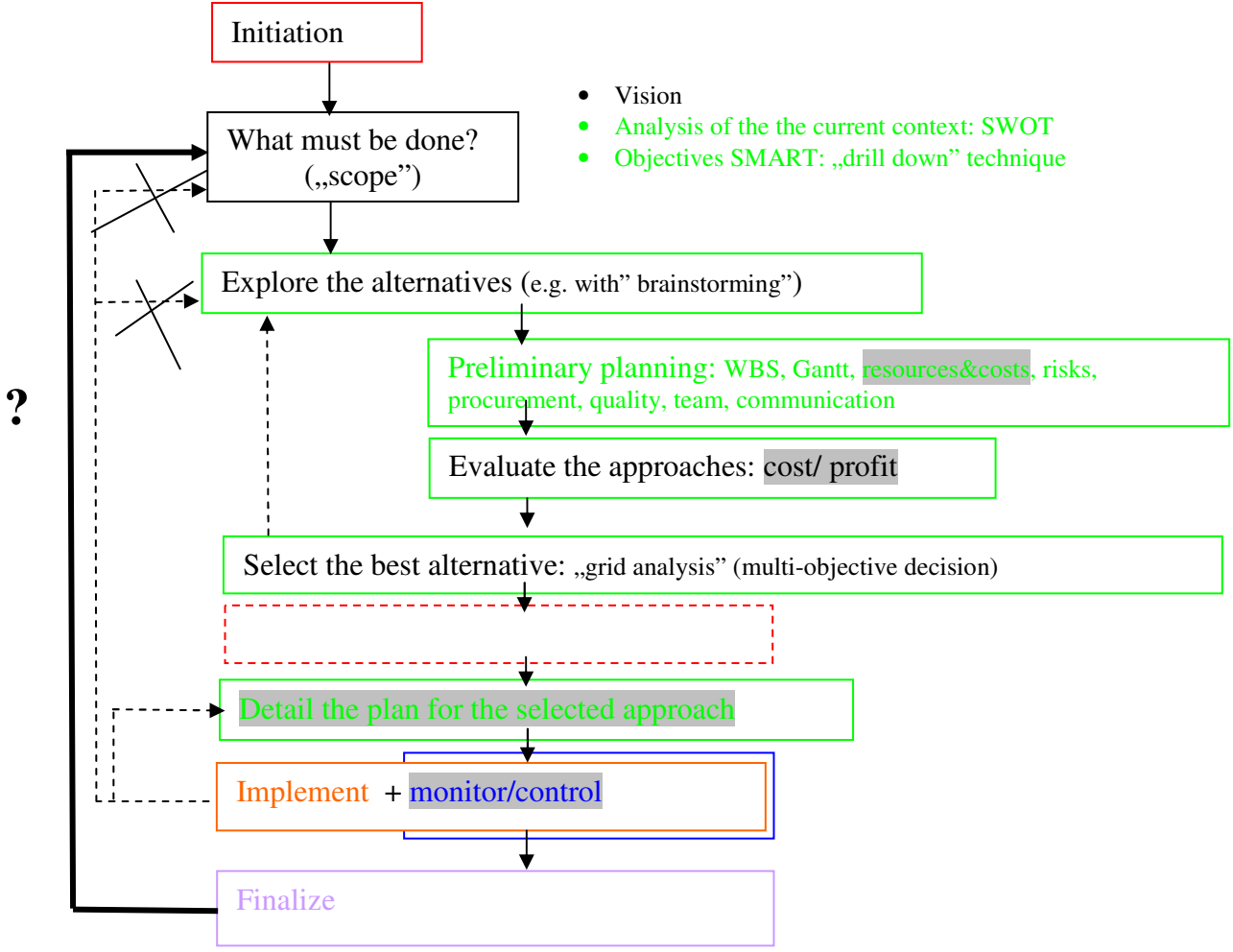
6. Cost Management

6. 1. Cost Management Processes

= the processes which keep the project in the **agreed budget**

>> cooperation with Accounting Department

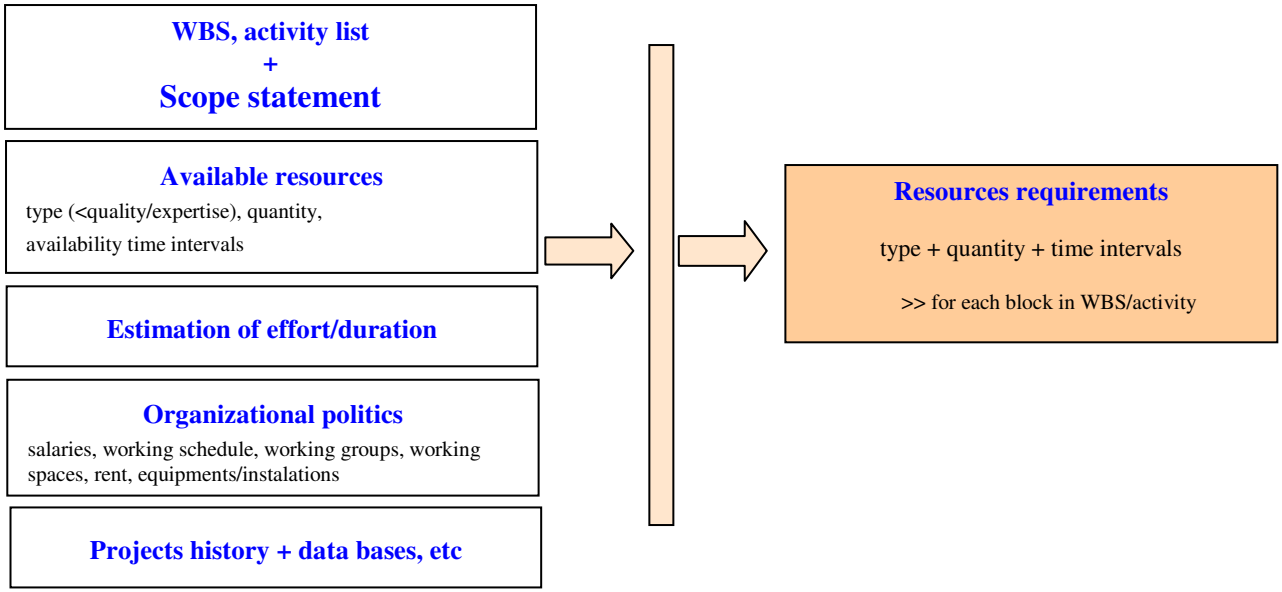
resource planning (PN)	set material and human resources (type + quantity, time intervals)
cost estimation (PN)	cost estimation – in relation to resource allocation scheme
budgeting (PN)	add the costs per activity
cost control (C)	control budget changes


Initiation
What must be done? („scope")
Explore the alternatives (e.g. with" brainstorming")
Preliminary planning: WBS, Gantt, resources&costs, risks, procurement, quality, team, communication
Evaluate the approaches: cost/ profit
Select the best alternative: „grid analysis" (multi-objective decision)
Detail the plan for the selected approach
Implement + monitor/control
Finalize
?
Vision
Analysis of the the current context: SWOT
Objectives SMART: „drill down" technique

6. 1. 1. Resource Planning (PN)

= identify + document requested human and material resources

WHEN/WHAT/HOW MANY RESOURCES ARE NECESSARY?



Remarks:

- For each project alternative (including contingency plans) - set the necessary resources

  >> with specialized software (PM)

- Use the expertise

  of others departments of the company

  of external consultants

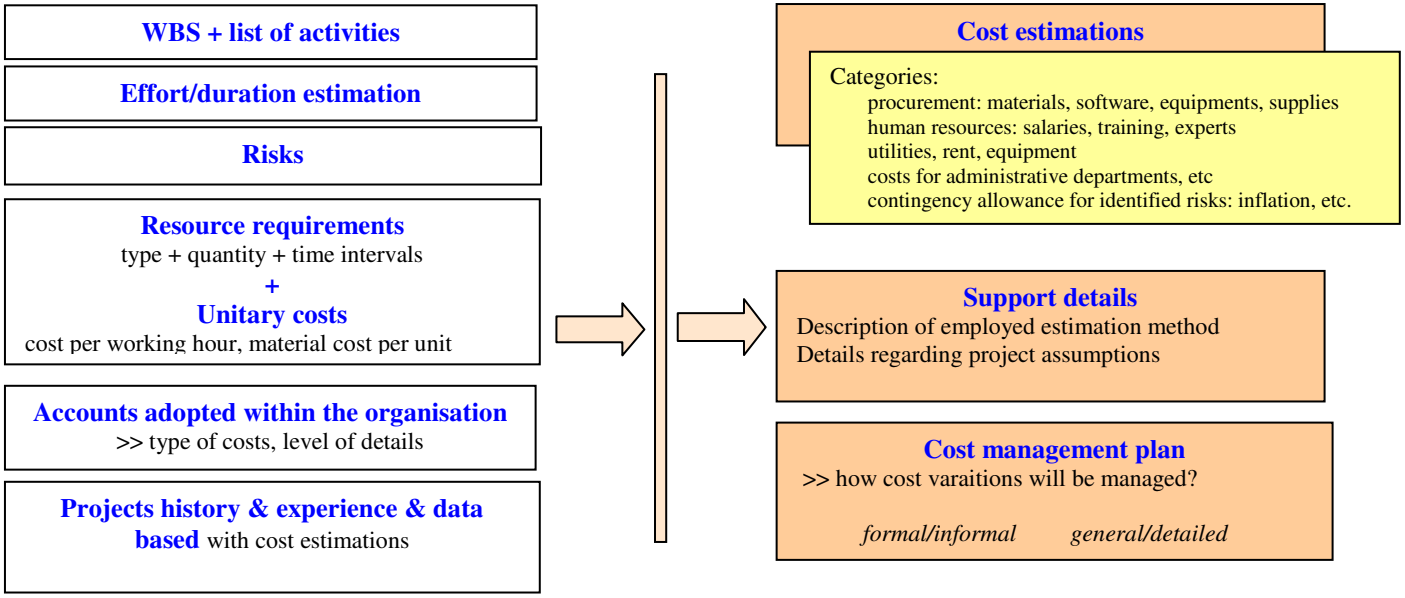
  of professional associations

  of team

6. 1. 2. Costs Estimations (PN)

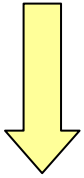
= estimate the costs necessary for project development
+
identify the main causes of potential cost changes

WHAT COSTS ARE NECESSARY?



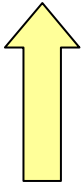
Methods for cost estimation:

- **Top down**



  - can be used in preliminary planning for gaining an overview
  - fast, with reduced accuracy

- **Bottom up**



  - difficult to apply
  - the granularity influences the accuracy
    (fine granularity >>better accuracy, hard estimation)

Recommendations:

- Work on phases >>WBS/activities + set the categories of costs
- Estimate the costs of each activity/deliverable package – for each cost category

- **Analogy**

  - fast, with low accuracy

  !! you must

    - find similar projects
    - find experts to outline the differences between projects

- **Parametric estimation**

  !! - a parametric model must be available (defined in relation to project complexity, working context, etc), based on quantifiable parameters

  >> reduced accuracy for improper models

  >> models available for multiple contexts are more difficult to obtain than cost estimation with other method

!! difficulty and accuracy depend on the field of applicability

- simple & accurate - in constructions
- hard & inaccurate – la software (too many variables)

>> verify the model on similar previous projects

- **Provider Offer Analysis**

Remarks:

use multiple methods: combined, for verification

discuss with stakeholders/internal and external experts

premature detailing are nor always necessary (e.g.: for long projects!!!)

costs can change during the project, but it is important to avoid big changes

it is not recommended to artificially increase the project costs!!!!

>> inconvenient for the organization

>> affect the credibility of PM

the cost must not be set starting from the price of the product,

:: however, one project motivation is related to profit

Recommendations:

- **Attention!**

  Don't forget: integration costs, testing costs, reworking /corrections, new employers adaptation, communication

  For risky activities (critical, innovative, difficult): consider cost contingency

  Include **all** procurement costs (service, maintenance, installing, etc)

- Be interest in a safe design and early testing >> small total costs

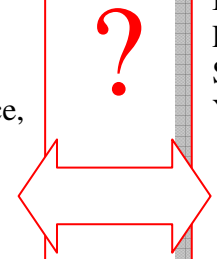
- Estimate the costs of all alternative plans

  >> pay attention to contingency plan for risk response

  >> analyze outsourcing possibilities

Made by the project team:

Available competences/resources
Somthing new and useful is learned by the organisation
Key component or expected risky cooperation
Cheaper
Better control on projcet development
Better control on copyright, maintainance, changes



Outsourcing – can you save money, time? can you reduce the risk level?

Unavailable competences/resources, yet avaible providers (credibility!!!)
You have alternative solutions in case of failure
Is cheaper
Risk transfer (safer)
Smaller duration
You can focus on other project activities

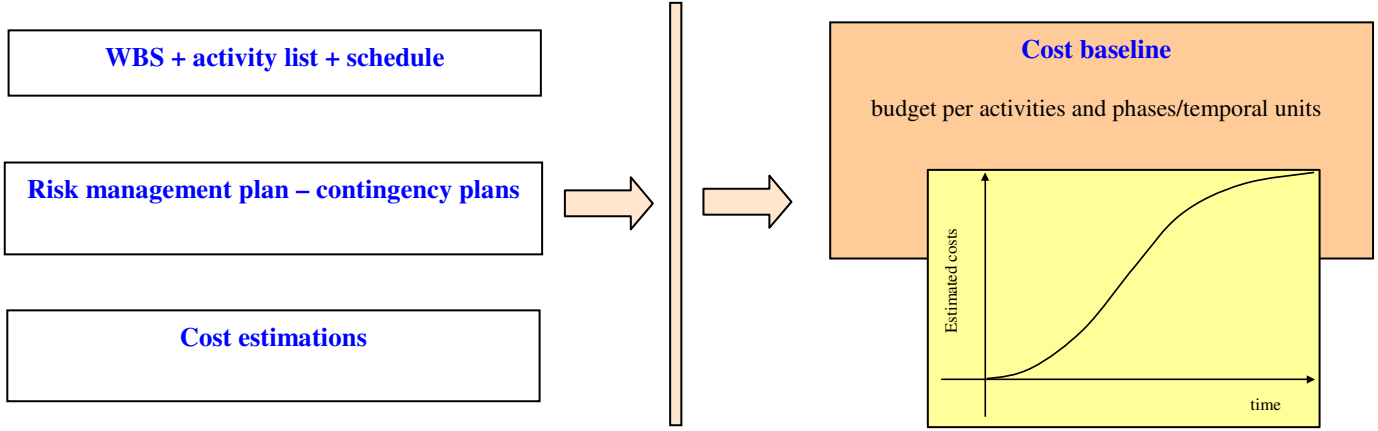
6. 1. 3. Budgeting (PN)

= allocate the costs per activity/ working package

+

build the cost baseline

WHAT IS THE SCHEDULE OF COSTS?



Observații:

- There are two alternatives for budgeting
  - „budget at completition”

    - cost baseline is drawn by taking into account the costs per activities / temporal units

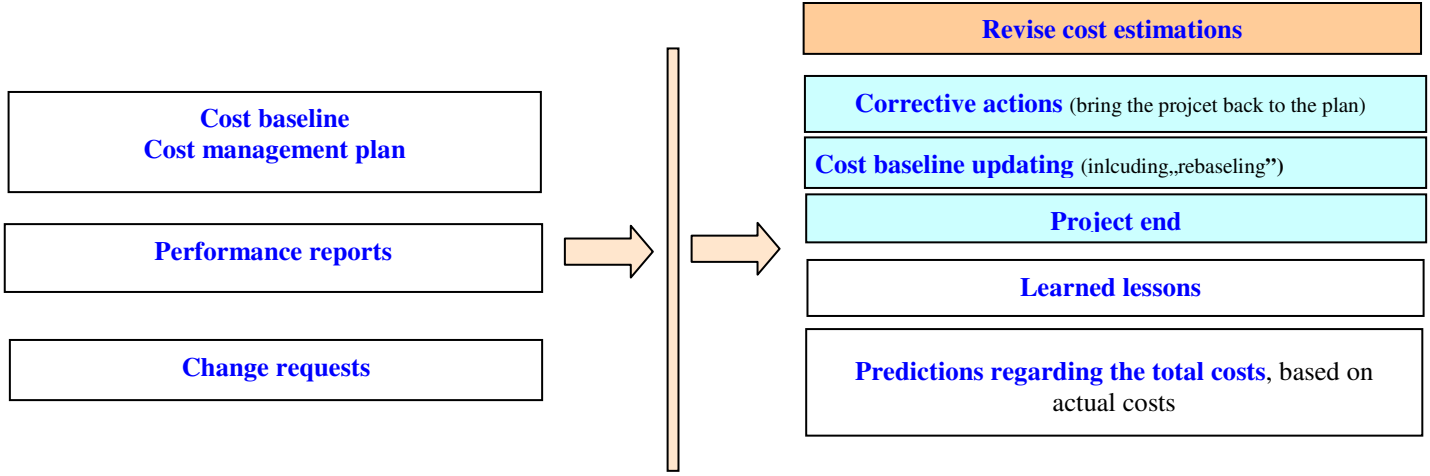
  - „zero-based budget”

    - cost base line indicates the difference between the cost of the project and the costs of another similar project (cost variation)
      >> more stressful for PM

6. 1. 4. Cost Control (C)

= find cost baseline changes
+
manage the changes of cost baseline
!!! obtain the agreement of change

COST BASELINE MUST BE CHANGED? CHANGE IT (carefully)!



Estimations of total costs, based on actual costs („Estimation at completition" - EAC)

Case 1. Initial estimations useless (imprecise, important changes occured)

EAC = costs until now (AC) **+**
estimation for the remaining cost (ETC)

Case 2. Initial estimations precise (or the cause generating the variation of costs will not occur again)

EAC = costs until now (AC) **+**
estimation for the remaining cost (budget total – EV)

Case 3. Initial estimations are corrected by a factor (the modification of costs will act similarly in the next phases –salaries changes, etc)

EAC = actual costs (AC) **+**
estimation for the remaining cost (budget total – EV)/CPI

Recommendations:

- Monitor the performances – in order to anticipate cost variations and the causes of these variations
  >> be objective (look at the indicators presented in the financial analysis)
  >> do not hide problems (hoping that the problem will be corrected before being observed by the others) and do not panic without reason

- indicate changes which can keep the project in reasonable costs

- indicate all project changes in cost baseline
  >> do not accept unauthorized changes!!!
  >> inform the key stakeholders about project changes

- be prepared to have changes
  >> if possible, negotiate with the client a cost risk sharing
  >> include cost contingency
  >> plan attentively, re-plan and then execute
  >> obtain a very good design and clear requirements !!!

Cost analysis - indicators

„Net Value Present Analysis" (NPV)

- Predict the net income which can be obtained after *k* years and translate it to the current year, by using a correction factor

$$\text{income\_year}_k^{\text{translated}} = \frac{\text{IN - OUT}}{\left(1 + \frac{r}{100}\right)^k}$$

$$NPV = \sum_k \text{income\_year}_k^{\text{translated}} - Cost\_initial$$

„Return of Investment" (ROI) – illustrates the efficiency of the investment

Without correction factor – income and costs over a time interval

$$ROI = \frac{Raw\_Income\_total - Cost\_total}{Cost\_total}$$

With correction factor – consider inflation, etc.

$$ROI = \frac{\sum_k \frac{Net\_income\_year\_k}{\left(1+\frac{r}{100}\right)^k}}{Cost\_initial}$$

Remark: it does not show how big incomes are involved
>> must be correlated with NPV

„Payback" (Pb) – the period after which investment can be recovered

Revision

Definitions, taxonomy

externalization

„budget at completition”/ „zero-based budget”

„estimation at completition”

cost analysis: NPV, ROI, Pb

Cost management processes: resource planning (PN), cost estimation (PN), budgeting (PN), cost control (C)

Documents

Resource requirements (materials + people) + cost estimations + support details

Cost management plan

Cost baseline