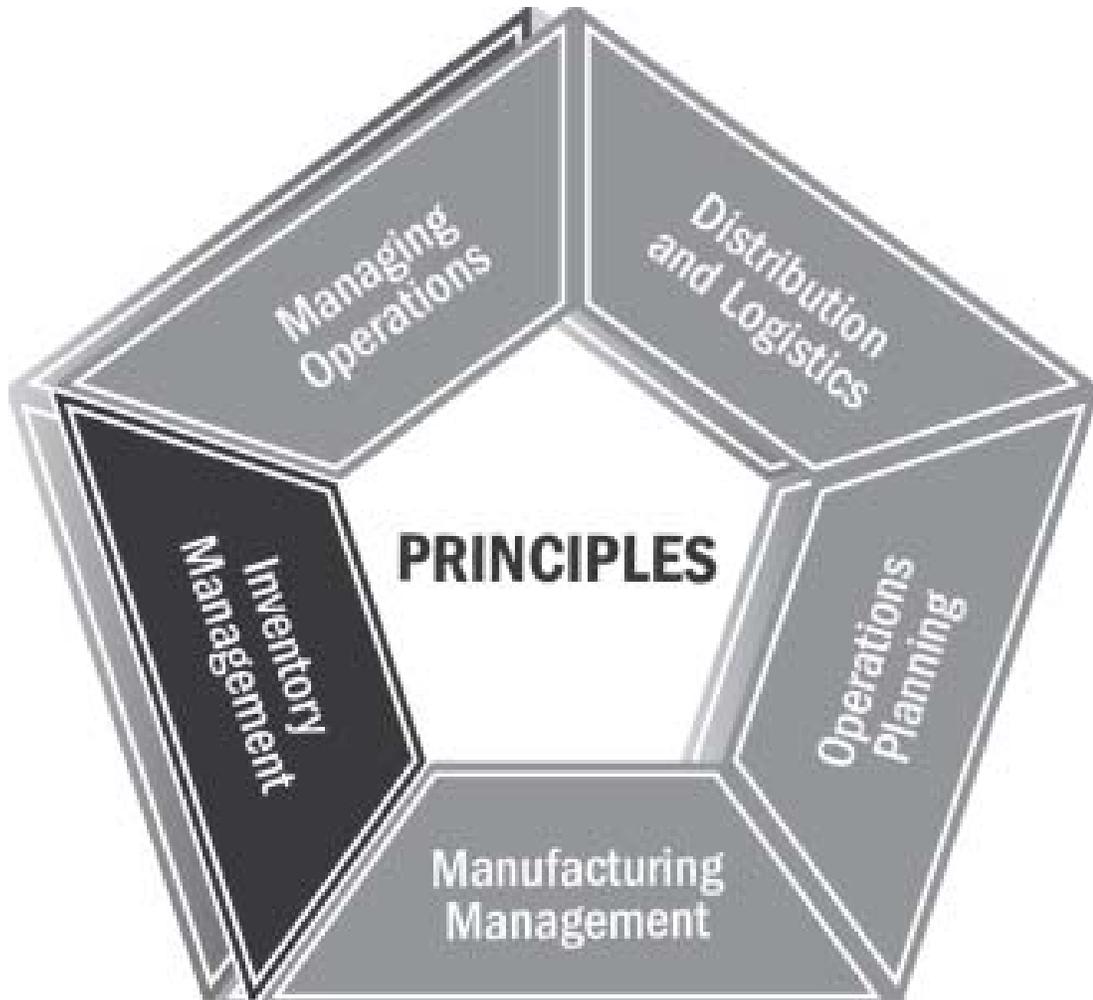


# Session 1

## Operations Management Foundations



## Instructor Guide

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## Principles of Operations Management – Overview



### Principles Program Overview



Visual 1-2



Introduce the *Principles of Operations Management* course of study.

- ◆ Quickly outline the four bullet points describing the benefits of the program.
- ◆ Describe briefly the five courses constituting the program of study found on the participants' workbook page.
- ◆ Remind participants that they are attending the *Principles of Inventory Management* course.

## Principles of Operations Management – Overview



### Principles Program Overview

Welcome to the *Principles of Operations Management* (POM) series of courses.

This program of study has been developed to respond to the needs of new entrants into the field of operations management. This program of study has been specifically designed to provide professionals from all areas of the organization with:

- ◆ a foundational knowledge of the principles and applications of operations management
- ◆ a working knowledge of the concepts, methods, techniques, and vocabulary of operations management
- ◆ an understanding of how operations management impacts the overall goals of the organization
- ◆ an understanding of how the daily functions involved in operations management support the execution of the strategies of the business.

The *Principles of Operations Management* program of study consists of five courses:

**Principles of Inventory Management** provides a functional knowledge and understanding of inventory and purchasing management principles and techniques. The course provides participants with a greater understanding of their roles and responsibilities in the control of inventory and the impact the effective management of inventory and purchasing have on competitive advantage.

**Principles of Operations Planning** imparts a fundamental knowledge and understanding of strategic and tactical planning principles and techniques, including forecasting, sales and operations planning (S&OP), and master scheduling.

**Principles of Manufacturing Management** provides an introduction to manufacturing management, material requirements planning (MRP), capacity management, and production activity control, and lean production management.

**Principles of Distribution and Logistics** introduces the foundations and operations of distribution and logistics management, including channel network design, distribution inventory management, distribution replenishment planning, warehousing, materials handling functions, transportation, and transportation operations.

**Principles of Managing Operations** imparts a fundamental knowledge and understanding of processes and operations, the function of project management, product and process design, quality management, process improvement, and organizational management and performance.

Completion of the five courses will greatly improve participants' knowledge of operations management and enable them to more effectively manage their own functions as well as collaborate with other organizational departments and supply chain business partners. The *Principles of Operations Management* will also provide the foundations for the successful pursuit of APICS' *Certified in Production and Inventory Management* (CPIM) and *Certified Supply Chain Professional* (CSCP) certification programs.

## Principles of Inventory Management – Course Overview



### Course Overview



Visual 1-3



Introduce the content of the *Principles of Inventory Management* course.

- ◆ Inform the participants that there are 11 sessions in the course.
- ◆ Briefly describe each of the sessions as found on the participants' workbook page.

## Principles of Inventory Management – Course Overview



### Course Overview

Welcome to the *Principles of Inventory Management* course. This course is concerned with the concepts and applications necessary for the effective management and control of inventory.

### Course Content

The *Principles of Inventory Management* course consists of 11 sessions briefly described as following:

**Session 1: Operations Management Foundations** introduces the concept and functions of operations management in the manufacturing and distribution environment.

**Session 2: Fundamentals of Inventory Management** introduces the role of inventory management in the organization, basic inventory flows, classes of inventory, and overview of the inventory planning process.

**Session 3: Purpose and Function of Inventory** defines the purpose and functions of inventory, basic issues in inventory management, costing and valuation, and obsolete and excess inventory management.

**Session 4: Inventory Replenishment Management** introduces basic ordering techniques like economic order quantity (EOQ), lot sizing rules, concept of stock replenishment, measuring demand uncertainty, order point concepts, role of safety stock, and time-phased order point.

**Session 5: Additional Inventory Replenishment Techniques and Inventory Performance** introduces ordering with supplier lead time uncertainty, the time phased order point (TPOP), replenishment by class, ABC classification, inventory accuracy, physical inventory, and cycle counting.

### **Session 6: Mid-Term Exam**

**Session 7: Lean Inventory–Theory and Practice** defines the lean philosophy, inventory waste elimination strategies, lean practice techniques, quality management, and continuous improvement.

**Session 8: Fundamentals of Purchasing** defines the purchasing function, objectives of purchasing, and the responsibilities of the purchasing management.

**Session 9: Sourcing Strategies** introduces the principles of effective sourcing, supplier scoring and selection, negotiation and pricing, contracting, and the basics of supplier relationship management (SRM).

**Session 10: Purchase Order Management and Performance Measurement** details the purchase order process, linkage to inventory planning, e-commerce, and PO, supplier, and organizational performance.

### **Session 11: Final Exam**

## Session 1: Operations Management Foundations Overview

### Session Overview



Visual 1-4



Before discussion begins on the principles of inventory and purchasing management, this opening session seeks to provide participants with a broad understanding of the meaning of operations management and how it is used in the management of the business.

- ◆ Begin by explaining how organizations manage their productive resources to bring products and services to the marketplace is critical to their continued growth and competitiveness.
- ◆ Continue by stating that the science of operations management enables managers to keep their organizations focused on providing the highest levels of responsiveness to meet the demands of their customers while continuously shrinking processing costs.
- ◆ State that operations management is applicable to any form of enterprise, be it a complex manufacturing company, a bank, or a restaurant.
- ◆ Conclude by reviewing quickly the critical questions specified on the participants' workbook page that will be discussed in this session on the foundations of operations management.

## Session 1: *Operations Management Foundations Overview*

### Session Overview

How organizations manage their productive resources to bring products and services to the marketplace is critical to their continued growth and competitiveness. The science of operations management enables managers to keep their organizations focused on providing the highest levels of responsiveness to meet the demands of their customers while continuously reducing materials and processing costs. Operations management encompasses the management of both products and services. Operations management is applicable to any form of enterprise, be it a complex manufacturing company, a bank, or a restaurant.

In this opening session, the focus is on providing you with a basic understanding of the content and objectives of operations management. Whether you are a student of accounting, marketing, engineering, manufacturing, or distribution, the effective management of operations will be shown as essential for consistently providing the products, services, and buying experiences that customers simply cannot get from the competition. Finally, an understanding of operations management provides a firm foundation upon which the instructional sessions in this course are built.

The task of this session on operations management is to address such questions as:

- ◆ What is operations management?
- ◆ What are the major business trends affecting the practice of operations management?
- ◆ How has operations management evolved over the past decades?
- ◆ Who are operations managers and what do they do?
- ◆ What value do operations managers provide for the business?
- ◆ How does operations management fit in with other business functions?
- ◆ How does operations management support the firm's business strategy?
- ◆ How can managers leverage operations management to build and sustain competitive advantage?
- ◆ What are the career opportunities in the field of operations management?

## Learning Objectives

Visual 1-5 is a slide titled "Learning Objectives" with a list of seven bullet points. The slide includes a small icon of a person at a computer in the top right corner and the APICS logo in the bottom right corner.

- Define the science and practice of operations management (OM)
- Answer the question why OM should be studied
- Describe how today's business trends are impacting OM
- Discuss the role of operations managers in the management of the organization
- Define the value-added activities performed by OM
- Describe how OM fits into the organization
- Describe the scope of OM functions

Visual 1-5

Visual 1-6 is a slide titled "Learning Objectives (cont.)" with a list of five bullet points. The slide includes a small icon of a person at a computer in the top right corner and the APICS logo in the bottom right corner.

- Describe how OM has changed over the decades
- Outline the role of OM and business strategy
- Identify how OM contributes to business strategy
- Detail the ten strategic decisions of OM
- Identify career opportunities in the field of OM
- Perform an inventory management concepts self-assessment

Visual 1-6



Refer to the learning objectives on Visuals 1-5 and 1-6 and review them with the participants.



Ask participants if they have questions about the objectives or wish to add other topics.



List any additional objectives on a flip chart to be reviewed at the end of the session.

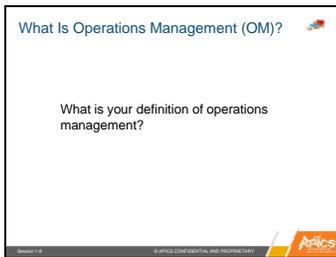
## Learning Objectives

Upon completion of Session 1, you will be able to:

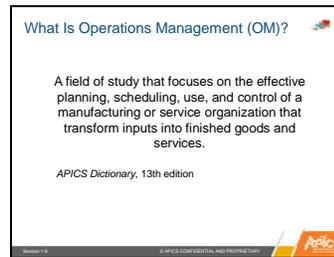
- ◆ define the science and practice of operations management (OM)
- ◆ answer the question why OM should be studied
- ◆ describe how today's business trends are impacting OM
- ◆ discuss the role of operations managers in the management of the organization
- ◆ define the value-added activities performed by OM
- ◆ describe how OM fits into the organization
- ◆ define the scope of OM functions
- ◆ describe how OM has changed over the decades
- ◆ outline the role of OM and business strategy
- ◆ identify how OM contributes to business strategy
- ◆ detail the ten strategic decisions of OM
- ◆ identify career opportunities in the field of OM
- ◆ perform an inventory management concepts self-assessment

## Basics of Operations Management

### What Is Operations Management (OM)?



Visual 1-8



Visual 1-8\*



Define the concept of *operations management* (OM).



◆ Begin the session by asking the participants to define OM.

◆ Once discussion is completed, reveal the definition from the *APICS Dictionary*, 13th edition, found on Visual 1-8\*.



◆ Discuss the *APICS Dictionary* definition. (*Note:* the definition is also found in the *Terms* section of Session 1.)

◆ As you begin to comment on the slide, compare the definition on the slide with the points identified by the participants.

◆ Review the following key points suggested by the operations management definition:

- OM is a field of study that focuses on the planning, scheduling, use, and control of all business functions associated with the manufacture of products and providing services to the customer.
- The output of OM is the sourcing, design, production, and delivery of products and services.
- OM is ultimately responsible for the level of the delivered experience and value determined by the customer.
- The goal of OM is the optimization of the complete chain of product and service processing activities, including cross-boundary and cross-enterprise operations.
- OM applies to non-operations fields such as marketing, finance, and information technology whose role is to assist manufacturing and distribution functions to perform at the highest level of efficiency and responsiveness.

◆ Complete the discussion by pointing out that operations management is a management function like marketing and finance. Inform the participants that operations management is not the same as operations research, industrial engineering, or quality/process improvement. These functions are primarily quantitative methods used in the decision sciences or engineering.

## Basics of Operations Management



### What Is Operations Management (OM)?

At the beginning of this session on the foundations of operations management it might be useful to start by agreeing on a workable definition of *operations management*. How would you define operations management? Write your answer in the lines provided below. Be prepared to discuss your answer in class.

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Record the definition of operations management proposed by the instructor in the class discussion.

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Note that the definition proposed by the instructor views operations management as a function, alongside marketing and finance, rather than just a set of application tools. Often operations management is confused with operations research, industrial engineering, and quality/process improvement. The difference is that operations management is considered a management science, while the others are basically quantitative methods used in the decision sciences or engineering. While operations management will often use the toolsets of operations research or industrial engineering, operations management should be considered a management science concerned with entire systems used in the production and delivery of goods and services.

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## Why Study Operations Management (OM)?



Visual 1-9



There are five important reasons why operations management (OM) should be studied.

- ◆ Begin the discussion by briefly stating why OM should be studied.
  - *Critical function.* Key points to discuss:
    - OM is about how businesses manage the design, production, and distribution of goods and services to the marketplace.
    - Since all organizations either produce tangible products or perform services, they are engaging in OM.
    - In a very real sense, all people in an enterprise are operations managers.
  - *Organizing processes.* Key points to discuss:
    - The role of operations managers is to make decisions about how businesses are organized to perform the information, production, and services activities that best realize the goals and objectives of the organization.
  - *Process performance.* Key points to discuss:
    - OM provides a detailed insight into how products and services are actually created and delivered to the marketplace.
    - Measuring the performance of processes enables managers to assess how well the organization is meeting its business targets and assists them in identifying areas for improvement.
  - *Cost.* Key points to discuss:
    - Managing operations constitutes by far the largest portion of cost expended by the typical organization.
    - Effectively managing a company's costs (efficiencies) while improving its customer service (responsiveness) is a critical function of OM.
  - *Role of OM professionals.* Key points to discuss:
    - Studying OM enables everyone in the organization to understand the role of OM professionals and how OM principles can be applied to their job.
- ◆ Conclude by stating that a well-rounded education in business management would be incomplete without a working knowledge of OM. OM provides managers with knowledge of analytical tools, as well as management concepts, such as supply chain management (SCM), total quality management (TQM), lean, and environmental sustainability, which enables them to solve real-world problems from planning work and productivity targets on the departmental level to managing operations on a global scale.

## Why Study Operations Management (OM)?

Operations management (OM) is studied for the following reasons.

- ◆ *Critical function.* OM is about how businesses manage the design, production, and distribution of goods and services to the marketplace. Since all organizations either produce tangible products or perform services, they are engaging in OM. In a very real sense, all people in an enterprise are operations managers. Some are responsible for producing products or delivering services to the customers. Others, working in marketing, sales, finance, and information technology, are engaged in managing processes that supply internal “customers” with services such as marketing and promotional plans, sales forecasts, budgets, information, and so on.

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- ◆ *Organizing processes.* The role of operations managers is to make decisions about how businesses are organized to perform the information, production, and services activities that best realize the goals and objectives of the organization.

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- ◆ *Process performance.* Knowledge of OM provides a detailed insight into how products and services are actually created and delivered to the marketplace. In addition, measuring the performance of processes enables managers to assess how well the organization is meeting its business targets and assists them in identifying areas for improvement.

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- ◆ *Cost.* Managing operations constitutes by far the largest portion of cost expended by the typical organization. By effectively managing a company’s costs (efficiencies) while improving its customer service (responsiveness), OM can directly contribute to profitability and enhance a company’s value to the marketplace.

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- ◆ *Role of OM professionals.* Studying OM enables everyone in the organization to understand not only what managers responsible for production and service management actually do, but also what concepts and practices from the science of OM can be directly applied to their business function.

Overall, a well-rounded education in business management would be incomplete without a working knowledge of OM. OM provides managers with knowledge of analytical tools, as well as management concepts, such as supply chain management (SCM), total quality management (TQM), lean, and environmental sustainability, which enables them to solve real-world problems from planning work and productivity targets on the departmental level to managing operations on a global scale.

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## What Business Trends Are Impacting OM?



Visual 1-10



Visual 1-10 introduces the first of six business trends that have increased global interest in the importance of operations management (OM).

### I. Rise of the Power of the Customer

- ◆ Begin the discussion by stating that the first trend focuses on the tremendous power that is now in the hands of the customer to determine the direction of products and processes.
- ◆ Discuss each point in detail with the participants.
  - *Demand economy*. Migration from standardized to customized products and services based on the unique, individual wants and needs of customers.
  - *Quality*. An unrelenting dedication to superior quality in products and services is required just to get into the marketplace.
  - *Price*. In the past, producers determined the market price of their goods and services. Today, it is customers who increasingly are gaining control over pricing by establishing what the value of the product or service means to them.
  - *Fulfillment*. With the rise of the Internet, customers now demand order management tools that facilitate self-service, are digitized, provide complex information content, and reduce the time from order entry to actual delivery.
  - *Products*. Customers no longer subscribe to the “one-size-fits-all” mentality of the past. They want products and services capable of being customized to meet their unique needs, including the ability to configure exactly what they want at the time of ordering.
  - *Service*. Customers no longer accept poor service. They look for a superlative buying experience that is instantaneous, flawlessly executed, and highly responsive.
- ◆ Comment on how the rise in the need for superlative customer responsiveness has placed added pressure on operations functions to increase the speed of fulfillment; cut cycle times everywhere in the supply channel from design, to rollout, to delivery; and search for methods to continuously cut costs from all processes (both internal and external to the organization).
- ◆ Have the participants provide examples of globalization they have encountered.

## What Business Trends Are Impacting OM?

The tremendous changes occurring in today's business environment have made the effective management of operations more critical than ever. Visual 1-10 introduces the first of six business trends that have increased global interest in operations management (OM).

### I. Rise of the Power of the Customer

- ◆ *Demand economy.* In the past, producers and distributors determined what products and services were to be offered to the marketplace. Today, business dynamics have changed from a supply to a demand economy. It is the *customer* who now determines what products are to be built; what product attributes, such as quality, reliability, service, and features, are to be included; how products should be marketed and priced; and what ordering and delivery methods should be available. In addition, customers are now bypassing traditional brand loyalties by going on the Internet to locate the exact products and prices they desire from anywhere on the globe.

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- ◆ *Quality.* Superior quality is demanded by the customer. An unrelenting dedication to superior quality in products and services is required just to get into the marketplace.

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- ◆ *Price.* In the past, producers determined the market price of their goods and services. Today, it is customers who are gaining control over pricing by establishing what the value of the product or service means to them. In addition, competitive pricing is increasingly driven by customers using an electronically-enabled global marketplace in their search for low cost, high quality products and services.

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- ◆ *Fulfillment.* With the rise of the Internet, customers now demand order management tools that facilitate self-service, are digitized, provide complex information content, and reduce the time from order entry to actual delivery.

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- ◆ *Products.* Customers no longer subscribe to the "one-size-fits-all" mentality of the past. They want products and services capable of being customized to meet their unique needs, including the ability to configure exactly what they want at the time of ordering. In addition, the use of social media enables customers to drive consensus on the nature of what constitutes superior products to them directly to producers.

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- ◆ *Service.* Customers no longer accept poor service. They look for a superlative buying experience that is instantaneous, flawlessly executed, and highly responsive.

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The magnitude of these demands has placed a heavy burden on businesses to construct operations that meet and continuously enhance customer expectations if they are to retain a competitive advantage. Even small errors in internal or external processes can have extreme consequences in an economy where customers have free access to a worldwide marketplace and are willing to execute their ability to choose alternative suppliers.

## What Business Trends Are Impacting (OM)? (cont.)



Visual 1-11



Visual 1-11 introduces business trends two and three.

### II. Globalization

- ◆ Discuss with the participants the following key elements of globalization:
  - The explosive growth in emerging nations, communications technologies, transportation, and merger of economies has opened up new opportunities for global competition.
  - The global economy has awakened the world's appetite for products and services spawned by local industry and opened opportunities for new markets.
  - The application of new management theories, such as supply chain management, has accelerated the growth of productive processes, access to new resources, and the expansion of core competencies.



- ◆ Have the participants provide examples of globalization they have encountered.



### III. Outsourcing of Channel Structures

- ◆ Discuss with the participants the impact that the trend toward outsourcing has had on operations management.
  - Decline of the traditional vertical organization.
  - Use of outsourcing to locate the best productive competencies from entire operations to detailed processes to minimize internal product development costs, maintain margin targets, and accelerate productive processes and gain access to new skills and resources.
  - As supply channels elongate, companies will need to effectively manage risk.
  - Outsourcing enables companies to explore new markets without incurring the cost.
  - Operations managers must become deeply involved in determining the processes outsourced to partners, the true gains and losses, reduction or increases in risk, and the productive competencies added and lost.



- ◆ Have the participants provide examples of outsourcing they have encountered.

## What Business Trends Are Impacting OM? (cont.)

Visual 1-11 introduces business trends two and three.

### II. Globalization

Globalization is the result of many factors, the most important of which are:

- ◆ The opening of markets in emerging nations, the proliferation of communications technologies, the speed of transportation, and the virtual integration of the world's economies have propelled companies into the global marketplace and have opened new opportunities for global competition.
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- ◆ The general growth of wealth, improved distribution and financial systems, and the ubiquity of Internet-based tools have increased the world's appetite for products and services, spawned the growth of local industries, and provided new opportunities for reaching markets located anywhere on the globe.
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- ◆ The application of new management theories, such as supply chain management, that seek to merge the competencies of companies located anywhere along the supply chain, has accelerated the growth of productive processes and gained access to new skills and resources.
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### III. Outsourcing of Channel Structures

The third trend focuses on the impact on operations management caused by outsourcing processes to supply chain partners. The impact of outsourcing has meant:

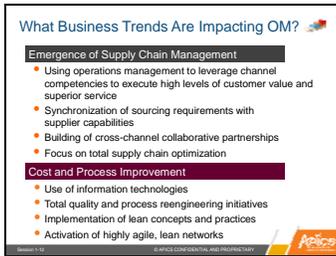
- ◆ Dismantling the vertical enterprise and expanding the use of outsourcing to locate the best core competencies found among business partners arranged along the supply chain to shrink product development, costs, time-to-market processes, and delivery times.
- 

- ◆ Leveraging investments in plant, equipment, and personnel already made by business partners to minimize internal product development costs and maintain margin targets. An additional element is determining the level of risk due to outsourcing to channel partners.
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- ◆ Enabling companies to keep their focus on what they do best instead of wasting energy and money on peripheral processes outside their core competencies.
- 

- ◆ Exploring the growth of new markets by leveraging the presence business partners might already have in a complex or distant business environment.
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## What Business Trends Are Impacting OM? (cont.)



Visual 1-12



Visual 1-12 introduces business trends four and five.

### IV. Emergence of Supply Chain Management (SCM)

- ◆ Discuss with the participants the following key elements of SCM and their impact on operations management (OM).
  - Managing logistics and the supply chain is no longer simply a disconnected backroom function but rather it is today a key driver of competitiveness and profitability.
  - SCM provides the capability for companies to deliver product as quickly and cost effectively as possible by leveraging the capabilities of channel business partners.
  - SCM enables whole supply chains to synchronize their demand requirements with available supply capabilities by constructing cross-channel collaborative partnerships.
  - Logistics and SCM form a single strategy. Logistics provides the operational structure for the realization of SCM strategic objectives.



- ◆ Ask participants what they know about SCM.



### V. Cost and Process Improvement

- ◆ Discuss with the participants the following key elements of cost and process improvement and their impact on OM.
  - Using information technologies to capture process outputs and performance measurements.
  - Implementing total quality management (TQM) and process improvement principles and techniques to drive a culture of continuously evolving quality and the optimization of organizational arrangements and functions.
  - Implementing lean improvement practices that seek to continuously identify and remove waste and redundancy that add cost and time to manufacturing, warehouse, and delivery functions while arranging processes to effectively execute the demand pull.
  - Using operations management toolsets to activate the cost and improvement imperative throughout the supply chain to enable highly agile, lean networks.



- ◆ Ask the participants to list cost and process improvements occurring in their environments.

## What Business Trends Are Impacting OM? (cont.)

Visual 1-12 introduces business trends four and five.

### IV. Emergence of Supply Chain Management (SCM)

The emergence of the concept and practice of SCM has required companies to expand their former definitions of operations management (OM) to include cross-channel operations management. The ability to blend and synchronize processes among supply chain participants is the main pillar of the SCM concept. Among the key points are:

- ◆ Managing logistics and the supply chain is no longer simply a disconnected backroom function but rather it is today a key driver of competitiveness and profitability.

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- ◆ SCM provides the capability for companies to deliver product as quickly and cost effectively as possible by leveraging the capabilities of channel business partners.

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- ◆ SCM enables whole supply chains to synchronize their demand requirements with available supply capabilities by constructing cross-channel collaborative partnerships.

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- ◆ Logistics and SCM form a single strategy. Logistics provides the operational structure for the realization of SCM strategic objectives.

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### V. Cost and Process Improvement

An important business trend is the use of OM concepts and techniques to relentlessly pursue opportunities for cost reduction and continuous improvement. Key points include:

- ◆ Using information technologies to capture process outputs and performance measurements.

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- ◆ Implementing total quality management (TQM) and process improvement principles and techniques to drive a culture of continuously evolving quality and the optimization of organizational arrangements and functions.

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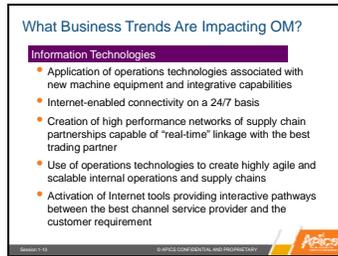
- ◆ Implementing lean practices that seek to continuously identify and eliminate any form of waste and redundancy that adds cost and time to manufacturing, warehousing, and delivery functions while arranging processes to effectively execute the demand pull.

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- ◆ Communicating lean and TQM cost and improvement imperative throughout the supply chain to enable the creation of highly agile, lean networks of business partners.

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## What Business Trends Are Impacting OM? (cont.)



Visual 1-13



Visual 1-13 introduces the sixth and final business trend impacting operations management (OM).

### VI. Information Technologies

- ◆ Discuss with the participants the following key elements of information technologies that are impacting OM.
  - Applying breakthroughs in operations associated with machine technologies, pick and place equipment, quality and performance tools, and use of visibility software that provides a window into the productive statuses of both internal and supply chain partner stakeholders.
  - Using operations management to create high-performance networks of supply chain partnerships and information flows capable of capturing customer requirements for customized product and service solutions and transmitting them in “real time,” digitally to the trading partner best able to respond.
  - Establishing highly agile, scalable internal operations and supply chains capable of being rapidly assembled and reassembled to provide new product development and rollout, flexible manufacturing, distribution, information processes, and fast flow fulfillment before the competition.
  - Activating Internet technologies that provide interactive pathways enabling the allocation of customer fulfillment tasks to specialist channel partners while presenting to the customer the appearance of dealing with a single, seamless enterprise dedicated to total customer service.
- ◆ Start a discussion on how information technology is impacting today’s manufacturing and distribution operations.



## What Business Trends Are Impacting OM? (cont.)

Visual 1-13 introduces the sixth and final business trend impacting operations management (OM).

### VI. Information Technologies

The development of today's integrative information and communications technologies and accompanying growth in cross-channel collaboration has accentuated the need for superlative OM. Information technologies range from computer-based production equipment, such as numerically controlled machine tools, machining centers, and industrial robots, to enterprise business systems such as flexible manufacturing systems (FMS), computer integrated manufacturing (CIM), enterprise resources planning (ERP), and supply chain planning (SCP).

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Key drivers include the following:

- ◆ Applying breakthroughs in operations associated with machine technologies, pick and place equipment, quality and performance tools, and use of visibility software that provides a window into the productive statuses of both internal and supply chain partner stakeholders.  

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- ◆ Using operations management to create high-performance networks of supply chain partnerships and information flows capable of capturing customer requirements for customized product and service solutions and transmitting them in "real time," digitally to the trading partner best able to respond.  

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- ◆ Establishing highly agile, scalable internal operations and supply chains capable of being rapidly assembled and reassembled to provide new product development and rollout, flexible manufacturing, distribution, information processes, and fast flow fulfillment before the competition.  

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- ◆ Activating Internet technologies that provide interactive pathways enabling the allocation of customer fulfillment tasks to specialist channel partners while presenting to the customer the appearance of dealing with a single, seamless enterprise dedicated to total customer service.  

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## What Do Operations Managers Do?

**What Do Operations Managers Do?**

- Operational Role**: Determine how the necessary productive resources and supporting services will be managed to meet business plan objectives
- Value Design**: Design the business's products, services, and processes
- Plan and Control Delivery**: Plan and control the delivery of products and services at each stage from supplier to customer
- Methods and Standards**: Develop the methods and standards defining process performance
- Operations Scheduling**: Organize, identify, and design the sequencing of tasks and assign necessary resources

Visual 1-14

**What Do Operations Managers Do? (cont.)**

- Information Management**: Determine the quantitative techniques and information technology tools to be used in managing enterprise and inter-enterprise processes
- Process Improvement**: Analyze process output data to eliminate errors and gaps and search for improvements
- Cost Management**: Perform ongoing cost and trade-off analysis to optimize processes
- Process Analysis**: Solve process problems by investigating symptoms and causes, performing diagnostics, and implementing solutions

Visual 1-15



Visuals 1-14 and 1-15 discuss the activities performed by operations managers.

- ◆ Begin by stating that operations management is part of the business strategy. Its objective is to manage the company's productive resources efficiently, maximizing the business's responsiveness to the company's planned and actual demand.
- ◆ Quickly introduce the activities performed by operations managers listed on Visuals 1-14 and 1-15. The goal is to provide participants with an understanding of the wide spectrum of business functions performed by operations managers.
  - *Operational role.* Operations managers determine how the productive resources and supporting services of the business will be managed to meet business plan objectives and goals.
  - *Value design.* Operations managers design the products, services, and processes by which the organization gains value and secures competitive advantage.
  - *Plan and control delivery.* Operations managers plan and control the delivery of products and services at each stage in the supply chain from supplier to customer.
  - *Methods and standards.* Operations managers are responsible for the development of the methods and standards defining operations and process performance.
  - *Operations scheduling.* Operations managers organize, identify, design the sequencing of processing tasks, and assign the necessary resources for the efficient production of goods and services.
  - *Information management.* Operations managers determine the quantitative techniques and information technology tools to be used in planning and managing production, inter-enterprise processes, and supply chain processes.
  - *Process improvement.* Operations managers analyze business processes to eliminate wastes, errors, and productivity gaps and to search for improvements.
  - *Cost management.* Operations managers perform ongoing cost management and trade-off analysis to optimize processes, reduce overall costs, and make the right decisions.
  - *Process analysis.* Operations managers solve process problems by investigating symptoms and causes, performing diagnostics, and implementing solutions.

## What Do Operations Managers Do?

Operations managers are responsible for the efficient planning, controlling, analyzing, organizing, directing, and implementing of all enterprise operations. The role of operations managers is divided between planning how operations and processes will best function to attain optimal output results and acting as a problem solver capable of responding effectively to opportunities for growth and change.

In detail, operations managers perform the following functions:

- ◆ *Operational role.* Operations managers determine how the productive resources and supporting services of the business will be managed to meet business plan objectives and goals.

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- ◆ *Value design.* Operations managers design the products, services, and processes by which the organization gains value and secures competitive advantage.

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- ◆ *Plan and control delivery.* Operations managers plan and control the delivery of products and services at each stage in the supply chain from supplier to customer.

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- ◆ *Methods and standards.* Operations managers are responsible for the development of the methods and standards defining operations and process performance.

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- ◆ *Operations scheduling.* Operations managers organize, identify, design the sequencing of processing tasks, and assign the necessary resources for the production of goods and services.

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- ◆ *Information management.* Operations managers determine the quantitative techniques and information technology tools to be used in planning and managing production, inter-enterprise processes, and supply chain processes.

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- ◆ *Process improvement.* Operations managers analyze business processes to eliminate wastes, errors, and productivity gaps and to search for improvements.

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- ◆ *Cost management.* Operations managers perform ongoing cost management and trade-off analysis to optimize processes, reduce overall costs, and make the right decisions.

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- ◆ *Process analysis.* Operations managers solve process problems by investigating symptoms and causes, performing diagnostics, and implementing solutions.

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## What Value-Added Activities Are Performed?



Visual 1-16



Operations management (OM) provides value through several different activities.

- ◆ Begin by stating that OM is about providing value to the customer through the performance of superior manufacturing and services functions.
- ◆ Visual 1-16 lists some of the ways OM is used to add value. Note that some values are added by manufacturing operations and others by service operations.
  - *Manufacturing.* State that this value involves the transformation of materials and components into the assemblies and products that are valued by the customer.
  - *Transportation.* State that this value is concerned with the planning, scheduling, and controlling of the movement of goods and service from where they are stored or located to where they need to be to meet customer requirements. The modes of transportation are truck, air, rail, water, and pipeline.
  - *Distribution.* State that this value encompasses the functions of warehousing, inventory control, materials handling, order administration, site and location analysis, industrial packaging, goods returns, and movement through one or more levels of field warehouses.
  - *Inspection.* State that this value is concerned with measuring, examining, testing, gauging, or validating one or more characteristics of a good or service and comparing the results to a predetermined standard.
  - *Exchange.* State that this value is concerned with assembling the right mix (bundle) of products and services that meet the specific needs of the customer.
  - *Information.* State that this value is concerned with the use of information technologies for collecting, storing, encoding, processing, analyzing, transmitting, receiving, and printing text, audio, or video information.
  - *Improvement.* State that this value is concerned with the use of management philosophies and total quality management (TQM) statistical tools to improve operations so that they are more effective, efficient, and capable of providing superior service to the customer.

## What Value-Added Activities Are Performed?

Operations management (OM) is about providing value to the customer through the performance of superior manufacturing and services functions. Visual 1-16 lists some of the ways OM is used to add value. Note that some values are added by manufacturing operations and others by service operations.

- ◆ *Manufacturing.* This value involves the transformation of materials and components into the assemblies and products that are valued by the customer. Manufacturing operations change the shape or form of materials and components that are input into manufacturing or process-based operations and guide them through to finished goods.

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- ◆ *Transportation.* This value is concerned with the planning, scheduling, and controlling of the movement of goods and service from where they are stored or located to where they need to be to meet customer requirements. The modes of transportation are truck, air, rail, water, and pipeline.

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- ◆ *Distribution.* This value encompasses the functions of warehousing, inventory control, materials handling, order administration, site and location analysis, and industrial packaging. It includes all activities related to physical distribution, as well as the return of goods to the manufacturer. In many cases, this movement is made through one or more levels of field warehouses.

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- ◆ *Inspection.* This value is concerned with measuring, examining, testing, gauging, or validating one or more characteristics of a good or service and comparing the results to a predetermined standard.

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- ◆ *Exchange.* This value is concerned with assembling the right mix (bundle) of products and services that meet the specific needs of the customer.

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- ◆ *Information.* This value is concerned with the use of computers, telecommunications, and other devices for collecting, storing, encoding, processing, analyzing, transmitting, receiving, and printing text, audio, or video information.

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- ◆ *Improvement.* This value is concerned with the use of management philosophies, such as lean and six sigma, and total quality management (TQM) statistical tools, to improve operations so that they are more effective, efficient, and capable of providing superior service to the customer.

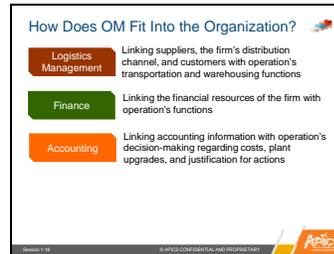
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## How Does OM Fit Into the Organization?



Visual 1-17



Visual 1-18



Operations management (OM) is closely integrated with and is supportive of each of the major functional departments found in a typical organization.

- ◆ Begin the discussion by pointing out the relationship of OM with an organization's departmental functions detailed in Visuals 1-17 and 1-18.
  - *Strategic planning.* Key points to discuss:
    - Discuss how strategic planning provides the business with an identity, a direction, a sense of purpose, and a path to sustainable competitive advantage.
    - Describe how realizing these objectives requires a timely and accurate knowledge of the capabilities of the firm.
    - Conclude by stating that the role of operations management in strategic planning is to build a tight, consistent fit between what the marketplace wants and what the firm can do. It tries to match customer requirements with operational capabilities.
  - *Marketing.* Key points to discuss:
    - Marketing serves the role of intermediary between the customer and the business.
    - Marketing identifies and communicates customer needs and expectations to the rest of the firm.
    - Marketing also seeks to shape the marketplace by developing advertizing that communicates the capabilities of the firm to current and potential customers.
    - OM must translate marketing goals, such as high quality and fast delivery, into specific actions that satisfy customer expectations at the lowest cost.
  - *Design and engineering.* Key points to discuss:
    - Design and engineering are concerned with the process of designing, implementing, maintaining, and continuously improving products and processing functions.
    - Design and engineering affects OM by influencing inventory decisions, shop floor operations processing times and complexity, capacity requirements, and resources needs, including equipment, types of worker skills, types of tools, and amount of resources.
  - *Human resources.* Key points to discuss:
    - This business function is concerned with human capital management: recruiting, training, skills development, evaluation, and control of employees.
    - OM can greatly benefit by linking its requirements with the insights, suggestions, and ideas advanced by its workforce. The people-side of operations must be seen as a critical source of process improvement and increased productivity.

## How Does OM Fit Into the Organization?

Operations management (OM) is closely integrated with and is supportive of each of the major functional departments found in a typical organization. The relationship of OM with an organization's departmental functions is detailed in Visuals 1-17 and 1-18.

- ◆ *Strategic planning.* Strategic planning provides the business with an identity, a direction, and a sense of purpose. The goal of the corporate mission is to create a sustainable competitive advantage. Realizing these objectives require a timely and accurate knowledge of the capabilities of the firm. The corporate mission guides the direction OM must go in order to build a tight, consistent fit between what the marketplace wants and what the firm can do. It tries to match customer requirements with operational capabilities.
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- ◆ *Marketing.* Marketing serves the role of intermediary between the customer and the business. It identifies and communicates customer needs and expectations to the rest of the firm. Marketing also seeks to shape the marketplace by developing advertising that communicates the capabilities of the firm to current and potential customers. OM must translate marketing goals, such as high quality and fast delivery, into specific actions that satisfy customer expectations at the lowest cost.
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- ◆ *Design and engineering.* Design and engineering are concerned with the process of designing, implementing, maintaining, and continuously improving products and processing functions. Design and engineering affect operations management in many ways. Design decisions affect the quantities and types of parts needed for production operations. Design decisions also affect processing times and complexities placed on shop floor operations. Finally, design decisions determine capacity requirements and resource needs, including equipment, type of worker skills, types of tools, and amount of resources.
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- ◆ *Human resources.* This business function is concerned with human capital management: recruiting, training, skills development, evaluation, and control of employees. Operations management can greatly benefit by linking its requirements with the insights, suggestions, and ideas advanced by its workforce. The people-side of operations must be seen as a critical source of process improvement and increased productivity.
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## How Does OM Fit Into the Organization? (cont.)



Visual 1-17



Visual 1-18



Continue discussing how operations management (OM) is closely integrated with and is supportive of each of the major functional departments found in a typical organization.

- *Purchasing.* Key points to discuss:
  - The purchasing function is responsible for identifying the best suppliers and works with them to ensure the reliable supply of goods and services at the highest quality at the lowest cost.
  - Ultimately, the performance of OM, measured by quality levels, lead time, cost, and flexibility, depends on the close integration of OM and purchasing.
  - In a real sense, suppliers perform the role of an external plant, providing OM with additional capacities and expertise.



- *Logistics management.* Key points to discuss:
  - Logistics is concerned with the transportation and storage of inventory within the supply chain.
  - Logistics helps OM by linking suppliers, the firm, the distribution channel, and customers.



- *Finance.* Key points to discuss:
  - This function manages the financial resources of the business.
  - Finance works with OM to determine what funds are necessary to operate the business and how those funds can best be distributed among operations functions.
  - OM assists finance in measuring how effective investment in productive functions has added to the firm's competitive advantage.
  - Finally, finance assists OM to identify financially stable customers and suppliers.



- *Accounting.* Key points to discuss:
  - This function gathers transactional information, such as the movement of inventory on the shop floor or the purchase of materials, and quantifies it.
  - The information is used by OM for reporting, decision making, and cost-benefit analysis.
  - Accounting also helps OM to determine the best structure for the plant's transformation processes, especially the addition of equipment or new technologies.
- ♦ Conclude by stating that OM should be perceived as being tightly integrated to the key business functions discussed above. As such, it would be virtually impossible to think of OM without understanding its role in the context of the total corporate organization.

## How Does OM Fit Into the Organization? (cont.)

Continue discussing how operations management (OM) is closely integrated with and is supportive of each of the major functional departments found in a typical organization.

- ◆ *Purchasing.* The purchasing function is responsible for identifying the best suppliers and works with them to ensure the reliable supply of goods and services at the highest quality at the lowest cost. The goal is to find suppliers who can adequately support and enhance OM's requirements for goods and services. Ultimately, the performance of OM, measured by quality levels, lead time, cost, and flexibility, depends on the close integration of OM and purchasing. In a real sense, suppliers perform the role of an external plant, proving OM with additional capacities and expertise.
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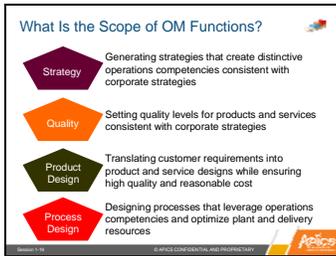
- ◆ *Logistics management.* Logistics is concerned with the transportation and storage of inventory within the supply chain. Logistics helps OM by linking suppliers, the firm, the distribution channel, and customers. Logistics operations provides for the planning, implementation, and control of the efficient, cost-effective flow and storage of goods and related information among the business entities along the supply chain.
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- ◆ *Finance.* This function manages the financial resources of the business. Finance works with OM to determine what funds are necessary to operate the business and how those funds can best be distributed among operations functions. Operations assists finance in measuring how effective investment in productive functions has added to the firm's competitive advantage. Finally, finance assists OM to identify financially stable customers and suppliers.
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- ◆ *Accounting.* This function gathers transactional information performed by OM, such as the movement of inventory on the shop floor or the purchase of materials, and quantifies it. The information gathered, in turn, can be used by OM for reporting, decision making, and cost-benefit analysis. Accounting also helps OM to determine the best structure for the plant's transformation processes, especially the addition of equipment or new technologies. Finally, accounting information assists OM to justify decisions to the rest of the firm.
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In conclusion, OM should be perceived as being tightly integrated to the key business functions discussed above. As such, it would be virtually impossible to think of OM without understanding its role in the context of the total corporate organization.

## What Is the Scope of OM Functions?



Visual 1-19



There are many functions, concepts, and techniques associated with the field of operations management (OM).

- ◆ Begin by stating that the functions of OM detailed in Visuals 1-19, 1-20, and 1-21 can be separated into two areas. The first seven consist of OM functions focused on *designing* a productive system. The final four functions focus on *operating* the productive system.
- ◆ Discuss each of the eleven major OM functions.

- *Strategy*. Key points to discuss:

- OM strategies must be consistent with the corporate strategy. Often, operations provides the *distinctive competence* by which a firm competes in the marketplace.



- *Quality*. Key points to discuss:

- The search for superior quality is at the core of all OM decisions.
- OM quality functions affect product and service design, production process design and factory layout, location of the plant, job design and work activities, supply chain configuration, and manufacturing planning and control.
- OM manages quality through total quality management (TQM) systems, statistical quality control (SQC) techniques, continuous process improvement, and the effective management and activation of human skills and knowledge.



- *Product design*. Key points to discuss:

- The starting point for OM functions is the design of products and services.
- OM must not only meet customer design requirements but also produce designs that are as simple as possible and ensure high quality at a reasonable cost.
- OM must be careful to design products and services in an efficient manner to capitalize on time-to-market objectives.



- *Process design*. Key points to discuss:

- Once the product has been designed to meet strategic and quality objectives, it is the role of OM to effectively design the physical processes for producing the firm's products and providing the firm's services.
- Tasks include designing plant location and layout, determining operator skills and knowledge, determining what equipment will be used, leveraging core and distinctive competencies, determining what planning and control systems will be implemented, and calculating the plant's productive capacities.

## What Is the Scope of OM Functions?

There are many functions, concepts, and techniques associated with the field of operations management (OM) as detailed in Visuals 1-19, 1-20, and 1-21. The first seven (strategy, quality, products and services, processes, facilities, human resources, and project management) consist of OM functions focused on *designing* a productive system. The final four (supply chain management, forecasting, planning and scheduling, and processing) focus on *operating* the productive system.

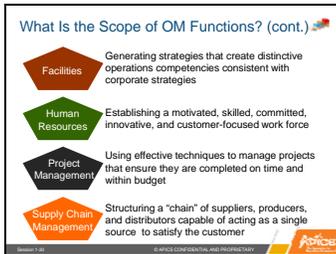
- ◆ *Strategy.* An effective business strategy requires that the corporate vision and strategic plan be converted into a series of consistent, achievable action plans that can be used to direct the entire organization. OM strategies must be consistent with the corporate strategy. Often, operations provides the *distinctive competence* by which a firm competes in the marketplace.

- ◆ *Quality.* The search for superior quality is at the core of all OM decisions. The level of quality a business seeks determines how products are made and services are delivered. OM functions regarding quality affect product and service design, production process design and factory layout, location of the plant, job design and work activities, supply chain configuration, and manufacturing planning and control. OM manages quality through total quality management (TQM) systems, statistical quality control (SQC) techniques, continuous process improvement, and the effective management and activation of human skills and knowledge.

- ◆ *Product design.* The traditional starting point for OM functions is the design of products and services. The design process seeks to convert customer requirements into technical product and service characteristics. It is the responsibility of OM not only to meet customer design requirements but also to produce designs that are as simple as possible and ensure high quality at a reasonable cost. OM must be careful to design products and services in an efficient manner to capitalize on time-to-market objectives.

- ◆ *Process design.* Once the product has been designed to meet strategic and quality objectives, it is the role of OM to effectively design the physical processes for producing the firm's products and providing the firm's services. Among the functions performed by OM are designing plant location and layout, determining operator skills and knowledge, determining what equipment will be used, leveraging core and distinctive competencies, determining what planning and control systems will be implemented, and calculating the plant's productive capacities.

## What Is the Scope of OM Functions? (cont.)



Visual 1-20



Continue discussing the scope of operations management (OM) functions.

- *Facilities*. Key points to discuss:
  - OM is responsible for the location and layout of processes in the firm's production facilities.
  - Effective facilities management relates to how work is to be organized and service delivery processes structured to ensure a smooth flow and reduced cycle times.
  - OM decisions include selecting the type of facility, site selection, and utilization of location analysis techniques.



- *Human resources*. Key points to discuss:
  - OM ensures that jobs are designed to meet the requirements of production and service processes in the most efficient and effective manner possible.
  - Job design encompasses attracting, developing, challenging, and retaining a diverse workforce with the proper skills and competencies for growth.
  - Job design also seeks to involve and empower employees to improve processes and participate in operations.
  - Finally, job design seeks to continuously improve the work environment to enhance employees' well-being, satisfaction, and productivity.



- *Project management*. Key points to discuss:
  - OM must be capable of successfully managing organizational projects.
  - OM must successfully identify and formalize project requirements, address the needs of stakeholders, harness and direct the energy of the project team, and deploy project management tools to balance the competing constraints of project scope, quality, activity scheduling, budgeting, resource allocation, and risk.
  - The goal is to implement new products, services, and processes that increase competitive advantage at the lowest possible cost and trauma to the organization.



- *Supply chain management*. Key points to discuss:
  - Supply chain management (SCM) is associated with the effective management of the flow of goods and services through the supply chain.
  - Activating SCM requires OM to pursue the integration of suppliers, manufacturers, and distributors linked in a supply chain and focused on total responsiveness to customer needs while lowering total supply chain costs.
  - OM is responsible for not only logistics functions but also strategic objectives encompassing the collaboration, cooperation, and communication of all supply chain members.

## What Is the Scope of OM Functions? (cont.)

Continue discussing the scope of operations management (OM) functions.

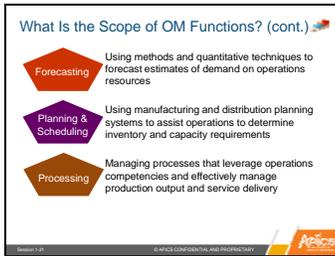
- ◆ *Facilities.* OM is responsible for the location and layout of processes in the firm's production facilities. Effective facilities management relates to how work is to be organized and service delivery processes structured to ensure a smooth flow and reduced cycle times. OM decisions include selecting the type of facility (heavy manufacturing, light industrial, distribution, or retail and service); site selection; and utilization of location analysis techniques.
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- ◆ *Human resources.* It is the role of OM to ensure that jobs are designed to meet the requirements of production and service processes in the most efficient and effective manner possible. Job design encompasses attracting, developing, challenging, and retaining a diverse workforce with the proper skills and competencies for growth. Job design also seeks to involve and empower employees to improve processes and participate in operations. Finally, job design seeks to continuously improve the work environment to enhance employees' well-being, satisfaction, and productivity.
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- ◆ *Project management.* Projects and the need for effective project management occur everywhere in the business. Successfully introducing new products, services, physical assets, and processes into the business, requires project management skills, tools, and techniques. Operations managers must be able to successfully identify and formalize project requirements, address the needs of stakeholders, harness and direct the energy of the project team, and deploy project management tools to balance the competing constraints of project scope, quality, activity scheduling, budgeting, resource allocation, and risk. The goal is to implement new products, services, and processes that increase competitive advantage at the lowest possible cost and trauma to the organization.
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- ◆ *Supply chain management.* A critical boundary-spanning function of OM is supply chain management (SCM). SCM is defined as the management of all activities associated with the flow and transformation of goods and services from the raw materials stage through to the end customer, as well as the associated information flows. Making SCM happen requires OM to pursue the integration of suppliers, manufacturers, and distributors linked in a supply chain and focused on total responsiveness to customer needs while lowering total supply chain costs. OM must be able not only to achieve superlative logistics functions but also strategic objectives requiring the close collaboration, cooperation, and communication among supply chain members to be effective.
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## What Is the Scope of OM Functions? (cont.)



Visual 1-21



Continue discussing the scope of operations management (OM) functions.

- *Forecasting.* Key points to discuss:
  - OM must perform several planning decisions to determine how much to produce, when to produce it, and where to produce it.
  - Normally the responsibility of marketing and customer management, OM plays, however, an essential role in forecast development.
  - OM must review the proposed forecast of customer demand, match it against current and anticipated productive capacities, and contribute to forecast authorization.
  - The authorized forecast then becomes a key input into the planning and scheduling functions performed by OM.



- *Planning and scheduling.* Key points to discuss:
  - OM must make decisions related to the allocation of resource capacities, the acquisition of materials and components for production, and the detailed scheduling of operators and machines to perform the work.
  - Other OM functions performed are allocating the labor and equipment to be used and optimizing productive competencies.
  - OM's tasks also include making macro-capacity decisions, such as the number of plants to operate and the size of those plants.



- *Processing.* Key points to discuss:
  - State that it is the role of OM to effectively manage the physical processes for producing the firm's products and providing the firm's services.
  - OM functions in this area encompass the deployment of MRP-push and lean-pull systems; scheduling, release, and control of released load; sequencing and dispatching activities; managing scheduling conflicts and bottlenecks; order completion; and deploying schedule performance and input/output work center management techniques.

## What Is the Scope of OM Functions? (cont.)

Continue discussing the scope of operations management (OM) functions.

- ◆ *Forecasting.* Once products, services, processes, and supply chains are in place, OM must perform several planning decisions to determine how much to produce, when to produce it, and where to produce it. Normally the responsibility of marketing and customer management, OM plays, however, an essential role in forecast development. OM must review the proposed forecast of customer demand, match it against current and anticipated productive capacities, and contribute to forecast authorization. The authorized forecast then becomes a key input into the planning and scheduling functions performed by OM.
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- ◆ *Planning and scheduling.* Once OM receives the authorized statement of demand, it must make decisions related to the allocation of resource capacities, the acquisition of materials and components for production, and the detailed scheduling of operators and machines to perform the work. Other OM functions performed are allocating the labor and equipment to be used and optimizing productive competencies. OM's tasks also include making macro-capacity decisions, such as the number of plants to operate and the size of those plants.
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- ◆ *Processing.* Once planning and scheduling functions have been completed, it is the role of OM to effectively manage the physical processes for producing the firm's products and providing the firm's services. OM functions in this area encompass the deployment of MRP-push and lean-pull systems; scheduling, release, and control of released load; sequencing and dispatching activities; managing scheduling conflicts and bottlenecks; order completion; and deploying schedule performance and input/output work center management techniques.
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# Operations Management and Business Strategy

## OM – Changing Perspectives



Visual 1-23



The purpose of Visual 1-23 is to introduce to the participants the changing perspectives of operations management (OM).

- ◆ Begin the discussion by pointing out that OM has evolved through four stages during its history. Briefly describe each stage as follows:

- *Stage 1: Production Management.* Key points to discuss:

- OM was concerned only with the management of a company's manufacturing organization.
- OM's primary objective was to optimize the components of productivity: labor, equipment, plant layout, inventory, and capital.
- The role of OM was to determine capacities, devise and execute production schedules, and reduce costs.



- *Stage 2: Operations Management.* Key points to discuss:

- The role of OM was expanded to include indirect manufacturing processes.
- The role also included the addition of supporting services into the concept of operations management.



- *Stage 3: Operations and Process Management.* Key points to discuss:

- The expansion of OM also included all the business processes, including marketing, sales, finance, and information technology.
- The goal was to: (1) apply the methods formerly used only in manufacturing to the whole enterprise; and (2) to use OM methods as an integrative demand and production management approach that sought to merge the plans of each company department into a single unified, customer-facing strategy.



- *Stage 4: Operations and Supply Chain Management.* Key points to discuss:

- This stage represents the current stage of OM.
- The main objective is still the use of OM to manage and direct all internal production, support, and services functions around a common strategy.
- This objective has been expanded by including a company's supply chain partners, both customers and suppliers.

## Operations Management and Business Strategy



### OM – Changing Perspectives

The concepts found in the definition of operations management (OM) discussed previously are the result of an evolutionary process beginning several decades ago. As seen in Visual 1-23, operations management has evolved through four distinct stages.

- ◆ In *stage 1*, termed *Production Management*, OM was concerned only with the management of a company's manufacturing organization. The primary objective in this stage was to optimize the components of productivity: labor, equipment, plant layout, inventory, and capital. In addition, through the use of quantitative methods and information technology tools, the role of OM was to determine capacities, devise and execute production schedules, and reduce costs.

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- ◆ In *stage 2*, termed *Operations Management*, managers became aware that to efficiently execute manufacturing functions, it was critical to expand the concept to include those non-core manufacturing processes that indirectly were responsible for production. In addition, it was realized that companies also sold services, either stand alone or in support of their products, that needed to be enclosed within the operations management concept.

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- ◆ In *stage 3*, termed *Operations and Process Management*, the concept of OM was significantly enlarged to include all business processes, including marketing, sales, finance, and information technology. The expansion was meant to accomplish two tasks: (1) to apply the methods formerly used only in manufacturing to the whole enterprise; and (2) to use OM methods as an integrative demand and production management approach that sought to merge the plans of each company department into a single unified, customer-facing strategy.

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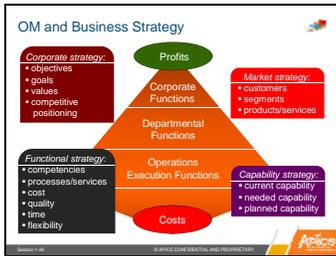
- ◆ *Stage 4*, termed *Operations and Supply Chain Management*, represents the current stage of OM. The main objective is still the use of OM concepts and practices for planning, controlling, integrating, and optimizing all the internal production, support, and services functions of the business around a common strategy. But, this objective has been expanded in this stage to include the productive operations of a company's supply chain partners, both customers and suppliers.

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## OM and Business Strategy



Visual 1-24



Operations management (OM) is a critical component of business strategy.

- ◆ Begin the discussion by discussing the elements of OM and business strategy illustrated in Visual 1-24.

- ◆ State that the role of OM is to coordinate the firm's business strategy with the core competencies found in its corporate, departmental, and operations execution functions.



- ◆ Review the four components of *corporate strategy* detailed in Visual 1-24.

- ◆ Review the three components of *market strategy* detailed in Visual 1-24.

- ◆ State that the output of these two strategies is the definition of the firm's *competitive priorities*.



- ◆ Detail the six *functional strategy* components managed by OM.

- *Competencies*. OM is responsible for building and leveraging the core competencies possessed by the organization's people and physical assets to plan and execute the firm's competitive priorities. Explain *core* and *distinctive competencies*.
- *Processes and services*. OM is responsible for decisions relating to the design of processing and service strategies.
- *Cost*. OM is responsible for determining how operations costs are to be managed that realize cost-competitive strategies, cost-reduction objectives, and plant investment.
- *Quality*. OM is responsible for meeting the quality levels and targets as specified in the firm's competitive priorities.
- *Time*. OM is responsible for executing fast delivery time, on-time delivery, and development-time-to-market strategies to meet competitive priorities.
- *Flexibility*. OM is responsible for designing the firm's operations so that they can react to marketplace and competitive priority changes quickly and efficiently.



- ◆ Summarize the role of OM in assessing, building, and continuously improving on the firm's *capability strategy*.

- Define operations capabilities as the level of competency possessed by the business's workforce and uniqueness of its physical plant and information systems.
- State that OM is responsible for validating the strengths of current capabilities needed to realize the firm's competitive priorities, as well as determining what new capabilities are needed and planning for their acquisition.

- ◆ Summarize the firm's *functional* and *capacity strategies* as defining how the organization's departmental and operations execution functions realize each of the business's competitive priorities.

## OM and Business Strategy

Operations management (OM) is a critical component of business strategy. As illustrated in Visual 1-24, businesses are driven by a corporate strategy which sets the tone and defines the boundaries of the firm's supporting strategies. The role of OM is to coordinate the firm's overall objectives, goals, values, and competitive positioning with the core competencies found in its corporate, departmental, and operations execution functions.

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Based on the corporate strategy, the *market strategy* categorizes the firm's customers, identifies their needs, assesses the strength of competitors, and defines the product and service offerings. These market strategies, in turn, define the business's *competitive priorities*, which are the operating advantages the firm's processes must possess to gain and maintain marketplace leadership. The goal of the firm's *functional* and *capacity strategies* is to ensure the organization's departmental and operations execution functions realize each of the business's competitive priorities.

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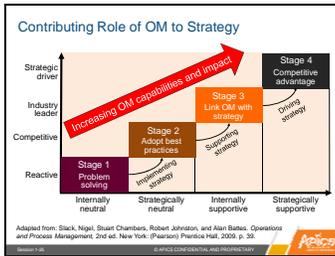
The firm's *functional strategy* is composed of the following components:

- ◆ *Competencies.* OM is responsible for building and leveraging the competencies possessed by the organization's people and physical assets to plan and execute the firm's competitive priorities. A *core competency* is a unique resource and strength possessed by a business. A *distinctive competency* is a unique resource and strength a company enjoys over any of its competitors.
  - ◆ *Processes and services.* OM is responsible for decisions relating to the design of processing and service strategies. Make-to-stock, assemble-to-order, and make-to-order strategies address competitive priorities related to manufacturing. Standardized, assemble-to-order, and customized-service strategies address competitive priorities related to services.
  - ◆ *Cost.* OM is responsible for determining how operations costs are to be managed that realize cost-competitive strategies, cost-reduction objectives, and plant investment.
  - ◆ *Quality.* OM is responsible for meeting the quality levels and targets as specified in the firm's competitive priorities.
  - ◆ *Time.* OM is responsible for executing fast delivery time, on-time delivery, and development-time-to-market strategies to meet competitive priorities.
  - ◆ *Flexibility.* OM is responsible for designing the firm's operations so that they can react to marketplace and competitive priority changes quickly and efficiently.
- 

In managing the functional strategy, OM is also responsible for assessing, building, and continuously improving on the firm's *capability strategy*. Operations capabilities are defined as the level of competency possessed by the business as manifested in the skills, knowledge, and innovativeness of its workforce and uniqueness of its physical plant and information systems. OM is responsible for validating the strengths of current capabilities needed to realize the firm's competitive priorities, as well as determining what new capabilities are needed and planning for their acquisition.

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## Contributing Role of OM to Strategy



Visual 1-25



Operations management (OM) can contribute in several ways to business strategy.

- ◆ Begin by describing the contents of an effective OM strategy. It should:
  - describe how the business's operations and processes contribute to the realization of the corporate strategy.
  - translate the business's *competitive priorities* into detailed performance objectives driving the activities of departmental and operations execution functions.
  - identify the broad decisions that will shape operations and process capabilities.
  - detail how the requirements arising from the competitive priorities are to be reconciled with operations decisions and capabilities.
- ◆ Introduce the Hayes and Wheelwright Four-Stage Model illustrated on Visual 1-25.
- ◆ Review the four stages of the model.
  - *Stage 1: problem solving.* Stage 1 OM has a very limited role in corporate strategy. OM is seen as playing purely a reactive role whose main function is problem solving and executing daily operations. OM is considered by the rest of the organization as *internally neutral*, meaning that it contributes very little, if at all, to competitive advantage.
  - *Stage 2: adopt best practices.* In this stage, OM is a positive supporter of the firm's competitive priorities. By adopting "best practice" concepts and performance norms from similar businesses in its industry, OM moves from a negative to a positive role in meeting *competitive priorities*. Stage 2 OM is considered *strategically neutral*.
  - *Stage 3: link OM with strategy.* In this stage, the strategic goal of OM is to be the very best in the market. OM seeks to build both core and distinctive competencies that are supportive of the business strategy, enabling operations to contribute positively to meeting the firm's competitive priorities. OM is considered as *internally supportive* by providing a credible operations strategy.
  - *Stage 4: competitive advantage.* Today, OM is not only *internally* but also *externally supportive* of the business strategy. Stage 4 OM acts as a strategy driver. It enables businesses to create operations strategies that are creative and proactive. It enables the creation of highly innovative and flexible operations that can rapidly restructure operations functions and quickly and cost effectively design, build, and deliver products and services before the competition.

## Contributing Role of OM to Strategy

What should be the role of an effective operations management (OM) strategy? To begin with, it should describe how the business's operations and processes contribute to the realization of the corporate strategy. Second, it should translate the business's *competitive priorities* into detailed performance objectives driving the activities of departmental and operations execution functions. Third, it should identify the broad decisions that will shape operations and process capabilities. Finally, it should detail how the requirements arising from the competitive priorities are to be reconciled with operations decisions and capabilities.

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A model that can be used to calibrate OM's contribution to a firm's business strategy is the Hayes and Wheelwright Four-Stage Model (Robert H. Hayes and Steven C. Wheelwright. *Restoring Our Competitive Edge*. New York: John Wiley, 1984). As illustrated on Visual 1-25, the model examines four possible roles OM can play in the development of a competitive business strategy.

- ◆ *Stage 1: problem solving.* Stage 1 OM has a very limited role in corporate strategy. OM is seen as playing purely a reactive role whose main function is problem solving and executing daily operations. OM is considered by the rest of the organization as *internally neutral*, meaning that it contributes very little, if at all, to competitive advantage.
  - ◆ *Stage 2: adopt best practices.* In this stage, OM has moved from being simply an operations problem solver to a positive supporter of the firm's competitive priorities. Stage 2 OM seeks to improve its operations and processes by adopting "best practice" concepts and performance norms by matching them with the capabilities of similar businesses in its industry. Despite its positive role in making the organization more competitive, stage 2 OM is considered *strategically neutral*.
  - ◆ *Stage 3: link OM with strategy.* In this stage, the strategic goal of OM is to be clearly and unambiguously the very best in the market. OM in this stage seeks to build both core and distinctive competencies that are supportive of the business strategy, and enabling operations to contribute positively to meeting the firm's competitive priorities. OM is considered as *internally supportive* by providing a credible operations strategy.
  - ◆ *Stage 4: competitive advantage.* In the past, stage 3 OM was considered as defining the boundaries of operations effect on strategic management. Today, the very best companies recognize that OM is not only *internally* but also *externally supportive* of the business strategy. A company with stage 4 OM is one where the operations function provides the foundation for competitive success. Stage 4 OM acts as a strategy driver. It forecasts likely changes in demand and supply, and, over time, it develops the operations-based capabilities that will enable the firm to generate more advanced and complex long-term strategies that will provide it with unassailable competitive advantage. Stage 4 OM enables businesses to create operations strategies that are creative and proactive. It enables the creation of highly innovative and flexible operations that can rapidly restructure operations functions and quickly and cost effectively design, build, and deliver products and services before the competition.
-

## Ten Strategic OM Decisions



Visual 1-26



Operations management (OM) contributes to a business's competitiveness when managers make effective OM decisions.

- ◆ Begin by discussing the ten strategic decisions enabling OM to effectively support business missions and implement strategies detailed in Visuals 1-26 and 1-27.
  - *Product and service design*. Key points to discuss:
    - Decisions in this area affect costs, quality, and human resources.
    - OM goals assist in increasing research and engineering competencies and designing and producing products and services with superior quality and inherent customer value.
  - *Quality*. Key points to discuss:
    - Decisions in this area affect design, manufacturing, and delivery.
    - OM goals help to achieve the quality level that is consistent with the company mission and marketing objectives by paying close attention to design, procurement, production, and field service opportunities.
  - *Process and capacity design*. Key points to discuss:
    - Decisions in this area involve determining solutions to issues, such as plant location, layout, work design, equipment, operator skills information technologies, and maintenance.
    - OM goals assist in determining and designing the production processes that will enable OM to establish the capacities to meet other strategic decisions related to low-cost products, high quality, and human resource development.
  - *Location selection*. Key points to discuss:
    - Decisions in this area involve location factors such as proximity to transportation services, utilities, materials, workforce competencies, taxes, and customers.
    - OM goals are concerned with locating, designing, and building efficient and economical facilities that will yield high value to the company, its employees, and the surrounding community.
  - *Layout design*. Key points to discuss:
    - Decisions in this area consider factors such as the flow of production materials, capacity needs, personnel levels, equipment and information technologies, and inventory requirements.
    - OM goals consist of achieving production effectiveness and efficiency, while supporting a high quality of work life, by leveraging productive skills, innovativeness, and resourcefulness in layout and work methods.

## Ten Strategic OM Decisions

Operations management (OM) contributes to a business's competitiveness when managers make effective OM decisions. Visuals 1-26 and 1-27 detail ten strategic decisions enabling OM to effectively support business missions and implement strategies. The ten decisions are:

- ◆ *Product and service design.* Decisions in this area have an important affect on the operations organization. Issues related to costs, quality, and human resources are often determined by design decisions. OM goals related to this decision area assist in increasing research and engineering competencies and designing and producing products and services with superior quality and inherent customer value.

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  - ◆ *Quality.* Decisions in this area will affect several areas of OM, such as design, manufacturing, and delivery. OM must receive from marketing detailed information regarding customers' quality expectations and then develop the policies and procedures to quantify and achieve quality targets. OM goals related to this decision area assist in achieving the quality level that is consistent with the company mission and marketing objectives by paying close attention to design, procurement, production, and field service opportunities.

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  - ◆ *Process and capacity design.* Decisions in this area involve determining solutions to macro issues, such as plant location and layout, and detail issues, such as the use of production equipment; work design; operator skills; planning, scheduling, and control technologies; and equipment maintenance. These decisions constitute most of a firm's costs and capital commitments. OM goals related to this decision area consist of determining and designing the production processes and equipment that will enable OM to establish the capacities to meet other strategic decisions related to low-cost products, high quality, and human resource development.

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  - ◆ *Location selection.* Decisions in this area involve both strategic and operational objectives. Factors, such as proximity to transportation services, utilities, materials, workforce competencies, taxes, and customers, often have a significant effect on the business's ultimate success. OM goals related to this decision area are concerned with locating, designing, and building efficient and economical facilities that will yield high value to the company, its employees, and the surrounding community.

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  - ◆ *Layout design.* Decisions in this area must consider factors such as the flow of production materials, capacity needs, personnel levels, equipment and information technologies, and inventory requirements. OM must be aware of corporate and marketing objectives that will influence the choice of manufacturing processes options (project, job shop/intermittent, batch, mass, and continuous production). OM goals related to this decision area consist of achieving production effectiveness and efficiency, while supporting a high quality of work life, by leveraging productive skills, innovativeness, and resourcefulness in layout and work methods.
-

## Ten Strategic OM Decisions (cont.)

Ten Strategic OM Decisions (cont.)	
Job design and work measurement	Developing and measuring OM workforce skills, talents, and innovative thinking
Supply chain management	Networking customers and suppliers with OM to promote mutual trust, quality, delivery, and innovation
Inventory	Leveraging inventory to optimize customer satisfaction, supplier capabilities, production schedules, and workforce planning.
Scheduling	Integrating product and service requirements with feasible production and purchasing schedules
Maintenance	Utilizing schedules of preventive maintenance to prevent equipment failure and downtime

Visual 1-27



Continue discussing the ten strategic operations management (OM) decisions.

- *Job design and work measurement.* Key points to discuss:
  - Decisions in this area seek to create a corporate culture that embraces employee development, empowerment, continuing education and training, meaningful work design, and commitment to quality and improvement.
  - OM goals assist in providing a good quality of work life, with well-designed, safe, rewarding jobs, stable employment, and equitable pay in exchange for a committed, creative contribution from personnel at all organizational levels.
- *Supply chain management.* Key points to discuss:
  - Decisions in this area span strategic objectives from developing integrated networks of supply chain partners to tactical objectives governing product and service outsourcing.
  - OM is responsible for engineering supply chains that enhance customer delivery, accessibility, pricing, and other issues while establishing an atmosphere of mutual trust and benefit among supply chain members.
  - OM goals focus on developing collaborative relationships with supply chain partners for the development of innovative products and services through the addition of core competencies that speed product to market and reveal access to new markets.
- *Inventory.* Key points to discuss:
  - Decisions in this area involve optimizing inventory investment everywhere in the supply chain through the pursuit of lean strategies that reduce waste while simultaneously realizing high levels of customer fulfillment.
  - OM goals help to achieve low investment in inventory consistent with high customer service levels and high facility utilization.
- *Scheduling.* Key points to discuss:
  - Decisions in this area involve integrating product and service requirements with feasible production and purchasing schedules.
  - OM goals assist in achieving high levels of product throughput through the plant and the timely delivery of products and services to the customer.
- *Maintenance.* Key points to discuss:
  - Decisions in this area relate to desired levels of productive equipment reliability and stability and reduce failure and downtime.
  - OM goals seek to achieve high levels of plant utilization through effective preventive maintenance and prompt repair of facilities and equipment.

## Ten Strategic OM Decisions (cont.)

Continue discussing the ten strategic operations management (OM) decisions.

- ◆ *Job design and work measurement.* Decisions in this area center on workforce management. Creating a corporate culture that embraces employee development, empowerment, continuing education and training, meaningful work design, and commitment to quality and improvement will have an important effect on the quality of work life. OM goals related to this decision area assist in providing a good quality of work life, with well-designed, safe, rewarding jobs, stable employment, and equitable pay in exchange for committed, creative contribution from personnel at all organizational levels.

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- ◆ *Supply chain management.* Decisions in this area span strategic objectives from developing integrated networks of supply chain partners to tactical objectives governing product and service outsourcing. OM is responsible for engineering supply chains that enhance customer delivery, accessibility, pricing, and other issues while establishing an atmosphere of mutual trust and benefit among the suppliers, producers, distributors, and retailers constituting the supply chain. OM goals related to this decision area focus on developing collaborative relationships with supply chain partners for the development of innovative products and services through the addition of core competencies and resources that speed product to market and reveal access to new markets.

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- ◆ *Inventory.* Decisions in this area involve optimizing inventory investment everywhere in the supply chain through the pursuit of lean strategies that reduce waste while simultaneously realizing high levels of customer fulfillment. Components of OM inventory decisions include the use of inventory ordering systems, production management and scheduling, warehousing, purchasing control, workforce planning, and transportation. OM goals related to this decision area helping to achieve low investment in inventory consistent with high customer service levels and high facility utilization.

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- ◆ *Scheduling.* Decisions in this area involve integrating product and service requirements with feasible production and purchasing schedules. Components of OM scheduling decisions include the selection of shop floor control management systems, developing and training scheduling staffs, and effective job status reporting. OM goals related to this decision area assist in achieving high levels of product throughput through the plant and the timely delivery of products and services to the customer.

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- ◆ *Maintenance.* Decisions in this area relate to desired levels of productive equipment reliability and stability and reduce failure and downtime. An important element is determination of the systems that will be used to plan, execute, and monitor maintenance tasks. OM goals related to this decision area seek to achieve high levels of plant utilization through effective preventive maintenance and prompt repair of facilities and equipment.

## Career Opportunities in OM



Visual 1-28



Discuss with the participants the many career opportunities associated with the science of operations management.

- ◆ Review the list of possible career positions appearing on the participants' workbook page.

## Career Opportunities in OM

A study of operations management opens professionals to many careers in any organization. Among some of the career paths can be found the following:

- ◆ production manager
- ◆ quality manager
- ◆ process engineer
- ◆ materials manager
- ◆ scheduler
- ◆ warehouse manager
- ◆ plant manager
- ◆ logistics and materials planner
- ◆ purchasing manager
- ◆ buyer
- ◆ sourcing analyst
- ◆ transportation manager
- ◆ international logistics manager
- ◆ supply chain manager
- ◆ consultant
- ◆ customer service manager
- ◆ commodity manager
- ◆ technology support manager
- ◆ customer service



# Inventory Management Self-Assessment

## Inventory Management Concepts Self-Assessment



Visual 1-30



Inform the participants that the rest of Session 1 will be concerned with performing a self-assessment of their knowledge of inventory management concepts.

- ◆ Inform the participants that there will be three exercises.
  - The “inventory management terms matching exercise” will test their knowledge of key inventory management terms and functions. Discussion will follow the completion of the exercise.
  - The “order point logic exercise” will provide participants with the opportunity to identify how well they know the components of order point logic.
  - The “performing a cycle count analysis exercise” will provide participants with the opportunity to determine an ABC classification used in the preparation of a firm’s inventory cycle count program.
- ◆ At the conclusion of these exercises, you should have a solid understanding of the depth of the skills and knowledge your participants are bringing to the course. This will assist you in designing a course and level of difficulty that will provide the greatest learning experience for your audience.

## Inventory Management Self-Assessment



### Inventory Management Concepts Self-Assessment

The second part of Session 1 is concerned with you performing a self-assessment of your knowledge of inventory management concepts and practices.

As illustrated in Visual 1-30, there will be three self-assessment exercises.

1. The “inventory management terms matching exercise” will test your knowledge of key terms and functions. Discussion will follow the completion of the exercise.
2. The “order point logic exercise” will provide you with the opportunity to identify how well you know the components of order point logic.
3. The “performing a cycle count analysis exercise” will provide you with the opportunity to determine an ABC classification used in the preparation of a firm’s inventory cycle count program.

Proceed to the next page and listen to the instructor’s instructions.

## Inventory Management Terms Matching Exercise

Inventory Management Terms Matching Exercise

Term	Answer
ABC Classification	
Buffer	
Cycle counting	
Kanban	
Lead time	
Order point	
Order quantity	
Periodic inventory	
Perpetual inventory record	
Safety stock	
Service level	
Two-bin inventory system	

Visual 1-31

Inventory Management Terms Matching Exercise

Answer:

Term	Answer
ABC Classification	d
Buffer	f
Cycle counting	h
Kanban	l
Lead time	j
Order point	g
Order quantity	a
Periodic inventory	e
Perpetual inventory record	c
Safety stock	b
Service level	i
Two-bin inventory system	k

Visual 1-31\*



Discuss the inventory management terms exercise with the participants.



◆ The answers to the exercise are as follows:

Term	Answer
ABC Classification	d
Buffer	f
Cycle counting	h
Kanban	l
Lead time	j
Order point	g
Order quantity	a
Periodic inventory	e
Perpetual inventory record	c
Safety stock	b
Service level	i
Two-bin inventory system	k

## Inventory Management Terms Matching Exercise

The purpose of this exercise is to test your knowledge of key terms used in inventory management that will be covered by this course.

Match the term with the correct description by placing the selection next to the term.

- |                               |                          |  |
|-------------------------------|--------------------------|--|
| 1. ABC classification         | <input type="checkbox"/> | a. The amount of a particular item that is ordered from the plant or a supplier or issued as a standard quantity to the production process.                      |
| 2. Buffer                     | <input type="checkbox"/> | b. A quantity of stock planned to be in inventory to protect against fluctuations in demand or supply.   |
| 3. Cycle counting             | <input type="checkbox"/> | c. A computer or manual document in which each inventory transaction is posted so that a current record of the inventory is maintained.                          |
| 4. Kanban                     | <input type="checkbox"/> | d. A group of items in decreasing order of annual dollar volume (price multiplied by projected volume) or other criteria.  |
| 5. Lead time                  | <input type="checkbox"/> | e. A physical inventory taken at some recurring interval.  |
| 6. Order point                | <input type="checkbox"/> | f. A quantity of materials awaiting further processing.  |
| 7. Order quantity             | <input type="checkbox"/> | g. A set inventory level where, if the total stock on hand plus on order falls to or below that point, action is taken to replenish the stock.                   |
| 8. Periodic inventory         | <input type="checkbox"/> | h. An inventory accuracy audit technique where inventory is counted on a periodic schedule rather than once a year.  |
| 9. Perpetual inventory record | <input type="checkbox"/> | i. A measure of satisfying demand through inventory or by the current production schedule in time to satisfy customers' requested delivery dates and quantities. |
| 10. Safety stock              | <input type="checkbox"/> | j. A span of time required to perform a process (or series of operations).   |
| 11. Service level             | <input type="checkbox"/> | k. A type of fixed-order system in which inventory is carried in some form of container.   |
| 12. Two-bin inventory system  | <input type="checkbox"/> | l. A lean method of managing inventory by using standard containers or lot sizes with a single card attached to each.  |



## Order Point Logic Exercise

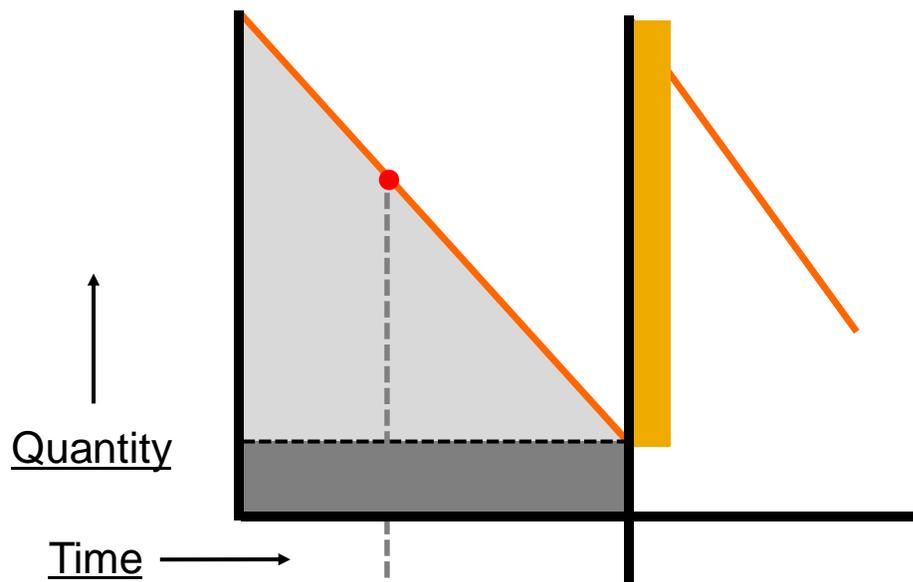
Managing inventory using reorder point logic requires inventory planners to be familiar with how the various components of the method work. As found in the *APICS Dictionary*, 13th edition, the order point is defined as

A set inventory level where, if the total stock on hand plus on order falls to or below that point, action is taken to replenish the stock. The order point is normally calculated as forecasted usage during the replenishment lead time plus safety stock.

A convenient way to understand order point logic is through the use of a *saw-tooth diagram* portrayed below. The vertical line in the diagram represents the *quantity* of a given item. The horizontal line represents *time*.

The exercise requires you to locate the following components of the order point logic on the blank diagram:

- ◆ The order point
- ◆ Demand
- ◆ Inventory
- ◆ Safety stock
- ◆ Replenishment lead time
- ◆ Replenishment inventory order receipt point
- ◆ Replenishment inventory



## Cycle Count Analysis Exercise

Cycle Count Analysis Exercise

Classification	# of Items	Count Frequency	# of Counts
A			
B			
C			
Total Counts			
Workdays per Year			250
Counts per Day			

Visual 1-33

Cycle Count Analysis Exercise

Answer:

Classification	# of Items	Count Frequency	# of Counts
A	1,800	24	45,600
B	3,000	4	12,000
C	5,100	1	5,100
Total Counts			62,700
Workdays per Year			250
Counts per Day			250.8

Visual 1-33\*



Discuss the cycle count exercise with the participants.

- ◆ This exercise is designed to determine participants' knowledge and experience with cycle counting.
- ◆ Some participants may not know anything about cycle counting, so provide a brief review of the technique by discussing the definition from the *APICS Dictionary*, 13th edition, detailed on the participants' workbook page.
- ◆ Review the details specified in the case scenario located on the participants' workbook page.



◆ *Solution:*

The answer is provided on Visual 1-33\*.

## Cycle Count Analysis Exercise

Cycle counting is defined in the *APICS Dictionary*, 13th edition, as

An inventory accuracy audit technique where inventory is counted on a cyclic schedule rather than once a year. A cycle inventory count is usually taken on a regular, defined basis (often more frequently for high-value or fast-moving items and less frequently for low-value or slow-moving items). Most effective cycle counting systems require the counting of a certain number of items every workday with each item counted at a prescribed frequency. The key purpose of cycle counting is to identify items in error, thus triggering research, identification, and elimination of the cause of the errors.

A key element in cycle counting is determining which items need to be counted and, more importantly, how often. As noted in the APICS definition, as the number of transactions on an item increases, the probability of record error increases and the more often the actual balance record needs to be verified. A key way of accomplishing this objective is to stratify items into classes (normally noted as A, B, and C classes) based on the number of transactions they experience. In this way, inventory planners can develop what items are to receive how many inventory balance reviews each year to ensure balance accuracy.

*Exercise:*

ABC Electronics does an ABC analysis of its inventory and calculates that out of its 10,000 stocked items, 1,900 can be classified as A items; 3,000 as B items; and the remainder as C items. Inventory management has decided that the A items are to cycle counted twice a month, B items every three months, and C items once a year. As the new inventory analysts, your job is to use this information to generate a cycle count program. Use the below worksheet to determine the number of counts for each class, the total counts per year, and the total counts per day. (Note: there are 250 work days per year.)

Classification	# of Items	Count Frequency	# of Counts
A			
B			
C			
Total Counts			
Workdays per Year			<b>250</b>
Counts per Day			

## Review, Terms, Discussion Questions, Exercises



### Learning Objectives

Learning Objectives

- Define the science and practice of operations management (OM)
- Answer the question why OM should be studied
- Describe how today's business trends are impacting OM
- Discuss the role of operations managers in the management of the organization
- Define the value-added activities performed by OM
- Describe how OM fits into the organization
- Describe the scope of OM functions

Visual 1-35

Learning Objectives (cont.)

- Describe how OM has changed over the decades
- Outline the role of OM and business strategy
- Identify how OM contributes to business strategy
- Detail the ten strategic decisions of OM
- Identify career opportunities in the field of OM
- Perform an inventory management concepts self-assessment

Visual 1-36



Review the learning objectives with the class.

## Review, Terms, Discussion Questions, Exercises



### Learning Objectives

With the completion of Session 1, you should be able to:

- ◆ define the science and practice of operations management (OM)
- ◆ answer the question why OM should be studied
- ◆ describe how today's business trends are impacting OM
- ◆ discuss the role of operations managers in the management in the organization
- ◆ define the value-added activities performed by OM
- ◆ describe how OM fits into the organization
- ◆ describe the scope of OM functions
- ◆ describe how OM has changed over the decades
- ◆ outline the role of OM and business strategy
- ◆ identify how OM contributes to business strategy
- ◆ detail the ten strategic decisions of OM
- ◆ identify career opportunities in the field of OM
- ◆ perform an inventory management concepts self-assessment

## Terms Check



Visual 1-37



Review the following terms with the participants.

Reinforce the idea that these terms will be used throughout the course.

## Terms Check

Review the following terms that have been discussed during this session.

*Competence*—A strength or attribute possessed by an organization enabling it to perform an activity that enhances its competitiveness.

*Continuous improvement*—The act of making incremental, regular improvements and upgrades to a process or product in the search for excellence.

*Core competencies*—Bundles of skills or knowledge sets that enable a firm to provide the greatest level of value to its customers in a way that is difficult for competitors to emulate and that provides for future growth. Core competencies are embodied in the skills of the workers and in the organization. They are developed through collective learning, communication, and commitment to work across levels and functions in the organization and with the customers and suppliers. For example, a core competency could be the capability of a firm to coordinate and harmonize diverse production skills and multiple technologies. To illustrate, advanced casting processes for making steel require the integration of machine design with sophisticated sensors to track temperature and speed, and the sensors require mathematical modeling of heat transfer. For rapid and effective development of such a process, materials scientists must work closely with machine designers, software engineers, process specialists, and operating personnel. Core competencies are not directly related to the product or market.

*Corporate culture*—The set of important assumptions that members of the company share. It is a system of shared values about what is important and beliefs about how the company works. These common assumptions influence the ways the company operates.

*Cycle counting*—An inventory accuracy audit technique where inventory is counted on a cyclic schedule rather than once a year. A cycle inventory count is usually taken on a regular, defined basis (often more frequently for high-value or fast-moving items and less frequently for low-value or slow-moving items). Most effective cycle counting systems require the counting of a certain number of items every workday with each item counted at a prescribed frequency. The key purpose of cycle counting is to identify items in error, thus triggering research, identification, and elimination of the cause of the errors.

*Design processes*—Processes that focus on the identification of new products and services and the continuous review and enhancement of existing products and services. New products and services arise from several avenues: customer requirements, enhancements to production processes, availability of new materials, presence of technologies, and others. These drivers can also impact existing products and services and require changes to functional specifications and redefinition of fitness for use.

*Distinctive competency*—A sustainable advantage that a company has over its competitors.

*Distributor*—A business that does not manufacture its own products, but purchases and resells these products. Such a business usually maintains a finished goods inventory.

*Employee empowerment*—The practice of giving non-managerial employees the responsibility and the power to make decisions regarding their jobs or tasks. It is associated with the practice of transfer of managerial responsibility to the employee. Empowerment allows the employee to take on responsibility for tasks normally associated with staff

specialists. Examples include allowing the employee to make scheduling, quality, process design, or purchasing decisions.

*Flexibility*—1) The ability of the manufacturing system to respond quickly, in terms of range and time, to external or internal changes. Six different categories of flexibility can be considered: mix flexibility, design changeover flexibility, modification flexibility, volume flexibility, rerouting flexibility, and material flexibility (see each term for a more detailed discussion). In addition, flexibility involves concerns of product flexibility. Flexibility can be useful in coping with various types of uncertainty (regarding mix, volume, and so on). 2) The ability of a supply chain to mitigate, or neutralize, the risks of demand forecast variability, supply continuity variability, cycle time plus lead-time uncertainty, and transit time plus customs-clearance time uncertainty during periods of increasing or diminishing volume.

*Globalization*—The interdependence of economies globally resulting from the growing volume and variety of international transactions in goods, services, and capital, and also from the spread of new technology.

*Information technology*—The technology of computers, telecommunications, and other devices that integrate data, equipment, personnel, and problem-solving methods in planning and controlling business activities. Information technology provides the means for collecting, storing, encoding, processing, analyzing, transmitting, receiving, and printing text, audio, or video information.

*Job design*—The function of describing a job with respect to its content and the methods to be used. Criteria, such as the degree of job specialization, job enrichment, and job enlargement are useful in designing work content.

*Lean*—A philosophy of process management that emphasizes the minimization of the amount of all the resources used in the various activities of the enterprise.

*Logistics*—In an industrial context, the art and science of obtaining, producing, and distributing material and product in the proper place and in proper quantities.

*Operation*—A planned series of actions or operations (e.g., mechanical, electrical, chemical, inspection, test) that advances a material or procedure from one stage of completion to another.

*Operations management*—1) The planning, scheduling, and control of the activities that transform inputs into finished goods and services. 2) A field of study that focuses on the effective planning, scheduling, use, and control of a manufacturing or service organization through the study of concepts from design engineering, industrial engineering, management information systems, quality management, production management, inventory management, accounting, and other functions as they affect the operation.

*Operations research*—1) The development and application of quantitative techniques to the solution of problems. More specifically, theory and methodology in mathematics, statistics, and computing are adapted and applied to the identification, formulation, solution, validation, implementation, and control of decision-making problems. 2) An academic field of study concerned with the development and application of quantitative analysis to the solution of problems faced by management in public and private organizations.

*Outsourcing*—Process of having suppliers provide goods and services that were previously provided internally. Outsourcing involves substitution—the replacement of internal capacity and production by that of the supplier.

*Process*—The performance of any planned work or method associated with an individual machine, process, department, or inspection.

*Process capability*—Refers to the ability of the process to produce parts that conform to (engineering) specifications. Process capability relates to the inherent variability of a process that is in a state of statistical control.

*Process control*—1) The function of maintaining a process within a given range of capability by feedback, correction, and so forth. 2) The monitoring of instrumentation attached to equipment (valves, meters, mixers, liquid, temperature, time, etc.) from a control room to ensure that a high-quality product is being produced to specification.

*Process input*—During the performance of any process, inputs consist of materials components, energy, equipment, and labor that are used during the product or service transformation.

*Process output*—Once a process transformation has been completed, the output is the result. Examples of output would be a finished good or the completion of a service.

*Product*—1) Any good or service produced for sale, barter, or internal use. 2) One of the four Ps (product, price, place, and promotion) that constitute the set of tools for directing the business offering to the customer. The product can be promoted as a distinctive item.

*Quality*—Conformance to requirements or fitness for use. Quality can be defined through five principal approaches: (1) Transcendent quality is an ideal, a condition of excellence. (2) Product-based quality is based on a product attribute. (3) User-based quality is fitness for use. (4) Manufacturing-based quality is conformance to requirements. (5) Value-based quality is the degree of excellence at an acceptable price. Also, quality has two major components: (1) quality of conformance—quality is defined by the absence of defects, and (2) quality of design—quality is measured by the degree of customer satisfaction with a product's characteristics and features.

*Responsiveness*—A dimension of service quality referring to the promptness and helpfulness in providing a service.

*Service*—A non-physical entity, often of knowledge-based content, produced and consumed at the same time.

*Stakeholders*—People with a vested interest in a company, including managers, employees, stockholders, customers, suppliers, and others.

*Statistical process control (SPC)*—The application of statistical techniques to monitor and adjust an operation. Often the term statistical process control is used interchangeably with statistical quality control.

*Statistical quality control (SQC)*—The application of statistical techniques to control quality. Often the term statistical process control is used interchangeably with statistical quality control, although statistical quality control includes acceptance sampling as well as statistical process control.

*Strategy*—The strategy of an enterprise identifies how a company will function in its environment. The strategy specifies how to satisfy customers, how to grow the business, how to compete in its environment, how to manage the organization and develop capabilities within the business, and how to achieve financial objectives.

*Supply chain management (SCM)*—The design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand, and measuring performance globally.

*Total quality management (TQM)*—A term coined to describe Japanese-style management approaches to quality improvement. Since then, total quality management (TQM) has taken on many meanings. Simply put, TQM is a management approach to long-term success through customer satisfaction. TQM is based on the participation of all members of an organization in improving processes, goods, services, and the culture in which they work. The methods for implementing this approach are found in teachings of such quality leaders as Philip B. Crosby, W. Edwards Deming, Armand V. Feigenbaum, Kaoru Ishikawa, J.M. Juran, and Genichi Taguchi.

*Transformation process*—The process of converting inputs into finished goods or services. In a service firm, the input may be a customer.

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## Performance Check – Answers

The following performance check questions are designed to assist the instructor in assessing each participant's understanding of the materials covered during the learning session.

Use of the performance check for this session is at the discretion of the instructor. Since the performance check is not included in the participant manual, the instructor can prepare an end of session performance test by copying the blank tests found in the instructor manual or by printing out the performance review for this session from the instructor CD.

It is optional if you want to return the papers.

### Answers:

1. **b**—Answer *b* is correct. Since all functions in a company are linked by the activities they perform, processes is the best answer.
2. **c**—Answer *c* is correct. When planning processes, managers must consider the capacities and capabilities of materials, equipment, and labor before starting an operation.
3. **c**—Answer *c* is correct. Reference the discussion on page 1-17.
4. **b**—Answer *b* is the best choice of those presented. The other three are correct answers, but they are all much narrower in scope than options *b*.
5. **b**—Answer *b* is correct. Reference the discussion on page 1-25.
6. **d**—Answer *d* is correct. While the other options are all part of a business's core competencies, answer *d* provides the broadest definition.
7. **c**—Answer *c* is correct. Reference the discussion on page 1-37.
8. **b**—Answer *b* is correct. Reference the discussion on page 1-41.
9. **d**—Answer *d* is correct. Flexibility enables companies to rapidly reorganize and deploy productive processes.
10. **a**— Answer *a* is correct. Reference the discussion on page 1-43.

## Performance Check

Name: \_\_\_\_\_ Date: \_\_\_/\_\_\_/20\_\_ Score: \_\_\_\_\_

Select the one best answer to each of the following questions.

1. Regardless of how departments like marketing, sales, finance, accounting, and engineering function in an organization, they are all linked together through:
  - a. Management
  - b. Processes
  - c. Customers
  - d. Organization chart
  
2. Which is a true statement about operations management?
  - a. It is primarily concerned with the application of quantitative methods.
  - b. It is primarily concerned with production management.
  - c. It considers materials, capital, and equipment and human resources as critical inputs.
  - d. It considers finished goods as a critical input.
  
3. Which of the following business trends has been driven by the dismantling of the vertical enterprise?
  - a. Globalization.
  - b. Rise of supply chain management (SCM)
  - c. Outsourcing of channel structures.
  - d. Cost and process improvement.
  
4. Which of the following best describes how operations management can be made more effective?
  - a. Search for cost reduction focused directly on manufacturing
  - b. Coordinating all activities related to operations directly or indirectly, both within and outside the organization
  - c. Coordinating operations with other functional areas that impact operations
  - d. Applying the optimal quantitative model to improve productivity
  
5. Which of the following value-added activities of operations management is concerned with assembling the right mix of products and services that meet the specific needs of the customer?
  - a. Manufacturing
  - b. Exchange
  - c. Distribution
  - d. Improvement

## Performance Check (cont.)

6. A company's core competencies can be described as
  - a. The ability to design and rollout unique products and services
  - b. Those delivery attributes assigned to specific supply chain partners
  - c. The ability to produce products before the competition
  - d. The unique resources and competencies possessed by a company to gain a competitive advantage
  
7. In which historical stage of operations management did businesses expand operation management to include all business processes?
  - a. Stage 1 – production management
  - b. Stage 2 – operations management
  - c. Stage 3 – operations and process management
  - d. Stage 4 – operations and supply chain management
  
8. An operations management function that is described as being *strategically neutral* would best be described by which of the following organizational types?
  - a. Type 1 – problem solving
  - b. Type 2 – best practices
  - c. Type 3 – strategic OM
  - d. Type 4 – operations management as a competitive advantage
  
9. A company's ability to reconfigure processes to meet diverse types of customer needs would be best described by
  - a. Delivery speed
  - b. Variety
  - c. Quality
  - d. Flexibility
  
10. The operations management decision that has increasing research and engineering competencies has a strategic goal would be which of the following?
  - a. Product and service design
  - b. Quality
  - c. Process and capacity design
  - d. Scheduling

## Discussion Questions



### 1. Why is it important to study operations management?

Operations management is about how businesses manage the design, production, and distribution of goods and services to the marketplace. Since all organizations either produce tangible products or perform services, they are engaging in operations management. In a very real sense, all people in an enterprise are operations managers. Some are responsible for producing products or delivering services to their customers; others working in marketing, sales, finance, and information technology are engaged in managing processes that supply internal “customers” with services such as marketing and promotional plans, sales forecasts, budgets, information, and so on.

The role of operations managers is to make decisions about how businesses are organized to perform the information, production, and services processes that best realize the goals and objectives of the organization. Knowledge of operations management provides a detailed insight into how products and services are actually created and delivered to the marketplace. By effectively managing a company’s costs (efficiencies) while improving its customer service (responsiveness), operations management can directly contribute to profitability and enhance a company’s value to the marketplace. Studying operations management will assist everyone in the organization to understand not only what those managers responsible for production and service management actually do, but also what concepts and practices from the science of operations management can be directly applied to their business function.

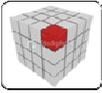
### 2. Define operations management.

While many definitions exist, they all center on operations management as a management method encompassing the design, operation, and improvement of systems that produce and deliver an enterprise’s products and services. Operations management can be defined as the systematic direction of the processes involved in the sourcing, production, and delivery of products and services. The concepts apply to the complete chain of activities in the production and delivery of products and services, including those that cross commercial and geographical boundaries. These concepts are applicable to non-operations fields such as marketing, finance, and information technology.

The key points in this definition of operations management can be detailed as follows:

- ◆ It is concerned with the *systematic direction* of processes.
- ◆ The output is the *sourcing, production, and delivery of products and services*.
- ◆ It is ultimately responsible for the level of the delivered experience and value determined by the customer.
- ◆ Its goal is the optimization of the *complete chain* of product and service processing activities, including cross-boundary and cross-enterprise operations.
- ◆ It applies to *non-operations fields such as marketing, finance, and information technology* whose role is to assist manufacturing or distribution functions to perform at the highest level of efficiency and responsiveness.

## Discussion Questions (cont.)



3. What impact has supply chain management had on operations management?

Changes in competition driven by the power of the customer, globalization, technology, and a focus on cost containment and reduction have forced companies to look beyond the planning and control of internal business processes to include the channel of suppliers that provide the materials and services for the firm's transformation processes and the channel of customers that will receive the company's products and services. The importance of supply chain management resides in the view that companies today are no longer isolated players in a struggle for competitive survival, but are actually part of marketplace "ecosystems" composed of tiers of supporting suppliers who depend on each other to survive, prosper, and grow.

The role of operations managers in this environment is to integrate all the business processes of all channel members as if they were functioning as a single virtual company. This mission of supply chain management at this level is focused on synchronizing both the strategic, as well as the day-to-day operations activities of a firm, with those of channel partners in an effort to realize the optimization of joint processes for product design, rollout, manufacture, delivery, and financial settlement.

4. The functional strategies managed by operations management are:

- ◆ *Competencies.* OM is responsible for building and leveraging the competencies possessed by the organization's people and physical assets to plan and execute the firm's competitive priorities. A *core competency* is a unique resource and strength possessed by a business. A *distinctive competency* is a unique resource and strength a company enjoys over any of its competitors.
- ◆ *Processes and services.* OM is responsible for decisions relating to the design of processing and service strategies. Make-to-stock, assemble-to-order, and make-to-order strategies address competitive priorities related to manufacturing. Standardized, assemble-to-order, and customized-service strategies address competitive priorities related to services.
- ◆ *Cost.* OM is responsible for determining how operations costs are to be managed that realize cost-competitive strategies, cost-reduction objectives, and plant investment.
- ◆ *Quality.* OM is responsible for meeting the quality levels and targets as specified in the firm's competitive priorities.
- ◆ *Time.* OM is responsible for executing fast delivery time, on-time delivery, and development-time-to-market strategies to meet competitive priorities.
- ◆ *Flexibility.* OM is responsible for designing the firm's operations so that they can react to marketplace and competitive priority changes quickly and efficiently.





## Suggested Additional Readings

*APICS Dictionary*, 13th ed., 2011.

*APICS Operations Management Body of Knowledge Framework*. APICS The Association for Operations Management, 2009.

*APICS Strategic Management of Resources References Sourcebook*. Upper Saddle River, NJ: Pearson Custom Publishing, 2009.

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Sheffi, Yossi. *The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage*. Cambridge, MA: The MIT Press, 2007.

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Thompson, Arthur A., A.J. Strickland, and John E. Gamble. *Crafting and Executing Strategy*. 15<sup>th</sup> ed., New York: McGraw-Hill, 2007.

Womack, James P. and Daniel T. Jones. *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York: Simon & Schuster, 1996.

Womack, James P. and Daniel T. Jones. *Lean Solutions: How Companies and Customers Can Create Value and Wealth Together*. New York: Free Press, 2005.

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