

# Budgeting and Costs analysis

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## Project cost planning

**Cost planning:** decisional process which try to forecast:

- The economic dimension of the project
- The temporal dimension of the cost

This is not to be considered a spot activities but a **process**: after a general evaluation of the project cost (in order to decide if “beginning” the project) it is necessary a **detailed analysis** (in order to provide a budget to the customer)

## **Cost estimation: complexity**

- Every estimation is complex
- There are several models for the estimation of the costs
- There are many factors to be valued
- There are the project risks

## **Methods of cost evaluation**

We can return the different evaluation modalities, according to their peculiar characteristics, to three main methods:

- Subjective methods
- Statistic and parametric methods
- Comparative methods

## Subjective methods

- They are mainly based on the competence and the experience of the individual involved in the evaluation process – “feeling”
- They hardly have “universal” value
- The “assumption” at the base of the choice can be hardly rationalized
- They are usually linked to the underlying principles for the individuation the “bottom up” activities

## Statistics and parametric methods

- They are based on the integration of the analysis made on historical data and on the technical characteristics of the project
- The mathematics and parametric analysis represent the relations present in the project
- Complexity factors can be integrated in the mathematics formula as well: the technological innovation, the experience, the project planning

## Comparative methods

- They are based on the possibility to correlate **final costs of past projects to budget costs of present project**
- Two principle techniques are usually used:
  - **Near-Neighbor** (very similar “pack of activities” are correlates in different projects)
  - **Rule of Thumb** (Relations between the project costs of the same program)

## Which method do we choose?

It depends on...

- The precision required to the estimation
- The experience of the involved people
- The specifics and requirements required by the customer
- The historian of the projects
- The contractual bonds
- The time available for the estimation
- The possibility of parameter re-making of the estimation

## Some tools

- The Bill
  - Activity
  - Cost nature
- CBS – Cost Breakdown Structure
- Bar charts
- Cost Bar chart

## The Bill of Activity

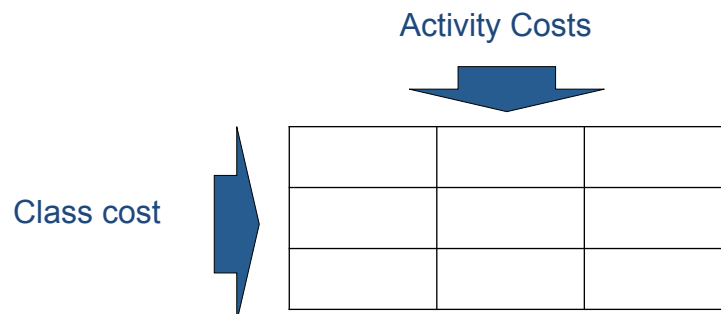
Activity	Cost
<b>Phase A</b>	<b>Sub-total (1800) €</b>
Activity A1	1000 €
Activity A2	800 €
<b>Phase B</b>	<b>Sub-total (7000) €</b>
Activity B1	6000 €
Activity B2	1000 €
<b>Project</b>	<b>Total (8800) €</b>

## The Bill by nature or class

Class	Cost
<b>Work</b>	<b>Sub-total (1800) €</b>
Ordinary	1000 €
Extraordinary	800 €
<b>Materials</b>	<b>Sub-total (7000) €</b>
xxx	6000 €
xxx	1000 €
<b>Project</b>	<b>Total (8800) €</b>

## CBS – Cost Breakdown Structure

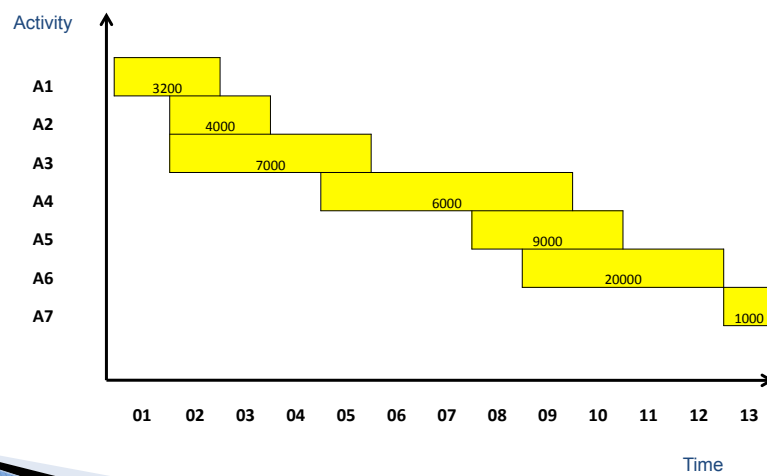
This double-entry chart comes from the intersection of the data related to:



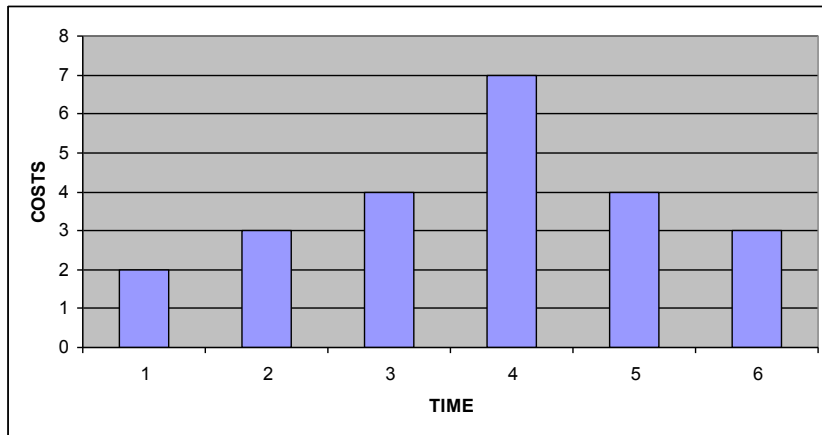
## Individuation chart

Activ.	M.stone	Resp.	Times	Costs

## Cost Gantt Diagram

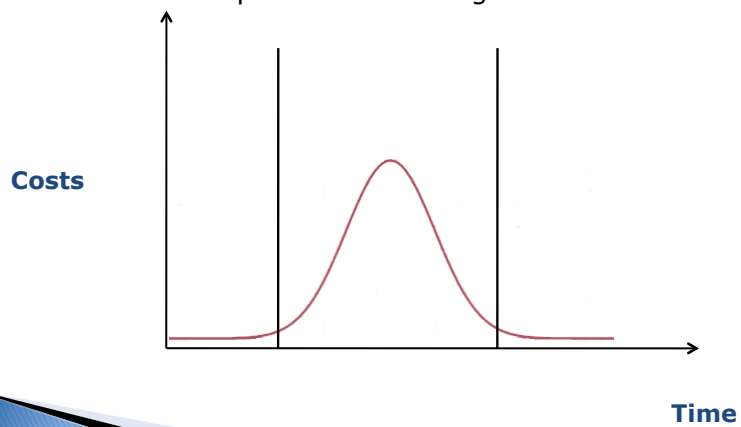


## Costs bar chart



## Trend of the project costs: the gaussian curve

The trend of the project costs can be generally represented with a gaussian curve

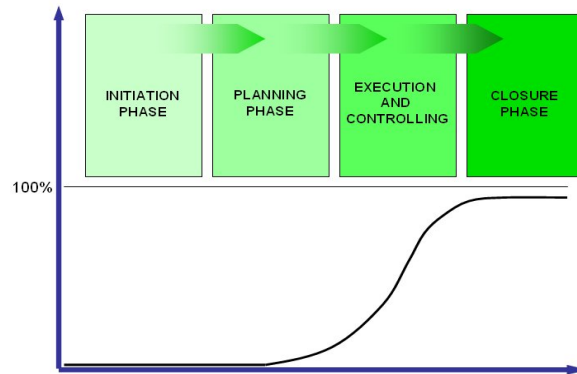




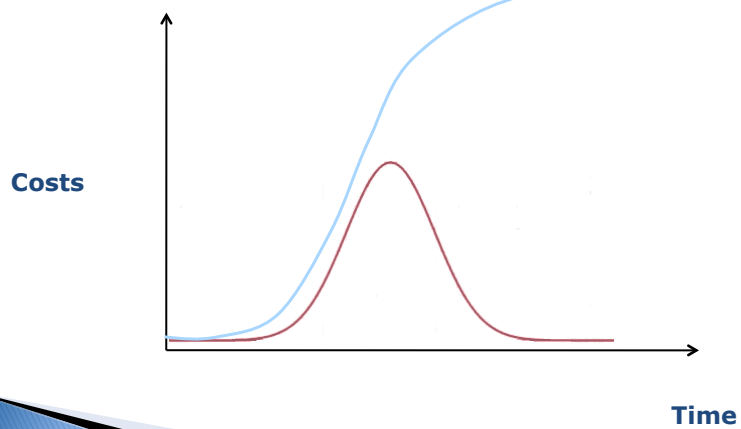
## Cumulative costs and the “S” curve

- The curve of cumulative project cost, typically follows the shape of the letter "S": the beginning represents a slow start, while the end represents a deceleration as the work runs out.

Sample project  
“s” Curve

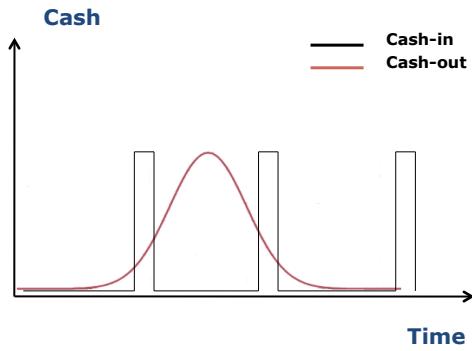


## Costs' Trends



## Cash receipts and payments : financial dimension of the projects

- An accurate analysis of the costs is not sufficient for a correct project management
- It's necessary to forecast the cash flows in order to avoid cash shocks



## Project costs Exercise

# Project Risk Management

## A risk

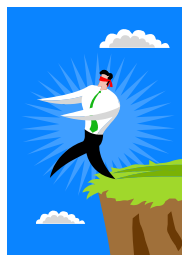


*Risk is the possibility that an event can occur and it will have an impact on the results*

## The objectives of Project Risk Management

*The objectives of the Project Risk Management are to increase the probability and the impact of positive events, and to decrease the probability and impact of events adverse to the project.*

## Risk Management



It depends inevitably by:

- ▶ The stake / impact
- ▶ The attitude toward risk

The personal and corporate values

## The Project Risk Management process

The Project Risk Management process include these phases:

- 1. Risk Management Planning**
- 2. Risk Identification**
- 3. Qualitative Risk Analysis**
- 4. Quantitative Risk Analysis**
- 5. Risk Response Planning**
- 6. Risk Monitoring**

## Risk Management Planning

*Is the process of deciding how to approach and conduct risk management*

In particular in this process you have to define:

- ▶ Methods & Tools
- ▶ Roles & Responsibility
  - ▶ Timing

## Risk Identification

### Some tools & methods to identify risks:

- ▶ Brainstorming
- ▶ Interviewing
- ▶ SWOT Analysis
- ▶ Assumptions Analysis
- ▶ Checklist
- ▶ Previous Projects Analysis

## Risk Evaluation

*According to PMI, we have two kind of risk evaluation:*

- Qualitative Risk Analysis
- Quantitative Risk Analysis

## Qualitative Risk Analysis

*The objective of **Qualitative Risk Analysis** is classify risks in functions of these two variables:*

- ▶ Probability of occurring
- ▶ Impact on project

## The risk rating




### The probability & Impact Matrix

It's an important tool that combine probability and impact of a risk

The objective of this tool is to define a risk rating

## A risk rating representation

To have an intuitive representation of the risks of the project you can match:

-  ▶ **High risks** with a red spot
-  ▶ **Moderate risks** with a yellow spot
-  ▶ **Low risks** with a green spot

## Quantitative Risk Analysis

- ▶ Quantitative Risk Analysis can't replace the Qualitative Risk Analysis
- ▶ Usually it's used to analyze relevant risks
- ▶ We can use tools as: interviews of experts, sensitivity analysis, monetary value analysis, decision tree analysis and simulations



## Risk Response Planning

The **Risk Response Planning** is the process of developing options, and determining actions to enhance opportunities and reduce threats to the project's objectives

*Some strategies to deal with risks and threats*

- ▶ **Avoid**: Modify the project plan to not fall into the risk
- ▶ **Transfer**: Try to shift a negative impact to a third party
- ▶ **Mitigate**: Reduce the impact or the probability of the risk
- ▶ **Retain**: Accept the risk

## An advanced risk log

Risk Cause	Event	Impact	Prob.	RR	Response	Cost	Owner	Residual Risk

## Risk Monitoring

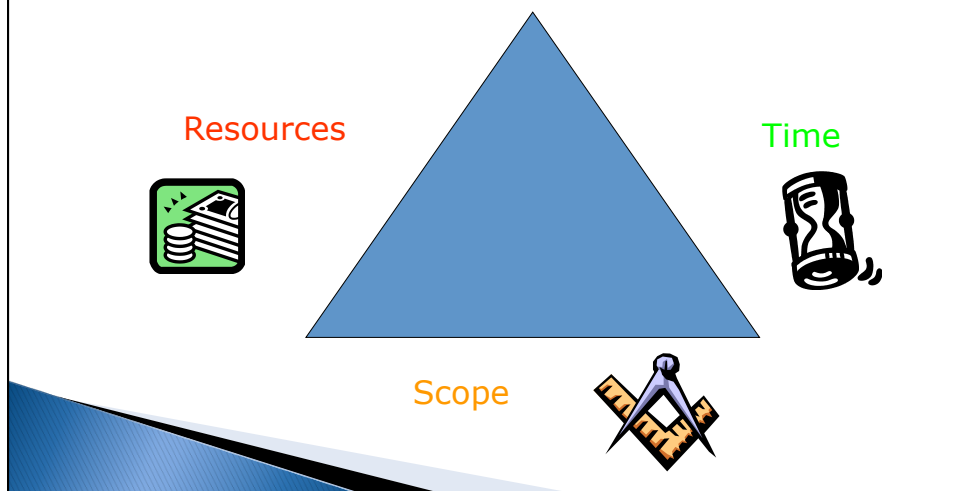
It's very important to know that the risk management is not a spot activity but a process that have to endure **for all the project live.**

## And ... Now?

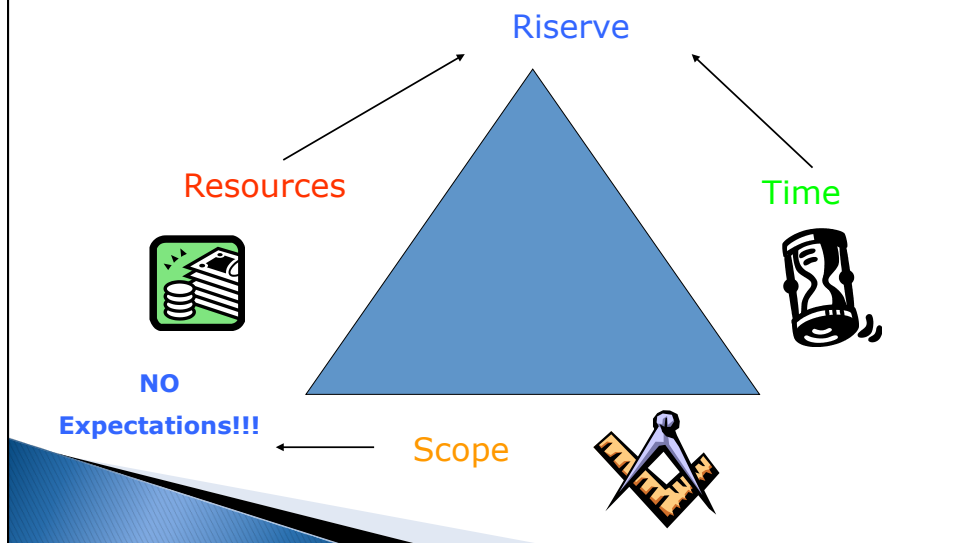


How can we represent risks in the project ?

# The project triangle



# The project triangle & risk



## The end of the project

Main elements:

- Identify real durations, costs, allocated resources and compare them with the baseline (forecasts)
- Call a meeting for the end of the project (post-mortem meeting)
  - Analyze criticalities
- Evaluate the possibility of reconsidering the company's standards

## The end of the project

Areas to be controlled:

- Results
- Activities
- Documentation
- Impact on production & sales
- Relationships with project team & stakeholders
- Project Budget
- Contracts

**Create lessons learned**