

A photograph of an industrial facility, likely a refinery or chemical plant, featuring several tall, white, cylindrical towers and large, white, corrugated storage tanks. The facility is set against a clear blue sky with some light clouds. The towers are connected by a complex network of pipes and metal walkways. The storage tanks are arranged in a row in the foreground.

Introduction to Production Management

Lecture 1



Definition of Production Management

Part 1

Management of Production

- The decisive key factor in a **successful business activity** is production and its results. It is affected by various macroeconomic factors, such as changes in ownership, financial and tax policy, foreign economic relations, monetary issues, legislation, and business activity.
- Production activity is an important component of the business unit, while the **production itself is the material basis of business prosperity and top-quality products....** a decisive factor in commercial success.
- **A very important part of business management is production management.**
- Production management must make a decisive contribution to business development, not in isolation, but **as an organic part of corporate management.**
- It follows from the given systemic understanding that production management must, in addition to the usual direction of production, **ensure primarily the development of production.** This means **developing** the
 - production base,
 - product quality,
 - other production activities
 - strategic development of production.

Operations Management

- Operations management (OM) is the business function that plans, organizes, coordinates, and controls the resources needed to produce a company's goods and services.
- Operations management is a management function. It involves managing people, equipment, technology, information, and many other resources. Operations management is the central core function of every company.
- This is valid whether the company is
 - large or small,
 - provides a physical good or a service,
 - is for-profit or non-profit.
- Every company has an operations management function.
- All the other organizational functions are there primarily to **support the operations function**. **Without operations, there would be no goods to sell or services to deliver.**
- The marketing function provides promotions for the merchandise, and the finance function provides the needed capital. It is the operations function, however, that **plans and coordinates all the resources needed to design, produce, and deliver the merchandise to the various retail locations.**

Interdisciplinary character

- The specific position of production management is that
 - on the one hand ...the development of business in production relies on knowledge of marketing, financial management, personnel management, and other special managerial analyzes,
 - on the other hand... production management influences other functional types of management (e.g. innovative, technical, investment, personnel, etc.).
- This **mutual penetration** is beneficial for all managerial activities.
- According to the mentioned relations, production management is a **synergistic subject**, which includes the results and knowledge of the mentioned disciplines.
- Production management does not replace other subjects, but **rather builds on their results and conclusions**, which it then uses in the creation of product development programs and effective production.
- Production management is **interdisciplinary** because it uses knowledge from economics, psychology, sociology, human resources, informatics, computer science, heuristics, marketing and financial analysis, and other disciplines and knowledge and PRACTICE - strong influence on management.
- The subject of management discipline has not been harmonized yet in terms of terminology or content. There are different opinions among scholars.

Management as ...a science?

- Management **is not an exact science**, like other scientific disciplines, but it contains a share of art significantly tied to a person - a manager, into whose management activities science is increasingly penetrating. Ideas about the relationship between science and art in management vary according to the authors.
- Management as a young science belongs to the **social sciences**.
- It is based on the knowledge of several scientific disciplines, which it applies and develops to management conditions.
- The term **management** has various meanings, the most commonly used are:
 - Management, as a **practical activity**, is a type of work or system of activities that managers perform to achieve a goal.
 - management as a **theory or scientific discipline**, management as a scientific department or scientific discipline is an accumulated and logically arranged set of knowledge about management principles, methods, and procedures, developed on the basis of abstraction and empiricism and which can be taught and taught
 - management as a **special group of people**, the term management is also used to refer to a group of people whose mission is to perform managerial functions.

Management as proces

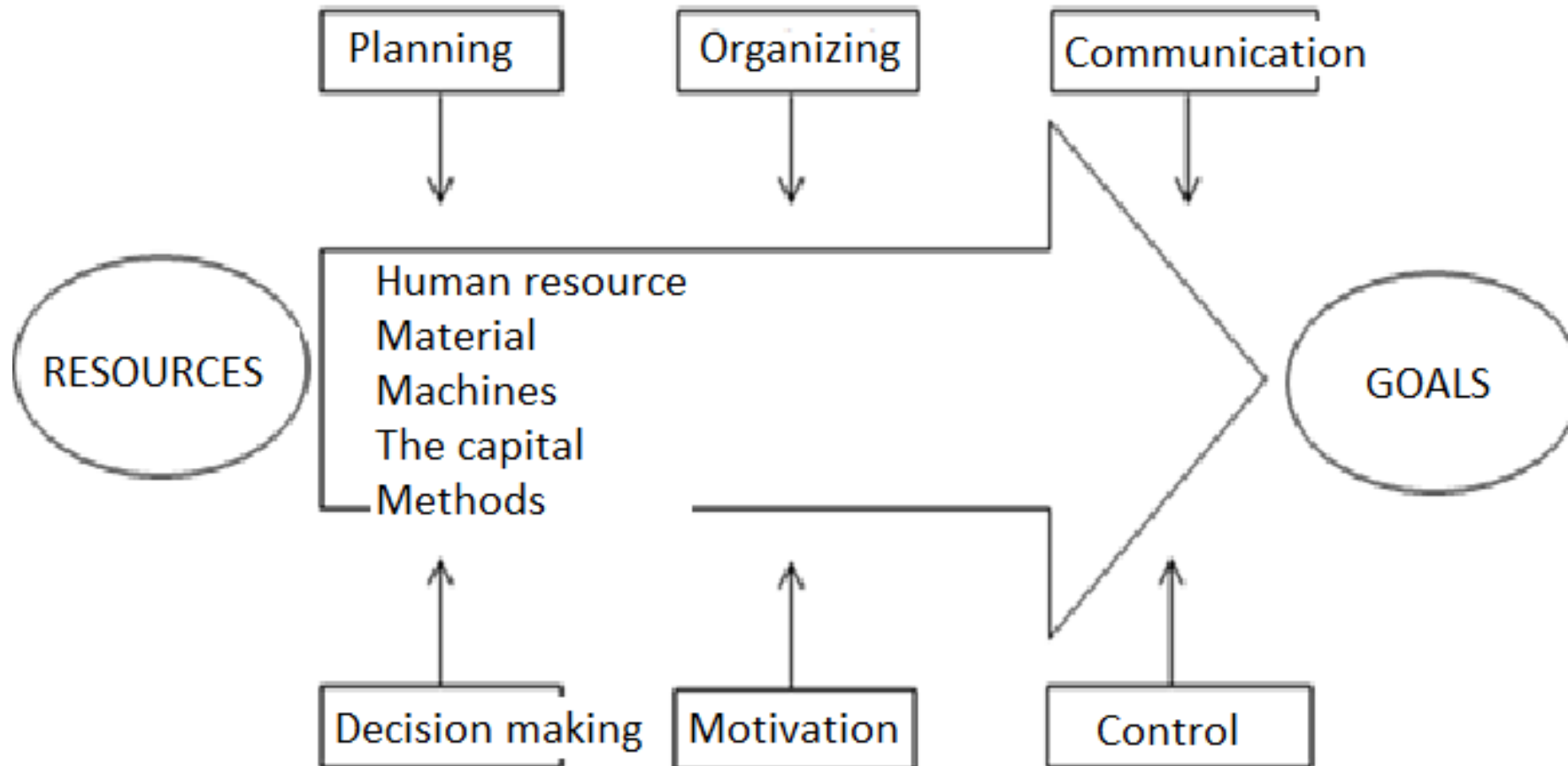
- At a factory, the **transformation is the physical change of raw materials into products**, such as
 - transforming leather and rubber into sneakers, denim into jeans, or plastic into toys.
 - At an airline, it is the efficient movement of passengers and their luggage from one location to another.
 - At a hospital, it is organizing resources such as doctors, medical procedures, and medications to transform sick people into healthy ones.
- Most professional sources generally **define management as the process of planning, organizing, staffing, leading people, controlling and using all resources to determine and achieve the goals of a business entity**.
- In connection with the management, the term **process means the systematic implementation of all its activities (functions)**.
- When management uses the necessary resources (human, information, financial, economic, etc.) their limitation and effective evaluation must be considered!!!!
- The basic content of production management is **based on the needs of a market-oriented business economy**, in which the main emphasis is placed on value, economic, personnel, marketing, and scientific and technical aspects of production management.



The role of operations management

- The role of operations management is to transform a company's inputs into finished goods or services.
- Inputs include human resources (such as workers and managers), facilities and processes (such as buildings and equipment), as well as materials, technology, and information.
- Outputs are the goods and services a company produces.

Management as a process



Functions and responsibilities of production management

- Opinions on the classification of managerial functions **are inconsistent**.
- Harald Koontz and Heinz Weihrich divide the activities (functions) that the manager uses: **planning, organizing, staffing, people management, and control**.
- **1. Planning** is the process in which the manager shapes the goal and ways to achieve it. The decisive means in the planning process are goals, strategies, plans, and policy. According to the time and content, there are:
 - strategic planning,
 - tactical planning,
 - operational planning.
- **2. Organizing** is the process of purposefully arranging the basic production elements in the production processes of the industry and the interrelationships between the individual elements and industries within the business unit in fulfilling the set tasks and goals. The form of securing the given tasks is organizational structures, which can be formal and informal.

Functions and responsibilities of production management

- **3. Staffing** is the process of staffing and securing sub-activities, such as planning, organizing, selecting suitable staff, upgrading or retraining staff, appraising staff and remunerating staff. Managing the development of the personnel structure is an integral part of the strategy of every business unit.
- **4. HR management** and coordination are considered to be the core work of managers at all levels. This content is interpreted as the ability to lead, guide, stimulate and motivate employees to quality goals.
- **5. Control** is the process of monitoring, analysis and adoption of conclusions. The managerial control emphasizes mainly the analytical nature of the measures before the regressive nature. The control process distinguishes five phases:
 - obtaining and selecting information,
 - verification of the accuracy of the initial information,
 - critical evaluation of all controlled phenomena and processes,
 - proposals for measures
 - feedback (control of the implementation of the proposed measures).

In practice, three types of control are used:



preventive control - is focused on detecting quantitative and qualitative deviations of the resources used in comparison with the standard.

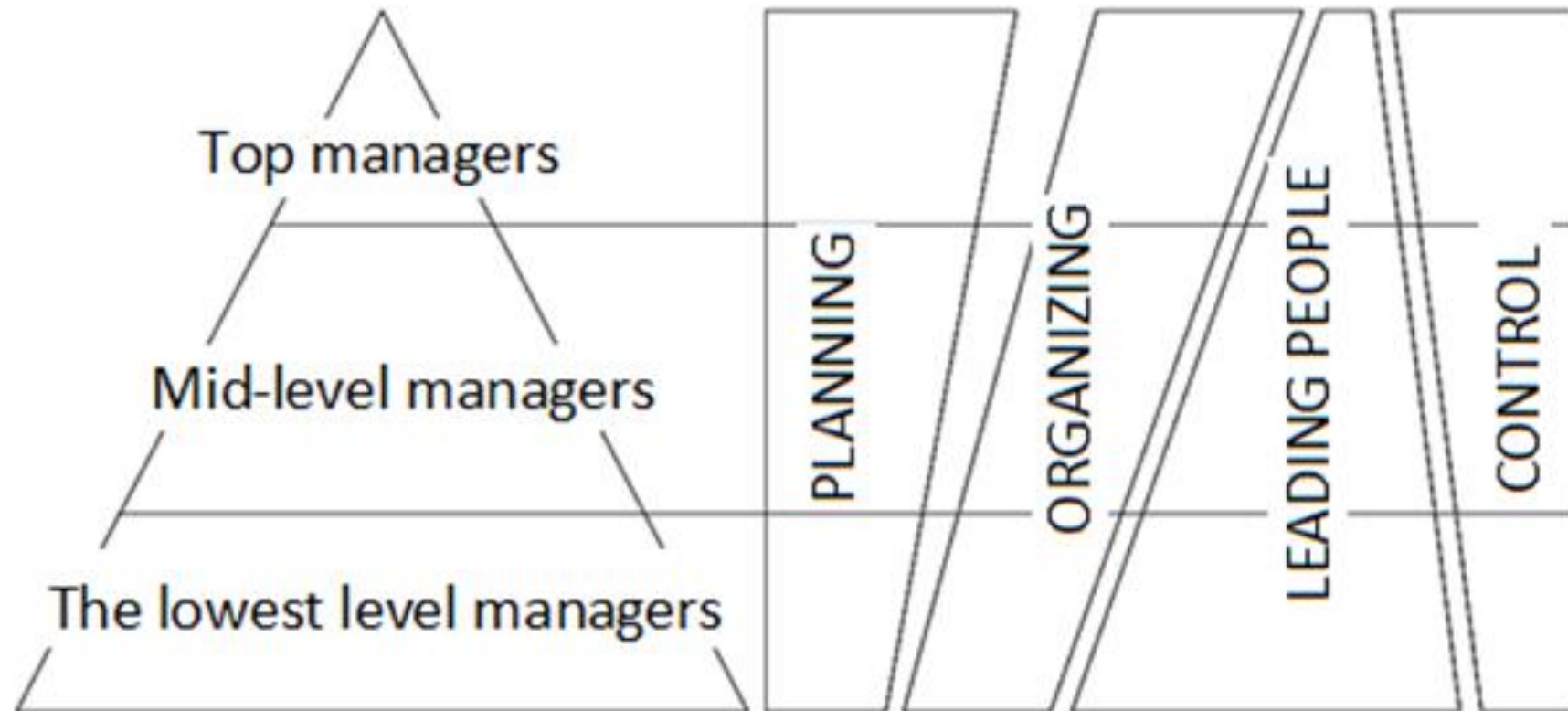


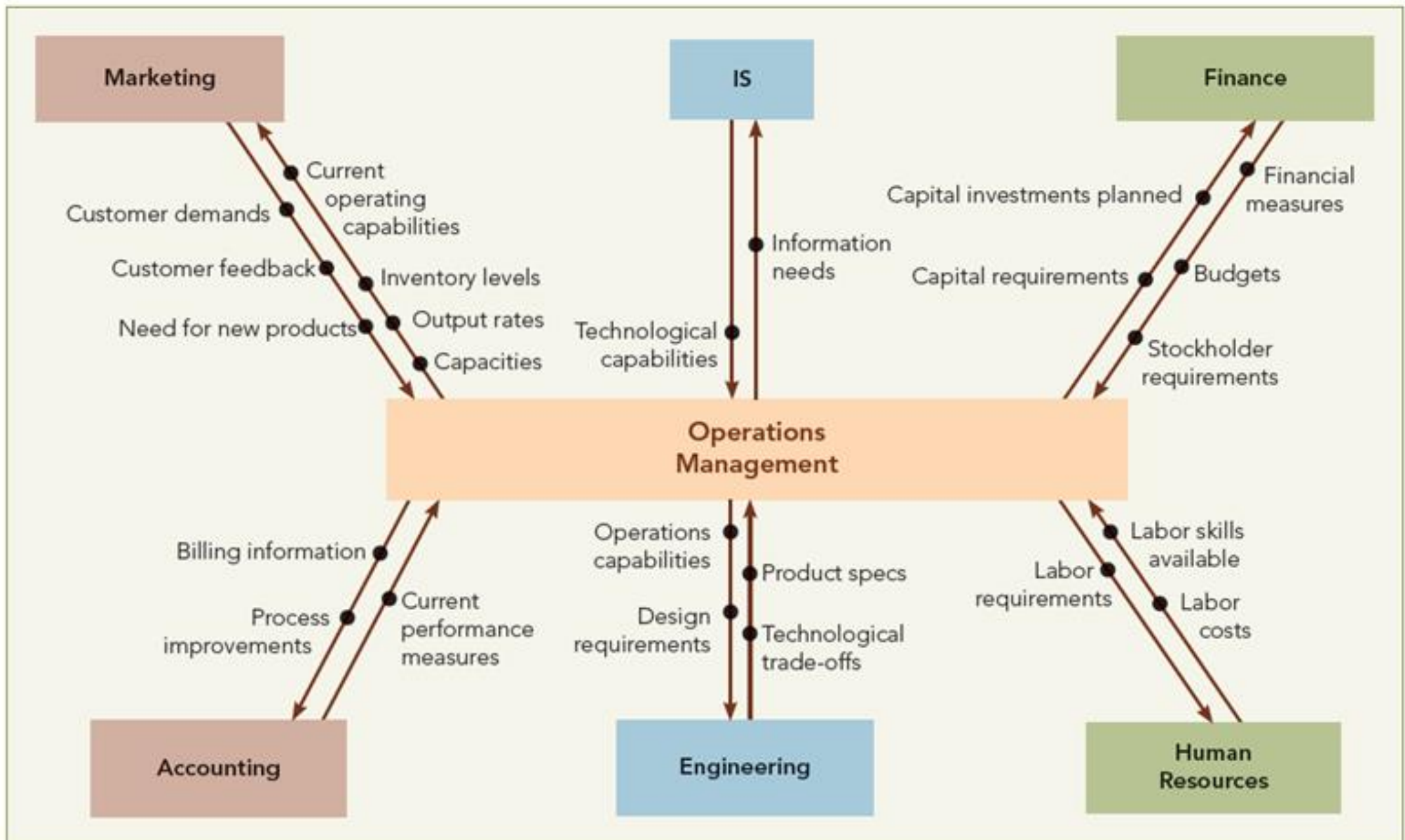
continuous control – its task is to determine whether the operations are carried out in accordance with the set objectives of the business entity.



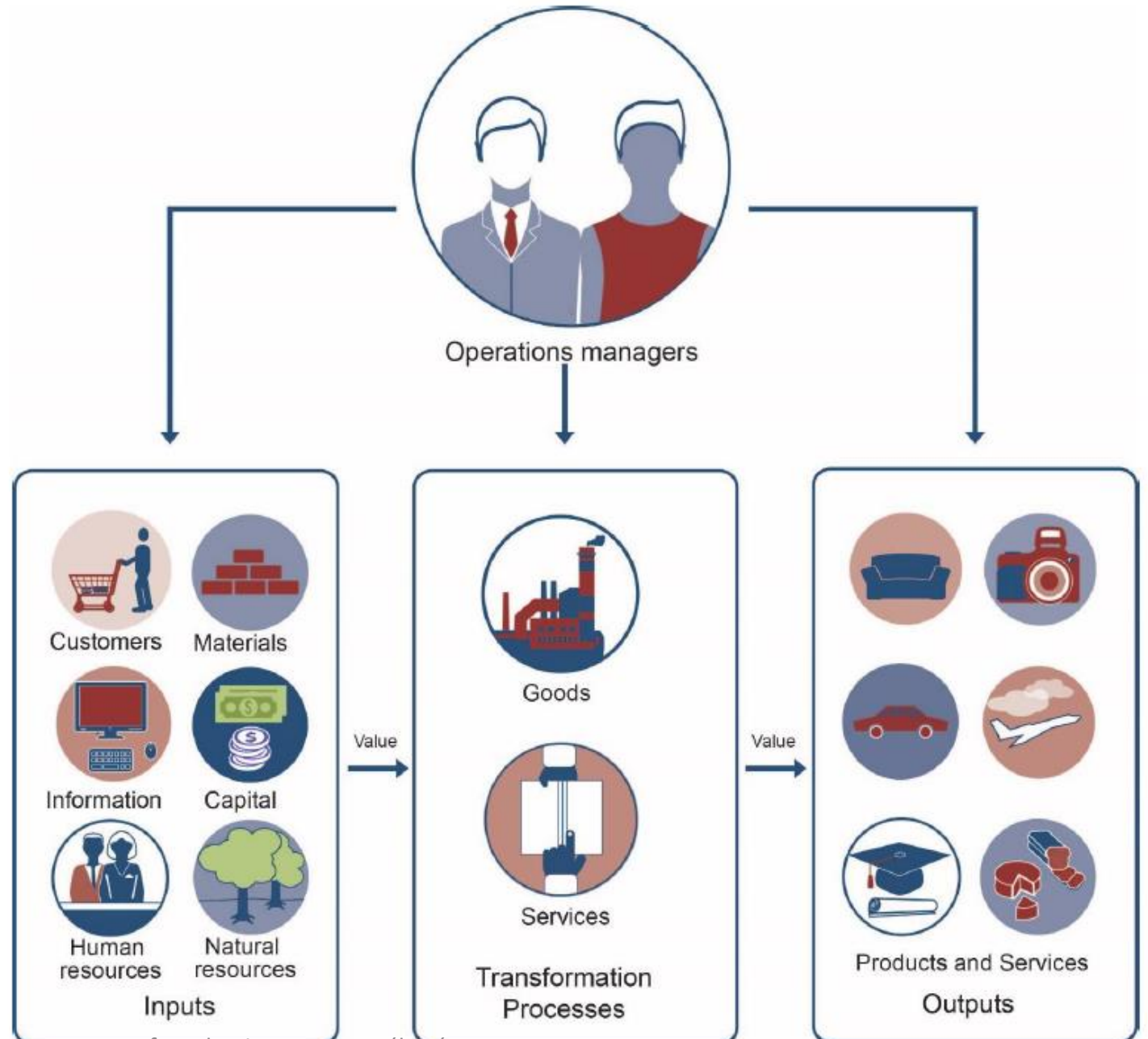
feedback control - is focused on the final results, with corrective measures directed at the subsequent use of resources or operations.

Structure of selected management functions



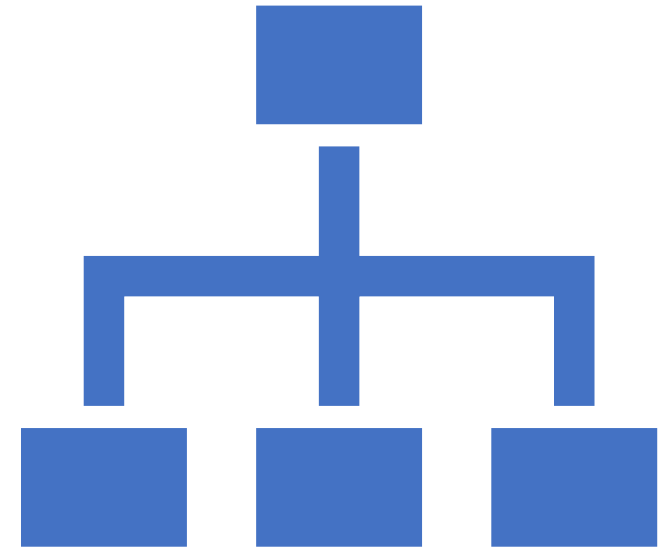


The transformation process



Operation Manager

- Every organization—whether it produces goods or provides services—furnishes customers with quality products.
- Thus, to compete with other organizations, a company must **convert resources (materials, labor, money, information) into goods or services as efficiently as possible.**
- The upper-level manager who directs this transformation process is called the **operations manager.**
- The job of operations management (OM) consists of all the **activities involved in transforming a product idea into a finished product.**
- In addition, operations managers are involved in planning and controlling the systems that produce goods and services.
- In other words, operations managers manage the process that transforms inputs into outputs.



Transformation process

All manufacturers set out to perform the same basic function: **to transform** resources into finished goods.

To perform this function in today's business environment, manufacturers must continually strive **to improve operational efficiency**.

They must fine-tune their production processes to

- focus on quality,
- hold down the costs of materials and labor
- to eliminate all costs that add no value to the finished product.

Make the decisions involved in the effort to attain these goals is another job of operations managers.

Proper management of the operations function has led to success for many companies.

Dell success story

- In 1994 Dell Computer Corporation was a second-rate computer maker that managed its operations similarly to others in the industry.
- Then Dell implemented a new business model that completely changed the role of its operations function.
- Dell developed new and innovative ways of managing the operations function that have become one of today's best practices. These changes enabled Dell to provide rapid product delivery of customized products to customers at a lower cost.
- The company has since expanded this model to use an analytics driven system.
- This has enabled Dell to identify certain models so common they could be stocked in preconfigured inventory. Ordered today the customer can have them tomorrow.
- Dell's model is one many have tried to emulate and is the key to its continued success.
- In 2019 the Digital Supply Chain Institute listed Dell as a top leader in their industry. Just as proper management of operations can lead to company success, improper management of operations can lead to failure.



Cosmo failure story

The failure can be illustrated using the example of Kozmo.com, a Web-based home delivery company founded in 1997.

- Kozmo's mission was to deliver products to customers— everything from the latest video to ice cream—in less than an hour. Kozmo was technology enabled and rapidly became a huge success.
- The initial success gave rise to overly fast expansion.
- The company found it difficult to manage the operations needed in order to deliver the promises made on its website.
- The consequences were too much inventory, poor deliveries, and losses in profits.
- The company rapidly tried to change its operations, but it was too late. It had to close in April 2001.
- Kosmo, however, had a solid foundation and in 2018 it was back online with new owners and a fresh vision of its operations.
- Today Kosmo provides wholesale groceries at offerings lower than those of nearby retailers delivered within a two hour window.



Web based age and operations

- The Web-based age has created a highly competitive world of **online shopping that poses special challenges for operations management.**
- The Web can be used for online purchasing of everything from books and groceries to prescription medications and automobiles.
- The Internet has given consumers flexibility; it has also created one of the biggest challenges for companies: delivering exactly what the customer ordered at the time promised.
- As we saw with the example of Kozmo.com, making promises on a website is one thing; delivering on those promises is yet another.
- Ensuring that orders are delivered from “mouse to house” is the job of operations and is much more complicated than it might seem. In the 1990s many dot-com companies discovered just how difficult this is.
- They were not able to generate a profit and went out of business.
- To ensure meeting promises, companies must forecast what customers want and maintain adequate inventories of goods, manage distribution centers and warehouses, operate fleets of trucks, and schedule deliveries, all while keeping costs low and customers satisfied.
- Many companies like Amazon.com manage almost all aspects of their operation. In fact, Amazon.com is launching its own delivery service called “Shipping with Amazon” (SWA) to compete with UPS and FedEx.

Solution...Outsourcing?

- Other companies hire outside firms for certain functions, such as outsourcing the management of inventories and deliveries to UPS.
- Competition among e-tailers has become intense as customers demand increasingly shorter delivery times and highly customized products.
- Samedervice has become common in metropolitan areas.
- For example, Barnesandnoble.com provides same-day delivery in Manhattan.
- Amazon.com has significantly expanded same-day delivery locations.
- Understanding and managing the operations function of an online business has become essential in order to remain competitive.

Content Areas of PM

- 1. **Rational provision of successful business activity in production and on the market.** In essence, it is a review in advance of what products the market will need, in what quantitative parameters, in what quantity, in what terms, in what price relations, etc. This basic information needs to be available to the business unit well in advance in order to be able to calculate whether the given production program and base will ensure market requirements and especially its economic prosperity and further development, or the necessary corrections must be made.
- 2. **Creating a promising production program.** The prerequisite is a qualified, forward-looking, conceptual and perspective preparation of a new production strategy, which will guarantee successful business activities within the appropriate time horizon.
- 3. **Consistent use of results and knowledge of marketing analyses in own production activities.** Only in this way production can be adequate to the requirements of the market and, in addition, the prognostic conclusions of the strategic development of production are constantly confronted with the specific market situation. At the same time, this guarantees business success in domestic and foreign markets.
- 4. **Orientation of production management to achieve commercial results, resp. in top production orientation on individualized requirements of a specific customer.** Compared to the current situation, a stronger link between sales and production management is required. The commercial approach must be considered as a natural starting point and the completion of the entire production management.

Content Areas of PM

- **5. The need to build own development background.** The development system of production has a unique mission:
 - flexibly ensure the changing requirements of customers and entire markets,
 - ensure the dynamic development of the entity's own production base.

This presupposes the constant development of a lucrative production capacity and an increase in economic efficiency in the entire production system.
- **6. The need for more qualified personnel work.** It is based on American knowledge in 1911, which characterized the focus of management in working with people. Production and production-technical issues are a matter for technicians and technologists. The decisive task of production management is not things, but people who are efficient in production, people working in development, active people in the entire production management process and from marketing to customer service.
- **7. Product quality management - irreplaceable component of modern production management.** It is a natural guarantee of business in production.
- **8. Active use of computer technology as a tool of interaction with pre-production, production and post-production stages of production processes.** The computer-connected and controlled production system (CIM - Computer Integrated Manufacturing) creates a new so-called computer production management.
- **9. Further expansion of business activities to achieve quality management activities** that will ensure the efficient use and evaluation of all components of production (machines, people, materials, energy, etc.) in order to achieve profit.

From a functional point of view, production management can be characterized by two levels:



The primary area is the **search for possibilities and ways to guide**, ensure and constantly strengthen the external influence of production management on components and activities in order to succeed in business and increase the effects of production,



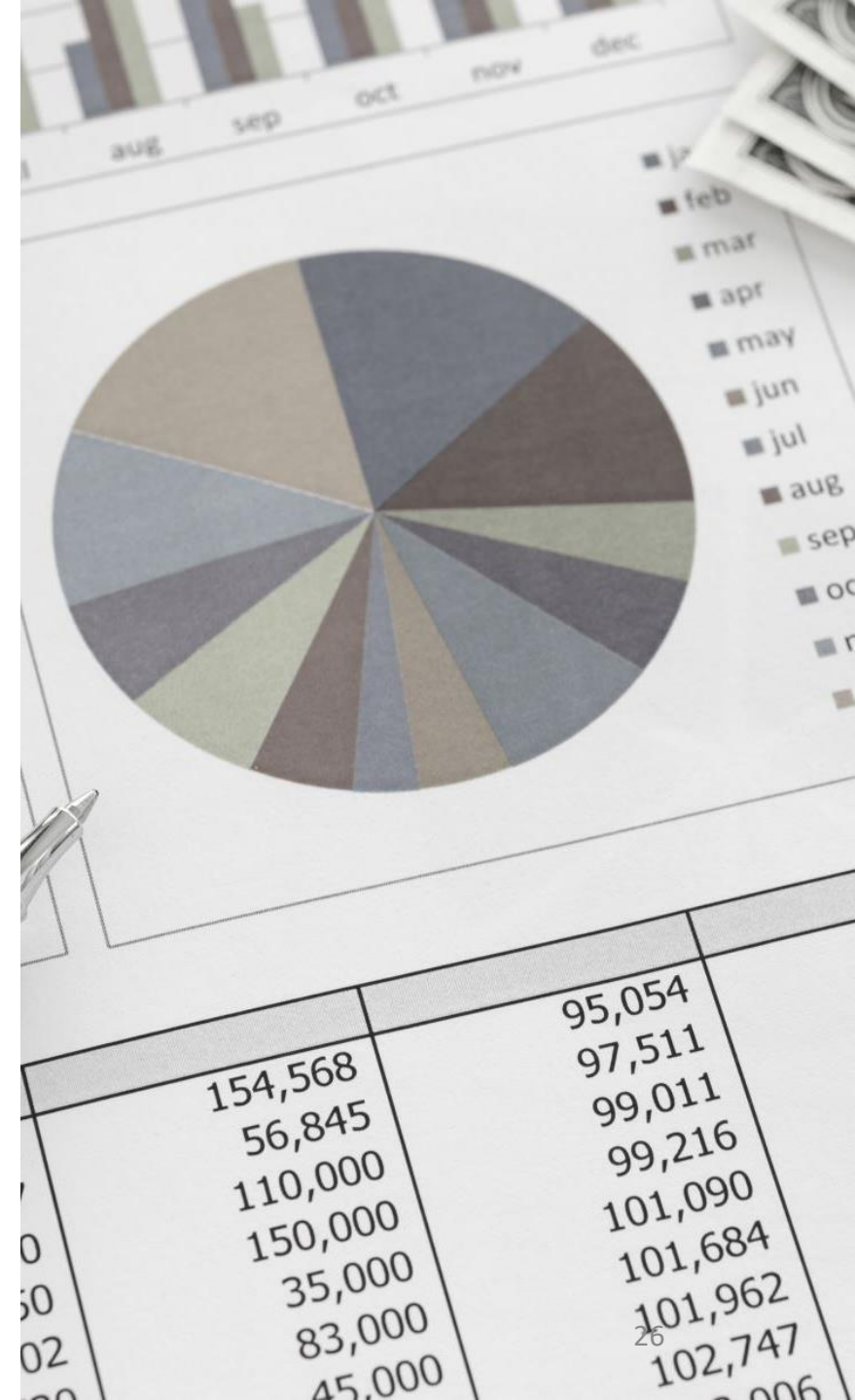
The secondary area is **self-improvement and improvement of activities** within the production management.

From a functional point of view of production management, the following should ultimately be ensured:

1. Create an intensive stimulus environment in the pre-production, production and post-production spheres for successful business.
2. Gain and expand markets for the products of the entity.
3. Increase commercial success and production quality through development processes.
4. Achieve the highest possible appreciation of the invested capital.
5. Ensure production efficiency, inter alia, by reducing its cost level.
6. Achieve favorable prices when selling on the market.
7. Continuously achieve profit and overall prosperity of the business unit.
8. Feedback and corrections to ensure its spiral development.
9. Development of business motivation, initiative and activation of employees of the business unit.

Successful production

- The main factor in a successful business is production and its results.
- At the same time, these are the material basis of business prosperity, and top-quality products are a decisive moment in the final success of a business unit.





Basic Principles of Production Management

- 1) Customer satisfaction is the prime goal of any organization - collect information about customer requirements.
- 2) Develop management commitment for product quality
- 3) Quality is the responsibility of every person in the organization
- 4) Develop a strategy for global competition
- 5) Rework and rejection are costly, so do the job right the first time and every time
- 6) Set the production rate and supply in conformance with the customer's demand rate
- 7) Reduce the unnecessary variety of products, parts, and materials (Standardization)
- 8) Reduce set-up time and idle non-productive time
- 9) Reduce cycle time by eliminating unnecessary operations and combining operations where possible
- 10) Use the full capacity of production equipment
- 11) Select simple, low-cost production equipment avoiding redundant features
- 12) Before ordering replacement of an old machine, establish the economic justification
- 13) Operational reliability and maintenance factors should be considered while ordering new equipment

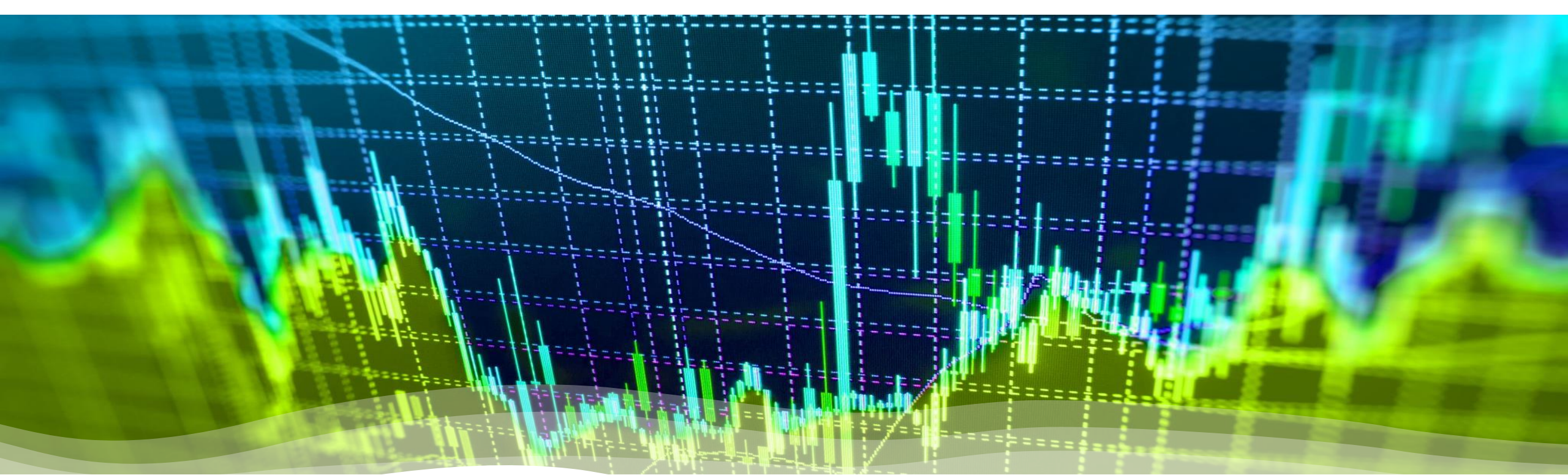
Basic Principles of Production Management II

- Reduce variety of production equipment for low inventory of spares and ease of maintenance
- Plan the layout of equipment to minimize workflow
- Use principles of motion economy to design the layout of workplaces
- Assign codes to parts, material and tools to facilitate traceability
- Exercise job rotation for mastery of multiple skills
- Automatic gradually and only when the process variability cannot be controlled otherwise
- Create more cells and workstations where waiting time and queues involve high cost
- Reduce inventories to minimum workable levels
- Record the performance of all-important function, particularly the output, quality appraisal and equipment breakdown and maintenance
- Analyze the records and derive interfaces for future decisions
- Rate the vendors and suppliers to select the best ones.



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Decision Making in OM

- Most operations decisions involve many alternatives that can have quite different impacts on costs or profits
- Typical operations decisions include:
 - **What:** What resources are needed, and in what amounts?
 - **When:** When will each resource be needed? When should the work be scheduled? When should materials and other supplies be ordered?
 - **Where:** Where will the work be done?
 - **How:** How will the product or service be designed? How will the work be done? How will resources be allocated?
 - **Who:** Who will do the work?



Operations Management

[OM Video](#)

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- Thank you for your attention.

