

operation management for undergraduate student

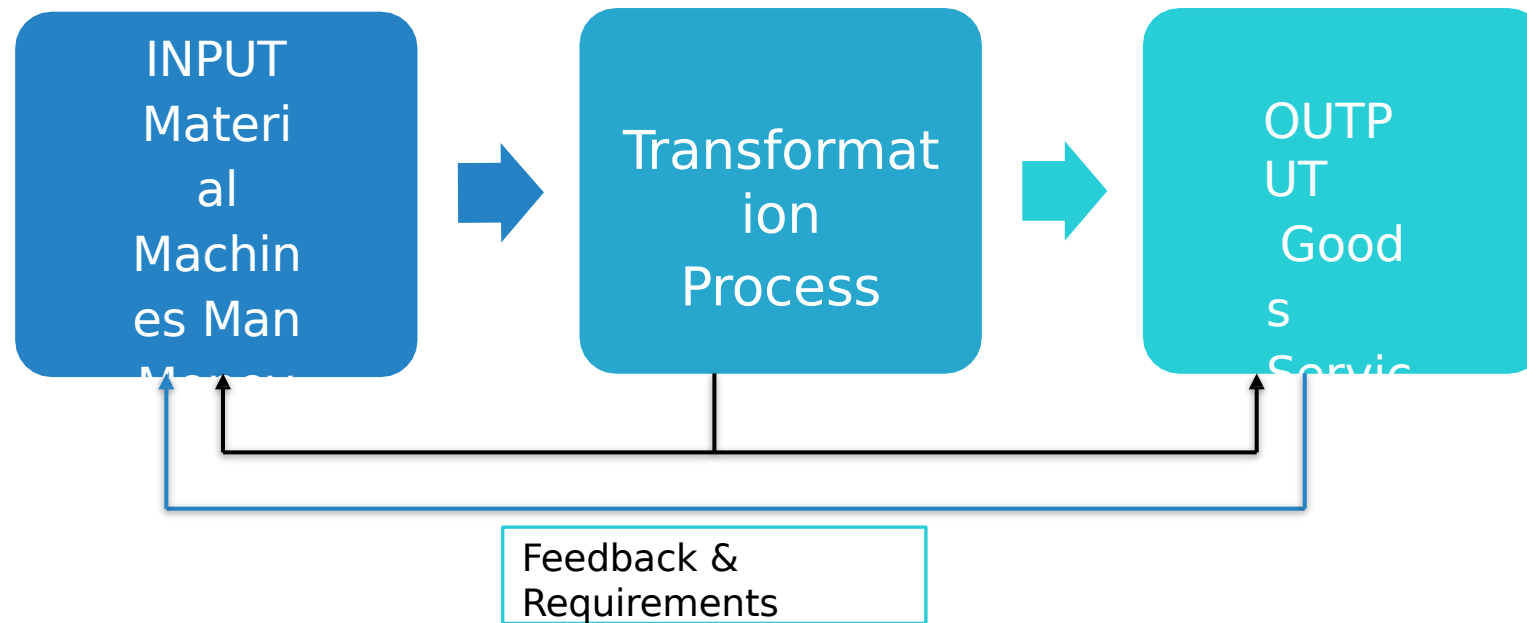
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WHAT IS OPERATIONS MANAGEMENT?

- **Production:** is the creation of goods and services whereas **Operations Management (OM):** is a set of activities that relate to the creation of goods and services through the transformation of inputs to outputs.

CONT'D



ORGANIZING TO PRODUCE GOODS AND SERVICES

Essential functions:

- **Marketing:** generates demand
- **Production/operations:** creates the product
- **Finance/accounting:** tracks how well the organization is doing, pays bills, collects the money

WHY STUDY OM?

- 1. OM is one of the three major functions of any organization,** and relate to all the functions. integrally d other business As (final), ce organization make important (account), know and how the function (operate). The OM function study how people organize themselves for productive enterprise.
- 2. We want to know how goods and services are produced.**
- 3. We study OM to understand what operations managers do.**
- 4. Because it is such a costly part of an organization.** A large percentage of the revenue of most firms is spent in the OM function. Indeed, OM

WHAT OPERATIONS MANAGER DO

Basic Management Functions

- Planning
- Organizing
- Leading
- Staffing
- Controlling



SCOPE OF OM

Ten Decision Areas

- Design of goods and services
- Managing quality
- Process and capacity design
- Location strategy
- Layout strategy
- Human resources and job design
- Supply chain management
- Inventory management
- Scheduling

THE CRITICAL DECISIONS

■ Design of goods and services

- What good or service should we offer?
- How should we design these products and services?

■ Managing quality

- How do we define quality?
- Who is responsible for quality?

CONT'D

▪ Process and capacity design

- What process and what capacity will these products require?
- What equipment and technology is necessary for these processes?

▪ Location strategy

- Where should we put the facility?
- On what criteria should we base the location decision?

CONT'D

- Layout strategy

- How should we arrange the facility?
- How large must the facility be to meet our plan?

- Human resources and job design

- How do we provide a reasonable work environment?
- How much can we expect our employees to produce?

CONT'D

- Supply chain management
 - Should we make or buy this component?
 - Who are our suppliers and who can integrate into our e-commerce program?
- Inventory, material requirements planning, and JIT
 - How much inventory of each item should we have?

CONT'D

- Intermediate and short-term scheduling
 - Are we better off keeping people on the payroll during slowdowns?
 - Which jobs do we perform next?
- Maintenance
 - Who is responsible for maintenance?
 - When do we do maintenance?

WHERE ARE THE OM JOBS?

PLANT MANAGER

Division of Fortune 1000 company seeks plant manager for plant located in the upper Hudson Valley area. This plant manufactures loading dock equipment for commercial markets. The candidate must be experienced in plant management including expertise in production planning, purchasing, and inventory management. Good written and oral communication skills are a must along with excellent understanding of and application skills in managing people.

Operations Analyst

Expanding national coffee shop; top 10 "Best Places to Work" wants junior level systems analyst to join our excellent store improvement team. Business or I.E. degree, work methods, labor standards, ergonomics, cost accounting knowledge a plus. This is a hands on job and excellent opportunity for team player with good people skills. West Coast location. Some travel required.

Quality Manager

Several openings exist in our small measurement. The work involves (1) a package processing facilities in the combination of hands-on applications Northeast, Florida, and Southern and detailed analysis using databases California for quality managers. and spreadsheets, (2) process audits to These highly visible positions identify areas for improvement, and require extensive use of statistical (3) management of implementation of tools to monitor all aspects of changes. Positions involve night hours service timeliness and workload and weekends. Send resume.

Supply Chain Manager and Planner

Responsibilities entail negotiating contracts and establishing long-term relationships with suppliers. We will rely on the selected candidate to maintain accuracy in the purchasing system, invoices, and product returns. A bachelor's degree and up to 2 years related experience are required. Working knowledge of MRP, ability to use feedback to master scheduling and suppliers and consolidate orders for best price and delivery are necessary. Proficiency in all PC Windows applications, particularly Excel and Word, is essential. Knowledge of Oracle business system I is a plus. Effective verbal and written communication skills are essential.

Process Improvement Consultants

An expanding consulting firm is seeking consultants to design and implement lean production and cycle time reduction plans in both service and manufacturing processes. Our firm is currently working with an international bank to improve its back office operations, as well as with several manufacturing firms. A business degree required; APICS certification a plus.

SIGNIFICANT EVENTS IN OM



Cost Focus	Quality Focus	Customization Focus	Globalization Focus
Early Concepts 1776–1880 Labor Specialization (Smith, Babbage) Standardized Parts (Whitney) Scientific Management Era 1880–1910 Gantt Charts (Gantt) Motion & Time Studies (Gilbreth) Process Analysis (Taylor) Queuing Theory (Erlang)	Mass Production Era 1910–1980 Moving Assembly Line (Ford/Sorensen) Statistical Sampling (Shewhart) Economic Order Quantity (Harris) Linear Programming PERT/CPM (DuPont) Material Requirements Planning (MRP)	Lean Production Era 1980–1995 Just-in-Time (JIT) Computer-Aided Design (CAD) Electronic Data Interchange (EDI) Total Quality Management (TQM) Baldrige Award Empowerment Kanbans Mass Customization Era 1995–2005 Internet/E-Commerce Enterprise Resource Planning International Quality Standards (ISO) Finite Scheduling Supply Chain Management Mass Customization Build-to-Order Radio Frequency Identification (RFID)	Globalization Era 2005–2020 Global Supply Chains Growth of Transnational Organizations Instant Communications Sustainability Ethics in a Global Workforce Logistics

OPERATIONS FOR GOODS AND SERVICES

Production of Goods Versus Delivery of Services

- Goods are physical items that include raw materials, parts, subassemblies, and final products.

E.g. Automobile, Computer, Oven, Shampoo

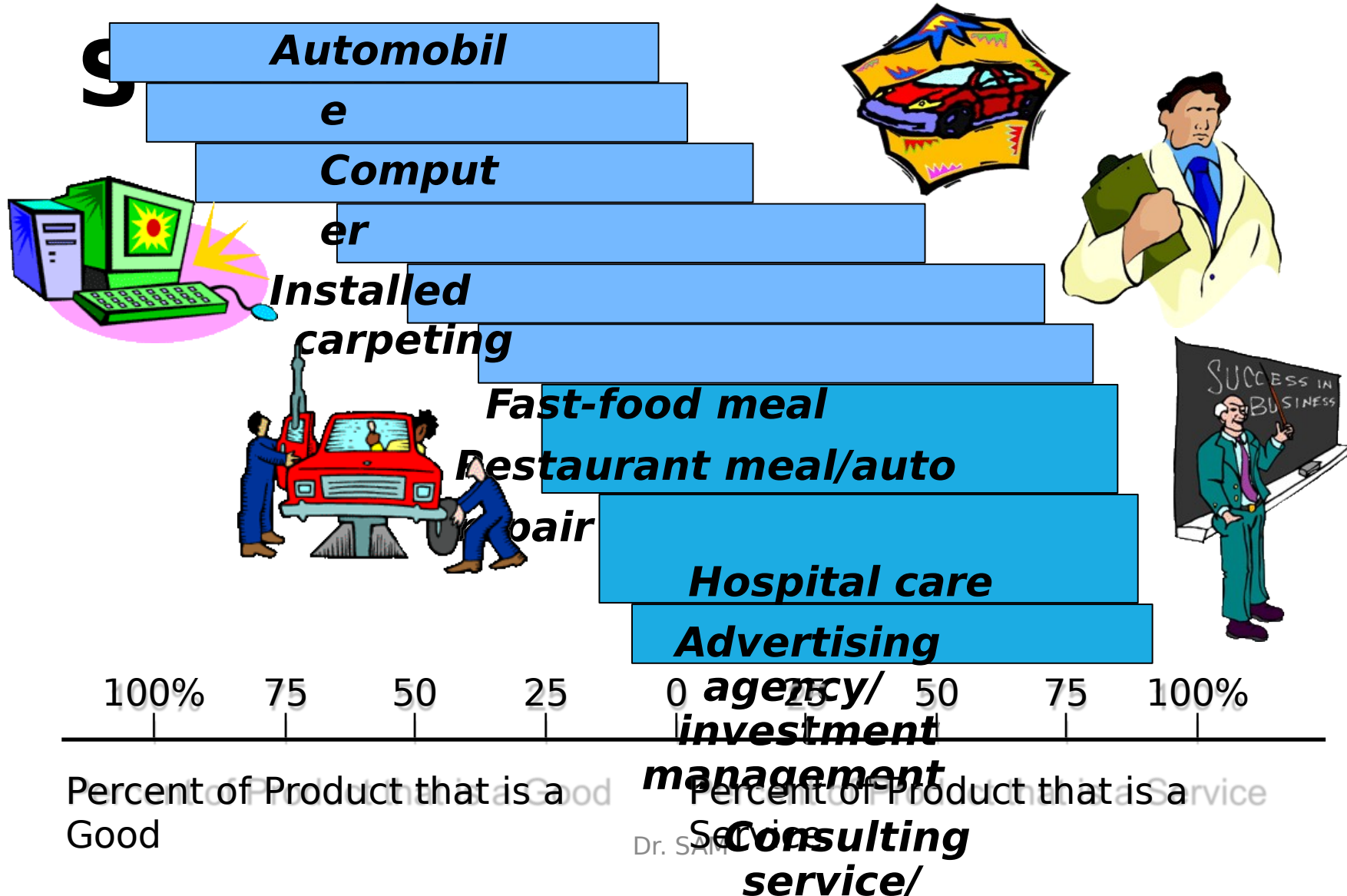
- Services are activities that provide some combination of time,

location, form or psychological value.

DIFFERENCES BETWEEN GOODS AND SERVICES

CHARACTERISTICS OF SERVICES	CHARACTERISTICS OF GOODS
Intangible: Ride in an airline seat	Tangible: The seat itself
Produced and consumed simultaneously: Beauty salon produces a haircut that is consumed as it is produced	Product can usually be kept in inventory (beauty care products)
Unique: Your investments and medical care are unique	Similar products produced (iPods)
High customer interaction: Often what the customer is paying for (consulting, education)	Limited customer involvement in production
Inconsistent product definition: Auto insurance changes with age and type of car	Product standardized (iPhone)
Often knowledge based: Legal, education, and medical services are hard to automate	Standard tangible product tends to make automation feasible
Services dispersed: Service may occur at retail store, local office, house call, or via Internet.	Product typically produced at a fixed facility
Quality may be hard to evaluate: Consulting, education, and medical services	Many aspects of quality for tangible products are easy to evaluate (strength of a bolt)
Reselling is unusual: Musical concert or medical care	Product often has some residual value

GOODS AND



PRODUCTIVITY CHALLENGE

Productivity is the ratio of outputs (goods and services) divided by the inputs (resources such as labor and capital)

The objective is to improve productivity!

Important Note!

Production is a measure of output only and not a measure of efficiency

PRODUCTIVITY

Productivity =

$$\frac{\text{Units produced}}{\text{Input used}}$$

- Measure of process improvement
- Represents output relative to input
- Only through productivity increases can our standard of living improve

PRODUCTIVITY CALCULATIONS

Labor Productivity

$$\begin{aligned} \text{Productivity} &= \frac{\text{Units produced}}{\text{Labor-hours used}} \\ &= \frac{1,000}{250} = 4 \text{ units/labor-hour} \end{aligned}$$

One resource input □ single-factor productivity

MULTI-FACTOR PRODUCTIVITY

$$\text{Productivity} = \frac{\text{Output}}{\text{Labor} + \text{Material} + \text{Energy} + \text{Capital} + \text{Miscellaneous}}$$

- Also known as total factor productivity
- Output and inputs are often expressed in dollars

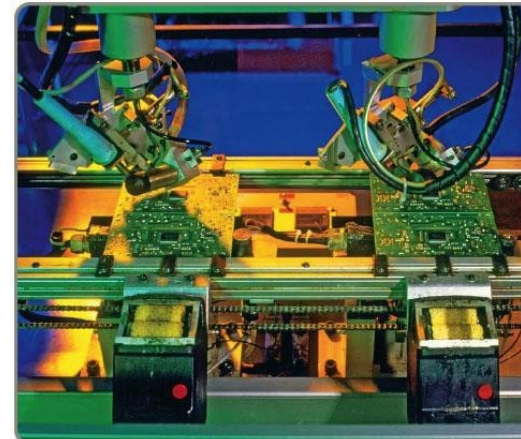
Multiple resource inputs → multi-factor productivity

MEASUREMENT PROBLEMS

- **Quality** may change while the quantity of inputs and outputs remains constant
- **Externalelements** may cause an increase or decrease in productivity
- **Precise units** of measure may be lacking

PRODUCTIVITY VARIABLES

- **Labor** - contributes about 10% of the annual increase
- **Capital** - contributes about 38% of the annual increase
- **Management** - contributes about 52% of the annual increase



KEY VARIABLES FOR IMPROVED LABOR PRODUCTIVITY

- Basic education appropriate for the labor force
- Diet of the labor force
- Social overhead that makes labor available
- Maintaining and enhancing skills in the midst of rapidly changing technology and knowledge

LABOR SKILLS

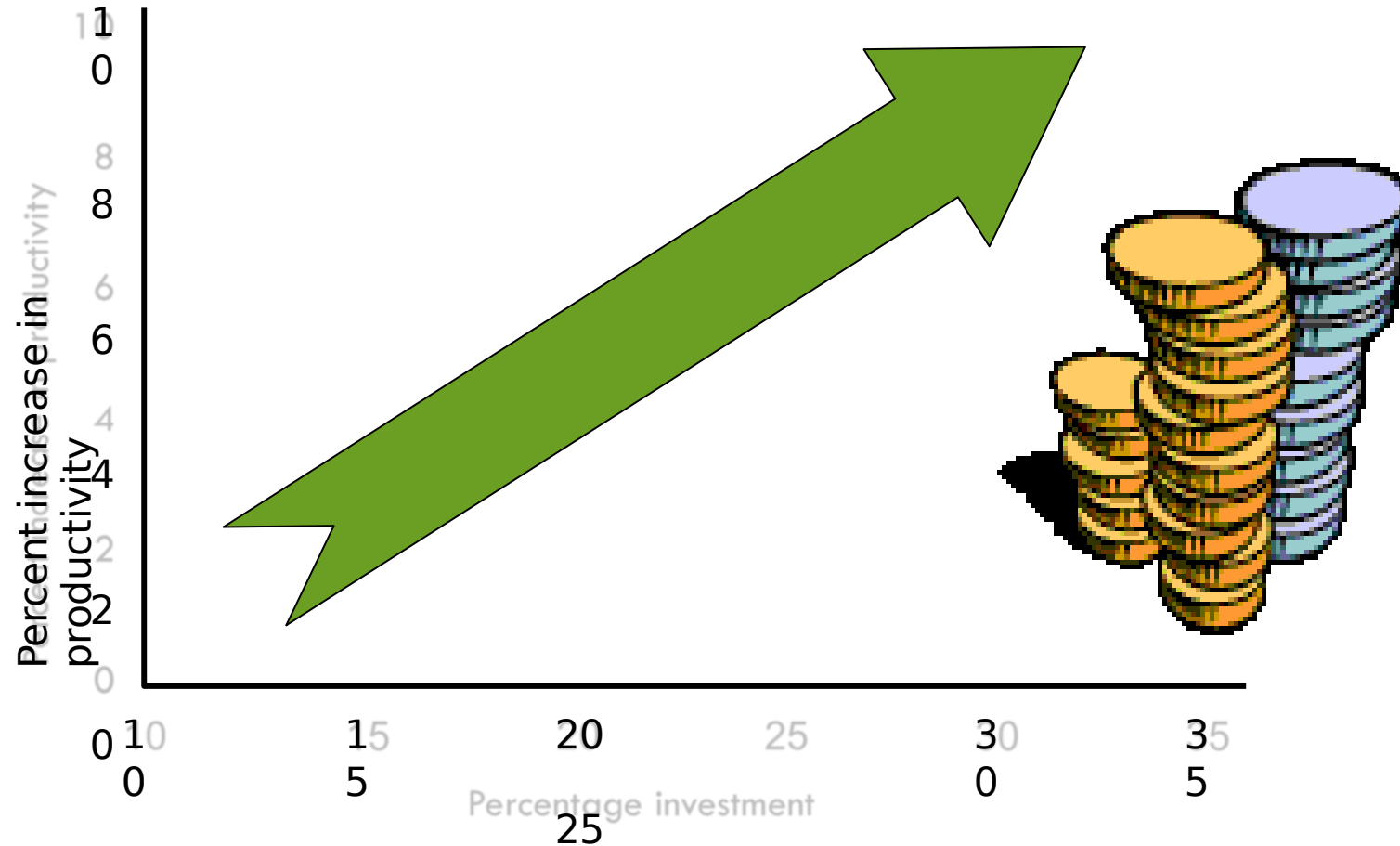
About half of the 17-year-olds in the US cannot correctly answer questions of this type

6 yds	
	4 yds
What is the area of this rectangle?	
_____	4 square yds
_____	6 square yds
_____	10 square yds
_____	20 square yds
_____	24 square yds

If $9y + 3 = 6y + 15$ then $y =$	
_____ 1	_____ 4
_____ 2	_____ 6

Which of the following is true about 84% of 100?	
_____	It is greater than 100
_____	It is less than 100
_____	It is equal to 100

INVESTMENT AND PRODUCTIVITY



CURRENT CHALLENGES IN OPERATIONS MANAGEMENT

Globalization: The rapid decline in the cost of communication and transportation has made markets global. Similarly, resources in the form of capital, materials, talent, and labor are also now global. As a result, countries throughout the world are contributing to globalization as they vie for economic growth. Operations managers are rapidly seeking creative designs, efficient production, and high-quality goods via international collaboration.

Supply-chain partnering: Shorter product life cycles, demanding customers, and fast changes in technology, materials, and processes require supply-chain partners to be in tune with the needs of end users. And because suppliers may be able to

CONT'D

Sustainable Operations managers' **intention** to improve productivity is concerned with designing processes and ecologically **designing green products**. That **is, in a sense, very clean, re-used, and are generally environmentally friendly.**

Rapid product development: Technology **intermediation** with rapid communication of news, entertainment, and lifestyles is dramatically chopping away at the life span of products. OM is answering with new management structures, enhanced collaboration, digital technology, and creative alliances that are more responsive and effective.

CONT'D

- **Mass customization:** Once managers realize that the world has become quite different, where consumers increasingly are aware of innovation and options, substantial pressure is placed on firms to respond in a creative way. And OM must rapidly respond with product designs and flexible production processes that cater to the individual whims of consumers. The goal is to produce customized products, whenever and wherever needed.

CONT'D

Lean operations: Lean is the management model sweeping the world and providing the standard against which operations managers must compete. Lean can be thought of as the driving force in a well-run operation, where the customer is satisfied, employees are respected, and waste does not exist. The theme of this text is to build organizations that are more efficient, where management creates enriched jobs that help employees engage in continuous improvement, and where goods and services are produced and delivered when and where the customer desires them.



OPERATIONS STRATEGY AND COMPETITIVENESS

CHAPTER TWO

STRATEGY

Strategy is defined as organizations theory about how to gain

competitive advantage (Barney & Hesterly, 2012).

Strategy is formulation of future plan of action, usually understood as being undertaken by senior management at a high level of leadership and management.

OPERATIONS STRATEGY AND COMPETITIVE ADVANTAGE

Operations Strategy: is a plan for using the operational capabilities of a company to decide how it will compete.

Competitive advantage: implies the creation of a system that has a unique advantage over competitors. The idea is to create customer value in an efficient and sustainable way.

SAMPLE MISSION STATEMENTS

Sample OM Department Missions

<i>Product design</i>	<i>To design and produce products and services with outstanding quality and inherent customer value.</i>
<i>Quality management</i>	<i>To attain the exceptional value that is consistent with our company mission and marketing objectives by close attention to design, procurement, production, and field service operations</i>
<i>Process design</i>	<i>To determine and design or produce the production process and equipment that will be compatible with low-cost product, high quality, and good quality of work life at economical cost.</i>

STRATEGIES FOR COMPETITIVE ADVANTAGE

- **Differentiation** – better, or at least different
- **Cost leadership** – cheaper
- **Response** – rapid response

COMPETING ON DIFFERENTIATION

- Uniqueness can go beyond both the physical characteristics and service attributes to encompass everything that impacts customer's perception of value
- Ability of a company to provide unique and superior value to the buyer in terms of product quality, special features or after-sale service

COMPETING ON COST

Ability of a company or a business unit to design, produce and market a comparable product more efficiently than its competitors. A low cost strategy does not imply low value or low quality.

For example:

- Southwest Airlines: secondary airports, no frills service, efficient utilization of equipment
- Wal-Mart: small overheads, shrinkage, distribution costs

COMPETING ON RESPONSE

- **Flexibility**

Is matching market changes in design, innovation and volumes

Example: HP's products often have a life cycle of months and volume and cost changes and the company has been successful at institutionalizing the ability to change products and volume to respond to dramatic changes in product design and costs thus building a sustainable competitive

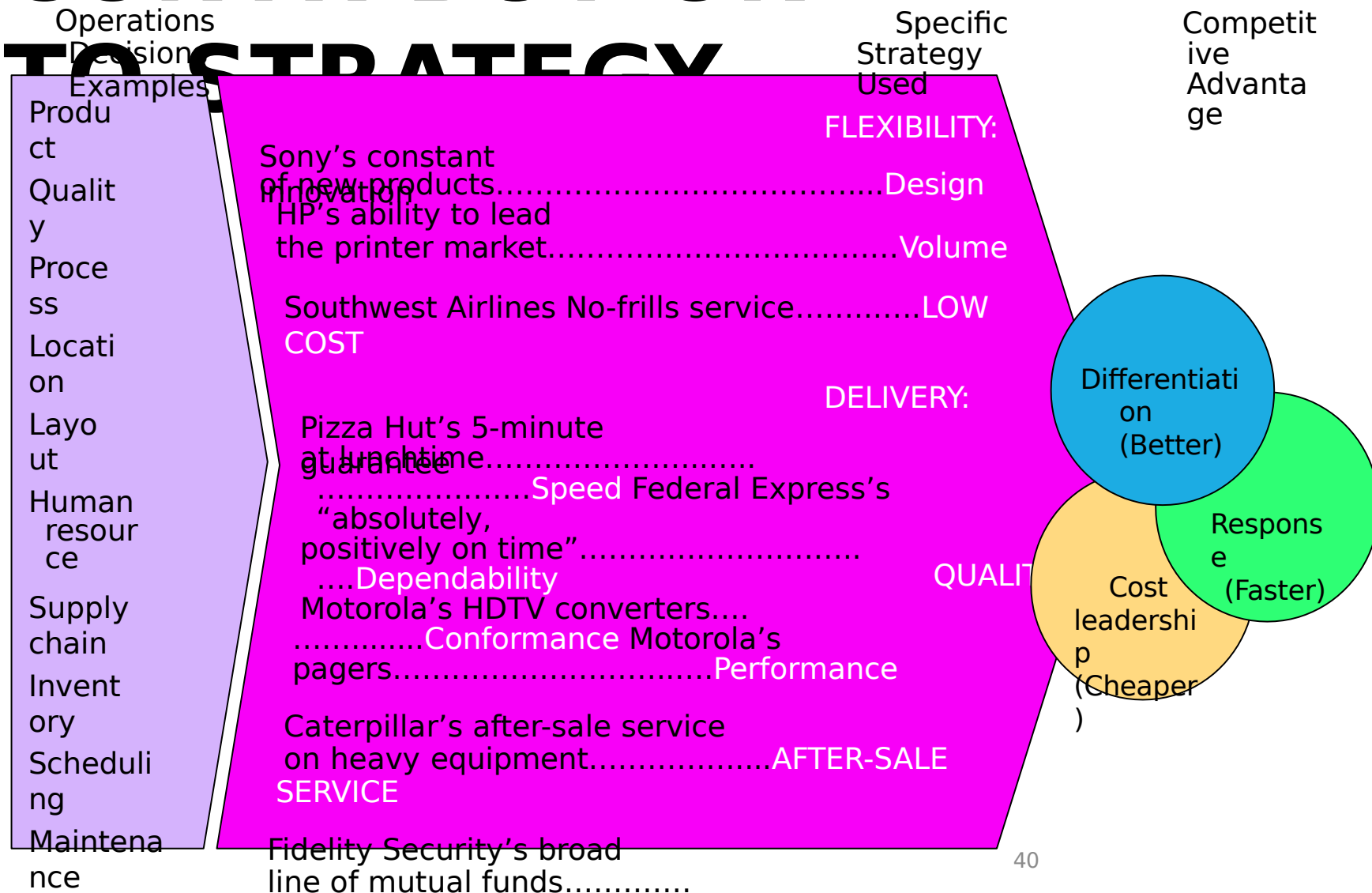
CONT'D

- **Reliability:** is meeting schedules

Example: German machine industry

- **Timeliness:** is quickness in design, production, and delivery

OM'S CONTRIBUTION TO STRATEGY



10 STRATEGIC OM DECISIONS

Differentiation, low cost and response can be achieved when managers make effective decisions in 10 areas of OM, these are collectively known as **operations decisions**.

MANAGING GLOBAL SERVICE OPERATIONS

Requires a different perspective on:

- Capacity planning
- Location planning
- Facilities design and layout
- Scheduling

ISSUES IN OPERATIONS STRATEGY

- Research about effective operations management strategies
- Preconditions for developing effective OM strategies
- The dynamics of OM strategy development

CHARACTERISTICS OF HIGH R&D FIRMS

- High product quality
- High capacity utilization
- High operating efficiency
- Low investment intensity
- Low direct cost per unit

STRATEGIC OPTIONS TO GAIN A COMPETITIVE ADVANTAGE

28% - Operations

Management

18% - Marketing/distribution

17% - Momentum/name

recognition 16% -

Quality/service

14% - Good

management 4% -

Financial resources

20% - Other

ELEMENTS OF OPERATIONS MANAGEMENT STRATEGY

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

PRECONDITIONS

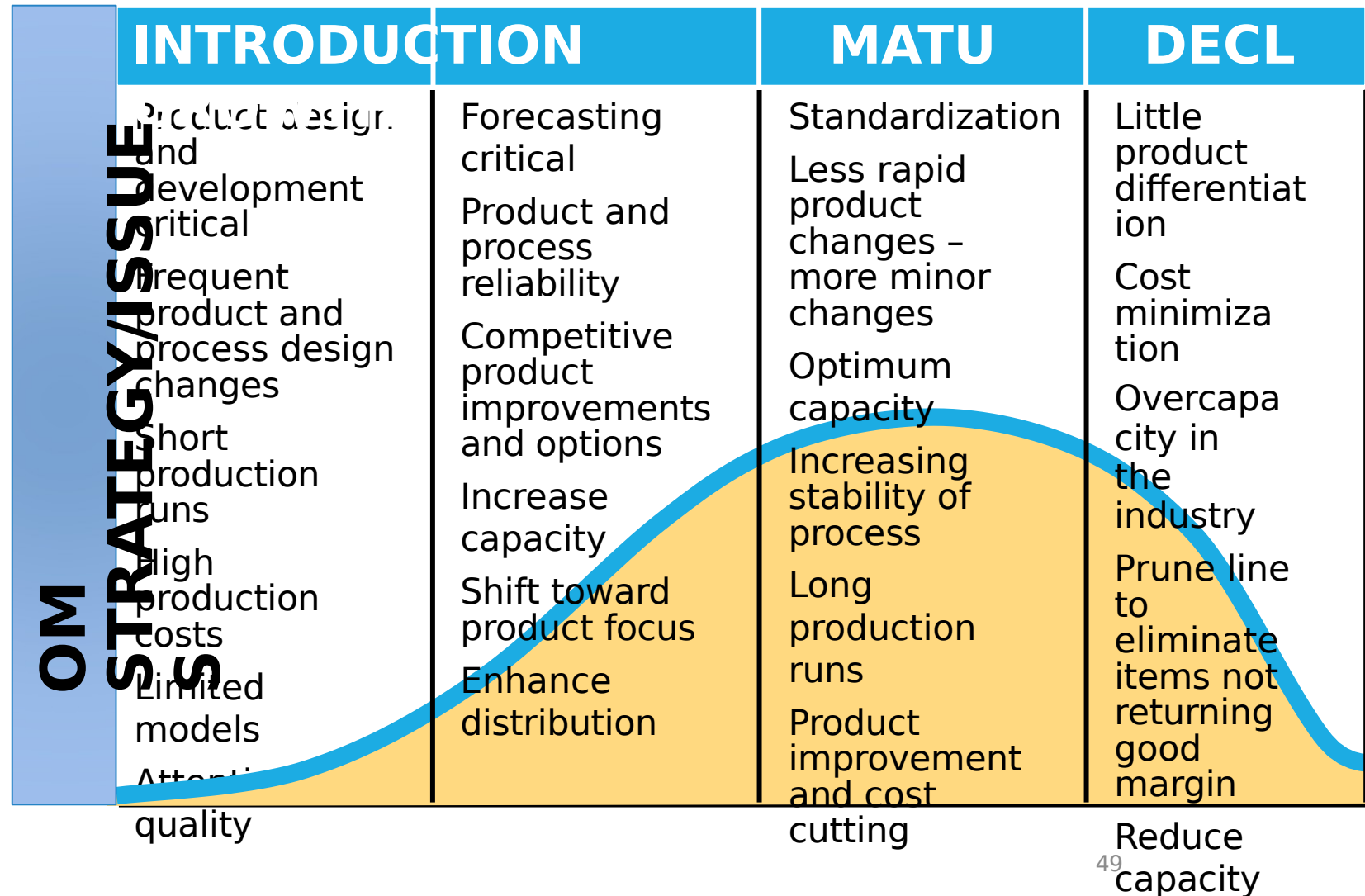
One must understand:

- Resource Based View (RBV)
- Value Chain Analysis
- Porter's Five Forces Model
- Environmental Analysis
- The Product Life Cycle
- Integration of OM strategy with company's strategy and with other functional areas

DYNAMICS OF STRATEGIC CHANGE

- Changes within the organization
 - Personnel
 - Finance
 - Technology
 - Product life
- Changes in the environment

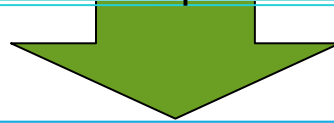
PRODUCT LIFE CYCLE



STRATEGY DEVELOPMENT PROCESS

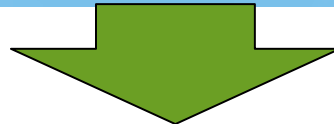
Environmental Analysis

Identify the strengths, weaknesses, opportunities, and threats. Understand the environment, customers, industry, and competitors.



Determine Corporate Mission

State the reason for the firm's existence and identify the value it wishes to create.



Form a Strategy

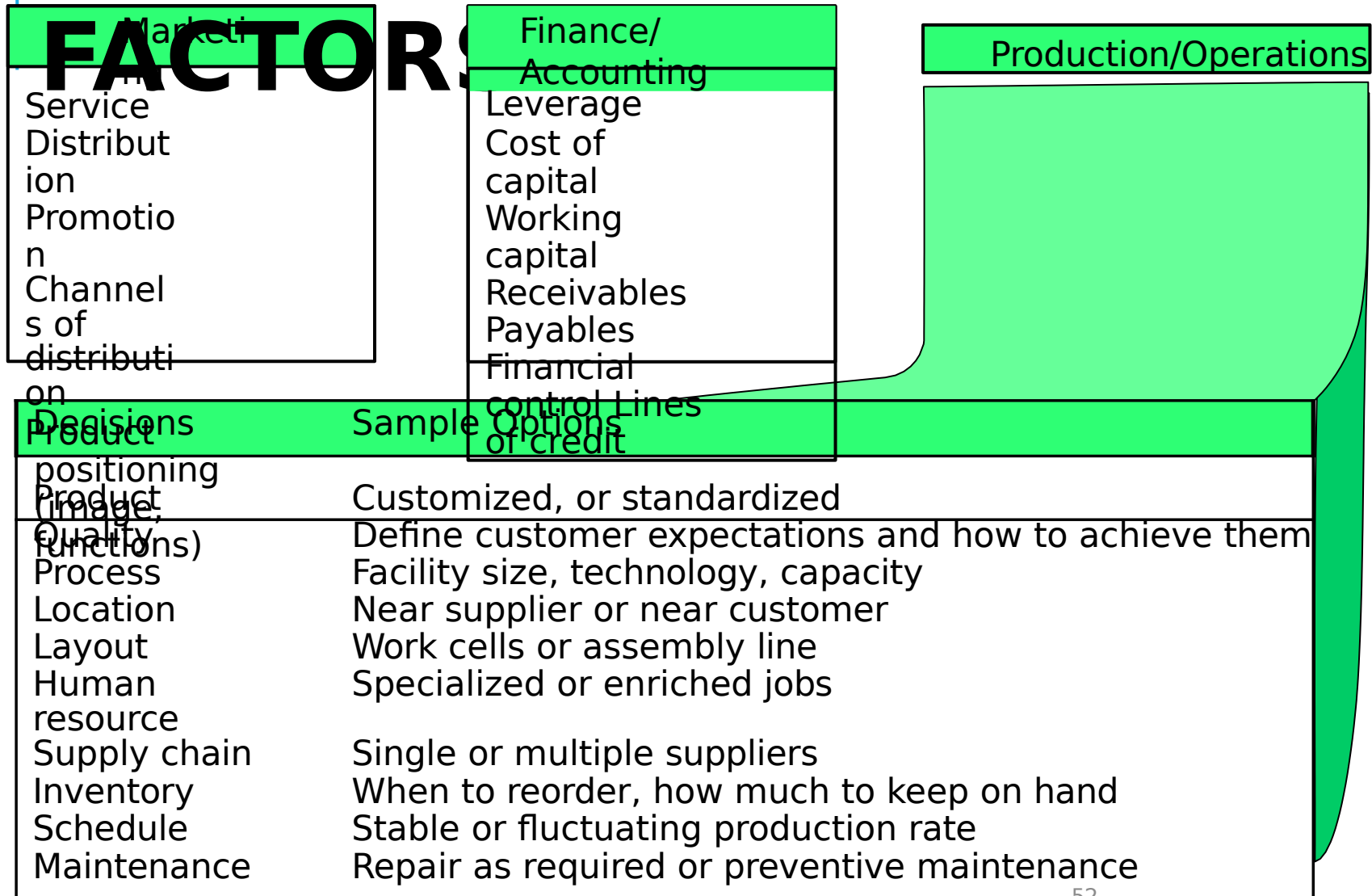
Build a competitive advantage, such as low price, design, or volume flexibility, quality, quick delivery, dependability, after-sale service, broad product lines.

STRATEGY DEVELOPMENT AND IMPLEMENTATION

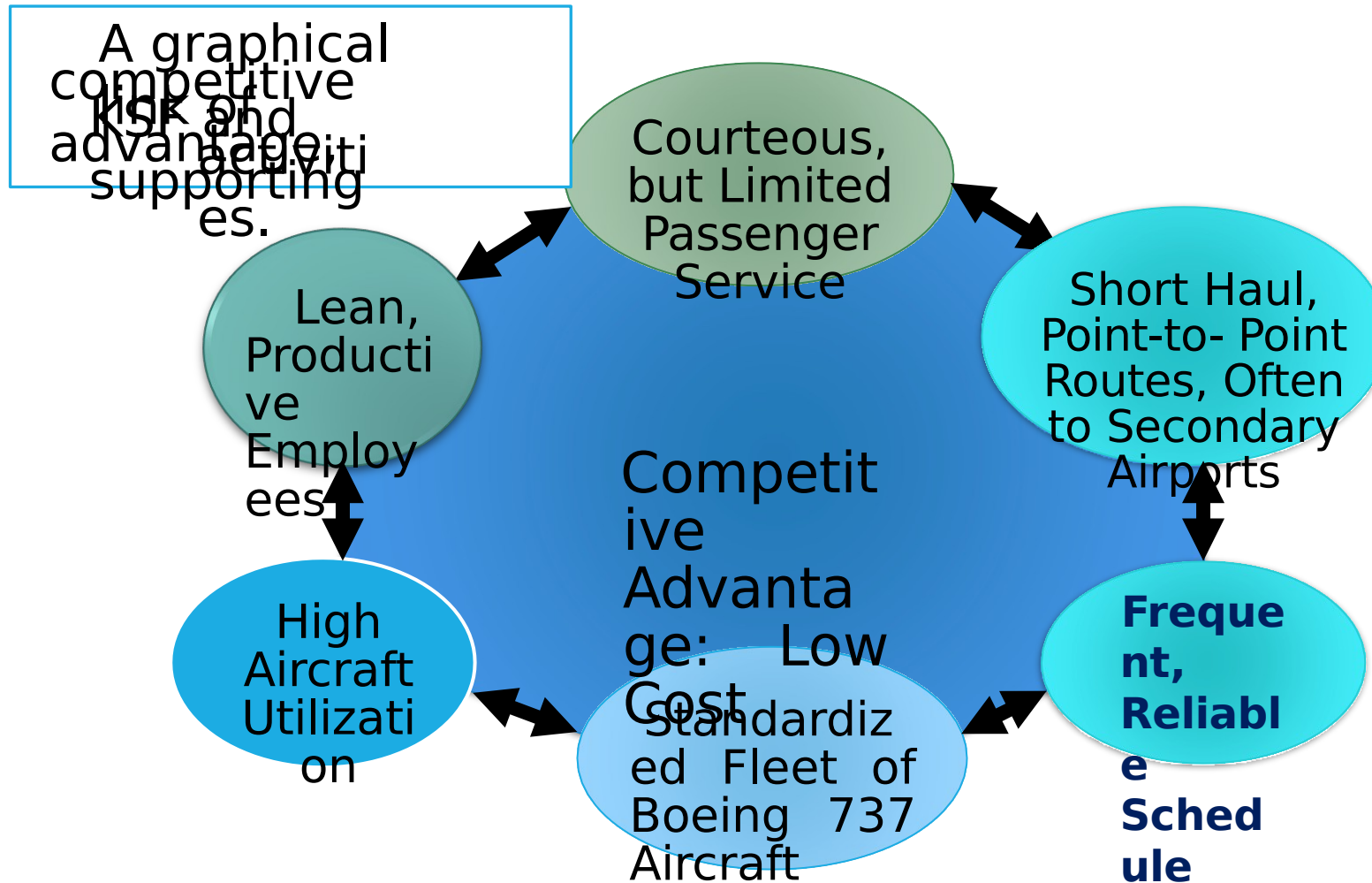
- Identify critical success factors
- Build and staff the organization
- Integrate OM with other activities

The operations manager's job is to implement an OM strategy,
provide competitive advantage, and increase productivity

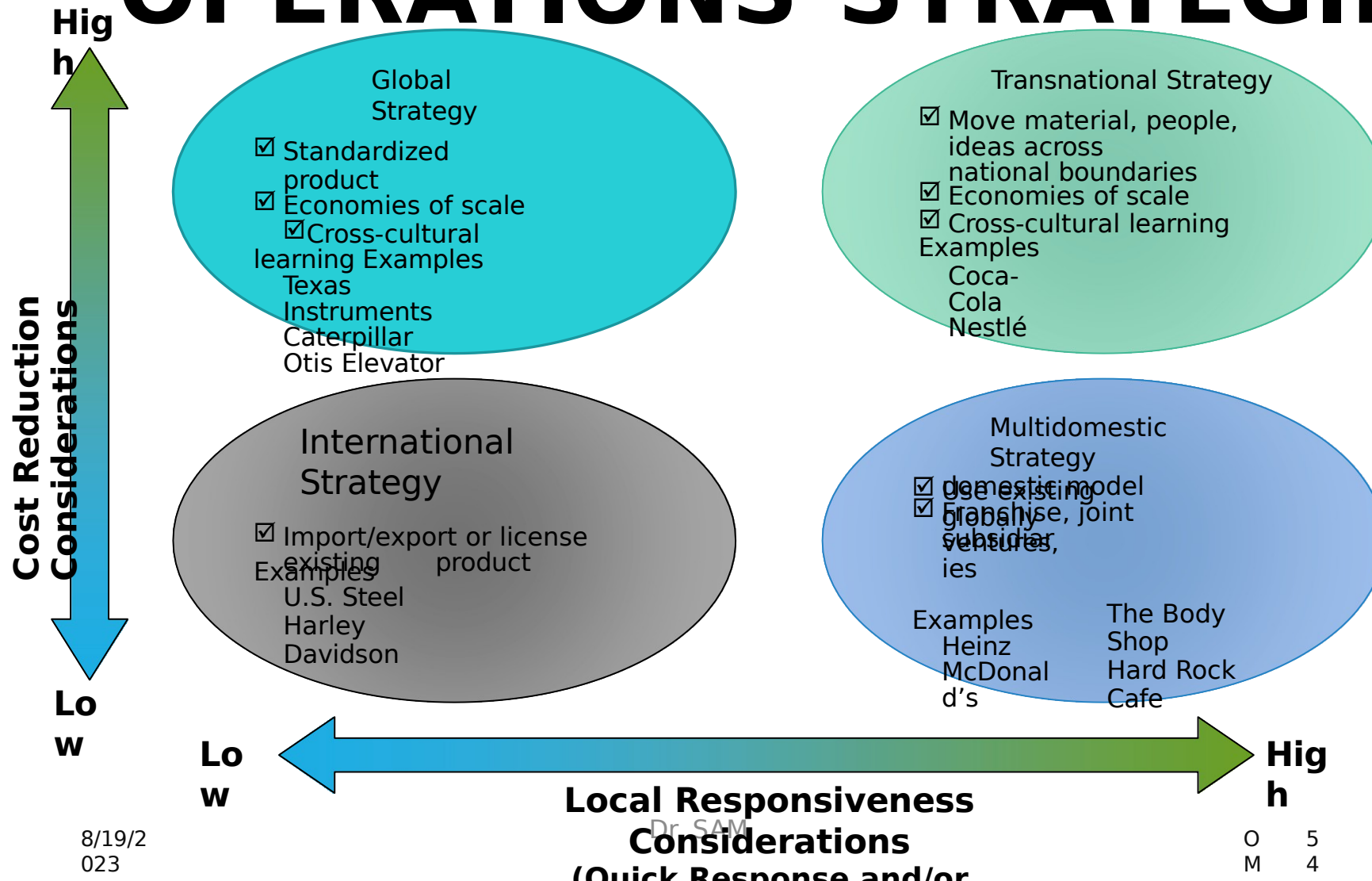
CRITICAL SUCCESS



ACTIVITY MAPPING



FOUR INTERNATIONAL OPERATIONS STRATEGIES



REASONS TO GLOBALIZE

Tangible Reasons



Intangible Reasons

-
1. Reduce costs (labor, taxes, tariffs, etc.)
 2. Improve supply chain
 3. Provide better goods and services
 4. Understand markets
 5. Learn to improve operations
 6. Attract and retain global talent

REDUCE COSTS

- Foreign locations with lower wage rates can lower direct and indirect costs
 - Maquiladoras
 - World Trade Organization (WTO)
 - North American Free Trade Agreement (NAFTA)
 - APEC, SEATO, MERCOSUR
 - European Union (EU)

IMPROVE THE SUPPLY CHAIN

- Locating facilities closer to unique resources
 - Auto design to California
 - Athletic shoe production to China
 - Perfume manufacturing in France

PROVIDE BETTER GOODS AND SERVICES

- Objective and subjective characteristics of services
 - On-time deliveries
 - Cultural variables
 - Improved customer service

goods
and

UNDERSTA ND

■ Interacting with foreign customers and suppliers can lead to new opportunities

MARKETS

- Cell phone design from Europe
- Cell phone fads from Japan
- Extend the product life cycle



LEARN TO IMPROVE OPERATIONS

- Remain open to the free flow of ideas
 - General Motors partnered with a Japanese auto manufacturer to learn
 - Equipment and layout have been improved using Scandinavian ergonomic competence

ATTRACT AND RETAIN GLOBAL TALENT

- Offer better employment opportunities

- Better growth opportunities and unemployment
- Relocate unneeded personnel to
- Incentives for people who like to travel locations

insulation against

more prosperous economies

CULTURAL AND ETHICAL ISSUES

- Cultures can be quite different
- Attitudes can be quite different towards
 - o Punctuality
 - o Lunch breaks
 - o Environment
 - o Intellectual property
 - o Thievery
 - o Bribery
 - o Child labor