



المحاضرة الأولى

ENGINEERING ECONOMY

Dr. Ayman Youssef



INTRODUCTION TO ENGINEERING ECONOMY

WHAT IS ECONOMICS ?

The study of how limited resources is used to satisfy unlimited human wants

WHAT IS ECONOMICS ?

The study of how individuals and societies choose to use scarce resources that nature and previous generations have provided.

Resources

- Capital رأس المال
- Labor العمل
- Land الأرض

LAND



All gifts of nature, such as:
water, air, minerals, sunshine, plant and
tree growth, as well as the land itself
which is applied to the production
process.

LABOR

The efforts, skills, and knowledge of people which are applied to the production process.

CAPITAL



Real Capital (Physical Capital)

Tools, buildings, machinery -- things which have been produced which are used in further production

Financial Capital

Assets and money which are used in the production process

Human Capital

Education and training applied to labor in the production process

Video Recorders



500

300

Personnel Computers

PRODUCTION POSSIBILITY FRONTIER

Video Recorders



500

Unused Resources

300

Personel Computers

PRODUCTION POSSIBILITY FRONTIER

Video Recorders



500

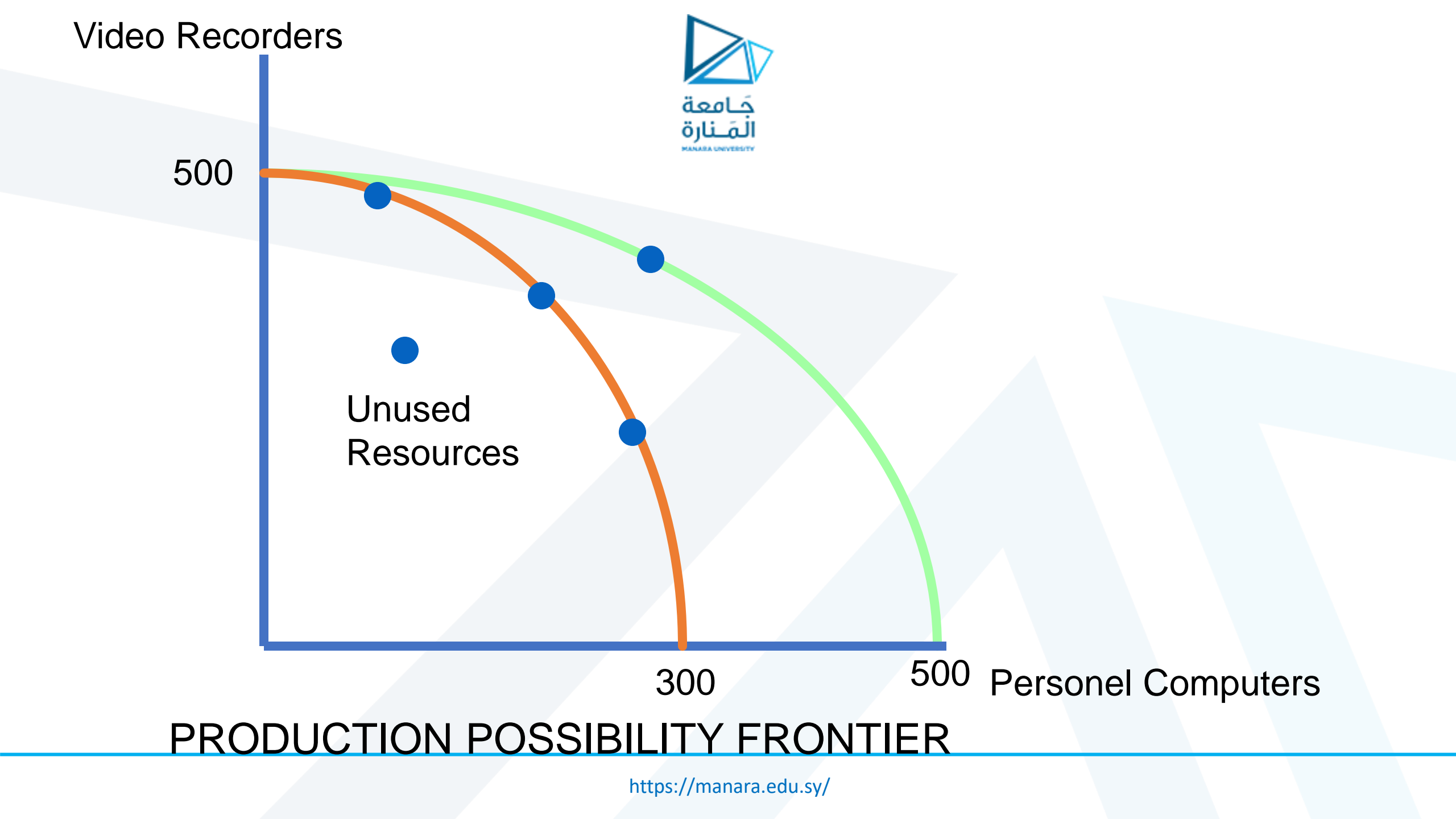
Unused Resources

300

500

Personel Computers

PRODUCTION POSSIBILITY FRONTIER



Video Recorders

600

500

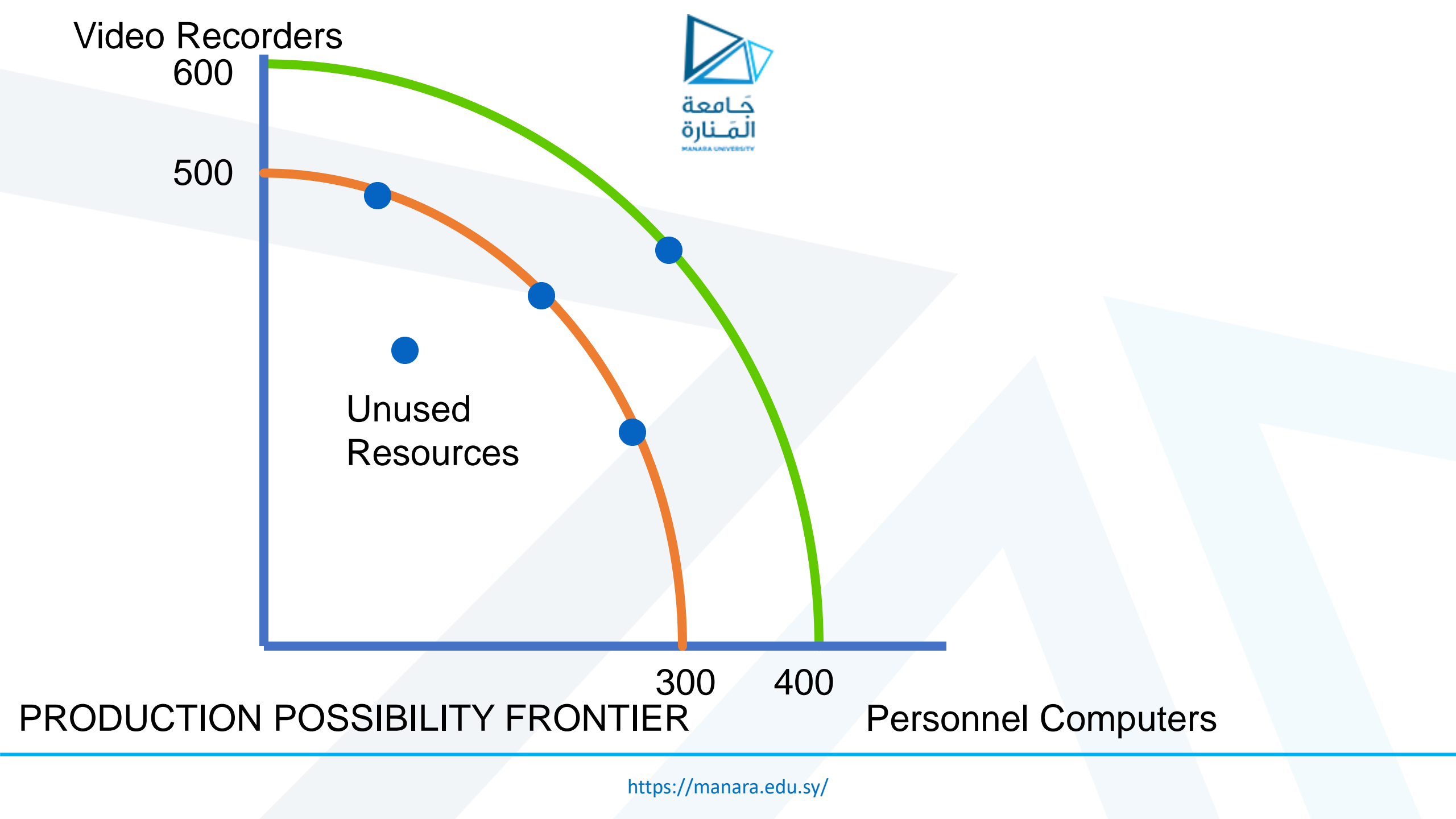
Unused
Resources

300

400

Personnel Computers

PRODUCTION POSSIBILITY FRONTIER



Origins of Engineering Economy

The perspective that ultimate economy is a concern to the engineer and the availability of sound techniques to address this concern differentiate this aspect of modern engineering practice from that of the past.

Origins of Engineering Economy

Pioneer: Arthur M. Wellington, civil engineer

latter part of nineteenth century;

addressed role of economic analysis in engineering projects;

area of interest: railroad building

Followed by other contributions which emphasized techniques depending on financial and actuarial mathematics.

PRINCIPLES OF ENGINEERING ECONOMY

1. Develop the Alternatives;
2. Focus on the Differences;
3. Use a Consistent Viewpoint;
4. Use a Common Unit of Measure;
5. Consider All Relevant Criteria;
6. Make Uncertainty Explicit;
7. Revisit Your Decisions

DEVELOP THE ALTERNATIVES

The final choice (decision) is among alternatives. The alternatives need to be identified and then defined for subsequent analysis.

FOCUS ON THE DIFFERENCES

Only the differences in expected future outcomes among the alternatives are relevant to their comparison and should be considered in the decision.

USE A CONSISTENT VIEWPOINT

The prospective outcomes of the alternatives, economic and other, should be consistently developed from a defined viewpoint (perspective).

USE A COMMON UNIT OF MEASURE

Using a common unit of measurement to enumerate as many of the prospective outcomes as possible will make easier the analysis and comparison of alternatives.

CONSIDER ALL RELEVANT CRITERIA

Selection of a preferred alternative (decision making) requires the use of a criterion (or several criteria). The decision process should consider the outcomes enumerated in the monetary unit and those expressed in some other unit of measurement or made explicit in a descriptive manner.

REVISIT YOUR DECISIONS

Improved decision making results from an adaptive process; to the extent practicable, the initial projected outcomes of the selected alternative should be subsequently compared with actual results achieved.

ENGINEERING ECONOMIC ANALYSIS PROCEDURE

1. Problem recognition, formulation, and evaluation.
2. Development of the feasible alternatives.
3. Development of the cash flows for each alternative.
4. Selection of a criterion (or criteria).
5. Analysis and comparison of the alternatives.
6. Selection of the preferred alternative.
7. Performance monitoring and post-evaluation results.

ACCOUNTING AND ENGINEERING ECONOMY STUDIES

Modern cost accounting may satisfy any or all of the following objectives:

1. To determine the cost of products or services
2. To provide a rational basis for pricing goods or services
3. To provide a means for controlling expenditures
4. To provide information on which operating decisions may be based and the results evaluated



جَامِعَة
الْمَنَارَة
MANARA UNIVERSITY