Project Management

EPITA Information Management Master

Project Management

Module 1

Olivier BERTHET

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Source : Photo Afidium

Teams recording

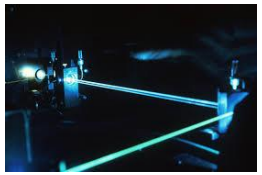
Any issue ?

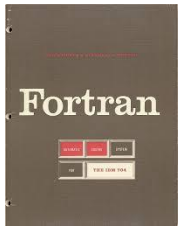
Attendance

https://student.epitamasters.com/login/

Project Management

My background





Education

Hobbies

Professional experience

Project Management

My courses at EPITA

Green IT

CRM

PM Principles

PM Workshops

IT Purchasing

Introduction to 6σ

Tell me and I forget,
teach me and I may remember,
involve me and I learn.

Benjamin Franklin

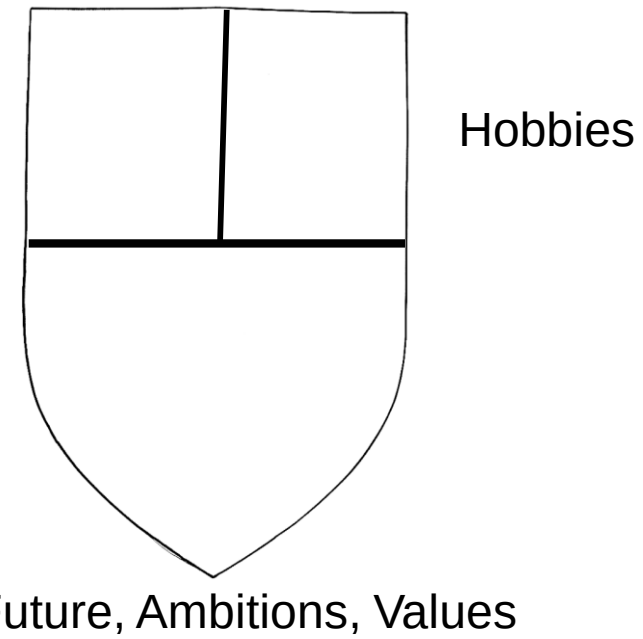
How do you feel today?

www.menti.com **code 9118 3228**

Slides 2 to 5

Other ice breakers

- **An object , a photo or a book**
- **Coat of arms**



Ground rules

- **Be respectful of those talking or presenting**
- **Be ON TIME**
  - **Being late is a sign of disrespect to the trainer and your peers**
  - **After 10 minutes delay , you will not be accepted in class**
- **Switch off your cell phones**
- **Laptops or tablets are tolerated only if you take notes**
- **Do not be shy , participate actively**
- **One discussion at a time**
- **Collaborate with your peers even if they are from a different nationality**

Course Schedule

Session#1	▪ Course description, schedule and objectives ▪ Definition of a project and project management ▪ Project Management Institute PMI organization ▪ Definition of Process groups and Knowledge areas ▪ Role and characteristics of a Project leader
Session#2	▪ From idea to project: feasibility study and business case ▪ Importance of Project Integration ▪ Definition and examples of project charter ▪ Scope management activities, scope control
Session#3	▪ Time and cost management, definition of the Gantt and Network (PERT) diagrams, identification of dependencies ▪ Practical examples with demos of Project Management software ▪ Estimation techniques, Budget preparation ▪ Definition and practice of Earned value technique

Course Schedule

Session#4	▪ Importance of quality management in a project, quality techniques (Six Sigma, Fishbone diagram, Pareto analysis) ▪ Preparation of the Human Resource Management plan ▪ Stages of the development of a team ▪ Management of the communication process in a project ▪ Know how to identify and measure the risks of a project
Session#5	▪ Understand the project's supply management process ▪ Understand the complexity of managing relationships with suppliers ▪ Know how to identify the stakeholders of a project and manage their expectations and their commitments ▪ Understand the issues and dilemmas that a project manager may encounter every day ▪ Understand the code of ethics that a project manager must subscribe
Session#6	▪ Ethics and Code of conduct ▪ Online Quiz exam with 100 questions

Tools

- **Teams of course for the moment**
- **OneDrive**
- **Office (Word, Excel, Powerpoint)**

- **Project management software tool**
  - **MS Project 2016**
  - **ProjectLibre**

Exam

- **Participation to the 6 modules/sessions (30% of your score)**
- **Exercises and homework 30%**
- **Quiz 100 questions in 2 hours 40%**

Project Management

How would you define a project ?
Menti slide 6

What is a project ?

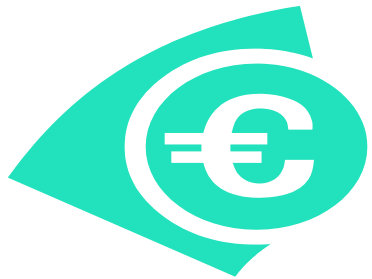
Definitions of the word “project”

- **Cambridge**
  - **a piece of planned work or an activity which is finished over a period of time and intended to achieve a particular aim**
- **Oxford**
  - **a planned piece of work that is designed to find information about something, to produce something new, or to improve something**
- **Webster**
  - **any piece of work that is undertaken or attempted**
  - **a planned undertaking**

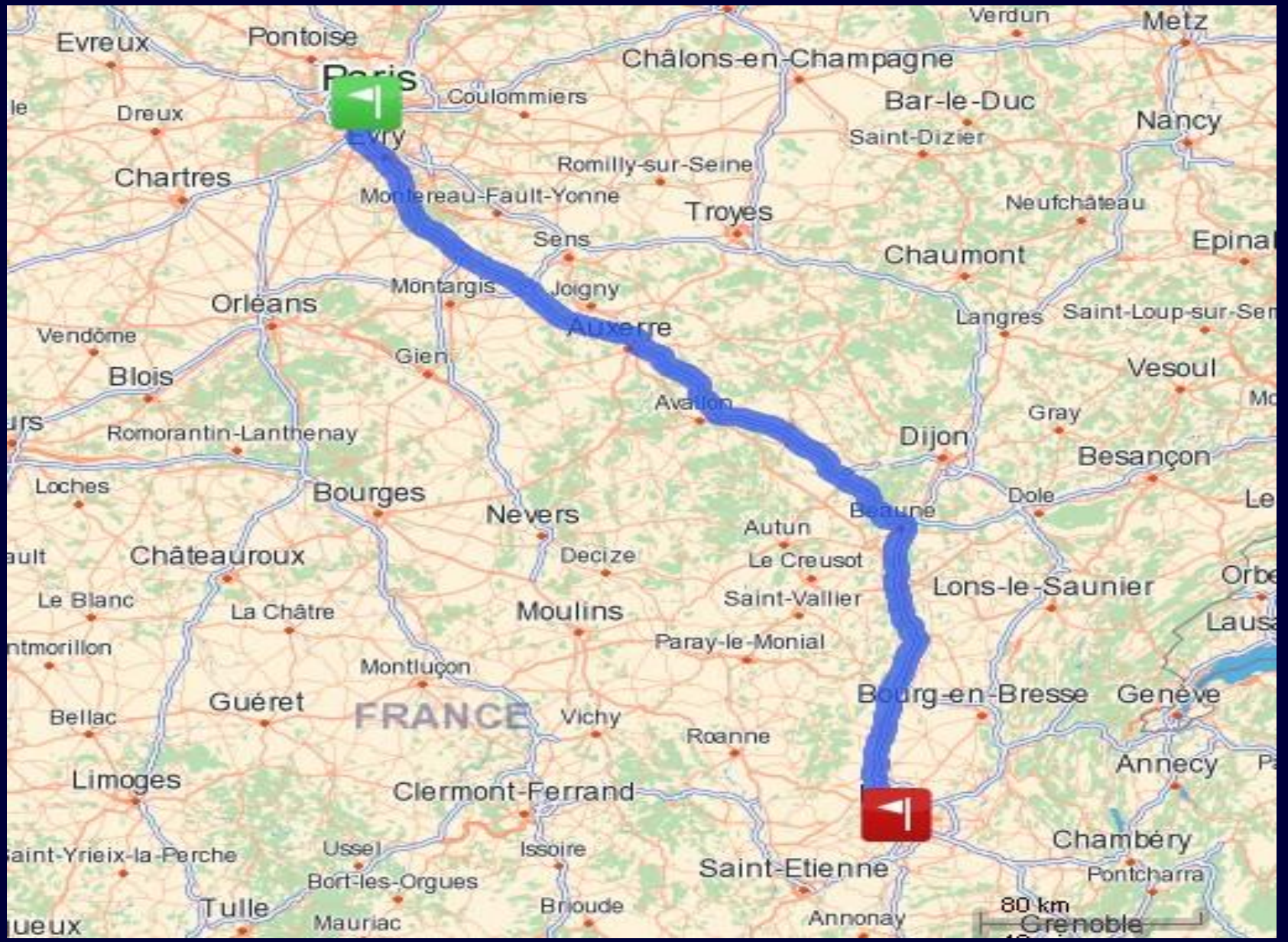
What is a project ? (2)

More precise and technical definitions

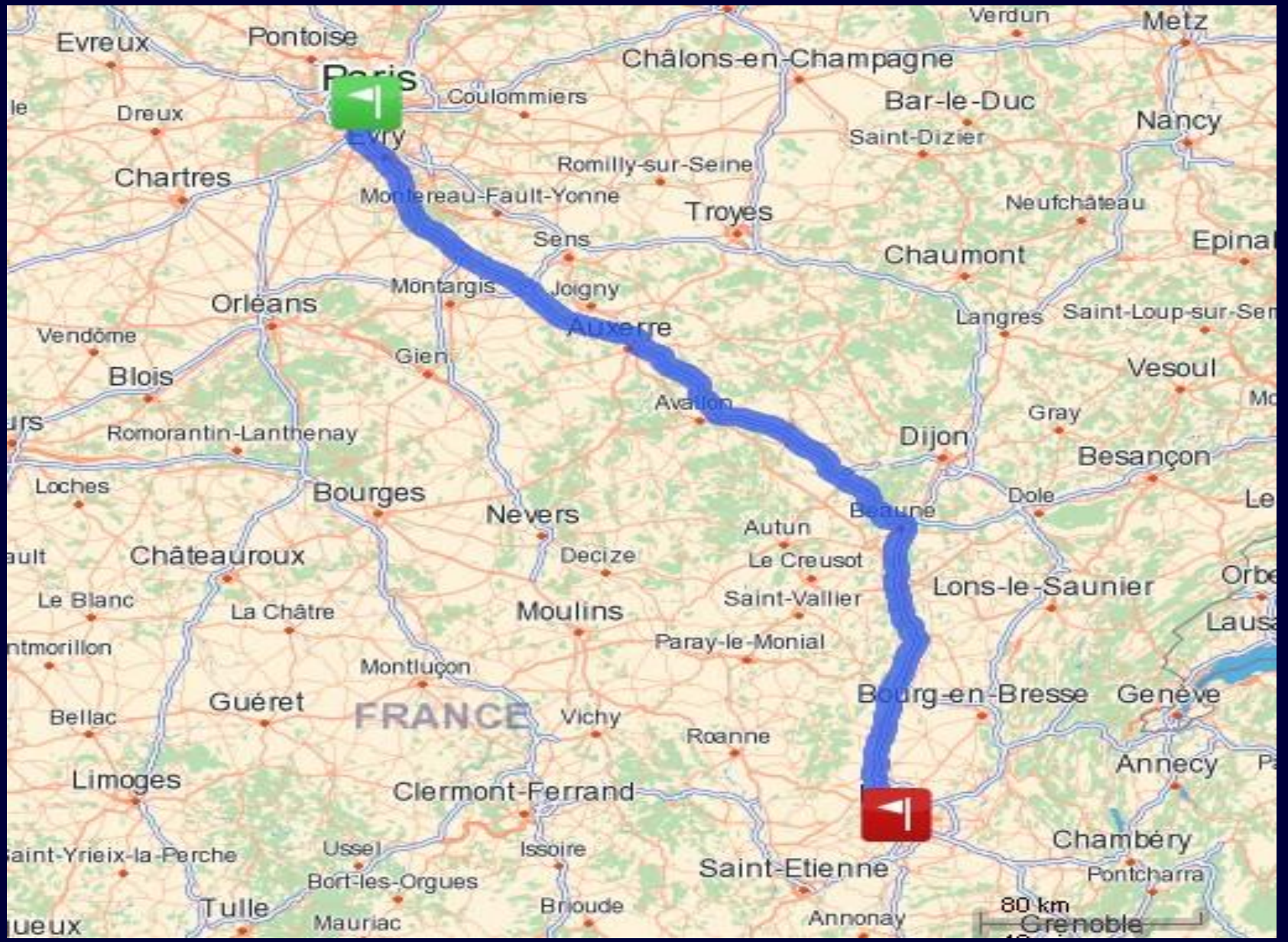
- **A project is a temporary endeavor undertaken to create a unique product, service or result (PMI)**
- **A project is a unique endeavor to produce a set of deliverables within clearly specified time, cost and quality constraints.**
- **A project is the set of actions leading from an idea to its concrete realization.**



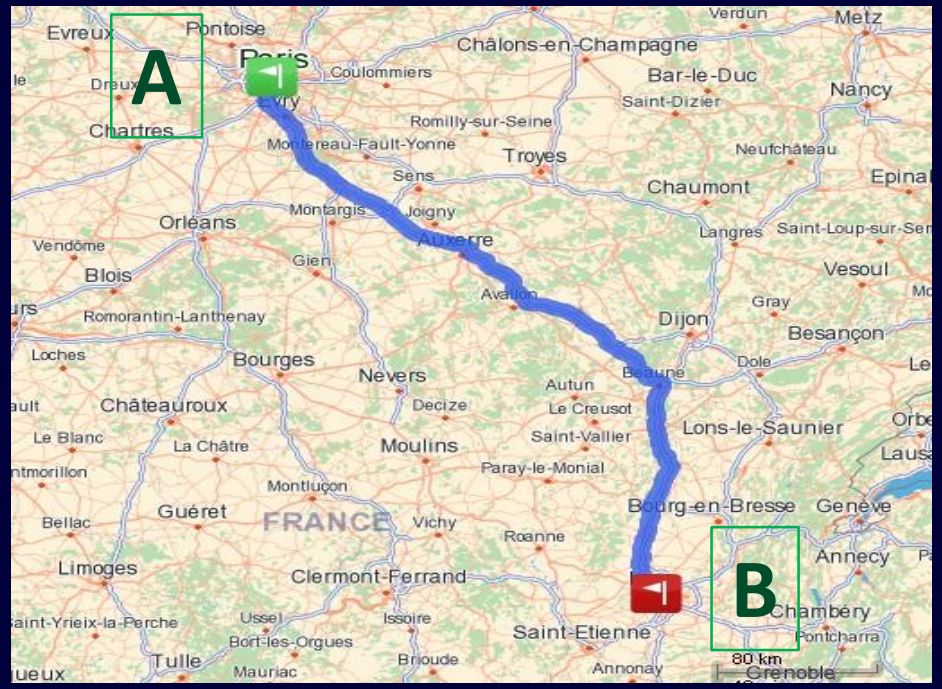
Idea: how about going from A to B?



Project: getting from A to B – Menti slides 7-12

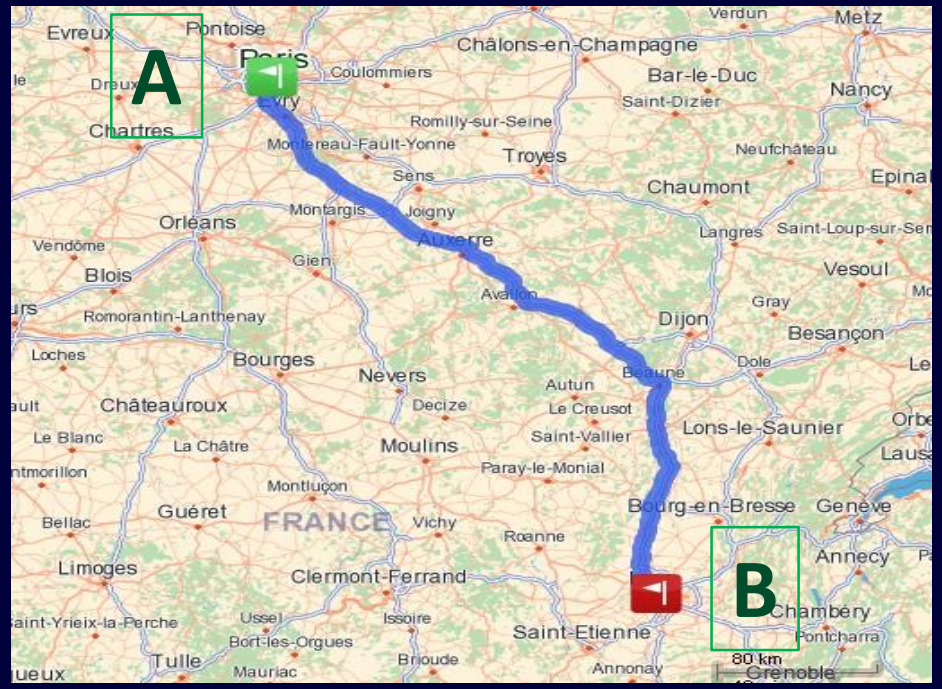


Project: getting from A to B



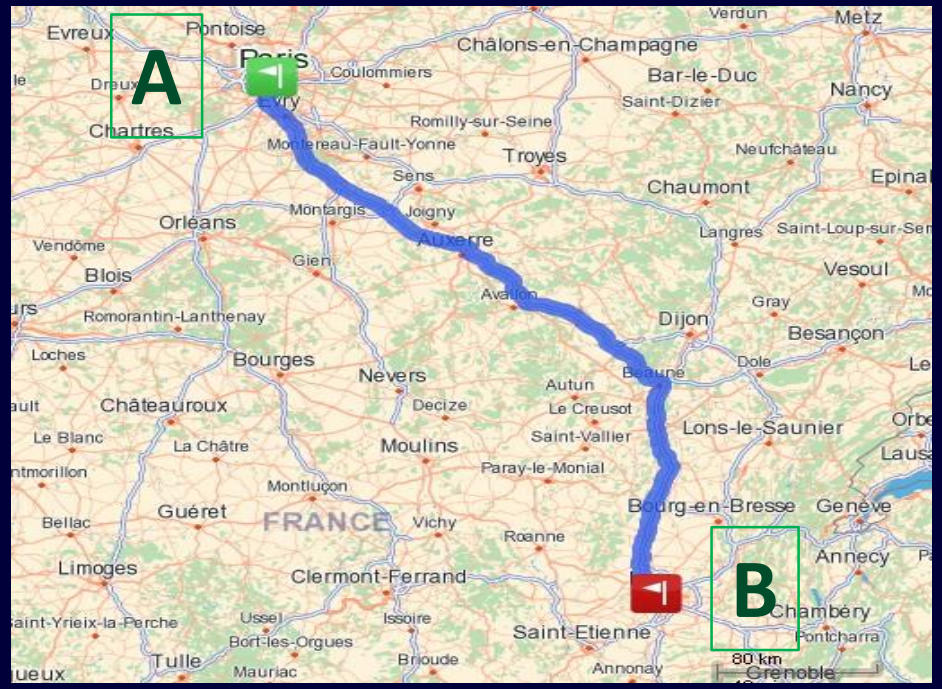
- How do we get there?

Project: getting from A to B



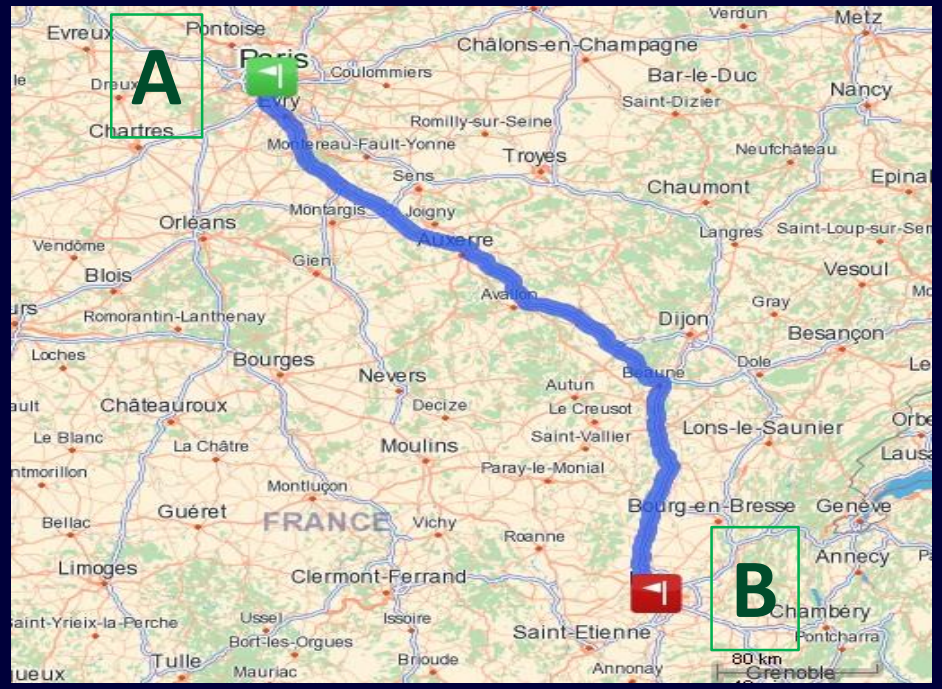
- How do we get there?
- What does it require?

Project: getting from A to B



- How do we get there?
- What does it require?
- How long will it take?

Project: getting from A to B



- How do we get there?
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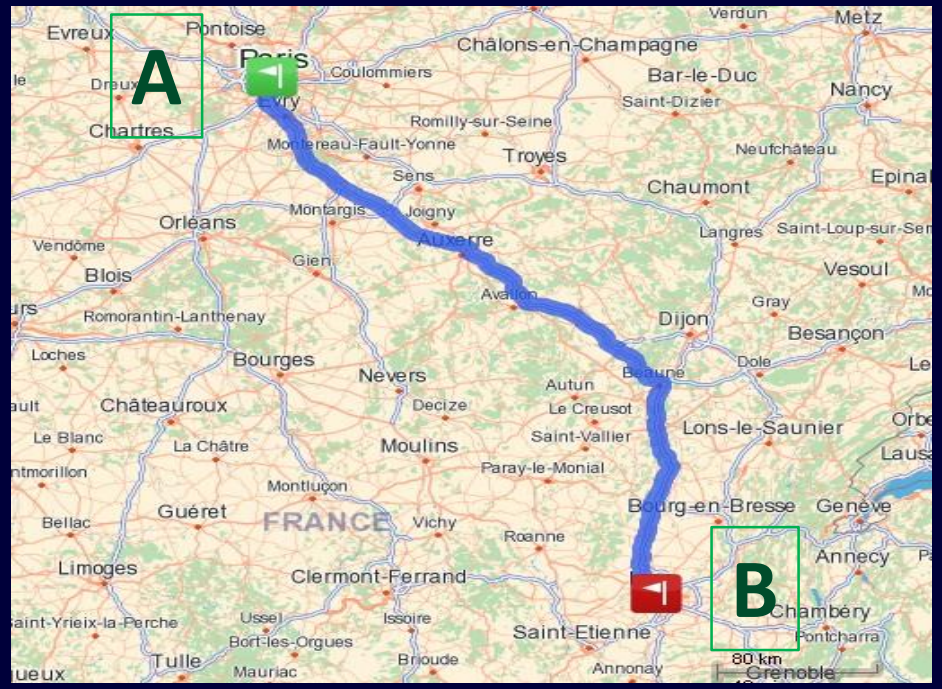
Project: getting from A to B



- How do we get there?
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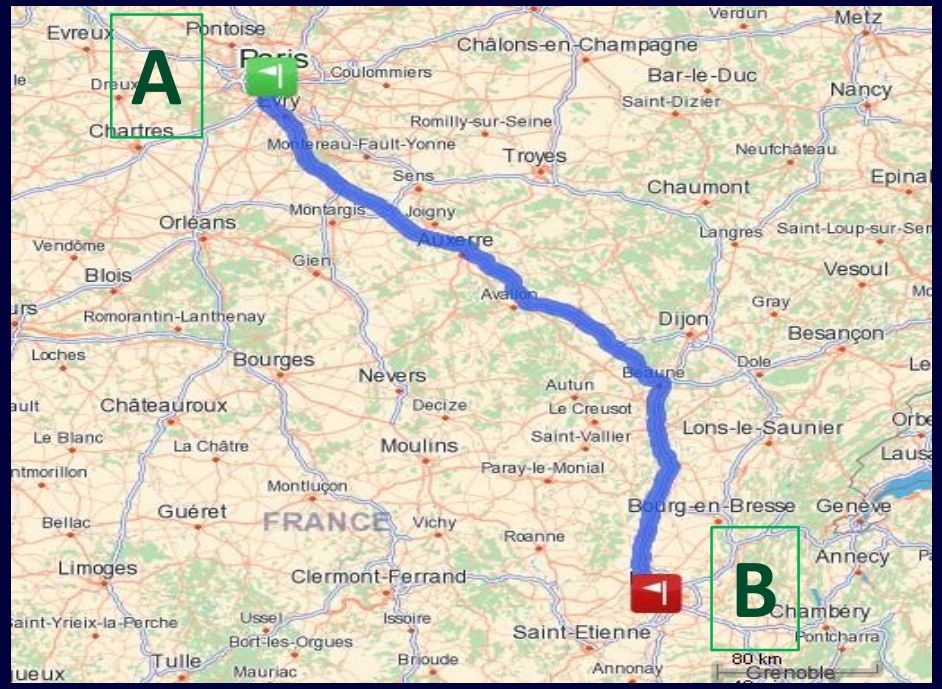
- What are the risks?

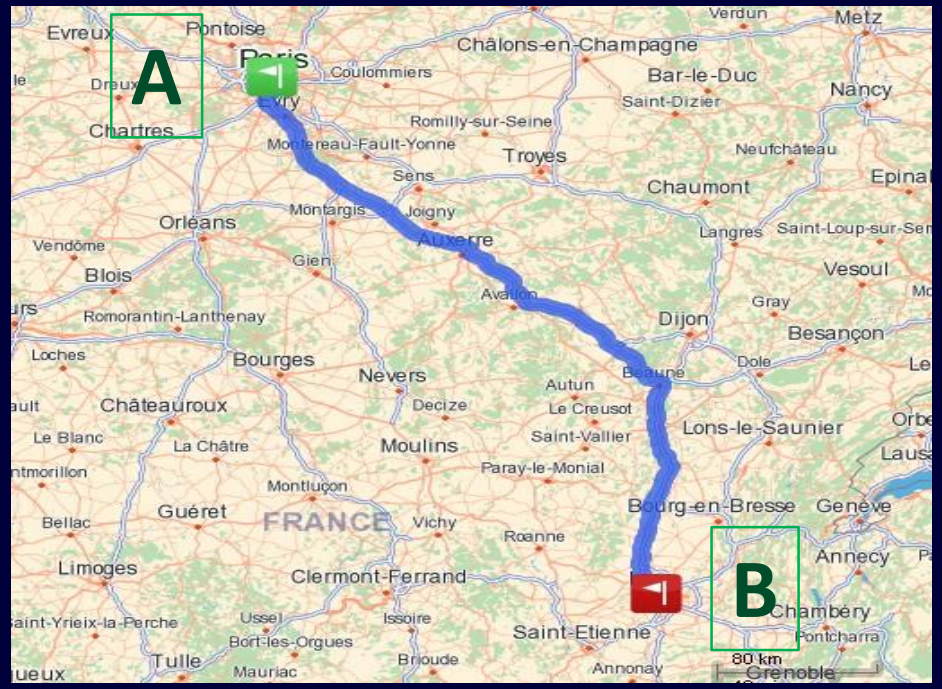
Project: getting from A to B



- How do we get there?
- What does it require?
- How long will it take?
- How much will it cost?
- What are the risks?

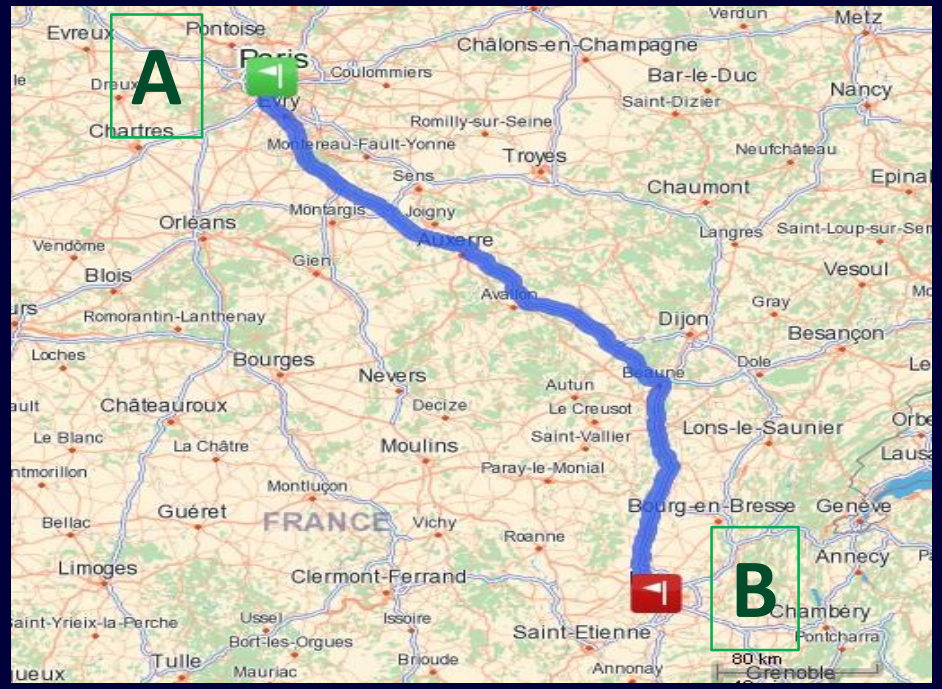
- How should the project be executed, monitored & controlled?

Project: getting from A to B



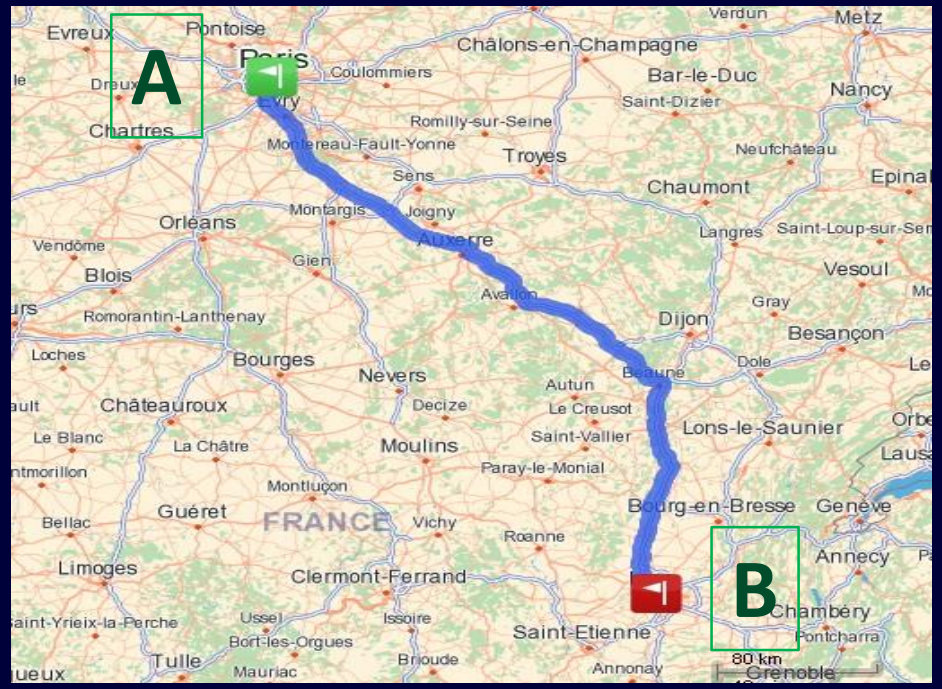
- Do it!

Project: getting from A to B



- Do it!
- Make sure you do it right!

Project: getting from A to B



- Do it!
- Make sure you do it right!
- Report back regularly!

Characteristic features of a project

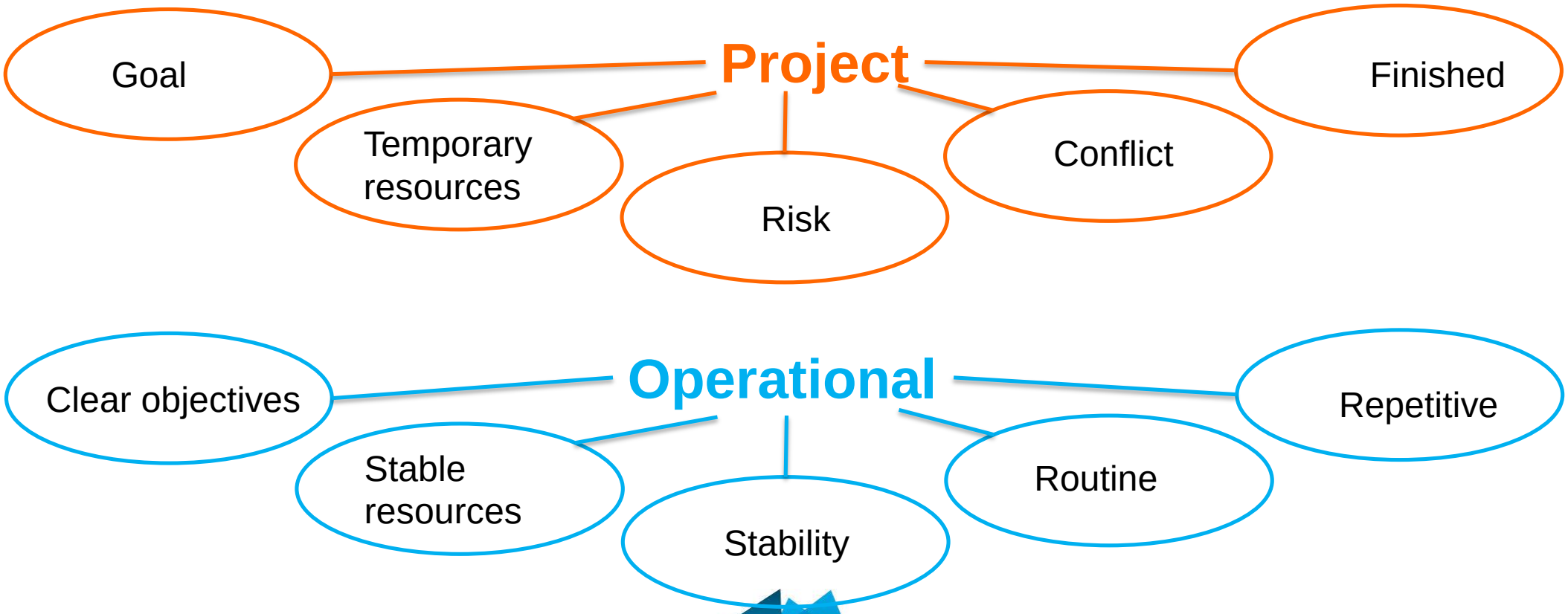
- **are unique in nature,**
- **have a clearly-defined timescale,**
- **have a specific, limited and approved budget,**
- **have well-identified resources,**
- **involve an element of risk,**
- **are usually intended to achieve beneficial change.**

Result of a project

- **The result (outcome) of a project is generally something new (product, service, system...).**
- **A project may be simple or complex, short or long.**
- **Whatever its characteristics, a project needs to be managed in order to produce the expected result.**

Project versus Operational

Why is a project different ?



What is project management?

- **Project management is the application of knowledge, skills, tools and techniques to manage project activities to meet project requirements.**

- **Project management is the discipline of planning, organizing and managing resources to achieve the specific project objectives.**

The objective of project management

- **To ensure the completion of a project in compliance with the agreed scope, schedule, budget and quality requirements, in order to meet customer expectations.**

Exercise : Identify the projects slide 13

1. Building of a new house
2. Implementation of the new payroll software
3. A movie’s making
4. Increase sales compared to last year
5. Installation of new machines to modernize a plant
6. New marketing campaign
7. Operation of a customer service desk
8. Implementation of a new software solution for a customer service
9. Production of pharmaceutical drugs
10. Maintenance of an electrical production unit

Project Management

1,2,3,5 et 8

1. **Building of a new house**
2. **Implementation of the new payroll software**
3. **A movie's making**
4. **Increase sales compared to last year**
5. **Installation of new machines to modernize a plant**
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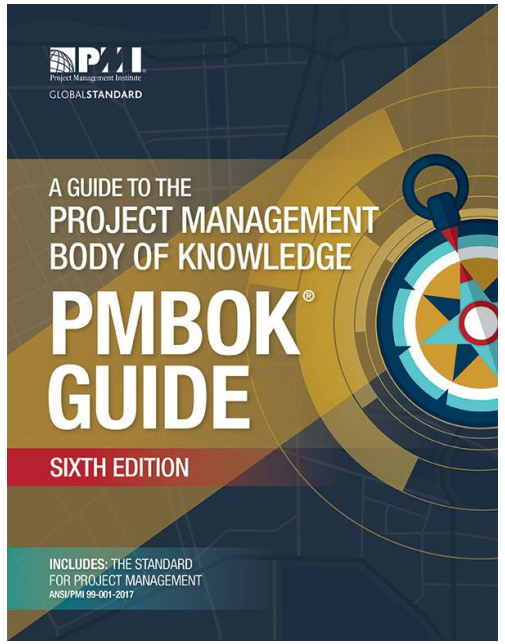
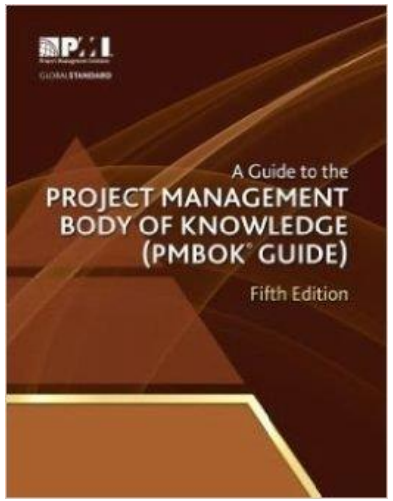
La gestion de projet dans le monde PMI Organisation

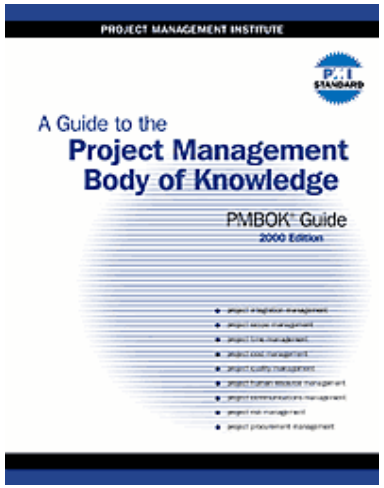
- **Project Management Institute (PMI)**
  - **Fondé en 1969**
  - **Association professionnelle sans but lucratif**
  - **Plus de 700 000 membres à travers le monde répartis dans 175 pays**
  - **Plus de 260 000 chefs de projets certifiés**
- **PMI élabore et publie des standards relatifs à la gestion de projet et propose différentes certifications dans ce domaine la plus connu étant la certification PMP**
- **Le PMI édite le PMBoK : Project Management Body of Knowledge qui est la Bible en gestion de projet**

Standards et normes de gestion de projet

- **Guide PMBOK est une norme mondiale qui fournit :**
  - **la structure de base pour la gestion de projet**
  - **la compréhension de l'environnement dans lequel opèrent les projets**
  - **une vue généralisée de la façon dont différents processus de gestion de projet souvent interagissent**
  - **4ème édition publiée en 2008, 5ème édition en 2013, 6ème édition en 2017**







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Project Management

The PMI Family of Credentials

	CAPM®	PMI-SP℠	PMI-RMP℠	PMP®	PgMP®
Full Name	Certified Associate in Project Management	PMI Scheduling Professional	PMI Risk Management Professional	Project Management Professional	Program Management Professional
Project Role	Contributes to project team	Develops and maintains project schedule	Assesses and identifies risks and mitigates threats and capitalizes opportunities	Leads and directs project teams	Achieves an organizational objective through defining and overseeing projects and resources
Eligibility Requirements	High school diploma/ global equivalent **AND** **1,500 hours** experience **OR** **23 hours** pm education	High school diploma/ global equivalent **5,000 hours** project scheduling experience **40 hours** project scheduling education **OR** Bachelor's degree/global equivalent **3,500 hours** project scheduling experience **30 hours** project scheduling education	High school diploma/ global equivalent **4,500 hours** project risk management experience **40 hours** project risk management education **OR** Bachelor's degree/global equivalent **3,500 hours** project risk management experience **30 hours** project risk management education	High school diploma/ global equivalent **5 years** project management experience **35 hours** project management education **OR** Bachelor's degree/global equivalent **3 years** project management experience **35 hours** project management education	High school diploma/ global equivalent **4 years** project management experience **7 years** program management experience **OR** Bachelor's degree/global equivalent **4 years** project management experience **4 years** program management experience
Steps to Obtaining Credential	application process + multiple-choice exam	application process + multiple-choice exam	application process + multiple-choice exam	application process + multiple-choice exam	3 evaluations – application panel review + multiple-choice exam + multi-rater assessment
Exam Information	3 hours; 150 questions	3.5 hours; 170 questions	3.5 hours; 170 questions	4 hours; 200 questions	4 hours; 170 questions
Fees For PMI Members	US$225	US$520	US$520	US$405	US$1500
Credential Maintenance Cycles and Requirements	5 years; re-exam	3 years; 30 PDUs in project scheduling	3 years; 30 PDUs in risk management	3 years; 60 PDUs	3 years; 60 PDUs

Process Groups

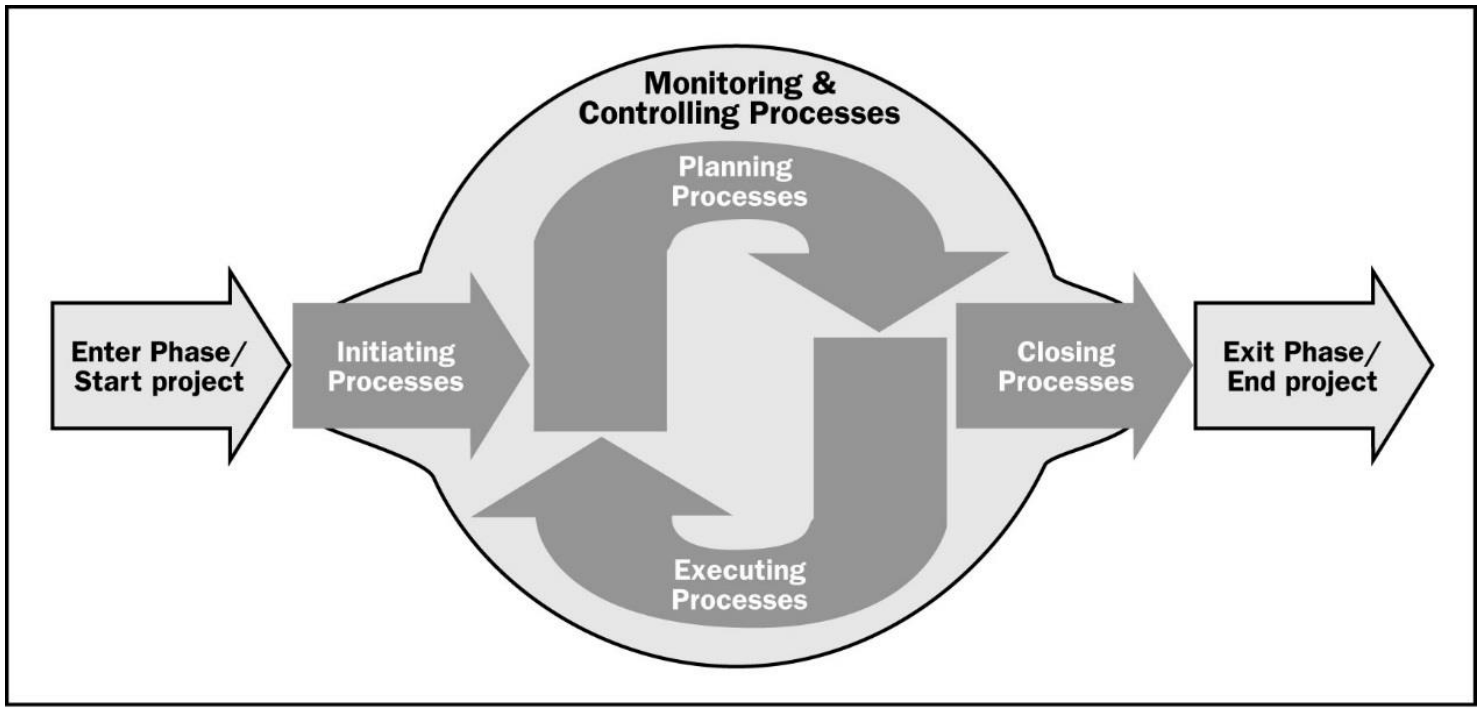


Figure 3-1. Project Management Process Groups

Source : Photo PMI et my

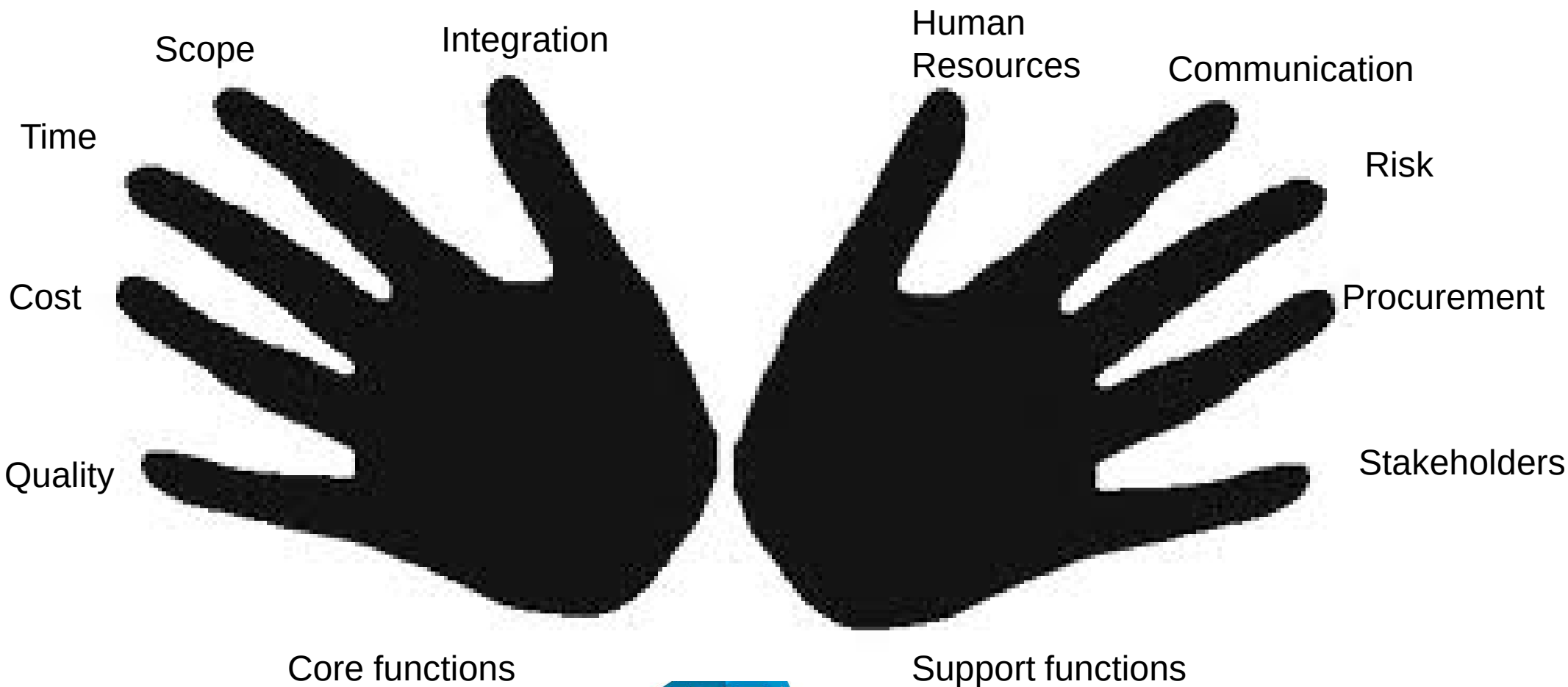
Knowledge areas

Project management is a matter of hands

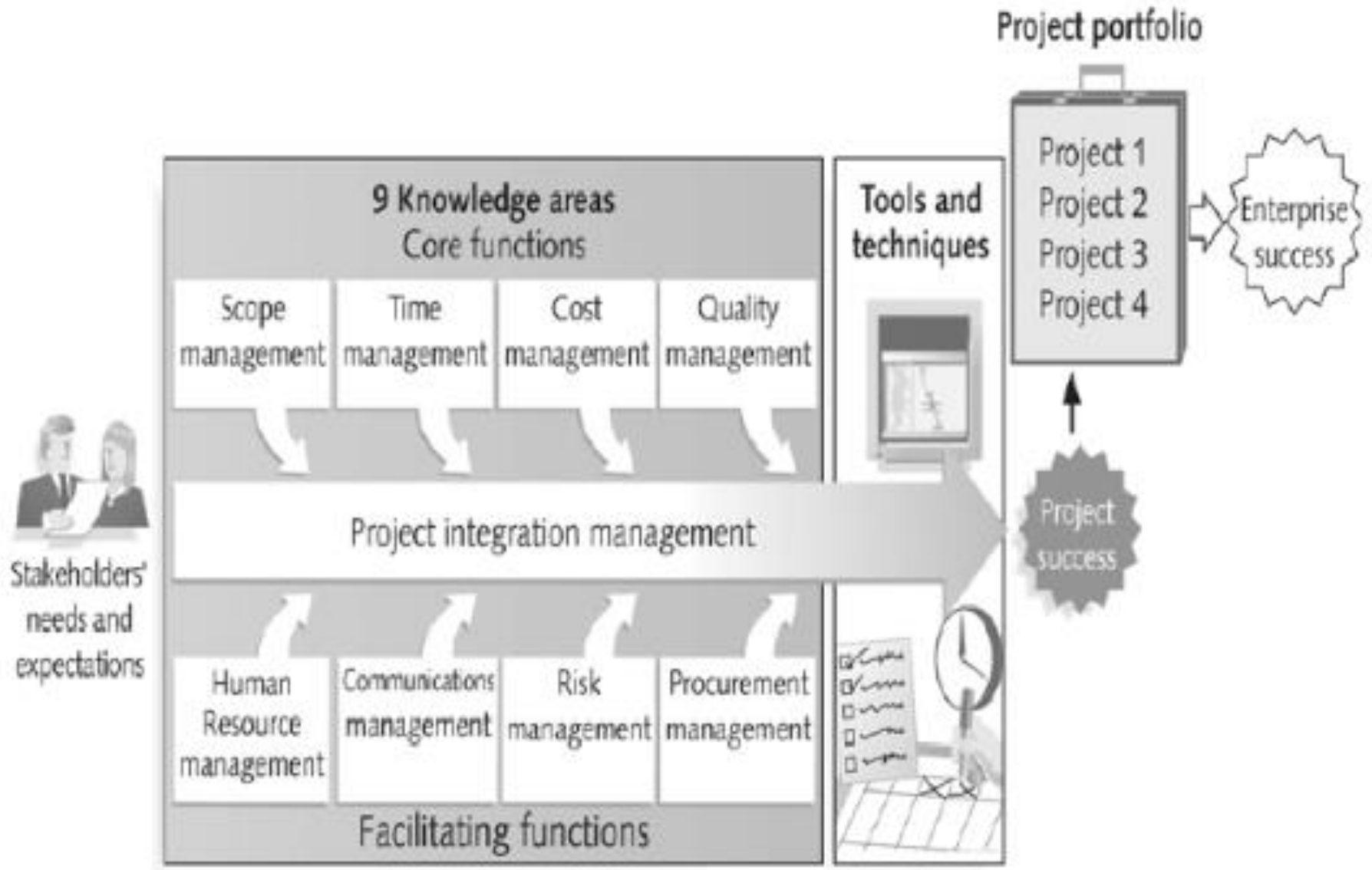
Project Management

The 5 process groups

The 10 knowledge areas



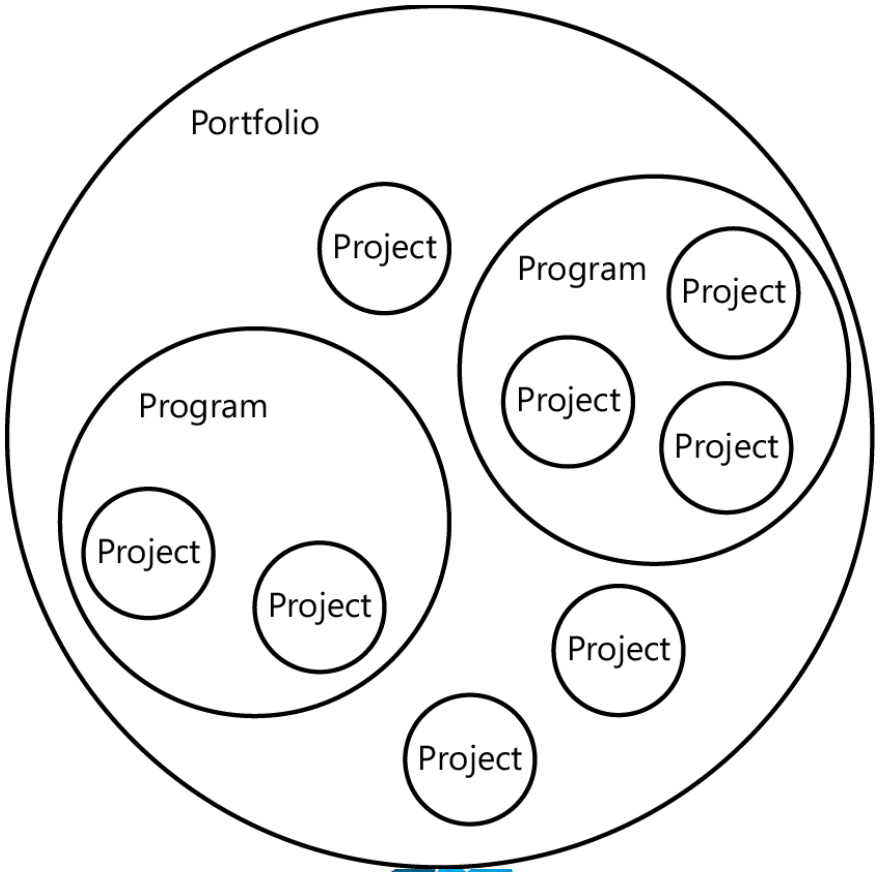
Project Management



Project Management

Knowledge Area	Initiating	Planning	Executing	Controlling	Close
Project Integration Management	Develop Project Charter Develop Preliminary Project Scope Statement	Develop Project Management Plan	Direct and Manage Project Execution	Monitor and Control Work Integrated Change Control	Close Project
Project Scope Management		Scope Planning Scope Definition Create WBS		Scope Verification Scope Control	
Project Time Management		Activity Definition Activity Sequencing Activity Resource Estimating Activity Duration Estimating Schedule Development		Schedule Control	
Project Cost Management		Cost Estimating Cost Budgeting		Cost Control	
Project Quality Management		Quality Planning	Perform Quality Assurance	Perform Quality Control	
Project HR Management		Human Resource Planning	Acquire Project Team Develop Project Team	Manage Project Team	
Project Communications Management		Communications Planning	Information Distribution	Performance Reporting Manage Stakeholders	
Project Risk Management		Risk Management Planning Risk Identification Qualitative Risk Analysis Quantitative Risk Analysis Risk Response Planning		Risk Monitoring and Control	
Project Procurement Management		Plan Purchases and Acquisitions Plan Contracting	Request Seller Responses Select Seller	Contract Administration	Contract Closure

Portfolio, Program and subproject



Project Management

The main reason for failing projects is the lack of project management

- 30% of projects are cancelled before being completed
- 70% of projects do not meet requirements
- 60% of projects run over budget or run behind deadline
- 40% of projects have not been correctly defined by customers and users
- 75% of projects have no management of change control nor risk management
- 95% of failures come from project management and not from technical issues

Only 16% of projects achieve their objectives

"If you fail to plan, you are planning to fail."

(si vous oubliez de planifier, vous planifiez l'insuccès)

Proverbe en gestion de projets du Gartner Group

Source : Standishgroups, Chaos, 2009

The challenges

- Lack of support from management
- Lack of users participation
- Inexperienced project manager
- Unclear objectives
- Project too big, too complex
- Lack of organizational support
- Incomplete requirements and specifications
- No formal method
- Unrealistic estimates

The project manager

- **Whatever its characteristics, a project needs to be managed in order to achieve the expected result.**
- **The person who manages a project is the Project Manager (“PM”).**

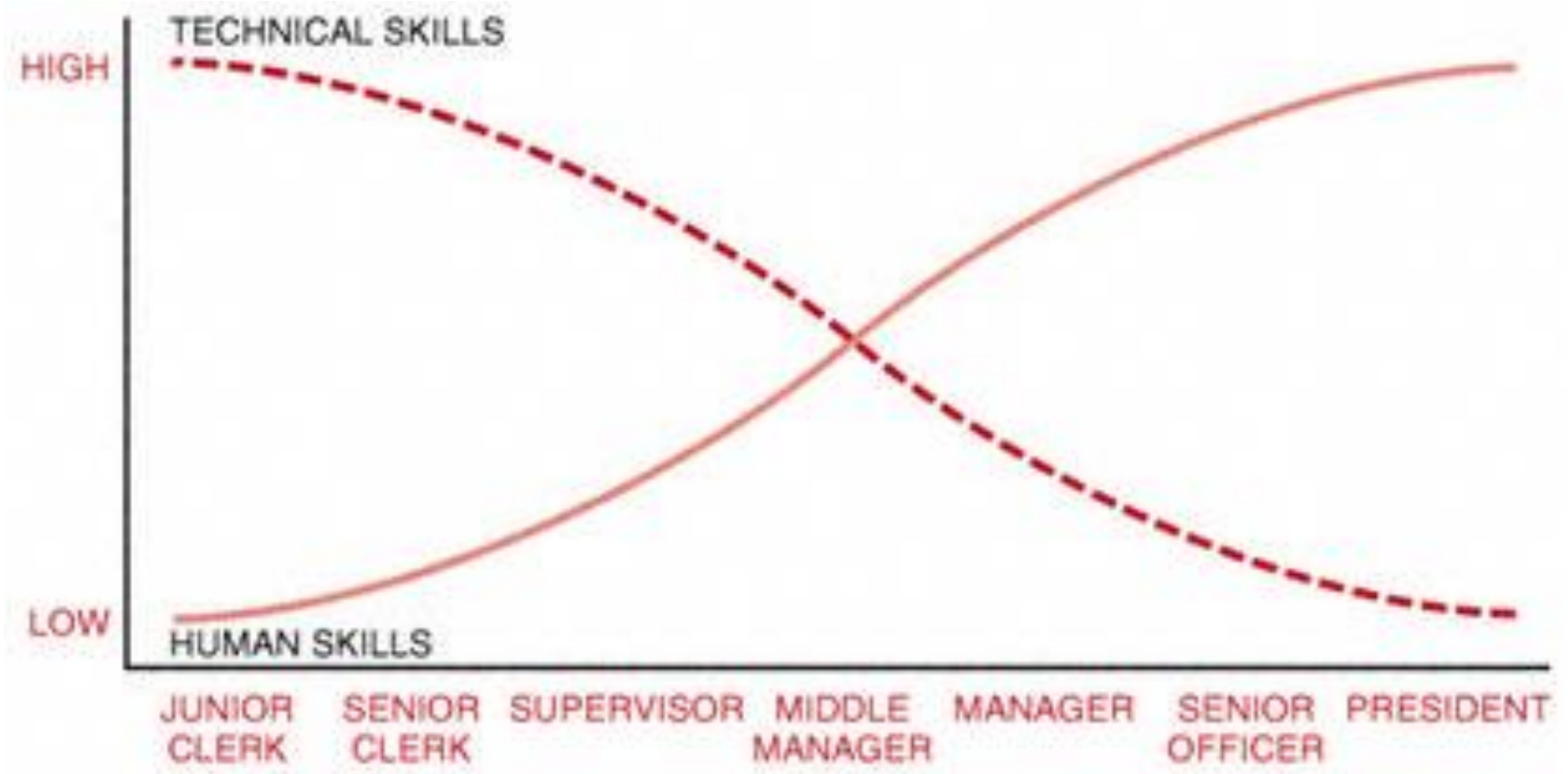
The art of getting things done through other people

L’art de faire faire les choses par d’autres personnes

Source : Photo jobenergies

Project Management

Compétences interpersonnelles (Annexe G: PMBoK V4)

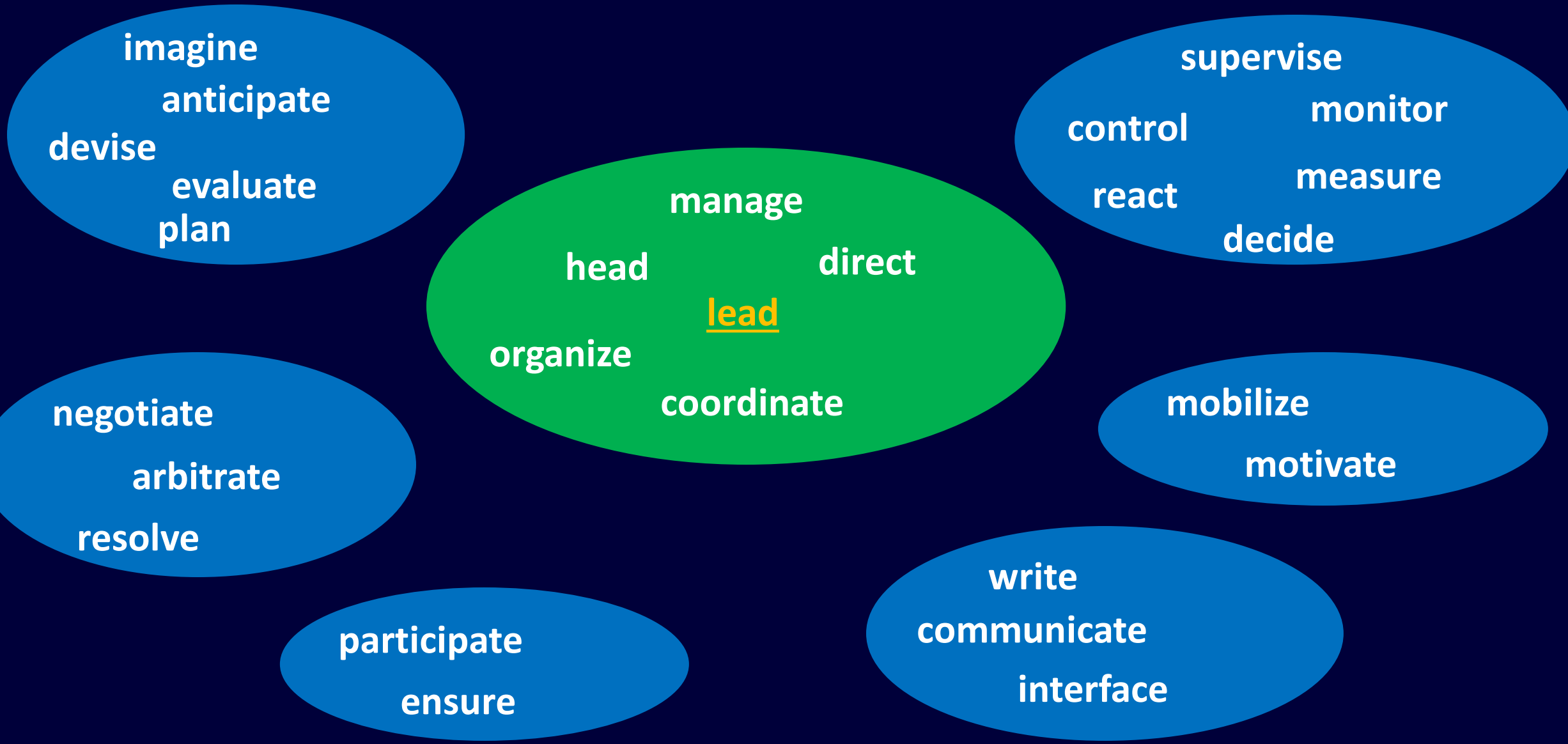


Your basic role and goal as a PM

To make every effort, with the means at your disposal, to achieve the set objective:

- successful completion of the project in compliance with its…
  - ✓ scope
  - ✓ schedule
  - ✓ budget
  - ✓ quality requirements
- and satisfaction of customer expectations

Keywords for the role of a PM



A bad project manager

- **Never comes to see you to discuss, does everything by Email**
- **Forgets the basics in the project charter**
- **Does not face problems when they are there, lets the situation get worse**
- **Does not protect the project team: directly sends stress back to his team**
- **Rejects responsibility on others when there is a problem**
- **Does not anticipate anything and comes to see you at the last minute just to "make a small change" and sends you 2 pages to treat**
- **Is not precise about the deadlines and the deliverables to produce**

A good project manager

- **Is in the exchange and listening**
- **Understands that a project is people management and not just a to-do list**
- **Defines tasks and prioritize**
- **Adopts a problem solving attitude**
- **Facilitates the work of all interlocutors**
- **Can motivate the project teams when it is necessary**
- **Can be firm at some key moments**
- **Know how to build trust with the team**

Five Ways to Describe a PM

Here are a number of ways to describe a project manager using some unconventional terms.

- **Plain Talker (communicate clearly)**
- **Risk Averter (manage risk)**
- **Obstacle Remover (manage issues)**
- **Morale Builder (manage staff)**
- **Bottom Line-er (manage schedule and budget performance)**

What do you get when you focus on the meat and potatoes of these five main responsibilities of a Project Manager? You become a plain talking, risk averting, obstacle removing, morale building, bottom line-er Project Manager! Who wouldn't want to have someone like that heading up their next project?

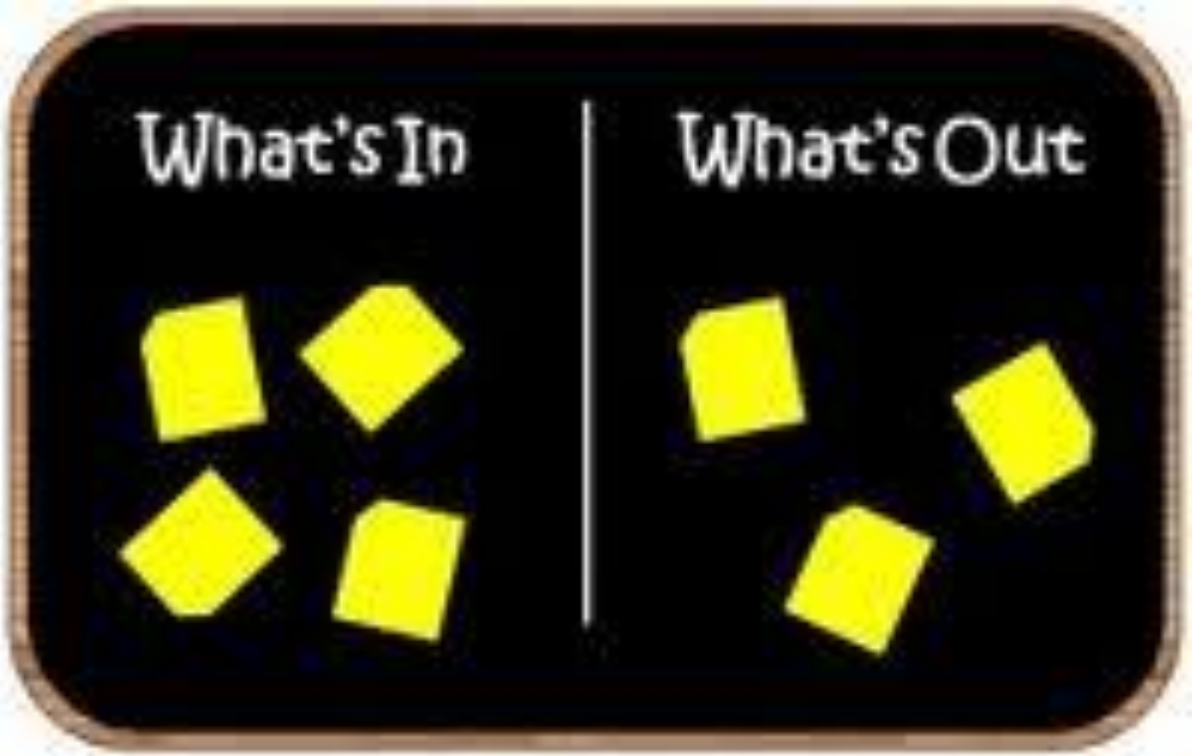
Being a team leader (1)

Being a team leader (2)

Sources and Bibliography

- **A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Fifth Edition**
- **PMP Training kit , Sean Whitaker , Microsoft © 2012**
- **Le Management de Projet, Mohammed Saad**
- **Cours de gestion de projet, Michel Emery**
- **Project Management cases studies, Harold Kerzner**
- **S'entraîner au management de projet, Gerard Herniaux, Insep Editions**
- **Project 2013, Guide pratique pour les chefs de projet , Vincent Capitaine, Dunod**

Project Management



EPITA Information Management Master

Project Management

Module 2

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Source : Photo Afidium

Project Management

Quotes

Quiz 4 questions Menti 1176 9276

Terminologie / Terminology

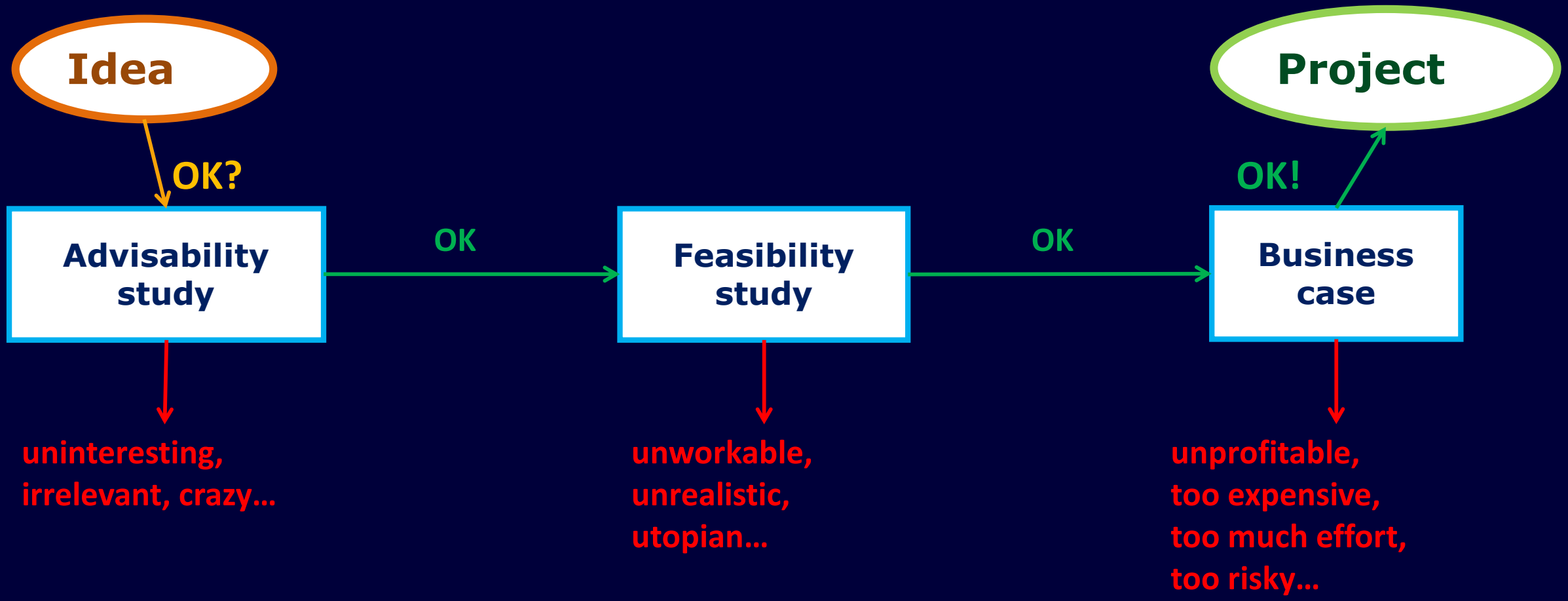
Project Management

Français	English
Projet	Project
Gestion	Management
Programme	Program
Portefeuille	Portfolio
Activité	Activity
Tâche	Task
Temps	Time
Coût	Cost
Qualité	Quality
Risque	Risk
Périmètre	Scope
Plan	Plan
Délai	Timeline
Calendrier	Schedule

Project Management

Français	English
Parties prenantes	Stakeholders
Cycle de vie	Lifecycle
Livrable	Deliverable
Budget	Budget
Evènement, Jalon	Milestone
Clôture	Close out
Estimation	Estimation
Communication	Communication
Structure de répartition du travail	Work Breakdown Structure WBS
Exigences	Requirements
Spécifications	Specifications

From idea to project (summary)



Business case

Business case

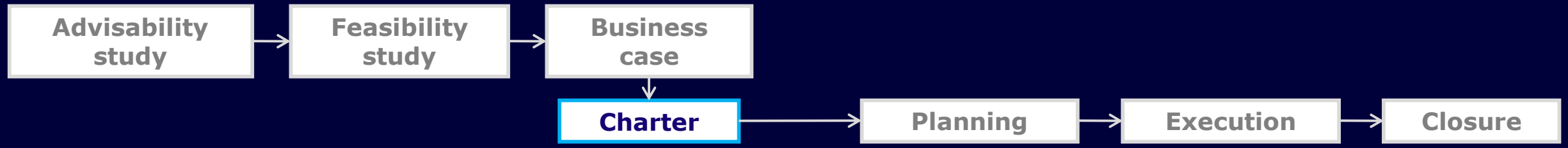
- **Tangible benefits**
  - **Revenue increases**
  - **Cost savings or avoidance**
- **Intangible benefits**
  - **Customer satisfaction**
  - **Employee satisfaction**
  - **Better marketing image**
- **Costs of the project**
  - **High level budget estimate**
  - **Return on Investment ROI**

Definition

The Project Charter is a document issued by the proponent or sponsor of the project, which formally authorizes its existence and gives authority to the project manager to allocate resources from the organization to the activities of this project

Source : PMBOK PMI

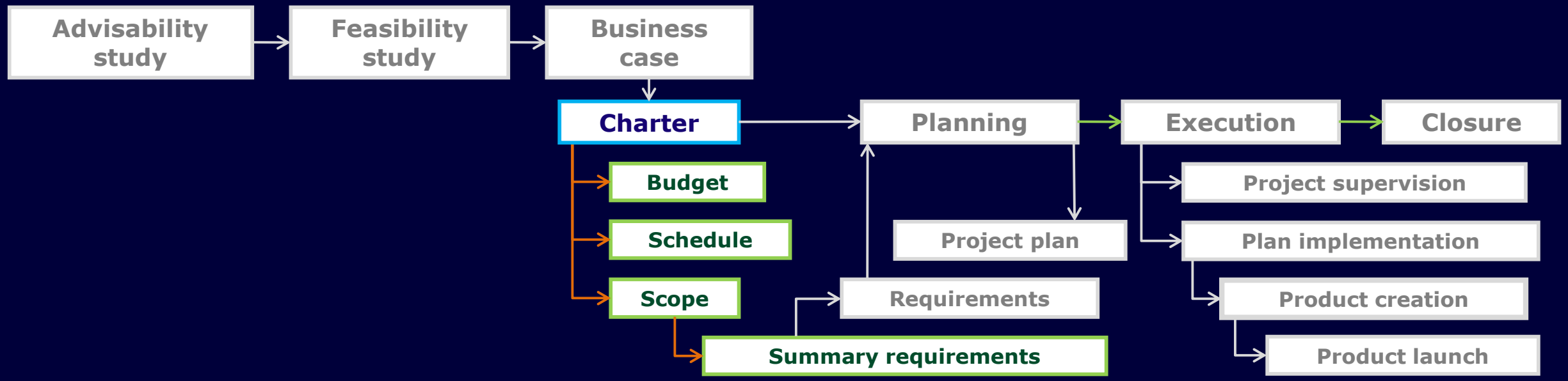
Project charter (1)



Reference document, also called…

- project mandate
- project definition
- project initiation document (PID)
- project overview statement (POS)
- terms of reference (TOR) of the project

Project charter (2)



Reference document describing in particular…

- the project's scope, budget and schedule
- the outcome of the project (summary requirements)
- the PM's responsibilities and level of authority

Project charter

- **The charter :**
  - **Establishes the strategic goal of the project**
  - **List project deliverables at a high level**
  - **Officially names the Project Manager**
  - **Authorizes the PM to use the organization's organizational resources to roll out and complete the project**
  - **It is approved by a Top Manager (sponsor, senior manager, committee ...)**
  - **It is signed by all persons authorizing the charter**

- **After signature of the project charter, the PM can start the constitution of the team and planning processes can begin**

Project Management

Exemple de charte de projet			
Nom du projet :		Préparé par :	
		Date :	

Description

[Décrire sommairement le projet, y compris les objectifs stratégiques et opérationnels et la portée globale. Identifier tout autre secteur pertinent non inclus dans le projet.]

Indicateurs de succès

[Définir les indicateurs de succès.]

Objectifs du projet

[Cerner les objectifs clés et des buts SMART : spécifique, mesurable, réalisable, réaliste et limité dans le temps.]

Produits à livrer

[Énumérer les principaux produits à livrer.]

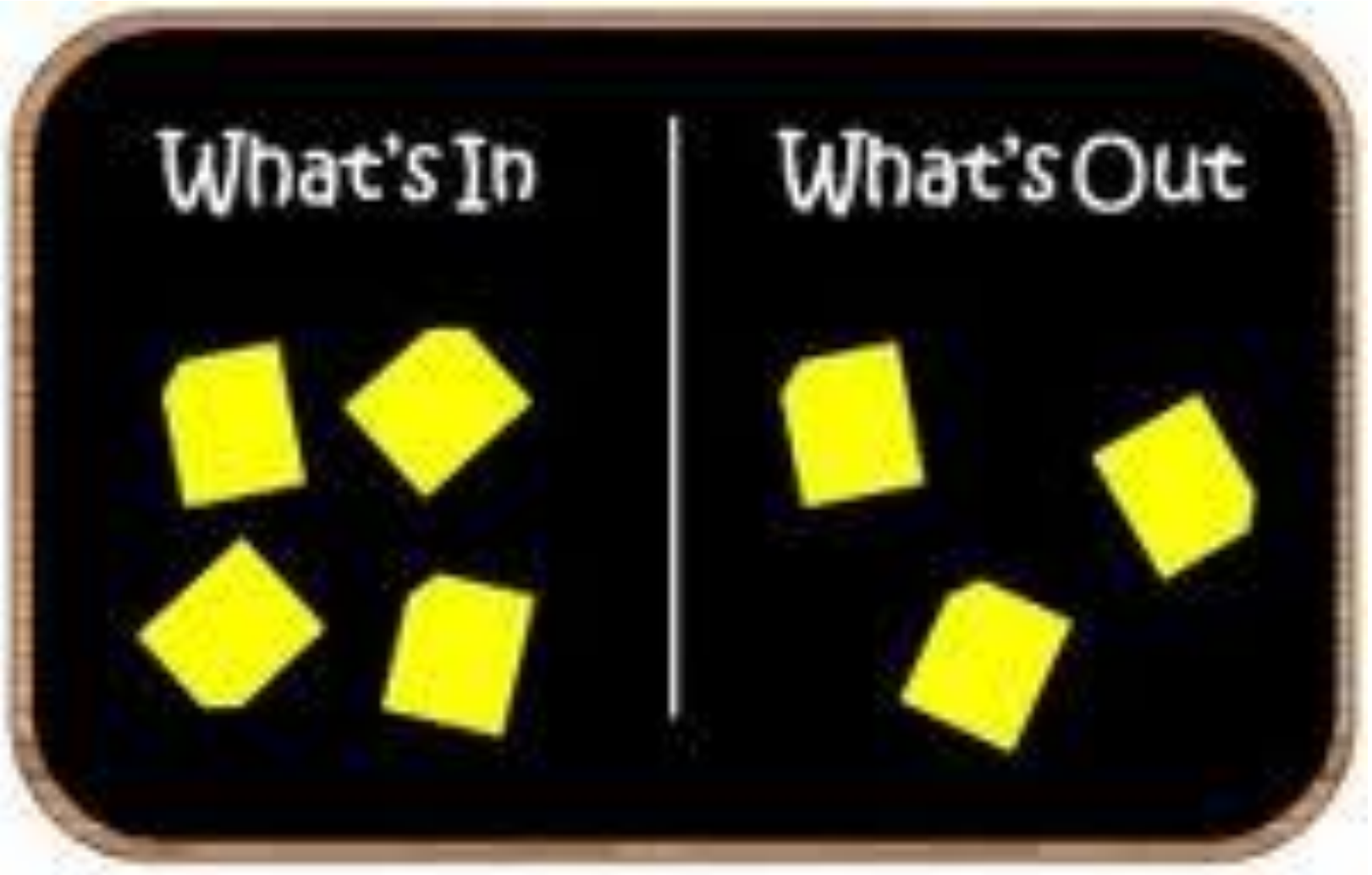
Calendrier

[Établir un calendrier de haut niveau; lien au RASCI.]

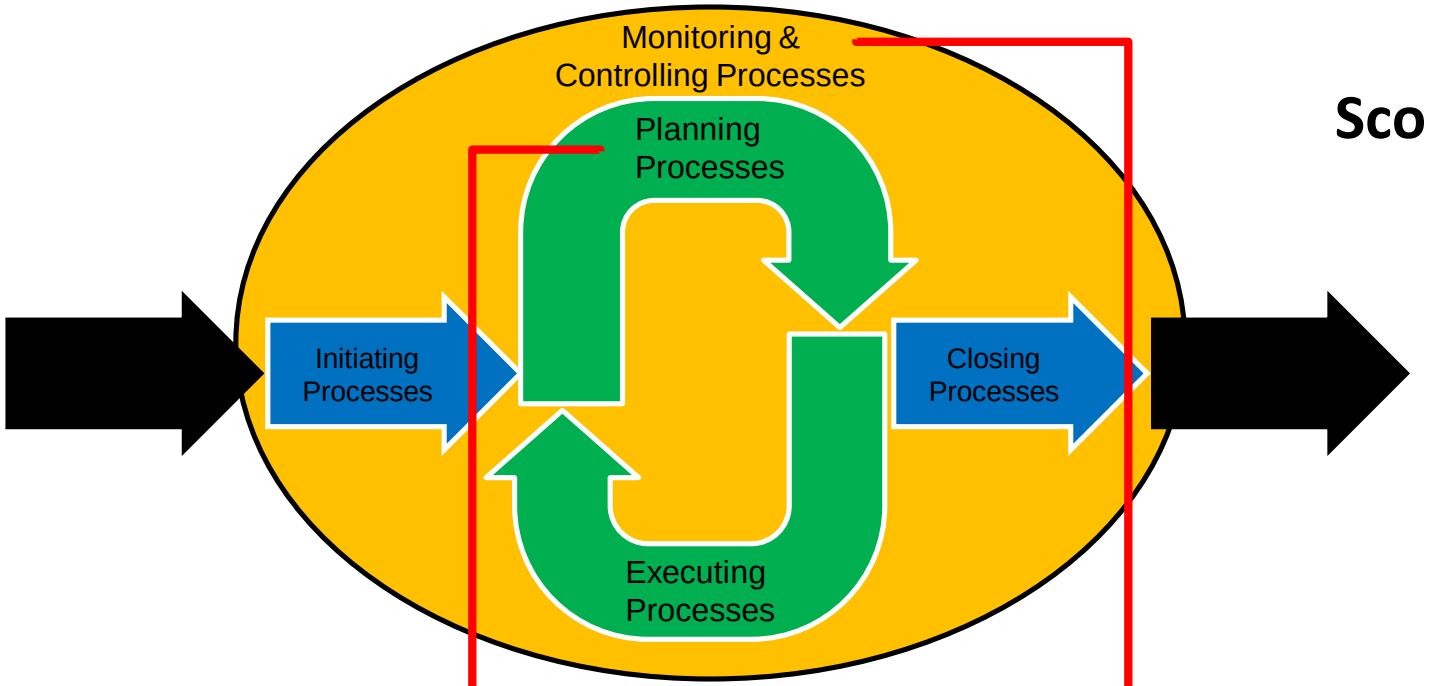
Project Management

Budget
[Estimer le budget requis.]
Approche
[Résumer la méthodologie du projet.]
Présomptions et contraintes
[Identifier toutes les présomptions et contraintes qui pourraient influer sur le projet.]
Approbation et signatures
[Identifier les principaux membres de l'équipe et intervenants ainsi que leur rôle dans le projet; lien au RASCI.]

Project Management



Project Management

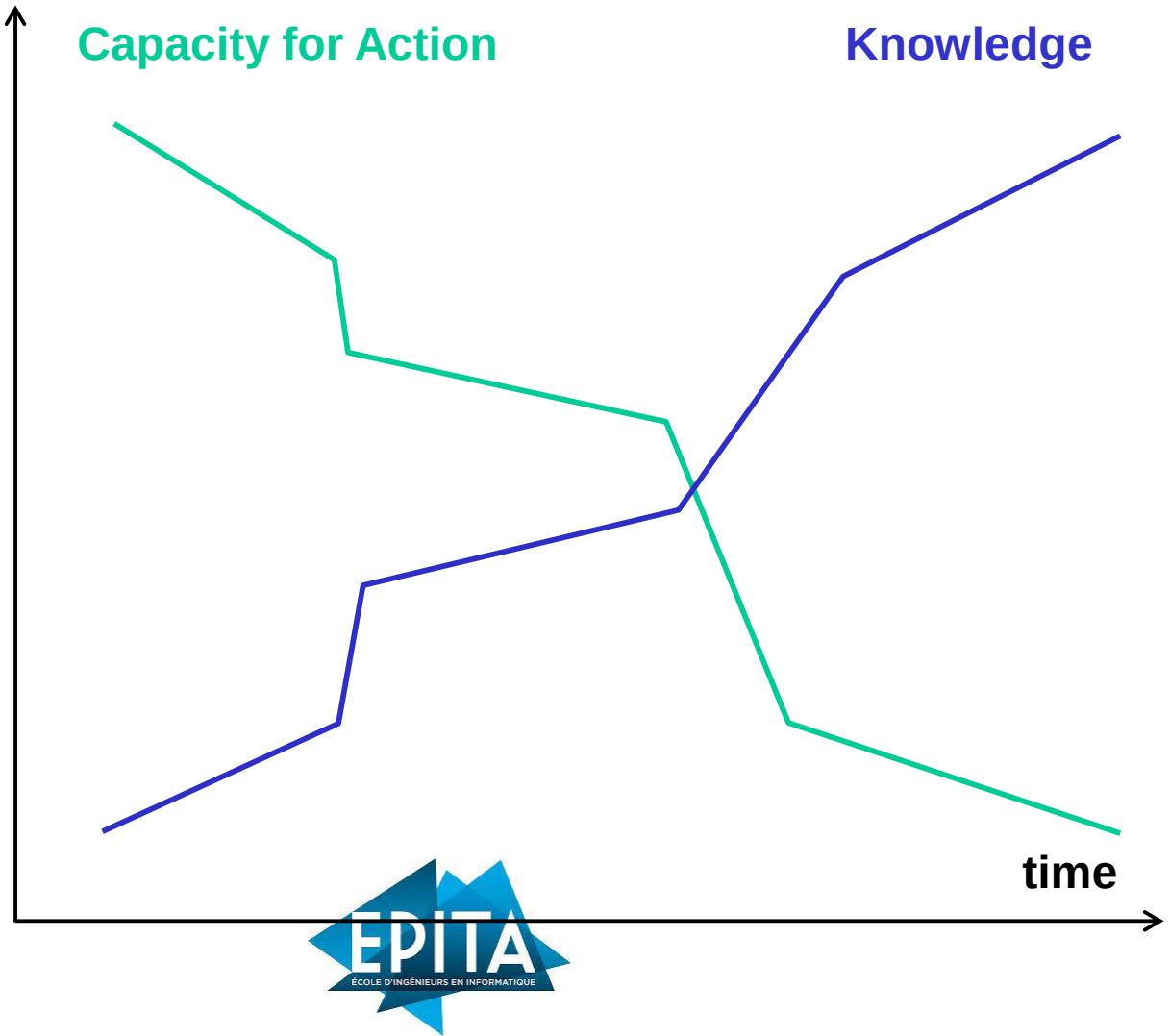


Scope Management

Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Contol	Closing
Scope		Collect Requirements Define Scope Create WBS		Verify Scope Control Scope	

- **At the beginning of the project , action levers are more important**
- **At the end , one knows what should have been done but it is too late…**

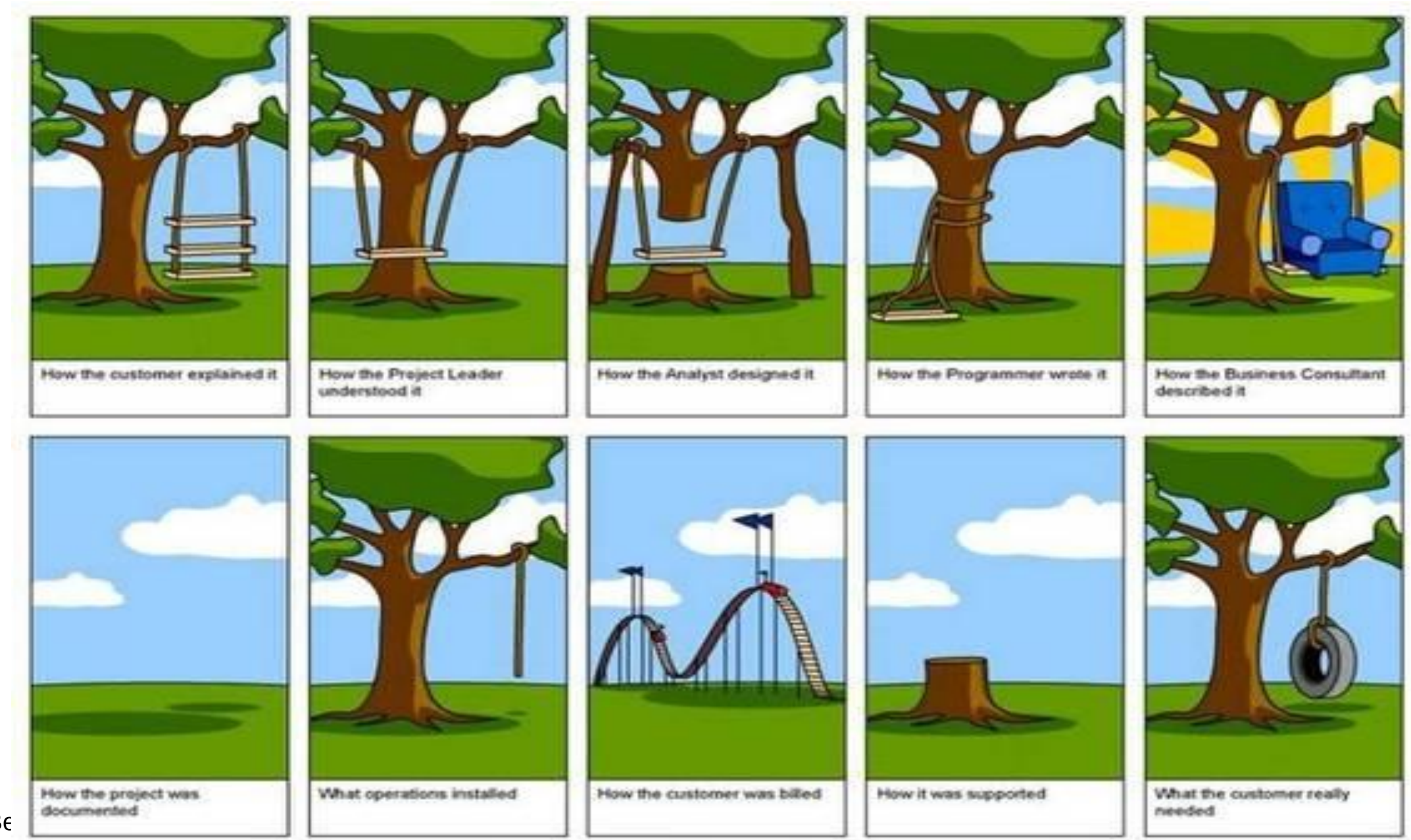
The paradox of Project Management



Scope Management

- **5.1 Collect requirements**
  - **The process of defining and documenting stakeholders' needs to meet the project objective**
- **5.2 Define scope**
  - **Process of developing a detailed description of the project and product *(Project scope statement may includes product scope, deliverables, product acceptance criteria, out of scope, additional risk, constraints & assumptions)***
- **5.3 Create WBS**
  - **Process of subdividing project deliverables and project work into smaller, more manageable components.**
- **5.4 Verify scope**
  - **Process of formalizing acceptance of the completed project deliverables.**
- **5.5 Control scope**
  - **Process of monitoring the status of the project and product scope and managing changes to the scope baseline**

Project Management



Collect Requirement Techniques (1)

- **INTERVIEWS: Directly talk with stakeholders**
- **FOCUS GROUPS: Interactive discussion with qualified Stakeholders & Subject matter experts**
- **FACILITATED WORKSHOPS: Focused cross functional stakeholders.**
  - **JAD Joint application design,**
  - **QFD Quality function development**
    Helps determine critical characteristic of new product development
    Start by collecting customer need - VOC: Voice of the Customers

Collect Requirement Techniques (2)

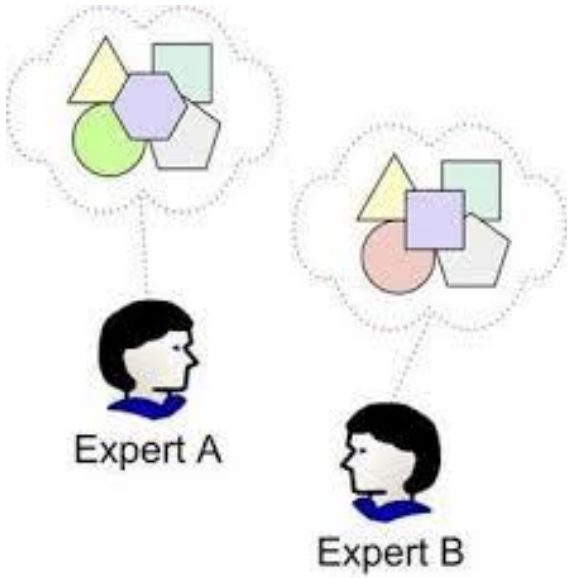
- **GROUP CREATIVITY TECHNIQUES:**
  - Brainstorming,
  - **Nominal group technique:** enhance brainstorming with voting and ranking
  - **Delphi Technique:** some expert answer questionnaire and give anonimity feedback
  - Idea/mind mapping,
  - **Affinity Diagram:** sort idea into groups

- **GROUP DECISION MAKING TECHNIQUES:**
  - Unanimity,
  - Majority (>50%),
  - Plurality,
  - Dictatorship

Collect Requirement Techniques

Mind mapping

Delphi



Brainstorming

Goal and Objective
Menti 1176 9276

- **A goal is a general statement of intent**
  - **I want to lose weight**
- **An objective is the quantifiable achievement of intent**
  - **I want to lose 3 kilos in two months**

Requirements document

- **Output of the Collect Requirement process**
- **Helps make sure the requirements clear and unambiguous.**

- ***How will we know if the work we do will acceptability meet this requirement?***

- ***Rule of thumb***
  - **Specific (Unambiguous)**
  - **Measurable (How will we know we have finished?)**
  - **Achievable (Can we do it?)**
  - **Relevant (Is it the right thing to do?)**
  - **Timed (When will we do it?)**

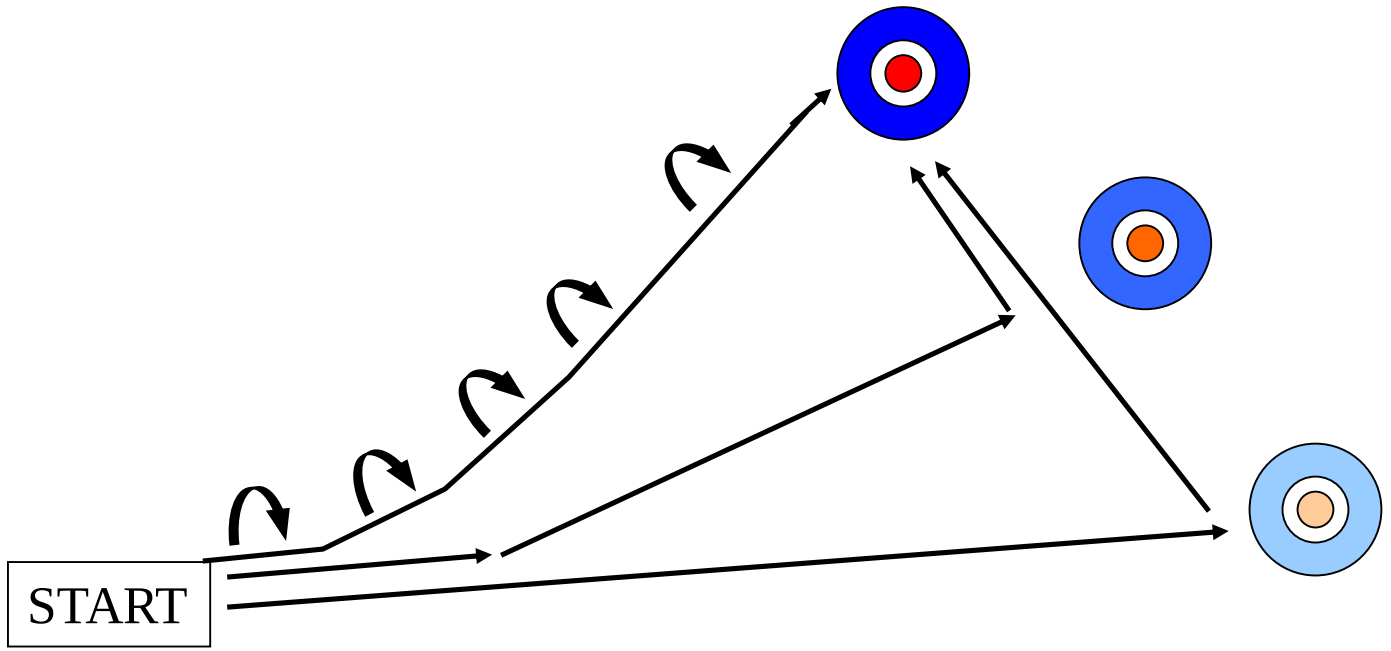
Scoping assessment

- **The Requirements and Process Review generates user-agreed, high quality business requirements, and improved future processes.**
- **Understanding and clearly communicating the parameters and benefits of your project diminishes risk.**
- **Document your scope using the conversations you have had.**
- **Generate a requirements and process review report.**

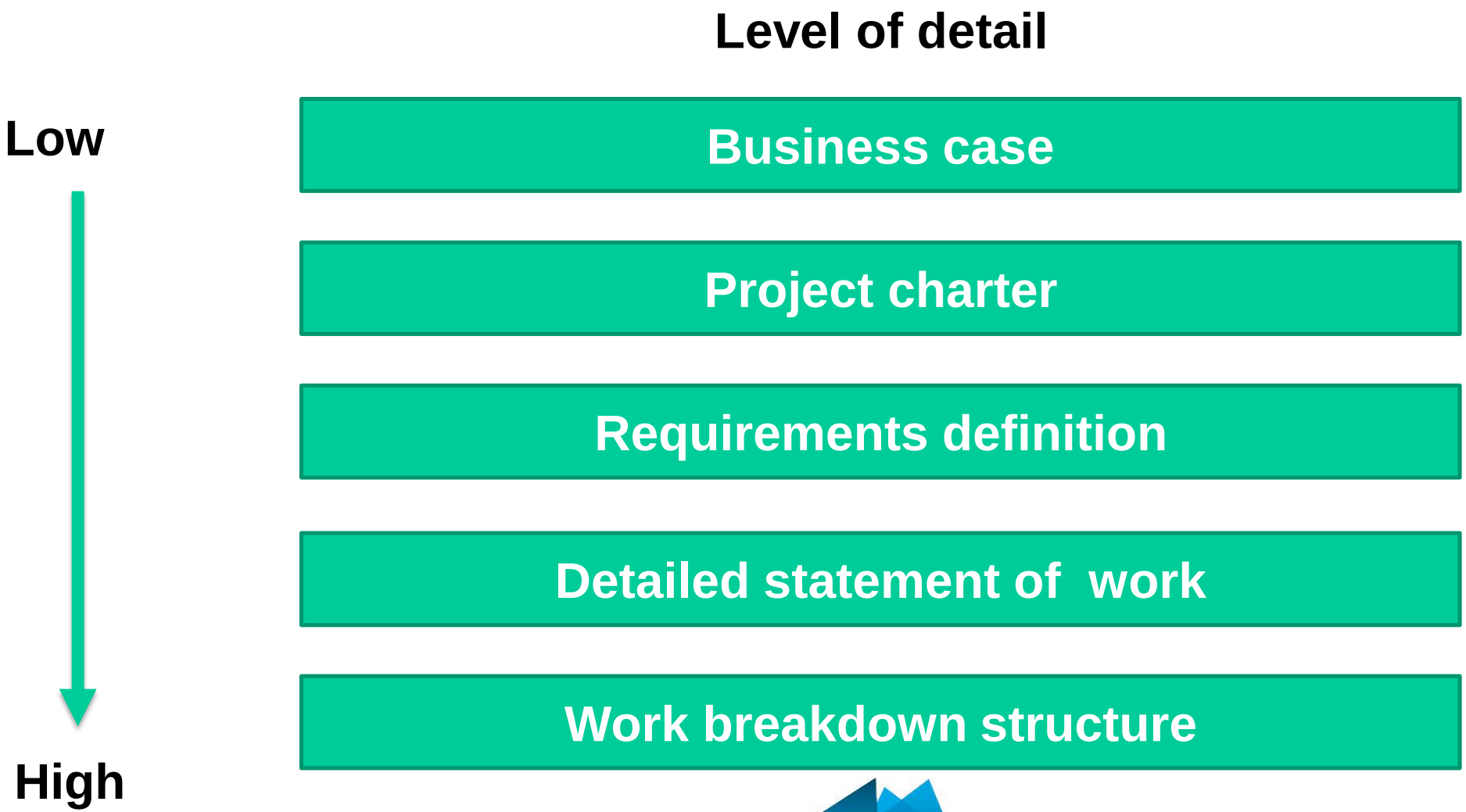
Delivrables

- **Deliverables are the specific outputs that can be measured and checked against the specifications and quality standards**

Scope creep



Project Management



Create WBS

- **WBS includes the project management works.**
- **Work package: lowest level WBS component which can be scheduled, cost estimated, monitored and controlled.**
- **WBS Structure can be organized by**
  - **Phases**
  - **Major deliverables**
  - **Subprojects e.g. contracted work**
- **Beware of excessive decomposition. It can lead to non-productive management effort, inefficient use of resources (performing work)**
- **Control account: management control point for performance measurement (one or more work packages)**
- **WBS dictionary provides more detailed components, e.g. description of work, responsible organization, acceptance criteria**
- **Agreed Scope baseline includes project scope statement, WBS, WBS dictionary**

Project Management

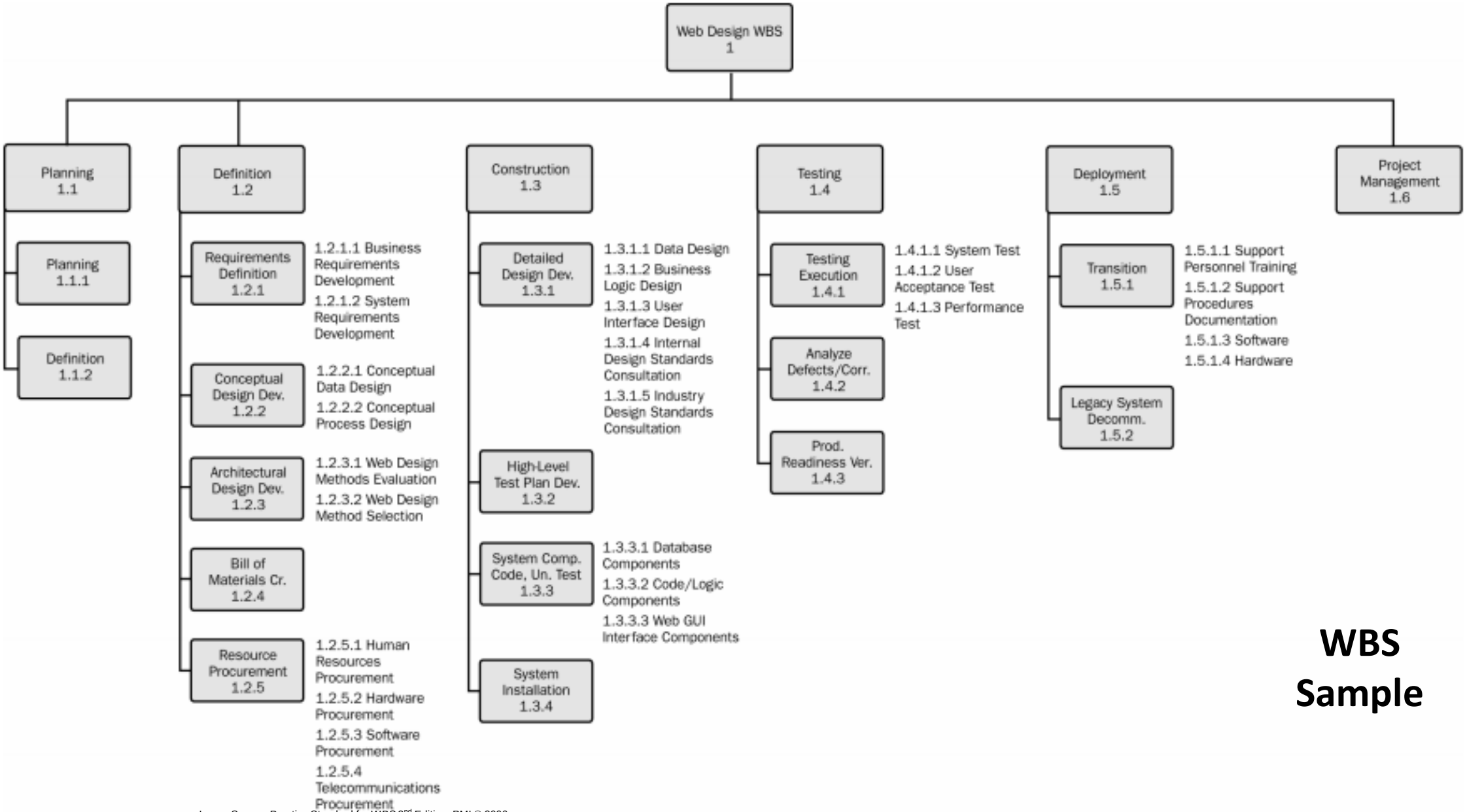
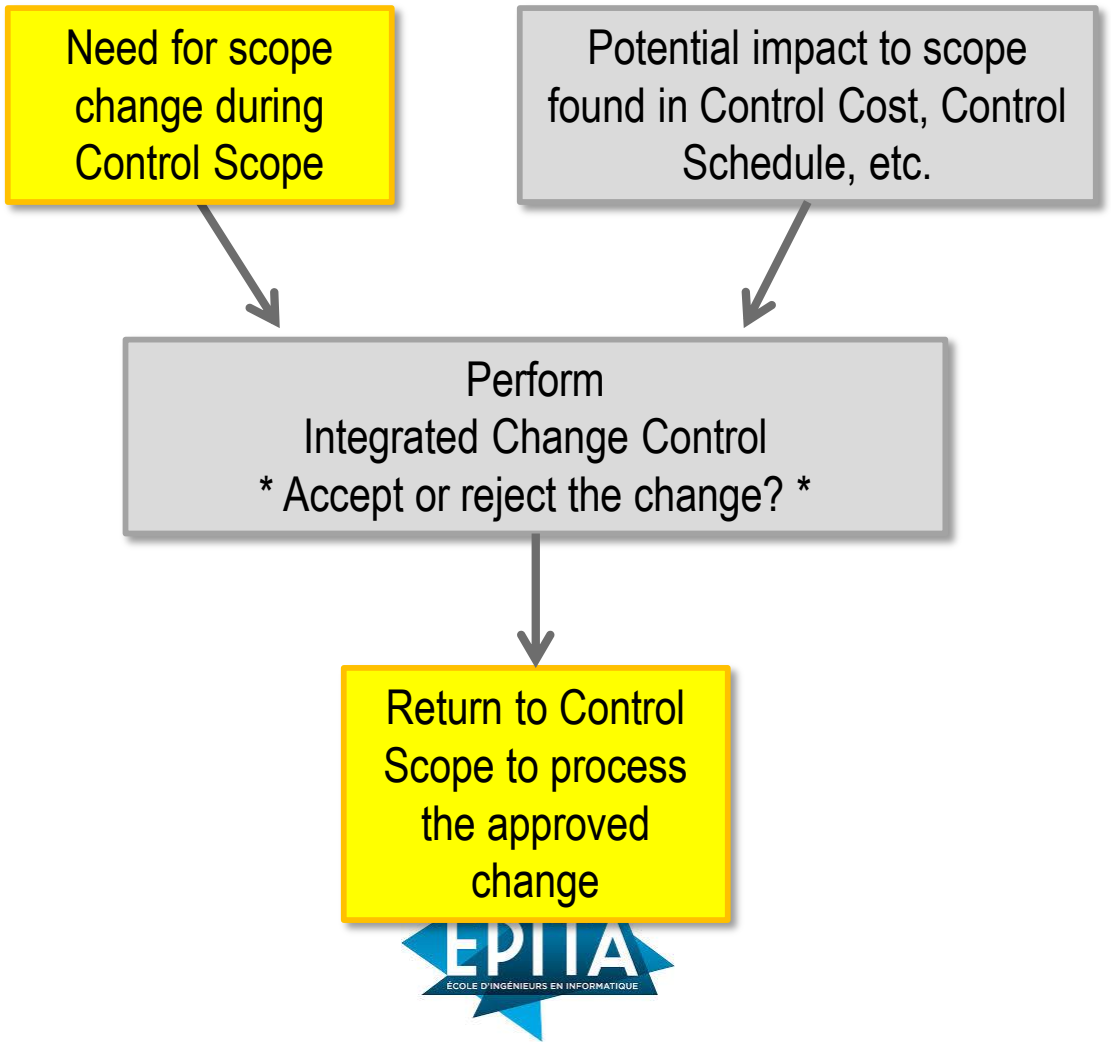


Image Source: Practice Standard for WBS 2nd Edition. PMI © 2006

WBS Sample

Control Scope



Project Management Plan (PMP)

- **The project manager must know how to mobilize around his realization**
- **The PMP is always associated with other documents and plans that will contribute to the success of the project**
  - **Requirements Management Plan**
  - **Time Management Plan (often referred to as THE Plan)**
  - **Cost Management Plan**
  - **Quality Management Plan**
  - **Risk Management Plan**
  - **Human Resources Management Plan**
  - **Communication Management Plan**
  - **Procurement Management Plan**

Business case & Project charter
COOK Company

Sources and Bibliography

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- **Cours de gestion de projet, Michel Emery**
- **Project Management cases studies, Harold Kerzner**
- **S'entraîner au management de projet, Gerard Herniaux, Insep Editions**
- **Project 2013, Guide pratique pour les chefs de projet , Vincent Capitaine, Dunod**

Project Management

EPITA Information Management Master

Project Management

Module 3

Olivier BERTHET

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Source : Photo Afidium

Time Management

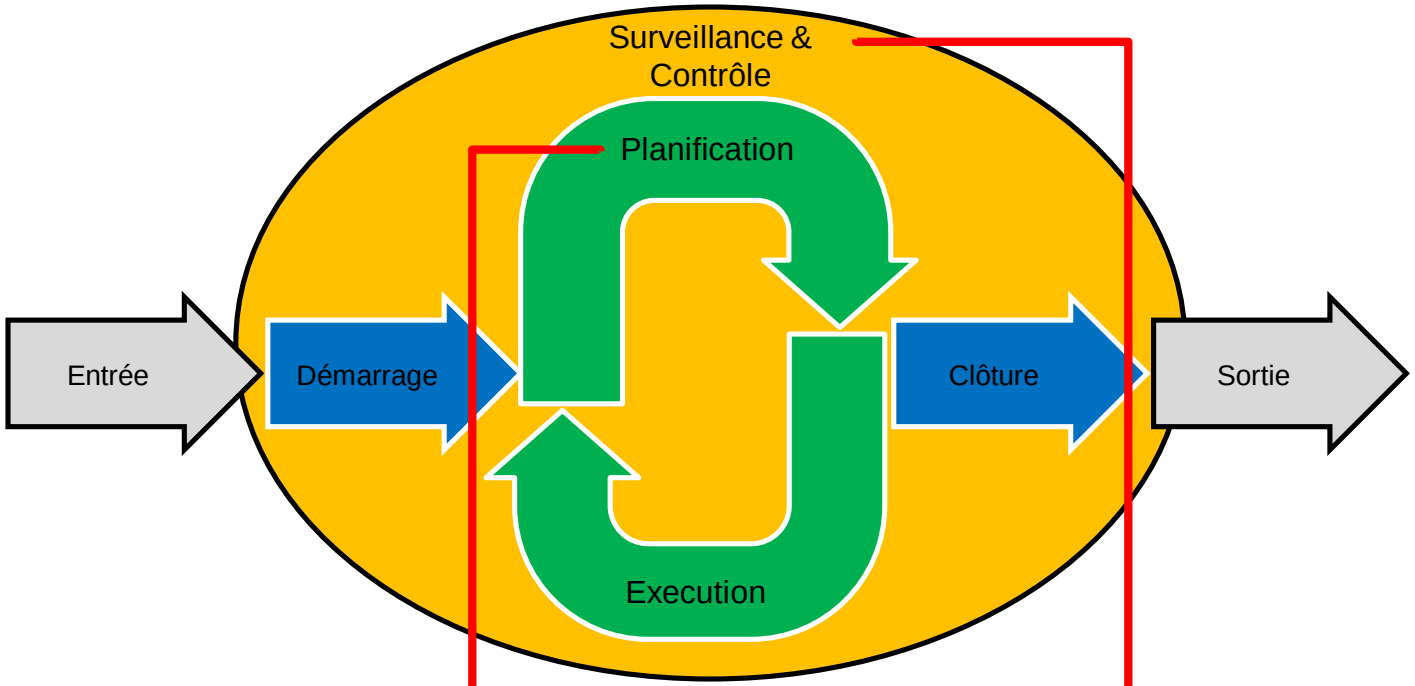
Objectives of the module

- **Define the core activities required for the project time management process**
- **Understand how to use network diagrams and their dependencies in time management of a project**
- **Use a Gantt and PERT chart in planning and tracking the project schedule**

Importance of project management

- **The biggest challenge for a project manager: meeting the deadline and the cost**
- **Most projects miss their delivery times**
- **Time management is one of the main causes of conflict, especially during the second half of the projects**

Gestion de Projet



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Contol	Closing
Time		Definition of activities Scheduling activities Resource estimate Estimated duration Preparation of the plan		Control of the plan	

Project Time Management Process

- **5.1 Definition of activities**
  - List of activities and their attributes
- **5.2 Scheduling activities**
  - Identification and documentation of dependencies between activities
- **5.3 Resource Estimate**
  - Estimated resources needed to carry out each activity
- **5.4 Estimated duration**
  - Approximation process of duration to carry out individual activities
- **5.5 Preparation of the plan**
  - Creation of the project calendar from sequences, durations, resource requirements
- **5.6 Control of the plan**

6.1 Define the activities

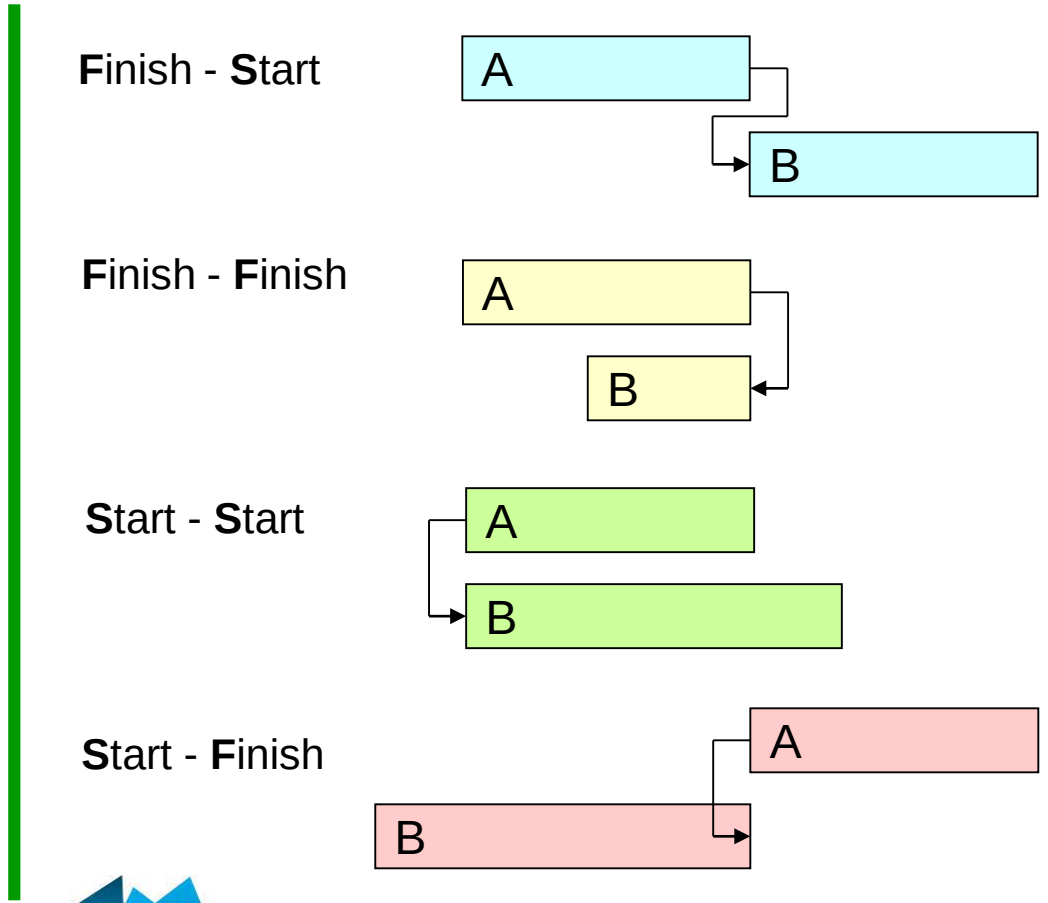
- **Creating a list of activities and their attributes using the WBS (SDP in French)**
  - **Predecessors and successors**
  - **Logical relationships**
  - **Resource requirements**
  - **Constraints**
  - **Non-negotiable dates**
- **Milestone**
  - **Very important event that has no duration and is used to monitor the progress of the project**

6.2 Scheduling of activities

- **Identify and document logical links or dependency relationships between project activities**

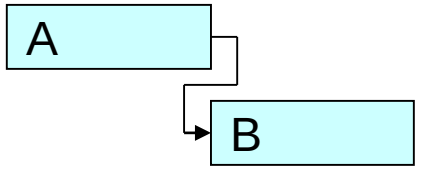
The sequencing

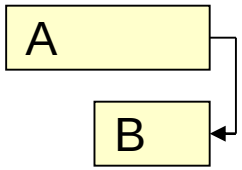
- **Sequencing is the establishment of a logical sequence between network activities, the most appropriate form for the project**
- **Sequencing uses the notion of antecedence between activities**

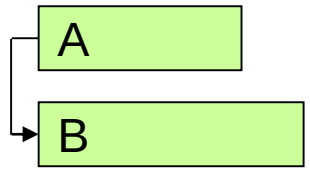


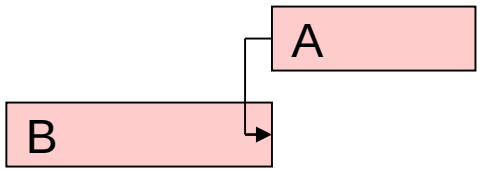
Examples of sequencing

- **Finish to Start**
  - **Wait for anesthesia to take effect before operating**
- **Finish to Finish**
  - **Wait until the end of the excavation to be able to finish removing the grounds**
- **Start to Start**
  - **Paste posters and advertise on the radio**
- **Start to Finish**
  - **Inaugurate the new hydroelectric plant to deactivate the gas station**









The PERT Network

- **Program Evaluation and Review Technique**
- **Created in 1958 at the request of the US Navy**
- **Focuses on the notions of flow and dependencies**
- **Determines the critical path**

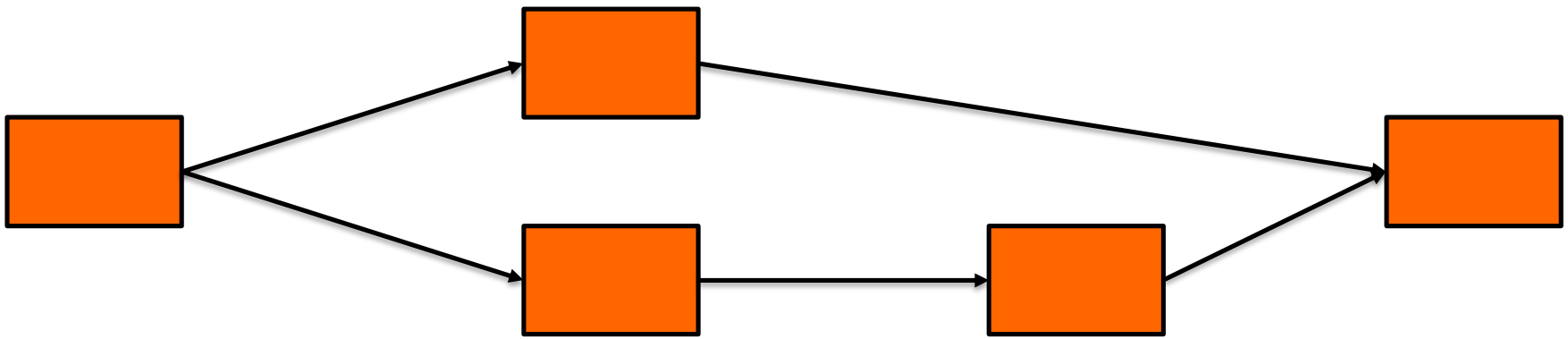
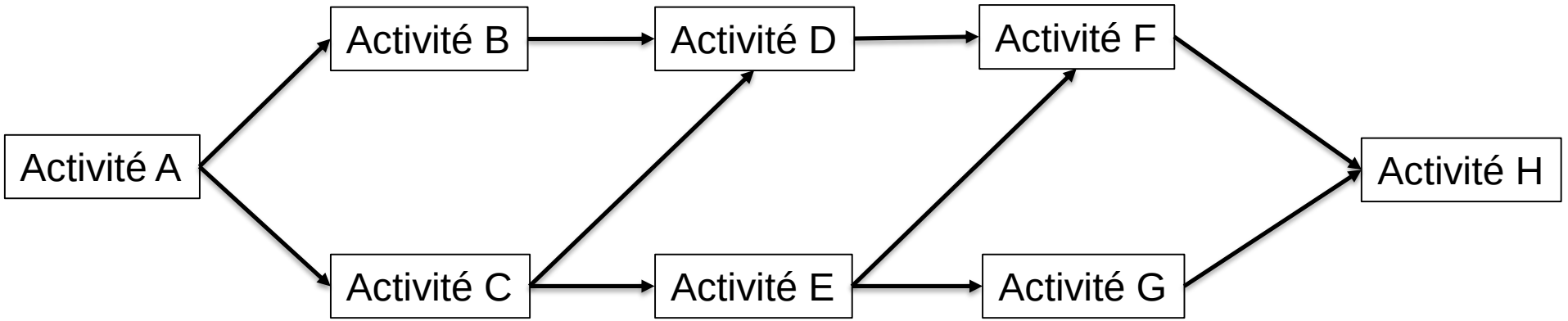


Table of Predecessors

Activité	Prédécesseur
A	
B	A
C	A
D	B,C
E	C
F	D,E
G	E
H	F,G

Gestion de Projet



Gestion de Projet

Activité	Prédécesseur
A	
B	A
C	A
D	B,C
E	C
F	D,E
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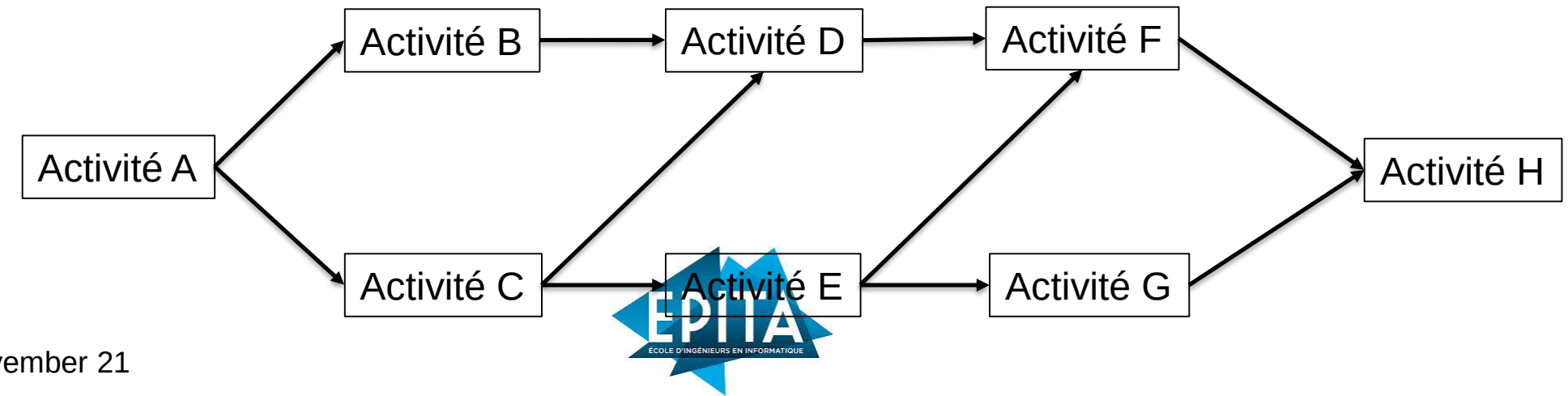
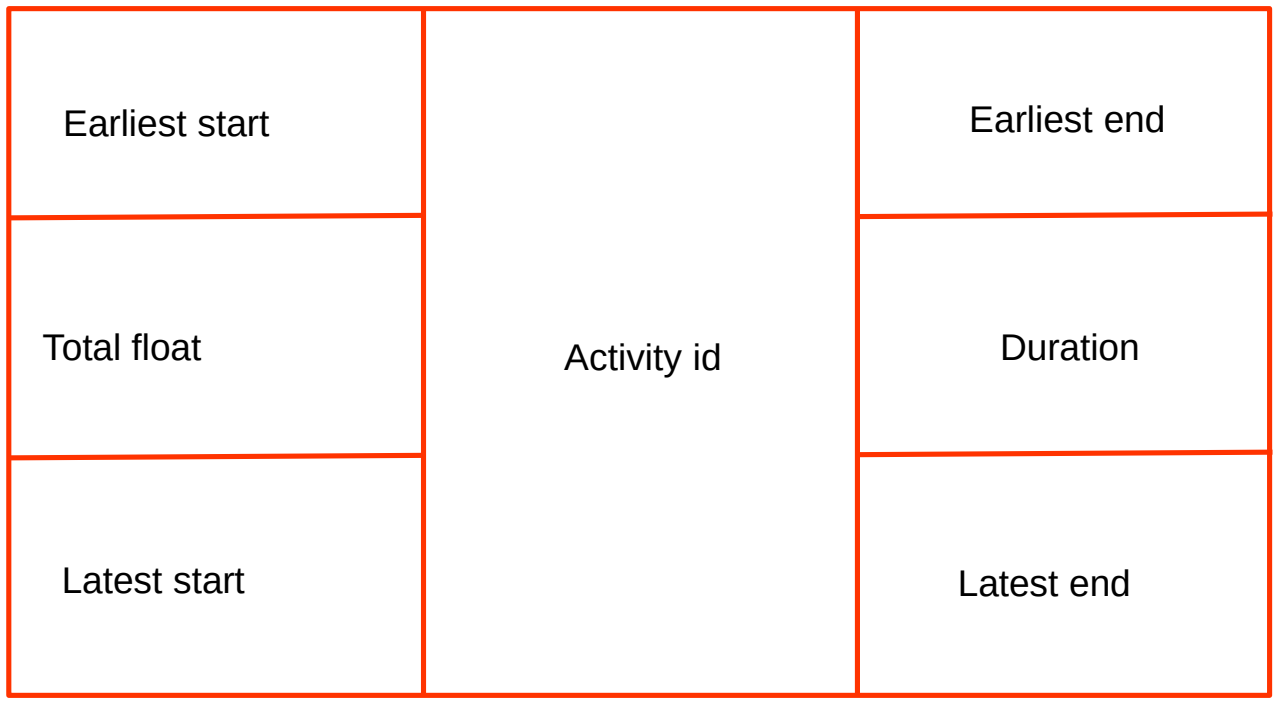
Table of Predecessors



Critical path method

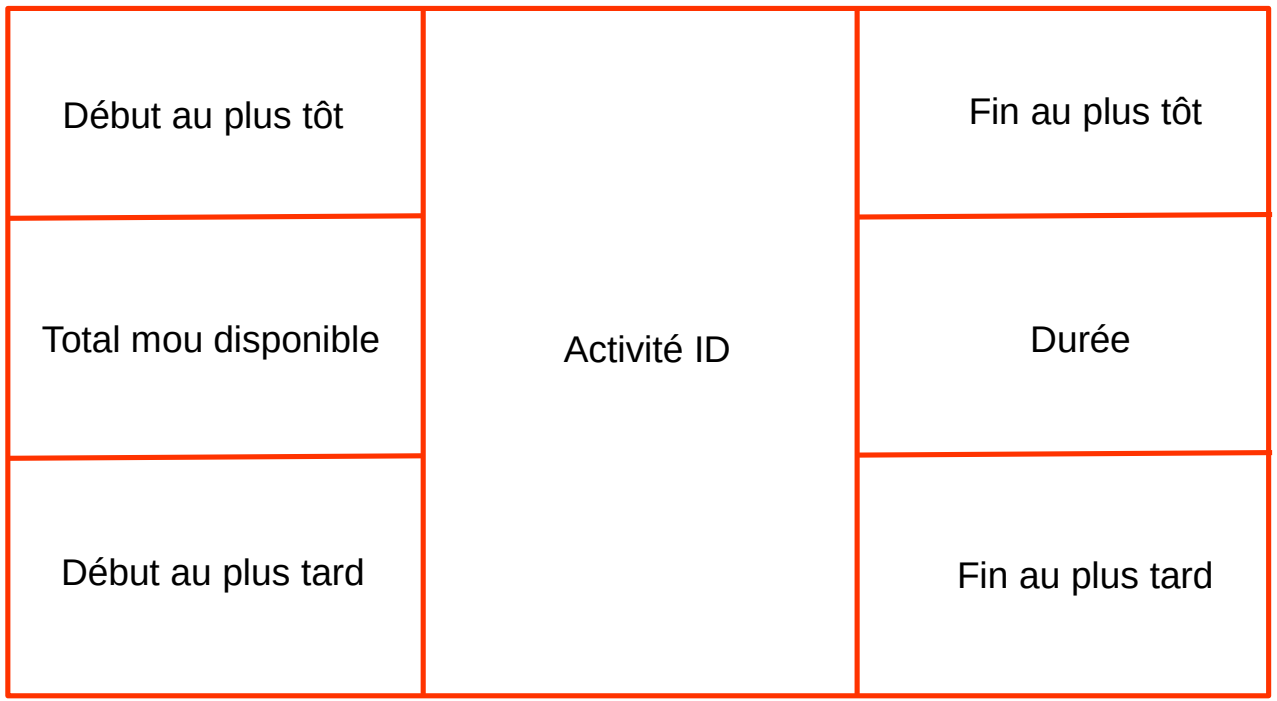
Activité	Durée	Prédécesseur
A	3	
B	5	A
C	4	A
D	2	B,C
E	6	C
F	5	D,E
G	4	E
H	7	F,G

Critical path method



Total float = Latest start – Earliest start

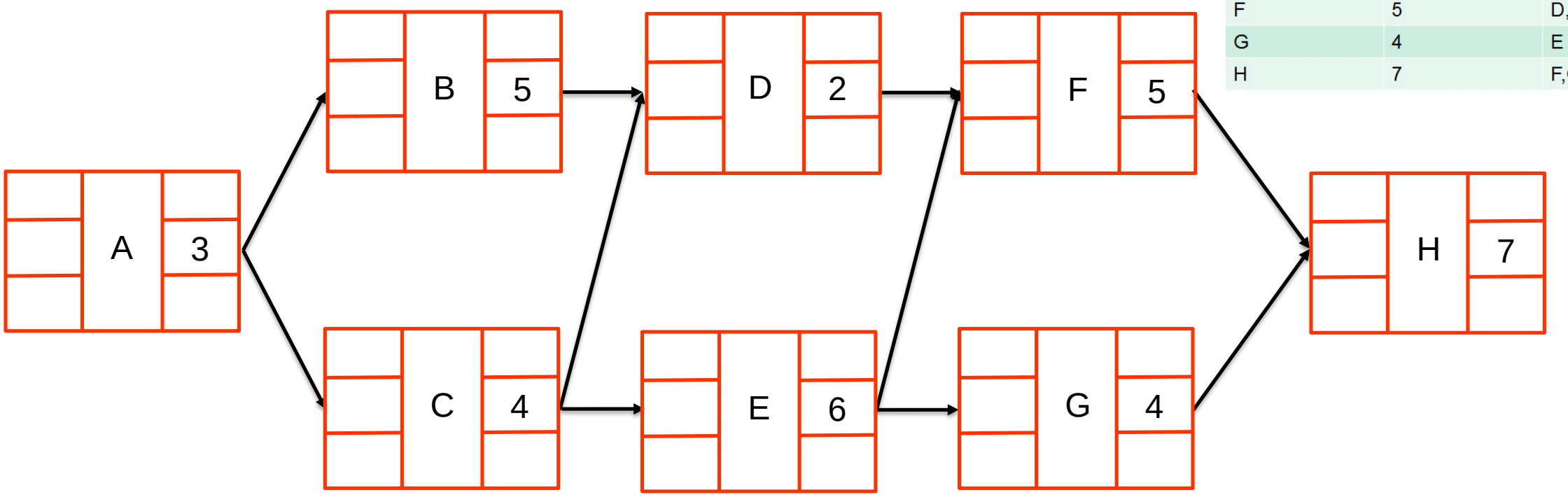
Méthode du chemin critique



Total mou disponible = Début au plus tard – début au plus tôt

Activité	Durée	Prédécesseur
A	3	
B	5	A
C	4	A
D	2	B,C
E	6	C
F	5	D,E
G	4	E
H	7	F,G

Critical path method



Gestion de Projet

Activité	Durée	Prédécesseur
A	3	
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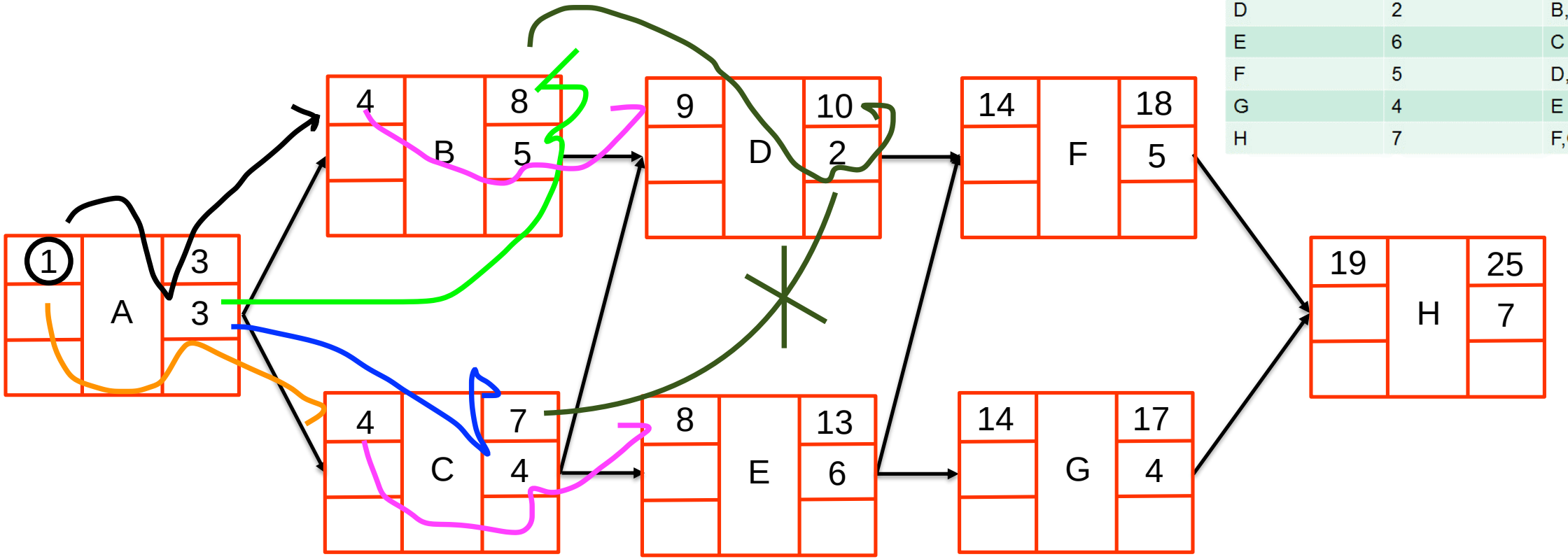
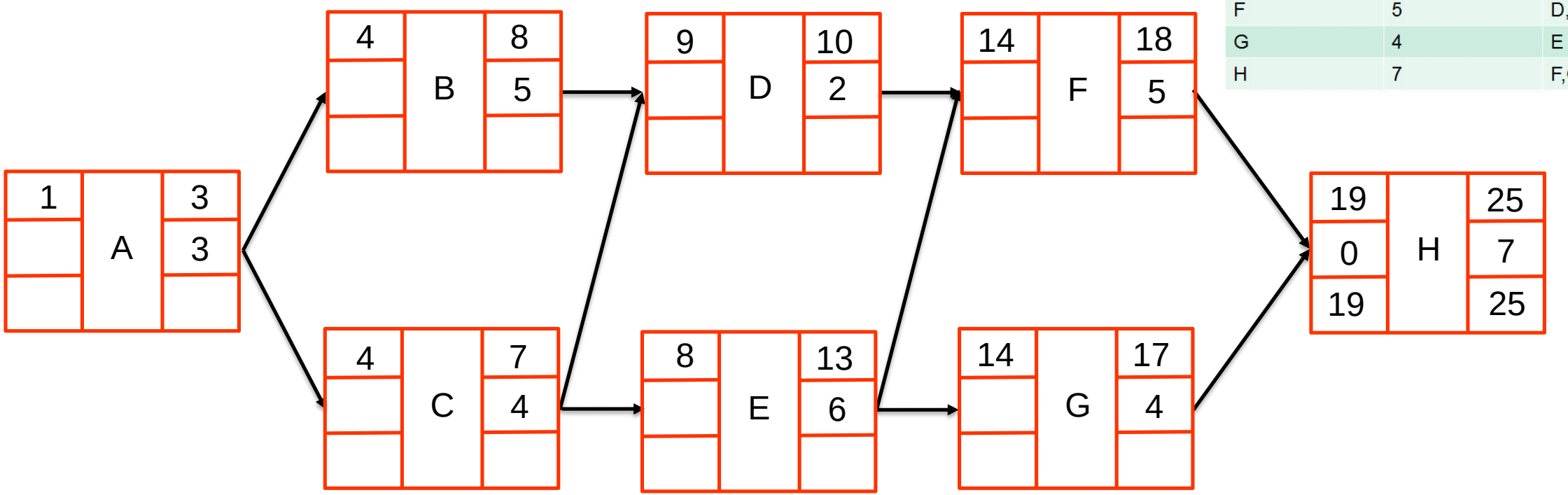
Critical path method



Activité	Durée	Prédécesseur
A	3	
B	5	A
C	4	A
D	2	B,C
E	6	C
F	5	D,E
G	4	E
H	7	F,G

Backtracking



Activité	Durée	Prédécesseur
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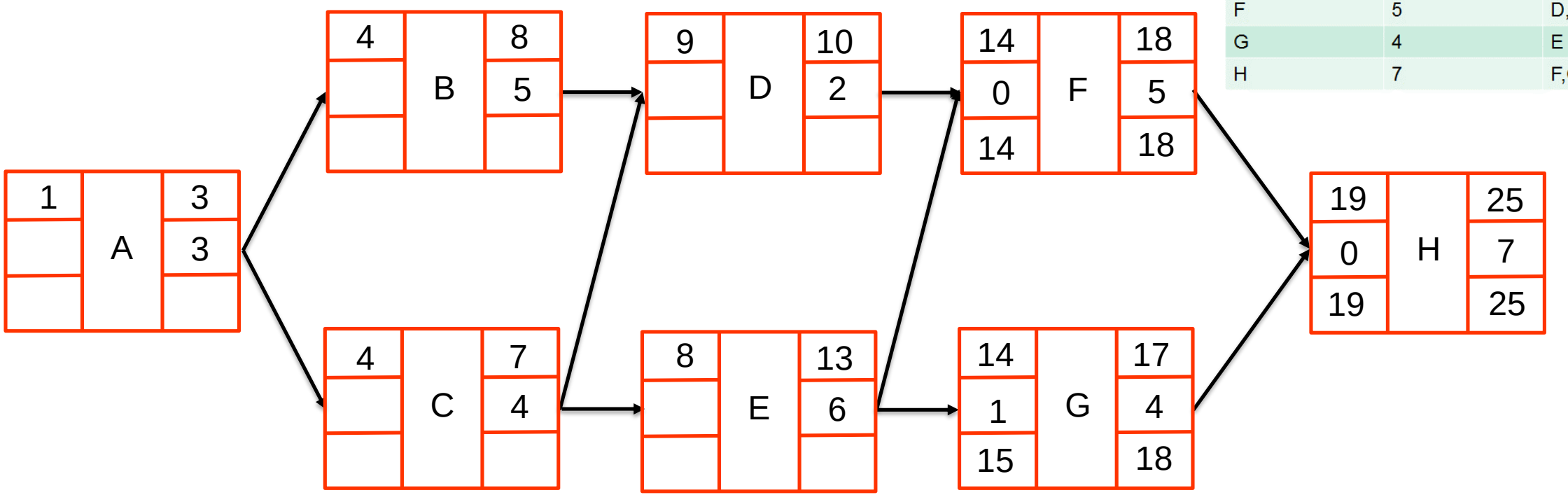
Backtracking



Gestion de Projet

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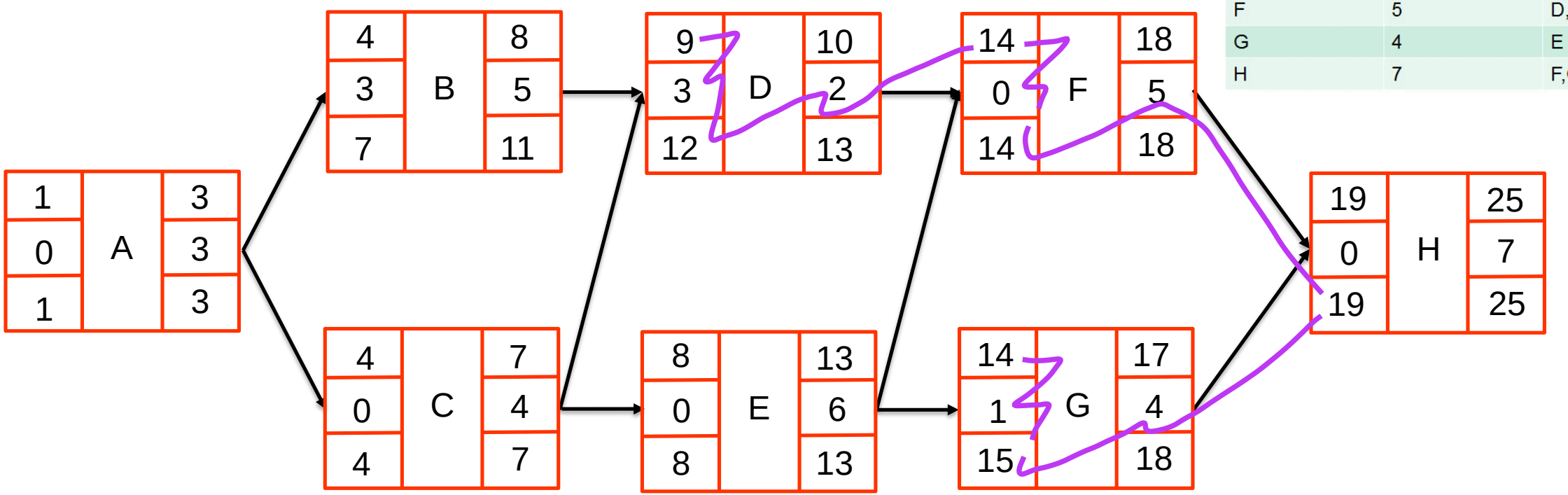
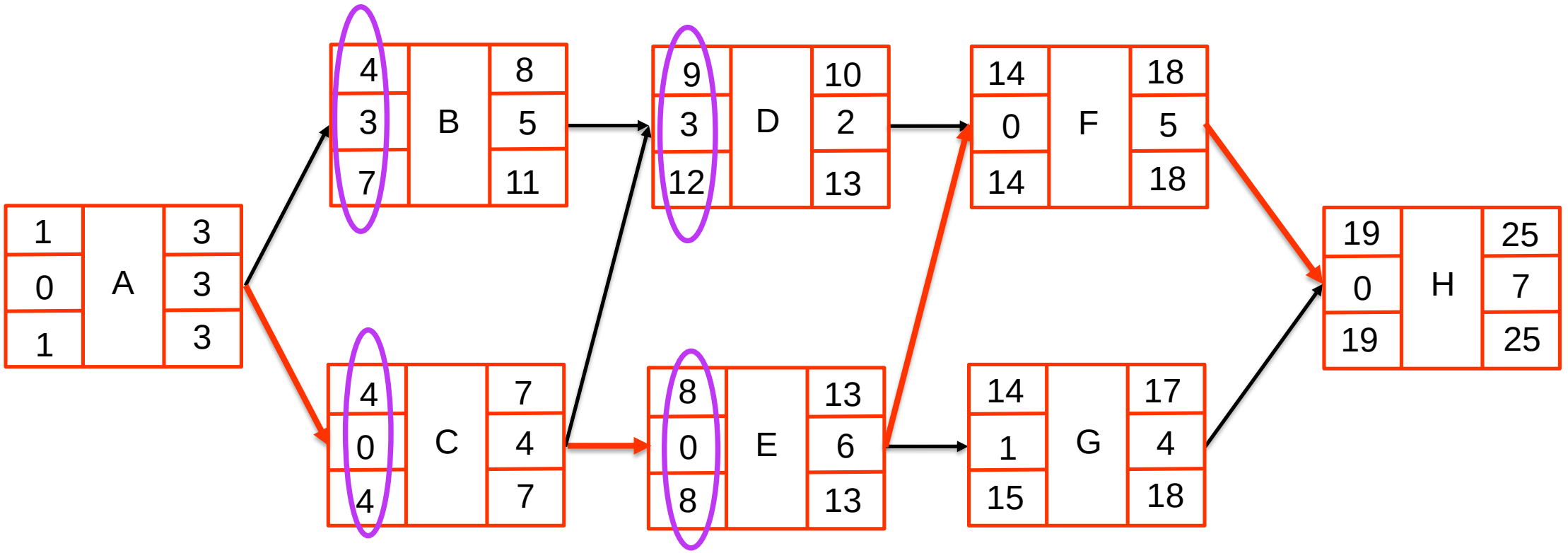
Backtracking



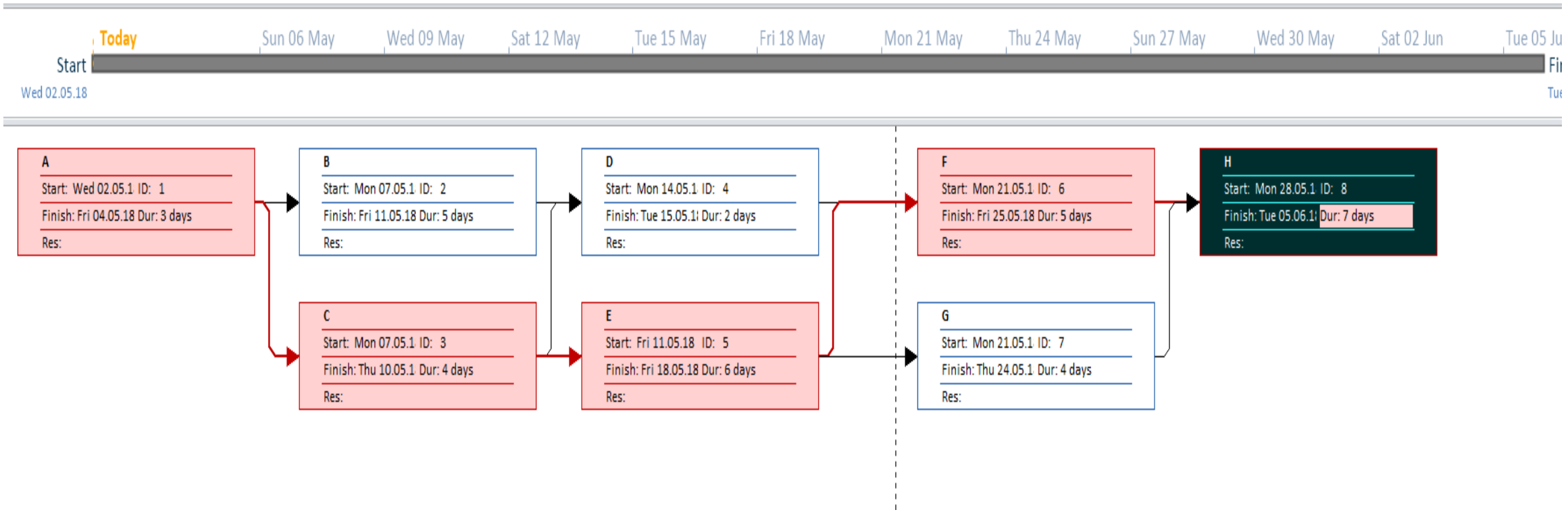
Where is the Critical path ?

Backtracking



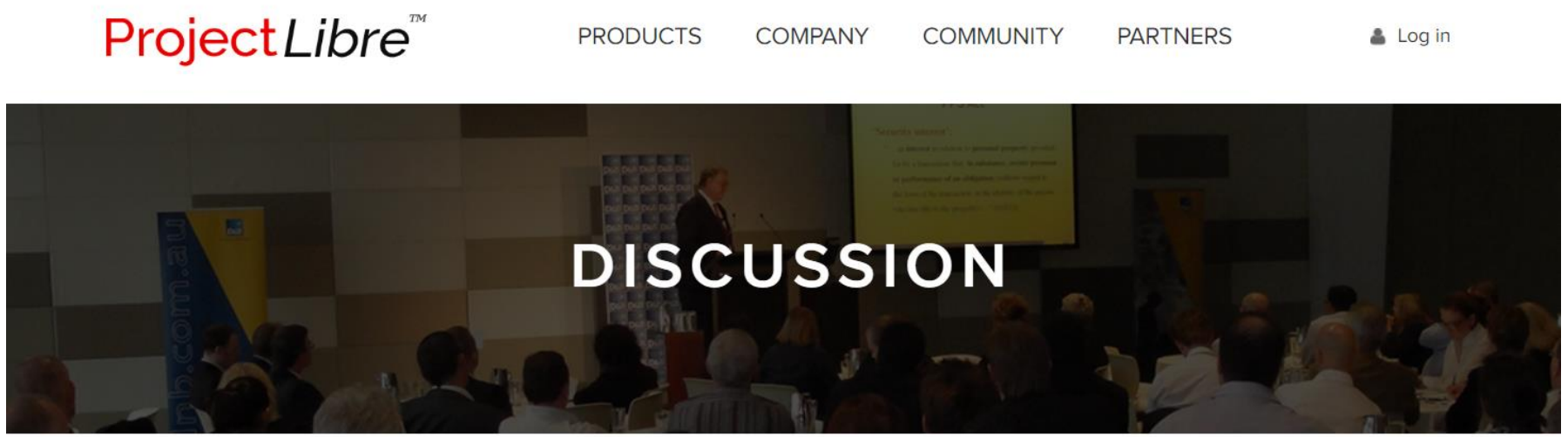
Critical path

Exercise: Diagram Network with MS Project



Gestion de Projet

www.projectlibre.com



6.3 Resource estimate

- **Estimate of resources (people, equipment or materials) needed to carry out each activity:**
  - **Resource identification (type, skills)**
  - **Quantities used**
  - **When these resources will be needed**
  - **When these resources will be available to carry out project activities**

6.4 Estimated duration

- **Process of approximation of duration or number of periods (days, weeks) to carry out individual activities with their resources**
- **The duration should be as credible and realistic as possible (do not accept filling)**
- **To estimate the duration, consider:**
  - **Level of difficulty of each activity**
  - **The experience of the organization in the execution of each activity**
  - **Availability and experience of the necessary resources**

6.4 Estimated duration

- **Rather than estimating the duration of an activity with a whole number (eg 4 weeks), it is often better to estimate at three levels.**
  - **Optimistic, pessimistic, realistic**

Estimation

$$\frac{P + 4M + O}{6}$$

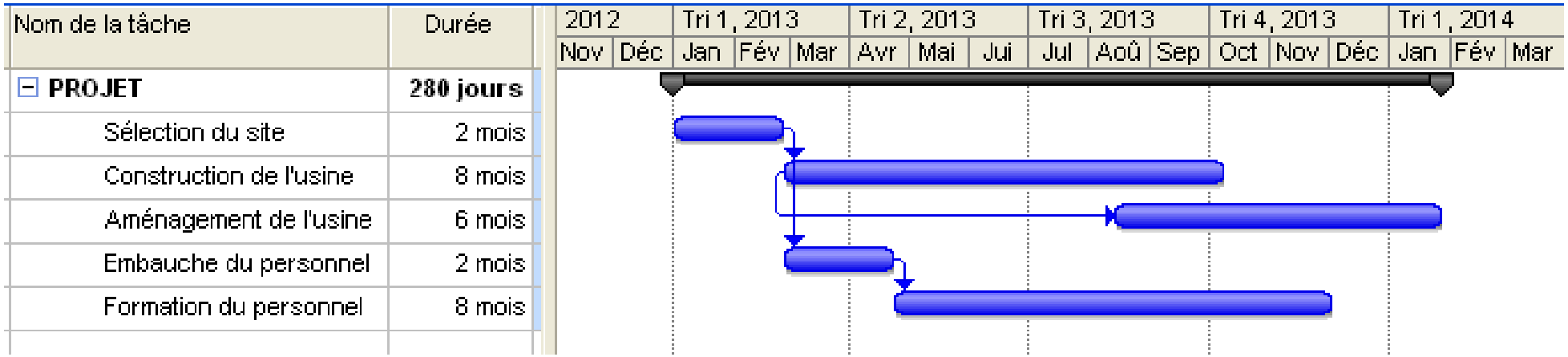
- **Iterative process: modify estimates over time to be closer to reality**

6.5 Preparation of the plan

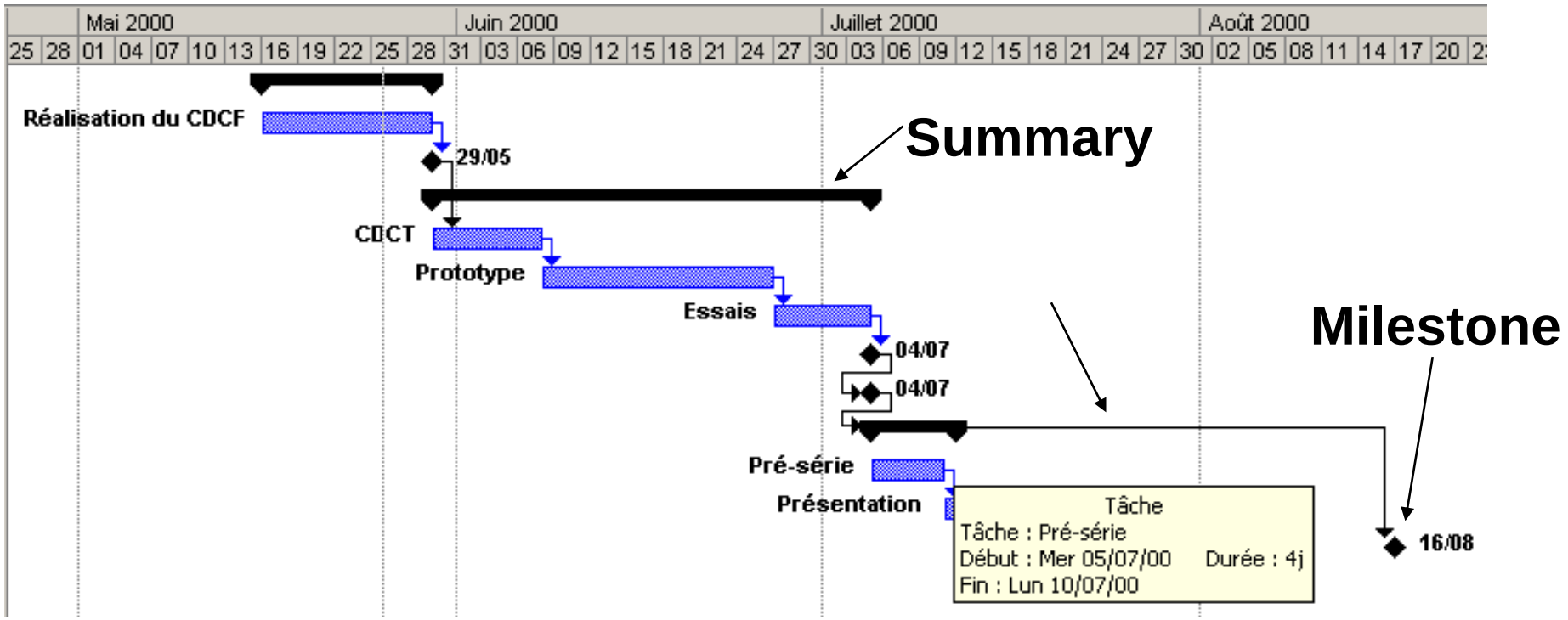
- **Analysis of activity sequences, durations, resource requirements and calendar constraints to create the project schedule.**
- **Iterative process**
- **Use project management software**
- **Important tools for developing the plan:**
  - **Gantt diagrams: temporal visualization of project activities**
  - **Critical path analysis: useful for controlling critical project times**

Gantt chart

- **Timescale**
- **User-friendly view and life to the project plan**
- **Dependencies between phases and tasks**



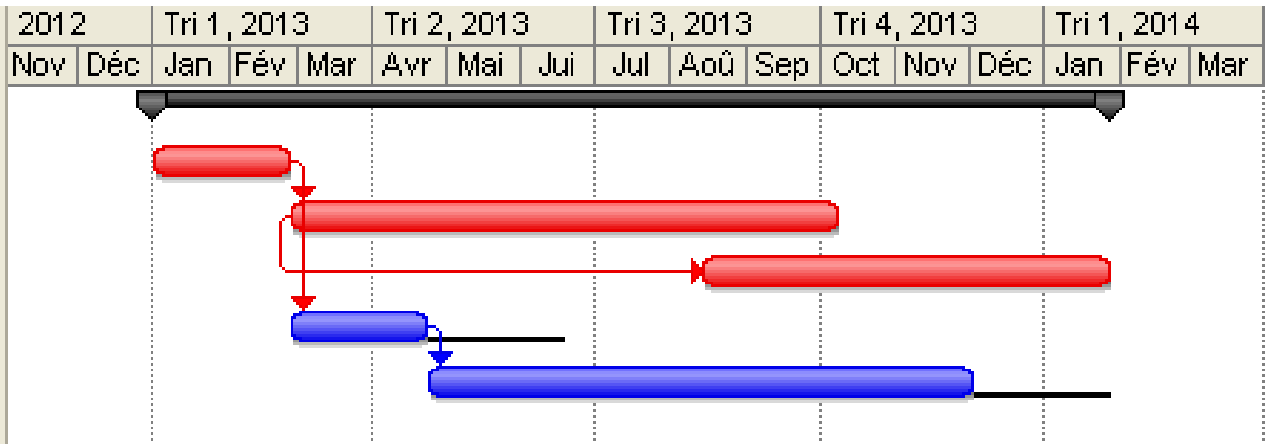
Gantt chart


Mai 2000
Juin 2000
Juillet 2000
Août 2000
Réalisation du CDCF
29/05
Summary
CDCT
Prototype
Essais
04/07
04/07
Milestone
Pré-série
Présentation
Tâche
Tâche : Pré-série
Début : Mer 05/07/00 Durée : 4j
Fin : Lun 10/07/00
16/08

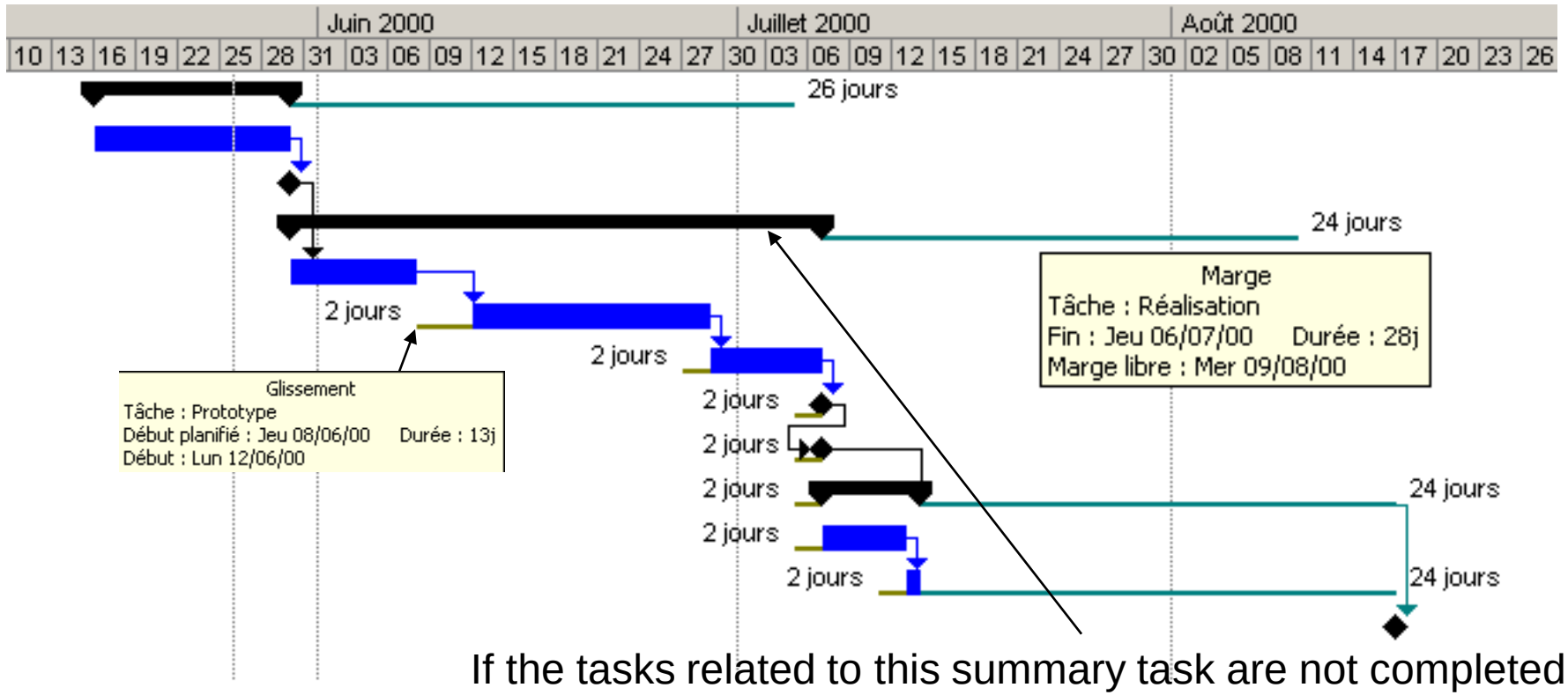
Gantt chart

- **Allows you to quickly determine and visualize the critical path**

Nom de la tâche	Durée
PROJET	**280 jours**
Sélection du site	2 mois
Construction de l'usine	8 mois
Aménagement de l'usine	6 mois
Embauche du personnel	2 mois
Formation du personnel	8 mois

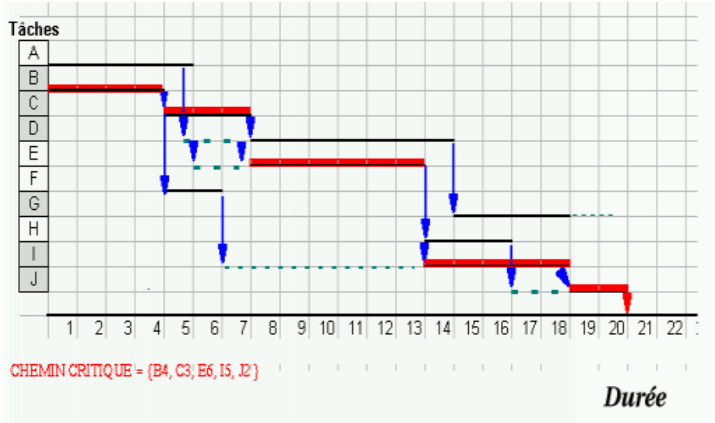


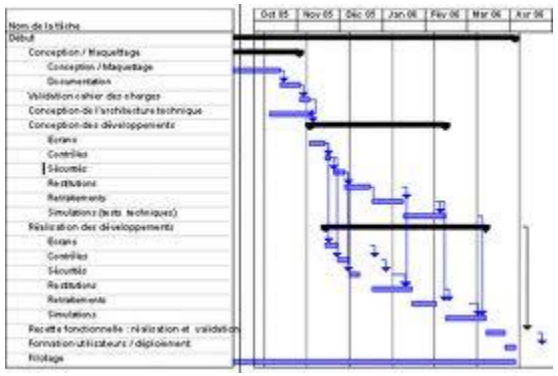
Float or Slack (Mou in French)

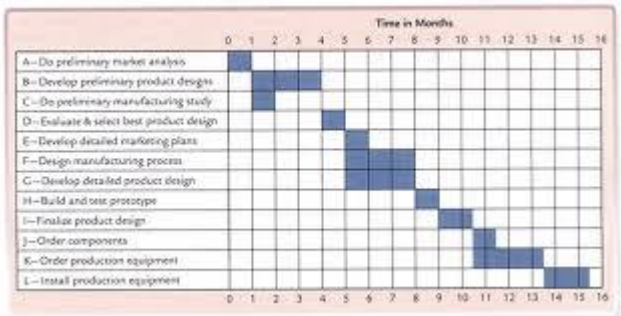


If the tasks related to this summary task are not completed before 09/08, then the project will be late ...

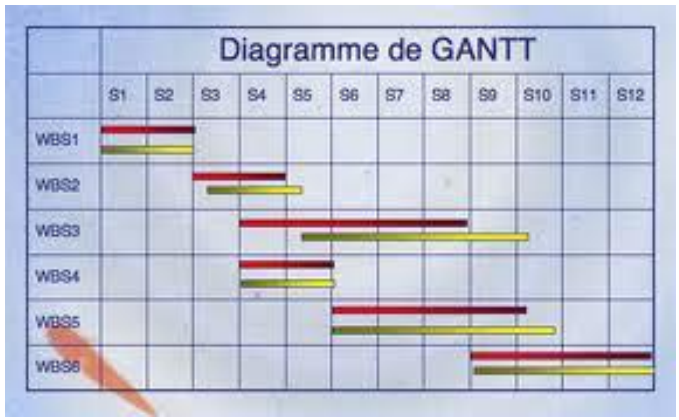
Gestion de Projet

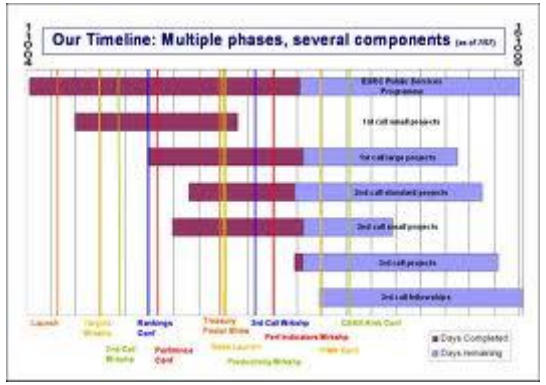






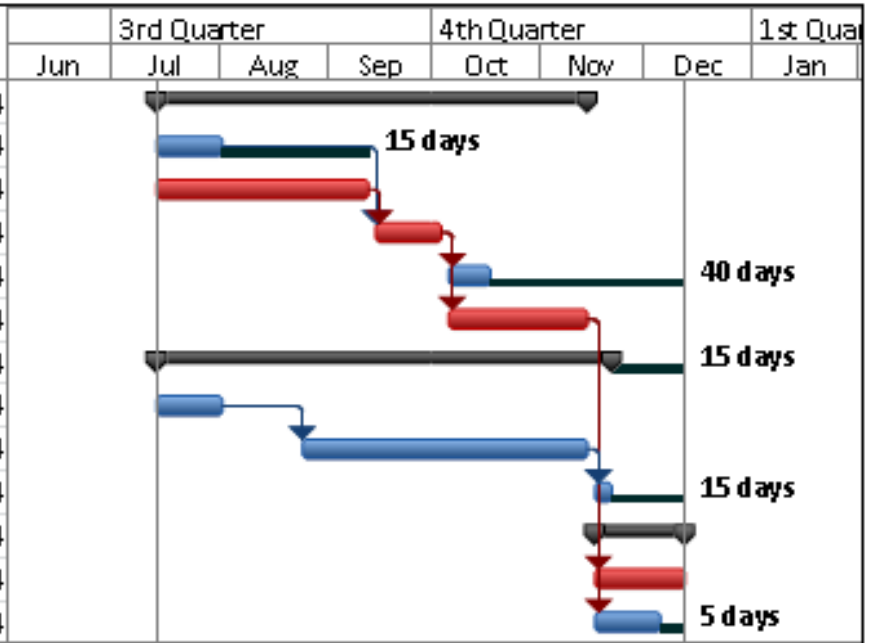
Various tools, various representations



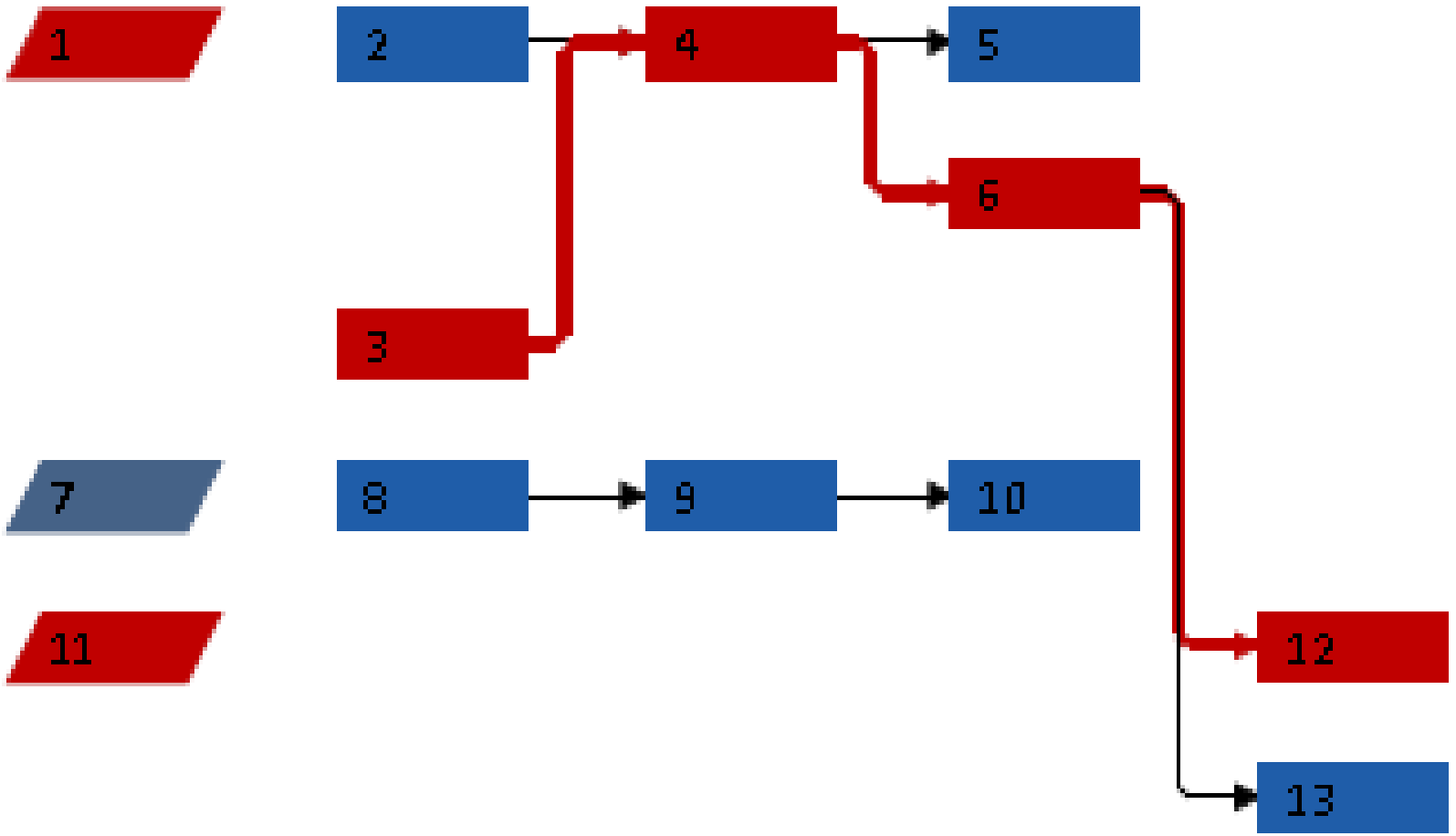


Gestion de Projet

ID	Task Mode	Name	Leveling Delay	Duration	Start	Finish
1		**Développement**	**0 edays**	**75 days**	**Mon 14/07/14**	**Fri 14/11/14**
2		Construction bancs d'éss	0 edays	15 days	Mon 14/07/14	Fri 01/08/14
3		Etudes de conception	0 edays	30 days	Mon 14/07/14	Fri 12/09/14
4		Fabrication prototypes	0 edays	15 days	Mon 15/09/14	Fri 03/10/14
5		Essais amortissement	0 edays	10 days	Mon 06/10/14	Fri 17/10/14
6		Essais endurance	0 edays	30 days	Mon 06/10/14	Fri 14/11/14
7		**Prospection**	**0 edays**	**80 days**	**Mon 14/07/14**	**Fri 21/11/14**
8		Création fichier prospect	0 edays	15 days	Mon 14/07/14	Fri 01/08/14
9		Prospection test	0 edays	60 days	Mon 25/08/14	Fri 14/11/14
10		Rédaction plaquette, pul	0 edays	5 days	Mon 17/11/14	Fri 21/11/14
11		**Industrialisation**	**0 edays**	**20 days**	**Mon 17/11/14**	**Fri 12/12/14**
12		Ordonnancement	0 edays	20 days	Mon 17/11/14	Fri 12/12/14
13		Mise en place sous-traita	0 edays	15 days	Mon 17/11/14	Fri 05/12/14

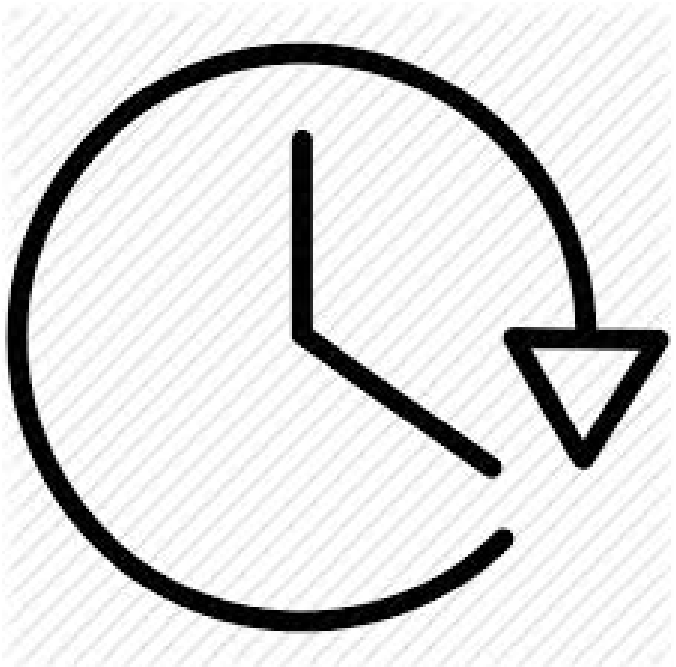


Gestion de Projet

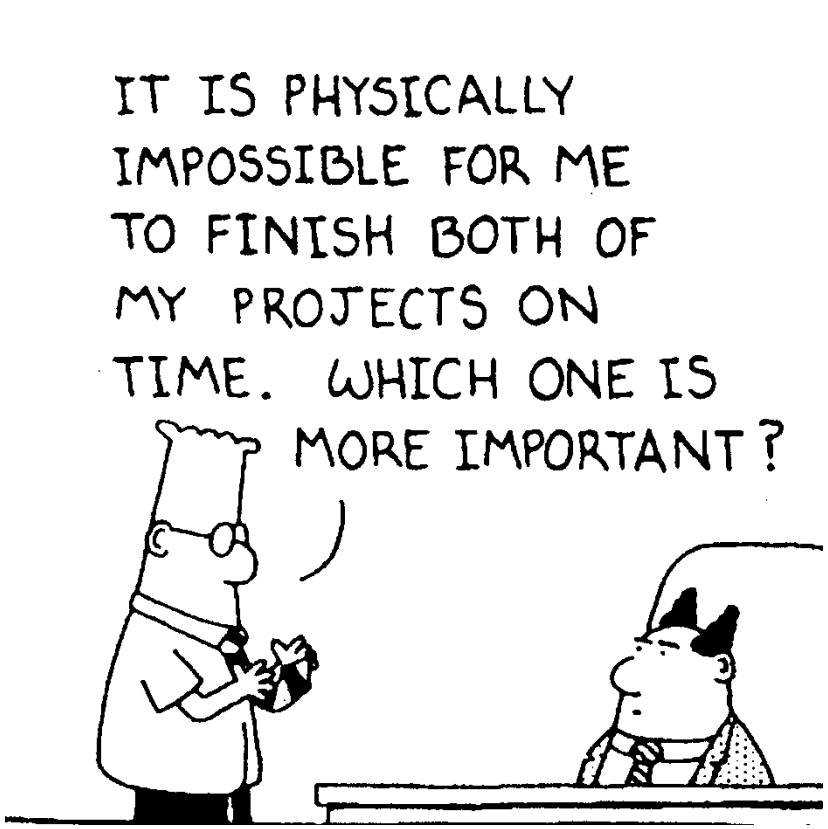


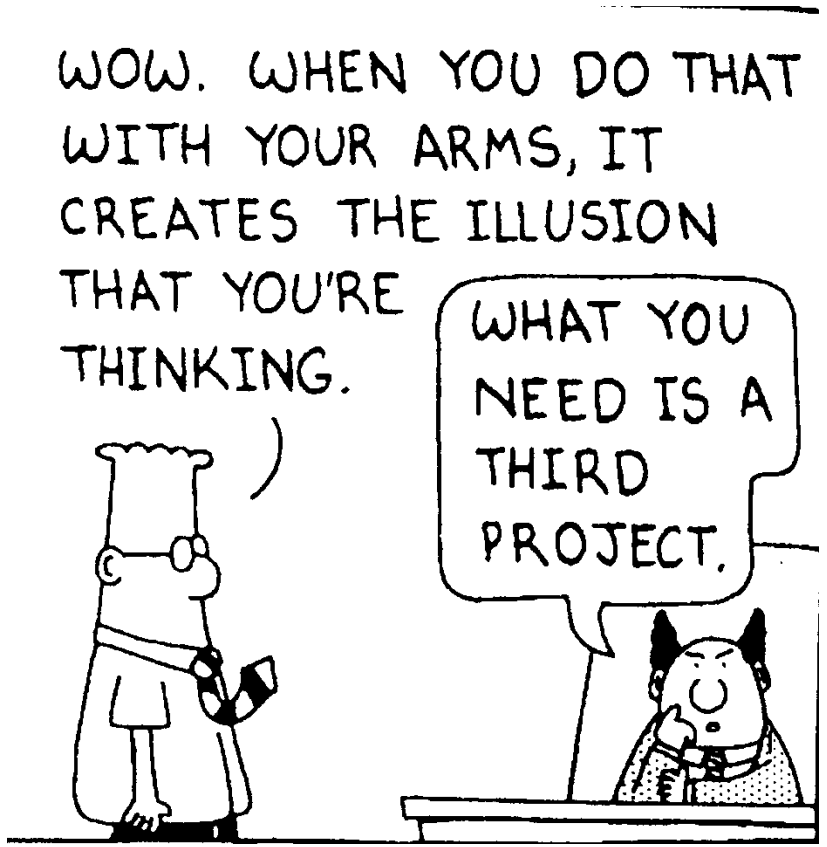
5.6. Control of the Plan

- **Periodic progress reports**
- **Various performance measures**
- **Plan for the unexpected**
- **Alert management in case of problems**



Project Management is …





EPITA Balancing Act

Cost Management

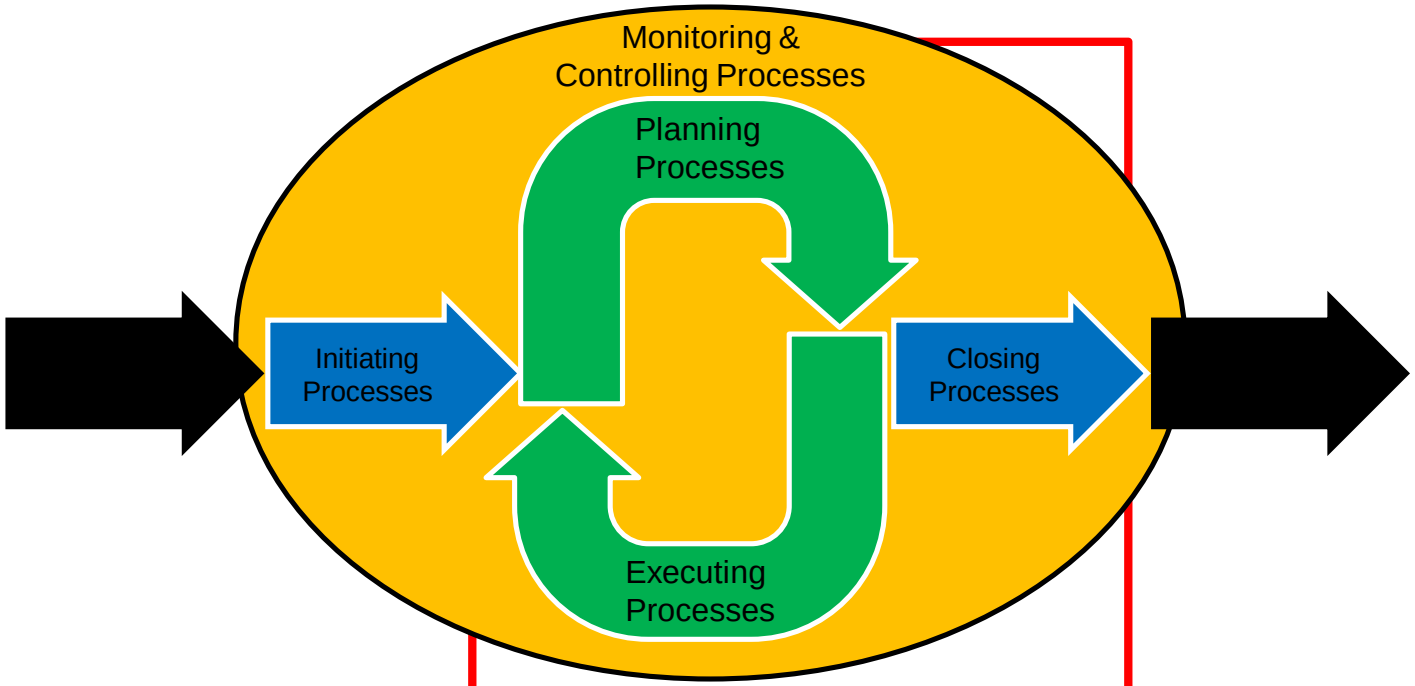
Cost management

- **The process of estimating, budgeting and controlling costs so that the project can be completed within the approved Initial Budget**
- **Value Analysis (value engineering): looking for less expensive ways to do the same job with the same content**
- **Law of diminishing returns: It is not by adding twice as many resources for a task that one can accomplish this task at half the time**

Objectives of the module

- **Understand the importance of cost management for a project to measure its performance**
- **Understand cost estimation techniques and budget preparation**
- **Master the use of the EARNED VALUE technique to control the cost of a project**

Gestion de Projet



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Contol	Closing
Cost		Cost Estimate Preparation of the project budget		Control cost	

Project Cost management process

- **7.1 Estimate Cost**
  - **Determine an approximate value of the cost of resources needed to complete project activities**
- **7.2 Preparation of the project budget**
  - **Consolidate cost estimates for individual activities or work packages to set a baseline cost**
- **7.3 Control Cost**
  - **Track project status to update budget and manage changes to baseline**

Types of costs

- **Variable costs**
  - **are proportional to the amount of work for example hours spent in labor costs, materials, supplies**
- **Fixed costs**
  - **Do not change with volume changes eg start-up costs, setting up, renting an office space**

- **Direct costs**
  - **Directly attributable to the work of the project eg travel of team members, recognition awards, team salaries**
- **Indirect costs**
  - **overheads or costs incurred for the benefit of more than one project such as taxes, social security charges, business services**

Quality and accuracy of the cost estimate

Estimate	Accuracy
Rough order of Magnitude (ROM)	+/- 50%
Budgetary Estimate	+/- 10%
Final Estimate	+/- 5%

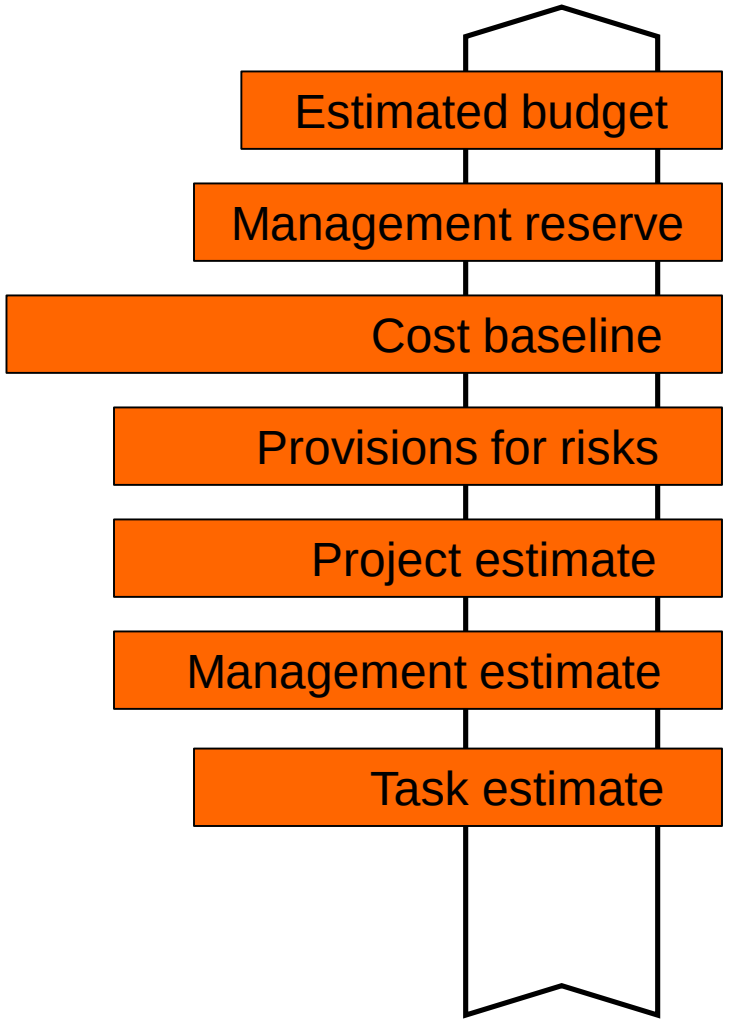
- The most difficult to estimate because very little information about the project is available during the project initiation process
- Used to finalize the authorization request and to establish a commitment made during the planning phase
- During the project. Used to establish the initial Estimated Budget. Refined and updated during the project

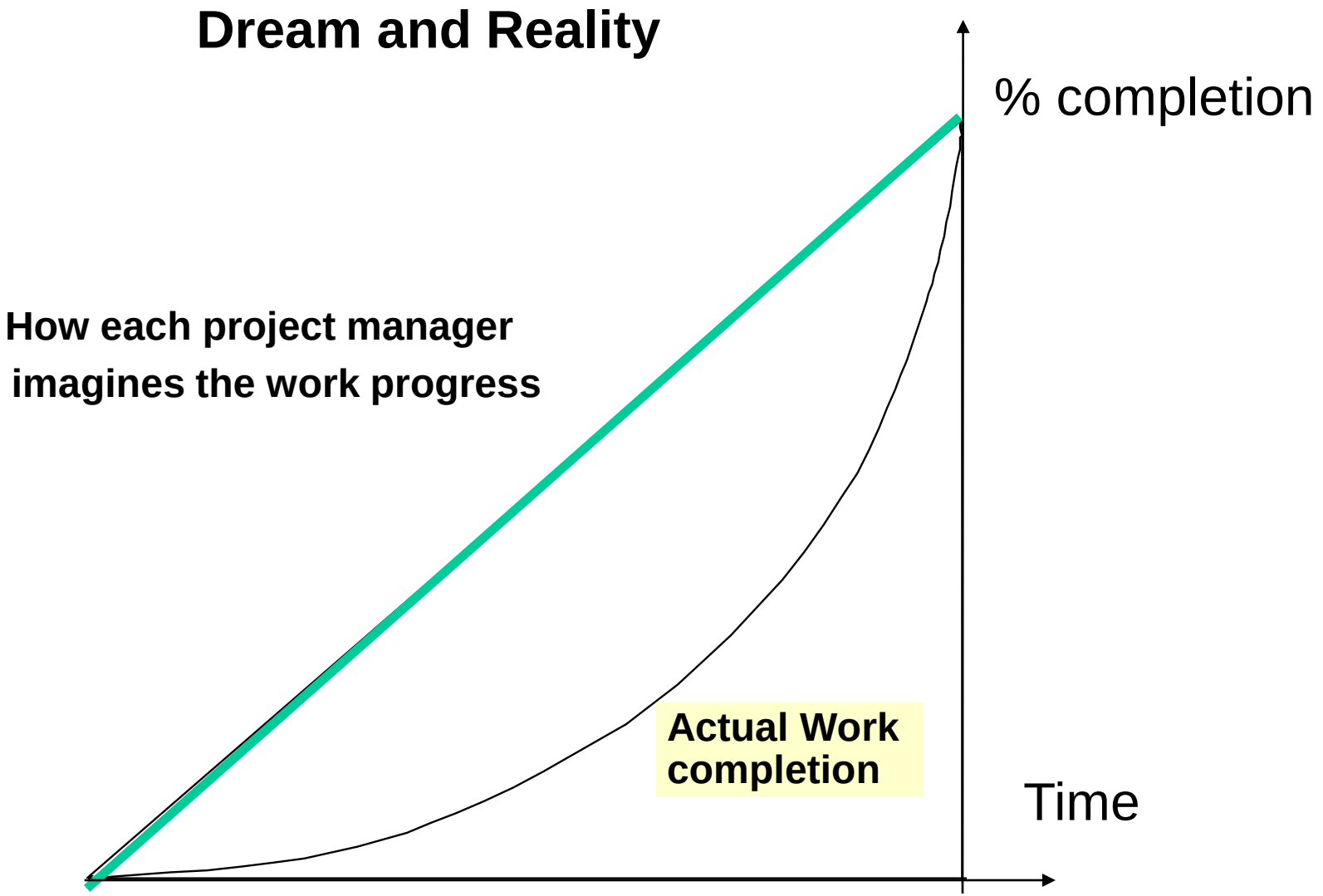
Estimating methods

- **Estimate by analogy**
  - **Uses the Actual cost of similar past projects as a basis for estimating the cost of the current project**
- **Ascending estimate**
  - **Estimate the cost of the detailed activities (WBS work breakdown structure) then total by level**
- **Expert judgment**
  - **Involves an expert who will most often apply the analogical method informally**
- **Delphi**
  - **Involves several experts and helps to organize the confrontation in order to bring them to a consensus while limiting the mutual influences**
- **Analysis of suppliers' offers**
  - **Tender and Bid Process. The estimates obtained are used to determine costs.**

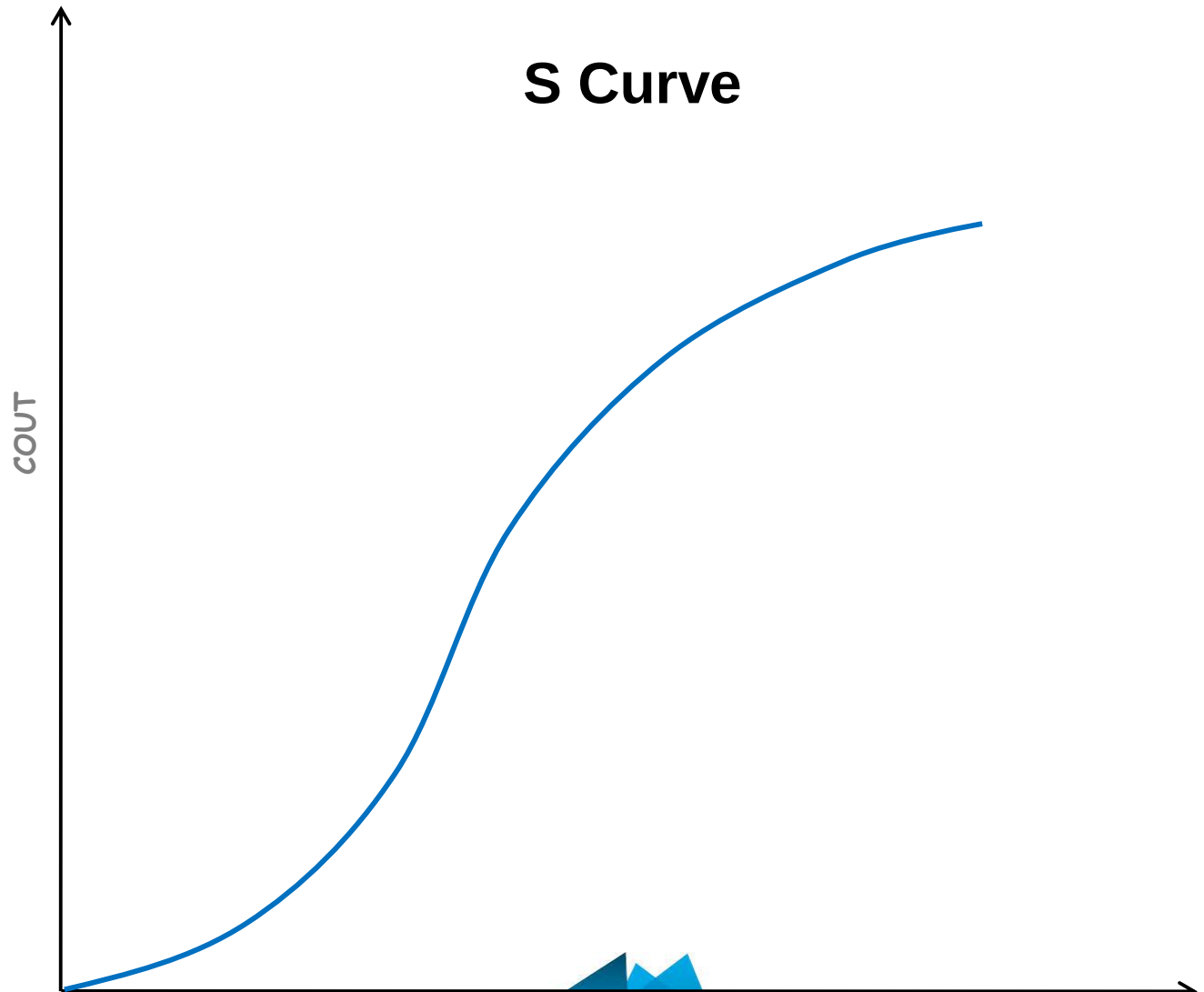
Costs consolidation

- **Provisions for risks are important for budget preparation**
  - **Provisions for risk included in the baseline**
    - **Known unknowns (contingency reserve)**
  - **Management reserve: additional funds to cover unforeseen circumstances or certain changes**
    - **Unknown unknowns (discretionary reserve)**

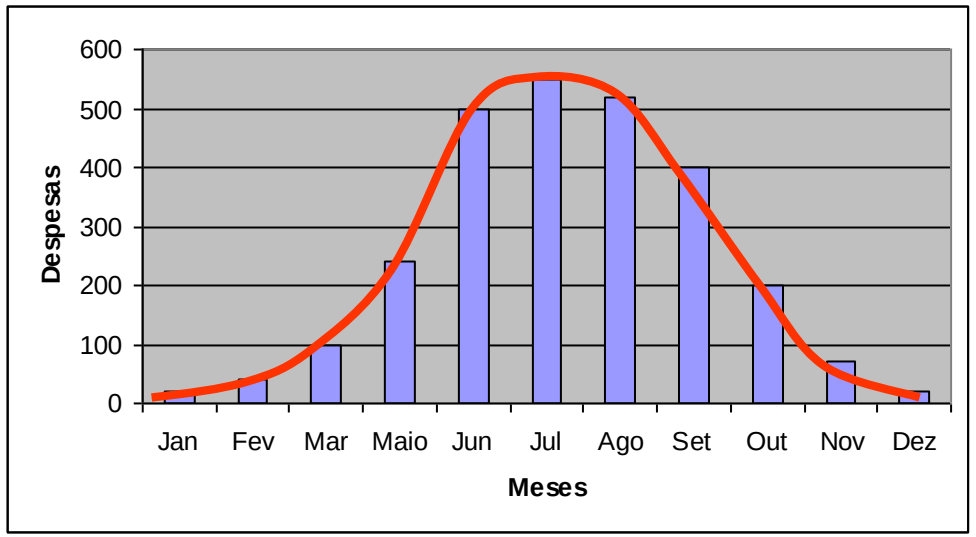



Dream and Reality
% completion
How each project manager
imagines the work progress
Actual Work
completion
Time

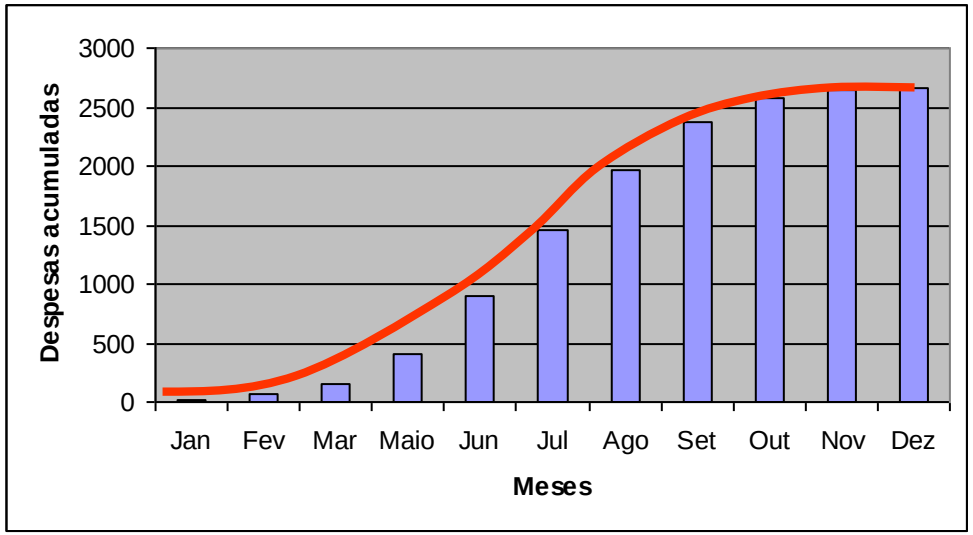
Gestion de Projet



S Curve



Spend by month

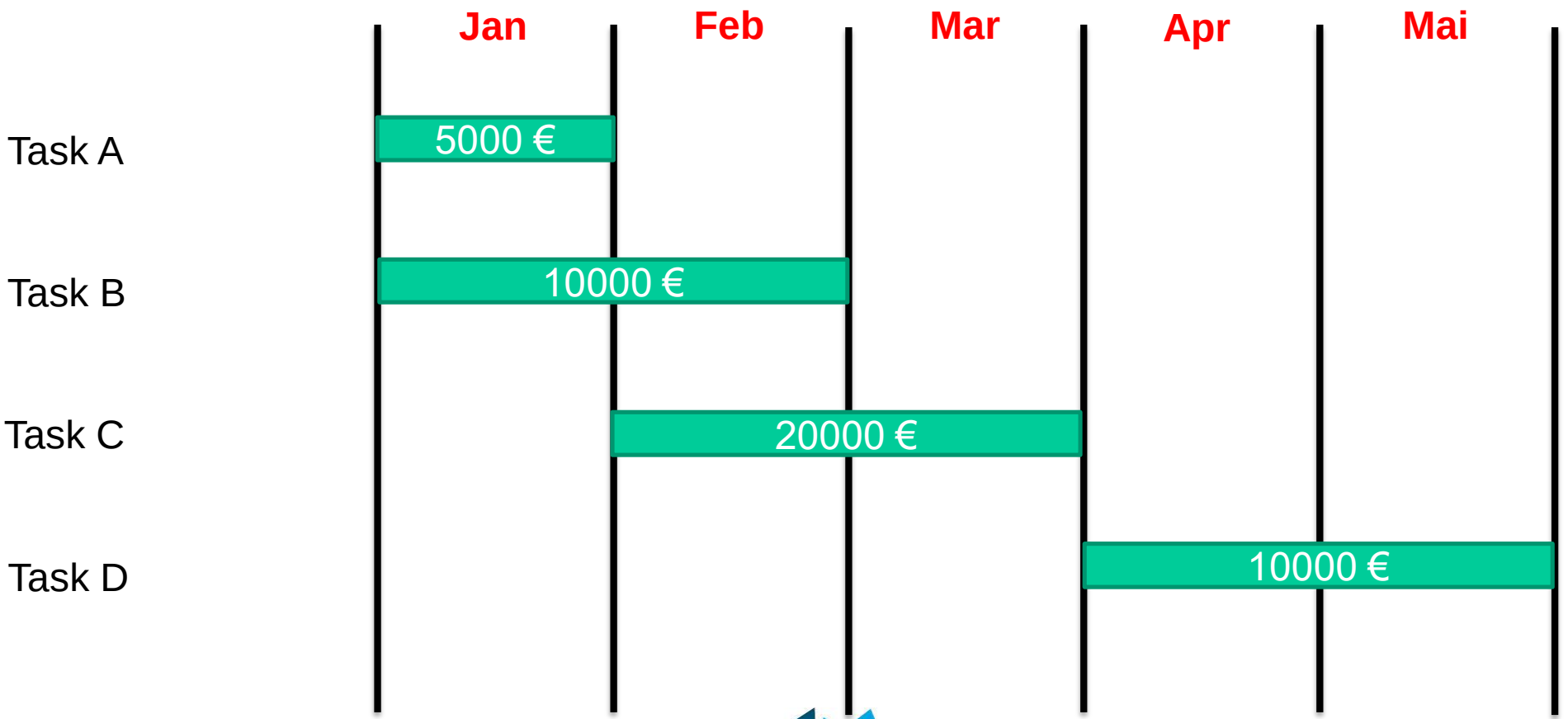


Cumulated spend

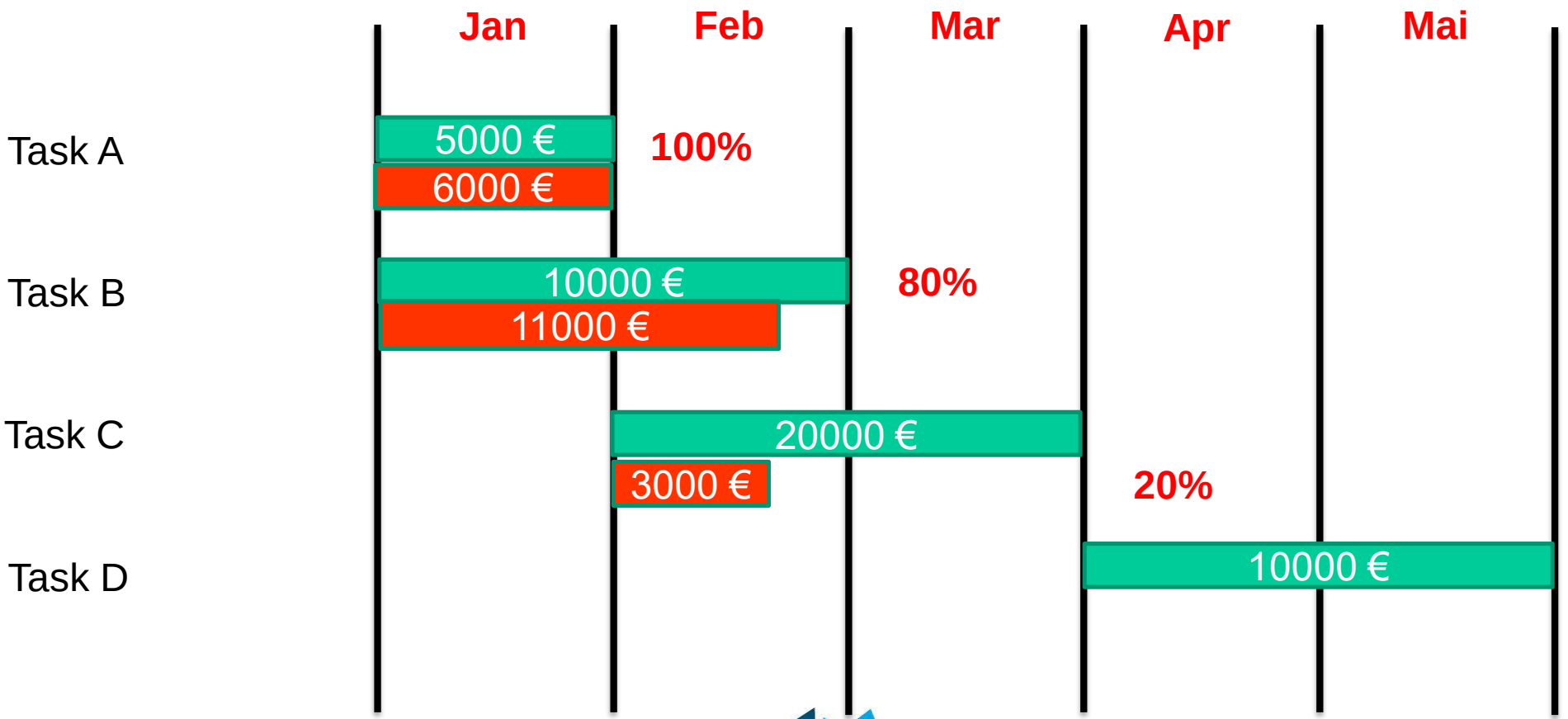
Exercise

- **Trip of 300 km (charge) in 3 hours consuming 30 liters of gasoline (resources). After one hour we traveled 120 km and consumed 14 liters. What is the gap compared to the plan?**
  - **We did 20 km more than expected (achievement variance)**
  - **We consumed 4 liters more than expected (consumption gap)**
  - **In fact for 120 km we had planned to consume 12 liters**
  - **So we are 20 km ahead but we consumed more than expected**

Another exercise

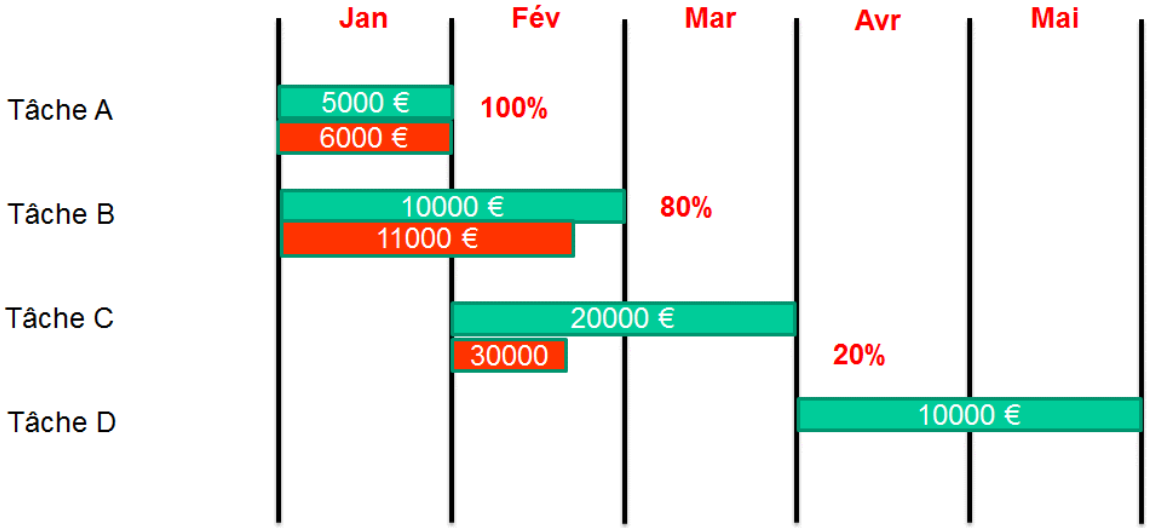


Another exercise



Gestion de Projet

- **End of February, we had planned**
  - **5000+10000+1/2*20000=25000**
  - **This is what we had planned**
- **We spent**
  - **6000+11000+3000=20000**
- **BUT TO DO WHAT ?**
- **We have earned in value**
  - **100%*5000+80%*10000+20%*20000= 17000**



Planned Value	**25000 €**
Actual costs	**20000 €**
EARNED VALUE	**17000 €**

EARNED VALUE Technique

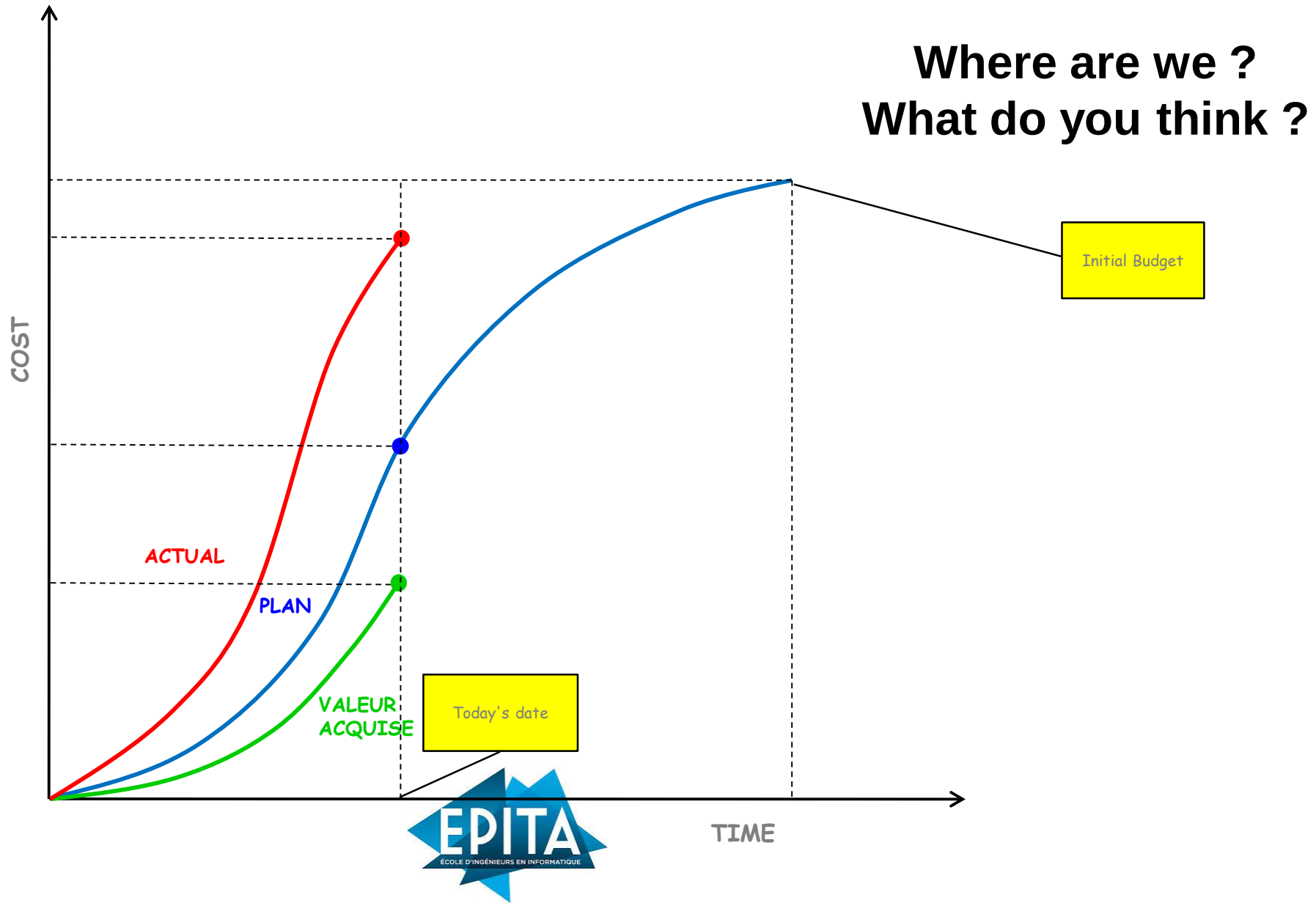
- **Project performance management technique that takes into account : content, time, and cost elements**
- **Comparison of actual situation (content, costs and time) versus a baseline**
  - **Baseline: Approved Schedule + Approved Changes**

Three basic values

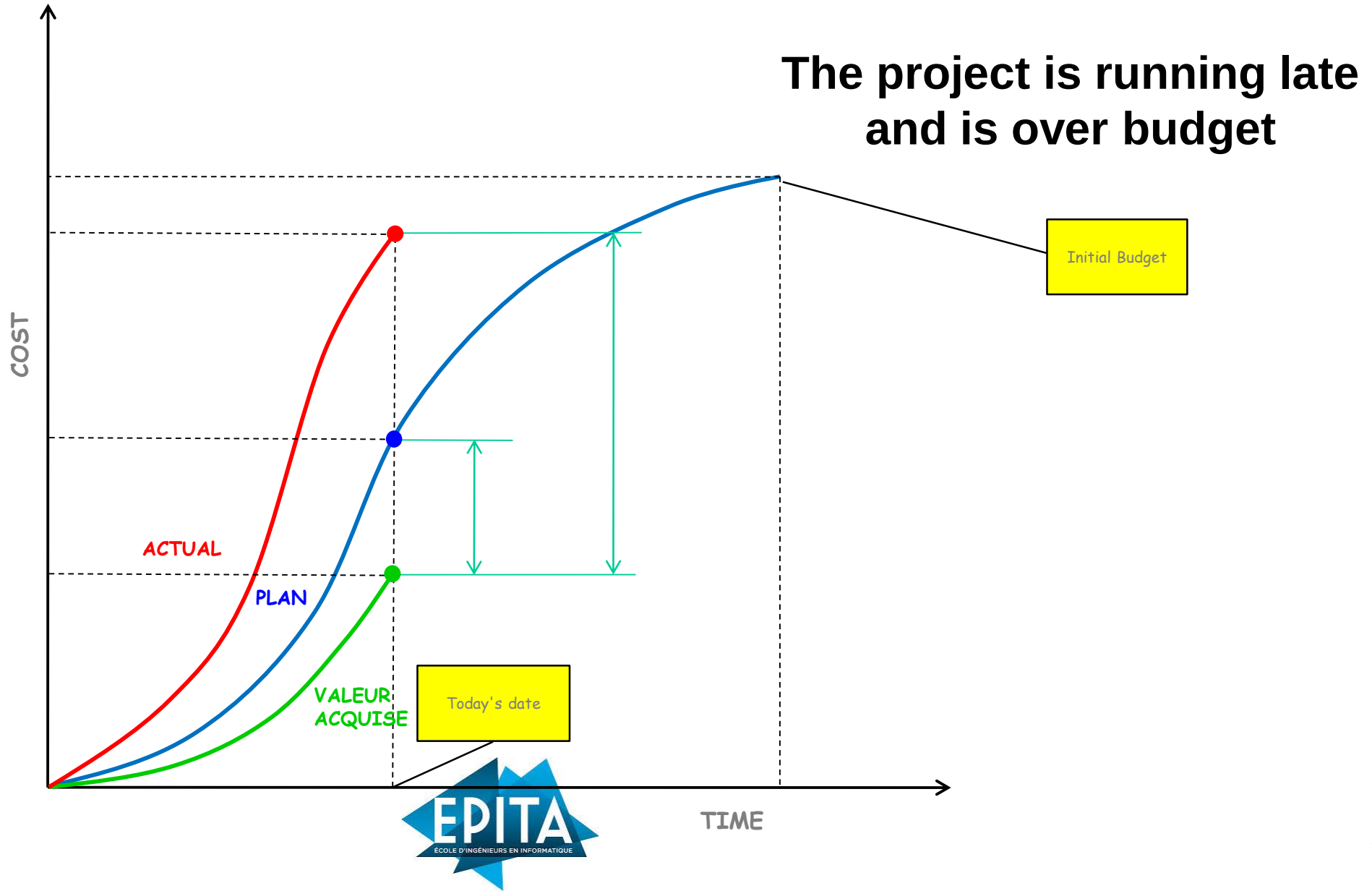
- **Planned value: budgeted amount to complete an activity**
  - **Total budget for an activity**
  - **Cumulative budget for an activity at a given time**
- **Actual cost: Actual cost to perform the work**
- **Earned Value : The amount of budgeted work actually done for a task in a given period.**
  - **Calculation: Planned value * percentage of completion**

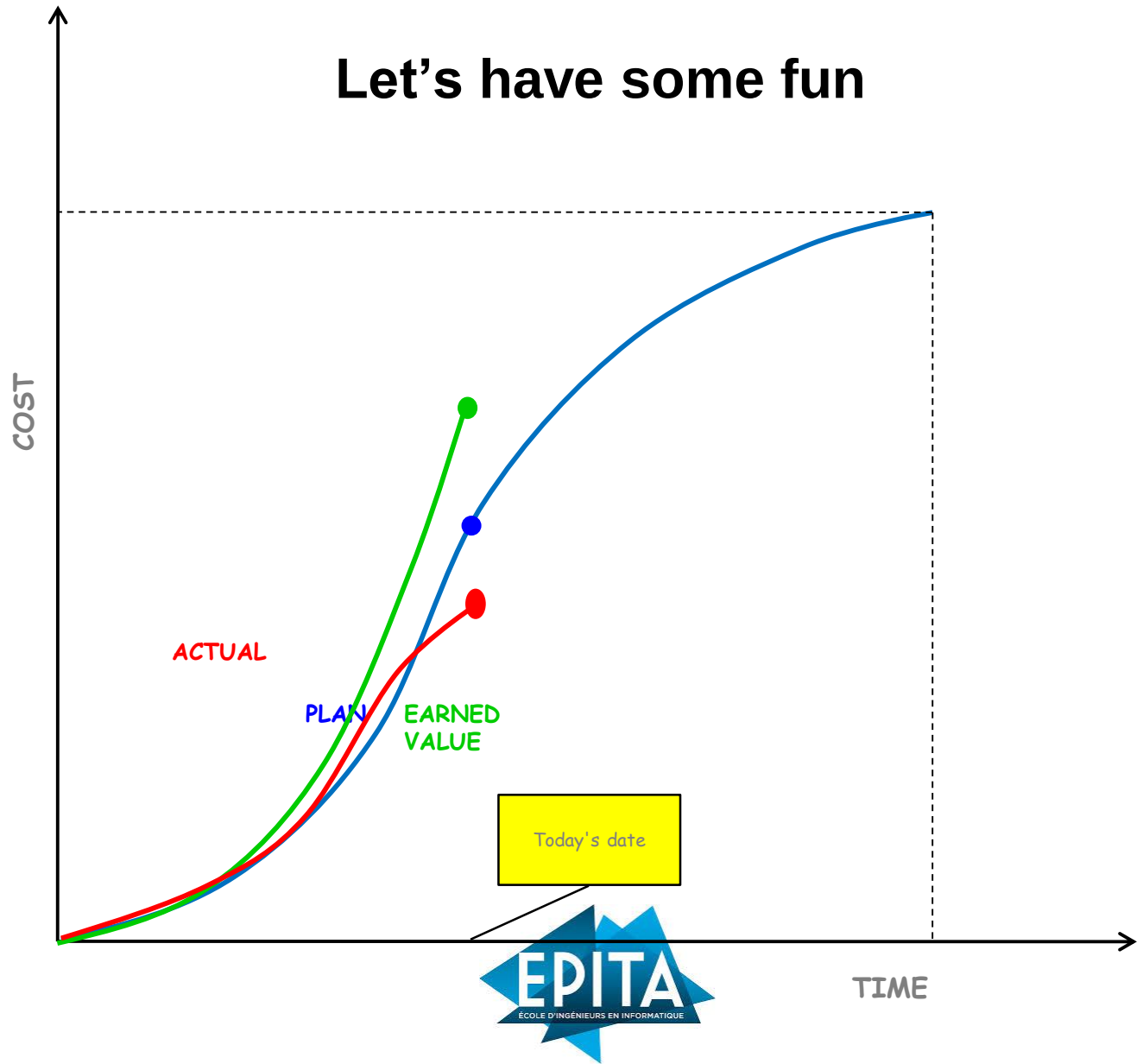
Gestion de Projet

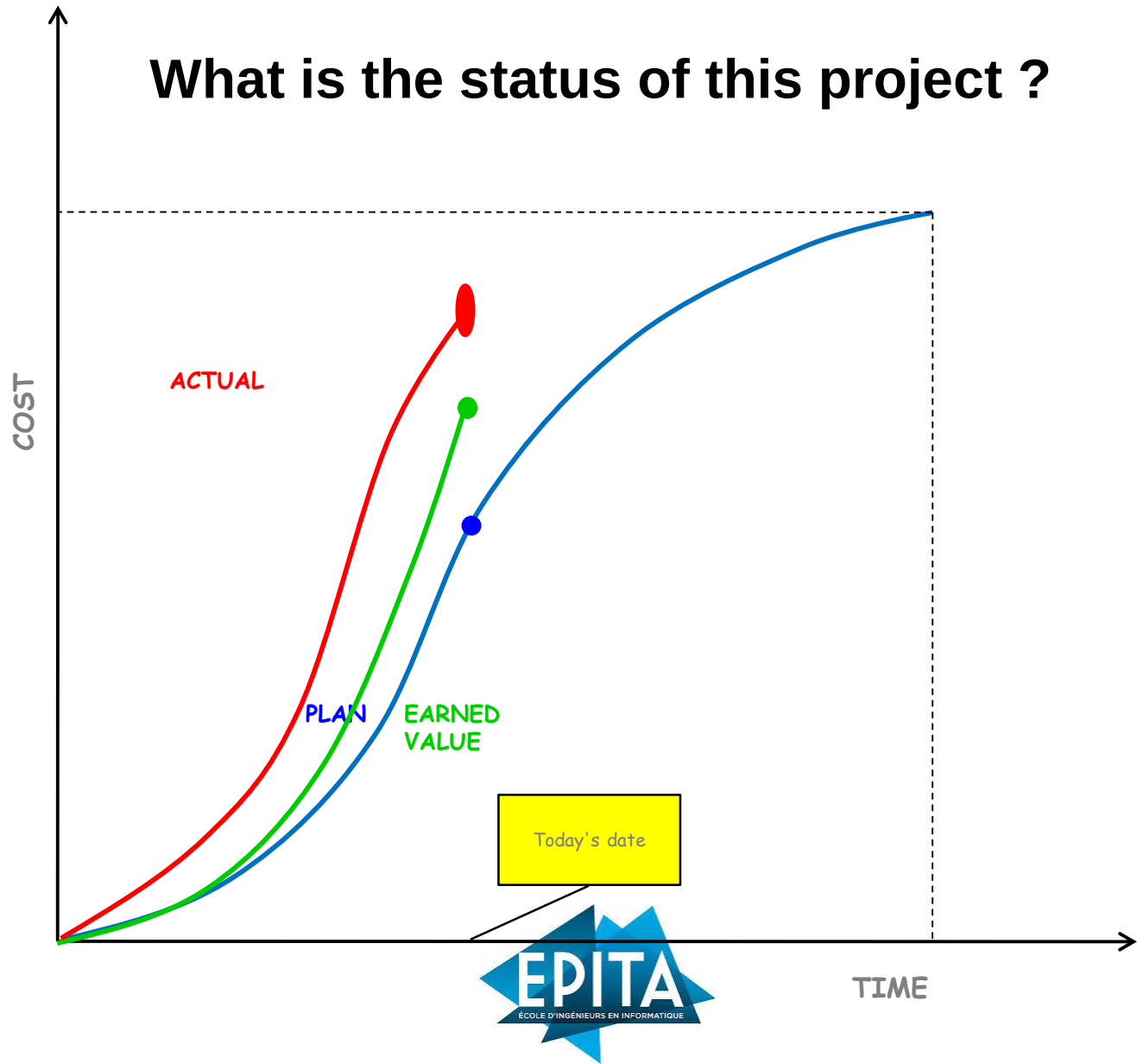
Where are we ?
What do you think ?



Gestion de Projet



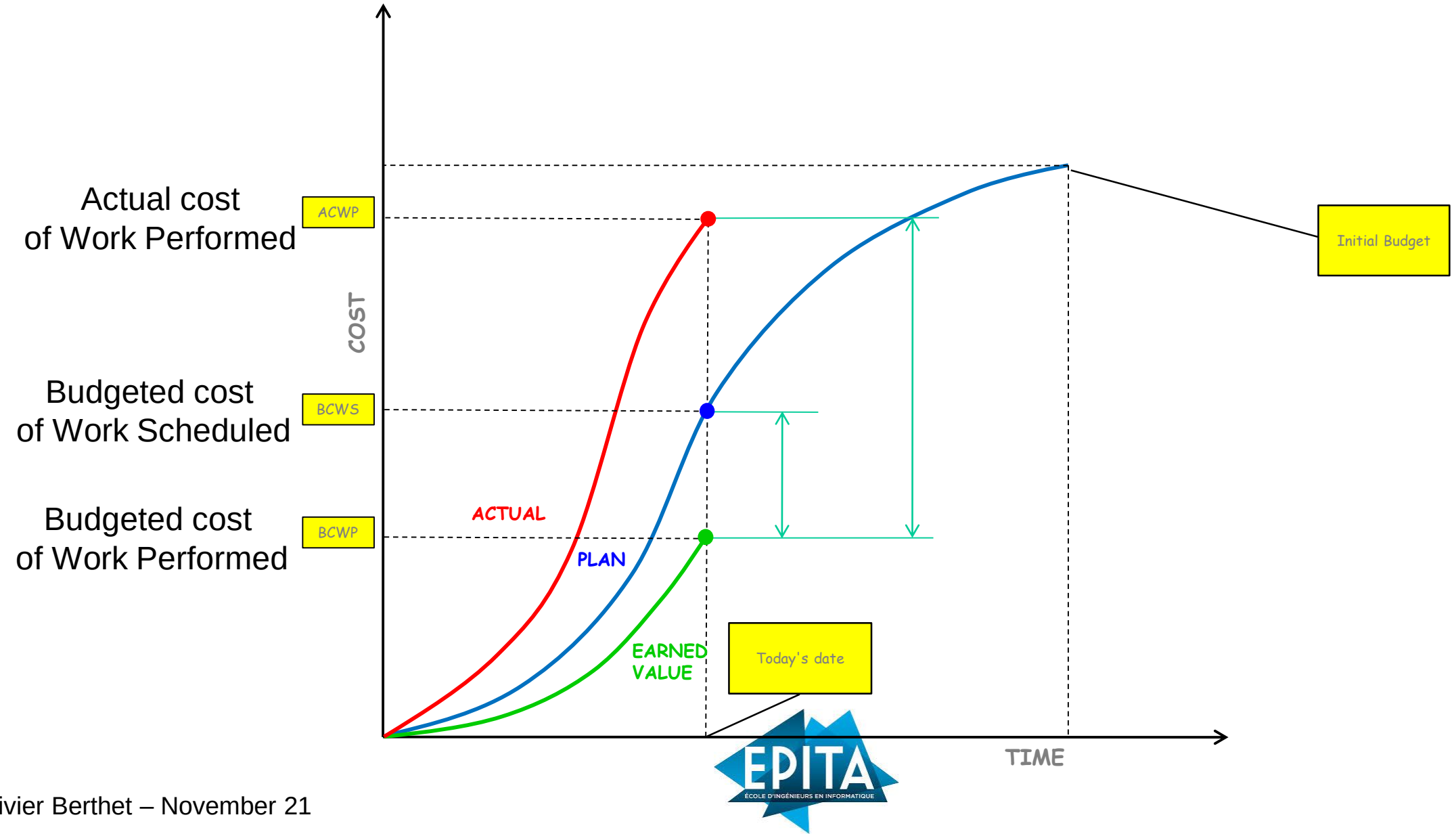

Let's have some fun
COST
ACTUAL
PLAN
EARNED VALUE
Today's date
TIME
EPITA
ÉCOLE D'INGÉNIEURS EN INFORMATIQUE


What is the status of this project ?
COST
ACTUAL
PLAN
EARNED VALUE
Today's date
TIME
EPITA
ÉCOLE D'INGÉNIEURS EN INFORMATIQUE

Terme	Signification	Définition
BCWS	Budgeted cost of Work Scheduled	This is the expected cost of the project corresponding to the expected progress. It is determined at the beginning of the project.
ACWP	Actual cost of Work Performed	This is the actual cost. This is the actual cost of the project applied to the progress made on a given date. This cost shows what really happened on the project.
BCWP	Budgeted cost of Work Performed	It is the budgetary value of the realized or the projected cost of the project applied to the progress made at a given date.

Now let's put these terms on the graph

Gestion de Projet

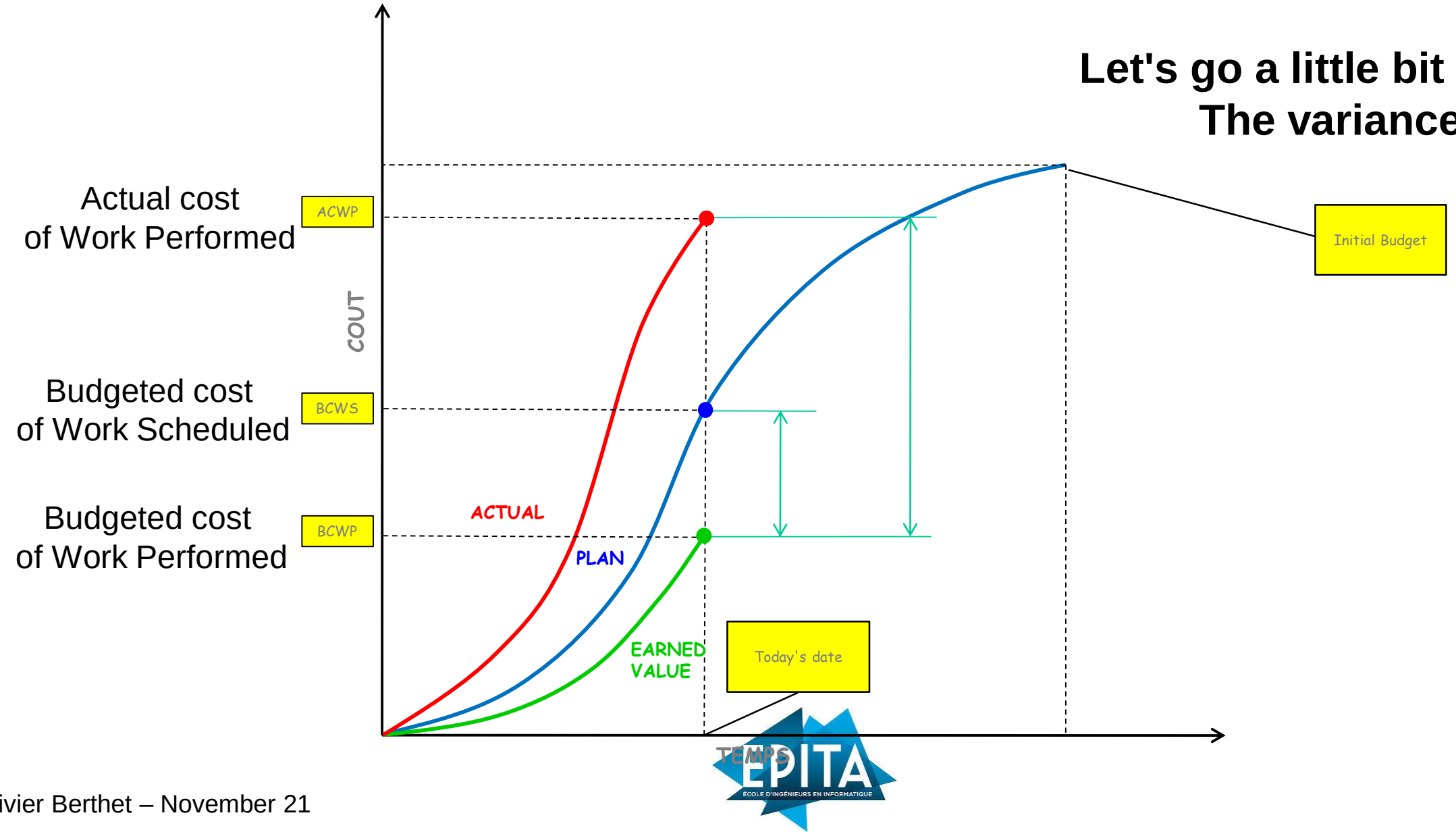


Terminology

Acronym	Meaning	Abbreviation	Signification
BCWS	Budgeted cost of Work Scheduled	PV	Planned Value
ACWP	Actual cost of Work Performed	AC	Actual Cost
BCWP	Budgeted cost of Work Performed	EV	Earned Value

Gestion de Projet

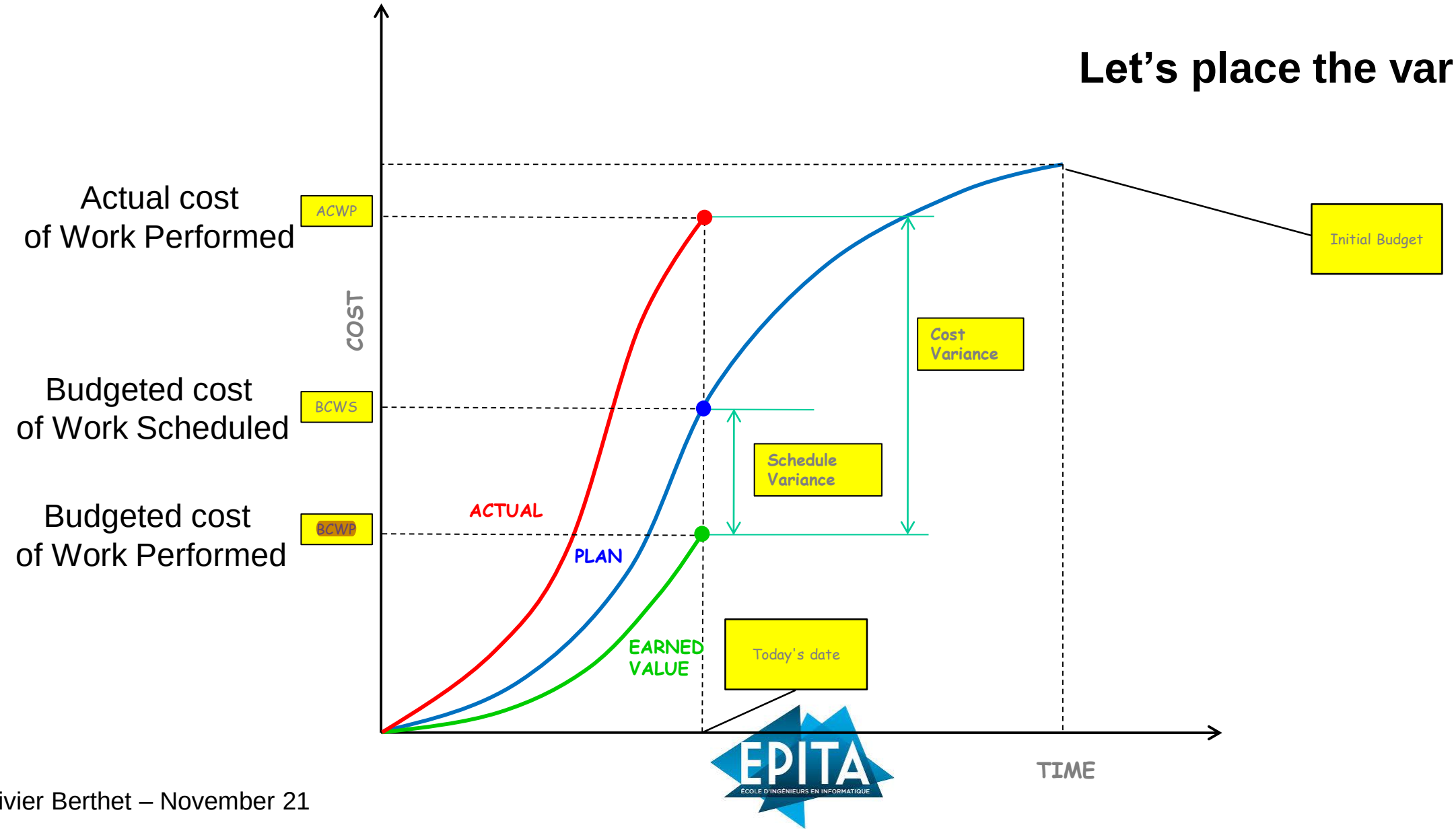
Let's go a little bit further
The variances



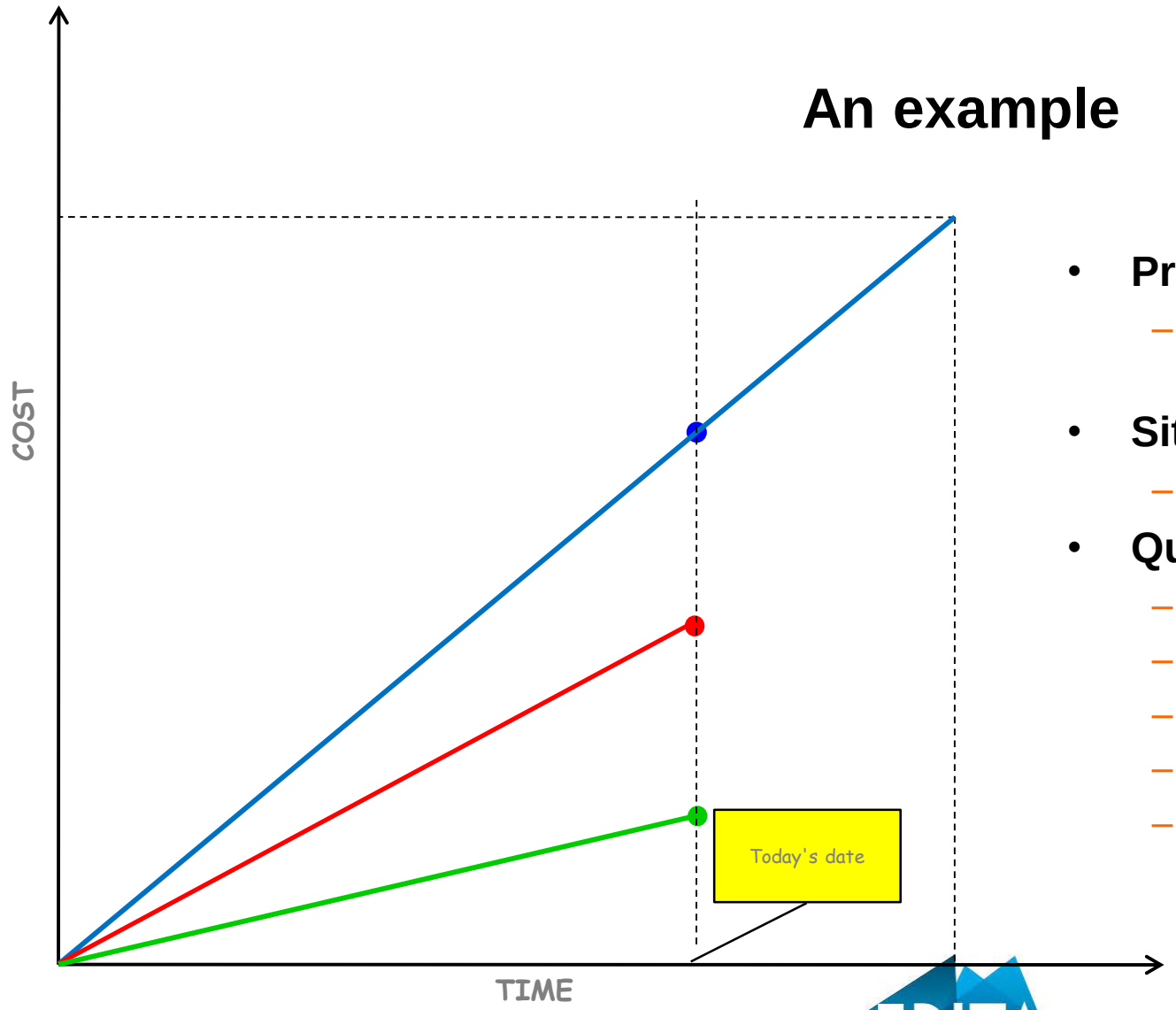
Les Variances

Terme	Signification	Formule	Définition
CV	Cost Variance	= BCWP - ACWP	The ACWP and the BCWP have the same basis of physical advancement: the work actually done. For this work actually done, it cost more or less to do what we got. The cost difference if there is one, is explained by the cost of the tasks performed.
SV	Schedule Variance	= BCWP - BCWS	The BCWP and the BCWS are calculated on the same basis: the Budgeted cost. The difference can only be explained by the difference in physical progress: more or less tasks were measured in value. But the difference can also be converted into deadlines: number of days, weeks

Let's place the variances



An example

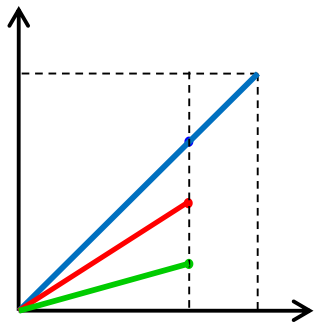


- **Project**
  - **Budget 400 k€, Duration 4 mois, Linear planning**
- **Situation after 3 months**
  - **Actual cost 200 k€, Work completed 100 k€**
- **Questions**
  - **BCWS**
  - **ACWP**
  - **BCWP**
  - **SV**
  - **CV**

An example

- **Project**
  - **Budget 400 k€, Duration 4 months, Linear planning**
- **Situation after 3 months**
  - **Actual cost 200 k€, Work completed 100 k€**

Terme	Signification	Calcul
BCWP	Budgeted cost of Work Performed	100 k€
BCWS	Budgeted cost of Work Scheduled	300 k€
ACWP	Actual costof Work Performed	200 k€
EC	Ecart de coûts = BCWP - ACWP	-100 k€
EP	Ecart de prévisions ou retard = BCWP - BCWS	-200 k€



Do we continue ? Performance indicators

- **The status of the work done is also indicated by two performance factors:**
  - **CPI (« Cost Performance Index », Efficiency) = What we did / What we spent = BCWP / ACWP**
  - **SPI (« Schedule Performance Index », Effectiveness) = What we did / What we should have done (at that date) = BCWP/BCWS**
- **The coefficient of efficiency, if less than 1, indicates that the value of Work Performed is less than the money spent. The project could exceed its budget.**
- **The coefficient of effectiveness, if less than 1, indicates that the work done is less than the planned work. The project is late.**
- **These indicators give an idea of the delay and the final cost, if the project continues at the same pace as until the measurement date.**

Variances

Terme	Signification	Formule
CV	Cost Variance	= BCWP - ACWP
SV	Schedule Variance	= BCWP - BCWS

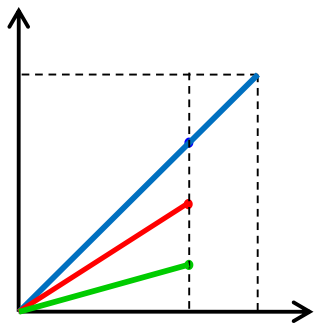
Indicators

Terme	Signification		Formule
CPI	Cost Performance Indicator	Efficiency	= BCWP / ACWP
SPI	Schedule Performance Indicator	Effectiveness	= BCWP / BCWS

Avec les indicateurs

- **Project**
  - **Budget 400 k€, Duration 4 months, Linear planning**
- **Situation after 3 months**
  - **Actual cost 200 k€, Work completed 100 k€**

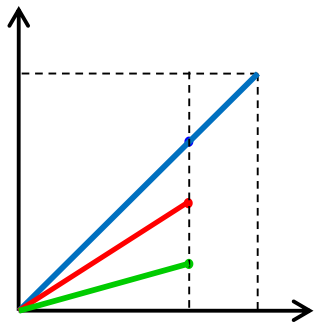
Terme	Signification	Calcul
BCWP	Budgeted cost of Work Performed	100 k€
BCWS	Budgeted cost of Work Scheduled	300 k€
ACWP	Actual costof Work Performed	200 k€
EC	Ecart de coûts = BCWP - ACWP	-100 k€
EP	Ecart de prévisions ou retard = BCWP - BCWS	-200 k€
CPI	Efficience	50%
SPI	Efficacité	33%



Reposons nous les bonnes questions

- **Project**
  - **Budget 400 k€, Duration 4 months, Linear planning**
- **Situation after 3 months**
  - **Actual cost 200 k€, Work completed 100 k€**

Terme	Signification	Calcul
BCWP	A la date d'aujourd'hui quelle est la valeur estimée du travail réellement effectué ?	100 k€
BCWS	A la date d'aujourd'hui quelle est la valeur du travail qui avait été prévu d'être fait ?	300 k€
ACWP	Actual costof Work Performed ?	200 k€
EC	Ecart de coûts = BCWP - ACWP	-100 k€
EP	Ecart de prévisions ou retard = BCWP - BCWS	-200 k€
CPI	Efficience	50%
SPI	Efficacité	33%



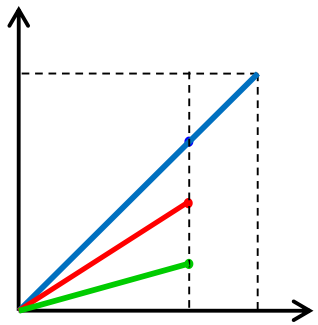
Gestion de Projet

Revised Duration

Initial Duraction / Effectiness ou SPI

4/0.33 = 12 mois

Terme	Signification	Calcul
BCWP	At today's date what is the estimated value of the work actually performed?	100 k€
BCWS	As of today what is the value of the work that had been planned to be done?	300 k€
ACWP	Actual cost of Work Performed ?	200 k€
CV	Cost Variance = BCWP - ACWP	-100 k€
SV	Schedule Variance = BCWP - BCWS	-200 k€
CPI	Efficiency	50%
SPI	Effectiveness	33%



Earned Value Method

- Method for measuring project performance on content, time, and cost
- Performance interpretation using CPI and SPI indicators

Performance Measures		Schedule		
		SV > 0 & SPI > 1.0	SV = 0 & SPI = 1.0	SV < 0 & SPI < 1.0
Cost	CV > 0 & CPI > 1.0	Ahead of Schedule Under Budget	On Schedule Under Budget	Behind Schedule Under Budget
	CV = 0 & CPI = 1.0	Ahead of Schedule On Budget	On Schedule On Budget	Behind Schedule On Budget
	CV < 0 & CPI < 1.0	Ahead of Schedule Over Budget	On Schedule Over Budget	Behind Schedule Over Budget

Improvement actions

- **Gain in Productivity: resources are now trained before tackling the last 3 faces**
- **Automation of processes**
- **Increased number of resources to catch up**

Now let's look to the future

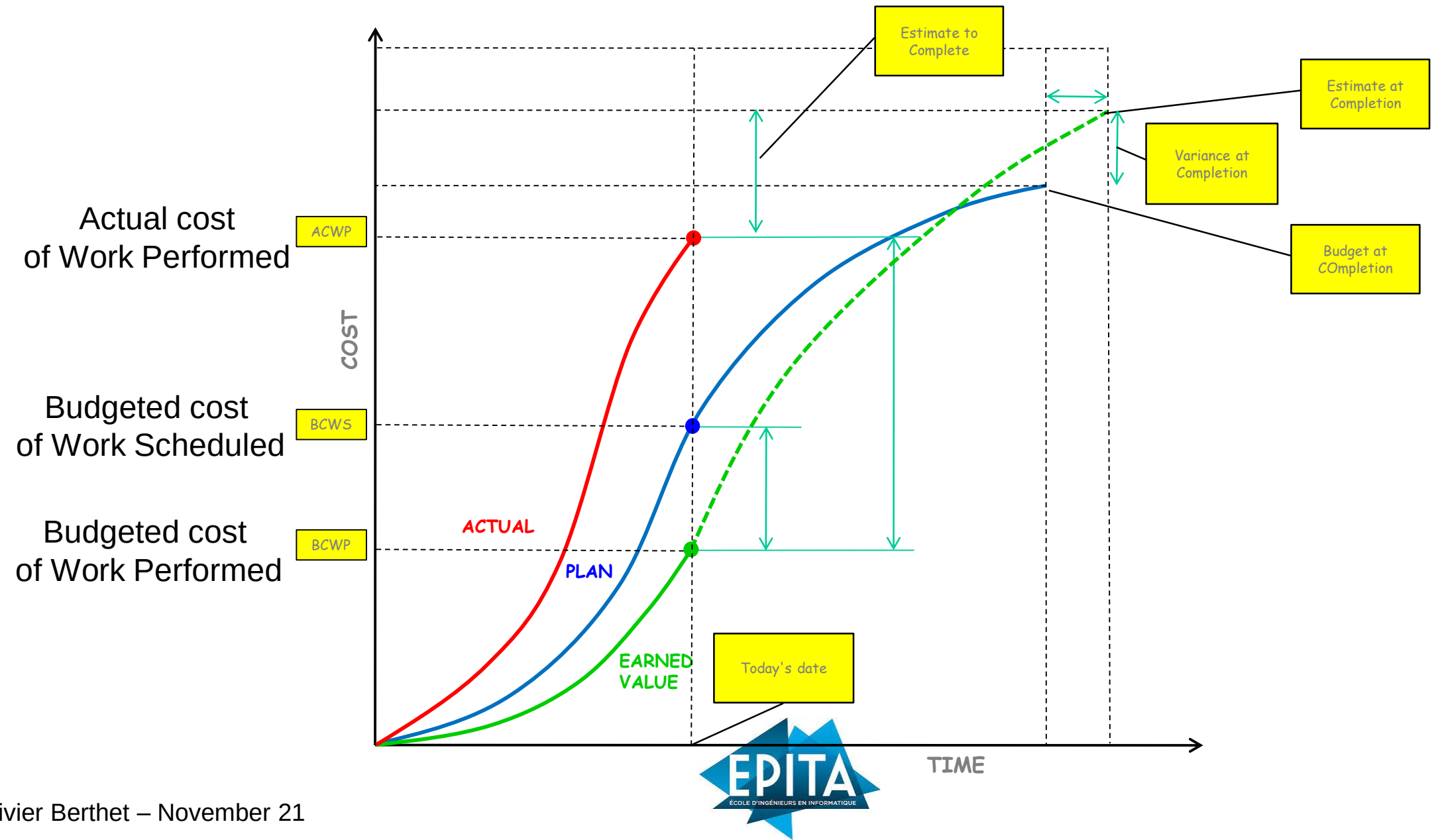
- **What does the EARNED VALUE method tell us about the end of the project ?**

Forecast values

Terme	Signification	Formule	Définition
BAC	Budget At Completion		The initial total cost budgeted
EAC	Estimate at Completion	= BAC / CPI	The expected forecast of the revised total cost
ETC	Estimate to Complete	= EAC – ACWP	Revised total cost minus the cost of Work Performed
VAC	Variance at Completion	= BAC - EAC	Difference at the end of the project between the final cost and the budget

EAC Estimate at Completion or the Final cost

Gestion de Projet

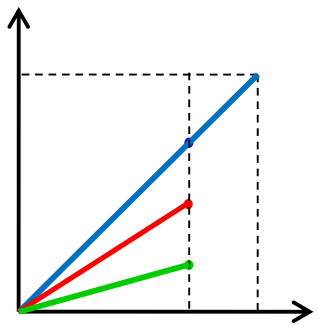


Exercice

- **Project**
  - **Budget 400 k€, Duration 4 months, Linear planning**
- **Situation after 3 months**
  - **Actual cost 200 k€, Work completed 100 k€**

•

Terme	Signification	Calcul
BCWP	Budgeted cost of Work Performed	100 k€
BCWS	Budgeted cost of Work Scheduled	300 k€
ACWP	Actual cost of Work Performed	200 k€
CPI	Efficiency	50%
SPI	Effictiveness	33%
BAC	Budget at Completion	400 k€
EAC	Estimate at Completion	800 k€
ETC	Estimate to Complete	600 k€
VAC	Variance at Completion	400 k€



It's your turn to play - Exercise

- **Your project is to build a box. The box has six faces**
- **Each face takes a day to build. Each face is budgeted at 1000 €**
- **Faces must be built one after the other**
- **Today we are at the end of the 3rd day, Your team reports you the following situation**

Tâche	Progrès	Coût ACTUAL
Tâche 1	100%	€1,200
Tâche 2	100%	€1,000
Tâche 3	75%	€750
Tâche 4	50%	€500
Tâche 5	0%	€0
Tâche 6	0%	€0

- **Using the following table, calculate the parameters and give your interpretation of the project's performance**

Parameter	Calculation	Result
BAC		
BCWP		
BCWS		
ACWP		
CV		
SV		
CPI		
SPI		

It's your turn to play - Exercise

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Tâche 5	0%	€0
Tâche 6	0%	€0

Parameter
BAC
BCWP
BCWS
ACWP
EC
EP
CPI
SPI

Gestion de Projet

Parameter	Calculation	Result
BAC		
EAC		
ETC		
VAC		

Project Management

EPITA Information Management Master

Project Management

Module 4

Olivier BERTHET

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Source : Photo Afidium

Exam

- **Participation to the 6 modules/sessions (30% of your score)**
- **Exercises and homework 30%**
- **Quiz 100 questions in 2 hours 40%**

Structure

1. Introduction to Project Management
2. Integration Management
3. Perimeter management
4. Time management
5. Cost management
6. Quality and Human Resources Management
7. Communication and risk management
8. Purchasing and Stakeholder Management
9. Ethics and professional conduct

Quality Management

Important points

- **Customer satisfaction**
  - **Compliance with the requirement**
  - **Suitability for use: product / service produced must meet real needs**
- **Prevention on inspection**
  - **Cost of error prevention <correction costs**
- **Continuous improvement (Kaizen)**
  - **Based on the PDCA cycle**
  - **Use of quality improvement initiatives eg TQM, 6 sigma**
  - **Using process improvement models, for example OPM3, CMMI, Malcolm Baldrige**
- **Management responsibility**
  - **To provide the resources needed to succeed**

Objectives

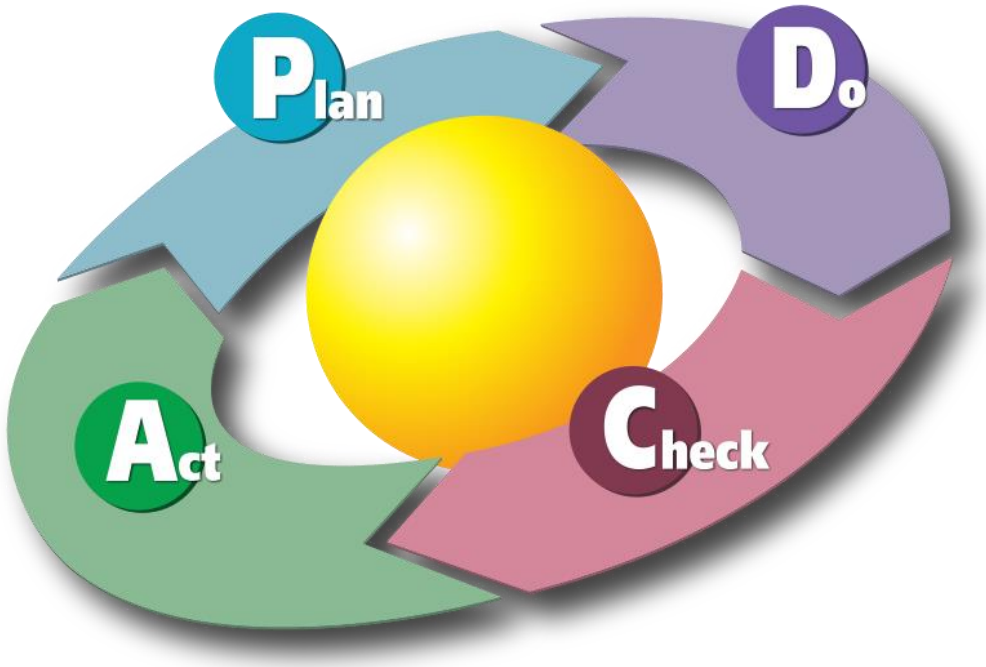
- **Understand the importance of quality management in project management**
- **Describe quality planning**
- **Show the importance of quality assurance**
- **Explain the main results of the quality control process**

- **Understand the practicalities of training and leading project teams**

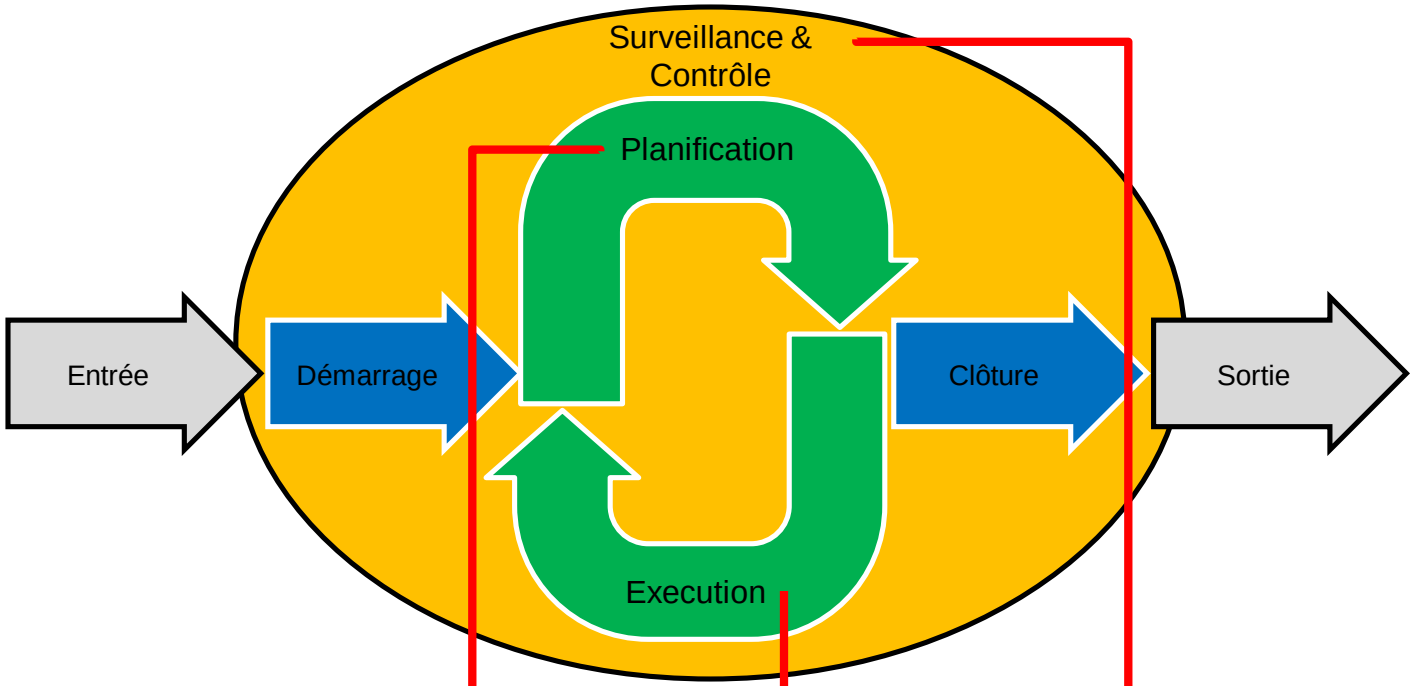
Definition of Quality

- **The International Organization for Standardization (ISO) defines quality as "the extent to which a set of intrinsic characteristics meets the requirements" (ISO9000: 2000)**
- **Other experts define quality based on**
  - **Compliance with requirements: Project processes and products meet written specifications**
  - **Fitness for use: a product can be used as intended**

Shewhart and Deming Plan-Do-Check-Act



Gestion de Projet



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Control	Closing
Quality		Quality Planning	Implement Quality Assurance	Implement Quality Control	

Quality Management Process

- **8.1 Quality planning**
  - **To identify the quality standards applicable to the project and to determine how to meet them**
- **8.2 Implement quality assurance**
  - **Periodic evaluation of the overall performance of the project against quality standards**
- **8.3 Implement quality control**
  - **Monitoring specific project results to determine if they meet the corresponding quality standards**
  - **Identification of ways to eliminate the causes of unsatisfactory results**

Quality planning

- **Quality Management Plan contains:**
  - **Project Management Method**
  - **Review of processes**
  - **Major control points**
  - **Inspection and acceptance criteria**
- **Quality indicators**
  - **What are the important things to measure and what is acceptable?**
- **Quality checklists**
  - **A list of items to inspect, measures to be taken if defects are found**

Some tools and techniques of quality control

- **Six Sigma**
- **Quality control diagrams**
- **Ishikawa diagrams**
- **Tests**
- **Maturity models**
- **ISO 15504 Standards**

Six Sigma 6σ

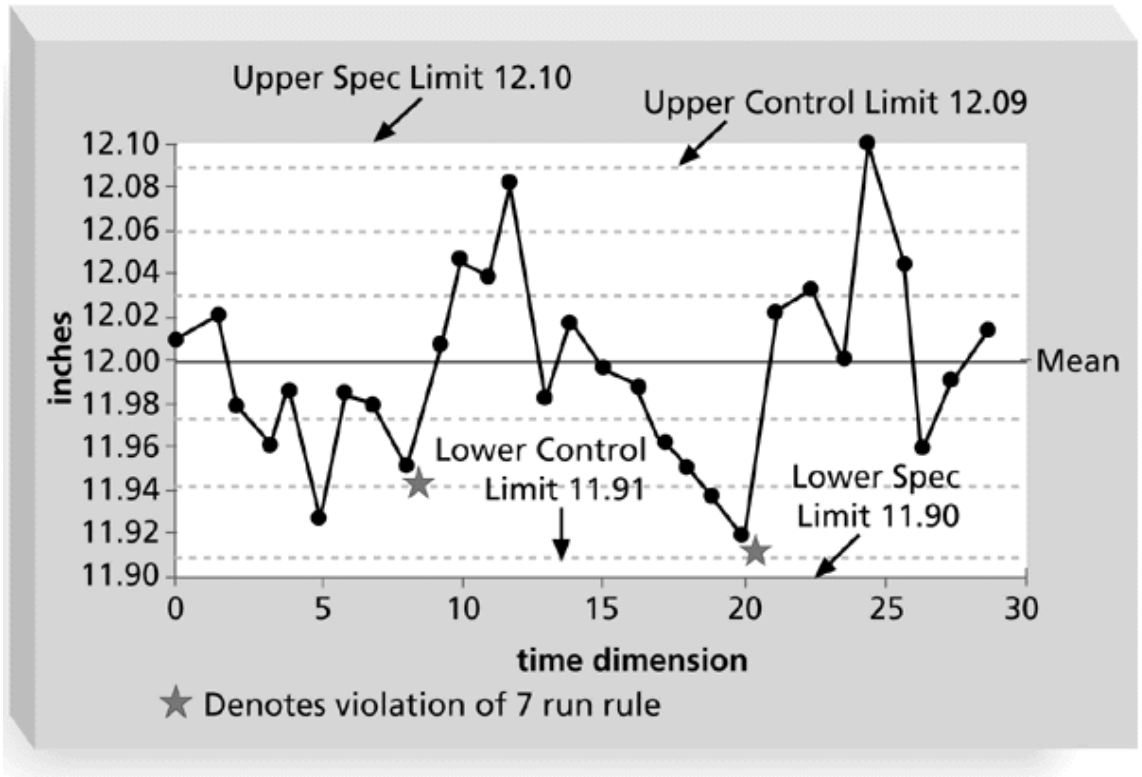
- **Six Sigma is a structured management method aimed at improving the quality and efficiency of processes.**
- **The Six Sigma method was first applied to industrial processes before being extended to all types of processes, including administrative, logistical, commercial and energy saving.**

Six Sigma (6 Σ) ©12manage.com

Sigma	% Good	% Defects	DPMO
1	30,9%	69,1%	691.462
2	69,1%	30,9%	308.538
3	93,3%	6,7%	66.807
4	99,38%	0,62%	6.210
5	99,977%	0,023%	233
6	99,9997%	0,00034%	3,4

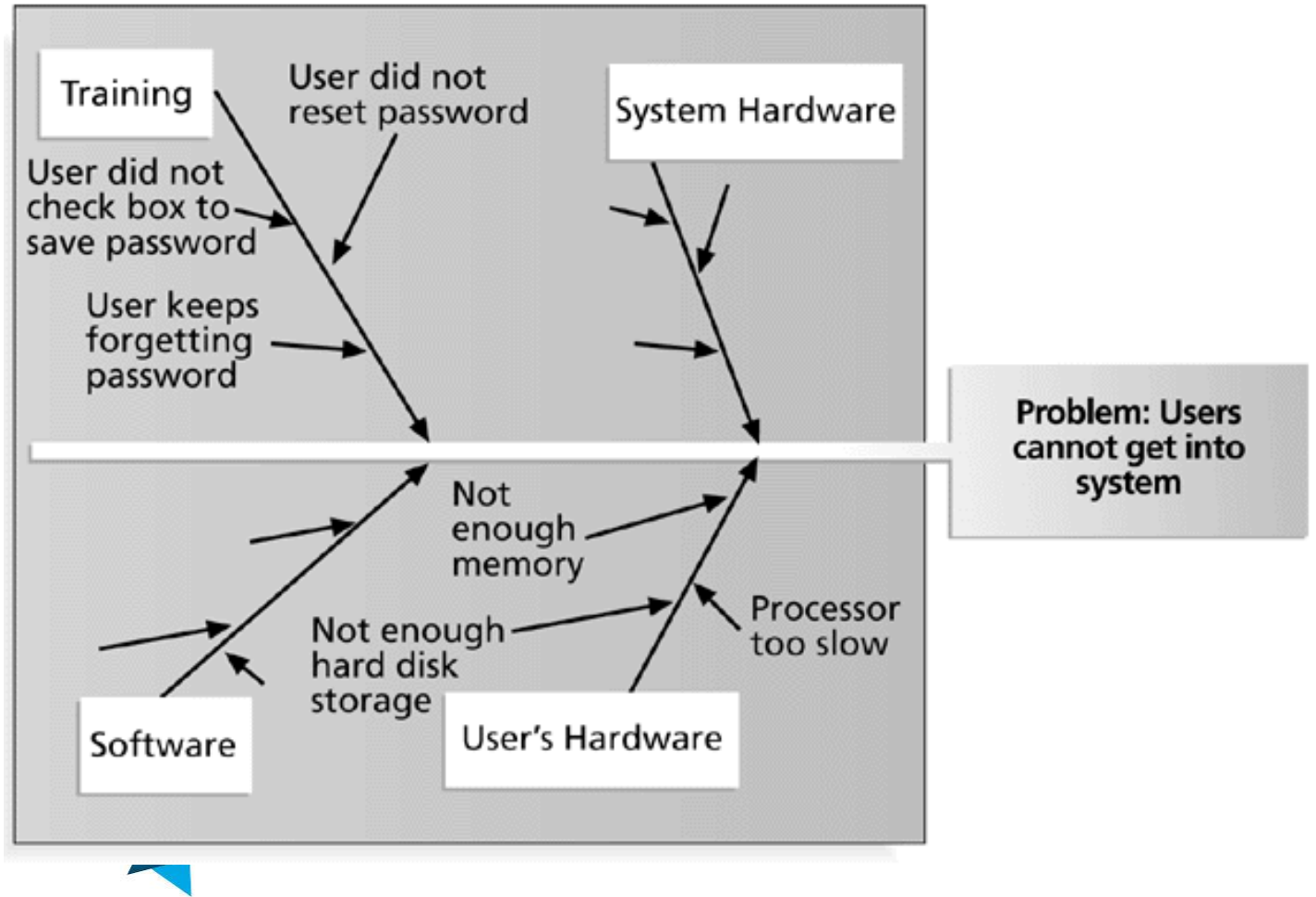
Control diagrams

- **Determine if a process is stable and has a predictable performance.**
- **Answer the question: are the process results within acceptable limits?**



Cause-effect diagram (Ishikawa)

- **Helps find the cause of a problem**
- **Fishbone diagrams that illustrate how various factors might be related to problems**
- **Used in determining needs with users**



Pareto

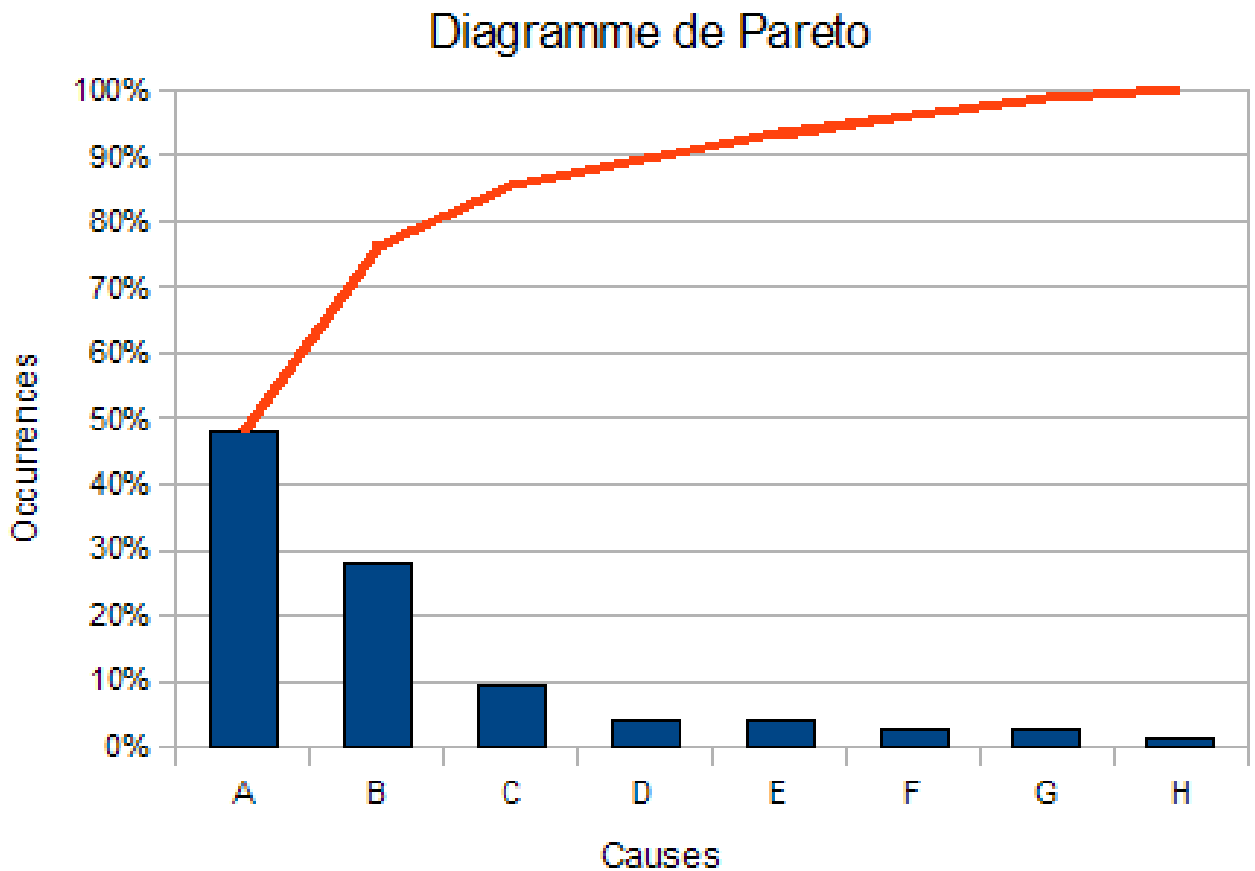


Diagramme de Pareto
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Occurrences
A
B
C
D
E
F
G
H
Causes


20% EFFORT
80%
RESULTS

Tests


OUR GOAL IS TO WRITE BUG-FREE SOFTWARE. I'LL PAY A TEN-DOLLAR BONUS FOR EVERY BUG YOU FIND AND FIX.
YAHOO!
WE'RE RICH
YES!!! YES!!! YES!!!
I HOPE THIS DRIVES THE RIGHT BEHAVIOR.
I'M GONNA WRITE ME A NEW MINIVAN THIS AFTER-NOON!

Tests

- **Activity which consists in checking if the product or service is exempt (as much as possible) from errors, defects, bugs, performance problems, etc.**
- **Activity that should be done throughout the development cycle of an information system**

Types of tests (some examples)

- **Unit tests**
  - Test programs individually
- **Integration tests**
  - Test several programs together
- **Conversion tests**
  - Test the reliability and completeness of the data in the new system
- **System tests**
  - Test the entire system
- **Compatibility tests**
  - Test system compatibility with other systems in place
- **Performance tests**
  - Test the system performance in real context
  - Test the system performance in high demand context
- **Security tests**
  - Test data security (reliability, integrity)
  - Test the system in a failover context
- **User tests**
  - Usability tests
  - Functional tests
  - Process tests

If you consider a diagram to determine the potential causes, which one will you use?

a) **A control diagram**

b) **A Pareto diagram**

c) **A fishbone diagram of Ishikawa**

d) **A checklist**

If you consider a diagram to determine the potential causes, which one will you use?

a) **A control diagram**

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d) **A checklist**

What is the best definition of Kaizen's principle?

a) **Define quality processes and verify that they are used**

b) **Continuous improvement**

c) **Verification of product quality**

d) **Have a quality management plan**

What is the best definition of Kaizen's principle?

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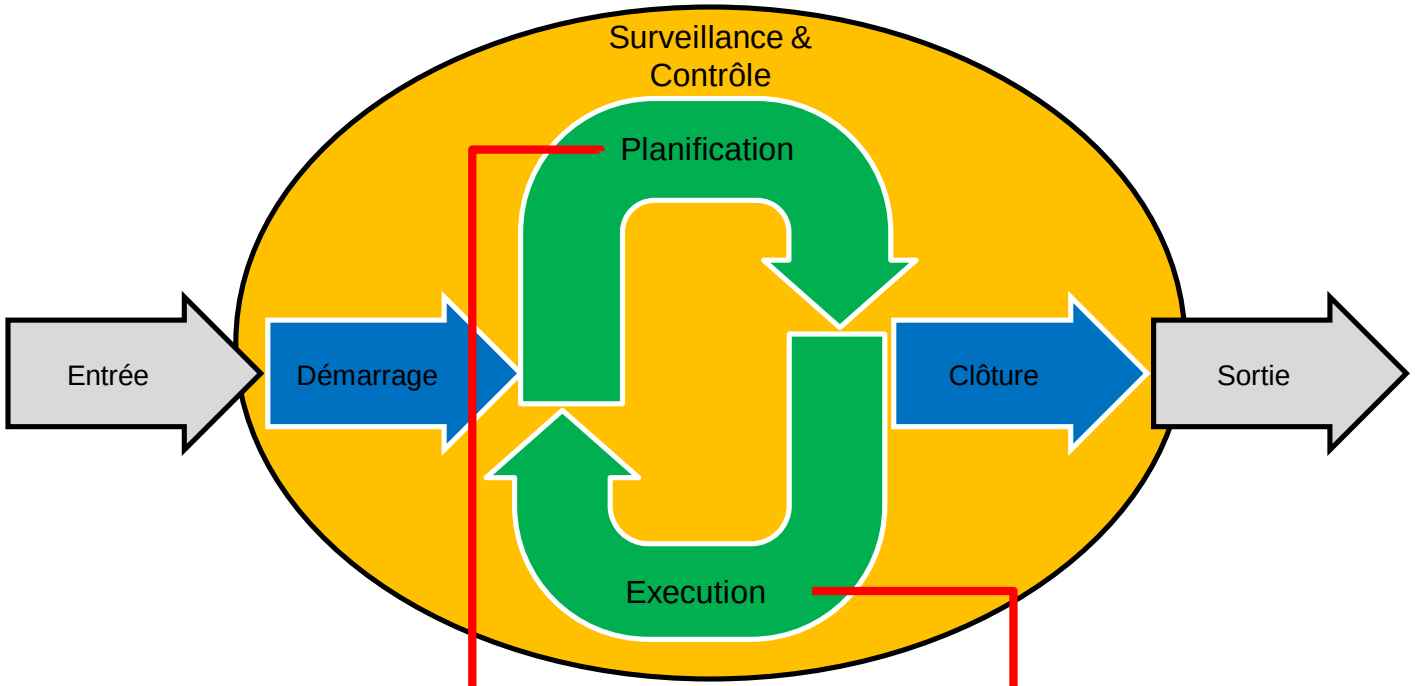
Human resources

Gestion de Projet



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Control	Closing
Human Resources		Develop Human Resources plan	Set up the team Train the team Manage the team		

Human Resources Management Process

- **9.1 Develop the Human Resources Plan**
  - **Identify and document roles, responsibilities and competencies required, reporting relationships and creating a management plan**
- **9.2 Set up the team**
  - **Confirm the availability of resources and put in place the team needed to complete the project.**
- **9.3 Train the team**
  - **Improve the skills and cooperation of team members to improve project performance**
- **9.4 Manage the team**
  - **Track the performance of team members**

RACI Matrix

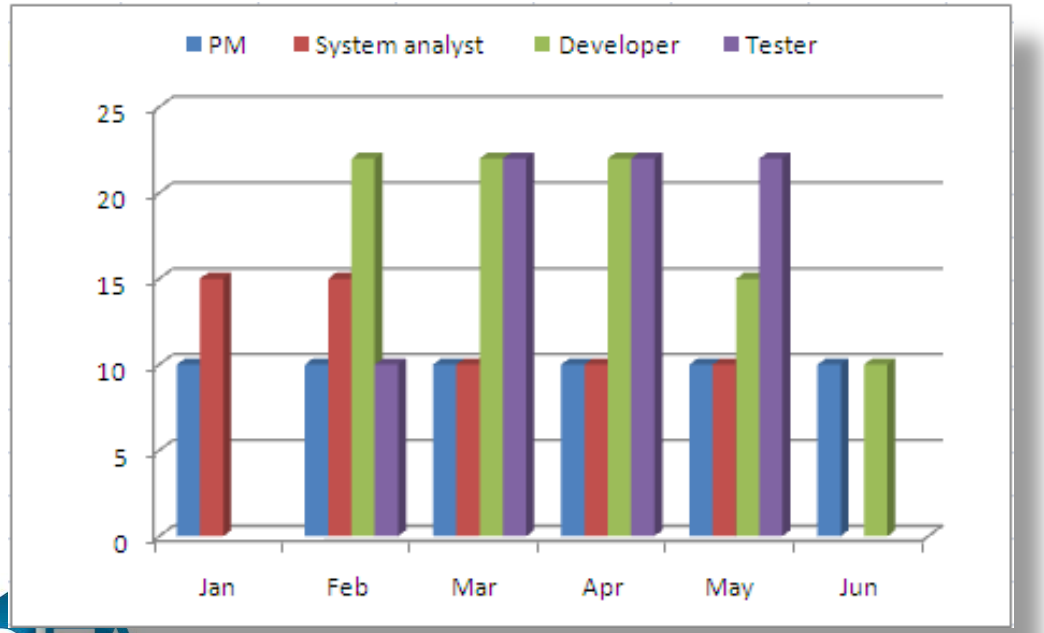
	Richard	Camille	Louis	Juliette	Nicolas
Define	A	R	I	I	I
Design	I	A	R	C	C
Program	I	A	R	C	C
Test	A	I	I	R	I

R = Responsibility; A = Accountability; C = Consult I = Inform

R= Who executes the tasks
A= Who approves the activity
C= Who has the information necessary to execute the task
I= Who is informed of the result and the status of the task

Human Resources Management Plan

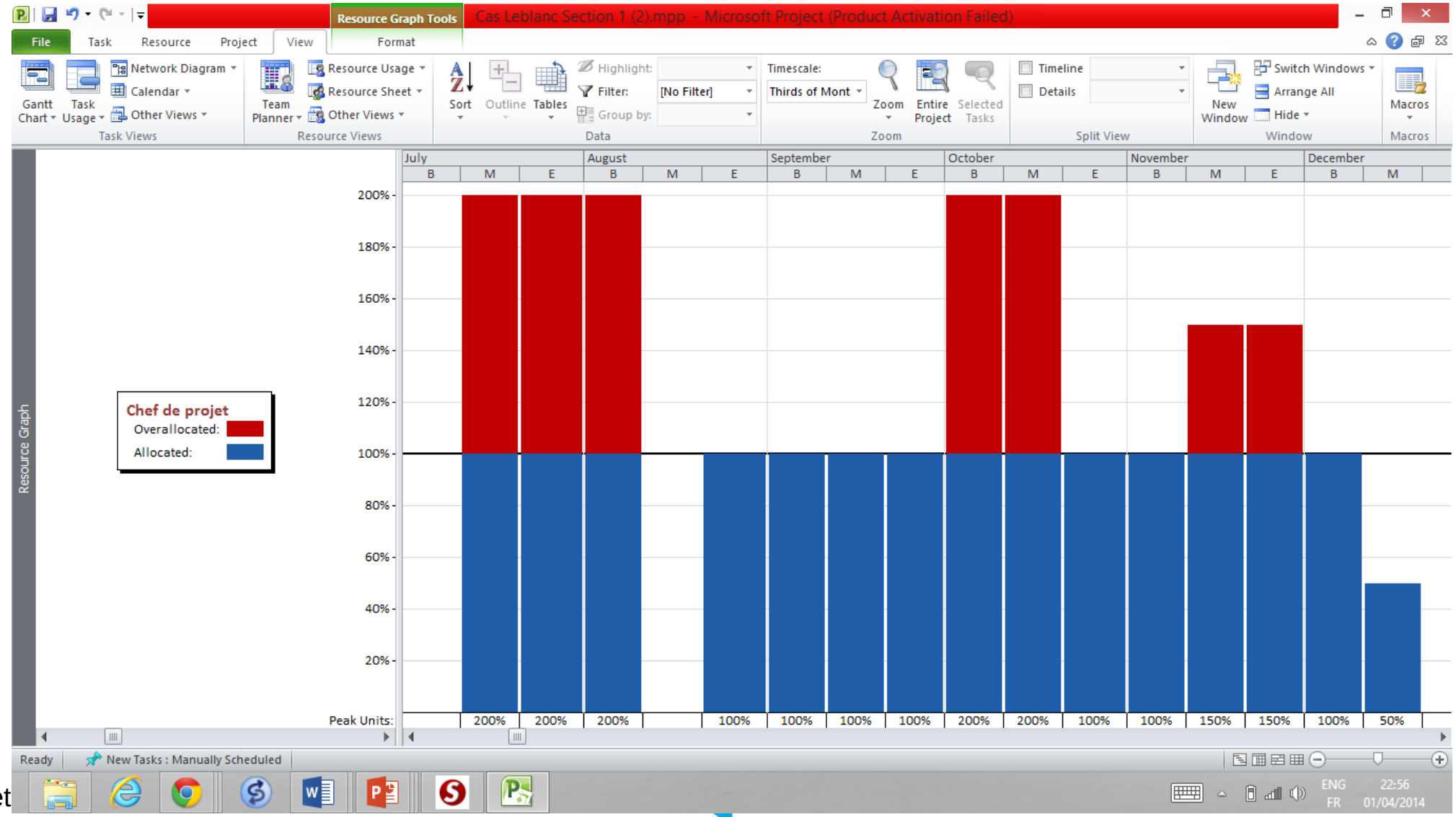
- **Human Resources Plan includes but not limited to**
  - **Roles and responsibilities**
  - **skills**
- **Organization chart of the project**
- **Resource Management Plan**
  - **Assignment of persons**
  - **Resource calendars**
  - **Reallocation plan**
  - **Training plan**
  - **Recognition and awards**
  - **Compliance and security**
- **Histogram of resources**



Resource allocation

- **Resource allocation refers to the number of people required to perform a number of activities over a given period of time.**
- **Take into account the use and availability of resources**
- **Allows the project manager to understand the impact of a project on the work schedule of the individuals involved.**
- **Over-allocation means that more resources than available are allocated to performing a particular activity over a given period of time.**

Find the mistake



Train the team

- **Relational skills (soft skills)**
- **Training**
  - **Can be formal (classroom, online) or non-formal (on-the-job training, mentoring, coaching)**
- **Co-location**
  - **Place several or all of the most active team members in the same physical location**
- **Recognition and reward**

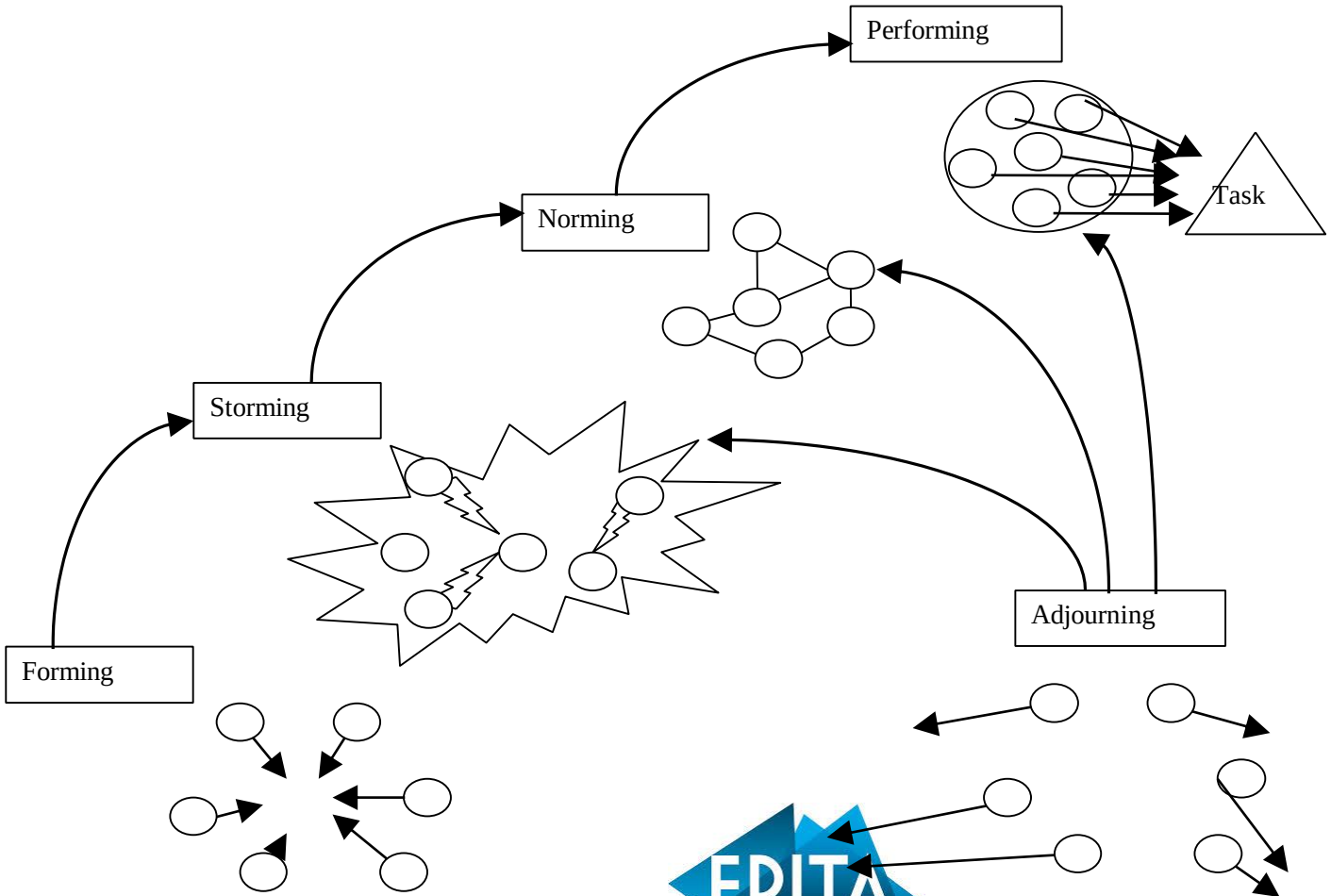
Form the project team – virtual teams

- **Allows you to form teams with people from the same organization who reside in different geographic areas**
- **Adds specific expertise to the team**
- **Allows employees to work from home**
- **Allows teams of people working on different schedules**
- **Allows to continue with projects that would have been ignored otherwise because of high travel costs**

Stages of development of a group (Tuckman, 1965)

- **Forming (inclusion)**
  - **The team meets and discovers the project, their role and responsibilities**
- **Storming (assault)**
  - **The team addresses project work, technical decisions and the project management approach. Conflicts and disagreements may appear**
- **Norming (adjustment, control)**
  - **The team works together and adjusts work habits to support the team**
- **Performing (production, acceptance)**
  - **The team acts as a very powerful unit**
- **Adjourning (separation, death)**
  - **The team finishes the work and leaves the project**

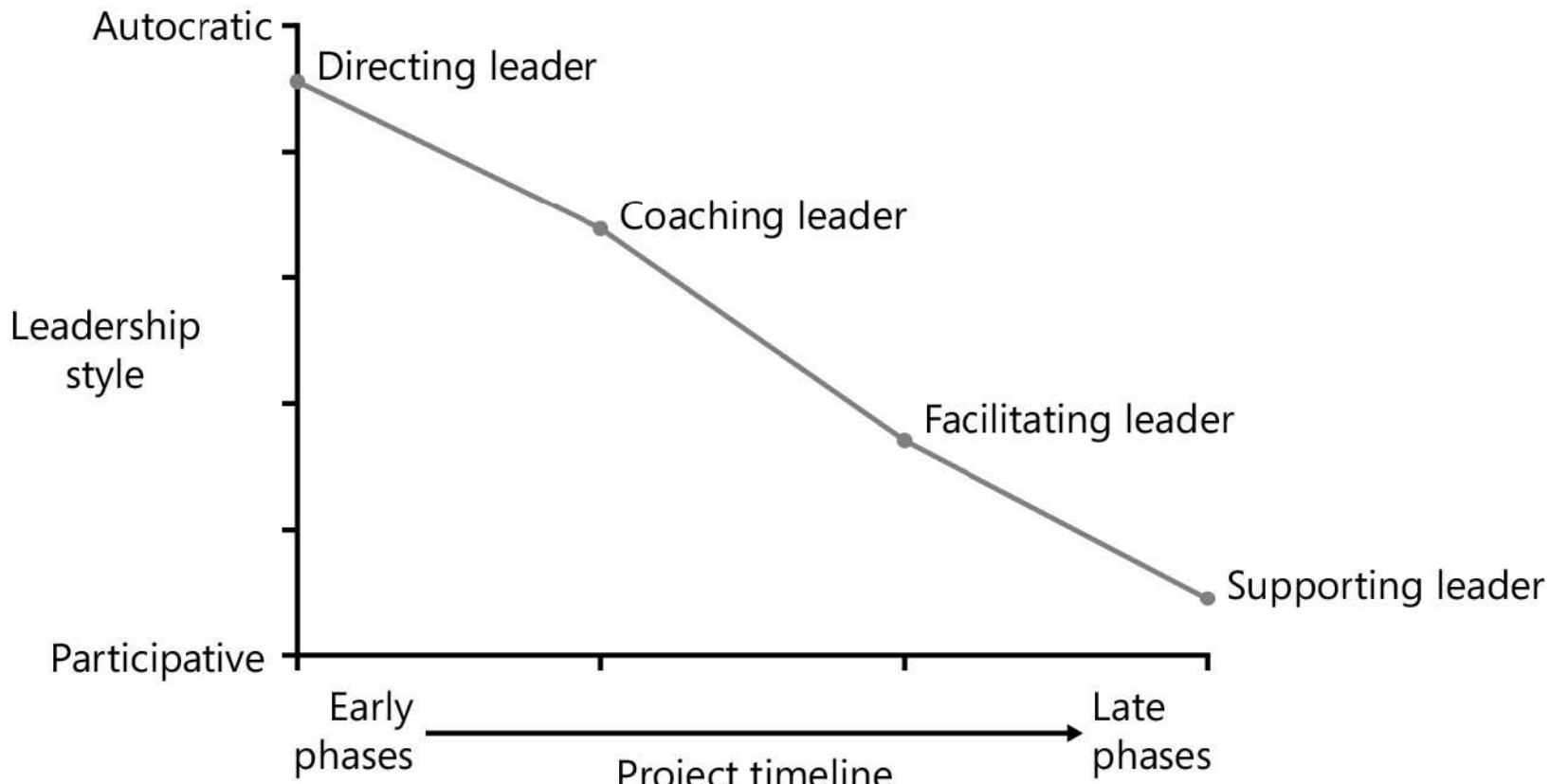
Stages of development of a group (Tuckman, 1965)



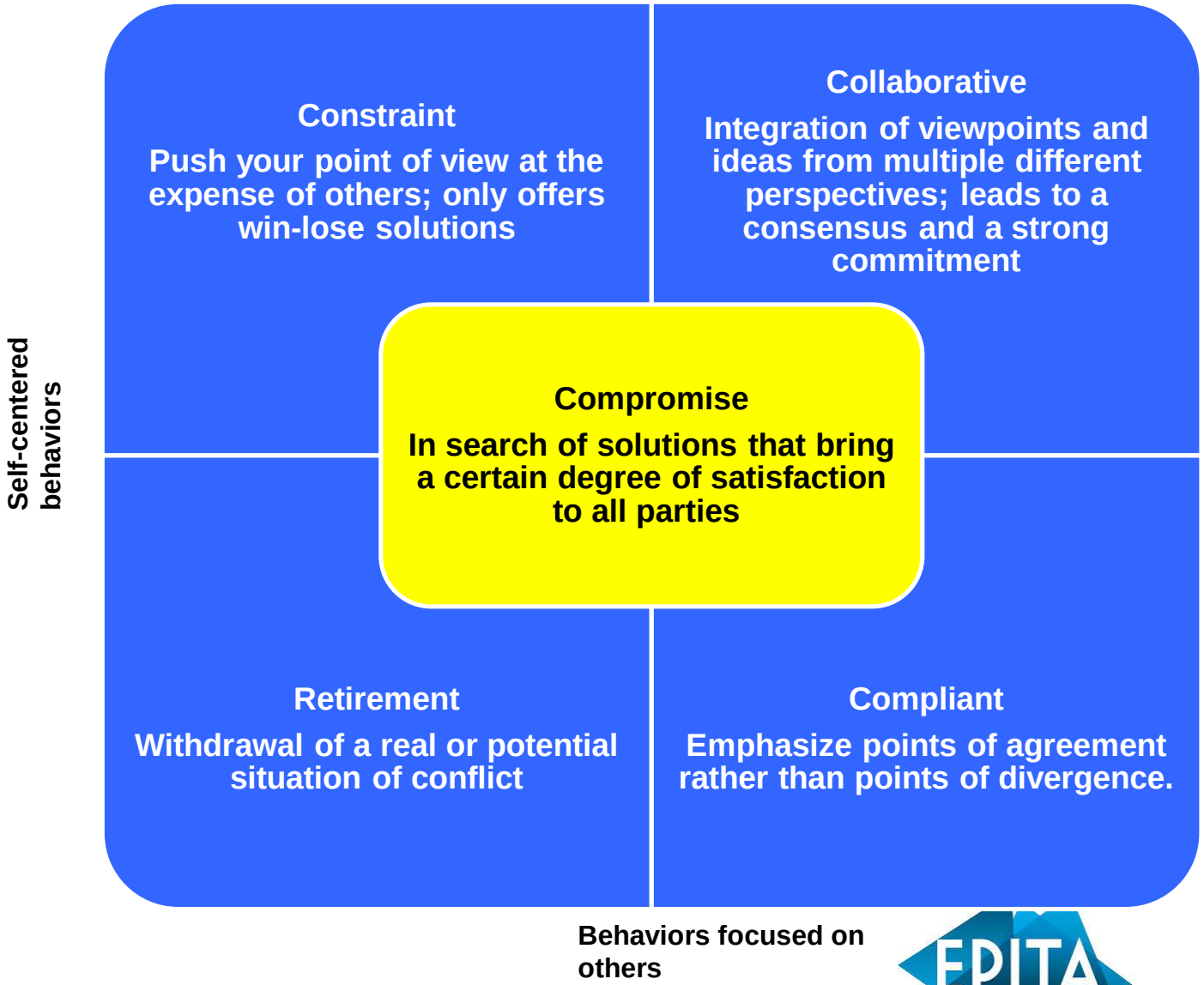
Conflict management

- **Conflicts can be beneficial (one of the opportunities for improvement)**
- **The conflicts in the team are due to the following reasons**
  - **Schedule**
  - **Project priorities**
  - **Resources**
  - **Technical solutions**
- **The most common cause of conflicts in projects are scheduling issues**
- **Conflict better resolved by those involved in the conflict**

Different types of management are needed at different stages of a project



Gestion de Projet



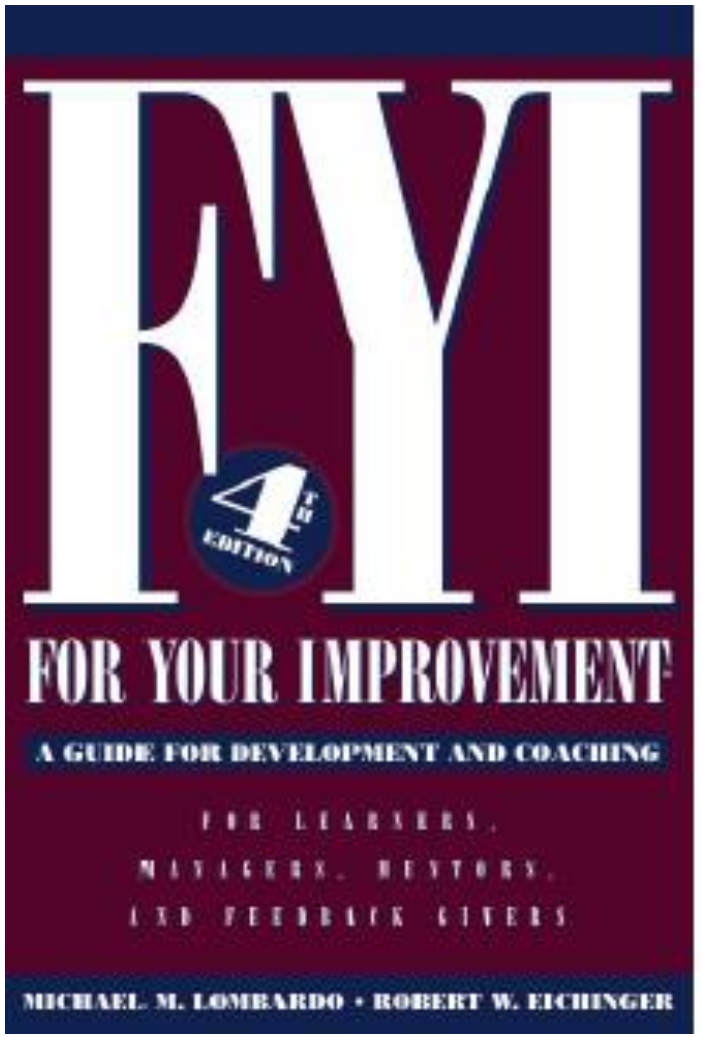
Confront & Solve problems

Treat the conflict as a problem to be solved by examining alternatives

Requires a "give and take" attitude and an open dialogue.

FYI Lominger

- **Exemple : Planning**
- **Card : Motivating others**



FRONT • THE LEADERSHIP ARCHITECT® COMPETENCY SORT CARDS

36 MOTIVATING OTHERS

SKILLED

Creates a climate in which people want to do their best; can motivate many kinds of direct reports and team or project members; can assess each person's hot button and use it to get the best out of him/her; pushes tasks and decisions down; empowers others; invites input from each person and shares ownership and visibility; makes each individual feel his/her work is important; is someone people like working for and with.

36B MOTIVATING OTHERS

OVERUSED SKILL

May not be good at building team spirit because of an emphasis on individuals; may be seen as providing inequitable treatment by treating each person individually; may not take tough stands when the situation calls for it; may take too long getting input; may be reluctant to assign work with tough deadlines.

UNSKILLED

Doesn't know what motivates others or how to do it; people under him/her don't do their best; not empowering and not a person many people want to work for, around or with; may be a one-style-fits-all person, have simplistic models of motivation, or may not care as much as most others do; may be a driver just interested in getting the work out; may have trouble with people not like him/her; may be a poor reader of others, may not pick up on their needs and cues; may be judgmental and put people in stereotypic categories; intentionally or unintentionally demotivates others.

Two members of the project team are in deep disagreement over the technical design of an important element of the project. You ask them to continue working and ignore the problem. Which conflict resolution technique do you use?

a) **Compromise**

b) **Collaborative**

c) **Constraint**

d) **Retirement**

Two members of the project team are in deep disagreement over the technical design of an important element of the project. You ask them to continue working and ignore the problem. Which conflict resolution technique do you use?

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What is the order of the phases that a team will go through according to Tuckman's model?

a) **Forming, storming, norming, performing, adjourning**

b) **Norming, storming, forming, performing, adjourning**

c) **Storming, norming, forming, performing, adjourning**

d) **Storming, forming, norming, performing, adjourning**

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d) **Storming, forming, norming, performing, adjourning**

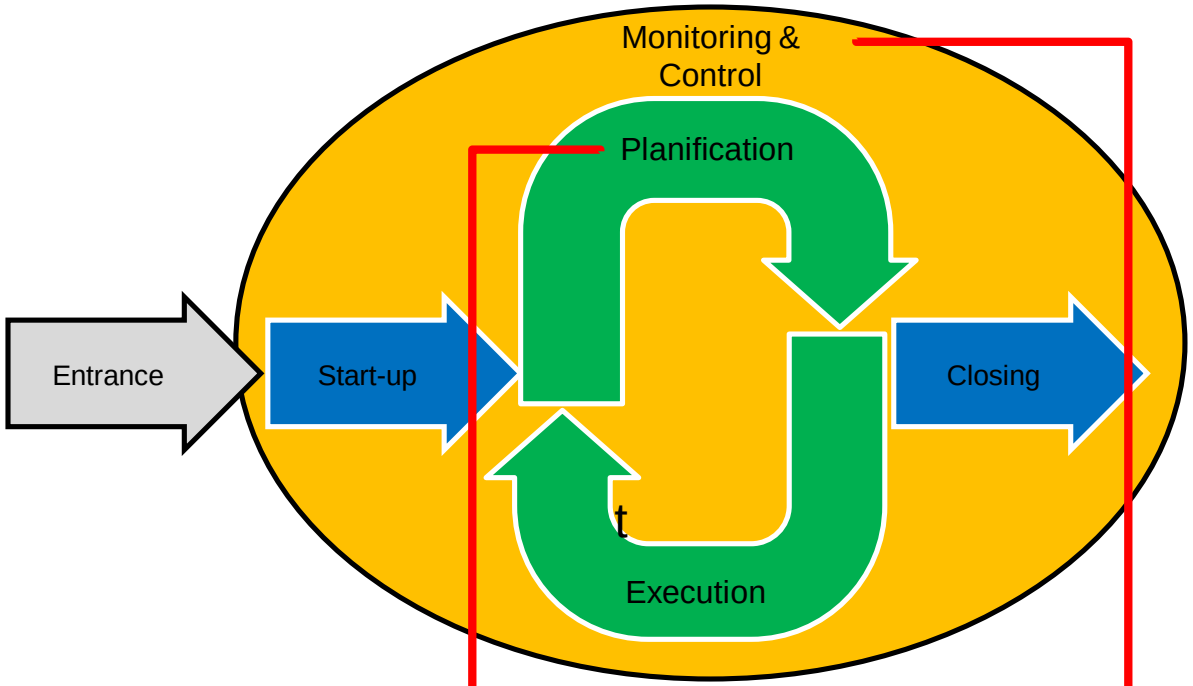
Communication Management

Objectives of this course

- **Understand what is good management of project communications**
- **Know the different methods that improve the management of project communications**
- **Understand the different methods of communication**
- **Understand what is risk and its importance in project management**
- **Know how to identify and measure the risks of a project**

Communication Management

Gestion de Projet



Knowledge Area	Process				
	Start-up	Planning	Execution	Monitoring & Control	Closing
Communication	Identify Stakeholders	Communication plan	Distribution information Manage stakeholders expectations	Report Performance	

Communication management process

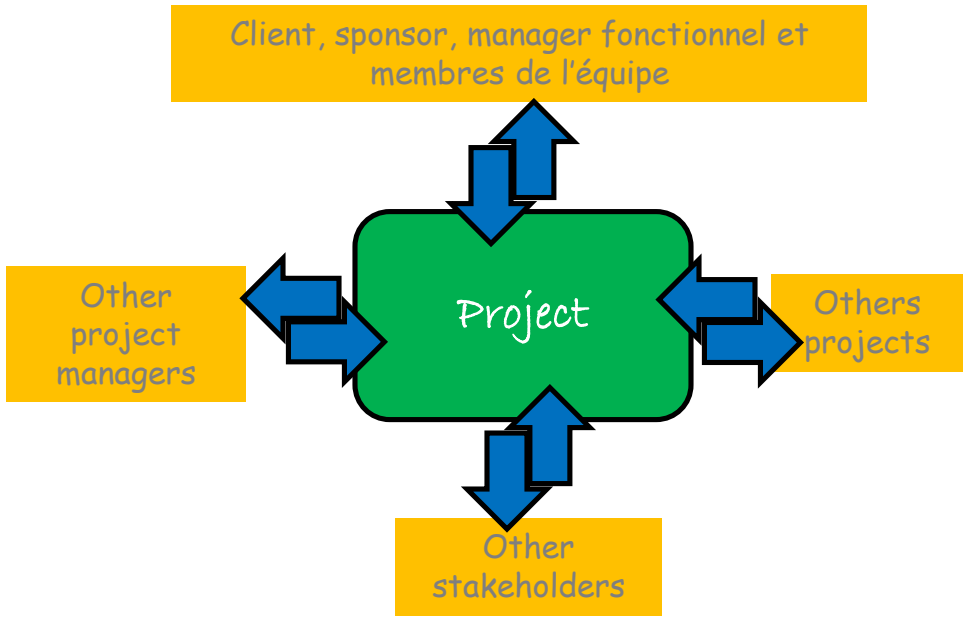
- **1. Stakeholders identification**
  - **Identify the people affected by the project, document their interests, involvement and the potential impact on the success of the project**
- **2. Communication planification**
  - **How to define the needs of stakeholders (in terms of communication), and how to define the overall approach to communication?**
- **3. Distribute information**
  - **Make information available as planned**
- **4. Managing Stakeholders expectations**
  - **Work with stakeholders to meet their needs, resolve problems as they arise**
- **5. Report performance**
  - **Collect and distribute information about project performance**

Communication Management

- **The process required to ensure the timely production, collection, distribution, storage, retrieval and ultimate disposal of project information**
- **Project leaders spend the majority of their time communicating.**
- **Few aspects of communication.**
  - **Internal - External**
  - **Formal - Informal**
  - **Vertical - Horizontal**
  - **Official - Non official**
  - **Written - Oral**
  - **Verbal - Non-verbal**

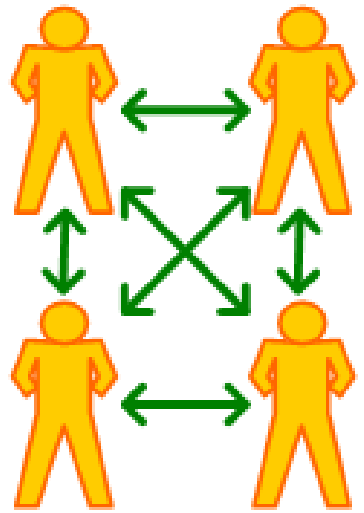
Communication needs

- **Communication in all directions**



- **Determine and limit who communicates with who and who will receive the information**

- **Consider the number of communication channels**



- **Formule**

$$\frac{N(N-1)}{2}$$

Communication Methods

- **Interactive Communication**
  - **Most effective way to ensure shared understanding**
  - **For example meetings, telephone calls, videoconferences**
- **Push communication**
  - **Does not guarantee that the message has reached its target or that it is heard**
  - **For example letters, e-mail, press release, fax, voicemail**
- **Pull communication**
  - **Used for very large volumes of information, very large audiences**
  - **For example intranet site, e-learning**

Plan Communication

- **Who should receive what information?**
- **In what form? (content, level of detail, type of presentation)**
- **When? Frequency?**
- **Who produces the information?**
- **How it will be transmitted (paper, email, website)**
- **Who will produce what information?**
- **Include in the Project Work Breakdown Structure**

Progress Reports

- **Keep stakeholders informed of the use of resources in achieving project objectives**
- **Status reports: describe the state of the project at a specific point in time**
- **Progress Reports: describes what the project team accomplished during a given period of time**
- **Forecast report: forecasts future state, and future progress, of the project against past trends and based on available information**
- **Earned Value technique**

Project Name – Weekly status report

Direction	
Sponsor	
team	
Budget	The project has currently spent € xx. The forecast for the end of the project is yy€
Project objectives	40 words or less

Achievements and Strengths

- 1
- 2
- 3

Importants problems and risks

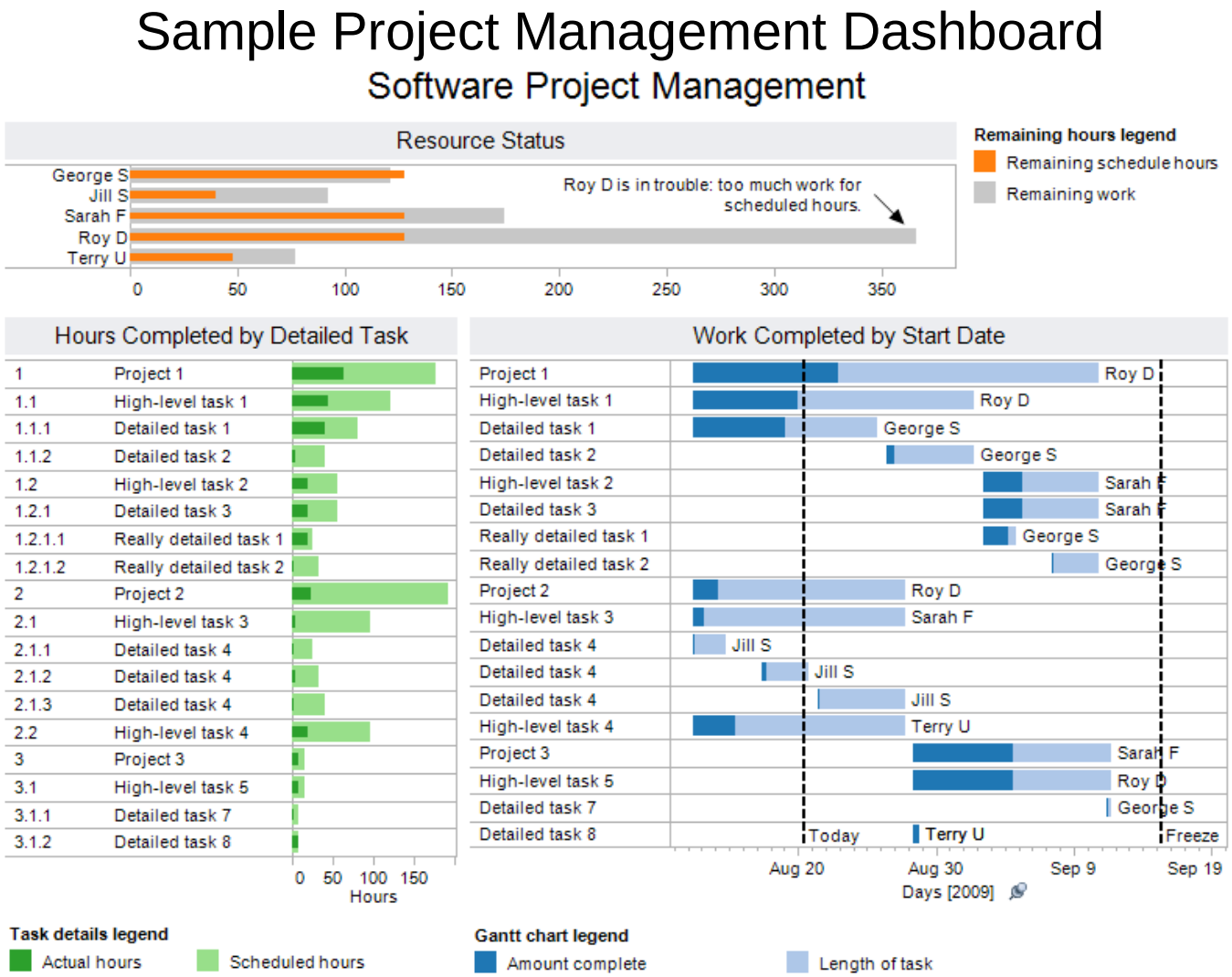
- 1
- 2
- 3

Activities of the week, Deliverables

G **As planned** Y **A risk** R **Ethic Problem**

	Budget	Périmeter	Ressources	Delays
Project				
Task 1				
Task 2				
Task 3				

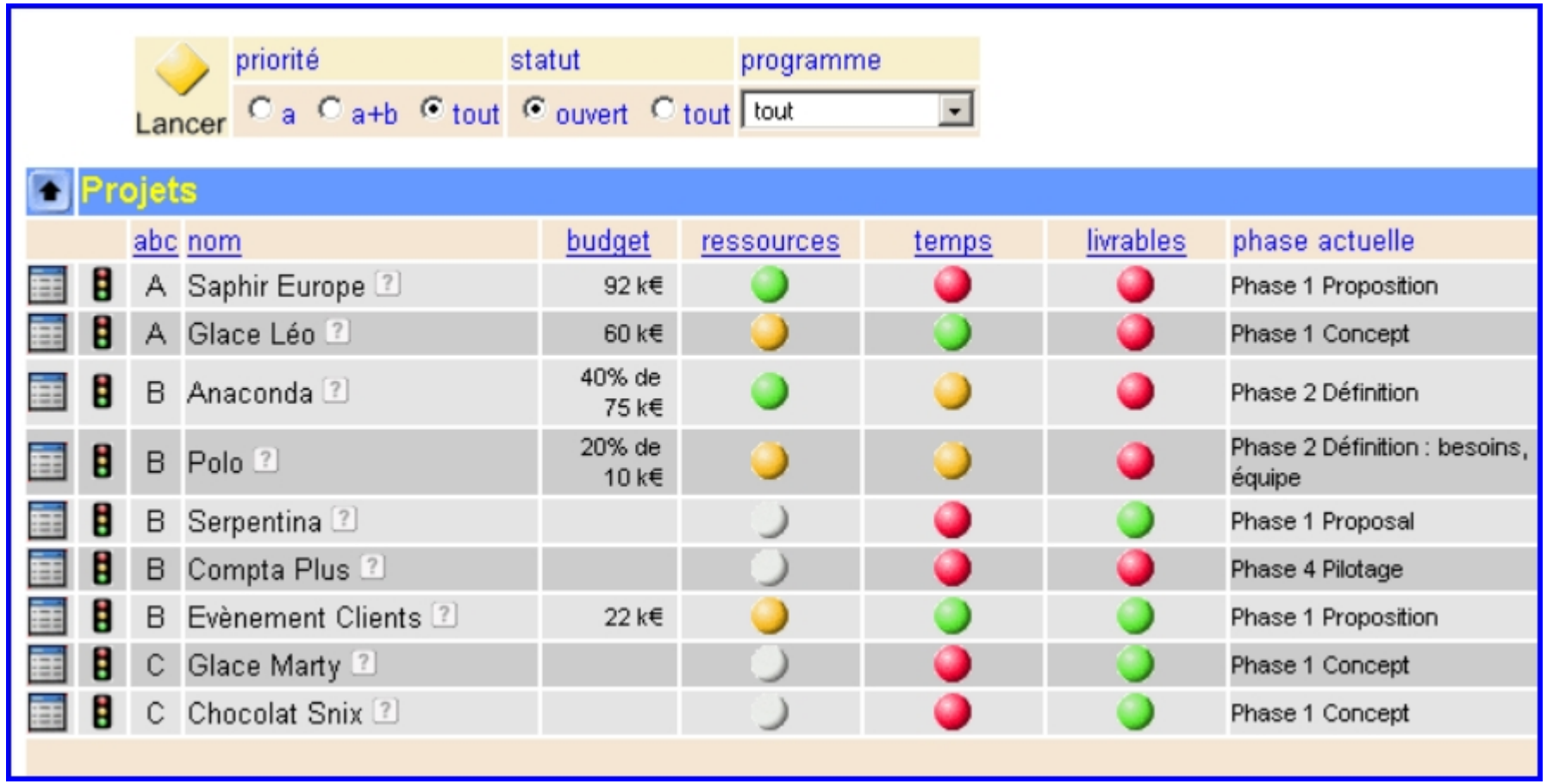
Gestion de Projet



Olivier Berthet – December 21

Gestion de Projet

Example of a scorecard in portfolio management



Lancer | priorité: a, a+b, tout | statut: ouvert, tout | programme: tout

Projets

abc	nom	budget	ressources	temps	livrables	phase actuelle
A	Saphir Europe	92 k€				Phase 1 Proposition
A	Glace Léo	60 k€				Phase 1 Concept
B	Anaconda	40% de 75 k€				Phase 2 Définition
B	Polo	20% de 10 k€				Phase 2 Définition : besoins, équipe
B	Serpentina					Phase 1 Proposal
B	Compta Plus					Phase 4 Pilotage
B	Evènement Clients	22 k€				Phase 1 Proposition
C	Glace Marty					Phase 1 Concept
C	Chocolat Snix					Phase 1 Concept

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You work on a project with 17 stakeholders, including you. How many potential channels of communication exist?

a) 17

b) 136

c) 272

d) 34

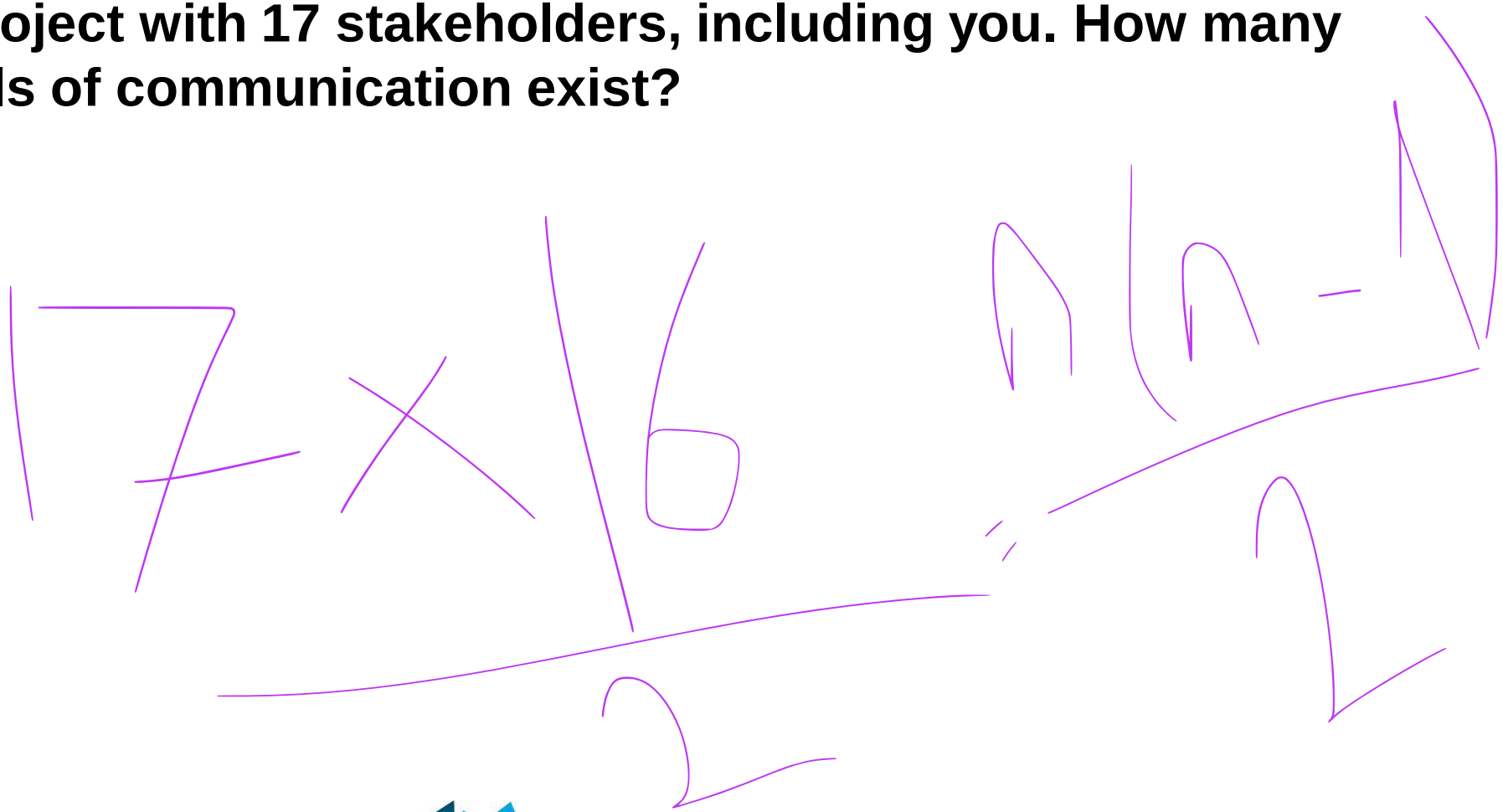
You work on a project with 17 stakeholders, including you. How many potential channels of communication exist?

a) 17

b) 136

c) 272

d) 34



Which of the following processes produces the Communications Management Plan?

a) **Develop a project management plan**

b) **Develop a communication plan**

c) **Manage communication**

d) **Distribute information**

Which of the following processes produces the Communications Management Plan?

a) **Develop a project management plan**

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Risk Management

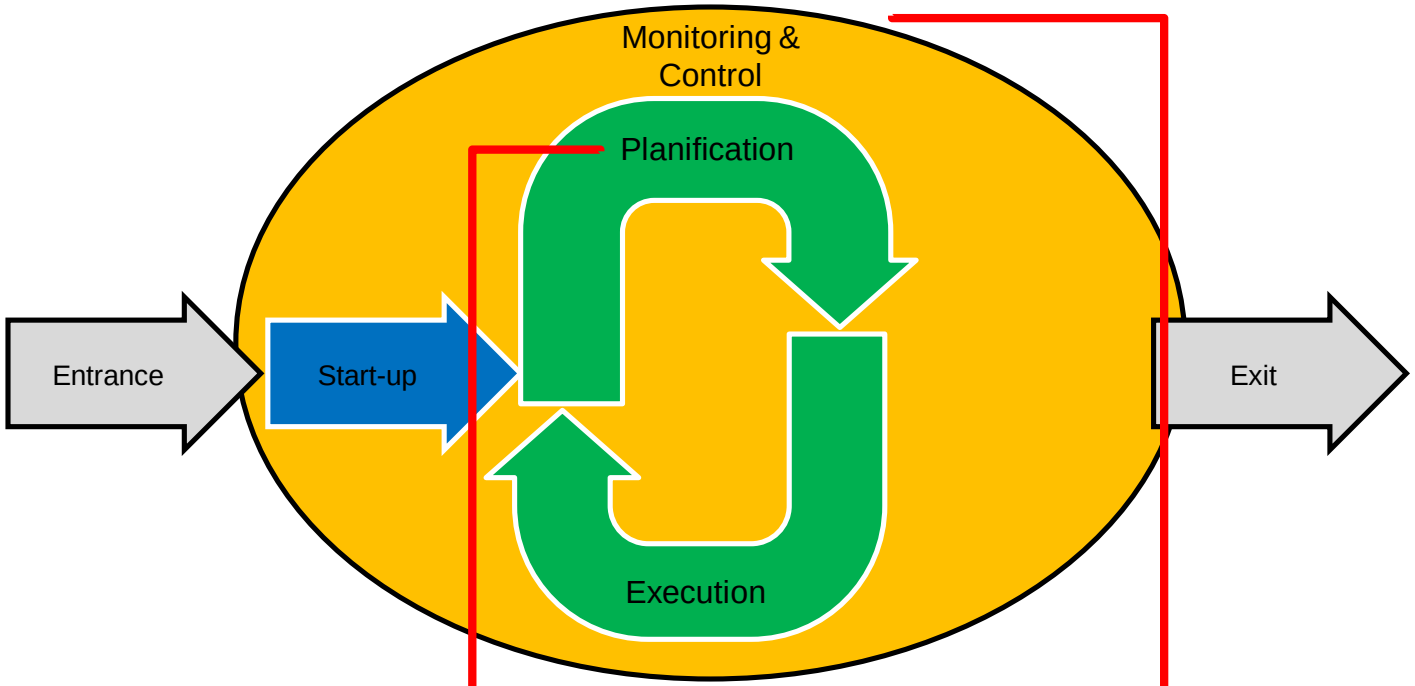
Benefits of Project Risk Management

- **What do you think ?**

Benefits of Project Risk Management

- **Avoid or anticipate problems**
- **Prevent surprises**
- **Improve negotiations power**
- **Manage expectations**
- **Reduce gaps in the schedule**
- **Reduce differences in costs**

Gestion de Projet



Knowledge Field	Process				
	Initation	Planification	Execution	Monitoring & Control	Closure
Risk		Risk Management Plan Risks identification Qualitative risk analysis Quantitative risk analysis Risk mitigation plan		Control risks	

Risk management process

- 1. Risk Management Planning
  - Decide how to manage the risk of a project
- 2. Risk identification
  - Determine what risks might impact the project and document their characteristics.
- 3. Qualitative risk analysis
  - Prioritization of risks according to their probability of occurrence and impacts
- 4. Quantitative risk analysis
  - Numerical analysis of the effects of risks on all project objectives
- 5. Risk mitigation plan
  - Development of options and actions to promote positive risks and control negative risks
- 6. Control risks
  - Track identified risks and identify new ones, execute risk response plans and evaluate their effectiveness

Project risk management

- **Risk is an uncertain event or condition that, if it occurs, affects at least one project objective.**
- **Risk Management Objectives:**
  - **increase the likelihood and impact of positive events (opportunities).**
  - **reduce the likelihood and impact of negative events (threat).**
- **Terms and concepts:**
  - **Uncertainty: a lack of knowledge about an event that reduces confidence**
  - **Risk aversion: someone who does not want to take risks.**
  - **Risk tolerance: the area of risk that are acceptable / unacceptable.**
  - **Risk thresholds: the point at which a risk becomes unacceptable**

Definitions

- **Unexpected**
  - **Unidentifiable virtual event**
- **Alea**
  - **Virtual event identifiable but not quantifiable**
- **Risk**
  - **Identifiable and quantifiable virtual event**
- **Problem**
  - **Virtual event already realized**
- **Risk management focuses on identifiable and quantifiable risks**
- **A risk can have a positive or negative impact on at least one objective of the project**
- **A risk can have one or more causes, and if it is realized, one or more impacts**

Exogenous risks

- **Political**
- **Meteorological**
- **Social**
- **Regulations**
- **Suppliers**

Endogenous risks

- **Business**
- **Organization**
- **Bad estimates**
- **Lack of internal skills**

Risks identification

- **Risks must be constantly reassessed (iterative) such as integrated change of control activities, when working with resources, when dealing with issues.**
- **Information gathering techniques**
  - **Brainstorming**
  - **Delphi Technique: Expert participate anonymously, the use of questionnaire facilitator; consensus can be reached in a few turns; Help reduce the bias in the data and prevent influence of each other.**
  - **Interviewer: interviewing experts, stakeholders, known PM**
  - **Root Cause Analysis: Reorganizing the risk identified by their cause can help identify more risk**
  - **Analysis Checklist: checklist developed on the basis of historical information accumulated previous similar project**
  - **Analysis of the Assumption: to identify the risk of inaccuracy, instability, inconsistency, incompleteness.**
- **SWOT analysis - Strengths, Weaknesses, Opportunities, Threats**

Risk identification

- **SWOT analysis – Strengths, Weaknesses, Opportunities, Threats**
- **Analyse SWOT - Forces, Faiblesses, Opportunités, Menaces**

Common Risks

Features	High Risk	Low Risk
Duration	More than 1year	Less than 3months
Team Size	More than 20	Less than 5
Content of project/ deliverables	Poorly defined	Well defined
Knowledge of the project team and the client	Neither the project team nor the client have a solid knowledge of the business	Neither the project team nor the client have a solid knowledge of the business
Specifications	Very complex and very difficult for the customer to define	Very easy to define for the client
Organisations	Many changes	Little or no change
Location	The team is scattered on several sites	The team is at the same place
Methodology	No formal method, no process	standard method used
Technology	New technology used for critical components	No technology used

Risk identification - results

- **Risk breakdown structure**
  - **Hierarchical classification of potential risks for a project**
- **Risk register - Excel table**
  - **Number, name and description**
  - **Rank and Category**
  - **Causes and triggers**
  - **Potential answer**
  - **Probability of occurrence**
  - **Head of Risk Management**
  - **Potential impact**

Qualitative risk analysis

- **Assess the priority of identified risks using:**
  - **The probability of occurrence**
  - **The possible impact on the objectives of the project**
  - **Expected deadlines**
  - **The risk tolerance of the project constraints on cost, schedule, content and quality.**

The risk level of an indicator

- **Each risk indicator is evaluated twice:**
  - **Probability of occurrence:**
    - **0: None (unrealistic)**
    - **1: Not likely (0-20%)**
    - **2 (20-40%); 3 (40-60%); 4 (60-80%)**
    - **5: almost certain (80-100%)**
  - **Severity level (impact):**
    - **0: no impact (why identify it?)**
    - **1: minor impact (does not block the application)**
    - **2: annoying: blocks some of the features but problem avoidable**
    - **3: serious: serious problem requiring an important action plan**
    - **4: blocking: important problem that will cause project slippages**
    - **5: critical: can cause the project to stop**

Probability and Impact Matrix

- **Different matrices can be used for cost, time, content**
- **They help to define the answers to these risks (priority actions and intervention strategies)**

Likelihood	Consequence				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
A Almost Certain	11	16	20	23	25
B Likely	7	12	17	21	24
C Possible	4	8	13	18	22
D Unlikely	2	5	9	14	19
E Rare	1	3	6	10	15

The risk response

- **Once you have identified the risks, you have to answer them!**
- **Develop options and determine actions for**
  - **increase opportunities or**
  - **mitigate threats**
- **Assign a manager to each identified risk requiring response**

How to react ?

- **Define corrective actions (preventive and curative)**
  - **Anticipate orders**
  - **Anticipate late penalties**
  - **Diversify sources of supply**
  - **Make prototypes, simulations**
  - **Learn about new regulations**

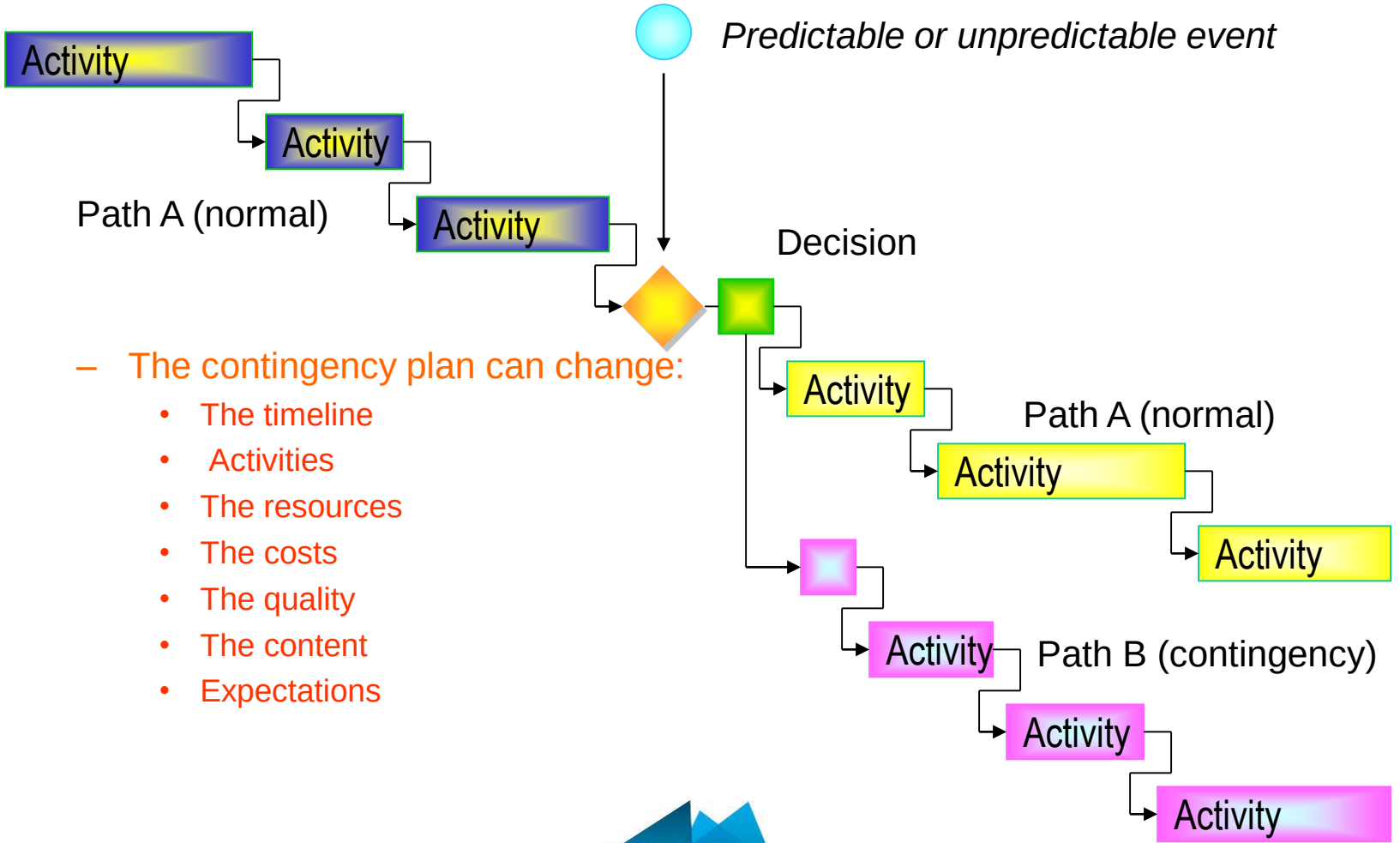
Response to negative risks

- **Avoid: eliminate risk by acting on its cause**
- **Accept: Refusal to modify the project management plan to address a risk**
  - **Either because we can not control it in any way**
  - **Either because we can not identify an appropriate response strategy**
- **Transfer: risk diversion to a third party (does not eliminate risk)**
- **Mitigate: Lower the risk probability threshold**

Control Risks

- **Execute the risk management plan in response to risks that materialize during the project**
- **Consists of:**
  - **Follow the identified risks and those mentioned on the watch list**
  - **Analyze emerging risks**
  - **Monitor the conditions for triggering emergency plans**
  - **Monitor residual risks**
  - **Review the execution of risk responses**
  - **Evaluate the effectiveness of risk responses**

Contingency plans



- The contingency plan can change:
  - The timeline
  - Activities
  - The resources
  - The costs
  - The quality
  - The content
  - Expectations

How to call an uncertainty that presents an opportunity to realize a project in advance?

a) **Risk threshold**

b) **Positive risk**

c) **Negative risk**

d) **Risk analysis**

How to call an uncertainty that presents an opportunity to realize a project in advance?

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You have called your team for a meeting where you ask them to analyze the strengths, weaknesses, opportunities, and threats your project faces. What tool or technique do you use?

a) **The Delphi technique**

b) **Brainstorming**

c) **SWOT analysis**

d) **Root cause analysis**

You have called your team for a meeting where you ask them to analyze the strengths, weaknesses, opportunities, and threats your project faces. What tool or technique do you use?

a) **The Delphi technique**

b) **Brainstorming**

c) **SWOT analysis**

d) **Root cause analysis**

Project Management

EPITA Information Management Master

Project Management

Module 5

Olivier BERTHET

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Source : Photo Afidium

Structure

1. Introduction to Project Management
2. Integration Management
3. Perimeter management
4. Time management
5. Cost management
6. Quality and Human Resources Management
7. Communication and risk management
8. Purchasing and Stakeholder Management
9. Ethics and professional conduct

Objectives of this course

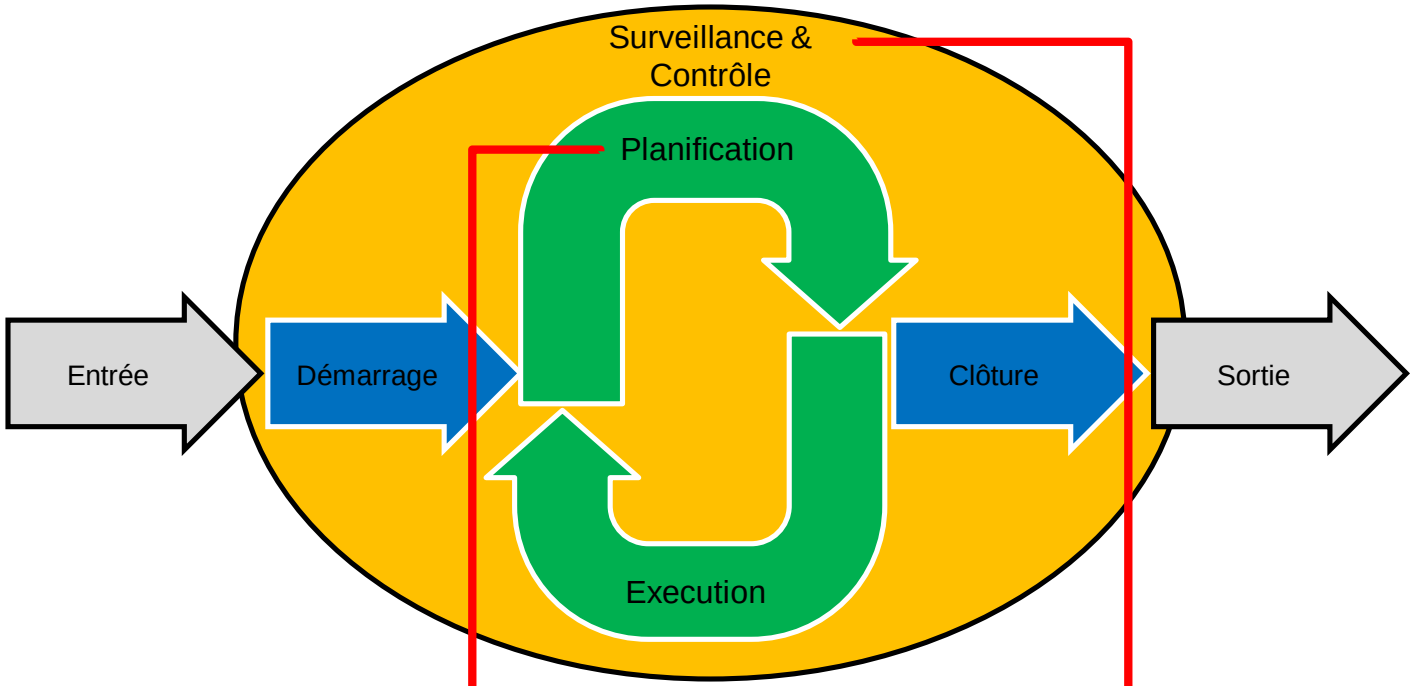
- **Understand why buying rather than doing internally**
- **Understand the project's supply management process**
- **Understand the complexity of managing relationships with suppliers**
- **Know how to identify the stakeholders of a project and manage their expectations and their commitments**

Why purchase ?

Why purchase ?

- **To reduce fixed and recurring costs**
- **To allow the organization to focus on its core business**
- **To fill a need for lack of expertise or particular technologies**
- **To offer flexibility**
- **Because this is a project that we will never do again**

Project Management



Domaine de Connaissances	Processus				
	Démarrage	Planification	Execution	Surveillance & Contrôle	Clôture
Procurement		Plan contracts	Request offers or proposals Select sellers	Administer contracts	Close the contract

Procurement Management Process

- **1. Plan supplies and contracts**
  - **Determine what to buy or acquire, when, and how.**
- **2. Solicit offers or proposals**
  - **Collect vendor responses, select vendors, negotiate written contracts**
- **3. Administer the contracts**
  - **Manage the supplier's performance, define the necessary corrective actions, control the contract changes.**
- **4. Close the contracts**
  - **Complete and finalize each contract, including the resolution of any outstanding issues, and close each contract applicable to the project or any of its phases.**

Supply Management

- **The process required to process and acquire the products or services, or needs outside the project team**
- **Involves planning, acquiring products or services from vendors, choosing a vendor, administering and closing contracts**

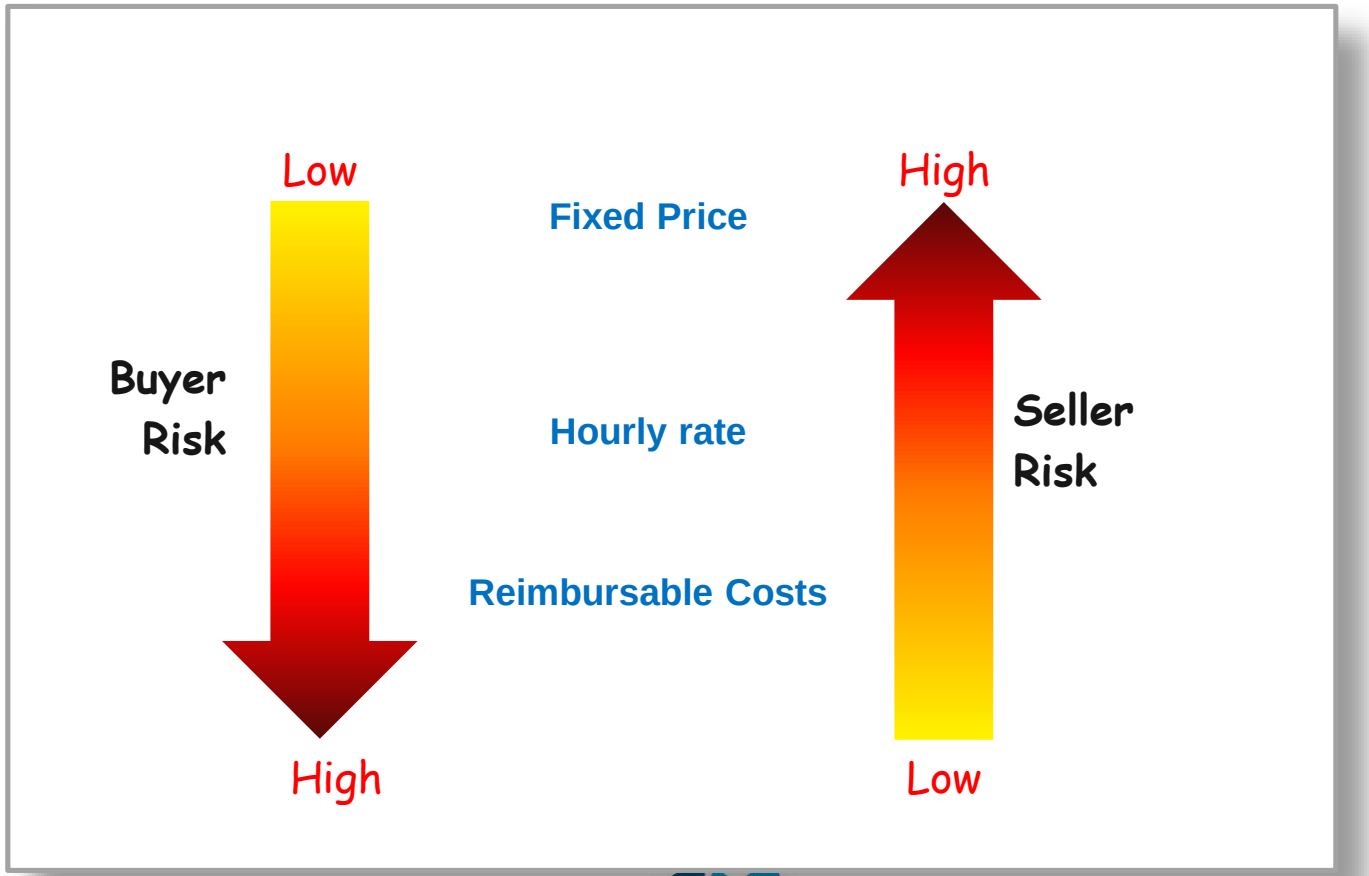
Role of the project manager in purchasing

- **The project manager must be involved in the creation of contracts**
- **Key roles:**
  - **Know the procurement process**
  - **Understand the terms and conditions of the contract**
  - **Ensure that the contract contains all project management requirements such as attendance at meetings, reports, actions and communications deemed necessary**
  - **Identify risks and integrate mitigation and risk allocation into the contract**
  - **Align the contract schedule and project schedule**
  - **Get involved in contract negotiation**
  - **Ensure the procurement process is smooth**
  - **Work with the contract manager to manage contract changes**

Type of contracts

- **Fixed-price or flat-rate contract (FP Fixed-price or Lump-sum)**
  - **Provides a fixed total price for a clearly defined product / service**
  - **May include incentives for the supplier to achieve certain project objectives**
  - **Risk assumed by the seller**
- **Cost-reimbursable contract**
  - **The buyer reimburses the supplier for the actual costs incurred (direct and indirect), plus fees**
  - **May include an incentive bonus for the provider if certain goals are met**
- **T&M Time and Materials contract**
  - **An hourly rate is negotiated for each of the resources involved in the project: junior, senior, technical expert, project manager**
  - **To ensure that costs do not become larger than expected, the buyer can put a "not to exceed" and "deadlines" in the contract**

Risk and type of contracts



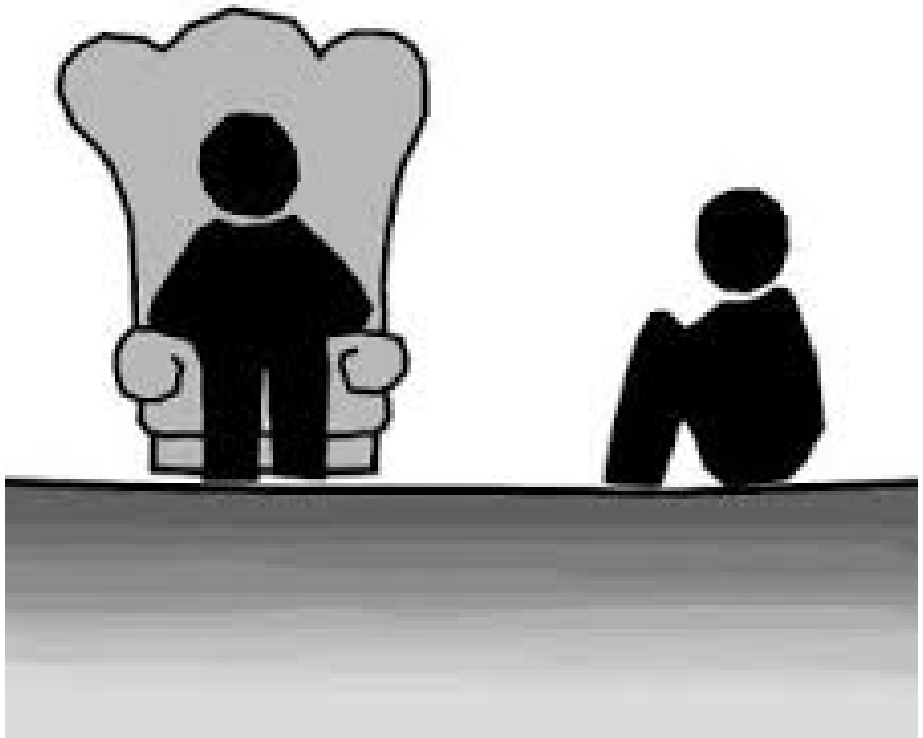
Request for Proposal RFP

- **Objective: solicit a price from suppliers for the products or services sought**
- **The submission is prepared by the suppliers. It specifies a price for which they undertake to deliver the requested products or to render the services required as defined by the customer.**
- **The customer usually retains the "lowest compliant bidder"**

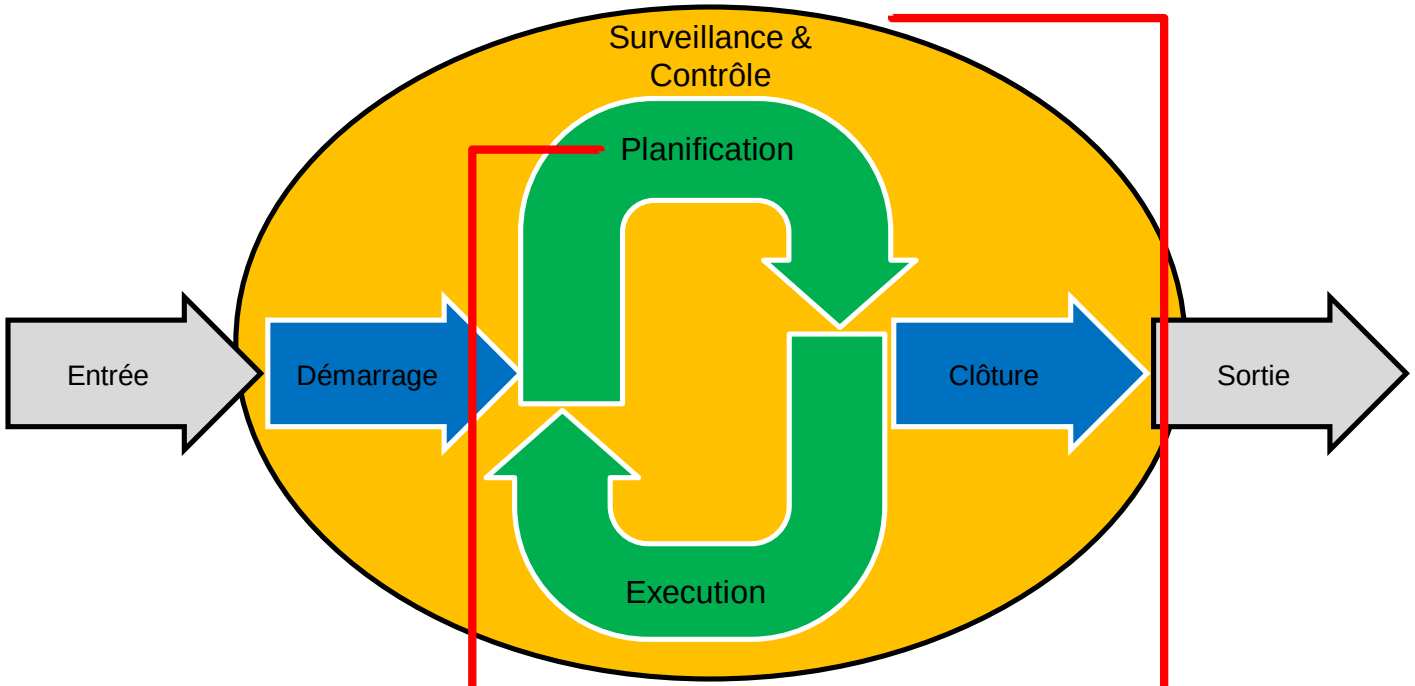
Vendor Evaluation Criteria

- **Understanding of the need**
- **Overall cost (life cycle cost)**
- **Technical capacity of the supplier**
- **Management approach**
- **Technical approach**
- **Financial capacity of the supplier**
- **Production capacity and interest**
- **Size and type of the supplier's company**
- **References**
- **Intellectual property rights**
- **Etc.**

Stakeholder Management
Gestion des parties prenantes



Project Management



Domaine de Connaissances	Processus				
	Démarrage	Planification	Execution	Surveillance & Contrôle	Clôture
Stakeholder Management		Identify stakeholders Plan the management of stakeholders		Manage stakeholder commitments Master stakeholder commitments	

Stakeholder Management Process

- **1. Stakeholder identification**
  - **Identify all the people or organizations involved in the project: clients, sponsors, team members, managers, internal and external suppliers, unions**
- **2. Plan the management of stakeholders**
  - **Develop appropriate strategies to engage stakeholders effectively throughout the project lifecycle**
- **3 Manage Stakeholder Commitments**
  - **Communicate and work with stakeholders to meet their expectations**
- **4. Master stakeholder commitments**
  - **Monitoring the overall relationship of the project with stakeholders**

Stakeholder management

- **A stakeholder can ....**
  - **act against the project if its needs are not taken into account**
- **Low or late involvement of stakeholders can lead to unpleasant surprises**
  - **New last minute requirements**
  - **Political pitfalls**
  - **Dragging feet during execution**
- **The solution**
  - **Regular communication**
  - **Structured participation**

Result of identification

- **List of stakeholders**

Name	Contact	Role	Department	Society	Impact	Influence	Main expectations	Attitude about the project	Main requirement

- **Stakeholder Management Strategy**
  - **Defines an approach to ensure stakeholder support and to reduce their negative influence**
  - **The information could be too sensitive to be shared**
  - **A common way of representing is to use a stakeholder analysis matrix**

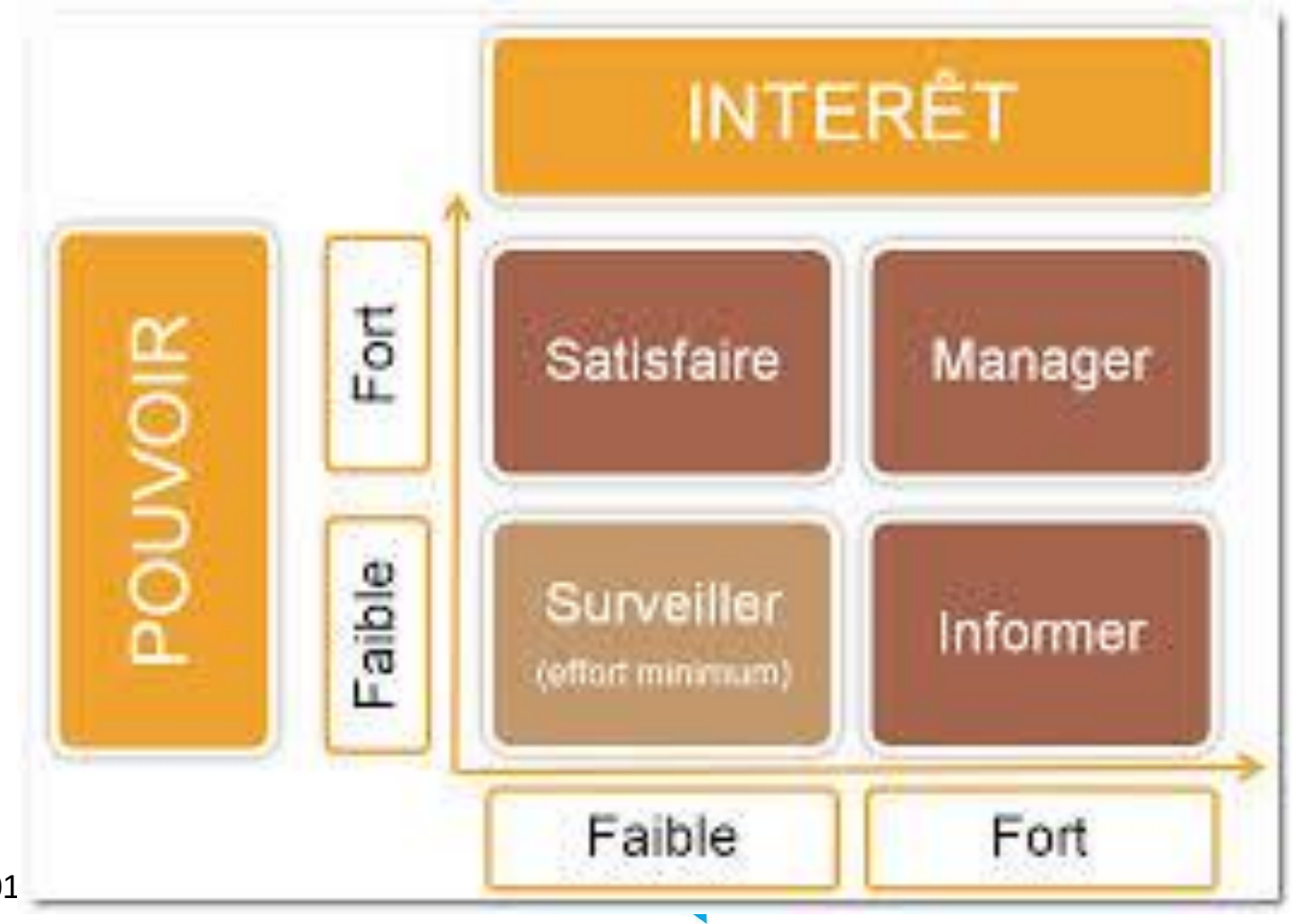
Stakeholder	Interest in the project	Evaluation of the impact	Possible strategies to gain support or reduce obstructions

Managing stakeholder expectations

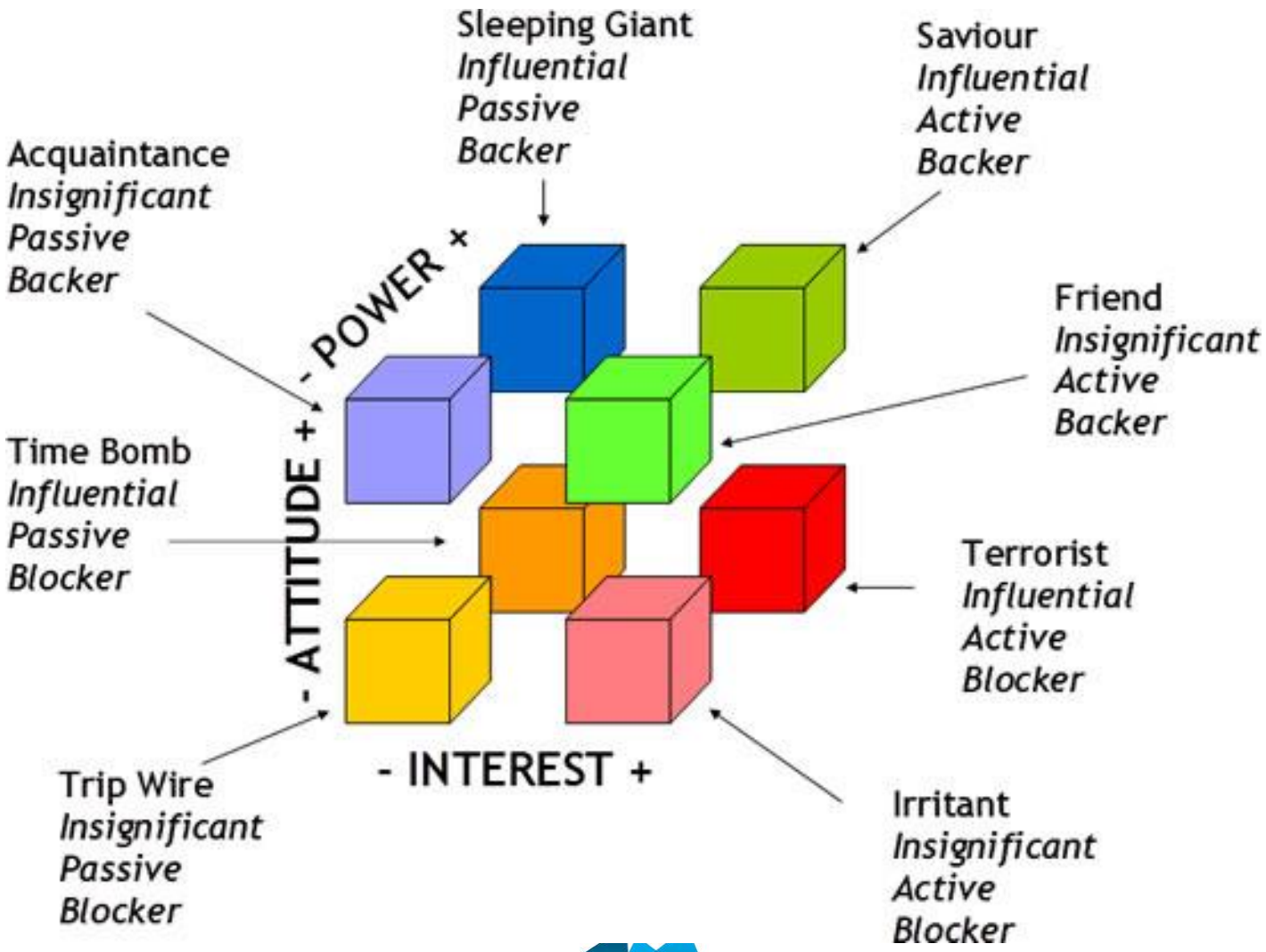
- **Active management of stakeholder expectations**
  - **Increase the likelihood of project acceptance through negotiation**
  - **Influence their desire to achieve and maintain the objectives of the project**
- **Anticipate and resolve concerns that have not yet become issues**
- **Clarify and solve the problems that have been identified**

- **The larger and more complex your project, the more attention you have to pay attention to stakeholder communication and involvement**

Stakeholder Influence Matrix - Gardner



Project Management



Manage stakeholder commitments

- **Establish a plan for regular communication with key stakeholders**
- **The plan must accommodate a bilateral exchange**
- **The plan must contain periodic progress reports, regular meetings and presentations, tours and demonstrations**
- **The plan must contain significant tasks that involve stakeholders**
  - **Kick-off**
  - **Attendance at meetings**
  - **Requirements collection activities**
  - **Steering group to arbitrate content changes**
  - **User acceptance testing**

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