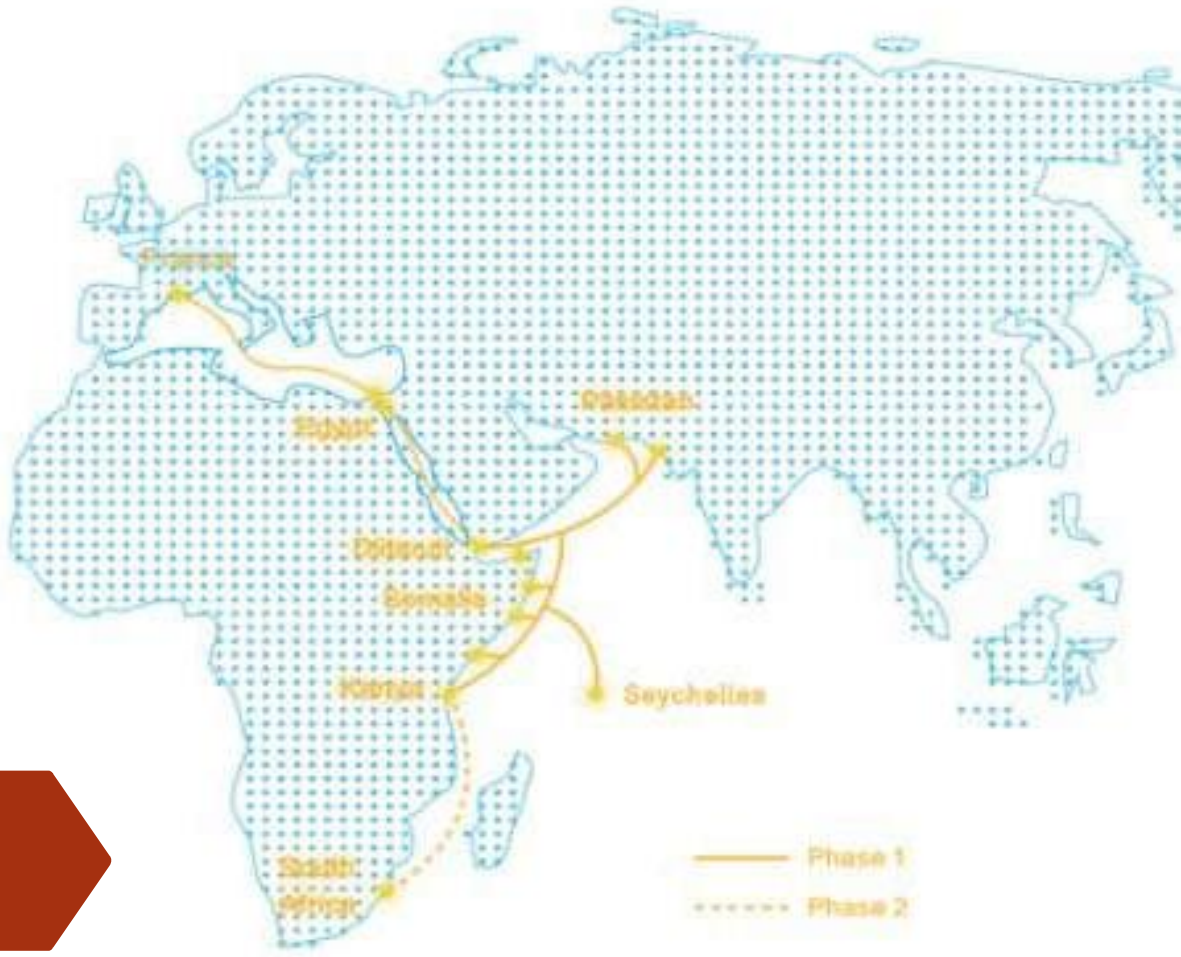
PART 1 – INTERNATIONAL LOGISTICS SCOPE

- **Economy, demand and fluctuation**
  - Depending on products
  - Population : age and culture
  - Freer trade or … not
- **Competition throughout the world**
- The right …. what ????
  - Quantity, time, place, quality…
- Market location is changing
- **Transportation and worldwide communication make it possible**
  - Sea way cheapest cost
  - Communication cost
  - And poles ….




SUBMARINE CABLE MAP
2013
TeleGeography
Telecom Egypt
Chronological Chart of Submarine Cable History

12,000 kms long



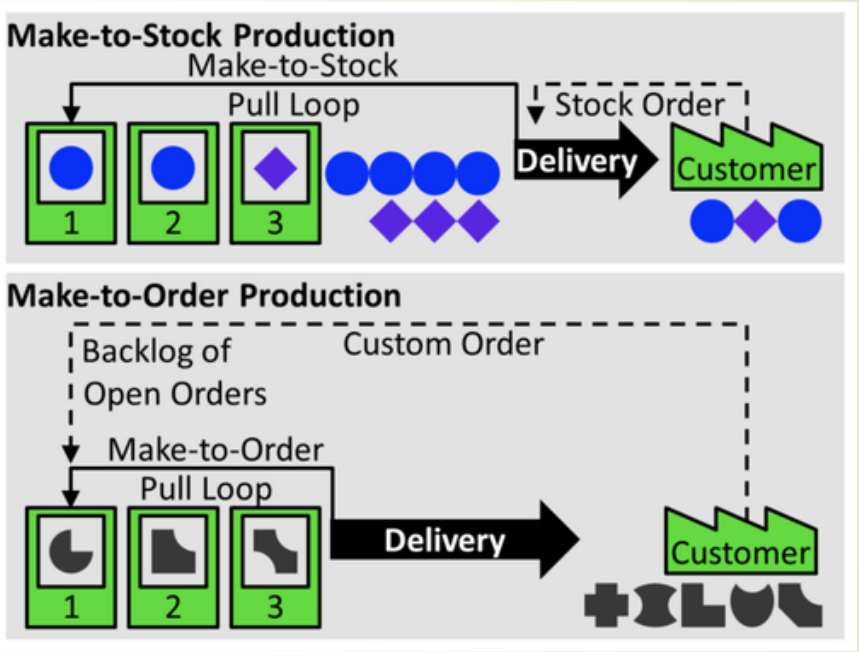
PART 1 – INTERNATIONAL LOGISTICS SCOPE

- **Customers, what they expect**
  - A fair price
  - Quality looking for exceeding customer expectations
  - Delivery lead time
  - Better pre sale after sale service
  - flexibility
- **Order qualifiers**
  - You need them
- and **order winners**
  - You select them
  - Depending on
    - Life cycle
    - country


in Apple iPhone
kaiphilipsen Oct 15, 2014
Canada
United States
Warhouse HQ
HQ
Mexico
SE
NO
Russia
UK
PL
UA
KZ
MN
FR
IT
ES
UZ
IR
DZ
LY
EG
SA
PK
India
ML
SD
NG
ET
KE
HUB middenoosten lucht
VE
CO
PE
Brazil
BO
Indonesia
Herkomst grondst
Antwerpen o.a behuizing
Mainport & assamblage

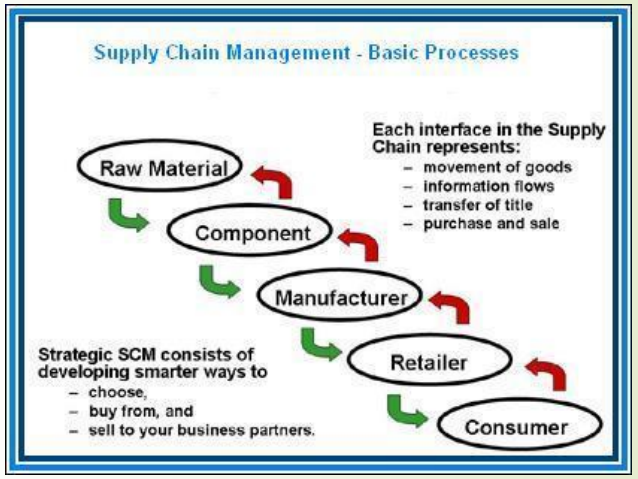
PART I

- **Manufacturing strategy**
  - Delivery lead time
  - Engineer to order
    - At the product design stage
  - Make to order
    - Raw material is available
  - Assemble to order
    - Parts are available
  - Make to stock
    - From finished goods inventory



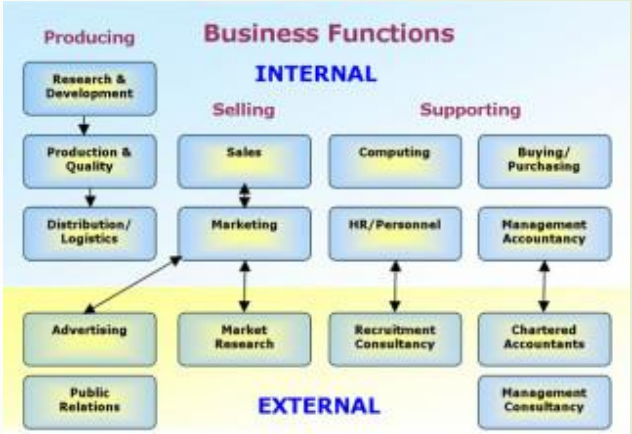
PART I

- **The supply chain concept**
  - Raw materials, manufacturing, finished goods
  - Several companies within the supply / demand relationship
  - Several suppliers as well as several customers
  - A number of intermediaries
- **From the past to today**
  - Internal management
  - Suppliers as business adversaries
  - The supplier partnership within the Just in Time management
    - Mutual analysis for cost reduction
    - Mutual product design
    - The speed of accurate information flow



PART I

- **Conflicts in traditional systems**
  - Before separate functions
    - Best customer service
    - Lowest production cost
    - Lowest inventory investment
    - Lowest distribution costs
  - To
    - Marketing
    - Finance
    - Production…
    - Against Finance
  - **Driven to conflicts**
    - Connections with goals
    - To balance conflicting objectives



Sum up …

WHAT ARE THE LOGISTICS FLOWS

WHAT IS LOGISTICS MAIN GOAL

WHAT IS THE MAIN PROBLEM LOGISTICS HAS TO SOLVE

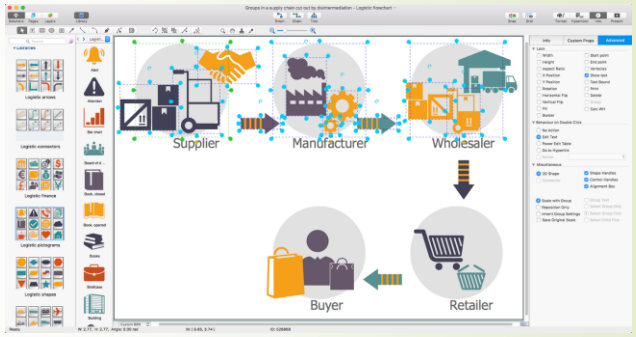
- **Supply chain metrics**
  - A performance measure qualitative or quantitative,
    - Control by superior
    - Reporting of data
    - Communication
    - Learning to …
      - Improve
- **Today major challenges**
  - Customers are never satisfied
  - A supply chain might be easily large
  - A vast amount of data
  - Product life cycle is shorter and shorter
  - Profit margin are more squeezed
  - By the way an increasing number of alternatives

Supply chain KPIs examples

- Compliance Rate: *Understand if suppliers fulfill your requirements*
- Number of Suppliers: *Track your level of dependency towards your suppliers*
- Purchase Order Cycle Time: *Know who to address your urgent orders to*
- Supplier Quality Rating: *Analyze the quality of your suppliers*
- Supplier Availability: *Measure suppliers' capacity to respond to demand*
- Supplier Defect Rate: *Evaluate your suppliers' individual quality*
- Vendor Rejection Rate & Costs: *Examine your quality management strategies*
- Lead Time: *Understand the total time to fulfill an order*
- Emergency Purchase Ratio: *Track the number of your emergency purchases*
- Purchases In Time & Budget: *Monitor purchasing time & budget*
- Cost of Purchase Order: *Control the internal costs incurred by each purchase*
- Procurement Cost Reduction: *Streamline the tangible costs savings*
- Procurement Cost Avoidance: *Avoid potential extra costs in the future*
- Spend Under Management: *Track and optimize your expenditures*
- Procurement ROI: *Determine the profitability of investments*

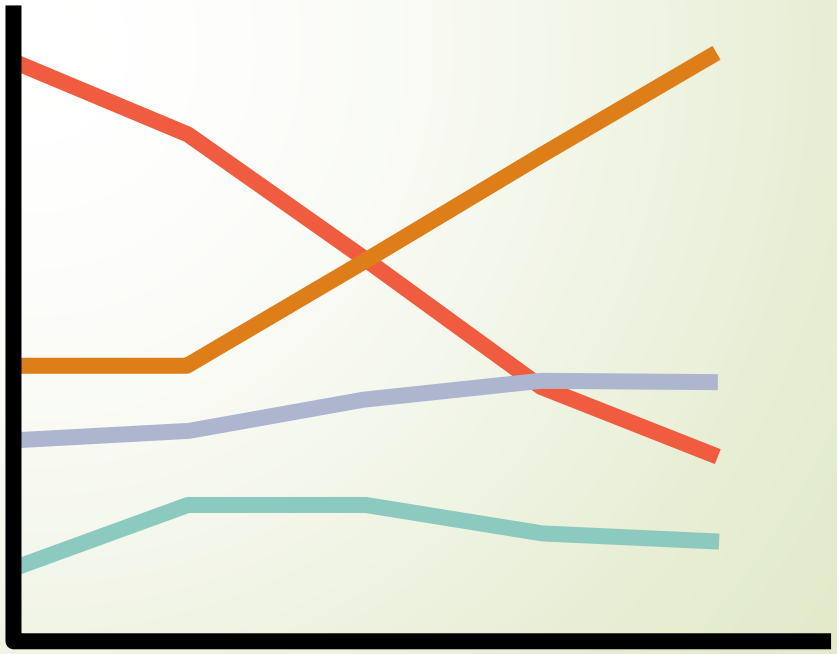
Datapine source

- ***Designing* the flow management**
  - **Product design**
    - Use, maintenance, analysis, plan, packaging
  - **Setting the objectives**
    - Assessment of service level, logistics categories
  - **Designing the information system**
    - Databases, software choice, telecommunication, EDI, codification
  - **Design of physical system**
    - Network, inventory level, transport alternatives
  - **Designing the management system**
    - Forecast, ressource allocation, priority rules



- **Intensification of trade and new breakdown**
  - means concentration

Part II – Competing with Operations (materials management)



COMPETING WITH OPERATIONS Introduction

Operations management deals with processes

Creates departments connection with Operations

accounting, finance, human resources, management information system, marketing, operations…

Inputs, adding value, provide outputs

Cuts across boundaries

Process View of an Ad Agency

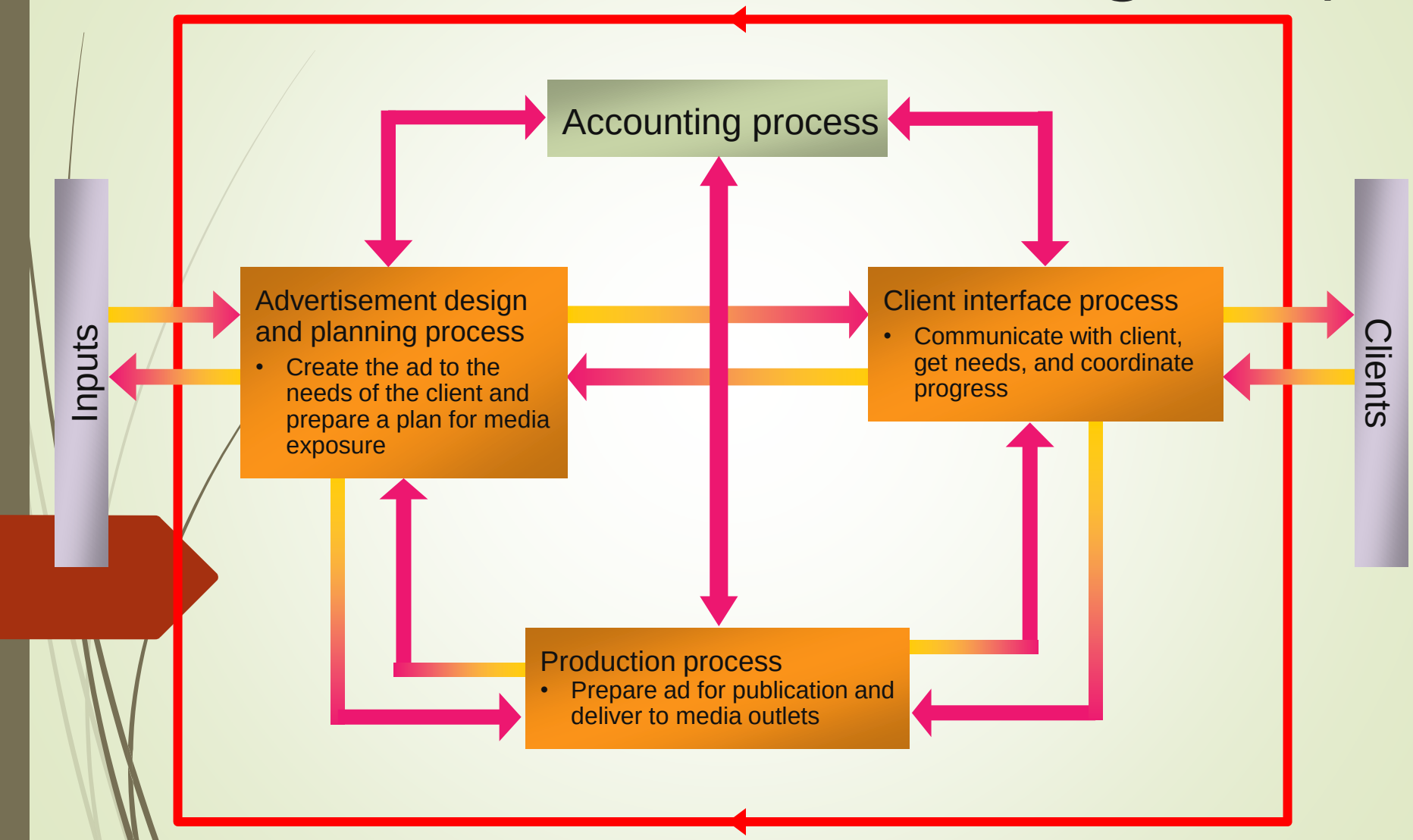


Figure 1

Nested Processes

Advertisement Design and Planning Process

Creative design process

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

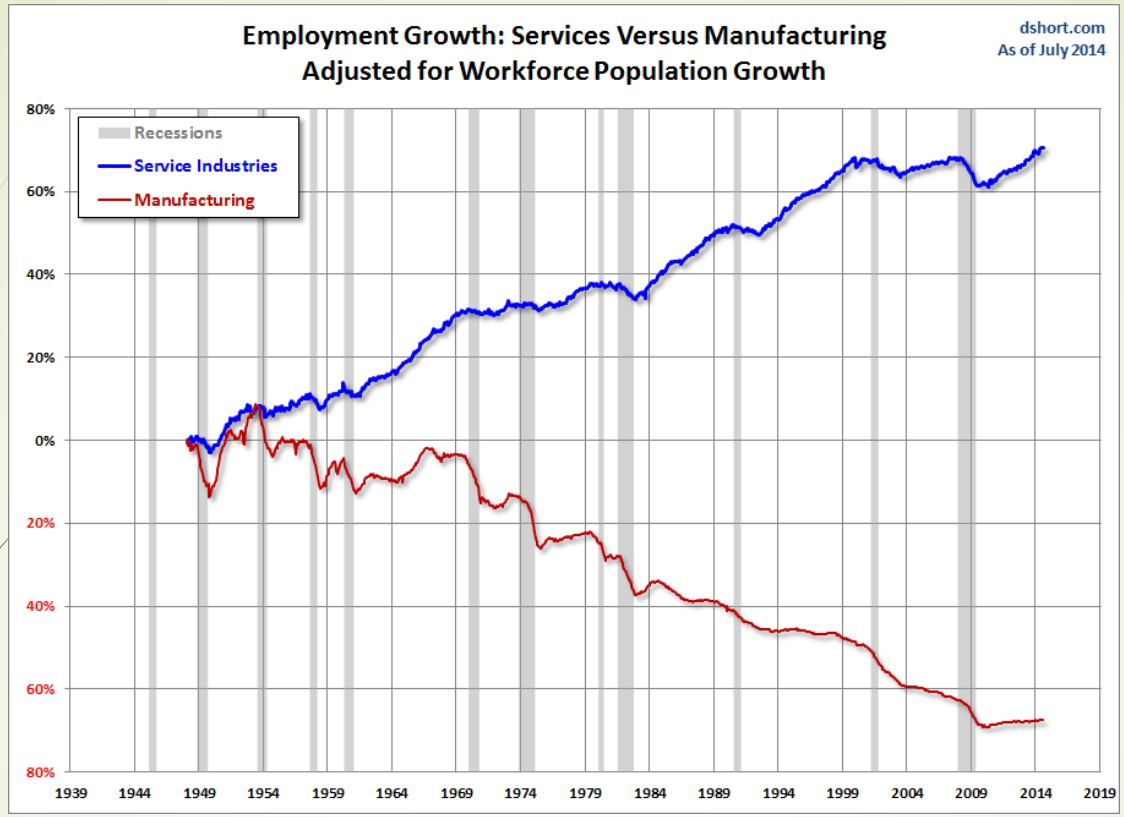
Media planning process

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

Figure 1.2

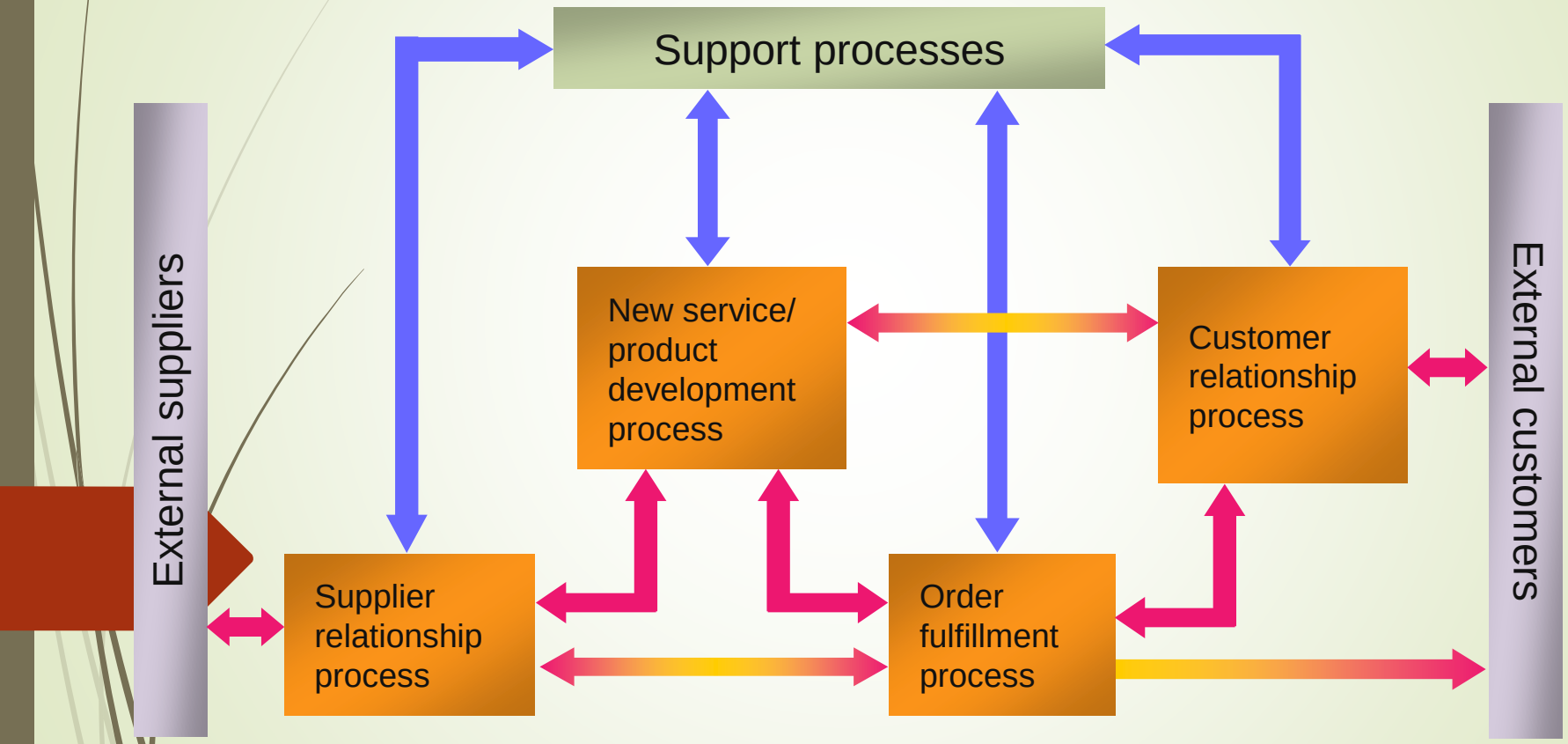
- Customer supplier relationships
  - End users and internal customers
  - External suppliers and internal suppliers
- Service and manufacturing processes
  - Services
    - Intangible perishable outputs
    - Finished goods inventory

Degree of customer contact
- High or low
- Management in service



Manufacturing and service comparison in the U.S.

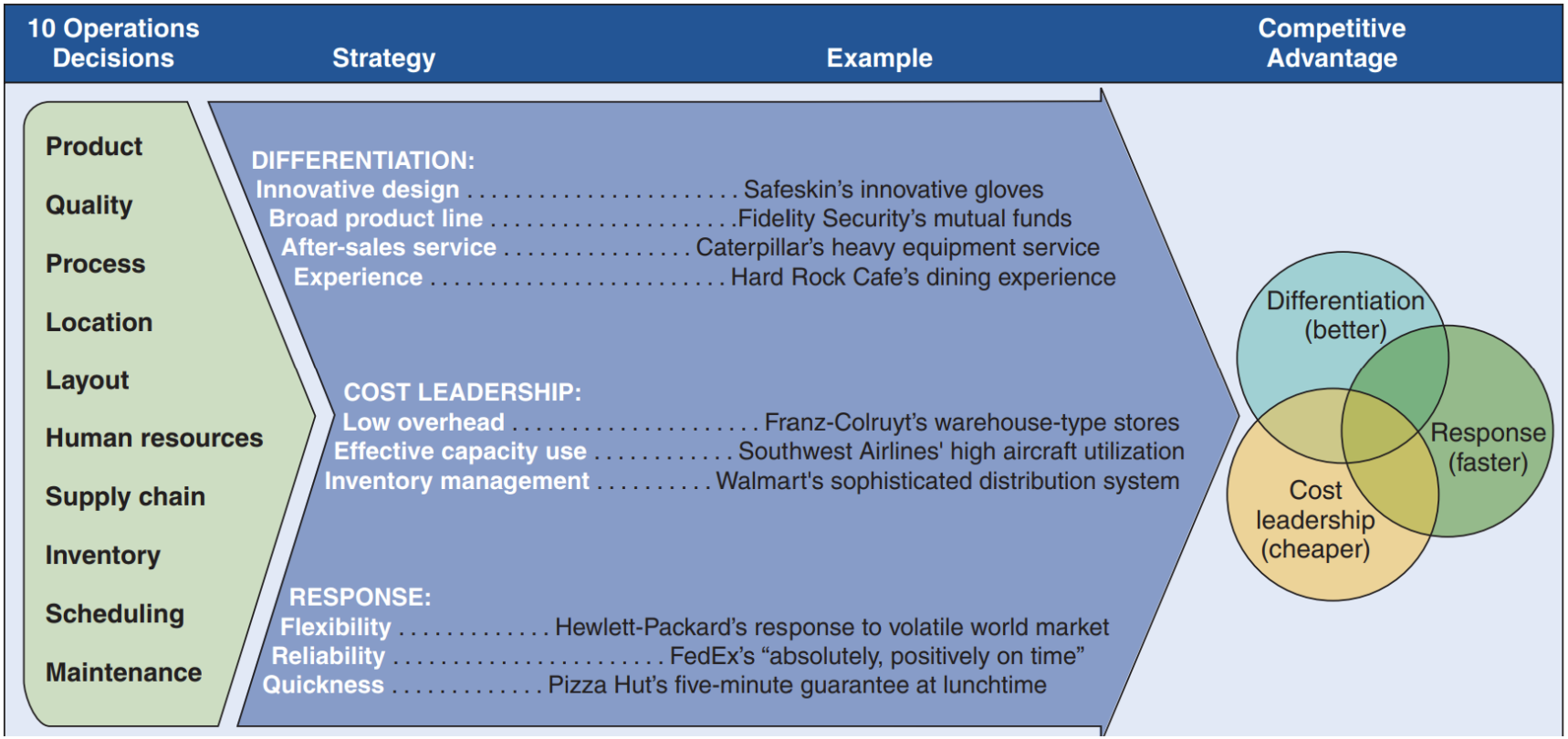
Internal Value-Chain Linkages Showing Work and Information Flows



- Added value : a core process
- A support process : provides vital resources

Support Processes

Table 1.1 Examples of Support Processes	
Capital Acquisition	*The provision of financial resources for the organization to do its work and to execute its strategy*
Budgeting	*The process of deciding how funds will be allocated over a period of time*
Recruitment and Hiring	*The acquisition of people to do the work of the organization*
Evaluation and Compensation	*The assessment and payment of the people for the work and value they provide to the company*
Human Resource Support and Development	*The preparation of the people for their current jobs and future skill and knowledge needs*
Regulatory Compliance	*The process that insure the company if meeting all laws and legal obligations*
Information Systems	*The movement and processing of data and information to expedite business operations and decisions*
Enterprise and Functional Management	*The systems and activities that provide strategic direction and ensure effective execution of the work of the business*



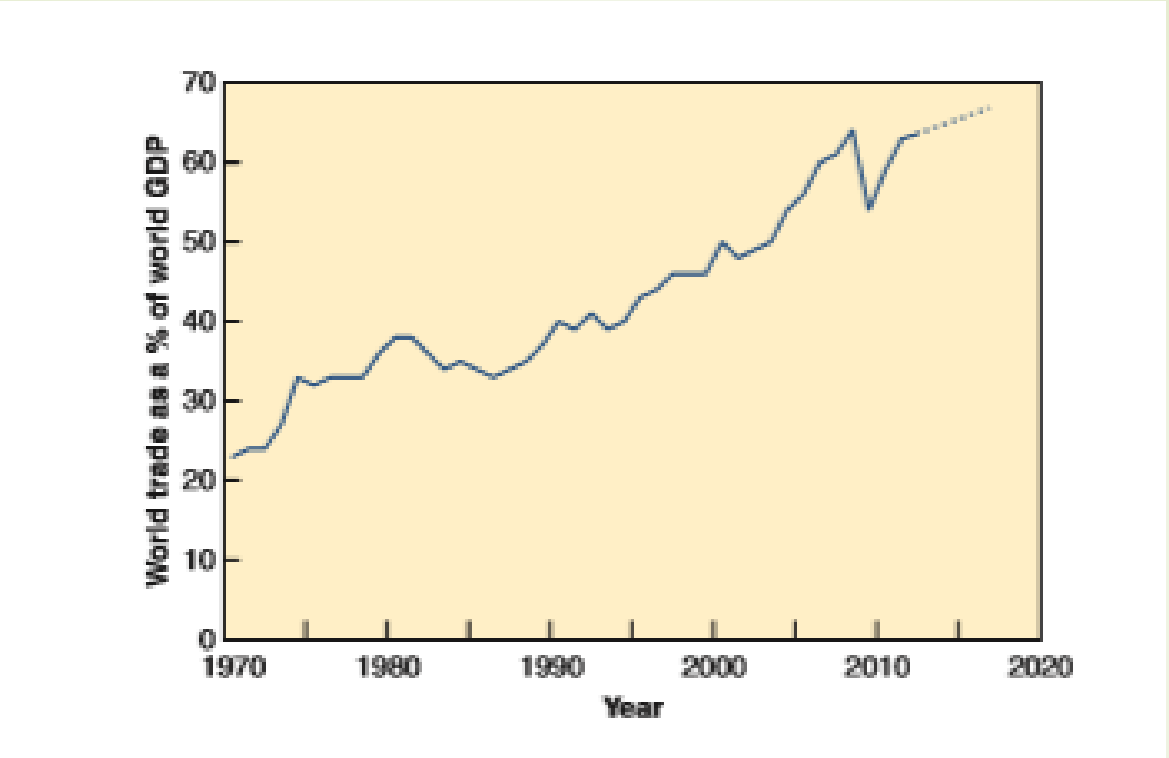
Operations Management book Pearson

- Operations Management book Pearson

Sample Company Mission
To manufacture and service an innovative, growing, and profitable worldwide microwave communications business that exceeds our customers' expectations.

Sample Operations Management Mission
To produce products consistent with the company's mission as the worldwide low-cost manufacturer.

Sample OM Department Missions	
Product design	To design and produce products and services with outstanding quality and inherent customer value.
Quality management	To attain the exceptional value that is consistent with our company mission and marketing objectives by close attention to design, supply chain, production, and field service opportunities.
Process design	To determine, design, and develop the production process and equipment that will be compatible with low-cost product, high quality, and a good quality of work life.
Location	To locate, design, and build efficient and economical facilities that will yield high value to the company, its employees, and the community.
Layout design	To achieve, through skill, imagination, and resourcefulness in layout and work methods, production effectiveness and efficiency while supporting a high quality of work life.
Human resources	To provide a good quality of work life, with well-designed, safe, rewarding jobs, stable employment, and equitable pay, in exchange for outstanding individual contribution from employees at all levels.
Supply-chain management	To collaborate with suppliers to develop innovative products from stable, effective, and efficient sources of supply.
Inventory	To achieve low investment in inventory consistent with high customer service levels and high facility utilization.
Scheduling	To achieve high levels of throughput and timely customer delivery through effective scheduling.
Maintenance	To achieve high utilization of facilities and equipment by effective preventive maintenance and prompt repair of facilities and equipment.



Growth of world trade, … after Covid 19 ?

Multi poles world

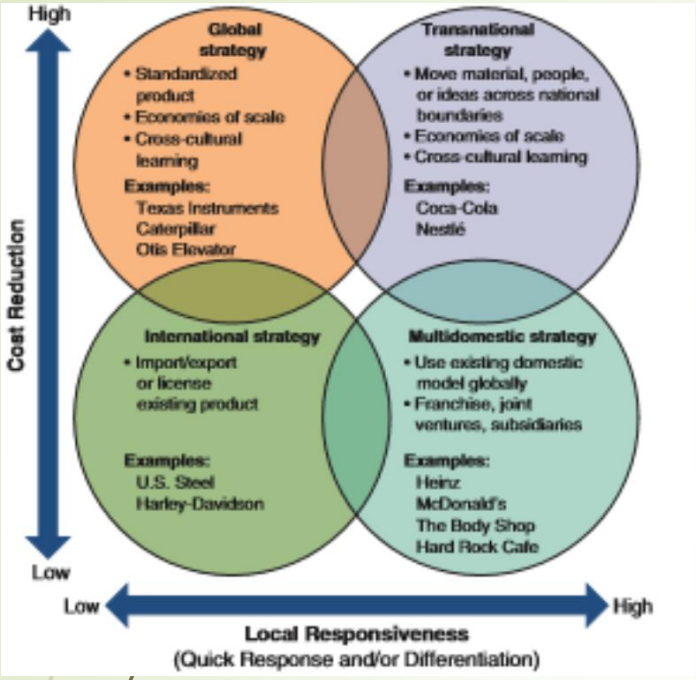
- **World Trade Organization (WTO)**
  - An international organization that promotes world trade by lowering barriers to the free flow of goods across borders.
- North American Free Trade Agreement (NAFTA)
  - A free trade agreement between Canada, Mexico, and the United States.
- European Union (EU)
  - A European trade group that has 27 member states...
- Enhanced economic partnership agreement EEPA with China …
- And now
  - Indicator of performance in service as well as in manufacturing

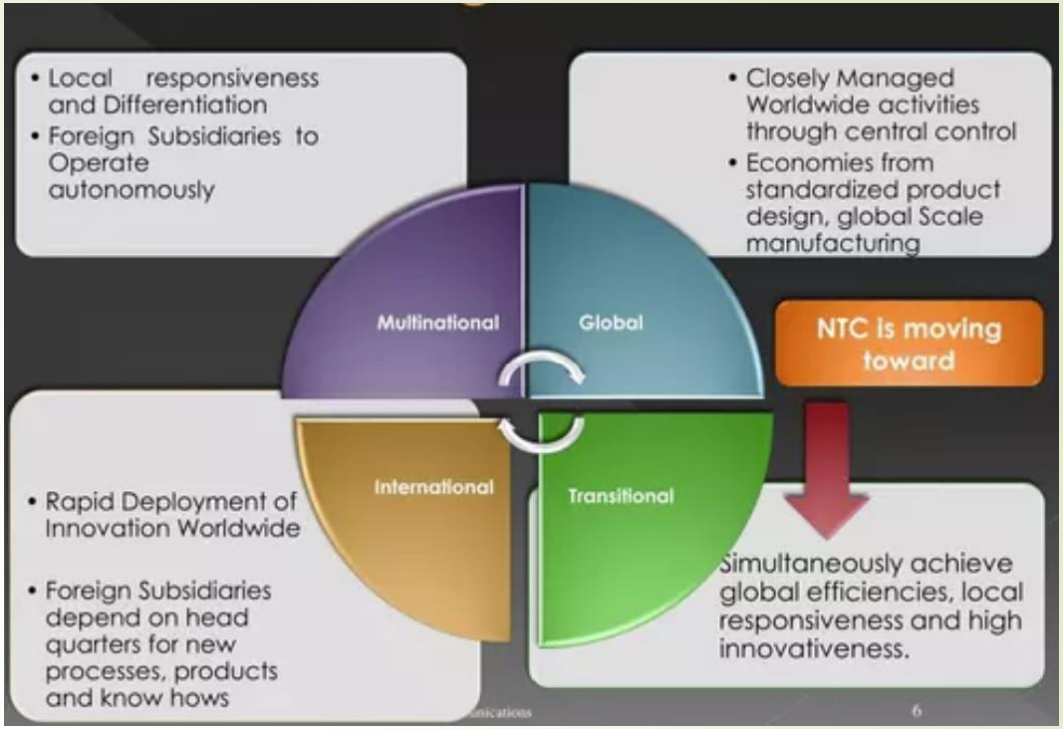
Sum up

Identify differences between services and manufacturing

what is their connection ?

Identify two main processes

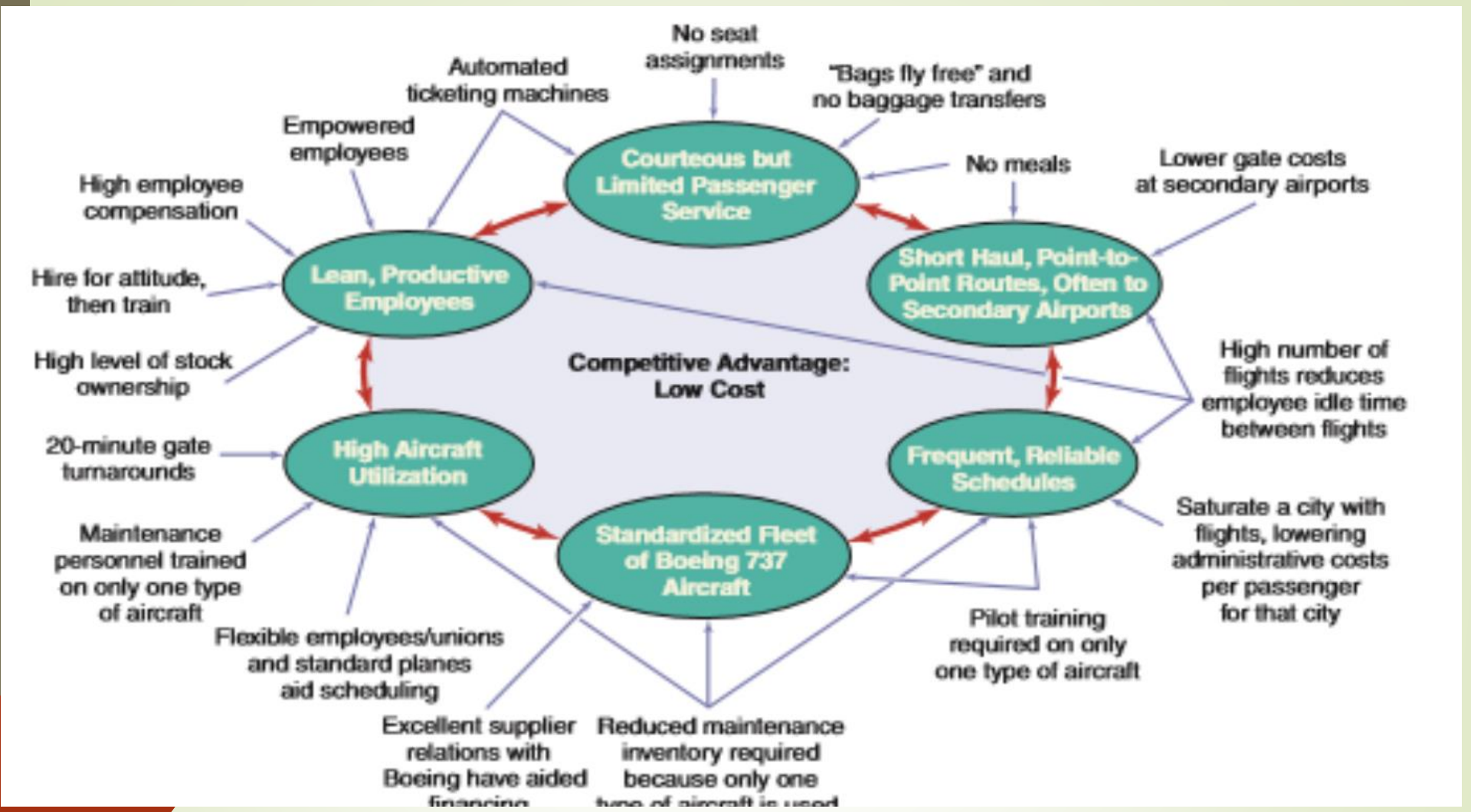




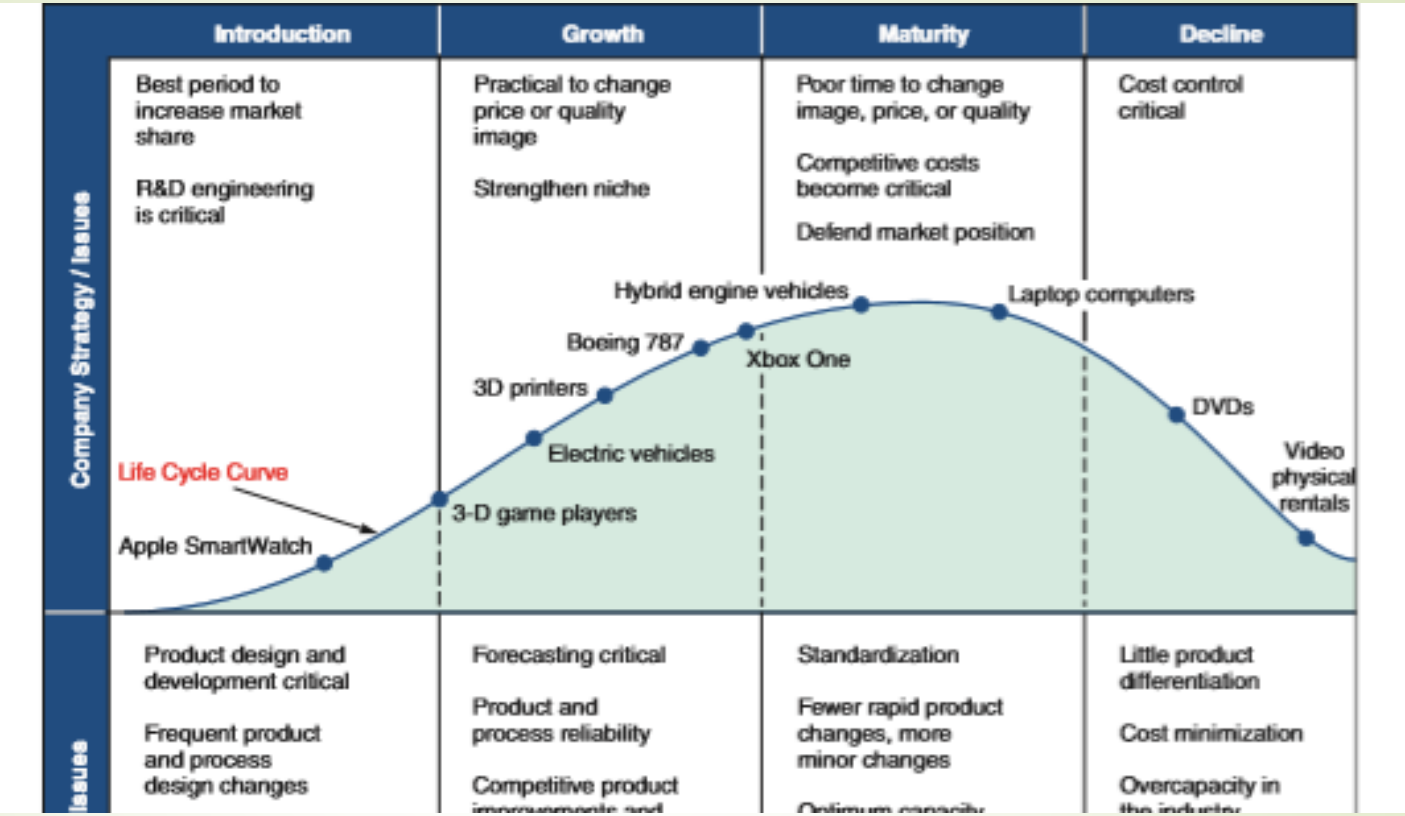
Four global strategies

COMPETITIVE ADVANTAGE	BRAND NAME DRUGS, INC.	GENERIC DRUG CORP.
	PRODUCT DIFFERENTIATION STRATEGY	LOW-COST STRATEGY
Product selection and design	Heavy R&D investment; extensive labs; focus on development in a broad range of drug categories	Low R&D investment; focus on development of generic drugs
Quality	Quality is major priority, standards exceed regulatory requirements	Meets regulatory requirements on a country-by-country basis, as necessary
Process	Product and modular production process; tries to have long product runs in specialized facilities; builds capacity ahead of demand	Process focused; general production processes; "job shop" approach, short-run production; focus on high utilization
Location	Still located in city where it was founded	Recently moved to low-tax, low-labor-cost environment
Layout	Layout supports automated product-focused production	Layout supports process-focused "job shop" practices
Human resources	Hire the best; nationwide searches	Very experienced top executives hired to provide direction; other personnel paid below industry average
Supply chain	Long-term supplier relationships	Tends to purchase competitively to find bargains
Inventory	Maintains high finished goods inventory primarily to ensure all demands are met	Process focus drives up work-in-process inventory; finished goods inventory tends to be low
Scheduling	Centralized production planning	Many short-run products complicate scheduling
Maintenance	Highly trained staff; extensive parts inventory	Highly trained staff to meet changing demands

- Operations Management book Pearson



Competitive advantage pattern application



Product life cycle

ADVANTAGES	DISADVANTAGES
Cost savings	Increased logistics and inventory costs
Gaining outside expertise that comes with specialization	Loss of control (quality, delivery, etc.)
Improving operations and service	Potential creation of future competition
Maintaining a focus on core competencies	Negative impact on employees
Accessing outside technology	Risks may not manifest themselves for years

- Operations Management book Pearson

FACTOR (CRITERION)*	IMPORTANCE WEIGHT	OUTSOURCE PROVIDERS		
		BIM (U.S.)	S.P.C. (INDIA)	TELCO (ISRAEL)
1. Can reduce operating costs	.2	.2 × **3** = .6	.2 × **3** = .6	.2 × **5** = 1.0
2. Can reduce capital investment	.2	.2 × **4** = .8	.2 × **3** = .6	.2 × **3** = .6
3. Skilled personnel	.2	.2 × **5** = 1.0	.2 × **4** = .8	.2 × **3** = .6
4. Can improve quality	.1	.1 × **4** = .4	.1 × **5** = .5	.1 × **2** = .2
5. Can gain access to technology not in company	.1	.1 × **5** = .5	.1 × **3** = .3	.1 × **5** = .5
6. Can create additional capacity	.1	.1 × **4** = .4	.1 × **2** = .2	.1 × **4** = .4
7. Aligns with policy/philosophy/culture	.1	.1 × **2** = .2	.1 × **3** = .3	.1 × **5** = .5
Total Weighted Score		3.9	3.3	3.8

*These seven major criteria are based on a survey of 165 procurement executives, as reported in J. Schildhouse, *Inside Supply Management* (December 2005): 22–29.


Measuring
performance
focus

Productivity

The ratio of outputs (goods and services) divided by one or more inputs (such as labor, capital, or management).

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

The operations manager's job is to enhance (improve) this ratio of outputs to inputs. Improving productivity means improving efficiency

Productivity

$$\text{Labor productivity} = \frac{\text{Policies processed}}{\text{Employee hours}}$$

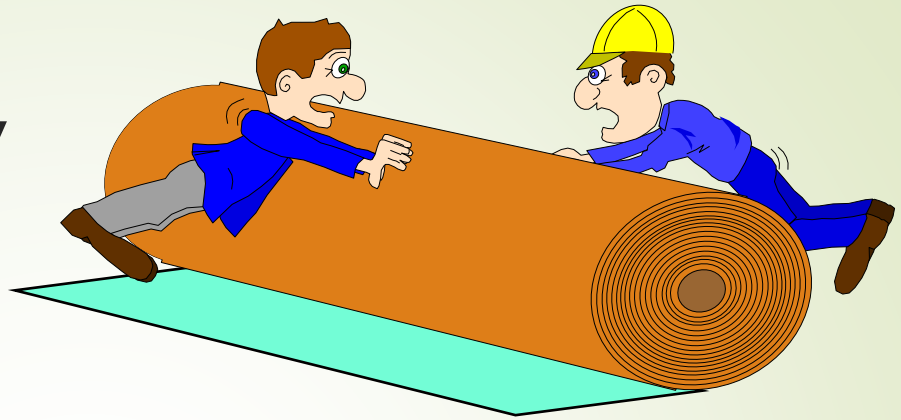
Productivity

$$\text{Labor productivity} = \frac{600 \text{ policies}}{(3 \text{ employees})(40 \text{ hours/employee})}$$

Productivity

Labor productivity = 5 policies/hour

Productivity

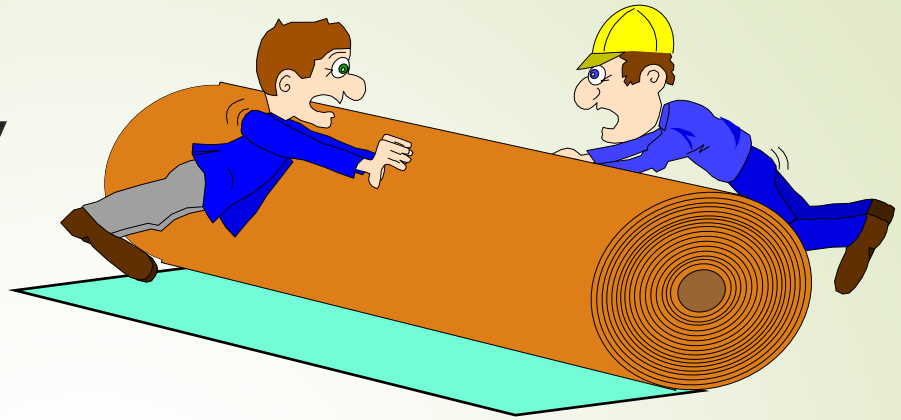


Labor productivity = 5 policies/hour

Multifactor productivity =

$$\frac{\text{Quantity at standard cost}}{\text{Labor cost + Materials cost + Overhead cost}}$$

Productivity



Labor productivity = 5 policies/hour

Multifactor productivity =

$$\frac{(400 \text{ units})(\$10/\text{unit})}{\$400 + \$1000 + \$300} = \frac{\$4000}{\$1700} = 2.35$$

Productivity labor exercice

- Productivity can be measured in a variety of ways, such as by labor, capital, energy, material usage, and so on.

- At Modern Lumber, Inc., **Art Binley, president and producer of apple crates** sold to growers, has been able, with his current equipment, to produce 240 crates per 100 logs. He currently purchases 100 logs per day, and each log requires 3 labor-hours to process. He believes that he can hire a professional buyer who can buy a better-quality log at the same cost. If this is the case, he can increase his production to 260 crates per 100 logs. His labor-hours will increase by 8 hours per day.

- **What will be the impact on productivity (measured in crates per labor-hour) if the buyer is hired?**

Productivity Measures

1. Labor, which contributes about 10% of the annual increase.
2. Capital, which contributes about 38% of the annual increase.
3. Management, which contributes about 52% of the annual increase.

Productivity and service

Productivity of the service sector has proven difficult to improve because service-sector work is…

1. Typically **labor intensive** (e.g., counseling, teaching).

2. Frequently focused on unique individual attributes or desires (e.g., investment advice).

3. Often an intellectual task performed by professionals (e.g., medical diagnosis).

4. Often difficult to mechanize and automate (e.g., a haircut).

5. Often difficult to evaluate for quality (e.g., performance of a law firm).

And ….

- Art Binley has decided to look at his productivity from a multifactor (total factor productivity) perspective.

- To do so, he has determined his labor, capital, energy, and material usage and decided to use dollars as the common denominator.

- His total labor-hours are now 300 per day and will increase to 308 per day. His capital and energy costs will remain constant at $350 and $150 per day, respectively. Material costs for the 100 logs per day are $1,000 and will remain the same. Because he pays an average of $10 per hour (with fringes), Binley determines his productivity increase as follows …

Productivity Measures

OM Explorer

Tutor 1.1—Productivity Measures

The state ferry service charges $18 per ticket plus a $3 surcharge to fund planned equipment upgrades. It expects to sell 4,700 tickets during the eight-week summer season. During that period, the ferry service will experience $110,000 in labor costs. Materials required for each passage sold (tickets, a tourist-information sheet, and the like) cost $1.30. Overhead during the period comes to $79,000.

a. What is the multifactor productivity ratio?
b. If ferry-support staff work an average of 310 person-hours per week for the 8 weeks of the summer season, what is the labor productivity ratio? Calculate labor productivity on an hourly basis.

Productivity Measures

Tutor 1.1—Productivity Measures

Place cell pointer on green shaded areas to examine formulas.

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

Step 1. Enter the number of tickets sold during a season, the price per ticket, and the surcharge per ticket. To compute value of output, multiply tickets sold by the sum of price and surcharge.

Tickets sold:	4,700	Value of output:	$98,700
Price:	$18		
Surcharge:	$3		

Step 2. Enter labor costs, materials costs per passenger, and overhead cost. For value of input, add together labor costs, materials costs times number of passengers, and overhead costs.

Labor costs:	$110,000	Materials costs:	$1.30	Overhead:	$79,000
		Value of input:			$195,110

Step 3. To calculate multifactor productivity, divide value of output by value of input.

Multifactor productivity: 0.51

Productivity Measures

Tutor 1.1—Productivity Measures

Place cell pointer on green shaded areas to examine formulas.

b. Labor productivity is the ratio of the value of output to labor hours The value of output is computed in part a, step 1.

Step 1. Enter person-hours per week and the number of weeks in the season; multiply the two together to calculate labor hours of input.

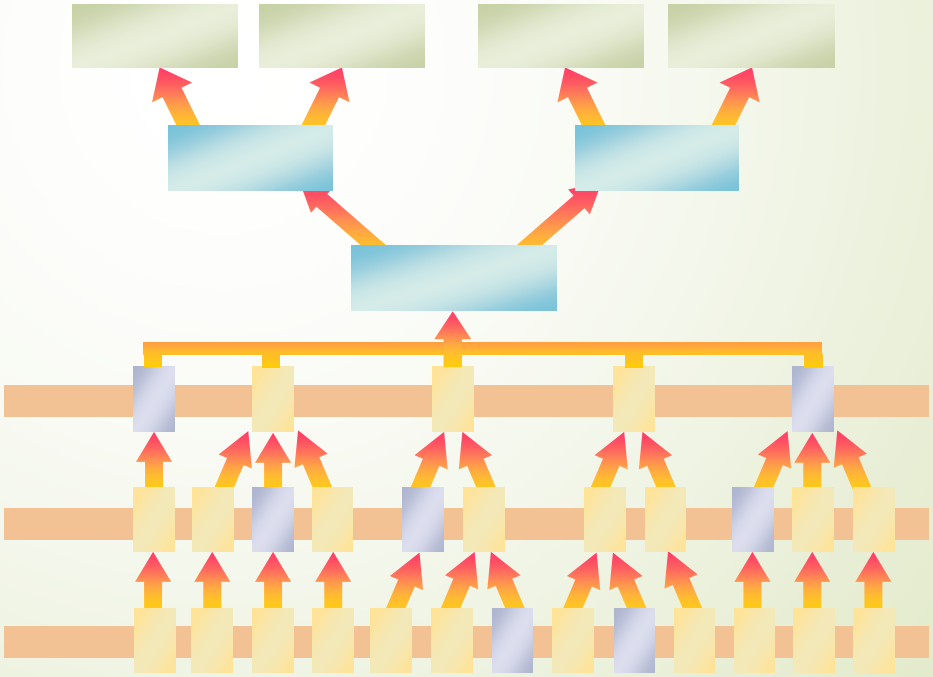
Hours per week:	310	Weeks:	8
		Labor hours of input:	2,480

Step 2. To calculate labor productivity, divide value of output by labor hours of input.

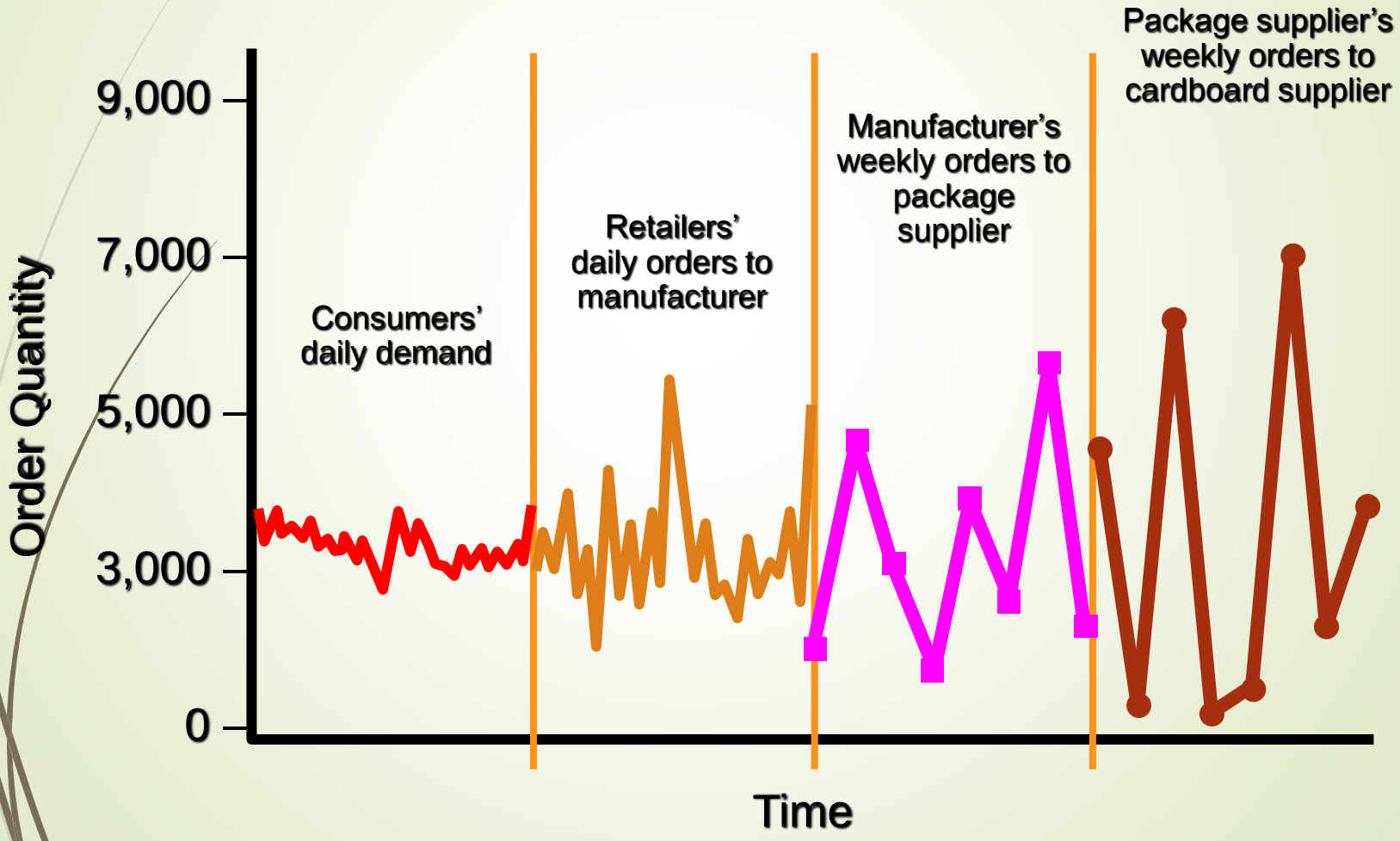
		Labor productivity:	$39.80

Figure 1.5c

Supply-Chain Design



Supply Chain Dynamics for Facial Tissue



External Value-Chain Linkages

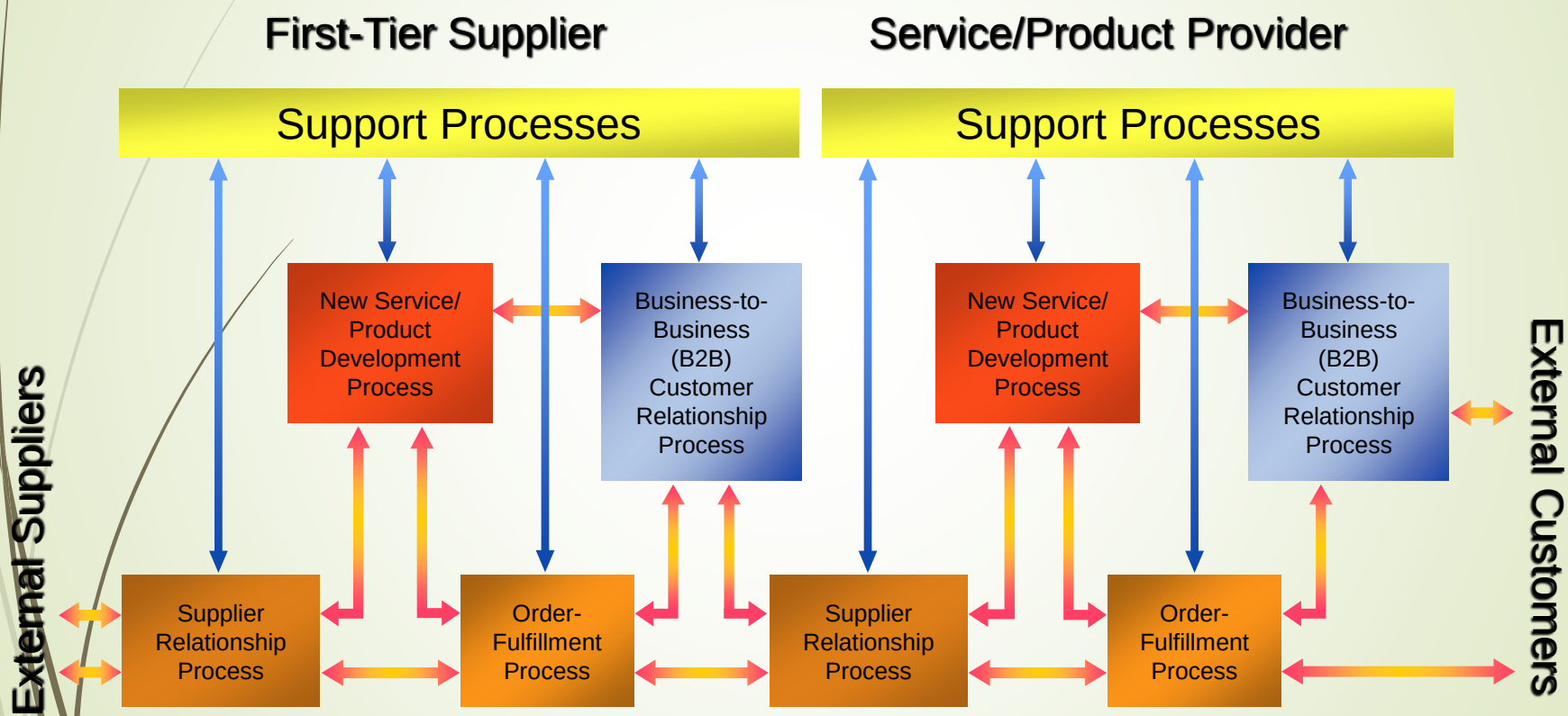
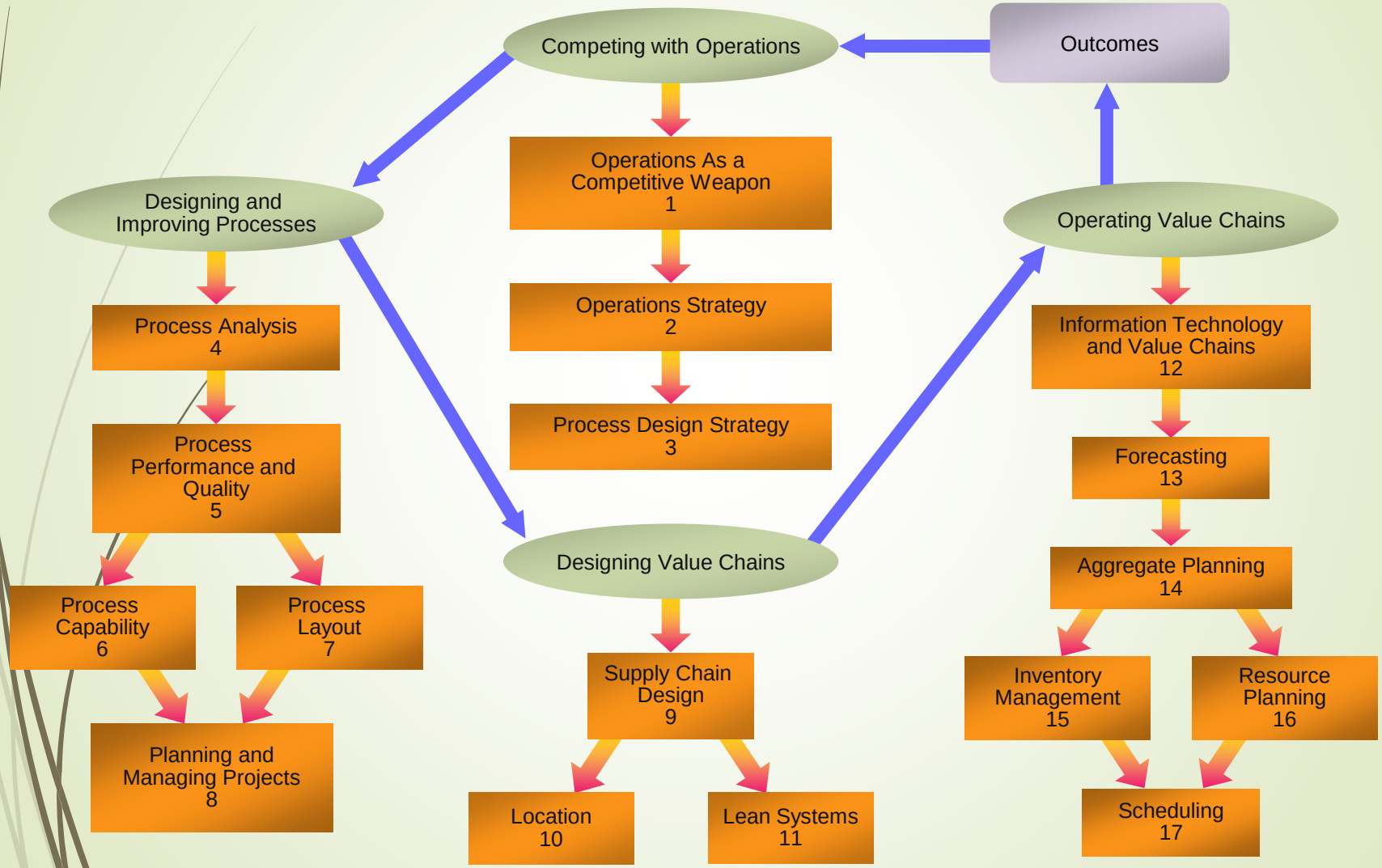


Figure 9.1

Operations Roadmap *to be developed … later*



LO 1.1 Productivity increases when:

a) inputs increase while outputs remain the same.
b) inputs decrease while outputs remain the same.
c) outputs decrease while inputs remain the same.
d) inputs and outputs increase proportionately.
e) inputs increase at the same rate as outputs.

LO 1.2 Services often:

a) are tangible.
b) are standardized.
c) are knowledge based.
d) are low in customer interaction.
e) have consistent product definition.

LO 1.3 Productivity:

a) can use many factors as the numerator.
b) is the same thing as production.
c) increases at about 0.5% per year.
d) is dependent upon labor, management, and capital.
e) is the same thing as effectiveness.

LO 1.4 Single-factor productivity:

a) remains constant.
b) is never constant.
c) usually uses labor as a factor.
d) seldom uses labor as a factor.
e) uses management as a factor.

LO 1.5 Multifactor productivity:

a) remains constant.
b) is never constant.
c) usually uses substitutes as common variables for the factors of production.
d) seldom uses labor as a factor.
e) always uses management as a factor.

LO 1.6 Productivity increases each year in the U.S. are a result of three factors:

a) labor, capital, management
b) engineering, labor, capital
c) engineering, capital, quality control
d) engineering, labor, data processing
e) engineering, capital, data processing

Student tuition at Boehring University is $100 per semester credit hour. The state supplements school revenue by matching student tuition dollar for dollar. Average class size for a typical three-credit course is 50 students. Labor costs are $4,000 per class, materials costs are $20 per student per class, and overhead costs are $25,000 per class.

a. What is the *multifactor* productivity ratio for this course process?
b. If instructors work an average of 14 hours per week for 16 weeks for each three-credit class of 50 students, what is the *labor* productivity ratio?

Natalie Attired makes fashionable garments. During a particular week employees worked 360 hours to produce a batch of 132 garments, of which 52 were "seconds" (meaning that they were flawed). Seconds are sold for $90 each at Attired's Factory Outlet Store. The remaining 80 garments are sold to retail distribution, at $200 each. What is the *labor* productivity ratio of this manufacturing process?

Ready for …

- QUIZ