Engineering Economics

Economics is a social science concerned with the production, distribution, and consumption of goods and services.

It studies how individuals, businesses, governments, and nations make choices on allocating resources to satisfy their wants and needs, trying to determine how these groups should organize and coordinate efforts to achieve maximum output.

Founding of modern economics is credited to Scottish philosopher **Adam Smith,** who published the book *An Inquiry Into the Nature and Causes of the Wealth of Nations* in 1776.

Engineering Economics

Types of Economics

Microeconomics : deals with the behaviour of individual economic units.

These units include consumers, workers, investors, owners of land business firms etc..

Microeconomics explain how and why these units make economic decisions.

For example, it explains how consumers make purchasing decisions and how their choices are affected by change in prices and income.

It also explains how firms decide how many workers to hire and how workers decide where to work and how much work to do.

Macroeconomics : deals with aggregate economic quantities.

It studies an overall economy on both a national and international level.

Topics studied include foreign trade, government fiscal and monetary policy, unemployment rates,

Economics Indicators

Economic indicators are reports that detail a country's economic performance in a specific area.

Some key indicators are:

- Gross Domestic Product (GDP)
- Retail Sales
- Industrial Production
- Employment Data
- Consumer Price Index (CPI)

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ENGINEERING DECISION-MAKERS

- Engineers are basically decision makers.
- Decision making involves alternatives

Designs,

Procedures.

Plans.

Methods.

Questions to be considered.

- Before taking decisions the following questions to be considered,
- Why do this at all,

Need for undertaking the proposed activity.

Whether the existing activity can be expanded, altered or abandoned?

Modify existing standards, procedures and methods.?

Why do it now.

Build a plant for present demand or take care of future demand

Cost of capital and business environment conducive for the proposed business?

Do we require more data, information before taking a decision.?

Questions to be considered.

- Adopt
- Why do it this way.

Adopt traditional method or go for modern approaches.

How to optimize the four M’s

Follow the conservative approach and get less returns, or follow riskier approach to get more returns.

What is the break even point.

Sell on credit basis to generate more demand or on cash basis.?

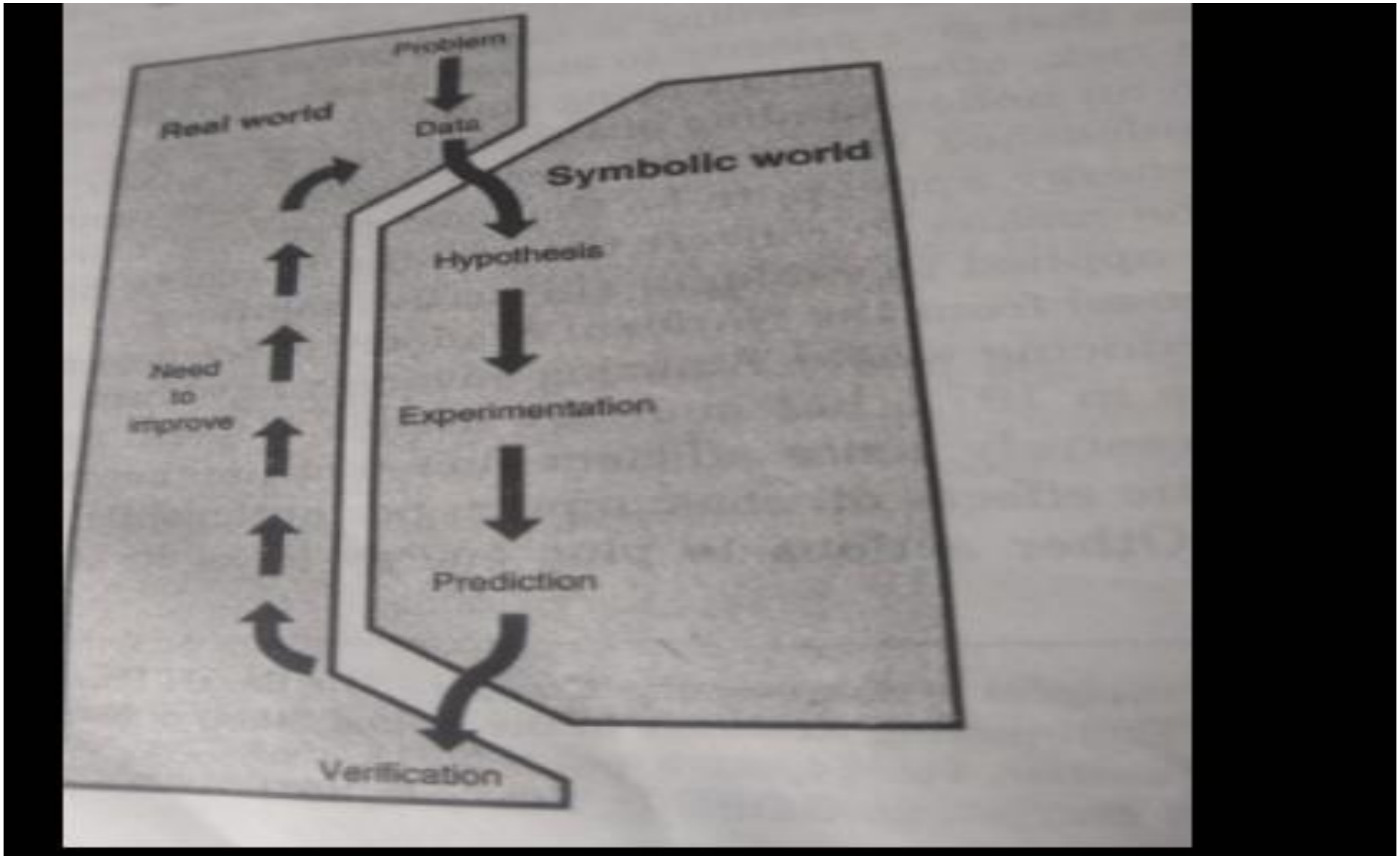
Questions to be considered.

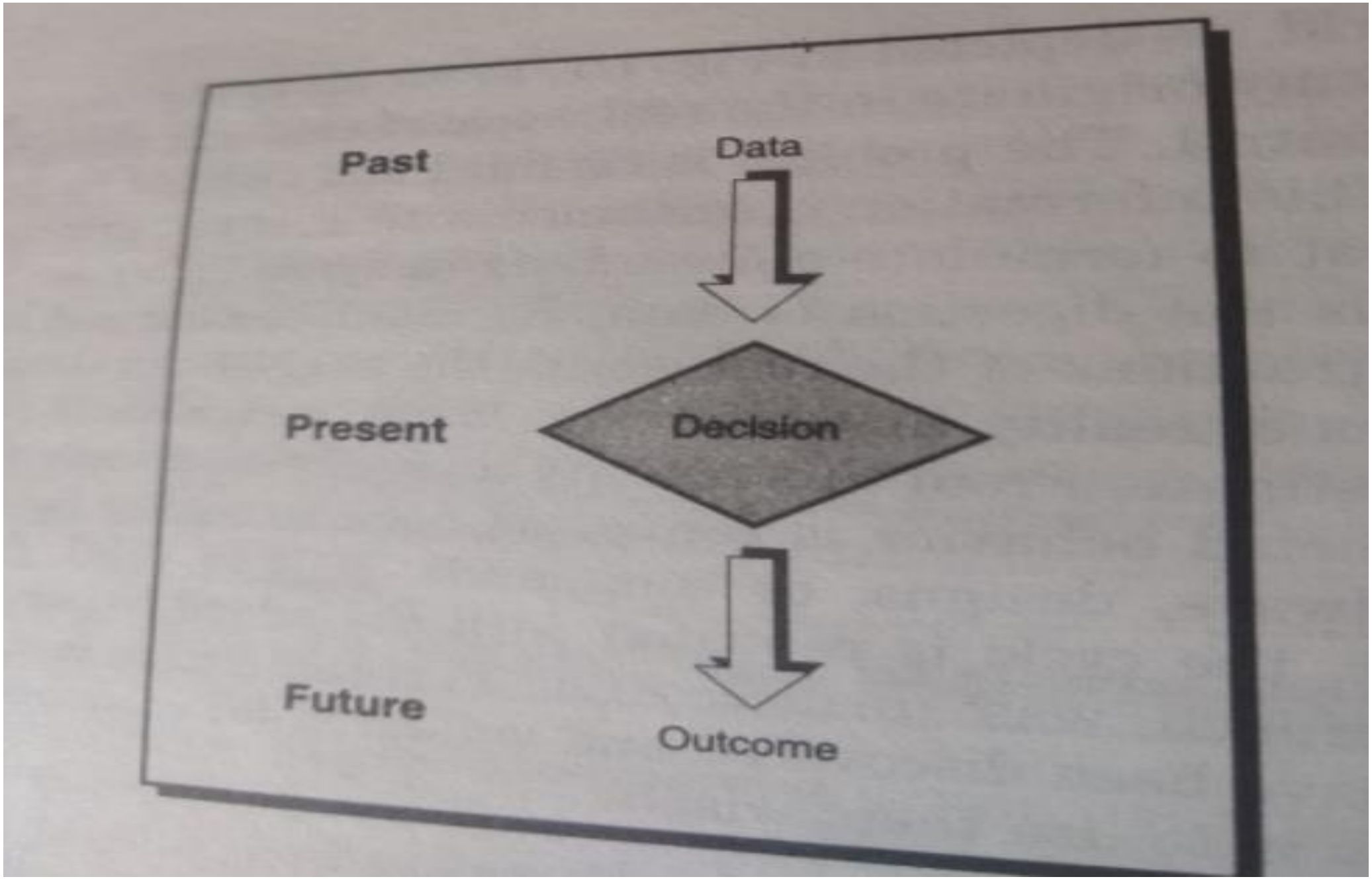
- Decision making involves the following.
- Identify the alternative uses for the limited resources and obtain appropriate data.
- Analyze the data to determine the preferred alternative.

PROBLEM SOLVING AND DECISION MAKING

- The fundamental approach to solve problems in engineering economics is through scientific methods.
- It takes both the real world of facts and figures and symbolic world of theories and hypothesis to solve problems, through an iterative process.
- Following are the steps to solve general problems involving both real and symbolic worlds.

1. Problems in engineering and managerial economy originates in real world of economic planning, management control.


Problem
Real world
Data
Symbolic world
Hypotheesis
Need
to
improve
Experimentation
Prediction
Verification


Past
Data
Present
Decision
Future
Outcome

PROBLEM SOLVING AND DECISION MAKING

2. The problem is defined and clarified by data from the real world.

3. This information is subjected to analysis based on scientific principles to formulate an hypothesis.

4. By manipulating and experimenting an analyst can simulate and project reality in multiple configurations so as to understand all outcomes.

5. From the predicted or forecast emerges, this can be considered as the possible solution to the problem.

6.This prediction is subjected to verification in the real world for its practical usage. If it gives the desired result, then the problem is solved.

7.If not the cycle is repeated with the feedback obtained in the previous approach adding to the data.

Intuition and analysis

intuition

- Quick decision based on the immediate perception of the mind.
- Experience and imagination based.
- Thumb rules and chance dominates.
- Undefined procedure.

analysis

- Decision based on rationality and reasoning.
- Data based
- Formulae, tables and graphs dominates.
- Standard operating procedures.

Intuition and analysis

intuition

- Used more in start-up companies.
- Can be right or wrong eventually.
- Time saving.

analysis

- Used more in well established companies/industries.
- Can also be right or wrong eventually.
- Time consuming.

STARTEGY AND TACTICS

- Strategy refers to broad plans that are set and major objectives that are to be achieved.
- Strategy is associated with broad plans set by high commands.
- Strategy sets ultimate objectives and also the associated tactics.
- The measure of merit for various strategies would be their effectiveness, which is nothing but the degree to which a plan meets the economic targets.
- Tactics refer to maneuvers and manipulations of the resources to attain the same objectives.
- Specific schedules proposed by the lower cadres.
- For economic studies, strategic and tactical considerations are essentially have the same meaning.