

CVEN3101
Engineering Operations and Control
Study notes

Semester 1 2016

Part 1: Risk Management and Ethics

Part 2: Financial and Economics

Part 3: Scheduling and Planning

Part 4: Cost Estimating and Construction Safety

CVEN3101 Engineering Operations – Class Notes

Week 1: Introduction to management

Management - process of achieving objectives through the use of various resources. Good management is effective and efficient.

Four basic types of resources that management utilises:

- Human resources (people)
- Physical resources (materials and equipment)
- Financial resources (money)
- Information

Effectiveness - degree to which a task or activity achieves its intended purpose.

Efficiency - degree to which a task or activity is accomplished with the least amount of effort, ie ensuring that scarce resources are not wasted.

Productivity - measure of efficiency. The ratio of an activity's outputs to its inputs.

Social Process - Management involves getting things done through people, thus it is a social process.

Scientific Process - scientific process in which logical, objective and systematic approaches are used to support decision making and problem solving.

Economic Process - economic resources such as labour, raw materials and capital equipment are utilised in the production of goods and services (allocating these resources to achieve future benefits).

Management Functions

1. Planning

Involves setting goals and determining the best strategy for achieving those goals. Known as the primary management function as it provides a basis for all others. Categorised as strategic (performed by senior management, has a long time horizon also focuses on setting the goals + direction of the organisation) or operational planning (shorter, focuses on determining the best way to achieve goals set by senior management and deciding how to perform specific work).

2. Organising

involves assigning resources to tasks + setting up proper work relationships between people working on specific tasks. Properly performing the organising function helps ensure that human resources are efficiently utilised.

3. Leading

Leading involves influencing other people to achieve organizational goals.

4. Controlling

involves monitoring work performance and comparing actual results to previously set goals. This process of monitoring and controlling is also called "supervising".

Management Roles - Henry Mintzberg identified 10 different roles that managers play within organizations, grouped into three categories:

	Role	Examples
Interpersonal roles	Figurehead	Representing the organisation at a ceremony, receiving visitors
	Leader	Motivating, counselling and supporting subordinates
	Liaison	Coordinating activities of different work units, representing the organisation on committees
Informational roles	Monitor	Looking for an obtaining valuable up-to-date information
	Disseminator	Transmitting information to staff within the work unit who need it
	Spokesperson	Relaying information about the organisation to outside parties
Decisional roles	Entrepreneur	Designing and initiating new activities within the organisation
	Disturbance handler	Dealing with crises, resolving conflict between staff
	Resource allocator	Developing budgets, schedules, and responsibilities
	Negotiator	Bargaining with other people, organisations or work units

Management Skills - Robert Katz identified three groups of skills that managers need:

1. Technical Skills → comprise of the knowledge required to carry out the specific type of work that the organisation does. Important skill in lower levels of management but even senior managers need some level of proficiency to be effective.
2. Interpersonal Skills → comprise an individual's abilities to relate to others. (Strong interpersonal skills inspire enthusiasm and trust). Important at all levels as all managers work with people.
3. Conceptual Skills → represent the ability to conceptualise and think abstractly. Managers use this to visualise the structure of the organisation, essential for problem solving.

Levels of Managers

Senior Managers - responsible for establishing the organisation's goals, policies and strategies, and managing the overall performance of the organisation as a whole.

Middle Managers - implement the policies and strategies that upper management has established, and supervise and coordinate the first line level managers.

First Line Managers - responsible for supervising and coordinating the activities of small work groups of non-managerial employees. spend much more of their time than the other levels supervising subordinate workers.

Types of Managers

Line Managers - managers whose position in the hierarchy places them directly above employees who directly contribute to the outputs of an organisation.

Staff Managers - managers whose job is to advise the line managers and support their work.

Management Theories

- Classical Theories

Two main groups within the classical school of thought scientific management (Frederick Taylor + Frank and Lillian Gilbraith), which focussed on individual employee productivity, and administrative management (Henry Fayol) which tried to improve the overall organisation's effectiveness and efficiency. A major limitation of the classical theories was their prescription of universal procedures, which is now considered simplistic as different situations may require different approaches.

Management Principle	Meaning
Division of work	Specialisation of task to enable expertise to be developed in a narrow area
Authority	The right to give commands, with requisite responsibility
Discipline	Managers should command (and get) respect
Unity of command	Each employee has only one superior to receive orders from and report to
Unity of direction	Only one manager and one plan for each group of activities having the same objective
Subordination of individual interest to general interest	No group should deviate from the interests of the organisation
Fair remuneration	For both employee and firm
Centralisation	A central system for direction and coordination
Scalar chain of command	Clear line of authority from top to bottom
Order	Everything and everybody should be in the most appropriate place
Equity	Management should be fair in its dealings with employees
Stability of tenure of personnel	Employees should not feel that their positions are under threat
Initiative	Managers should encourage employees to use their initiative within the limits of authority and discipline
Esprit de corps	Management should build up team spirit and morale