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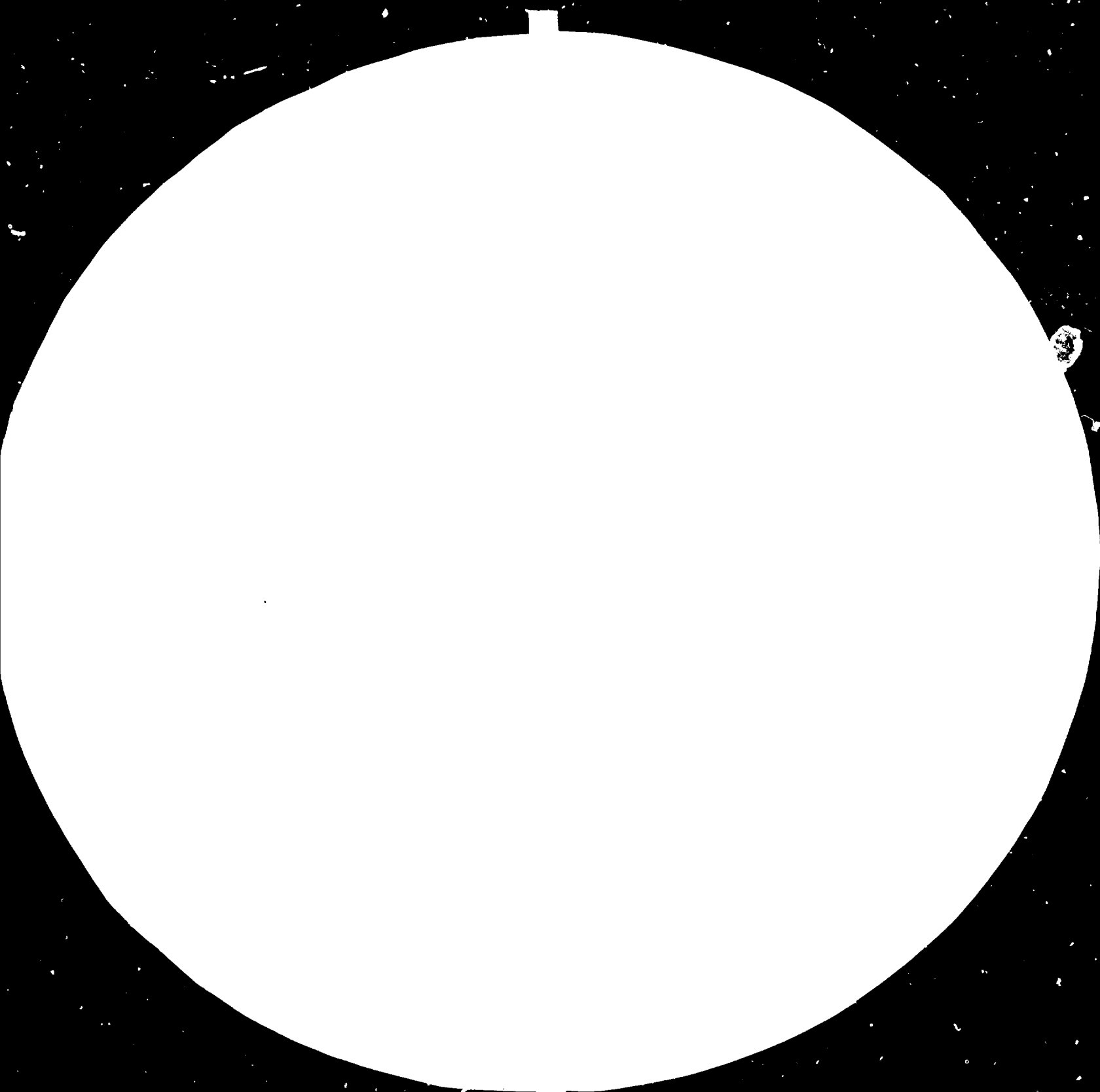
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

the respondent. It also depends on the randomness of the sample selected. Considering the high degree of non-response and false information, an initially random sample may result in information that is far from being representative and reliable. But surveys, by and large, yield statistics that are far more reliable than data deom existing documentation.

## CONCLUSION

In the light of Nigeria's weak statistical base, only simple techniques of demand forecasting can at the moment be used. The Research Department of NIDB usually makes use of simple regression techniques for trend fitting and extrapolation to determine the supply gap. Nigeria has not yet reached a stage where advanced econometric models can be employed for demand estimation. A recent attempt by my Department to forecast the demand for wheat flour by multiple regression ended in futility when the matrix determinant turned out to be zero owing to linear dependence among the variables involved.

G. K. Ajayi
NIDB Research Department
13th October, 1983

**ANNEX   5:**   Test for UNIDO Training Course:
18 questions to be answered by the
participants of the seminar

Test for UNIDO Training Course

Lagos, Nigeria - October 6, 1983

1. What is the difference between NPV and IRR, and indicate'
   how you could estimate the IRR graphically? (Label all lines.)

2. Indicate the three types of debt repayment schemes used,
   and describe the difference between them?

3. What is a 'grace period' and when is it appropriate?

4. To calculate the Current Ratio, what 'entries' must you use?

5. What cost factors are considered in calculating 'working capital'?
   Give an example of how it might be done.

6. What 'costs' are included in the UNIDO definition of:
   Production Cost ?   Factory Cost ?   Operating Cost ?

7. What do you need to know about costs to construct a 'break-even'
   chart ?   Construct one, and label all lines.

8. What kind of information do you need to <u>know</u> in order to prepare
   a manpower requirements table and the Estimate of production costs

9. What is meant by 'project life' and 'plant life' and how may they
   differ ?   Where is each approriate to be used ?

10. Describe 'inventory costing' by LIFO and FIFO methods ?
    Which one would:maximize the annual profit ? overstate inventory ?

11. What does it mean that 'inventory turnover' is 7 times ? How was
    this calculated ?

12. What does it mean if 'collections' are running 90 days ?   How
    was this calculated ?

13. What kind of information would you need to know to determine if
    a prospective project had a market ?   How would you treat the data
    (Methods of statistical analysis)

14. How would you handle the costs for land - if they are a lump sum ?
    - if they are an annual rental ?   How would you <u>depreciate</u> them ?

15. Describe how the normal demand ('optimal allocation') is influenced by subsidies ?   Indicate this effect graphically.

16. Describe the mechanism of demand/supply of foreign exchange works to 'self-regulate' in an economy with no artificial trade or monetary barriers ?

17. What is the 'shaddow wage rate' in the 'Little-Mirrlees' Method, what are its components, and how is it calculated ?

18. A loan of Naira 1 million at 14% for 15 years, 3 years 'grace' is given to a project. Calculate annual payment by 'annuity' method ? What is the interest payment in the first and last years of the loan? (Note: Drawdowns: 1st yr=N250,000; 2nd yr=N500,000; 3rd yr=N250,000.

**ANNEX**     6:  Teaching Materials and Outlines for Slides,
            Module I: Outline of the Project Development
            Cycle

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

COURSE OUTLINE:
THE PROJECT CYCLE

Refer Section:    1

Module:    I

INDUSTRIAL PROJECT PREPARATION
FINANCIAL AND COST-BENEFIT AND
TECHNICAL ANALYSIS/EVALUATION

## COURSE ORIENTATION

WHAT IS PROJECT PREPARATION AND PLANNING  ?

WHAT   TO   PRODUCE  ?

HOW TO PRODUCE IT  ?

HOW MUCH TO PRODUCE  ?

WHERE TO PRODUCE IT  ?

HOW TO DISTRIBUTE AND
    SELL THE PRODUCTION  ?

HOW TO FINANCE ?

HOW TO MANAGE THE PROJECT ?

ALTERNATIVES TO BE EXAMINED FOR DECISIONS  :

MARKET SEGMENT

TECHNOLOGY

SIZE OF FACILITY

LOCATION/ SITE

MARKETING IMPLEMENTATION PROGRAM

METHODS OF FINANCING

ORGANIZATIONAL STRUCTURE

ADDITIONAL FACTORS  :

RAW MATERIAL AVAILABILITY

ECONOMICS OF CAPITAL ALLOCATION

DEVELOPMENT  PRIORITIES

SOCIAL BENEFITS FROM BOTH PRODUCTION
    AND THE PRODUCTION PROCESS

· OBJECTIVES :

    WHAT IS A 'FEASIBILITY STUDY' ?

    WHY ARE FEASIBILITY STUDIES MADE  ?

    WHEN AND WHAT KIND OF STUDIES SHOULD
          BE UNDERTAKEN  ?

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

  PRE-INVESTMENT PHASE

      PROJECT IDENTIFICATION - 'PROFILES'

      PROJECT 'OPPORTUNITY' STUDIES.

         BY :   AREA or REGION

               SUBSECTOR of the ECONOMY

               RESOURCES AVAILABLE

               INTERLINKAGES WITH OTHER PROJECTS

    SPECIFIC PROJECT INVESTMENT STUDIES

        ALTERNATIVE METHODS & TECHNOLOGIES

        COST IDENTIFICATION & LIMITATIONS

        SPECIFICATION OF CONSTRAINTS

  PRE-FEASIBILITY STUDIES :

        INTERMEDIATE STAGE -  LESS FULLY DEVELOPED
            THAN 'FEASIBILITY' STUDY

        LESS COSTLY

        PRE-SELECTION PROCESS/ALLOCATION OF RESOURCES

        TRANSFORMATION INTO AN INVESTMENT PROPOSAL

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

SUPPORT STUDIES :

MARKET RESEARCH AND ANALYSIS :

RAW MATERIAL AND INPUT STUDIES :
PRICES/PRICE TRENDS  (Economic)
LABORATORY STUDIES/TESTS (Technical)

LOCATION STUDIES :
UTILITY AVAILABILITY (WATER,ELECTRICITY)
TRANSPORT COSTS
ORIENTATION TOWARDS RAW MATERIAL or MARKETS
AVAILABILITY OF MANPOWER

TECHNICAL STUDIES / ECONOMIES OF SCALE
ALTERNATIVE PROCESSES/PLANT SIZES
PILOT PLANT OPERATION TO PROVE THE
TECHNOLOGY

EQUIPMENT STUDIES :
EQUIPMENT - IDENTIFICATION OF POTENTIAL
SUPPLIERS
CHOICES ON DEGREE OF MECHANIZATION' or
INTENSIFICATION OF MANUAL OPERATIONS
SPECIFICATIONS FOR SUCCESSFUL BIDDING

THESE ARE UNDERTAKEN TO SUPPORT THE 'PRE-FEASIBILITY'
OR 'FEASIBILITY' STUDY

THEY MAY BE EXPANDED TO CLEAR-UP QUESTIONS

IN RELATION TO THE COMPLEXITY OF A 'FEASIBILITY STUDY'

THEY ARE :

- SINGLE SUBJECT FOCUSED
- MAY INVOLVE VERY SPECIALIZED SKILLS
- ASSIST IN THE PROJECT SELECTION PROCESS

THE FEASIBILITY STUDY :

MUST PROVIDE ALL THE INFORMATION -
TECHNICAL SPECIFICATIONS
COMMERCIAL/MARKET
FINANCIAL/VIABILITY/ABILITY TO GET CREDITS
ECONOMIC/COST-BENEFIT in terms of COLLECTIVITY

MUST INDICATE POSSIBLE ALTERNATIVES

MUST DEFINE PROJECT SCOPE/SIZE etc.

SHOULD CONTAIN DRAWINGS, TABLES etc.

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

THE FEASIBILITY STUDY (continued)
COMBINES RESULTS OF :
MARKET RESEARCH
RAW MATERIAL INPUTS
LOCATION
TECHNICAL
EQUIPMENT ......STUDIES

LEADS TO A DEFINITIVE INVESTMENT DECISION

EVALUATION AND DECISION STAGES :

EVALUATION REPORT

TECHNICAL EVALUATION
FINANCIAL EVALUATION - Commercial Profit-
ability
ECONOMIC EVALUATION -
Cost/Benefit Analysis -
National Economic Profitability
FIVE PARAMETERS :

Aggregate Consumption
Income Distribution
Growth Rates of National
Income
Employment Objectives
Self-Reliance and Merit Wants

INVESTMENT STAGE :

NEGOTIATION and CONTRACTING

FINAL PROJECT DESIGN

CONSTRUCTION

START-UP and COMMISSIONING

OPERATIONAL PHASE :

EX-POST EVALUATION STAGE :

IMPORTANCE IN CASES OF PROJECT PROBLEMS
CERTAINLY IN CASES OF PROJECT FAILURES
NECESSARY IN CASES OF PROJECT ORIENTATION
CHANGES FOR POLITICAL or OTHER REASONS

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

THE PROJECT CHOICE :

THE OPPORTUNITY STUDY :

THE CONCEPT OF ECONOMIC ADVANTAGE
IN TRADE AND DEVELOPMENT

PRIORITIZING THE PROJECT SELECTION :

PRESENT CONSUMPTION PATTERNS and
'IMPORT SUBSTITUTION'

RAW MATERIAL PROCESSING and
'ECONOMIC INTEGRATION'

EXPORT PROMOTION and REGIONAL
ECONOMIC INTERDEPENDENCE

THE FIVE COST/BENEFIT PARAMETERS

'MERIT WANTS' AND POLITICAL DETERMINATION

ECONOMIC CRITERIA :

AVAILABILITY OF MARKETS

AVAILABILITY OF RAW MATERIALS

AVAILABILITY OF 'APPROPRIATE' TECHNOLOGY

AVAILABILITY OF MANPOWER AND SKILLS
PROJECT IMPLEMENTATION CAPABILITY
TRAINING POSSIBILITIES AND FACILITIES
TECHNOLOGY TRANSFER AND DEVELOPMENT

AVAILABILITY OF NECESSARY INFRASTRUCTURE
WATER, POWER, FUELS

AVAILABILITY OF CAPITAL or CREDITS

POLICY OBJECTIVES :

ALLOCATION OF CAPITAL AS A 'SCARCE'

SELF-SUFFICIENCY WITH REGARD TO BASIC NEEDS

INDUSTRIALIZATION

PROCESSING INTEGRATION AND LINKAGES

REGIONAL TRADE DEVELOPMENT

FOREIGN EXCHANGE GENERATION OR SAVINGS

INDEPENDENCE FROM EXTERNALLY CAUSED
CYCLICALITIES

PRODUCT DIVERSIFICATION and MARKET DEVELOP-
MENT

TAKE ADVANTAGE OF ECONOMIES OF SCALE

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

NATIONAL, SECTORAL
and PROJECT PLA'TNG

Refer Section:     3
         Module:     I

## ** NIGERIA **

### THE NATIONAL PRIORITIES : ALLOCATION OF RESSOURCES

I.   IMPROVE STANDARD OF LIVING OF POPULACE
     (Cost-Benefit Analysis--AGGREGATE
     CONSUMPTION OBJECTIVE)

II.  DEVELOPMENT OF :

         AGRICULTURE
         INDUSTRY
         IMPORT SUBSTITUION
         EXPORT GENERATION

III. EMPLOYMENT GENERATION

IV.  PROVISION OF SOCIAL SERVICES
     ('Merit Wants')

FOCUS OF THE COURSE :  INDUSTRIAL SUB-SECTOR

A.   MAXIMUM UTILIZATION OF AGRICULTURAL AND
         MINERAL RESOURCES

B.   MAXIMIZE 'VALUE ADDED' THROUGH :

         AVAILABILITY OF MARKETS FOR PRODUCTS
         AVAILABILITY OF RAW MATERIAL INPUTS
         DEVELOP SKILLS IN SECURING APPROPRIATE
         TECHNOLOGY
         AVAILABILITY OF MANPOWER AND SKILLS
         TRAINING
         ACCESS TO CAPITAL FOR INVESTMENT
         -- INCLUDING METHODS OF FOREIGN FINANCING
         PROCUREMENT OF NECESSARY INPUTS ON
         ADVANTAGEOUS TERMS

THESE GOALS WERE ENUMERATED BY THE HONORABLE
MINISTER OF INDUSTRIES IN HIS OPENING ADDRESS

                              Lagos,  5 September 1983

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

INDUSTRIAL POLICIES
and STRATEGIES

Refer Section:    6
Module:    I

POLICY INSTRUMENTS :

PROMOTION OF :

| | |
|---|---|
| IMPORT SUBSTITUTION : | TARIFFS |
| | QUOTAS |
| | LICENSING |
| | ARTIFICIAL EXCHANGE RATES |
| | |
| EXPORT PROMOTION : | SUBSIDIES |
| | TAX EXEMPTIONS/DRAWBACKS |
| | EXCHANGE RATE ADVANTAGES |
| | |
| EMPLOYMENT : | WAGE LEVELS |
| | TAX EXEMPTIONS |
| | FRINGE BENEFIT FORGIVENESS |
| | TRADE UNION PRESSURES |
| | |
| LOCATION : | LOCAL TAX DIFFERENTIATION |
| | CHANGES IN INVESTMENT INCENTIVE PACKAGES |
| | PUBLIC INVESTMENT IN NEEDED INFRASTRUCTURE |
| | LAND AVAILABILITY AND PRICES |
| | |
| CAPITAL ACCUMULATION AND PRIVATE SAVINGS : | TAXES ON CONSUMPTION; SALES TAXES TURN-OVER TAXES INCOME TAXES AND SPECIAL EXEMPTIONS |
| | |
| GENERAL INVESTMENT INCENTIVES : | CREDIT FACILITIES SUBSIDIZED INTEREST RATES CAPITAL REPATRIATION AGREEMENTS TAX HOLIDAYS EXEMPTIONS FROM LOCAL OWNERSHIP REQUIREMENTS ACCELERATED WRITE-OFFS DIVIDEND REPATRIATION ALLOWANCES |
| | |
| GENERAL INVESTMENT DISINCENTIVES : | HIGH INFLATION RATES REVALUATIONS AND 'FREEZING' OF ASSETS AND DEPOSITS UNCONVERTIBILITY OF CAPITAL AND DIVIDEND REPATRIATION UNREALISTIC LOCAL OWNERSHIP REQUIREMENTS IN FACE OF LOCAL CAPITAL AVAILS HIGH RATES OF INTEREST WHICH REFLECT RISK ASSESSMENT PRICE CONTROLS |

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

PROJECT IDENTIFICATION :

Refer Section:     7

Module:     I

# PROJECT IDENTIFICATION

APPROACH IN ONE OF TWO WAYS :

I.  'T O P    D O W N'

PROJECTS DERIVED FROM COUNTRIES
POLICIES AND STRATEGIES :

RESULT :

PROJECTS ARE COMPATIBLE WITH THE
LONG-TERM PLANS

PROJECTS MAY HAVE MICRO*ECONOMIC
DEFICIENCIES

II. 'B O T T O M    D O W N'

PROJECTS DERIVED FROM 'GRASS ROOTS'
IE: MICRO*ECONOMIC CONSIDERATIONS
'THE MARKET ECONOMY' APPROACH

RESULT :

PROJECTS USUALLY FINANCIALLY AND
COMMERCIALLY SOUND
PROJECTS MAY DIFFER FROM POLICIES
AND STRATEGIES OF THE GOVERNMENT
PROJECTS MAY FAIL COST-BENEFIT TESTS
OF ECONOMIC AND SOCIAL VALUE CONTRIBUTION
DEPENDENT UPON STRESS GIVEN TO CRITERIA

QUESTION ?? IS THE 'FREE MARKET' APPROACH
INCOHERANT WITH PROGRAMS FOR DEVELOPMENT ?

WHAT ARE THE OBSERVED RESULTS IN THE CENTRALLY
PLANNED ECONOMIES ? WHAT SHOULD NIGERIA DO ?

**ANNEX   7:   Teaching Materials and Outlines for Slides, Module II: Market Analysis**

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

MARKET RESEARCH

Refer Section:     3
            Module:     II

# MARKET RESEARCH
## Orientation

IDENTIFY the PRODUCT   - (Specifications)

    "       "   QUANTITY - Domestic Demand
                          - Potential for Export

    "       "   PRICE   - Supply/Demand Relationship
                          'Elasticity'

    "       "   MARKET  - Charateristics of Consummer
                                 Methods of Consumption
                          - Character and Restraints of
                                   Distribution Channels

HOW MARKET RESEARCH IS CARRIED OUT :

        ANALYSIS  - Past and Present DEMAND Data

                 'Purifying' the DEMAND TREND by.

                 Fragmenting/Segmenting MARKET

                 Separating EFFECTS of PRICE CHANGES

                 (Note: CONSUMPTION is Not Always
                           Equal to DEMAND.  Why?)

      DATA REQUIREMENTS:

                WHAT is needed?

                WHERE can it be found?

      STATISTICS: DOMESTIC MARKET  : AREA SERVED etc.

                LOCAL PRODUCTION PLUS IMPORTS

                    'SMUGGLING'/MARKET DIFFERENTIATION

                LIMITATIONS of DATA GROUPINGS/BREAKDOWN

                SEARCH for RELATED DEMANDS WHICH ARE KNOWN
                        or CAN BE INDEPENDENTLY ESTIMATED

                PRICE DATA:  IMPORTS - F.O.B. / C.I.F.
                    (Free on Board; Cost Insurance & Freight)

                PRICE STRUCTURE: Breakdown;  ex-factory,
                    Middle-men commissions, retail mark-up

                DISTRIBUTION REQUIREMENTS:  Stocks, freight
                    containers, packaging, returns, product
                    warrenties and guarantees, (aging, etc.)

                OTHER DATA SOURCES:

                    FAMILY BUDGET SURVERYS/'MARKET BASKET'
                    IMPORT DUTIES/SALES TAX COLLECTIONS

                QUALITATIVE DATA:

                    CONSUMER ATTITUDES
                    DEGREE of COMPETITION in MARKET
                    GOVERNMENT REGULATIONS: HEALTH
                        LICENSING;  SUBSIDIES  etc.

## MARKET   RESEARCH
### Orientation (2)

How MARKET RESEARCH IS CARRIED OUT :

STATISTICS:   EXPORT MARKET :   AREA SERVED etc.

IMPORT   STATISTICS IN PROSPECTIVE MARKETS/ AVAILABILITY

IMPORTANCE OF FREIGHT

POSSIBILITIES OF TRANSPORT AND ECONOMICS

GOVERNMENT REGULATIONS AND LICENSING/ QUOTAS/
IMPORT DUTIES/ EXPORT 'DRAWBACK on TAXES ??
OTHER INCENTIVES TO ENCOURAGE EXPORTS

DEGREE OF COMPETTION IN PROSPECTIVE MARKETS : TRADITIONAL
TRADING PARTNERS : CAPTIVE SUBSIDIARIES etc.

METHODS OF DISTRIBUTION/ AGENTS; FEES; PROMOTION METHODS

FINANCING OF STOCKS; PROBLEMS OF WARRANTIES & GUARANTEES
PRODUCT RETURNS etc.

PRICE DATA; F.O.B./ C.I.F.

PRICE STUCTURE: Breakdown; costs of transport; mark-ups

DISTRIBUTION REQUIREMENTS: containers, packaging, quantities
quality determinants, etc.

SOURCES OF INFORMATION :

PUBLISHED DATA :  Actual, ESTIMATES

OFFICIAL:  GOVERNMENT; BANKS; TRADE ORGANIZATIONS

UNPUBLISHED DATA :  PRESENT IMPORTERS
PRIVATE ENTREPRENEURS/POTENTIAL PARTNERS
SURVEYS; INTERVIEWS  etc.

EXAMPLES:

DOMESTIC MARKET :

MINISTRIES; CENTRAL BANK ANNUAL REPORTS
CUSTOMS DATA; TRADE PROMOTION AGENCIES
FIVE YEAR PLAN; GOVERNMENTAL BUDGETS

EXPORT MARKET :

INTERNATIONAL ORGANIZATIONS :

I.M.F.
WORLD BANK
UNCTAD/ ITC
UNIDO
FAO / ILO
O.E.C.D.
E.C.A.  (Ecomomic Commission for Africa
B.A.D.  (African Development Bank)
ECOWAS Secretariat
International Federations and
Associations
Equipment Suppliers

# MARKET RESEARCH
## Orientation (3)

DEMAND FORECASTING :

    UNCERTAINTY

    POTENTIAL INFLUENCE OF UNFORSEEN EVENTS·

USE OF MATHMATICAL TECHNIQUES :

    TIME SERIES

    FITTING A TREND LINE

        REGRESSION; CORRELATION OF DATA

        TYPES OF TRENDS : STRAIGHT LINE

                        COMPOUNDING/ EXPONENTIAL

                        SEASONAL

                        CYCLICAL

        USES OF WEIGHTED AND MOVING AVERAGES etc.

    DATA FROM 'INPUT-OUTPUT' MODELS

    USE OF ECONOMETRIC MODELS

    STATISTICAL SAMPLING TECHNIQUES

USE OF JUDGEMENT :

    COMMON SENSE

COMPARISONS OF RESULTS UNDER DIFFERENT METHODS :

    FAMILY BUDGET SURVEYS ; DISPOSABLE INCOME ESTIMATES

    INTERNATIONAL COMPARISONS USING PUBLISHED DATA FOR OTHER
        MARKETS

    PRODUCT SUBSTITUTION IN OTHER MARKETS

    EFFECTIVENESS OF IMPORT SUBSTITUTION IN OTHER MARKETS

    COMPARABLE CASES OF EXPORT PROMOTION AND RESULTS ACHIEVED

    CHECKING OUT THROUGH USE OF CAREFULLY DESIGNED SAMPLING

WHERE TO SEEK ASSISTANCE :

    'WHEN' IS AN INDIVIDUAL DETERMINATION

    USE OF CONSULTANTS; INDUSTRIAL ENGINEERING AND OTHERS

    POSSIBILITY OF 'REPROCESSING' ORIGINAL DATA (ex. CUSTOMS
        DATA) TO FIND REQUIRED INFORMATION USING ORIGINAL
        DOCUMENTS

    USE OF THE POTENTIAL MACHINERY SUPPLIER

    USE OF THE APPROPRIATE INDUSTRY TRADE ORGANIZATION

## MARKET RESEARCH
### Orientation (4)

OBJECTIVES :

    DETERMINE :

        PRODUCT SPECIFICATION

        MANUFACTURING QUANTITY

        SALES PRICE

    MARKET LIMITATIONS :

        TYPE OF DOMESTIC DEMAND/ CONSUMER PREFERENCES

        PRODUCTION LIMITATIONS & FORECAST DEMAND

            POTENTIAL TO EXPORT

        DISTRIBUTION AND PRICE STRUCTURE/
          PRICE CONTROLS

    CATEGORY OF MARKET :

        CONSUMER GOOD // DURABLE; NON-DURABLE

        INDUSTRIAL GOOD
           LINKAGES WITH OTHER PRODUCT PRODUCTION

    DEMAND FACTORS :

        IDENTIFICATION OF TRENDS

        PRODUCT SUBSTITUTION

    MARKET RESEARCH TECHNIQUES  (Vocabulary)

        MARKET SECTORS/SEGMENTS = FRACTURIZATION

    RESUPPLY OF MARKET DEMAND :

        PRODUCT LIFE CYCLE

        PLANNED OBSOLESCENCE

    COLLECTION OF DATA :

        CORRELATION WITH 'KNOWN' TRENDS

        DEMAND INTER-RELATIONSHIPS

        AVAILABLE STATISTICS

    ESTIMATION OF FUTURE DEMAND :

        NOT A SCIENCE; MORE OF AN ART

        INFLUENCE OF EVENTS - PLANNED and UNPLANNED.

        SENSITIVITY TO WHAT FACTORS

    INFLUENCE OF PRODUCT SPECIFICATIONS :

        QUALITY VERSUS PRICE OBJECTIVES

        DISTRIBUTION LIMITATIONS AND RESTRAINTS

    DEMAND CREATION/SUBSTITUTION
        ADVERTISING etc.
        OTHER POSSIBILITIES

    IS IT NECESSARY TO USE A CONSULTANT ? ?

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept — 14 Oct 1983
Materials used by
Mark Weber

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

U.W. REQUIREMENTS/TYPE etc.

Refer Section:      A

Module:      II

## MARKET RESEARCH
### Discussion

DEMAND and MARKETING ANALYSIS

A.  MANUFACTURER'S CRITERIA TO PRODUCE A PRODUCT

B.  MARKET ASSESSMENT
   1.  PRODUCT CLASSIFICATION :   Consumer
       (by Market destination)      Industrial
   2.  PRODUCT SPECIFICATIONS and CHARACTERISTICS
   -  MARKET SUPPLY
   1.  Present -  Production
                  Imports
                  Substitutes
   2.  Future
   -  MARKET DEMAND
   1.  Is present SUPPLY equal to DEMAND ?
   2.  If not, what are restraining factors ?
       Will they continue to affect new project ?
   -  PRICE LEVELS and TRENDS
   1.  Factors influencing price levels:
       Quotas, Import duties, (ie; Tariff Bariers)
   -  CHANNELS of DISTRIBUTION
   -  GOVERNMENT POLICIES

C.  SALES FORECASTING METHODS

   *  This is the objective of the exercise (Ref; Manual)

D. * ESTMATED SALES REVENUES
   -  VOLUME DETERMINANTS / PRODUCTION PROGRAM CAPABILITY
   -  PRICE OBJECTIVES:
   1.  MAXIMIZE ROI
   2.  MAXIMIZE PENETRATION of MARKET/INCREASE MARKET
                                              SHARE
   3.  STABILIZE MARKET; DEVELOPMENT OF LOCAL MATERIALS
   -  COST of SALES
   1.  METHODS of MARKET PROMOTION
   2.  ALTERNATIVES IN CHANNELS OF DISTRIBUTION
   -  Determined by:  MARKET CHARACTERISTICS
              -  PRODUCT  (perishable, durable, size etc.
              -  CUSTOMER PREFERENCES and RESTRAINTS
              -  DISTRIBUTION CHANNELS and RESTRICTIONS

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S

MARKET RESEARCH
DATA SOURCES :

Refer Section:   4A

Module:   II

IRONSTONE DM

**Where to find business information**

New York, John Wiley, 1979. xi, 616 p.

605 Third Avenue, New York, NY 10016, USA

ECONOMIST INTELLIGENCE UNIT, LONDON.
**Publication list**
London.

Spencer House, 27 St. James's Place, London SW1A 1NT, UK.

UK British Overseas Trade Board
**INTERNATIONAL DIRECTORY OF PUBLISHED MARKET RESEARCH.**
London.

50 Ludgate Hill, London EC4M 7HU, UK

TROPICAL PRODUCTS INSTITUTE
**Publications list.**
London.

56/62 Gray's Inn Road, London WC1X 8LU, UK.

UN. DAG HAMMARSKJOLD LIBRARY
**UNDOC. current index.**
New York.

UN Publications, A-3315, UN, New York. NY 10017, USA.

UNIDO
**Documents List**
Vienna.

P. O. Box 300, A-1400 Vienna, Austria.

UNIDO
**Industrial development abstracts.**
New York, UN.

Sales Section, Palais des Nations, 1211 Geneva 10, Switzerland or UN Publications A-3315, New York, NY 10017, USA.

OECD
**OECD publications.**
Paris.

2 rue Andre-Pascal, 75775 Paris Cedex 16, France.

Chamber of Commerce of the United States
**IMPORTER'S GUIDELINES; SOURCES OF INFORMATION FOR U.S.**
Washington D.C.

224 Seventh St., Garden City, N.Y. 11530, USA.

* **IMPORTERS AND FOREIGN EXPORTERS TO THE UNITED STATES.**

Economic Information Service, the Hague
**ECONOMIC TITLES**
The Hague, Nijhoff.

P. O. Box 269, The Hague, Netherlands.

INTERNATIONAL CHAMBER OF COMMERCE
**Publications.**
Paris.

33 Cours Albert 1er, 75008 Paris, France

**TRADE DIRECTORIES OF THE WORLD**
Queens Village, Corner Publications.

211-03 Jamaica Avenue, Queens Village, NY 11428, USA.

**ULRICH'S INTERNATIONAL PERIODICALS DIRECTORY**
New York, Bowker.

1180 Avenue of the Americas, New York, NY 10036, USA.

INTERNATIONAL TRADE CENTRE
**Annotated bibliography of country serials**
Geneva.

Palais des Nations, 1211 Geneva 10, Switzerland.

UNCTAD
**Guide to publications.**
Geneva.

UNCTAD Information Service, Palais des Nations, 1211 Geneva 10, Switzerland.

WORLD BANK, WASHINGTON
**Catalog World Bank publications.**
Washington, D.C.

1818 H. Street, N.W., Washington, D.C. 20433, USA.

UN. ECONOMIC COMMISSION FOR AFRICA
**List of ECA documents issued**
Addis Ababa.

P. O. Box 3001, Addis Ababa, Ethiopia.

**GOVERNMENT PERIODICALS AND SUBSCRIPTION SERVICES OFFICE**

**LIST 36**
Washington, D.C.

US. Government Printing Office, Washington, D.C. 20402, USA.

US. DEPARTMENT OF AGRICULTURE:
List of available publications.
Washington, DC. (Its List no.:-H)

Washington, D.C 20250q USA

US INTERNATIONAL TRADE COMMISSION
Publications.
Washington, D.C.

Washington, D.C. 20436, USA.

UN. ECONOMIC COMMISSION FOR LATIN
AMERICA:
List of printed publications in English.
Santiago.

Casilla 1790, Santiago, Chile

PUBLISHED DATA ON EUROPEAN INDUSTRIAL
MARKETS.
London Industrial Aids Ltd.

14 Buckingham Palace Road, London
SW1W 0QP, UK.

European Communities
EUROPEAN COMMUNITY AS PUBLISHER;
EXTRACT FROM OUR CATALOG OF PUBLICATIONS.
Brussels.

Case postale 1003, Luxembourg.

GOVERNMENT PUBLICATIONS.
London, Her Majesty's Stationery Office.

P. O. Box 569, London SE1 9NH, UK.

OECD
Macrothesaurus for information processing
in the field of economic and social deve-
lopment.
Paris, 1978, xiii, 433 p.

2 rue Andre-Pascal, 75775 Paris Cedex 16,
France.

UN STATISTICAL OFFICE
Standard international trade classifi-
cation revision 2.
New York. 1975. viii, 117 p. (Statisti-
cal papers, Series M no. 34/Rev.2)
ST/ESA/STAT/SER.M/34/Rev.2.

UN Publications, A-3315, UN, New York,
NY 100017, USA.
Sales Section, Palais des Nations, 1211
Geneva, Switzerland.

DICTIONARY OF ECONOMICS AND COMMERCE.
London, Pan Books, 1976. 437 p.

Cavaye Place, London SW10 9PG, UK.

HORTEN HE
Export-import correspondence in four
languages.   Correspondance commercial
Epping, Essex, CM16 4BU, UK.

Government Budgeting and Expenditure
Controls:   (Theory and Practice)
Publications Unit, International Monetary,
Fund.
Box A-103,   Washington DC 20431 USA.

US DEPARTMENT OF COMMERCE
United States department of commerce
publications - a catalog and index.

Washington, D.C.

Superintendent of Documents,
US Government Printing Office, Washington, D.C.
20402, USA.

OAS. GENERAL SECRETARIAT
Catalog of publications.
Washington, D.C.

Washington D.C. 20006, USA.

HARVEY JM
Statistics Europe: sources for social, economic
and market research.  3rd ed.
Beckenham, CBD Research, 1976, xii, 467 p.

151 High Street, Beckenham, BR3 1EA, UK.

UN ECONOMIC COMMISSION FOR EUROPE
List of ECE documents.
Geneva.

ECE Documents Distribution, Palais des Nations,
1211 Geneva 10, Switzerland.

CURRENT BRITISH DIRECTORIES.
Beckenham, CBD Research.

151 High Street, Beckenham, BR3 1EA, UK.

UK. MINISTRY OF AGRICULTURE FISHERIES AND FOOD
MAFF publications catalogue.    Pinner.

Tolcarne Drive, Pinner, Middlesex HA5 2DT, UK.

Customs Co-operation Council, Brussels
NOMENCLATURE FOR THE CLASSIFICATION OF GOODS
IN CUSTOMS TARIFFS.

NOMENCLATURE POUR LA CLASSIFICATION DES MARCHA-
DISES DANS LES TARIFS DOUANIERS.
Brussels.

26-38 rue de l'Industrie, B-1040 Brussels, Belgium.

BRADY GS
Materials handbook - an encyclopedia for purcha-
sing agents, engineers, executives, and foremen.
10th ed.
New York, McGraw-Hill, 1971. viii, 1045 p.

1221 Avenue of the Americas, New York,
NY 100020, USA.

HANSON JL.
Dictionary of economics and commerce.
London, Macdonald and Evans, 1976, 412 p.

Estover, Plymouth PL6 7PZ, UK

FINANCE DEVELOPMENT (A quarterly )

World Bank Publications, P. O. Box 37525
Washington DC 37525 USA.

IMF glossary: English-French-Spanish.
Washington, 1976. vii, 154 p.

Washington, D.C. 20431, USA.

Cont'd .                         -3-

PENGUIN DICTIONARY OF ECONOMICS.
London, Allen Lane, 1975. 467 p.

Allen Lane, 17 Grosvenor, London SW1, UK.

DUNTERS' ALMANAC YEAR BOOK
Croydon, Thomas Skinner Directories

Windsor Court, East Grinstead House,
East Ginstead, West Sussex RH19 1XE, UK.

PRINCIPAL INTERNATIONAL BUSINESSES;
THE WORLD MARKETING DIRECTORY.
New York, Dun and Bradstreet.          $9

P. O. Box 3221, Church Street Station,
New York, N.Y. 10008, USA.

WORLD WIDE CHAMBER OF COMMERCE DIRECTORY
Loveland, Johnon.
Box 455, Loveland, Colorado 80537, USA.

ACP STATES YEARBOOK. ANNUAIRE DES ETATS
ACP : Brussels, Editions Delta.

92-94 Square E. Plasky, B-1040 Brussels,
Belgium.

ECONOMIC YEARBOOK OF MEMBER STATES OF
THE ORGANIZATION OF AFRICAN UNITY.
Terni, EDICA.

B. P. 146, 05100 Terni, Italy.

AMERICAN EXPORT REGISTER

New York, Thomas International Publishing Co.

One Penn Plaza, 250 West 34th Street, New York.
NY 10001, USA.

LESIKAR RV
How to write a report your boss will read and
remember.
Homewood, Ill., Dow Jones-Irwin, 1971. ix, 216 p.
1818 Ridge Road, Homewood, Ill. 60430, USA.

OWEN'S COMMERCE AND TRAVEL AND INTERNATIONAL
REGISTER.
London, Owen's Commerce and travel Ltd.

100 Belsize Lane, London NW3SB2, UK.

WORLD IN FIGURES
London, Economist Newspaper.

25 St. James's Street, London SW1A 1HG, UK.

Union of International Associations
YEARBOOK OF INTERNATIONAL ORGANIZATIONS.
Brussels.

1 Rue aux Laines, 1000 Brussels, Belgium.

Association of Africa Trade Promotion organiza-
tions(AATPO).
DIRECTORY OF TRADE PROMOTION INSTITUTIONS IN
AFRICA.
Tangiers.

P. O. Box 23, Tangiers, Morocco.

## Appendix 2

Annotated select bibliography for basic market information

MACROECONOMIC RESEARCH

1.  International Financial Statistics

    Frequency of publication: Monthly

    Publisher: International Monetary Fund (IMF), 19th and H Streets, N.W., Washington, D.C. 20431

    Price: $10 per year (including annual supplement)

2.  Yearbook of National Accounts Statistics

    Frequency of publication: Annual

    Publisher: United Nations, New York

    Price: $7 (1966)

    Detailed estimates of national income and related economic measures for about 100 countries. Among the subjects discussed are: expenditure on gross national product, distribution of national income, composition of private consumption expenditure, general government revenue and expenditure, and external transactions. Published since 1958 and available on standing order.

3.  National Accounts of OECD Countries, 1958-1967/Comptes nationaux des pays de l'OCDE, 384pp.

    Date of publication: 1969

    Publisher: Organisation for Economic Co-operation and Development (OECD) 2, rue André Pascal, Paris 16e

    Price: $6.50

    Statistical tables showing, for each of the member countries of OECD, including Finland, as well as for total OECD, European OECD and the EEC, the main aggregate of national accounts. Special tables give growth triangles, price and volume indices, ratios between selected aggregates.

4.  National Accounts of Less Developed Countries, 1950-1966/Comptes nationaux des pays moins développés, 216pp.

    Date of publication: 1968

    Publisher: Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, Paris 16e

    Price: $5.00

    Part I: Data on real product, population and real product per capita; part II: Data on growth of value added by main industrial sectors; part III: National accounts tables for seventeen less developed countries selected for their economic role.

5. <u>Main Economic Indicators</u>

Frequency of publication: Monthly

Publisher: Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, Paris 16e

Price: $1.50 per issue, $19.50 per year (including supplements)

An essential source of statistics for the student of the international business cycle. Provides a picture of the most recent changes in the economy of the member countries of OECD, together with a collection of international statistics on economic development affecting the OECD area in the past few years.

## RESEARCH ON INTERNATIONAL TRADE STATISTICS

6. <u>Compendium of Sources: International Trade Statistics</u>, 150pp.

Date of publication: 1967

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

Lists production statistics for 163 countries and territories.

7. <u>Commodity Indexes for the Standard International Trade Classification, Revised, Vols.I and II (Statistical Papers, Series M, No.38)</u> 453pp., 392pp.

Date of publication: 1963

Publisher: United Nations, New York

UN Sales Number: 64.XVII.2, 64.XVII.3

Price: Vol.I - $5.00, Vol.II - $4.50

Two volumes bringing the original Indexes up to date and classifying about 30,000 articles of commerce. Volume I consists of an item index showing for each item of the Standard International Trade Classification, Revised (SITC, Rev.), the principal articles falling within the item. Volume II begins with the SITC, Rev., followed by the Alphabetic Index, containing the result of alphabetizing all the entries occurring in the Item Index, together with new entries resulting from such rearrangements or modifications of the wording of the basic entries as were thought to be needed, amounting to about 45,000 entries. Once a product has been identified in this work, one may consult the <u>World Trade Annual</u> (see item 8 below).

8. <u>World Trade Annual</u>, Vol.I-IV, prepared by the United Nations Statistical Office

Frequency of publication: Annual

Publisher: Walker and Company, 720 Fifth Avenue, New York, N.Y. 10019

Price: $25.00 per volume, $100 for the set

This work gives data for 90 per cent of world trade. To use it, access to the <u>Commodity Indexes for Standard International Trade Classification</u> (see item 7 above) is essential. The four volumes contain detailed

export and import statistics for 24 developed countries: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Federal Republic of Germany, Finland, France, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States and Yugoslavia.

9. Supplement to the World Trade Annual, Vol. I-V, prepared by the United Nations Statistical Office

Publisher: Walker and Company, 720 Fifth Avenue, New York, N.Y. 10019

Price: $50.00 per volume, $250.00 for the set

Each volume shows the trade of the 24 developed countries with other regions: Eastern Europe, Latin America, Africa and the Far East. Although this is a costly publication, every embassy and trading board should purchase it and thus help its exporters to find new markets.

10. Commodity Trade Series (Statistical Papers, Series D)

Frequency of publication: About 25 issues per year

Publisher: United Nations, New York

Price: $1.50 per issue, $25.00 per year

Issued in fascicles of about 200 pages as quarterly data become available, this series contains international commodity tables, according to the SITC, Rev., showing the imports and exports of countries reporting according to that classification (taken together, without duplication, the imports and exports of these countries cover about 90 per cent of world trade). Within commodity headings trade is analysed by country, region of provenance and destination. Figures are in US dollars and metric units of quantity.

11. Yearbook of International Trade Statistics

Frequency of publication: Annual

Publisher: United Nations, New York

Price: $11.50 (1964)

A compilation of national tables showing annual figures for several years for over 138 countries, and summaries of trade by large commodity classes and by principal regions and countries. Published since 1951 and available on standing order.

12. Trade by Commodities: Market Summaries/Exchanges par produits. Résumé par marché (Foreign Trade Statistics, Series C)

Frequency of publication: Half-yearly

Publisher: Organisation for Economic Co-operation and Development (OECD) 2, rue André Pascal, Paris 16e

Price: $19.50 per year

Detailed information on the trade of OECD countries by commodities (defined according to the SITC) and partner countries. Data in terms of both value and quantity are presented in synoptic tables, bringing

together the countries comprising the market for a commodity, as outlets and/or sources of supply. This series has been published since 1959, and its presentation is now in three volumes: General, Imports, Exports. While this work is less detailed than the World Trade Annual (see item 8 above), it is much less costly.

13. Trade Yearbook

Frequency of publication: Annual

Publisher: Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome

Price: $6.00

Covers about 200 agricultural products throughout the world.

14. Foreign Trade: Analytical Tables (Imports, Exports) (German and French)

Frequency of publication: Quarterly in two volumes

Publisher: Statistical Office of the European Communities, 170, rue de la Loi, Brussels 4

Price: BF 850 per year

RESEARCH ON PRODUCTION STATISTICS

15. Compendium of Sources: Basic Commodity Statistics,[1]/232pp.

Date of publication: 1967

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

16. Production Yearbook

Frequency of publication: Annual

Publisher: Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome

Price: $9.00

17. Commodity Yearbook

Frequency of publication: Annual

Publisher: Commodity Research Bureau, 82 Beaver Street, New York, N.Y. - 10005

Price: $14.00

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1/ The products described in this work are listed in ~~appendix 3~~, page 70

RESEARCH ON TRADE ASSOCIATIONS

18. Manufacturing and Trading Associations in Twenty-Eight Countries, (trilingual: English/French/Spanish), 93pp.

   Date of publication: 1966

   Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

   Price: Free to developing countries

19. Europa Yearbook: Vol.I, International Organizations and Europe; Vol.II, Asia, the Americas, Africa, Australasia, 1,316pp., 1,664pp.

   Frequency of publication: Annual

   Publisher: Europa Publications Ltd., 18 Bedford Square, London, W.C.1

   Price: £ 13

20. European Companies, a Guide to Sources of Information, 2nd ed., compiled and edited by G. P. Henderson

   Date of publication: 1966

   Publisher: CBD Research Ltd., 114 High Street, Beckenham, Kent, UK

   Price: $13.50

21. Trade Directories of the World, compiled by U. H. E. Croner

   Frequency of publication: first published 1952, monthly amendments

   Publisher: Croner Publications Inc., 211-03 Jamaica Avenue, Queens Village, N.Y. 11428

   Price: $20 (incl. amendment service)

   Loose-leaf format with monthly amendments.

DESK RESEARCH ON DEMAND

22. McGraw-Hill Encyclopedia of Science and Technology, 15 vols.

   Date of publication: 1966

   Publisher: McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York, N.Y. - 10035

   Price: $370

23. Materials Handbook, an Encyclopedia for Purchasing Agents, Engineers, Executives, and Foremen, by G. S. Brady, 9th ed., 968pp.

   Date of publication: 1963

   Publisher: McGraw-Hill Book Co., 330 West 42nd Street, New York, N.Y. - 10036

   Price: $19.50

24. Demographic Yearbook (bilingual: English/French)

   Frequency of publication: Annual

   Publisher: United Nations, New York

   Price: $11.00 (1967)

   International demographic statistics for over 250 countries and terri-
   tories. Basic data on area, density, population growth rates, natality,
   mortality, life expectancy, nuptiality and divorce. Each issue also
   includes extended data on a special demographic topic. Published since
   1949 and available on standing order.

25. Statistical Yearbook (bilingual: English/French)

   Frequency of publication: Annual

   Publisher: United Nations, New York

   Price: $15.00 (cloth); $11.00 (paper) - 1965 volume

   Annual statistical data for more than 270 countries and territories
   covering a wide range of economic and social subjects, including:
   population, agriculture, manufacturing, construction, transport, trade,
   balance of payments, national income, education and culture. Published
   since 1949 and available on standing order.

26. Sources statistiques des études de marchés/Sources of Statistics for
   Market Research, guides prepared by C. Kapferer

   | Vol.1 Appareils de radio/Radio Sets, 1961 | Price: $6.50 |
   | Vol.2 Chaussure/Footwear, 1962, Europe and North America | Price: $10.00 |
   | Vol.3 Statistiques generales/General Statistics, 1964, France, Fed. Rep. of Germany, Italy | Price: $2.50 |
   | Vol.4 Appareils ménagers/Household Appliances, 1963 Europe and North America | Price: $6.50 |
   | Vol.5 Machines-outils/Machine Tools, 1963, Europe and North America | Price: $3.00 |
   | Vol.6 Produits pharmaceutiques/Pharmaceuticals, 1963, Europe and North America | Price: $6.50 |

   Publisher: Organisation for Economic Co-operation and Development
   (OECD), 2, rue André Pascal, Paris 16e.

27. Social Statistics: Special Series of Economic Accounts,
   (bilingual: French/German or Dutch/Italian)

   Frequency of publication: 4 to 6 issues per year

   Publisher: Statistical Office of the European Communities, 170 rue de
   la Loi, Brussels 4

   Price: BF 1,200 whole series; BF 200 per issue

   Seven issues: one for each EEC member country and a general survey.

INFORMATION ON PRICES

28. Sources of Commodity Prices, compiled by P. Wasserman, 170pp.

Date of publication: 1959

Publisher: Special Libraries Association, 31 East Tenth Street, New York 5, N.Y.

Price: $5.00

This work is limited to American and Canadian journals. The body of the work is an alphabetical list of commodities. For each commodity the following information is provided: name of commodity, title of periodical publishing the price, market or markets in which price is effective and the frequency with which prices appear in the periodical. The appendix gives an alphabetical list of periodicals covered in the main part of the book, together with publisher, address of publisher and frequency of publication.

29. Agricultural Statistics (bilingual: German, French)

Frequency of publication: At least 8 issues yearly

Publisher: Statistical Office of the European Communities, 170 rue de la Loi, Brussels 4

Price: BF 450 per year; BF 75 per issue

Each issue is divided into 3 parts: agricultural costing, agricultural prices and price indices.

30. Wall Street Journal

Frequency of publication: Daily

Publisher: Dow Jones and Co., 30 Broad Street, New York, N.Y. - 10004

Price: $30 per year

Leading American financial paper.

31. Oil, Paint and Drug Reporter

Frequency of publication: Weekly

Publisher: Schnell Publishing Co., 100 Church Street, New York, N.Y. - 10007

Price: $15.00 per year

32. International Customs Journal

Frequency of publication: Irregular

Publisher: International Customs Tariff Bureau, 38, rue de l'Association, B-1000 Brussels

Price: Available only from the competent national administrations (finance, customs, etc.) of member countries. Price varies. Contains complete, updated tariff schedules for selected countries.

33. **Deutsches Handelsarchiv** (German Trade Archives)

   Frequency of publication: Twice monthly .

   Publisher: Bundesministerium für Wirtschaft, Bonn, Federal Republic of Germany

   Price: DM 110 per year

   World-wide coverage of tariffs and trade regulations, changes and trade agreements. Up-to-date information.

34. **International Commerce**, prepared by the US Department of Commerce

   Frequency of publication: Weekly

   Publisher: US Government Printing Office, Washington, D.C. 20402

   Price: $16.00 per year, $5.00 additional for foreign mailing

   A special Foreign Government Actions column covers changes in tariffs and trade regulations all over the world.

   International Commerce Reprints:     World-wide Tariff Guide
   World-wide Customs Data
   World-wide Import Rates

35. **Croner's Reference Book for World Traders**, edited by B. K. Bridges, 400pp.

   Date of publication: 1966

   Publisher: Croner Publications, 211-03 Jamaica Avenue, Queen's Village, N.Y.

   Price: $25.00, including amendment service

   Loose-leaf handbook with a monthly amendment service, covering all the countries in the world. Contains general background information, documentation requirements, packing, marking and labelling, various certificates required, import and exchange controls, transportation and insurance.

36. **Exporter's Encyclopedia**, 830pp.

   Date of publication: 1969

   Publisher: Dun and Bradstreet Publications Corp., P.O.B. 3088, Grand Central Station, New York, N.Y. - 10017

   Price: $50.00, including up-to-date supplements

   Import and exchange regulations, general export information on law, export terms and control, shipping, packing, marking of origin and other rules, all on an individual country basis for 220 world markets.

37. **Export Documentation**, 3 vols.

   Date of publication: 1967, yearly updating supplements

   Publisher: Associated Chambers of Manufacturers of Australia, Industry House, Canberra

   Price: $20.00 per volume, $6.00 for yearly supplements

Loose-leaf handbook with regular amendment service.  Covers all countries and lists their requirements on documentation, import and exchange controls, tariffs, packing, packaging, marking, labelling, sanitary and other required certificates.

38. International Advertising Standards and Practices

Publisher:  International Advertising Association, 475 Fifth Avenue, New York, N.Y. - 10017

Contains general information on advertising in 60 countries

MISCELLANEOUS SOURCES

39. Export Marketing Research for Developing Countries

Date of publication:  1967

Publisher:  International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price:  $5.00, free to developing countries

40. An Annotated Bibliography of Market Surveys by Products and Countries

Date of publication:  1969

Publisher:  International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211, Geneva 10

Price:  $5.00, free to developing countries

41. Handbook on the International Exchange of Publications, 3rd rev. ed., (quadrilingual:  English/French/Russian/Spanish), 767pp.

Date of publication:  1964

Publisher:  United Nations Educational, Scientific and Cultural Organization (UNESCO), Place de Fontenoy, 75 Paris 7e

Price:  $8.50

Chapters on:  different types of exchange, the organization of national and international exchange services; conventions and agreements for the exchange of publications; transport and customs; list of exchange offers of international organizations; etc.  A select list of current international directories, a subject index and an index to countries are also provided.

42. Ulrich's International Periodical Directory, a Classified Guide to Current Periodicals, Foreign and Domestic, 14th ed., 2 vols.

Frequency of publication:  Annual

Publisher:  R. R. Bowker Co., 1180 Avenue of the Americas, New York, N.Y. - 10036

Price:  $30.00

This directory can be used to identify periodicals dealing with specific products.

43. <u>Compilation of Basic Information on Export Markets</u>

Date of publication: 1968

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

More general information is available from such sources as:

The selected commodity price publications of

Merrill Lynch, Pierce, Fenner and Smith, Inc.
70 Pine Street
New York, N.Y. - 10005;

The publications of the Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome, on the prices of agricultural goods;

The catalogues of mail-order houses, for the prices of consumer goods;

Commodity exchange quotations;

The various trade journals for industrial products.

44. SPECIAL CALCULATORS: Hewlett Packard Personal Computer Digest

HEWLETT-PACKARD Company.
1000 North East Circle Blvd., P.O. Box 999
Corvallis, Oregon 97330 U.S.A.

other Books: Investment Analysis and Statistical Applications (90026)
Marketing and Forecasting Applications (90049)

U.S. SALES   Retail Computer Center Inc.
28251 Ford Road
Garden City, Michigan 48135 U.S.A
Telephone: (313)-261-0424

Price Example.   HP 12C - £ 90 - +Sourts
41C - £ 150 -  . "
41CV - £ 210 -  . "

45.   NIGERIAN CONSULTANTS ORGANIZATION:

Institute of Management Consultants - IMC.
14 KAGORO CLOSE
P.O. Box 9194
KADUNA, NIGERIA
Tel. 062- 211437

T E A C H I N G

M A T E R I A L S

A N D

O U T L I N E S

F O R

S L I D E S


PRICING POLICY

Refer Section:  13
Module:   II

PRICING POLICY

ALTERNATIVE METHODS OF PRODUCT PRICING :

THE COST APPROACH : .

TOTAL COSTS PLUS PROFIT :

| COSTS: | TOTAL (Gross) | per UNIT (At PRODUCTION CAPACITY) |
|---|---|---|
| RAW MATERIALS: | | |
| DIRECT LABOR : | | |
| INDIRECT LABOR : (Associated w/ Production) | | |
| UTILITIES : | | |
| SUB-TOTAL= VARIABLE COSTS | | |

UNIDO SYSTEM

OVERHEADS :

INDIRECT LABOR :       - - "FACTORY COST" (Variable)
(Not Associated
w/ Production)

ADMINISTRATION :  (incl. SALES/DISTRIBUTION COST
                  - - "OPERATING COST"

AMORTIZATION of :
EQUIPMENT &
FACILITIES
INTEREST/FINANCING COSTS

PRODCUTION TAXES :
SUB=TOTAL =
FIXED COSTS

TOTAL/VARIABLE
and FIXED COSTS    * - "PRODUCTION COST" - - - - -

ADD :   PROFIT AND TAXES :
        (Based on a pre-
         determined R.O.I.)

        TOTAL PRODUCTION
            COSTS:

IS THIS UNIT COST THE COST AT ALL LEVELS OF PRODUCTION ?

## PRICING POLICY (2)

PROBLEMS WITH THE COST APPROACH :

1. Not reflective of ACTUAL UNIT COST

    DURING START-UP PERIOD

    IF MAXIMUM CAPACITY IS NOT REALIZED :
    - DUE TO TECHNICAL DIFFICLUTIES
    - DUE TO LACK OF SUFFICIENT DEMAND

2. Not reflective of MARKET CONDITIONS

    COMPETITION :

    - FROM OTHER PRODUCERS
    - FROM IMPORTS(Including Smugling)
    - FROM CONSUMMER SUBSTITUTION

    WHAT ABOUT CONSUMMER'S MARGINAL WILLINGNESS
    (AND, IN SOME CASES, ABILITY) TO PAY ie;

    THE SUPPLY/DEMAND CURVE ?

BASIC NEED TO COVER 'VARIABLE COSTS '

HOW LONG TO WAIT BEFORE PROFIT PROJECTIONS CAN BE REALIZED ?

CONTRIBUTIONS TO OVERHEADS :

    GRADUAL ABSORPTION BY MARKET OF FIXED COSTS

ALTERNATIVES :

    MONOPOLY GIVEN BY GOVERNMENT FOR INITIAL PERIO!

    IMPORT RESTRICTIONS

    TARIFF OR QUOTA BARRIERS

RETURN TO PROBLEM OF PLANT CAPACITY SIZE :
    'OPTIMUM ECONOMIC PLANT SIZE'
    THE ''LEARNING CURVE'
        OR PRODUCTION START*Up CURVE

MARKET and DEMAND

## PRICING POLICY (3)

PRICE DETERMINATIONS :    OUTPUTS :

IF IMPORT SUBSTITUTIONG :

OUTPUTS MIGHT BE PRICED AT :

C.i.f. PRICE, including
IMPORT TAXES AND DUTIES,

INTERNAL AND PORT CHARGES
FOR CLEARING and TRANSPORT
TO WHAREHOUSES

INSURANCE, etc.

IF PRODUCT IS ALREADY MARKETED INTERNALLY :
OUTPUTS MUST BE REFLECTIVE OF THE
COMPETITIVE PRICE STRUCTURE TKAING
INTO CONSIDERATION QUALITY DIFFERENCES

IF PRODUCT IS DESTINED FOR EXPORT :
OUTPUTS MUST RELECT COSTS TO DELIVER TO
THE EXPORT MARKET--UNLESS :

PROJECT IS UNDERTAKEN TO EARN FOREIGN EXC
THEN  A GOVERNMENT SUBSIDY, OR SOME ADVAN'
FROM FOREIGN EXCHANGE MUST BE FACTORED IN
THE PROJECT PROFITABILITY

PRICE DETERMINATIONS :    INPUTS :

IF MATERIALS ARE IMPORTED, PRICE/COST VALUE
SHOULD BE ACTUAL C.i.f. PRICE PLUS CHARGES

IF MATERIALS ARE LOCALLY PRODUCED :

COSTS FOR THE FINANCIAL ANALYSIS OF THE PROJECT
PROFITABILITY SHOULD BE BASED ON COSTS PREVAILIN
IN THE LOCAL MARKET.  WHERE NO LOCAL MARKET EXIS
THE COST F.o.b. THE PORT OF EXIT FOR EXPORTED RA
MATERIALS WOULD SEEM APPROPRIATE

THE HANDOUT ON PRICE DETERMINATION AND
GOVERNMENT PRICING POLICY

**ANNEX    8:** Teaching Materials and Outlines for Slides, Module III: Technical Analysis

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# MODULE III

## TECHNICAL ANALYSIS

Lectures and exercises.
Table of contents:

TRAINING COURSE F.M.I. - N.I.D.B. - UNIDO
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Chapter I. Overview of the technical analysis.

Lecture content:

1. Time sequence of different activities in the project development.
2. Hierarchy of preparatory activities. [1]
3. Procedures and stages of project development.
4. What is to be designed? [2]
5. How extensive should engineering study be? [3]
6. Technical aspects of the project feasibility.
7. Investment-production cycle. Impact of different variables on feasibility of the project.

Comments:

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[1] Every action which is to be undertaken in any of the systems belongs to the one of the stages:

- preparatory stage
- realization stage

Sometimes preparatory stage is performed several miliseconds before realisation /action of the boxer/, but very often preparatory action is overtaking the realisation stage long time /erection of big dam/. This classification is of the hierarchical character. It means that the previous action is preparatory to the following one. But also in the preparatory action one clearly define the preparatory and realization stage.

Industrial development which is time dependent change of production and economical structures needs also preparatory stage.

Production of goods and commodities needs to use installations, plants. This physical structure needs to be artificially erected and afterwards operated at the flow of materials and using energy, managerial and workers skill.

It means that erection of the facility, is a preparatory stage in the context of the production stage. What is than preparatory stage for the physical process of the plant erection. Of course those are all activities described as design and engineering, to which preparatory is the decision to undertake such investment. Feasibility study serves to help this decision making process.

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2/ Definitions:

Function-transformation of a state of flow which can be measured by change of at last one of parameters of this flow.

Processing element-Piece of hardware having structural properties

Processing unit-set of processing elements which can perform at least one function.

Technological unit-set of processing units transforming marketable input to salable output.

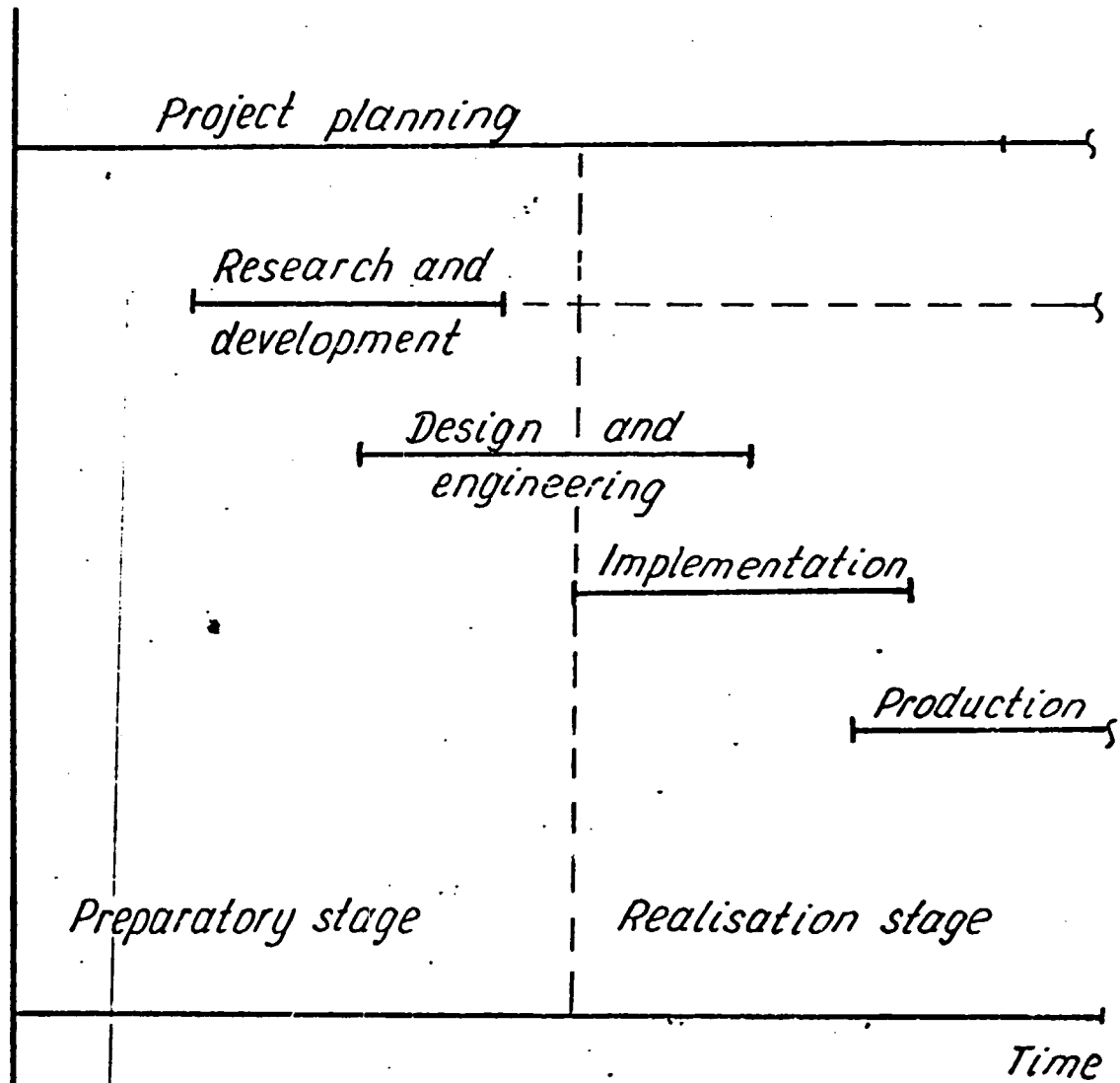Installation-technological unit supported by service  chains/like water, energy, conveyers, storages ets.

Plant-set of installations which under management functions can perform technically autonomously.

Enterprise-at least one plant organized to perform economical function

Company-at least one enterprise with financial functions.

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3/ Research and design cost is growing exponentially with the volume of knowledge collected and process properties precise description. Laboratory research, models, pilot plants, engineering calculations however are introducing higher probability of the succes in the project commercial implementation. Therefore risk and cost of failure are reduced at extensive investigation of the project. Those two functions are defining the feasible range of extensivity of the engineering study.

Activities

Project planning

Research and
development

Design and
engineering

Implementation

Production

Preparatory stage | Realisation stage

Time

Time sequence of different activities
in the process of project development.
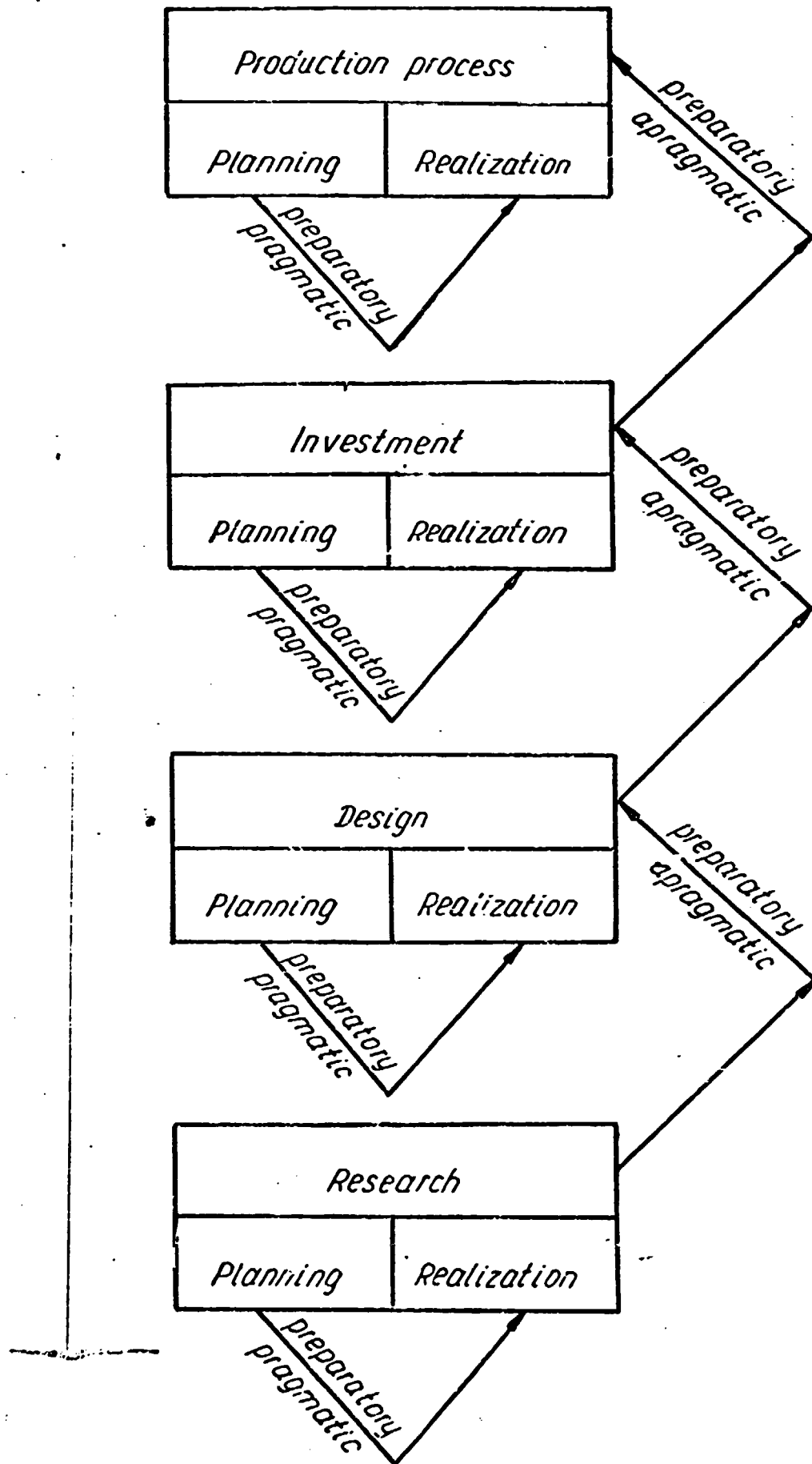
Hierarchy of preparatory activities.
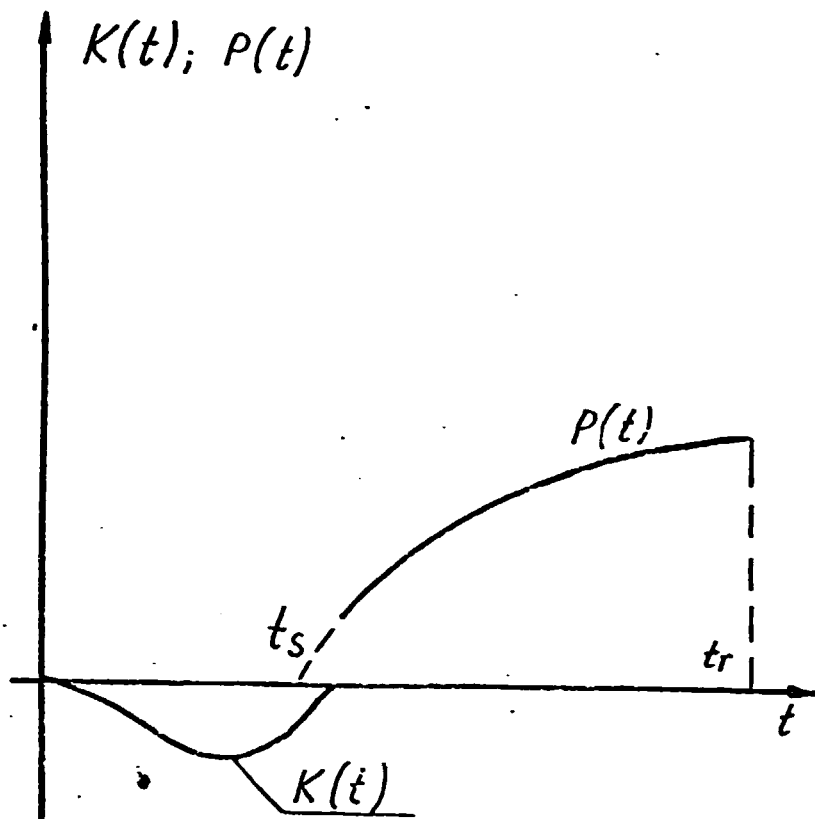
$$\int_0^{t_1} K(t)\,dt \;\leqq\; \int_{t_s}^{t_r} P(t)\,dk$$

Investment - production cycle

Properties:

      a) time sequence
      b) specific structure of the
          cost-profit areas.

$$\int_{0}^{t_1} K(t)\,dt \qquad \int_{t_S}^{t_r} P(t)\,dt$$

a) $t_1$ value

b) cost $K(t)$

c) rate of interest

a) market demand

b) price of product

c) technical failures

d) production cost

Impact of different variables on economical feasibility of the project.

Processing element

Processing unit

Technological unit

Installation

Plant.

Enterprise
Factory

Company
Enterprise

+ Service chains
and facilities

+ Management
functions

+ Trade functions

+ Financial functions

What is to be designed?

Costs

2

1

0

Probability of the success
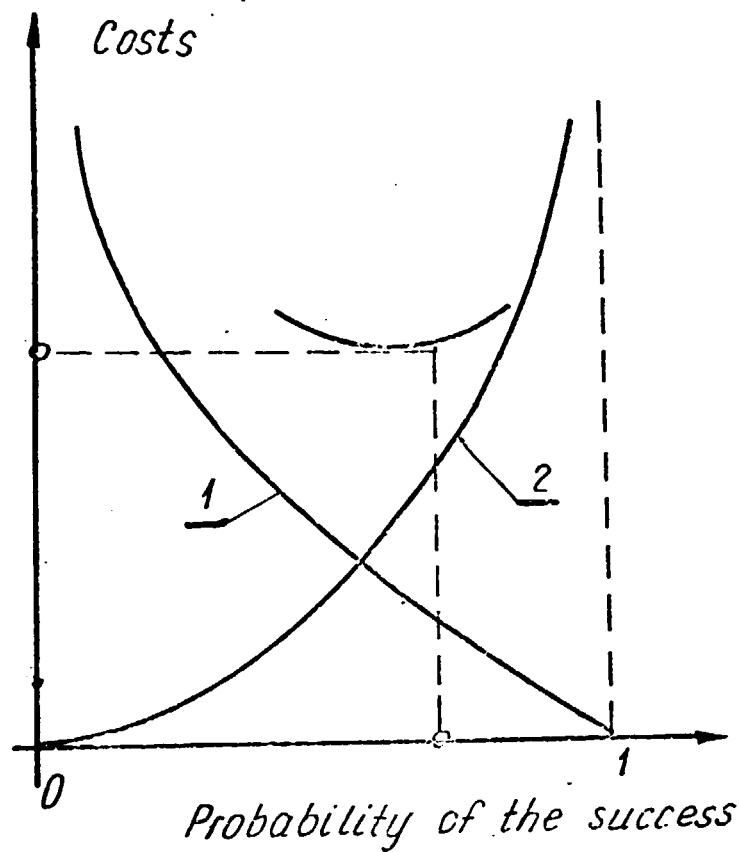
1 - cost of the unfeasible solutions
2 - cost of the research, design and
alternatives comparision.

How extensive should engineering study be?

# EVALUATION OF GOALS
## OF THE PROJECT



EXISTING COMMODITY       NEWLY DESIGNED COMMODITY

OLD APPLICATON       NEW APPLICATION

OLD TECHNOLOGY       NEW TECHNOLOGY

OLD TECHNICAL STRUCTURE       NEW TECHNICAL STRUCTURE

OLD MATERIALS       NEW MATERIALS
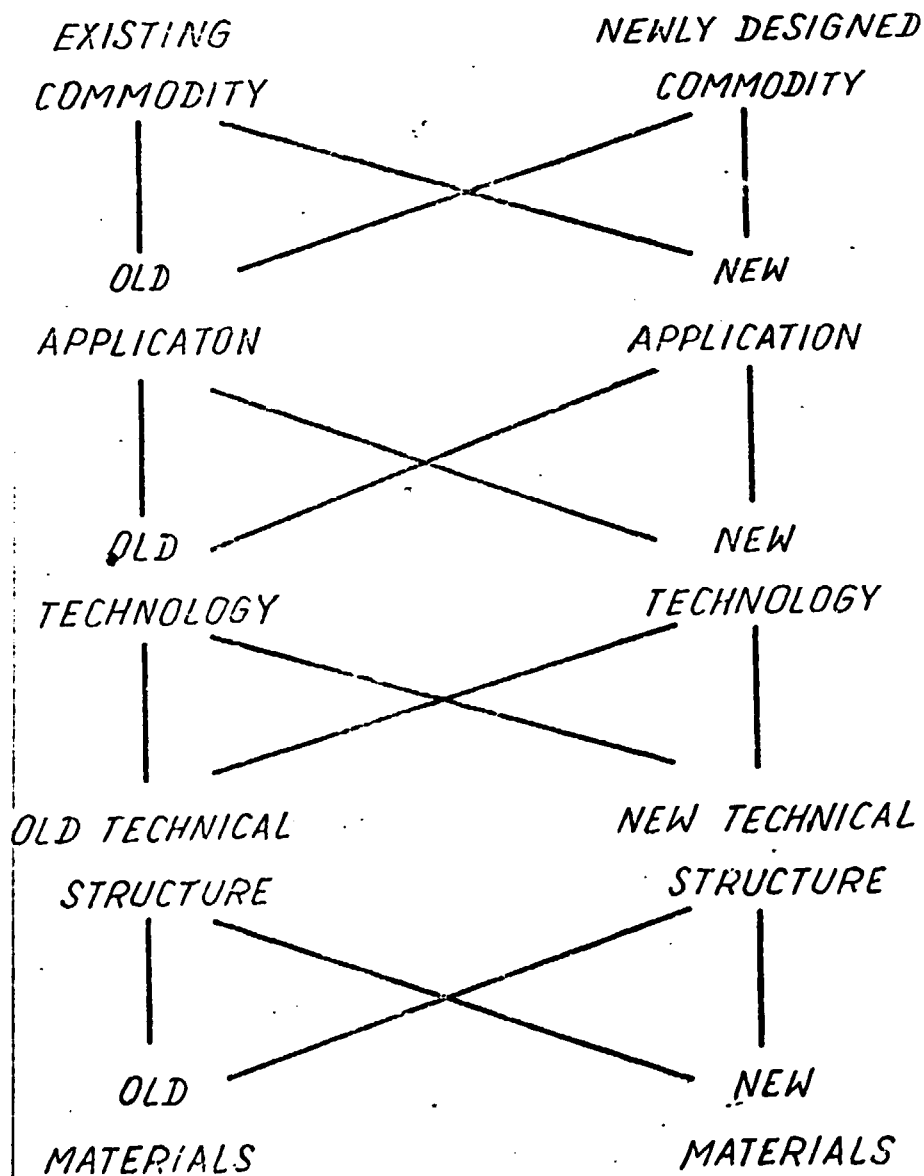
TOTAL NUMBER OF PATHS: 32

| Assured | If properly designed |
|---------|----------------------|
| | Market |
| Goal feasibility | Production programme |
| Functional feasibility | Design and engineering |
| Technical feasibility | Technology |
| Resources feasibility | Materials and inputs |
| Infrastructural feasibility | Location and site |
| Implementation feasibility | Investment realization |
| Operational feasibility | Production realization |
| Human feasibility | Manpower and management |
| Environmental feasibility | Development programme |

Aspects of project feasibility.

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Chapter II. Technical aspects of the production programme and
plant capacity.

Lecture content:

1. Production programme over the life span of the plant.[1]

2. Scheduling of the production process. Cases of productio.
schedule.

3. Plant capacity concept.[2] Relations between different
capacity concepts.

4. Relation between plant capacity and production cost.

5. Is the capacity technically unlimited? Physical, techno-
logical logistic and marketing options and constraints
of the plant capacity.[3]

6. Optimum economic capacity of the installation.

Comments:
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[1] Evaluated on the basis of marketing studies and sectoral analysis
product demand has to be translated into production programme.
The first problem to be discussed is demand versus time relation.
Evaluated demand can be never achieved at the first year of the
production. There are two main reasons of such situation:

- market is not ready to consume new product

- technical structure of the plant, skills of management
and workers

Therefore from this point of view production programme is a time
dependent function.

Influence of these factors are not constant during the different
periods of plant operation. It could be shown that generally
exists three periods of plant production schedule: the start up
period, the normal operation period and obsolete technics
operation period.

Type of the industry to which belongs project has another impact on production programme. Industries are working different time schedule dependend on their hard ware characteristics. All the industries we divide into two classes:

- continuously working three shifts

- interrupting process after first or second shift

In every case production process can organised batch-wise or at constant flow. It is easy to prove that in each case the production programme will be estimated differently.

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2/ Capacity is a definition of measure of some output in agreed time period.

That incure necessity to establish the time in which we are intended to measure the output and to estimate if during that time the output can be considered as constant. The first measure is output in hour of production, the others could be monthly and yearly rates of production. But monthly and yearly rates of production are not the result of simple multiplication of the respective time on hour's output. Taking into account these remarks we can define several capacities of the same production facility:

- installed capacity /nominal time hour output/

- nominal maximum capacity /defined time x defined hour output/

- feasible normal capacity /feasible time x feasible hour output/

- statistical capacity /data collected from reports/

What are major factors which infringe possibility to operate plants with installed capacity:

- natural time breaks /holidays, shift patterns, combination of different machines to different products/

- technical time breaks /exchange of tools, catalysts, maintenance/

- output-input limitations /supply of raw materials and sales of products, utility supply breaks, spare parts availability/

- management system limitations /skill of managers and workers, periodical lack of labor forces, failures of the training system/

- stochastic breaks /accidents, fires, explosions

3/ Now it is necessary to resolve the problem of minimum economic siz
of the production line and/or whole installation. Simple calcula-
tions are showing that unit cost is in the relation with product io
capacity of pipe, valve, reactor, and other categories of the
equipment. The cost of square meter of building as well as other
civil works shows the same relationship. It means that unit invest
ment cost of bigger installation is lower. If that relationship
would be the only one, the most economical way of every production
realization is the one plant for whole the world. But of course
There are many constraints to that solution. They can be divided
into several groups:

- physical constraints /every kind of hard ware can be built
only maximum dimensions, because of resistance of materials
and weight considerations/
- technology capability /technological process is standardize
and can not overcome some dimensions of principal equipment
/e.g. from the point of view heat exchange volume/surface
relationship/
- logistic reasons /at growing concentration of industrial un
the cost of transportation, cost of the storages and cost o
supply of the utilities is much larger per unit of the prod
- market reasons /market is not ready to absorb new productio
and is not ready to met the demand on raw materials at the
level of acceptable for the process prices./

To avoid extremely high cost of engineering studies of different
sizes of the installations simple equations can be applied:

$$I_b = I_s \left(\frac{P_b}{P_s}\right)^X \qquad\qquad C_b = C_s \left(\frac{P_b}{P_s}\right)^Y$$
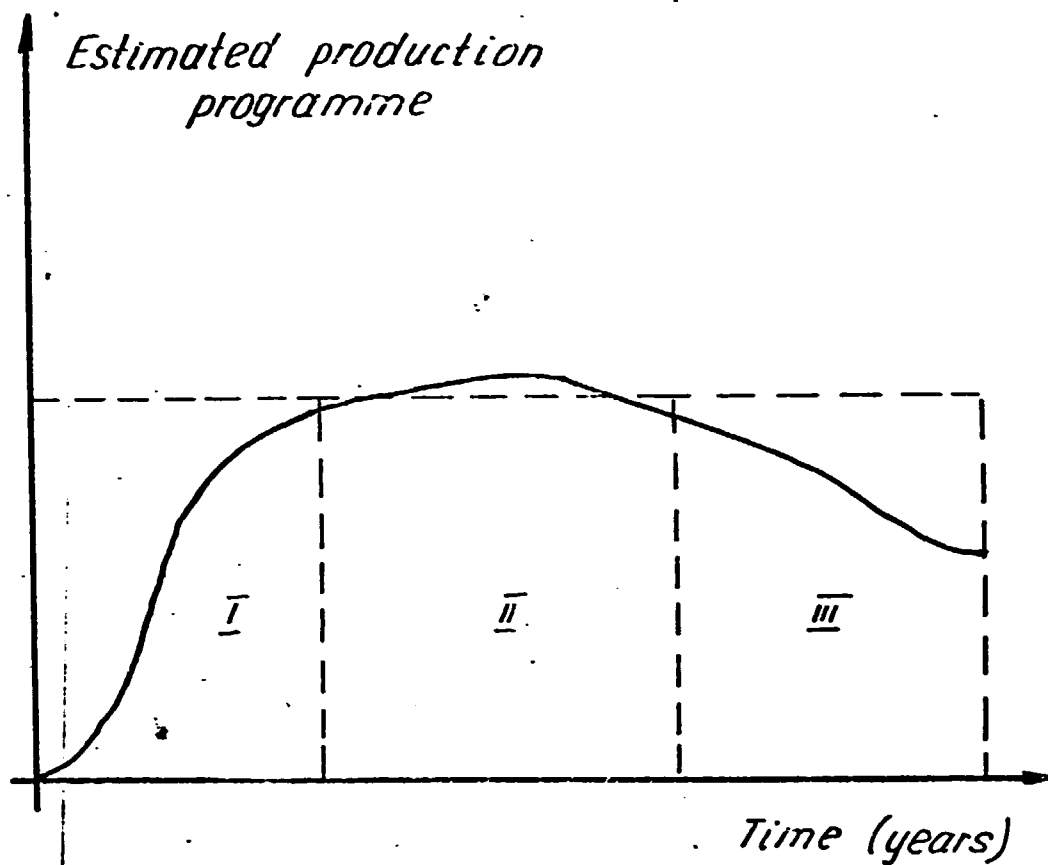
Where: $I_b$, $I_s$ - capital requirment for bigger and respectivly
smaller size plants

$P_b$, $P_s$ - capacities of bigger and smaller plants

$C_b$, $C_s$ - production cost of bigger and smaller capacity plai

But the exponential rule has its limitations, and can be applied
only in defined region of the capacities of-the equipment as well
as of the complete installations.

In complicated cases where high capital involvement is expected there is necessary to prepare engineering study on the capacity of the plant. The study can be limited to critical equipment and all the rest can be added proportionally. If standard type equipment is included in the installation there it is necessary to seek complete quotations from producers for several capacities.
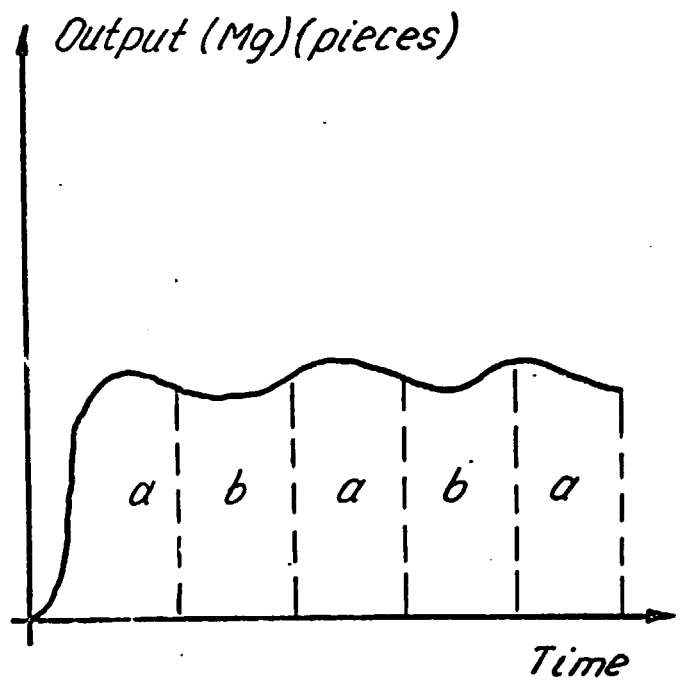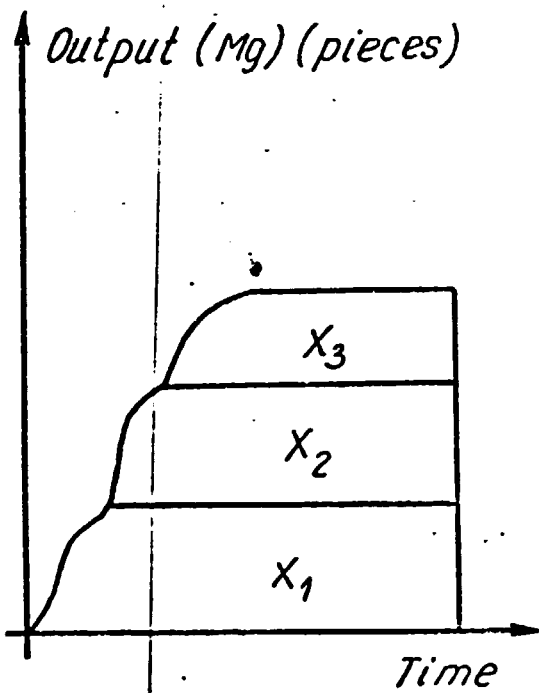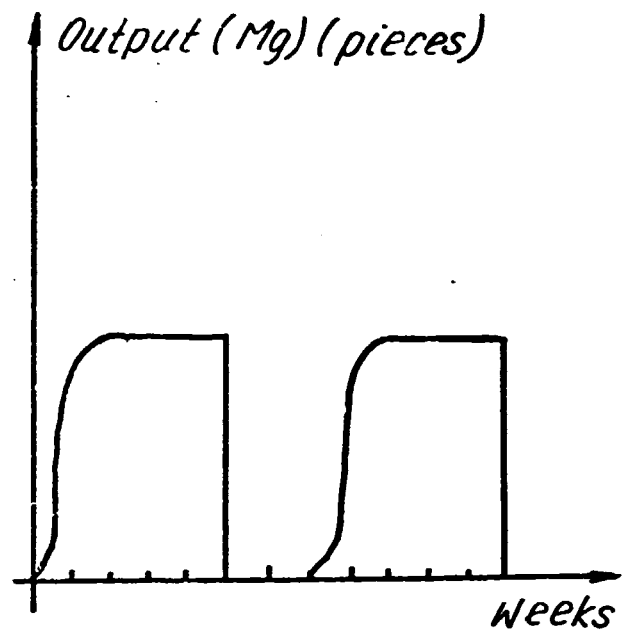
Inventories $M(\tau)$

Inventories $Q(\tau)$

Output $P(\tau)$

Sales $S(\tau)$
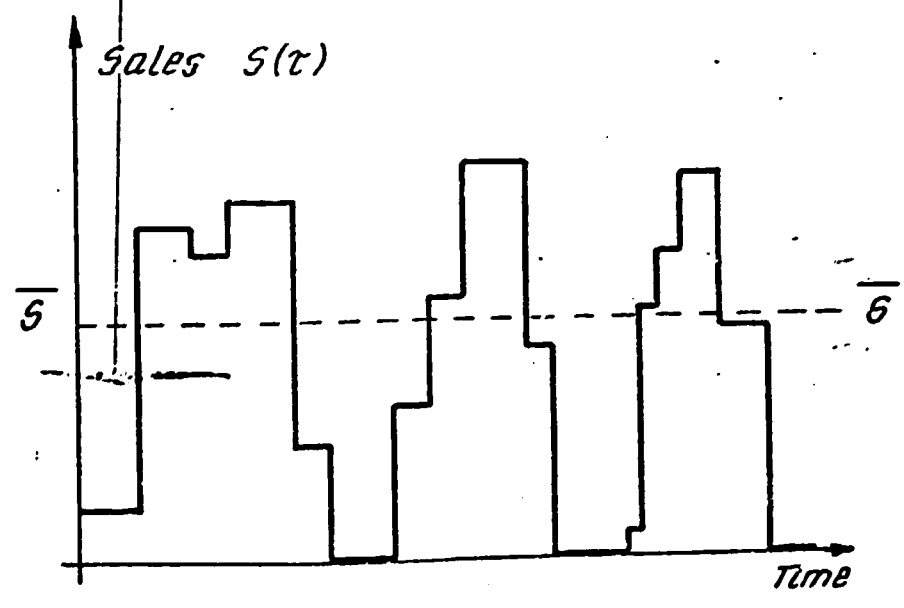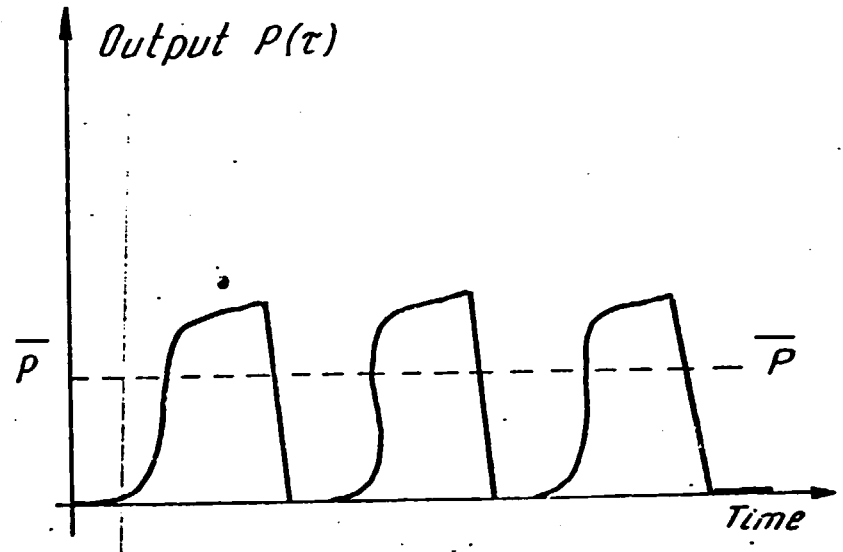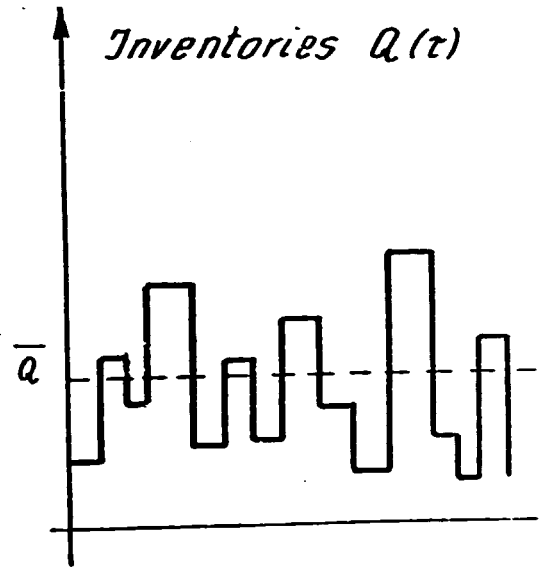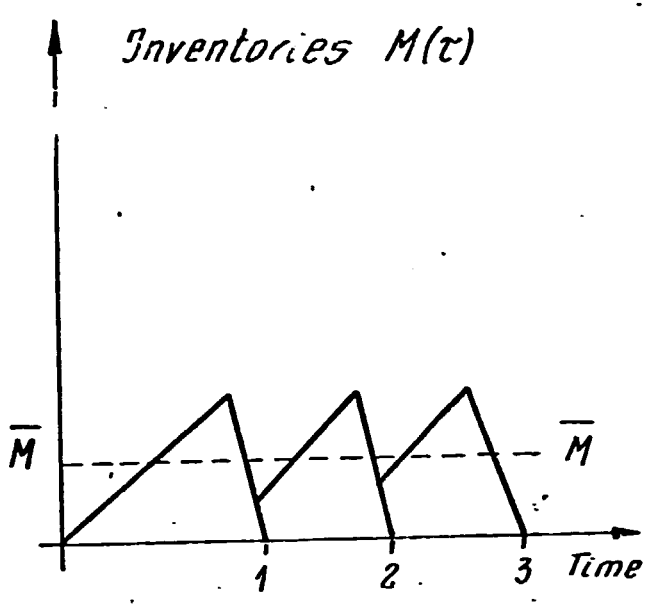
Production planning objectives

Estimated production programme

Time (years)

I    II    III
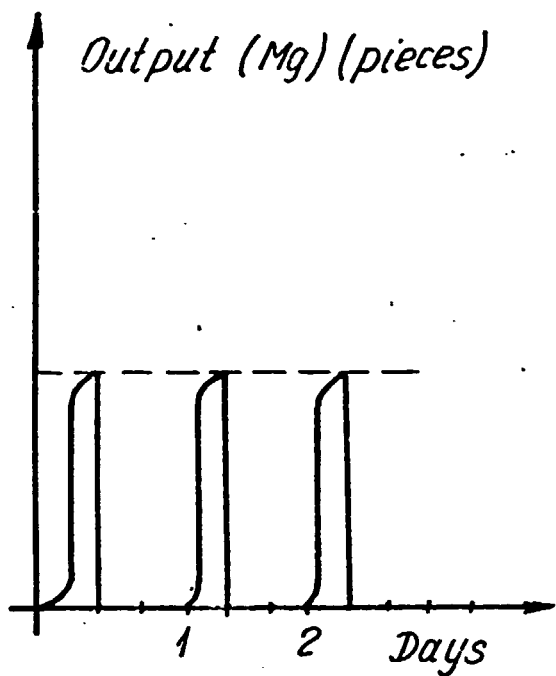
Production programme over the life span of the plant.

I period    2-5 years

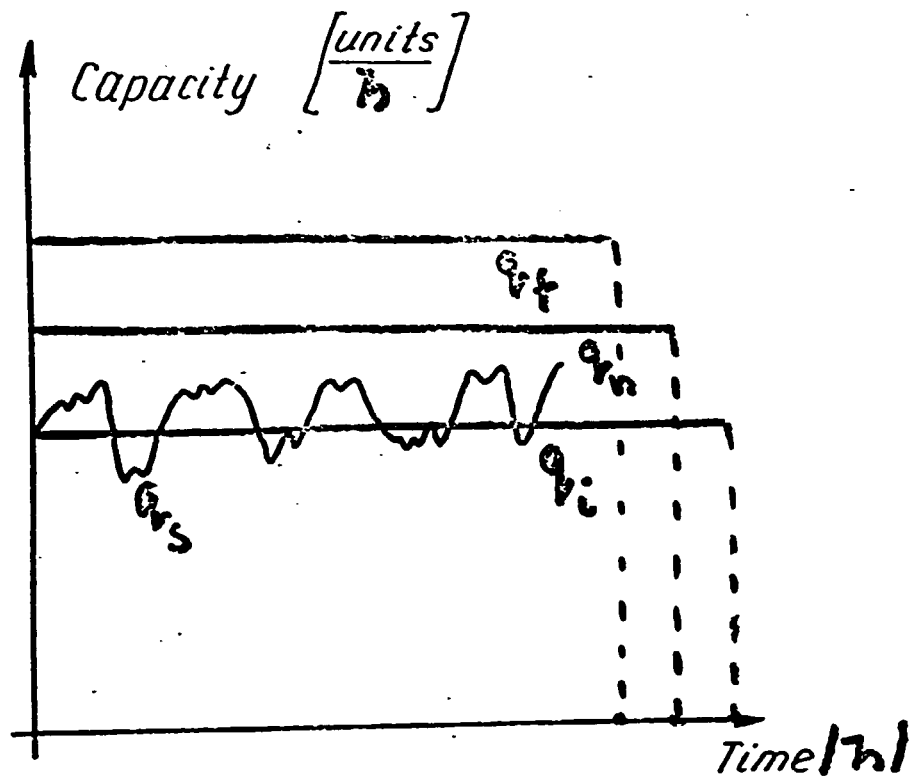II period   10-15 years

III period  5-6 years

Cases of production schedule.

$\underline{I}$ - one shift per day

$\underline{II}$ - weekend break

$\underline{III}$ - multiproduct batch plant

$\underline{IV}$ - continuous seazonally adapted
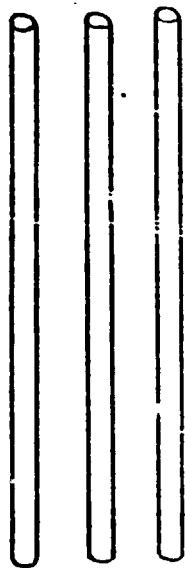
$$Q_i = q_i \times 8760 \ \frac{units}{year}$$

$$Q_n = q_n \times 8000 \ \frac{units}{year}$$

$$Q_f = q_f \times 7600 \ \frac{units}{year}$$

$$q_s = \frac{\sum q_s \cdot te}{T} \ \frac{units}{year}$$

Relations between different capacity concepts.

$d = 20$
$t = 4$
$f_1 = 3.14 \cdot 10^{-4} m^2$
$v_1 = 30.15 \cdot 10^{-4} m^3$
(metal)

$g_2 = g_1 \left(\dfrac{f_2}{f_1}\right)^x$

$x = 0.?$

The same capacity
$3f_1 = f_2$
Weight proportion

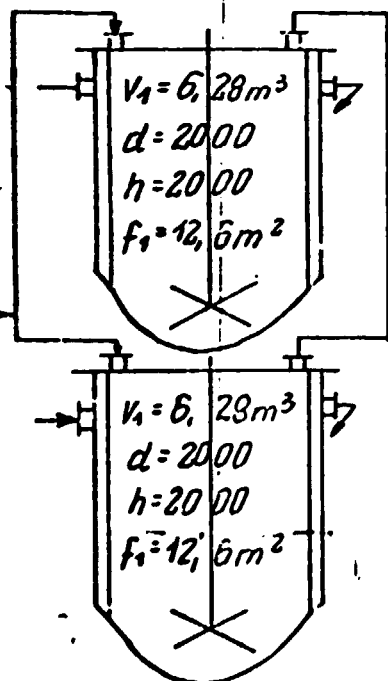$\dfrac{3g_1}{g_2} = 1.93$

Growth factor of
one tube capacity
3
Growth factor of
one tube weight
1.62

$d' = 35$
$t = 4$
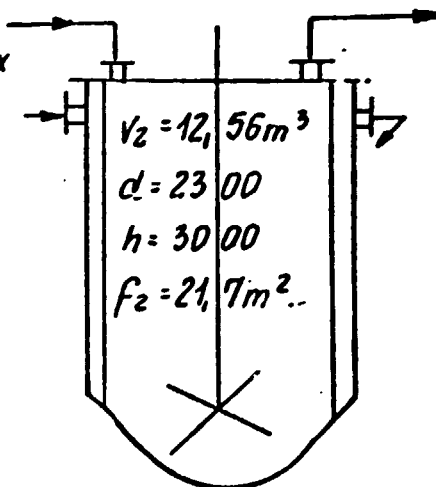$f_2 = 9.42 \cdot 10^{-4} m$
$v_2 = 48.78 \cdot 10^{-4} m$

Economy of the scale

$q_1 = q_2 \ (m^3/h)$

$V_1 = 6.28 m^3$
$d = 20\,00$
$h = 20\,00$
$f_1 = 12.6 m^2$

$V_1 = 6.28 m^3$
$d = 20\,00$
$h = 20\,00$
$f_1 = 12.6 m^2$

$f_2 = f_1 \left(\dfrac{v_2}{v_1}\right)^x$

$x = 0.72$

$h = f \, \Delta t \, K$

$h_2 < h_1$

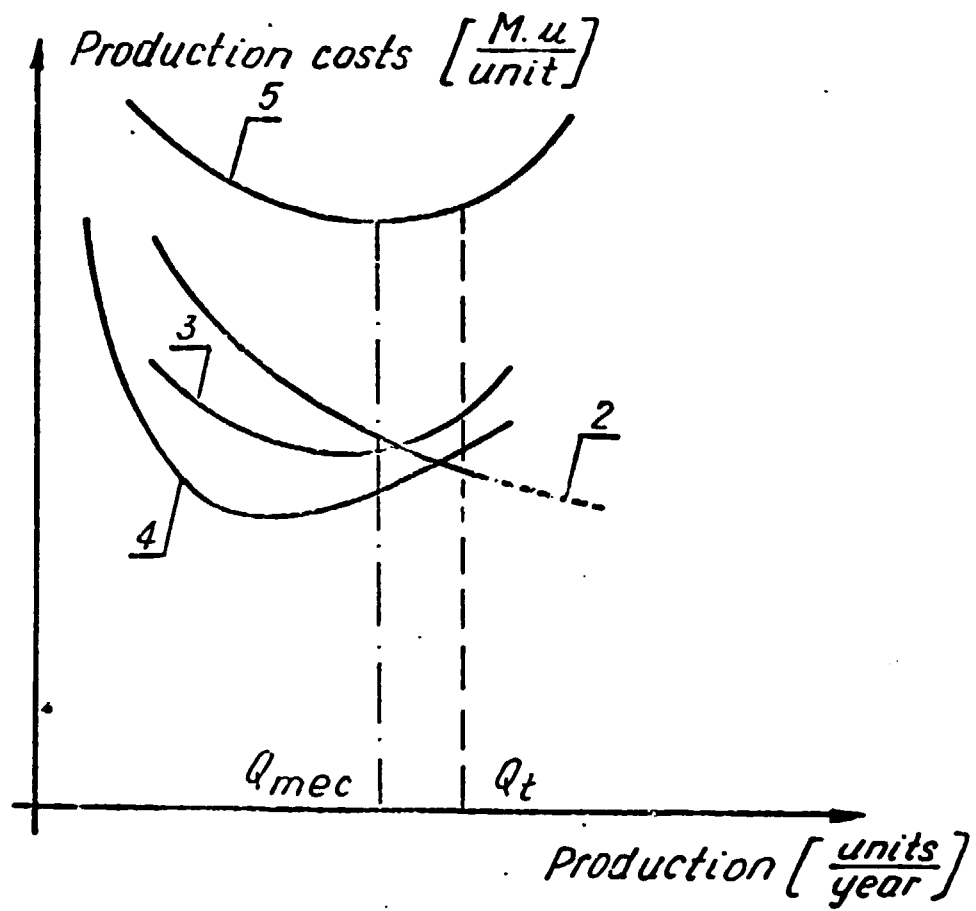$V_2 = 12.56 m^3$
$d = 23\,00$
$h = 30\,00$
$f_2 = 21.7 m^2$

Technological constraints of the scale growth
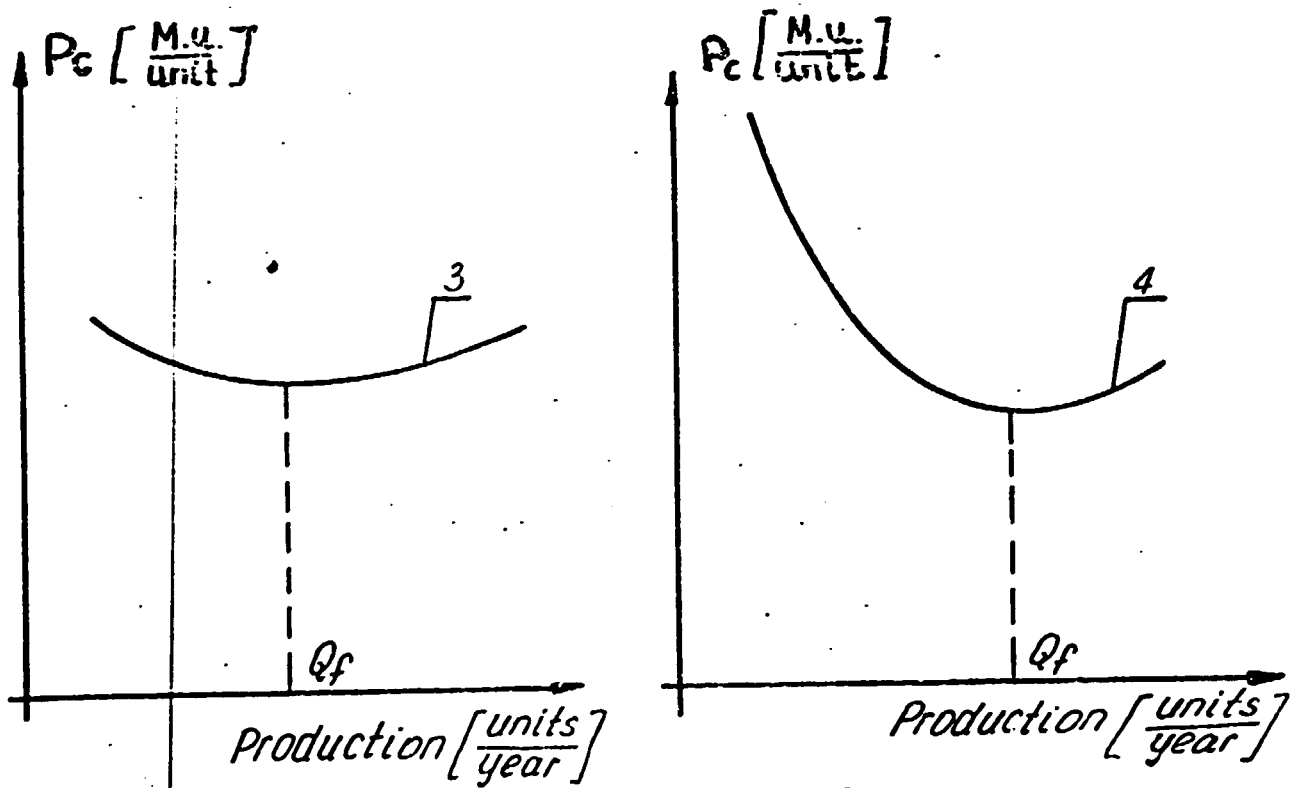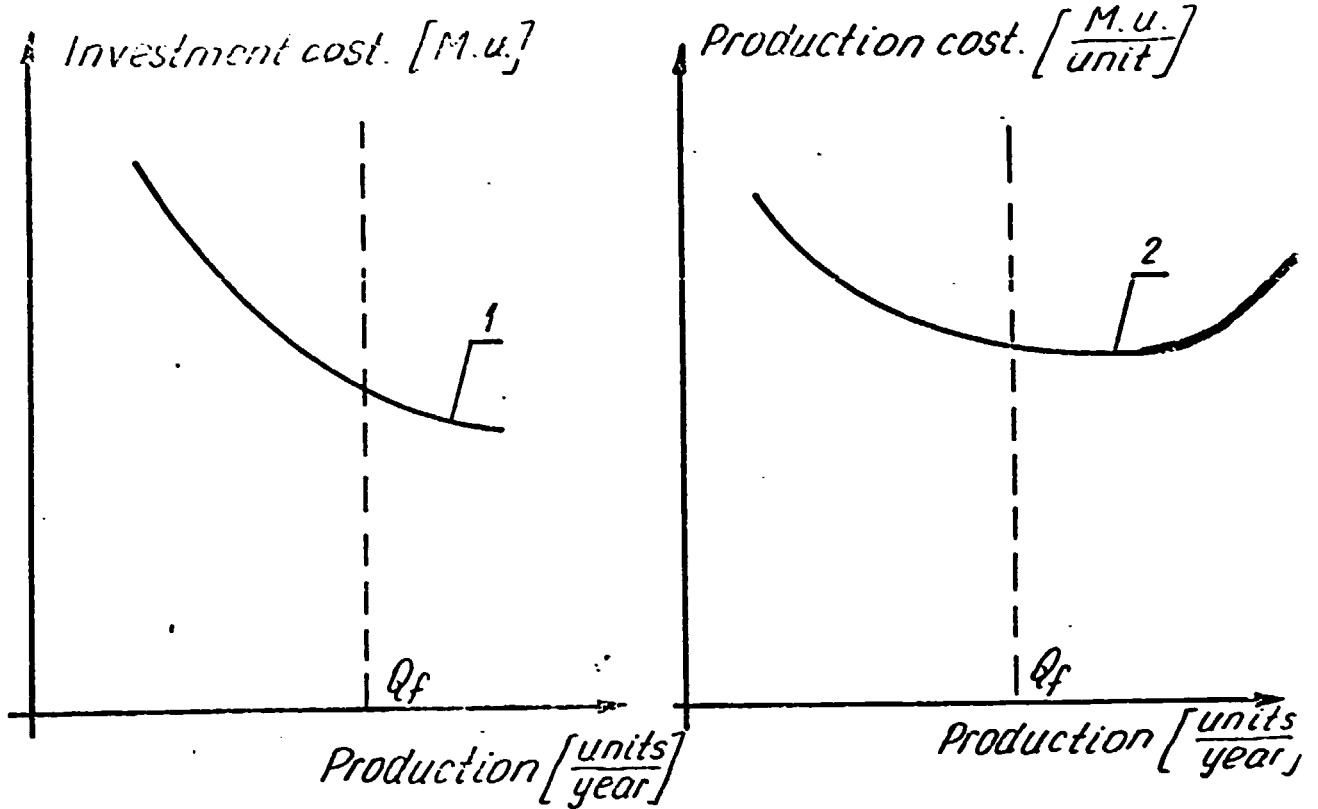
Impact of different options and constraints on minimum economic capacity.

1,2 – physical or technological constraints
3 – logistic options
4 – marketing options

Minimum economic capacity
determination.

2 - investment cost

3 - logistic costs

4 - marketing costs

5 - total costs

Chapter IV. Materials and inputs.

Lecture content:

1. Significance of the materials and inputs availability, quality and price for the project feasibility.
2. Classification of materials and inputs [1]
3. Properties of the materials and inputs [2]
4. Supply programme
5. Cost of materials and inputs [3]
6. Utilities [4]

Comments:

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[1] The main goal of the production process is the transformation of flows. The inputs generally depends on technology, techniques of the processing, which are adopted to defined production programme Therefore adequate range of materials or their substitutes should be in demanded quantity and quality. There is a close relationship between the definition of the input requirements and other project problems.

All the materials and inputs can be classified into several groups:

- raw materials /unprocessed and semiprocessed materials/
- processed industrial materials
- components
- auxiliary materials
- factory supplies
- utilities

Raw materials are the most important group from the point of view of availability and logistics. This group can be classified as follows:

- agricultural products
- livestock origin products
- forestry origin products
- marine and water origin products
- mineral products /mineral ores and nonmetalic minerals/

Every class of raw materials has its options and constraints when use

2/ Quality of the raw materials is one of the crucial points in production process. Therefore careful analysis by the specialists is to be done. All properties should be listed and controlled:

- properties /physical, chemical, mechanical, electrical and other concerned/

- changes in the properties during the year

- handling, transportation and storage properties /kind of wrapping and packing is to be defined/ as well as all security prescriptions during this operations

- list of impurities which are not allowed by the technologic: process

- processing properties

The most important properties of raw materials are:

- renovability - exaustability

- supply timing /seasonal - uniform distribution consumption/

- changable-stable /on quality/

- concentrated-diluted

Each property has its influence on cost of the processing. Thus assuring the deliveries of the raw materials special care has to be taken and following steps observed.

- yearly quantities should be defined and for the higher part of demand long-term agreement should be prepared

- alternative resources should be allocated

- bulk purchase arrangements should be sought

- transportation agreement long term are necessary

- wastes should be determined at different supply resources

- output/yield should be controlled at last in laboratory but scmentimes the tests on industrial scale are indispensable.

Foreign raw materials should be avoided, only when comfortable exchange of the raw materials against local products is assured in the delivery contract.

Second important group of inputs are the processed materials and components. Many of the indications given for the raw materials are valid in group of inputs. Important difference is laying in the standardization of the products. Processed materials are mostly subject to international or national standards and quotations and contracts are always referring to this standards. Analysis of inputs should take this into account, but it does not mean that standard specification is sufficient for every production process. It is necessary add to specifications necessary amendments and define the methods of analysis or determination of such unspecified in standards properties.

Different situation is in the case of components which are integral part of product. Because it is impossible to assure production of all components inside the one country special precaution should undertaken to assure full and qualitative supply under changeable conditions of the market. The first princip here is to avoid one supplier of the components, and than some kind of standardization is also necessary. The best solution is unconditional exchange of the components with supplier, on the balance rate of exchange.

The original producer is sometimes quickly changing the final product and than this arrangements is very important to avoid unnecessary development of the process, just started at nonreimbursed.

Third group of inputs concerns the auxiliary materials and factory supplies. Auxiliary materials could be sometimes critical for production process e.g. catalysts of the process, additives to oils and fuels, which are used in small quantity, but processing of the raw materials without this additions is impossible. Therefore they should be choosen with a big care and special contract agreements are necessary as well different schedule of deliveries /they are supposed to be contracted in bigger quantity than Economic Order Quantity./ Factory supplies should be specified in documentation of the equipment as well the spare parts. Specification should be made on the basis of the properties and characteristics of the factory supplies /not only trade names of the product/ and local products should be checked and adapted during the preinvestment stage.

Spare parts has to be specified in the engineering documentation of the equipment and definite cost of the yearly supply should be estimated. For the easily tearing/wearing parts detailed drawings are to be prepared.

Special care is necessary in the preparation of the warehouses and storages.

Physical and economical constraints should be investigated.

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3/ Unit cost is to be established on the basis of price prognosis
/or contract/.

The difference in imported and domestic materials cost is very
important:

Cost on the imported material

- CIF cost/price

- clearing charges

- import duties

- custom duties

- land transportation

- VAT

- insurance

- port costs

Cost on the domestic material

- ex-work cost/price

- land transportation

- insurance

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4/ Special part of the inputs are utilities. They are intensive factors
for the transformation of the raw materials to ready made products
and in the most cases they do not participate physically in the prod
duct. We can specify several kinds of utilities:

- technological fuel

- steam and other heat carriers

- technological water

- cooling water

- cooling air

- other cooling agents

- special utilities /air compressed, nitrogen etc./

- electric power

Technological fuel serves to heat furnaces where the endothermic process
is carried out. There are several kinds of technological fuels:
gas-methane, light fractions of the oil rafination, heavy diesel fract-
ion, different kinds of fuel oil. The consumption is defined by the
process, but for use of that kind of source of heat it is necessary to
assure logistics of its supply. Gaseous fuels are supplied by pipes and
depressurised in gas stations and sometimes purified from sulphur
/corrosion of the furnace/. Liquid fuels are supposed to be delivered
by road or railway transport.

On site it is necessary to provide reloading facilities and storages.

Steam or other heat carriers /like dowtherm/ are produced on the factory in boiler section. If the use of heat energy is high enough than one should built the power station where the part of the steam energy is used to produce electroenergy.

Investments in this case are higher, but at todays prices of the energy it is easy to prove that this kind of investment is economic. The steam are produced at high pressure and after turbines we can have several levels of pressure /high pressure steams like 60-80 ata medium pressure steam like 20-30 ata and low pressure steam like 2-6 ata/.

Condensate after utilisation of the steam heat is recycled to power station.

Losses are covered by specially processed water.

Steam is very economic kind of heat carrier because it contains in 1 kg 540 kcal of the heat and also heat transfer coefficients are high is diminishing the size of heatexchangers. When temperatures of the process are higher than 250-300$^o$C high boiling heat carrier are used. The typical example is dowtherm or other highly aromatic fractions from refineries. The dowtherm is heated in special furnace and than is used as heat carrier in the process. Equipment in this closed circuit is highly specialised.

Water is used for technological purposes or like cooling agent. Use of the water in the technological process requests it pre-preparatio Technology of the water preparation is rather standard and installat is composed from mechanical filters and anxionic and cationic filter Disstilled water is used in special cases, because of high energy consumption in this process.

As a cooling agent water is used also after some preparation, filtration and some demineralisation. If it is used in closed circuits /cooling towers/ than stations of biological treatment is necessary e.g. clorination of circulating water. Water as cooling agent in closed circuits can be used only at low or medium humidity and temperatures not higher than 40$^o$C.

In some cases air can be used as a cooling agent. Several models of the air-coolers are widely used in the petrochemical and refinery industry. For special purposes other cooling agents can be used e.g. ammonia, freons when temperatures of the process should be kept from 0- -30$^o$C and propane-ethane mixtures when temperatures below -70$^o$C are requested. This kind of cooling agents is expensive and can be used in very sophisticated processes, when added value of the produc is high.

To produce low temperature energy the primary electrical energy is used /mainly for compression of the gases/.

Compressed gases as air and nitrogen are used for mainly two purpose
- as technological agent or safety antyexplosion blankets /nitrog..
- as energy cerrier in pneumatic systems of mechanisation or automation

Gas stations are equipped with compressors, coolers, condesators or/and drying filters. Compressors can be driven or by electrical energy or by diesel motors. The specially universal energy carrier and over all used utility is electricity. It is source of lightning and power and as we have seen any of other utilities would be useless without the electiric power.

There are several standard tensions at which electroenergy is used:

- for lightning 110 V, 220-250V /also for small motors/
- as power resource the 500-600V, and for the high power motors also 6000V tension is used.

Therefore the circuits of electrical energy are complicated at any factory. They should be equipped in transformer of tension, special blocade systems switchboards of different size and capacity, and control systems.

Installed power is measured in KVA which includes both the resistive and reactive energy. Power factor is the coefficient to calculate the resistive component of energy KW, which is the sum of power in KW of all motors in factory. Of course not all the motors installed are working simultanously and this is expressed by the coefficient of the load factor. From this informations we can calculate the power which should be connected to the factory. In some countries this figure is reason fo the taxation, independently if energy is used or not. Consumption of the energy depends on time factor. Therefore to estimate the bill of energy quantity of hours of motors exploitation should be defined and quantity of KWh calculated.

Utilities

Raw materials → Products

Auxiliary materials  Factory supplies  By-products
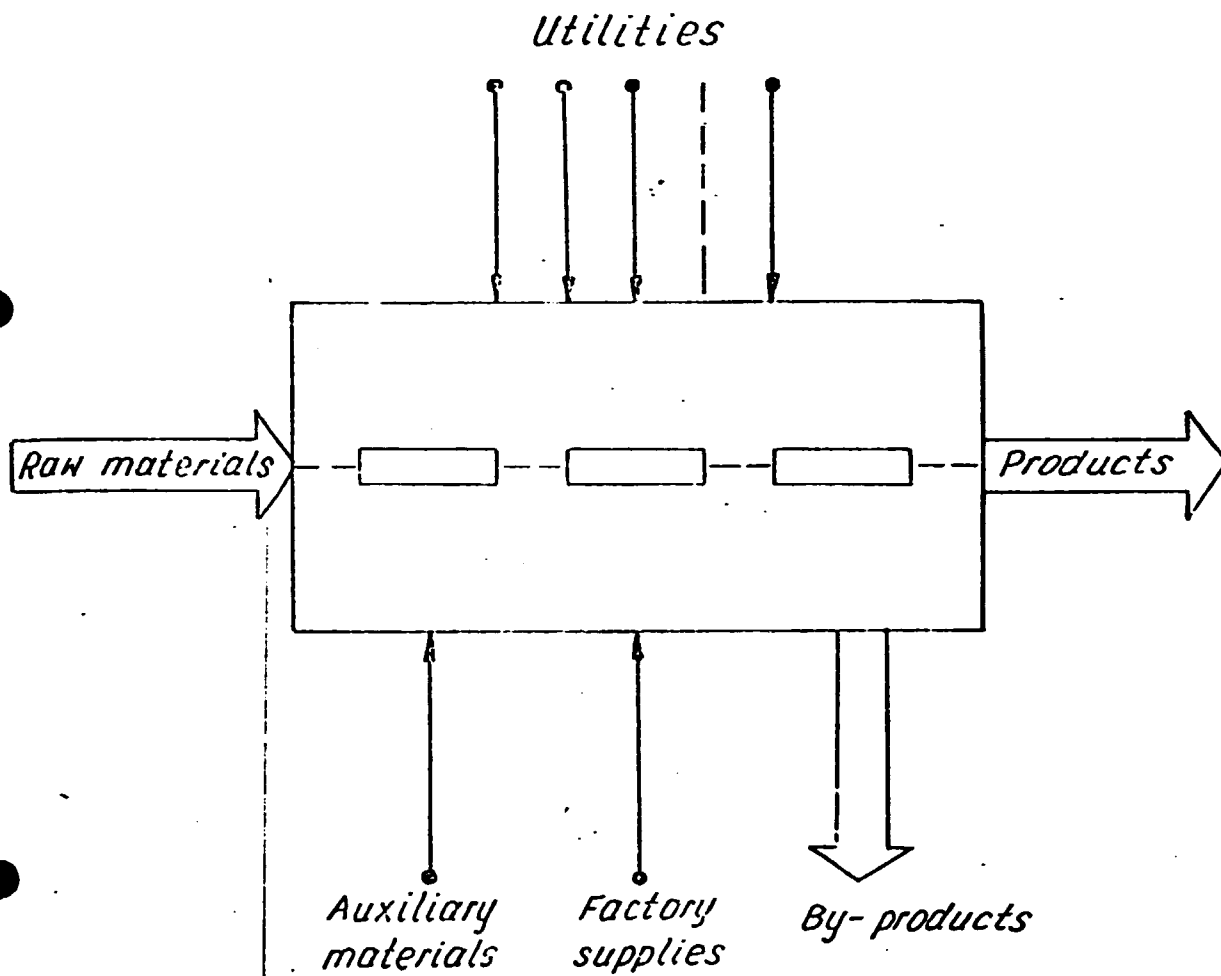
Model of materials and inputs transformations in the production process.
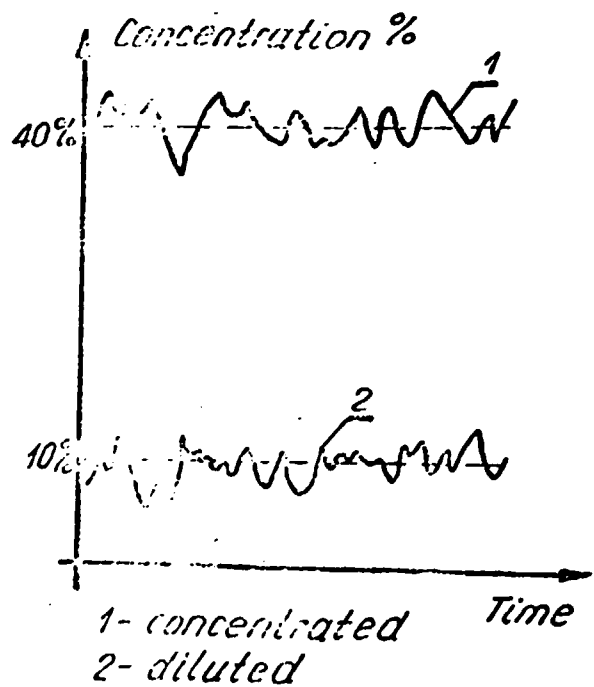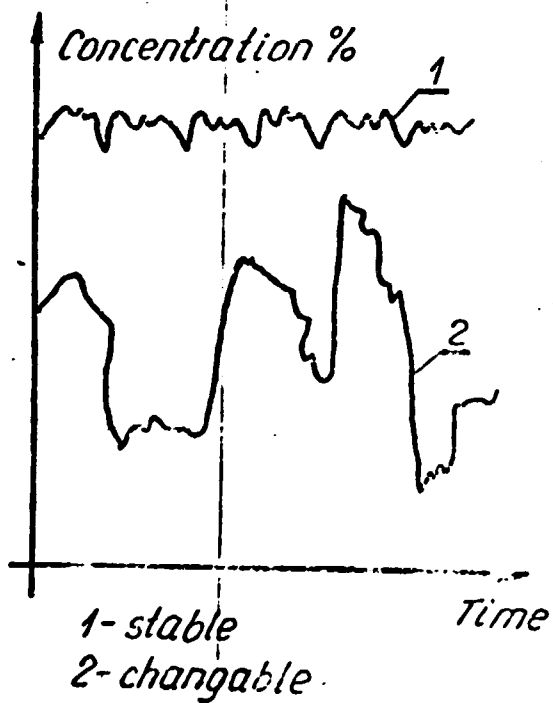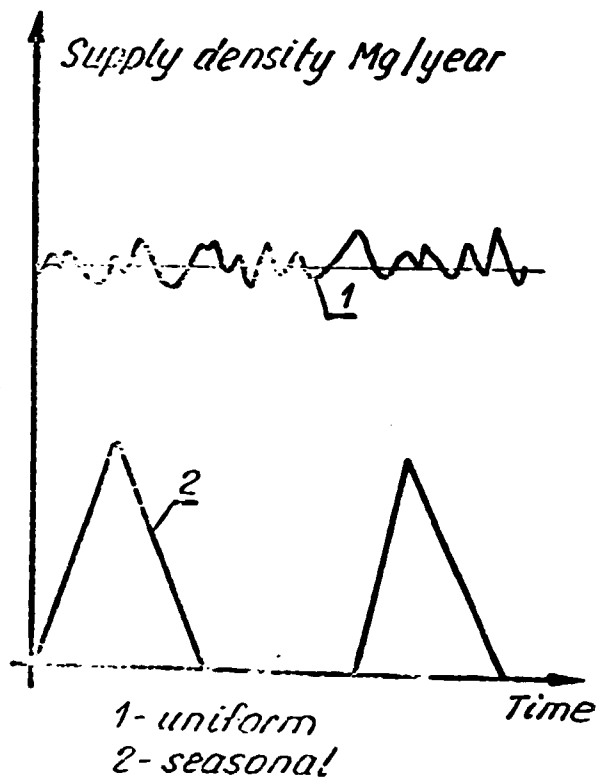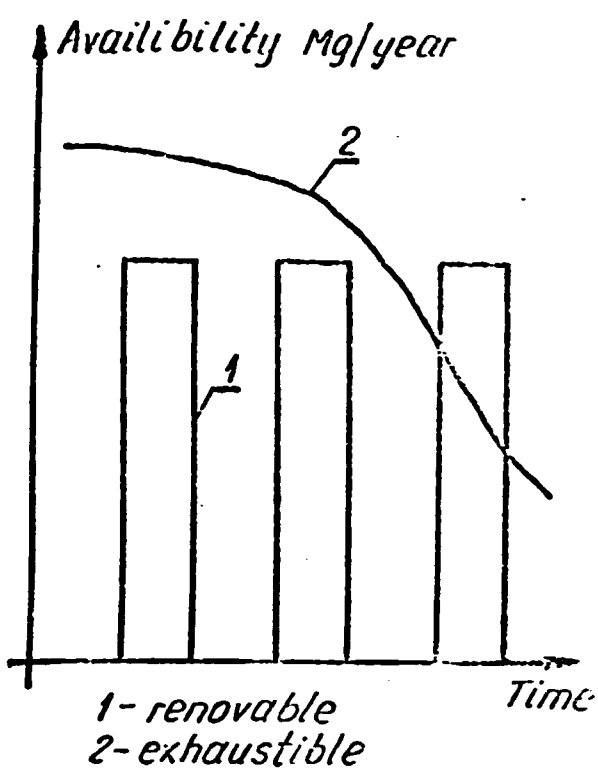
Time dependent properties of the raw materials

**Technical variables**

Deposit reserves /status of definition/
Quantity already used
Proportion of old users
Quality /statistical/
Variability of output
Yields of product

**Logistic variables**

Existing transportation facilites
Monopoly of transport means
Transportation impact on quality
Storage at supplier
Storage impact on quality
Storage standards and methods

**Economical variables**

Cost determinants
Seasonal opportunity cost
Supplier monopoly positions
Cost charges and surcharges
Form of contract
Suppliers organization
User organization
Joint - venture possibility

Availability analysis of raw materials

```
┌─────────────────────────────────────┐
│           Considerations            │
├─────────────────────────────────────┤
│                                     │
│   Production  programme             │
│   Localisation of suppliers         │
│   Transportation  means             │
│   Time delivery schedule            │
│   Storage  capacity                 │
│   Economical order quantity         │
│   Special transportation and        │
│   storage requirements              │
│                                     │
└─────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────┐
│   Technical and economical          │
│        calculation                  │
└─────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────┐
│   Supply   programme                │
└─────────────────────────────────────┘
```

— Supply  programme  considerations

Exercise

## Chapter V          Materials and inputs supply

Determination of the materials and other utilities quantities for
the acrylic resin suspension production process.

1. Key words:  Acrylic resin suspension - water

suspension of solid copolymer /latex/ of the concen-
tration 40% used in paint industry.

2. Technological recipe of process.

| Item | Units | Input per charge |
|---|---|---|
| BEAA | Kg | 1.000 |
| Styrene | Kg | 614 |
| AA | Kg | 100 |
| AN | Kg | 200 |
| Water | Kg | 3.000 |
| Emulsifier | Kg | 100 |
| Catalyst | Kg | 6 |
| Salts | Kg | 20 |

Copolymer yield 98%

Process is carried out in 7 $m^3$ reactor equiped with stirrer, heating
cooling coil.

Process parameters:

Raw materials temperature $20^o$C
Temperature of process $70^o$C
Heat of reaction 330 kcal/kg
Latex temperature $20^o$C

Motor power: N = 12 KW

Time of the reaction: 5 h

Stripping nonomer under vacuum: 1 h

./.

Utilities consumption at stripping:

180 kg of 1.2 MPa steam and 24 $m^3$ cooling water of $16^o$ C.

Loading, unloading, cleaning 2 h

3. Exercise

Calculate required quantities of the materials and utilities per
1 year of production. Insert the results into schednle 4-1/page 73/.
Calculate the cost of materials and utilities.


Exercise N3

Price list

| Item | Units | Price |
|------|-------|-------|
| BEAA | M.u./Mg | 1.500 |
| Styrene | M.u./Mg | 1.000 |
| AA | M.u./Mg | 1.200 |
| AN | M.u./Mg | 1.000 |
| Demineralised water | M.u./$m^3$ | 150 |
| Emulsifier | Mu/kg | 10 |
| Catalyst | Mu/kg | 100 |
| Salts | Mu/kg | 5 |
| Cooling water | Mu/$m^3$ $10^3$ | 15 |
| Steam | Mu/Mg | 50 |
| Power | Mu/MWh | 77 |

Chapter VI. Technology. Technology transfer.

Lecture content:

1. Technology definition. [1]
2. Technology classification[2] and application conditions
3. Strategics of technology transfer
4. Degrees of technology acquisition
5. Results of different procedures of technology transfer
6. Model of the process adaptation
7. Special cases of trade-offs in the process adaptation.
8. What is to be licensed?
9. List of technology transfer documents
10. Expected risk reduction and profit expectations at different contract models.

Comments:

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1/ Every acticity is realized by special means. If we are repeating the same activity using the same means this can be called a method of activity execution. When methods are based on scientific results than methodology has been developed. Technology is the methodology to conditions of the input of the flow transformation to the requested product. Technological process transforms substances or their shape with the application of the physical, chemical and other rules and laws in certain region of parameters and variables, using standard or specialized technical structure. The technical structur may by part of the technology in the cases when is specificaly attached to the transformation process. In most cases however the equipment and machinery serve as the environment to the technological process, and their particular source selection is secondary with aspect to technology.

Every technological process is characterised by its parameters like parameters like pressure, temperature, size, concentration, sequence of elementary actions etc., and the specific recipes or prescriptions are countless. But in every case action of those parameters can be integrated to the several intensive properties like consumption of the energy, consumption of the labor, consumption of the materials, and consumption of the capital /total fixed capital/.

2/ The classification of the technologies can be made in branches of
industries, or by means used in the production process. But for
decision maker this classification is useless. When the process
of the selection of the technology starts than we should use
classification of its applicability to the given project. From
this point of view qualitative definitions are used:

- frontier technology
- advanced technology
- mature technology
- obsolete technology
- primitive technology

The frontier technology is such a process which brings not only the
highest reward to the investement, but normally uses unique materi-
als specially trained people, and needs very developed infrastru-
cture in the inputs and specialized equipment.
Normally is exercised in one or very few countries. The examples
are: space technology, aviation, electronics, special chemical
products like low tonnage plastics, pharmaceuticals, pesticides,etc.

Advanced technology is less sophisticated and during the moderni-
zation of existing technologies is being permanently developed to
meet the competition of the market. Realization is much more easy
and universally available materials are used as well rather standard
equipment. Only skill of the management and workers is high and
permanent research is carried out and improvements, continuously
are being introduced. The examples are: motor car industry, high
tonnage plastics, shipbuilding industry, cosmetics and detergents
etc.

The mature technology has been utilized in many places at different
climatic and economical conditions in different sizes of output
and be easily tailored to practically any request of the customer.
Is using standard equipment and if special machinery is necessary
it could be produced in many machineshops or factories over the
world. The examples are: fertilizers, anorganic products, standard
housing equipment, furniture, standard machinery and equipment,
some petrochemicals etc.

Obsolet technology is the realisation of the old engineering concepts
and in most cases is characterised by the low capacity, low yields
of the final product, large quanitity of the effluents and many
industrial hazards in plent operation. Mostly it uses manpower in
extensive way in unacceptable conditions. The examples are: marten
steel furnaces old machineshops, coke industry etc.

3/ To make any choice of the technology we have to be equipped with
some specific measurable parameters, which allow to compare
different production processes and can assure at last to establic
order of the priority of the different technological processes.
As we have mentioned before there are four main properties of eac
technology which are in the most cases substitute one to another.
For every specific process it could be some trade off between the
consumption of the materials, energy, labor and capital.
Comparison between different proposals or self developed processe
should be made taking into account real internal trade of betweer
those properties of the process. Measure of trade off can be made
or in monetary terms or in physical terms /e.g. materials versus
energy/.

Exercise

## Chapter VII          Technology selection

Comparison of the semicontinuous and continuous bleaching of fats
and oils.

1/ Key words: <u>Bleaching</u> - sequence of unit operations removing some
colouring impurities from fats or oils

<u>Fats and oils</u> - glyceride esters of fatty acids $C_{14}$- $C_{22}$
/mostly $C_{12}$- $C_{15}$/

<u>Semicontinuous process</u> - Limited time continuous flow of inputs
and at last one of the output, followed
by the nonproductive /service/ operation.

<u>Continuous process</u> - Permanent flow of inputs and outputs

2/ Technologies description

A - technology - semicontinuous bleaching of the almond / peanut/
oil

### Fig. N1

The oil is pumped to kettle equiped with stirrer and heating coil
and than bleaching earth /or activated carbon/ is added. After one
hour of mixing oil with earth, suspension is pumped through filter
press, from which pure oil is obtained. Bleaching earth is recovered
from filter after termination of the operation.

B - technology - continuous bleaching of the almond oil.

### Fig. N2

The oil and bleaching earth are continuously transfered to kettle
equiped with stirrer and heating coil. Mixed suspension is pumped
to rotary filter. Formed on the first vacumm section cake is washed
with solvent and filtered on following sections. Dry cake is cut
out from filter and transported to solids disposal. Solvent-oil
mixture is pumped from separator to distillation unit.

Recovered oil is added to filtrate from first section of the filter
and pure solvent is recycled to washing section of rotary filter.

3/ Process data for the alternatives at 100 MTPD capacity.

| Items consumed | Units | Process semicont. | cont. |
|---|---|---|---|
| Oil losses | Kg | 1.600 | 160 |
| Bleaching earth | Kg | 2.000 | 1.600 |
| Solvent losses | Kg | - | 300 |
| Steam | Kg | 9.000 | 19.000 |
| Power | KWh | 650 | 950 |
| Water | $m^3$ | 600 | 1.600 |
| Man-hours | h | 96 | 48 |

Price list of items is attached to the exercise.

4. Exercise

Compare the processes costs of the operation. Determine condition
for equipment cost increment at which continuous process is an
appriopriate technology. Semicontinuous process investment expendi-
tures has benn evaluated and figure $0.5 \cdot 10^8 \frac{M.u}{E75}$-- was accepted for
the project. If the semicontinuous process was previously implement
what possible solutions are to be investigated ?

Exercise N1

Price list

| Items | Units | Price |
|---|---|---|
| Oil | M.u/Mg | 1.800 |
| Bleaching earth | M.u/Mg | 800 |
| Solvent | M.u/Mg | 600 |
| Steam | M.u/Mg | 50 |
| Power | M.u/MWh | 77 |
| Water | $M.u/10^3 m^3$ | 15 |
| Manhour | M.u/h | 5 |

Exercise N1
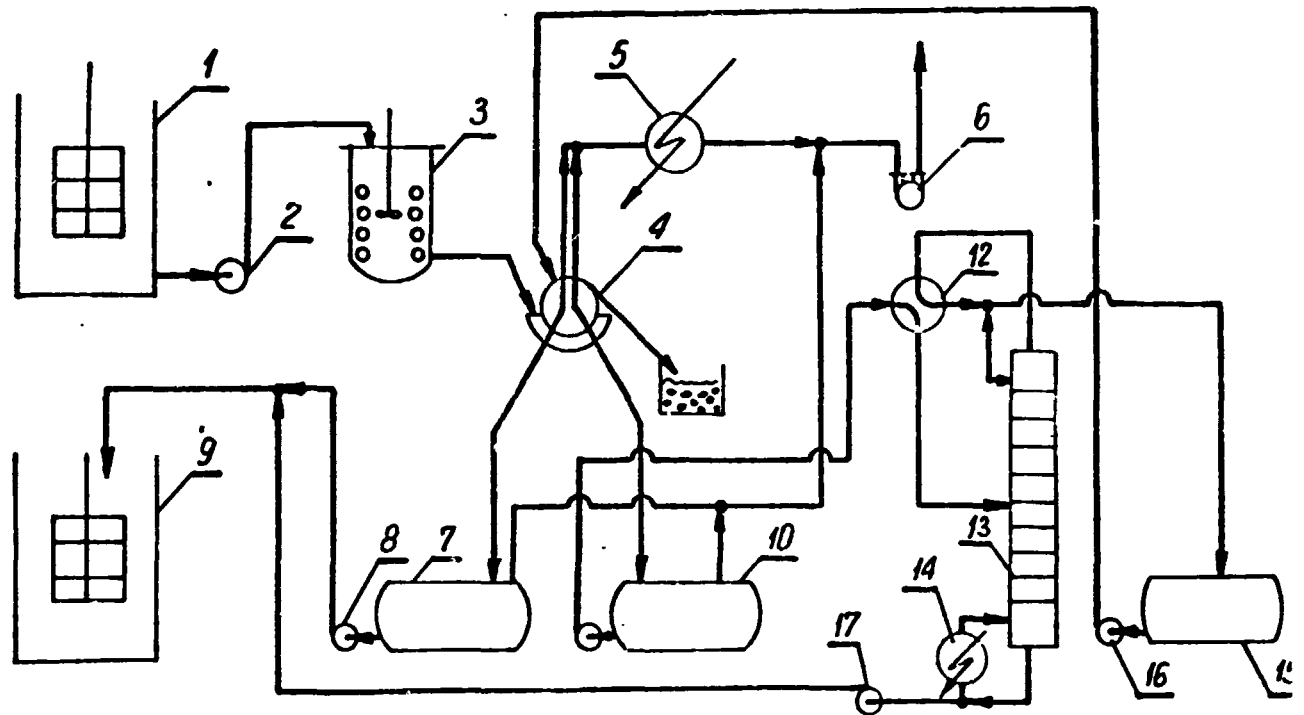


Fig. N2. Flowsheet of continuous process.

Equipment list

| Item N | Specification |
|--------|---------------|
| 1 | Tank |
| 2 | Pump |
| 3 | Kettle |
| 4 | Rotary filter |
| 5 | Cooler |
| 6 | Vacuum pump |
| 7 | Vessel |
| 8 | Pump. |
| 9 | Tank |
| 10 | Vessel |
| 11 | Pump |
| 12 | Heat exchanger |
| 13 | Distillation column |
| 14 | Heater |
| 15 | Vessel |
| 16 | Pump |
| 17 | Pump |

Exercise N 1
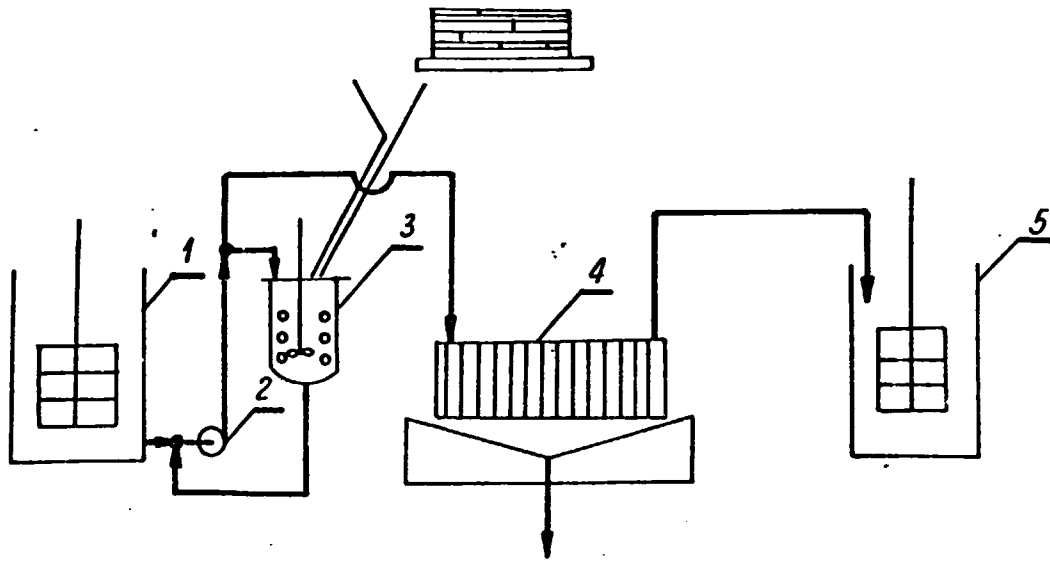


Fig N1. Flowsheet of semicontinuous process.

Equipment list

| Item N | Specification |
|--------|---------------|
| 1 | Tank |
| 2 | Pump |
| 3 | Kettle |
| 4 | Filter press |
| 5 | Tank |

# Technology selection

## Considerations

Evaluat factors

- raw materials availibility, inventory cost  **Q, E**
- % of the foreign components and sources of acquisition/how many producers/  **E**
- quality and shape compatibility of the product with internal requirments/measvrel  **Q**
- elasticity of the production programme  **Q**
- source of the technology and its supporting portfolio (patents, trade marks)  **Q**
- terms of licensing agreement  **Q, E**
- competitive cost of the technology (?)  **E**
- infrastructural compatibility  **Q, E**
- capability of the user to absorb and use technology  **Q**
- economical considerations/investment production costs, NPV, ROI/  **E**
- local versus foreign alternatives  **E**
- technical considerations  **Q**
  -- production schedule/elasticity/
  -- dependence of the technology on critical equipment
  -- lower upper limits of operational capacity
  -- pollution
  -- level of automation and mechanisation

Q - qualitative appraisal    E - economical appraisal

## Comparision of the qualitative parameters of technology

| Parameter | Weight factor % | Qualification of alternatives /points/ | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | | II | | III | |
| A | 10 | 3 | 0.3 | 2 | 0.2 | 3 | 0.3 |
| B | 20 | 2 | 0.4 | 3 | 0.6 | 2 | 0.4 |
| C | 50 | 1 | 0.5 | 2 | 1.0 | 3 | 1.5 |
| D | 20 | 2 | 0.4 | 1 | 0.2 | 1 | 0.2 |
| Total | | 1.6 | | 2.0 | | 2.4 | |
| | | S | | C | | A | |

Case

| | | I | | II | | III | |
|---|---|---|---|---|---|---|---|
| elasticity | 15 | 3 | 0.45 | 1 | 0.15 | 2 | 0.3 |
| source of engy | 10 | 3 | 0.3 | 1 | 0.1 | 2 | 0.6 |
| capability of absorbtion | 25 | 3 | 0.75 | 2 | .05 | 2 | 0.5 |
| dependance on c.e | 35 | 3 | 1.05 | 1 | 0.35 | 3 | 1.05 |
| pollution | 10 | 3 | 0.3 | 1 | 0.1 | 2 | 0.2 |
| level of cult. and medu. | 5 | 1 | 0.05 | 3 | 0.15 | 2 | 0.1 |
| | | 2.9 | | 1.35 | | 2.35 | |

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## Chapter IX. Project engineering.

Lecture content:

1. Production planing objectives
2. Process design. Functional chain of unit operations.
3. Function and structure compatibility for unit operatio
4. Process and Instrumentation flow-sheet of unit operati
5. Parametrisation of process flow
6. Hierarchy of technical and economical parameters and variables describing the porduction process
7. System analysis of the technical structure of the production process.
8. Procedure of the equipment selection.
9. Investment cost estimate.
10. Preliminary project /project charts and layouts/[1]

Comments:

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1/ Once technology has been selected or at last alternative solutions are known it is necessary to define the main and auxiliary equipment. Sometimes it is very easy task because equipment used in the process is standard. This is the case for most machineshops. When specialized equipment is to be used special preliminary design it is necessary. In some cases technology and equipment are so interdependent that selection of the technology automatically define the equipment.

What is necessary to specify equipment or to prepare order for bids?

   - Material and energy balance of the technological proces

While the production programme is defined plant capacity preliminary estimated, materials and inputs calculated and technology selected, balance of the flows through the different process units is a problem with which every process engineer can deal. Parctically balance preparation is solution of the several to several hundreds of equations including process parameters and flow properties.

   - preliminary flowsheets of the technological process should be prepared.

2/-

Some information is given in the basic engineering or in bids of the technology supplier. Using the data from material and energy balance and process information Process and Instrumentation /P  I/ charts should be prepared.

Than we will have the complex look on all interconnections between the unit process equipment and all additional points of the flows will be identified. Indications on the instrumentation and control points are to be discussed because at this moment the manpoweer is decided in quantity and skill.

        - balancing of the equipment capacities

Identification of each unit process on the P  I diagram and material balance are giving the possibility to calculate the each process unit capacity. Calculations are made on the basis of the engineering manuals or on the basis of the informations from the catalogues or specification lists of the equipment producers. Choose of the equipment is to be made keeping the proper capacity proportions between the all items of the production process.

Selected equipment has to be specified on special check lists which are source for further calculation of the equipment cost. The typical check list is given in the MANUAL /p. 119 English edition/.

Procedure of the purchasing of the equipment and its cost estimate on the basis of the data in the offers or quotations of the producers will be discussed later.

Process functional charts.

Technological process defined on the P  I diagram and dimensions of the every piece of the equipment given in the specifications, allow to prepare layouts of the equipment in the three dimensional space. This plant layout must follow several rules:

- location of the equipment is to be concise with the material flow,

- place for transport routes, local storages of processed materials, control and instrumentation rooms and necessary rest tooms for the workers has to be provided

- proper proportion between the working surface and many-level flooring is to be kept /cost of the land energy is to be considered/

General functional layouts.

All the equipment and machinery are to be placed in production areas which could be buildings or open air structures. Division of the process into several block depends mostly on the process requirements and organisation and management system in the factory. Sometimes the physical constraints are the obstacles to put all the equipment into one building.

All the auciliary buildings and structures are to be defined and properly placed on the site. All kinds of the buildings are to be considered:

- factory production buildings and structures

- anciliary buildings /maintenance mechir shops, garages, research and control laboratories, medical service building factory, restaurants etc./

- stores and warehouses /raw materials, auxiliary materials, finished products/

- welfare buildings

- administrative buildings

- hostels and eventual residential buildings

Transport layouts.

All the transport routes of the materials and products has to be investigated and proper roads, tunnels, bridges, railroad and truck loading stations designed with the connection to existing public facilities.

Utility layouts and diagrams.

Machinery and equipment specification shows the necessary quality and quantity of the utilities. Then the total consumption and supply as well as distribution points can be drawn. This source of information serves to design the all lines of distribution of the utilities, as well allows the dimensioning of pipes, cables and structures.

Telecommunication layouts.

Every process demands the central control and collection of the information as well the interprocess communication. Therefore layouts for the telephone wiring and distribution are necessary.

4/-

Sometimes two parallal telephone systems should exists /internal to supervise process and external to communicate with the factory administration/. Computer centres, printing and reporduction facilities as well as the telex contre should be designed.

Manpower and staffing of the factory.

Charts of manpower requirement and skill description with indications to training programme, and staff estimation is to be prepared. Methods of manpower estimation will be discussed later.

Organisational layouts.

Organigrams showing the organizational set up for the operation of the factory are to be prepared. This should be supported by the regulations and obligations as well responsibility prescriptions. Because organization of the operating factory is different also the organization during the engineering and erection time is to be proposed as well during the start up period. From every layout the necessary equipment and materials should be defined and specification charts should be prepared. This would serve to establish or control the cost of the civil works and will allow to place orders at the proper time.

Civil engineering works.

Already collected information allows the analysis of the civil engineering works which are necessary for the factory erection. Additional data are collected from the localisation and site description.

Three kinds of civil engineering works are to be estimated:

- site preparation and development
    The volume on check list is given in the manual /P. 120/

Calculation of the cost is made on the estimation basis of the physical volume of each kind of jobs, and prices dominating in the country or region. The tenders from the contractors should be sought giving them site data and appropriate layouts and charts.

- buildings and civil works.
    The check list is given in the manual /P.120/

The procedure of the volume and cost estimate as above is to be applied

- outdoor civil works
    The check list is given in the manual /P. 121/

The procedure of the volume and cost estimate as above is to be 5/- applied.

Engineering design objectives.

- to define parameters and variables of the process

- to define dimensions, sizes, weights of machinery and equipment

- to define space allocation of structural elements

- to define volume, schedule of civil works

- to define interconnections inside and with environment

- to define inputs consumption

- to define investment cost, production cost
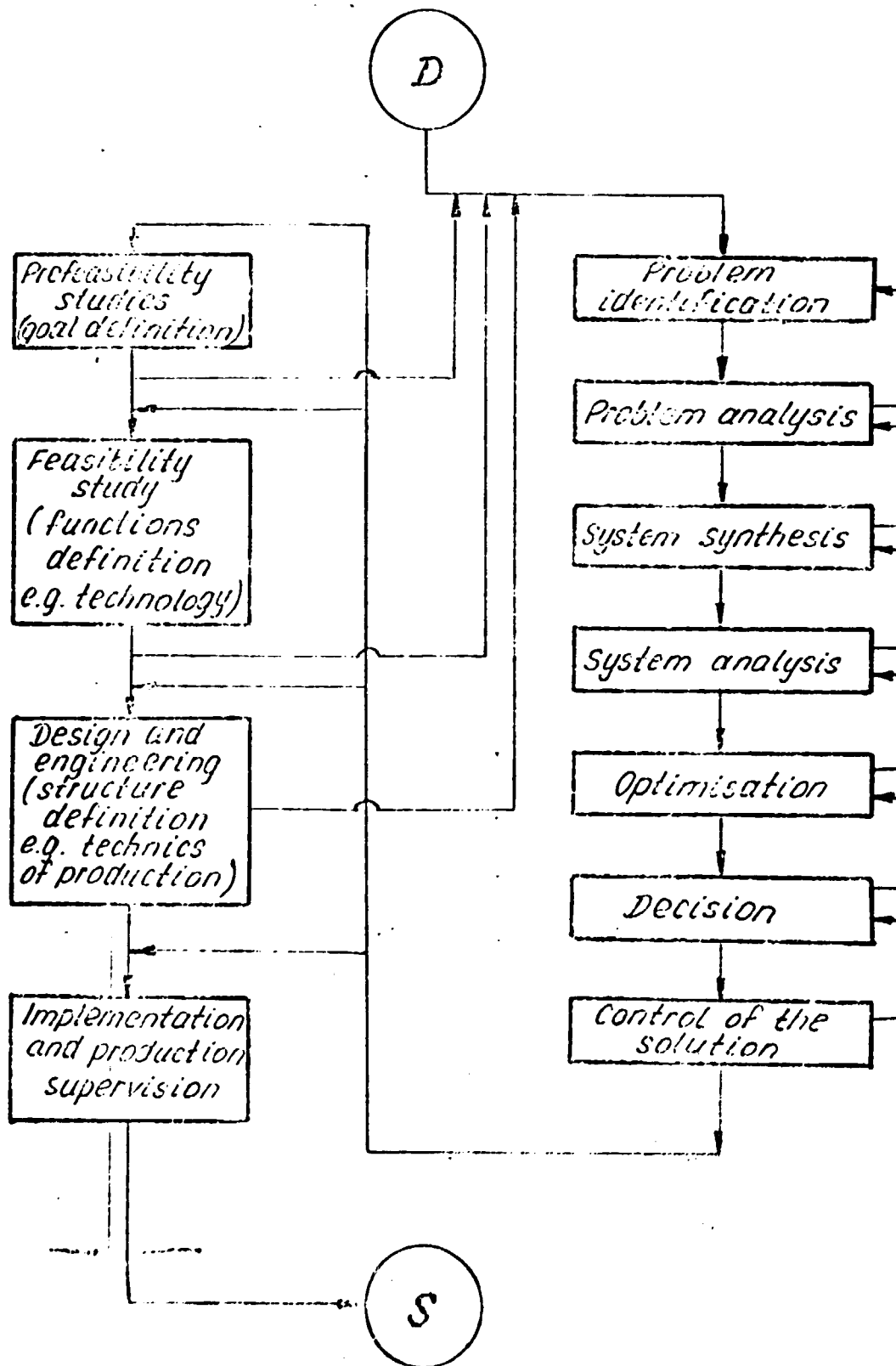
Procedure and stages of project development.

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Chapter X Manpower.Training.

Lecture content:

1. Estimation of working time a/per year b/ per shift
2. Estimation of working places quantity [1]
3. Coordination of the operation time and working time
4. Indirect labour[2]
5. Working schedules
6. Wages-skill categories of workers. Salaries scheme.[3]
7. Organization chart of the installation, plant, compa
   General principles.
8. Staff and managerial forces
9. Cost estimate of labour.
10. Training programme[4]

Comments:

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1/ Estimation of the quantity of the labor and their skill should
be a result of the production process analysis. Direct applica
tion of information concerning the manning the process from ot
countries is leading to erroneous decisions, because of differ
organization of the industry as a whole /e.g. service system/.
Some help in the labor estimation could be:

- equipment supplies
- output data from other factories in the country

The best solution for the labor estimate is the analysis of th
working places. To the working place is attached permanent
function fullfiled by the operation on the place, or in the
several places, covering his scheduled time of work. On the wo
ing place operator is in the contact directly or indirectly wi
the flow of the materials and the machinery or equipment.
It means that only analysing the P I diagram and layouts of th
equipment one can define the quantity and quality of the labor
The procedure of the estimation is as follows:

- define the places on the P I diagram where the partic
  pation of the worker is anticipated

- estimate the time necessary to service the equipment
  or flow of the materials

- add auxiliary activities

- count the quantity of the labor on the every working plac
- add the control operation and time
- estimate direct supervisory manning
- · - add the personnel in control rooms or at steering panels
- define the capabilities and knowledge to service each working place

Result should be the direct labor specification in the given section or departament of the factory.

In some factories above the direct working place attached personne it is necessary to follow periodically the performance of the some specialised machinery which is selfcontrolled, but needs some supervision on the mechanical side /like compressors, pumps, hydra ulic pressure facilities/. Than the route of the controlled places is to be established and routine circulation personnel is to be assessed. This personnel may to be obliged to execute simple maintenance like greasing, liquidation of the small leakages etc. It i necessary to establish control timers for this personnel, or other way of reporting.

2/ Additionally to the direct production personnel is to be defined on the basis of the functions of each service section:

- store and warehouses personnel /on the basis of time schedule of the activity/
- maintenance machinshops personnel and specialized maintenance personnel
- water, electricity, effluences and other utilities servi personnel
- automation and instrumentation section personnel

Quantity and skill has to be defined on the basis of layouts and diagrams of the utility distribution and the procedings of the timing.

3/ Salaries are to be established in two models:

- monthly salary for the clerical, managerial, and supervi sory personnel
- hourly pay for the most of the workers

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