



MANAGEMENT FOR CHEMICAL ENGINEERING (0905401)

06 – DECISION MAKING PROCESS

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Planning Ahead — KEY TAKEAWAYS

- Discuss the role of information in the management process.
- Identify how managers approach problems and decisions.
- Describe the six steps in the decision-making process?
- Describe the potential pitfalls and sources of creativity in managerial decision making.



Outline

1. Information, Technology, and Management
 - a) Information and information systems
 - b) Data Mining and Analytics
 - c) Business Intelligence and Executive Dashboards
2. Problem Solving and Managerial Decisions
 - a) Managers as Problem Solvers
 - b) Problem-Solving Approaches and Styles
 - c) Structured and Unstructured Problems
 - d) Crisis Problems
 - e) Problem-Solving Environments
3. The Decision-Making Process
 - a) Step 1 – Identify and Define the Problem
 - b) Step 2 – Generate and Evaluate Alternative Courses of Action
 - c) Step 3 – Decide on a Preferred Course of Action
 - d) Step 4 – Implement the Decision
 - e) Step 5 – Evaluate Results
 - f) At All Steps – Check Ethical Reasoning
4. Issues in Managerial Decision Making
 - a) Decision errors and traps
 - b) Creativity in decision making



Information, Technology, & Management

■ Managers must have

■ Technological competency

- Ability to understand new technologies and to use them to their best advantage

■ Information competency

- Ability to locate, gather, organize, and display information for decision making and problem solving

■ Analytical competency

- Ability to evaluate and analyze information to make actual decisions and solve real problems



Data and Information

- ■ What is useful information?
- ■ Data
 - ■ Raw facts and observations
- ■ Information
 - ■ Data made useful and meaningful for decision making
- ■ Information drives management functions



Characteristics of Useful Information:

- ■ Timely
- ■ High quality
- ■ Complete
- ■ Relevant
- ■ Understandable



Data Mining and Analytics

- **Analytics:** systematic gathering and processing of data to make it useful as information
- **Data mining** is the process of analyzing data to produce useful information for decision makers.
- **Big data** exists in huge quantities and is difficult to process without sophisticated mathematical and computing techniques.
- Management with analytics involves systematic gathering and processing of data to make informed decisions.



Business Intelligence and Executive Dashboards

- Management information systems (MIS)
 - Use IT to collect, organize, and distribute data for use in decision making.
- Business intelligence
 - Taps information systems to extract and report data in organized ways that are helpful to decision makers.
- Executive dashboards
 - Visually update and display key performance indicators (KPI) and information on a real-time basis.

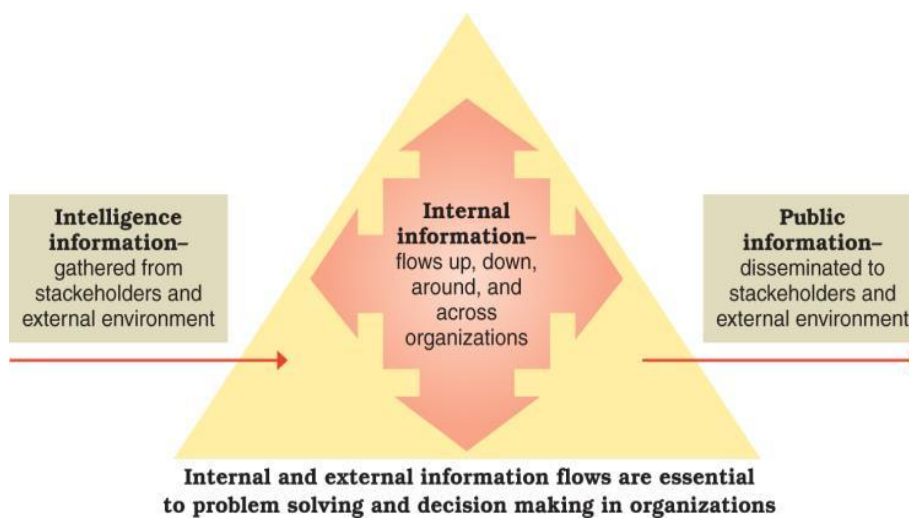


Information Needs in Organizations

- Information exchanges with the **external** environment
 - Gather intelligence information.
 - Provide public information.
- Information exchanges within the organization (**internal** environment)
 - Facilitate decision making.
 - Facilitate problem solving.



Internal and external information needs in organizations

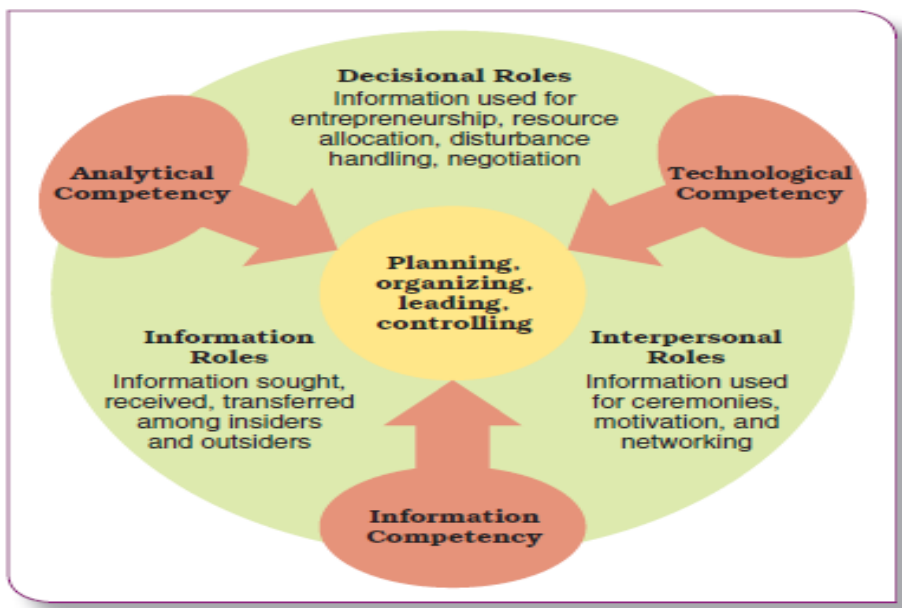


Problem Solving and Managerial Decisions

- Managers as Information Processors
 - Continually gather, give, and receive information
 - Now as much electronic as it is face to face
 - Always on, always connected

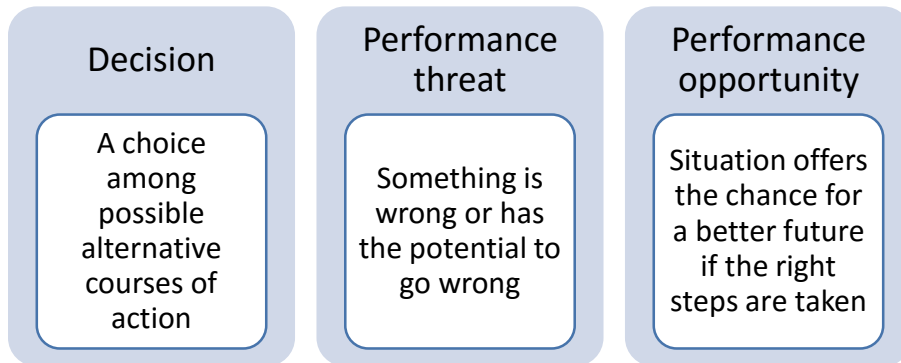


The manager as an information-processing nerve center

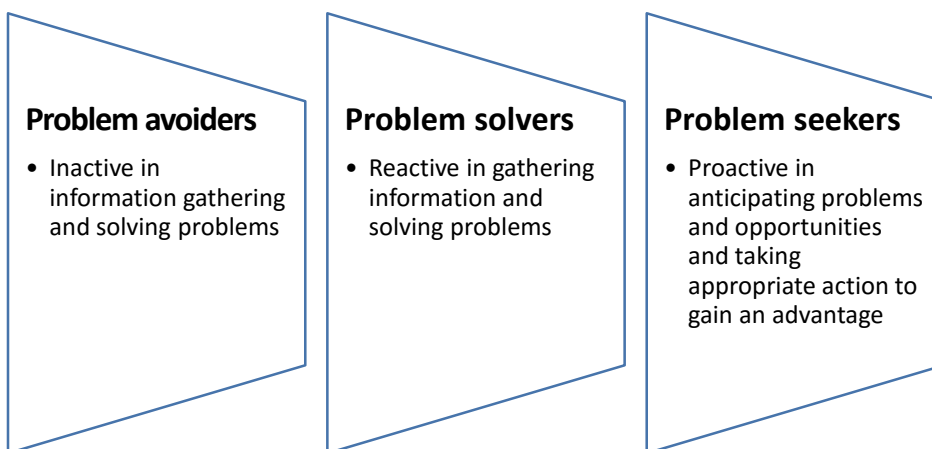


Problem Solving

- The process of **identifying** a **discrepancy** between **actual** and **desired** performance and taking **action** to resolve it.



Problem-Solving Approaches or Styles



Systematic versus Intuitive Thinking

Systematic thinking	Intuitive thinking
<ul style="list-style-type: none"> approaches problems in a rational, step-by-step, and analytical fashion 	<ul style="list-style-type: none"> approaches problems in a flexible and spontaneous fashion

Multidimensional thinking applies both intuitive and systematic thinking

Effective multidimensional thinking requires skill at **strategic opportunism**.



Managers Use Different Cognitive Styles

Information Evaluation	Thinking	Sensation Thinkers "STs"—like facts, goals	Intuitive Thinkers "ITs"—idealistic, theoretical
	Feeling	Sensation Feelers "SFs"—like facts, feelings	Intuitive Feelers "IFs"—thoughtful, flexible
		Sensing	Intuition
Information Processing			



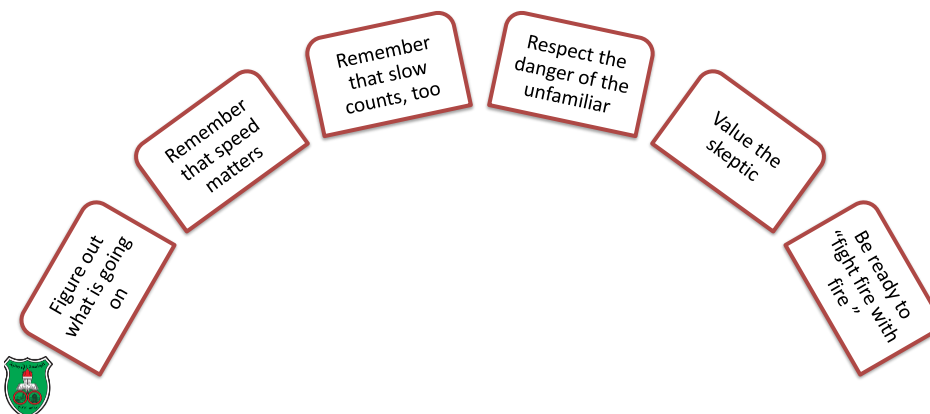
Types of Problems

- Structured problems are ones that are familiar, straightforward, and clear with respect to information needs.
 - Programmed decisions apply solutions that are readily available from past experiences to solve structured problems.
- Unstructured problems are ones that are full of ambiguities and information deficiencies
 - Nonprogrammed decisions apply a specific solution to meet the demands of a unique problem.
 - Commonly faced by higher-level management.



Rules for Crisis Management

A crisis involves an unexpected problem that can lead to disaster if not resolved quickly and appropriately.



Problem Solving and Managerial Decisions

- Managers make decisions with various amounts of information

Certain environment

- offers complete information on possible action alternatives and their consequences

Risk environment

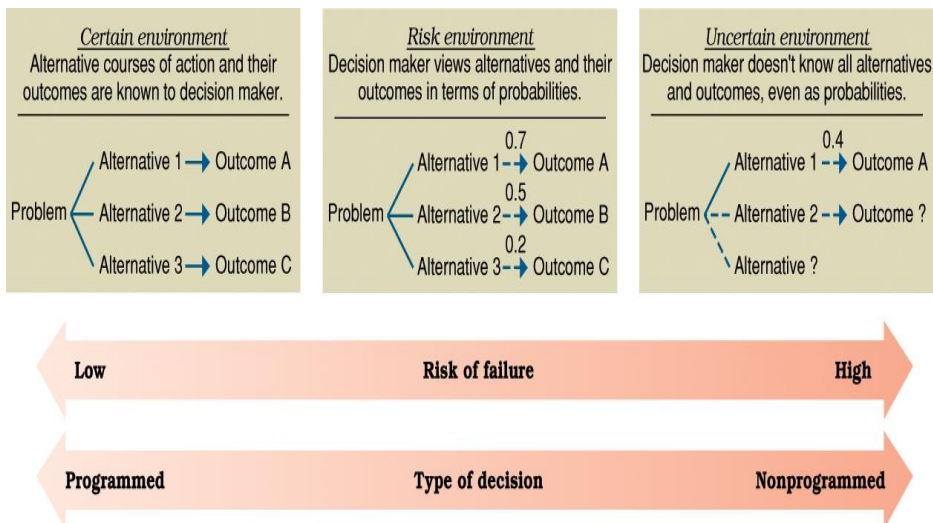
- lacks complete information but offers probabilities of the likely outcomes for possible action alternatives

Uncertain environment

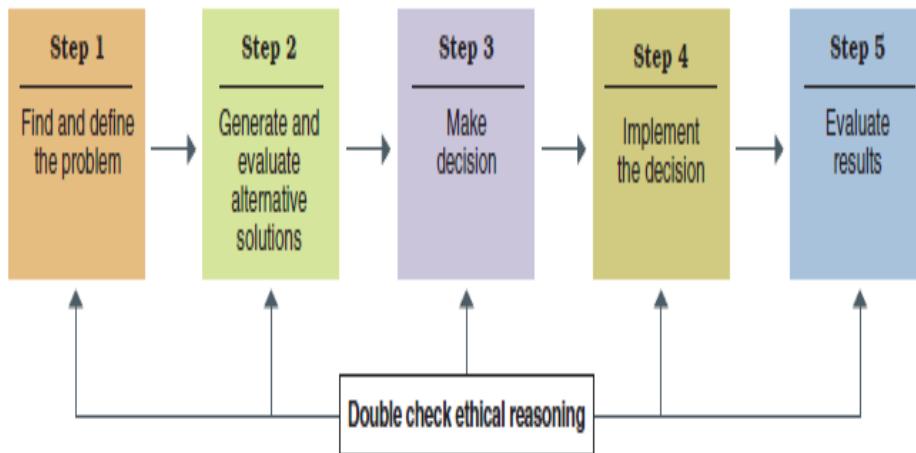
- lacks so much information that it is difficult to assign probabilities to the likely outcomes of alternatives



Environments for Managerial Decision Making and Problem Solving



Steps in Managerial Decision Making and Problem Solving



The Decision-Making Process: Identify and Define the Problem

- Focuses on information gathering, information processing, and deliberation.
- Decision objectives should be established
- Common mistakes in defining problems:
 - Defining the problem too broadly or too narrowly
 - Focusing on symptoms instead of causes
 - Choosing the wrong problem



The Decision-Making Process: Generate and Evaluate Alternative Courses of Action

- Potential solutions are formulated and more information is gathered, data are analyzed, the advantages and disadvantages of alternative solutions are identified
- Approaches for evaluating alternatives:
 - Stakeholder analysis
 - Cost-benefit analysis



The Decision-Making Process: Generate and Evaluate Alternative Courses of Action

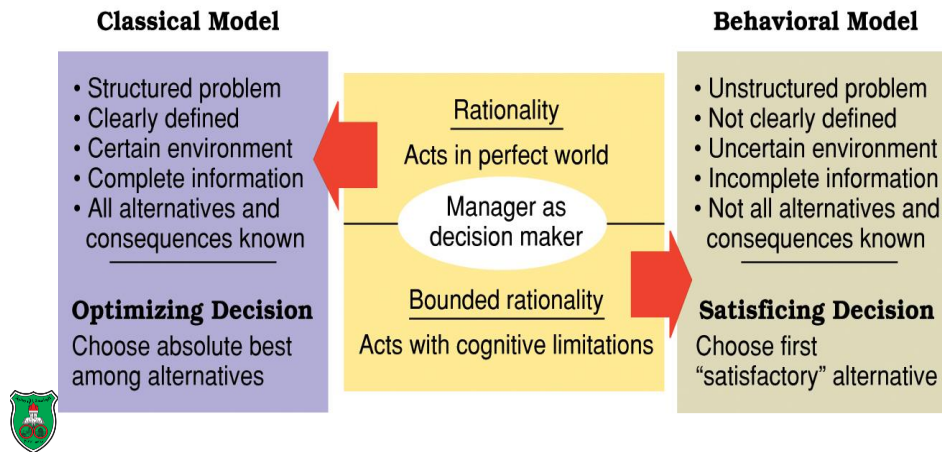
- Criteria for evaluating alternatives:
 - Benefits
 - Costs
 - Timeliness
 - Acceptability
 - Ethical soundness
- Common mistakes:
 - Abandoning the search for alternatives too quickly.



The Decision-Making Process: Decide on a Preferred Course of Action

■ Two different approaches

- Behavioral model leads to satisficing decisions.
- Classical model leads to optimizing decisions.



The Decision-Making Process: Implement the Decision

- Involves taking action to make sure the solution decided upon becomes a reality.
- Managers need to have willingness and ability to implement action plans.
- Lack-of-participation error should be avoided.



The Decision-Making Process: Evaluate Results

- Involves comparing actual and desired results.
- Positive and negative consequences of chosen course of action should be examined.
- If actual results fall short of desired results, the manager returns to earlier steps in the decision-making process.



The Decision-Making Process: Check Ethical Reasoning

Utility

- Does the decision satisfy all constituents or stakeholders?

Rights

- Does the decision respect the rights and duties of everyone?

Justice

- Is the decision consistent with the canons of justice?

Caring

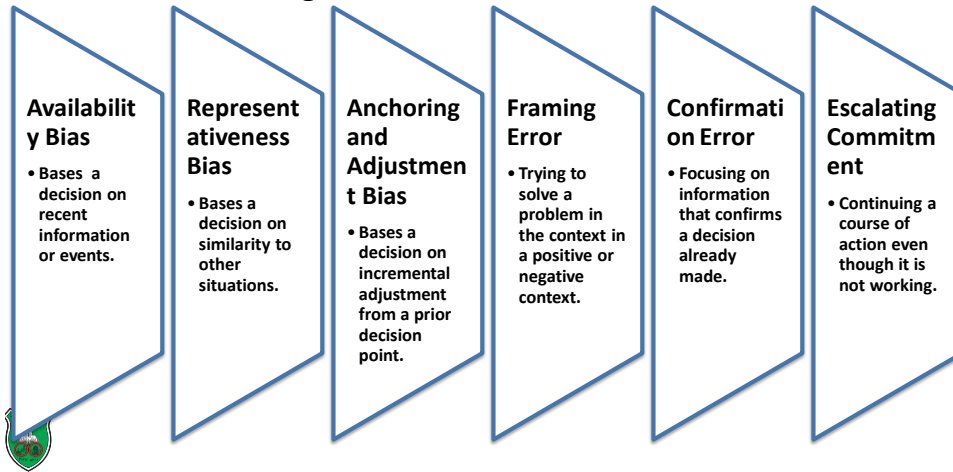
- Is the decision consistent with my responsibilities to care?



Issues in Managerial Decision Making

■ How do decision errors happen?

■ Heuristics are strategies for simplifying decision making.



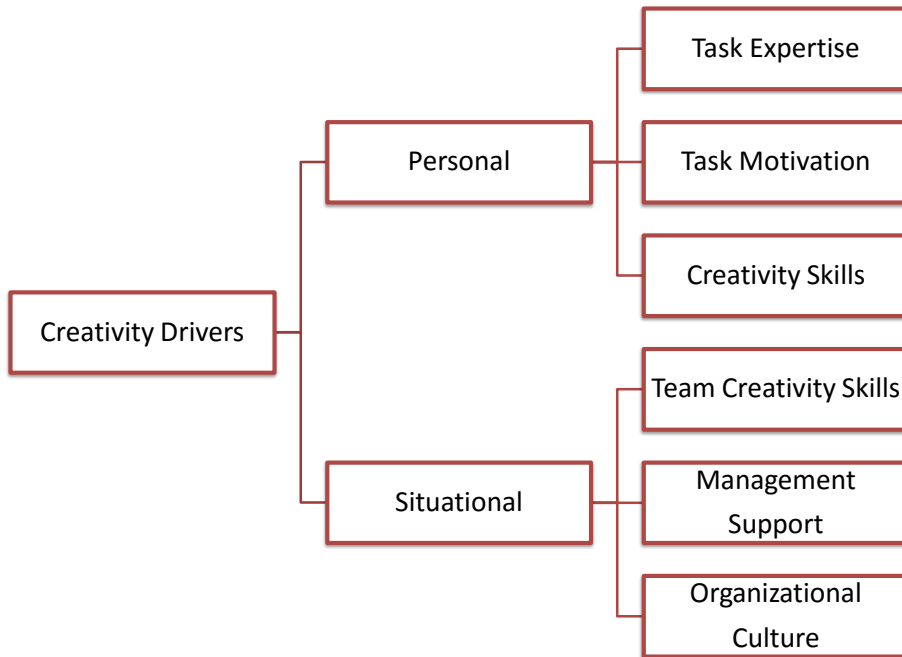
Creative Decision Making:

■ Creativity is the generation of a novel idea or unique approach that solves a problem or crafts an opportunity

■ Big-C creativity occurs when extraordinary things are done by exceptional people.

■ Little-C creativity occurs when average people come up with unique ways to deal with daily events and situations.





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