

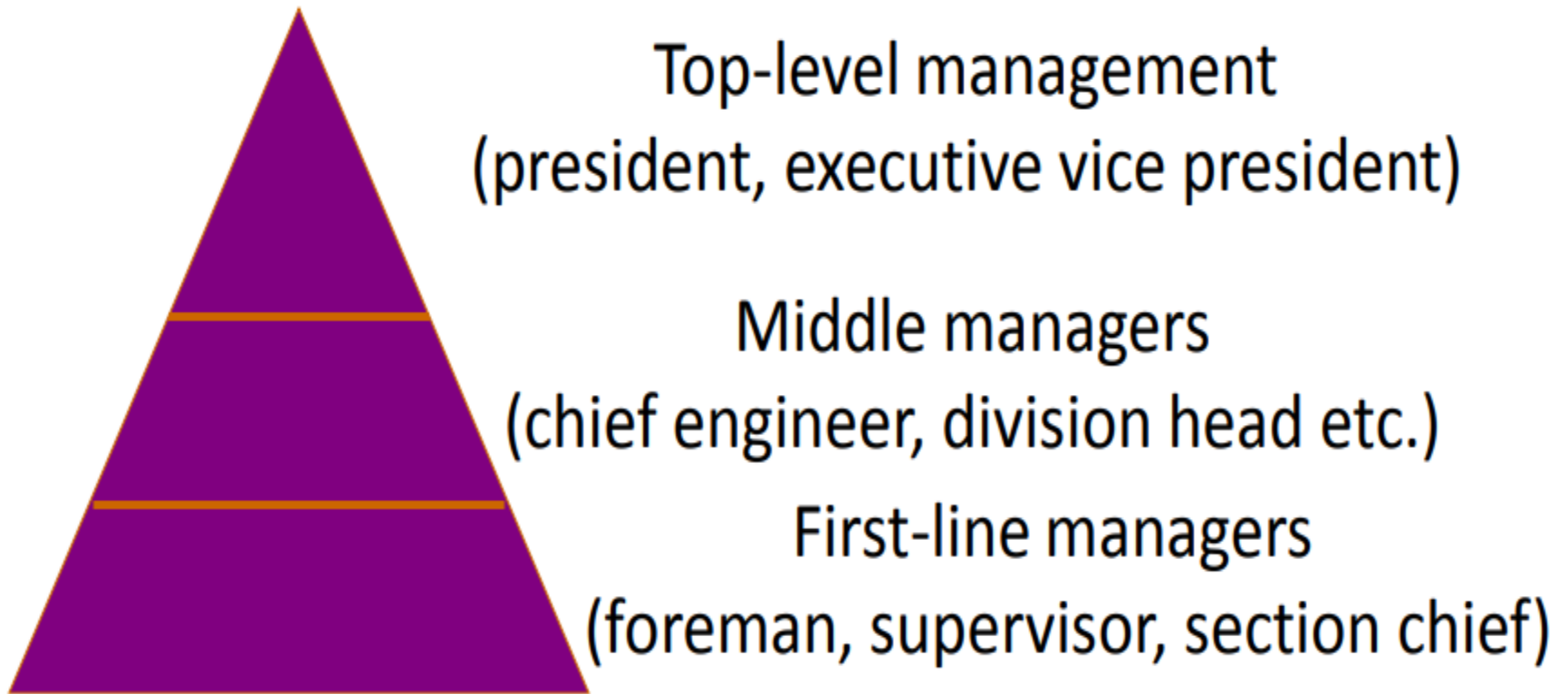
# ENGINEERING MANAGEMENT

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# Definition of Engineering by ABET (Accrediting Board for Engineering and Technology)

The profession in which a knowledge is applied with judgment to develop ways to utilize, economically, the materials and of the mathematical and natural sciences gained by study, experience, and practice and forces of the nature for the benefit of mankind.

- **Engineer:** A person applying his mathematical and science knowledge properly for mankind



## Levels of Management

Top managers

Middle managers

First-line managers

Marketing

Finance

Operations

Human resources

Administration

Other

**Management** Coordinated activities to direct and control an organization (ISO 9000/2000).

**ISO: International Organization for Standardization**

**Management** is the process of Planning, Organizing, Directing/Leading, Communicating, Motivating and Controlling the efforts of the organizational members and resources in order to achieve organizational goals.

- Engineering Management (EM) is a specialized form of management that is required to successfully lead engineering or technical personnel and projects.
- Engineering Management is a career that brings together the technological problem-solving of engineering and the organizational, administrative, and planning abilities of management in order to oversee complex enterprises from conception to completion.

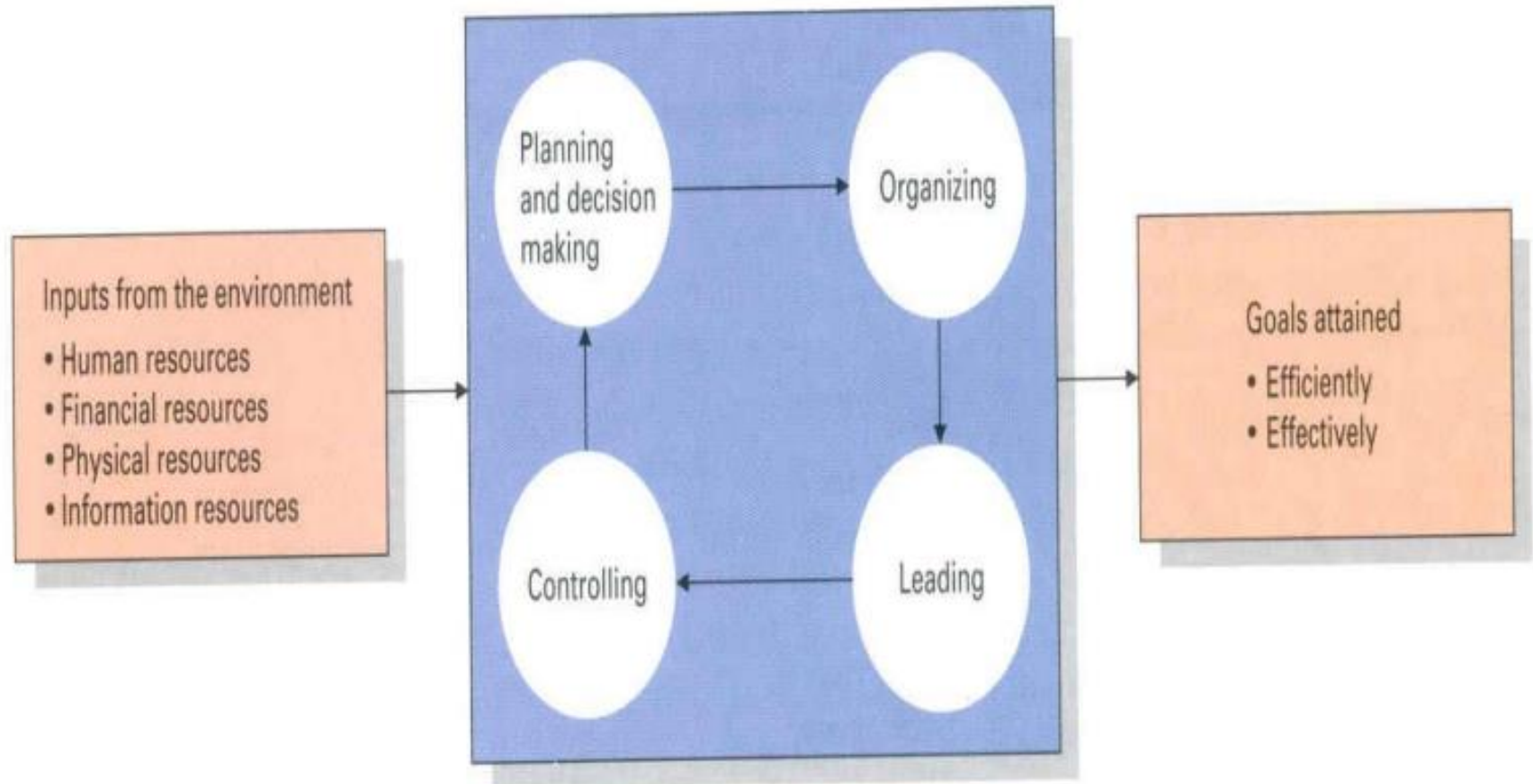
**Engineering Manager** *Engineer possessing both abilities to apply engineering principles and skills in organizing and directing people and projects.*

# ENGINEERING MANAGEMENT

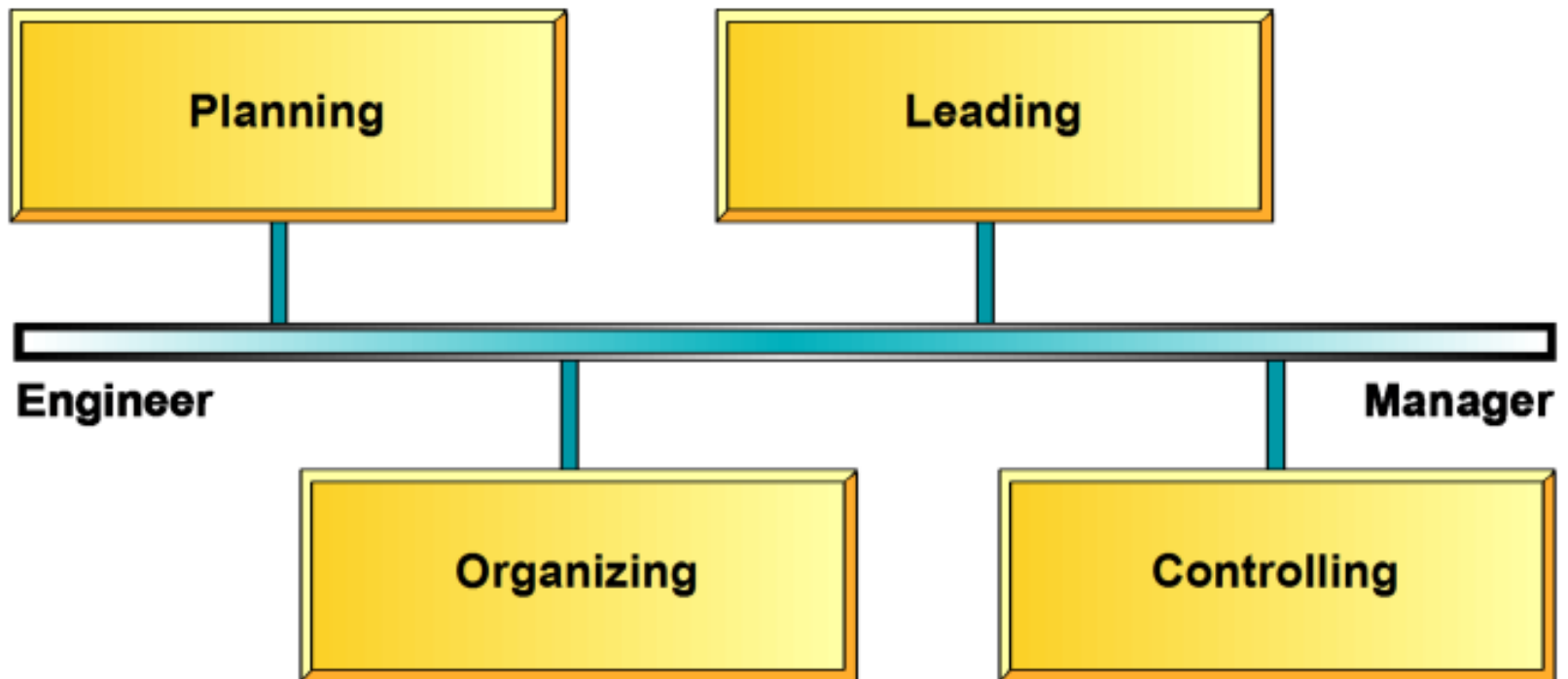


Engineering Management programs typically include instruction in accounting, economics, finance, project management, systems engineering, mathematical modeling and optimization, management information systems, quality control & operations research, human resources management, ethical and legal perspectives, team relations, safety and health.

# Management in Organizations



# Engineering Management Functions







# Management Functions

- **Planning:** Setting goals and deciding how best to achieve them.
- **Decision Making:** Selecting a course of action from a set of alternatives.
- **Organizing:** Grouping activities and resources in a logical fashion.
- **Leading:** Processes to get members of the organization to work together to further the interests of the organization.
- **Controlling:** Monitoring organizational progress toward goal attainment and taking corrective action when needed.

# Management Context



-  Internal environment
-  External environment
-  Task environment
-  General environment

## **engineering background and engineering management position**

1. Engineers: logical, methodical, objective, and make unemotional decisions based on facts.
2. Use their technical knowledge to check the validity of information.
3. Can analyze problems thoroughly, look beyond the immediate ones, and ask good questions to explore alternative solutions to technical problems.
4. Understand what motivates engineers.
5. Can review and evaluate the work of their subordinates since they understand what they are doing.



## **engineering background and engineering management position**

6. Can engage in future planning with appropriate consideration for technology and its relationship to cost effectiveness.
7. Engineering backgrounds help in technical discussions with customers.
8. Their background increases the manager's credibility with subordinates, customers, and superiors. People attribute qualities, abilities, skills, and knowledge to them, which allows the manager to influence those who have that perception.