

# Project Theory

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**V2.0**

# Industrial engineer's main tasks

- To **improve**
- To innovate
- To take decisions/to assume
- To organise
- To make benefits
- To save money
- To find solutions
- To design
- To manage
- To direct
- To **lead**
- To project/design
- To think
- To earn money/selling
- To produce
- This is a nice way of living?

## Aspects to be considered:

- The general project theory includes economic, planning and control elements.
- The general project theory does not supply different specific technologies as required by the technical nature of the project.
- *Projects are done for making money... increasing users welfare !!!!*

# Content of the subject

The project and its stages: Introduction

Systems, Users and Functions: their well-being and their ergonomic limitations

Study of alternatives value analysis, creativity techniques, and realibility

Study of viability from technical and economical point of view

Project management or the skill of leading people

Project documentation and communication techniques for showing your work

# 1-Introduction: The project and its stages

1-1 The project concept

1.2 Project design characteristics and types

1.3 Project stages.

# 1-1 Project concept

## Classical project concept evolution

- **A)** Collection of documents, calculations and **drawings** that are made to give an idea of how an architecture or engineering work must be and how much it costs.
- **B)** Collection of all the necessary activities to execute a **task**

- C) Combination of human and non-human resources , gathered in a temporal organisation, in order to achieve a certain purpose.
- D) Combination of all the necessary resources , gathered in a temporal organisation, in order to transform an idea into a real object or work.
- E) Must be seen as a conflict or user need solved
  - *It is a complex operation regarding time and human resources that is justified with the success of an effective resolution of a conflict or need*

# Knowledge areas in Project Management

Today, Project managers should have as detailed knowledge as possible of each of the mentioned areas, both in the theoretical aspects and in the practical issues related to processes, techniques and tools for managing:

Project scope

Time

Costs

Quality

Human Resources

Communications

Risks

Information and its Integration

Users

Purchases



# 1-2 Project characteristics and types

## Project characteristics

- Complexity
- Integral
- Multidisciplinary
- By tasks with start and finish

## Types of projects

- **By Objectives**
  - Natural resources..... Mining industry, forest industry, marine...
  - Buildings and infrastructures..... Civil, construction...
  - Manufactured products..... Industrial, mechanical, naval industry
  - Services and systems..... Computing, Electrical, Telecommunications...
- **By Engineering**

## By documentation/machines ratio

- +Documentation



+Machines

Natural resources,  
Buildings...

**INDUSTRIAL PROJECTS**

Services and  
Systems

## By industrial investment

- Big **investment** projects
- Industrial installations and industrial plants
- Lines and production units
- Machines, equipment and *prototypes*

# 1-3 Project stages

Characteristics of engineering projects related to stages:

**Stage:** different stadiums of conflict resolution

- Different stages **by chronological criteria**
- Different stages **by operations to be made**
- Different stages **by project management**

## By chronological criteria

- 1- Planning, design and engineering stage
- 2- Production and consumption stage
- 3- Market withdrawal

# Planning, design and engineering

- Viability study: different alternatives

Generally difficult, parameters, restrictions, different solutions (physical possibility and economic cost) and useful solutions must be prioritised and selected)

- Preliminary project: identify the best alternative

Different solution analysis, synthesis of the most adequate characteristics evaluation, critical elements and materials. Prospective study, evaluation and decision



- Development Project:

It is the project implementation.

General planning, detail engineering, specifications, experimental prototypes, tests and corrections

# Production and consumption

- Production: from a prototype to an industrial production

Process design, tools, installations, quality control systems, staff, production control, information systems, financial resources

- Distribution: establishing a marketing policy

Commercial network, advertising, stock policy,  
logistics, packing

- Consumption: to stimulate the use of the product

after-sales service network, image, improvements, price policy and sales finance

# Market withdrawal

- Product's positive output.

The project has accomplished the function for which it was created and it is withdrawn.

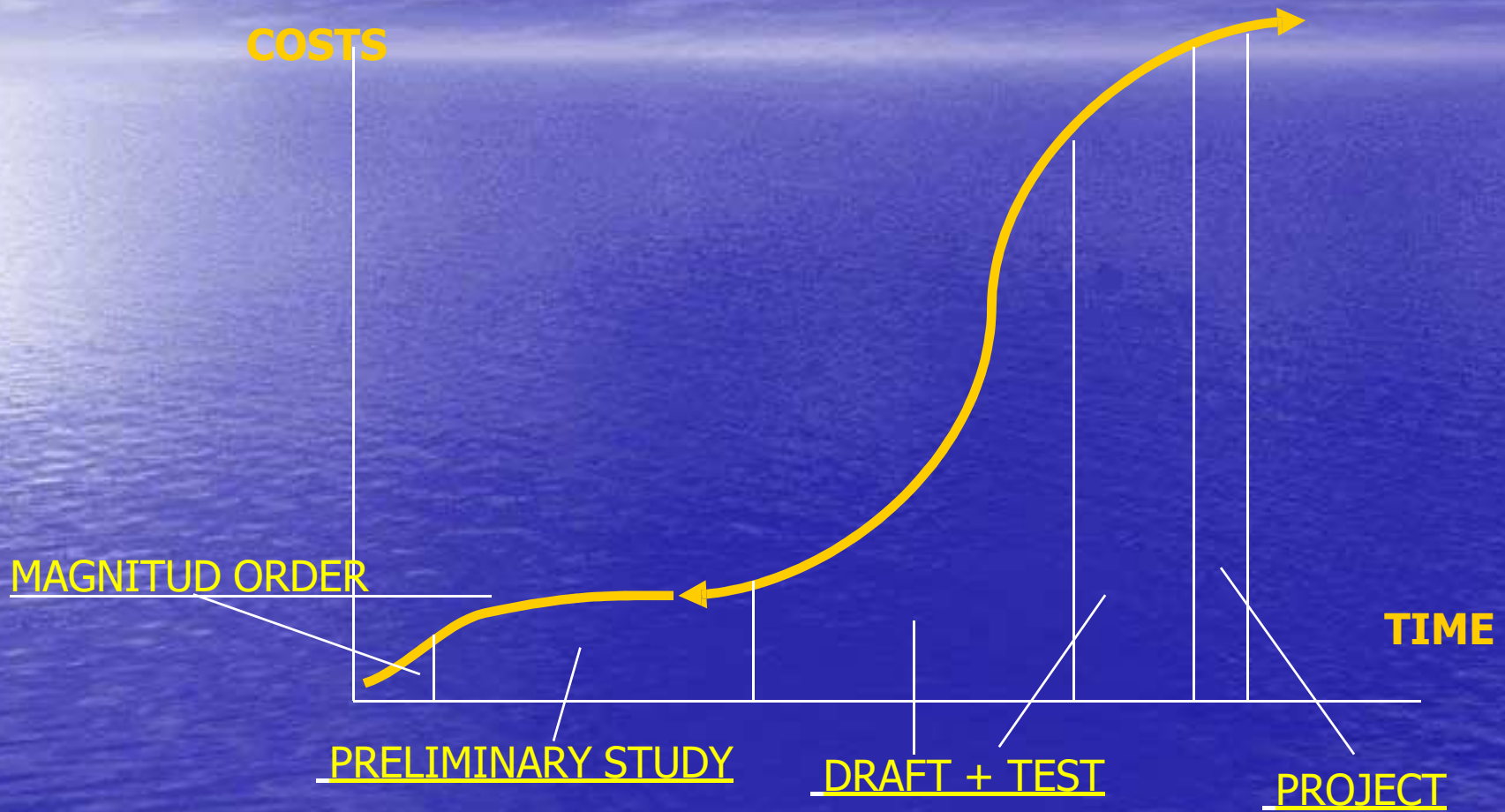
## By Operations to be made (used in this subject)

Stages	Characteristics	Name	Basic Dependence
Creative	Transforming an idea into a project	Magnitude order Preliminary study Pre-Project Project	project / designer
Construction	Transforming the project into a physical reality	Implementation	Project/Designer or Company Suppliers
Exploitation	Life of the project	Production Distribution Consumption Project end	Company

## By Project Management processes

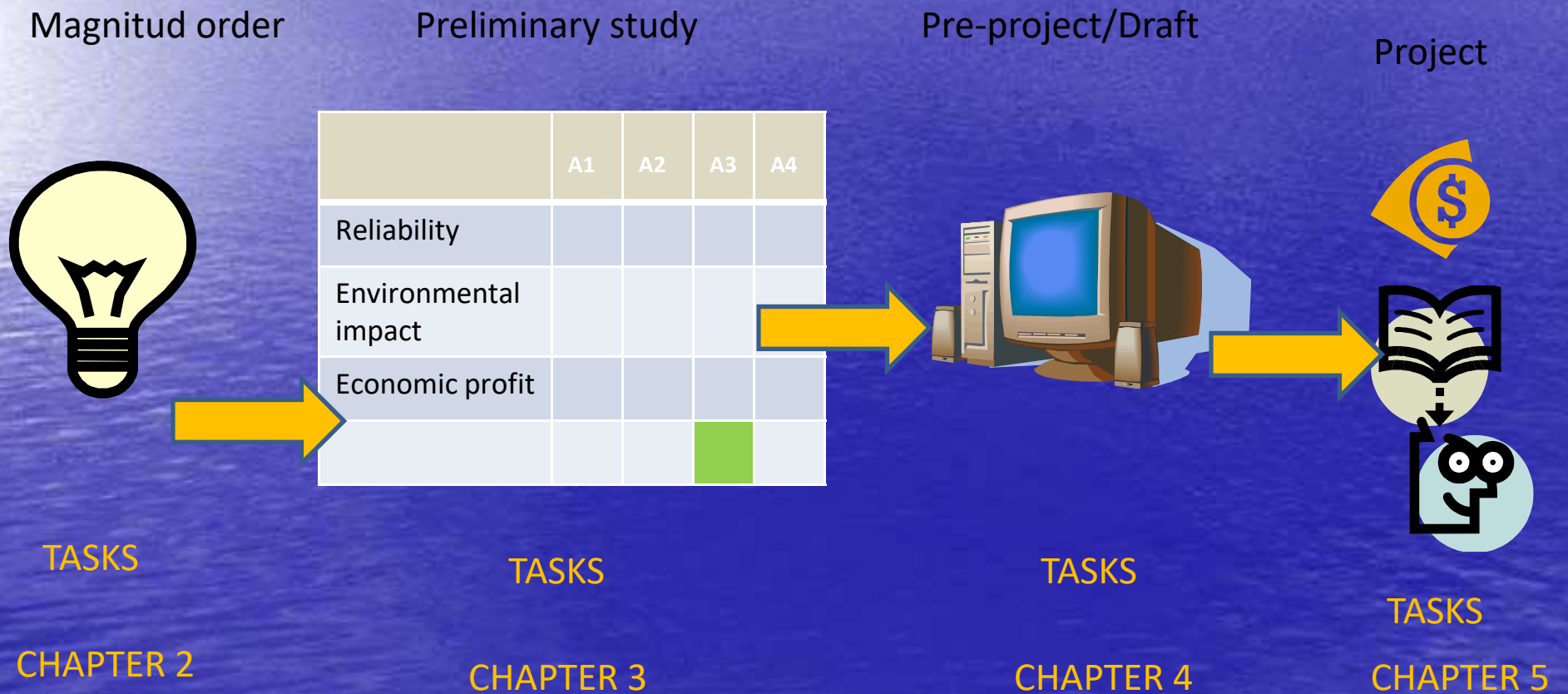


# PROJECT LIFE CYCLE **IN CREATIVE STAGE**





# Easy way to remember:



## Jobs to do during the semester in this subject:

- Find a conflict to fix (groups)
- Answer 3 groups of questions related with your conflict (project) (groups)
- Write a final preliminary study report (groups) (>50 pages)
  - With powerpoint + poster (paper + jpg) + report resume (1 page pdf)
- Final exam (individually)
- No partial exam