Project Management

EPITA Information Management Master

Project Management

Module 4

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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

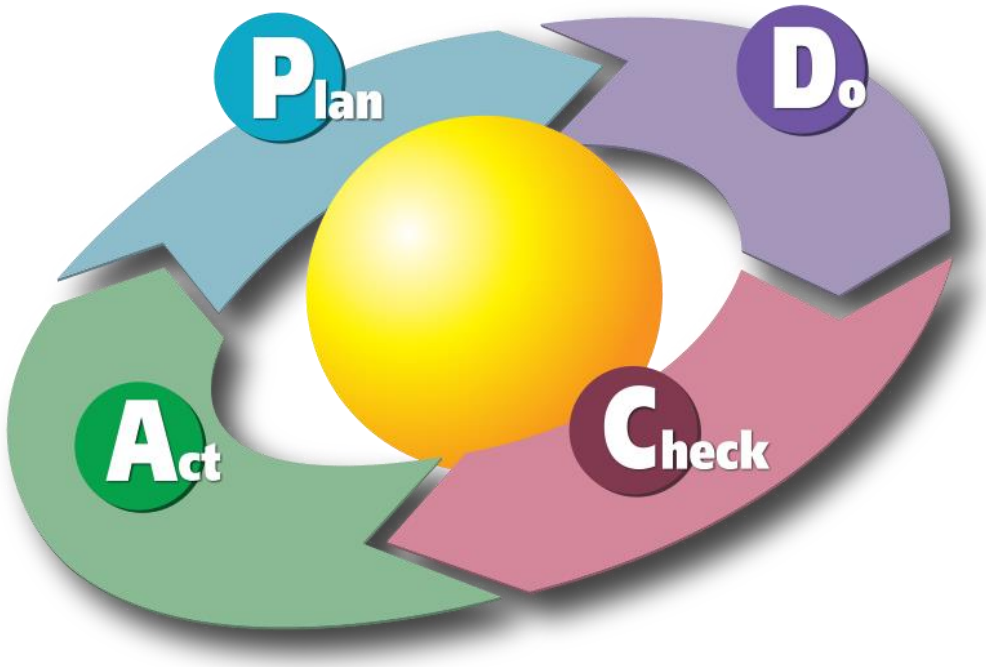
- **Understand the importance of quality management in project management**
- **Describe quality planning**
- **Show the importance of quality assurance**
- **Explain the main results of the quality control process**

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

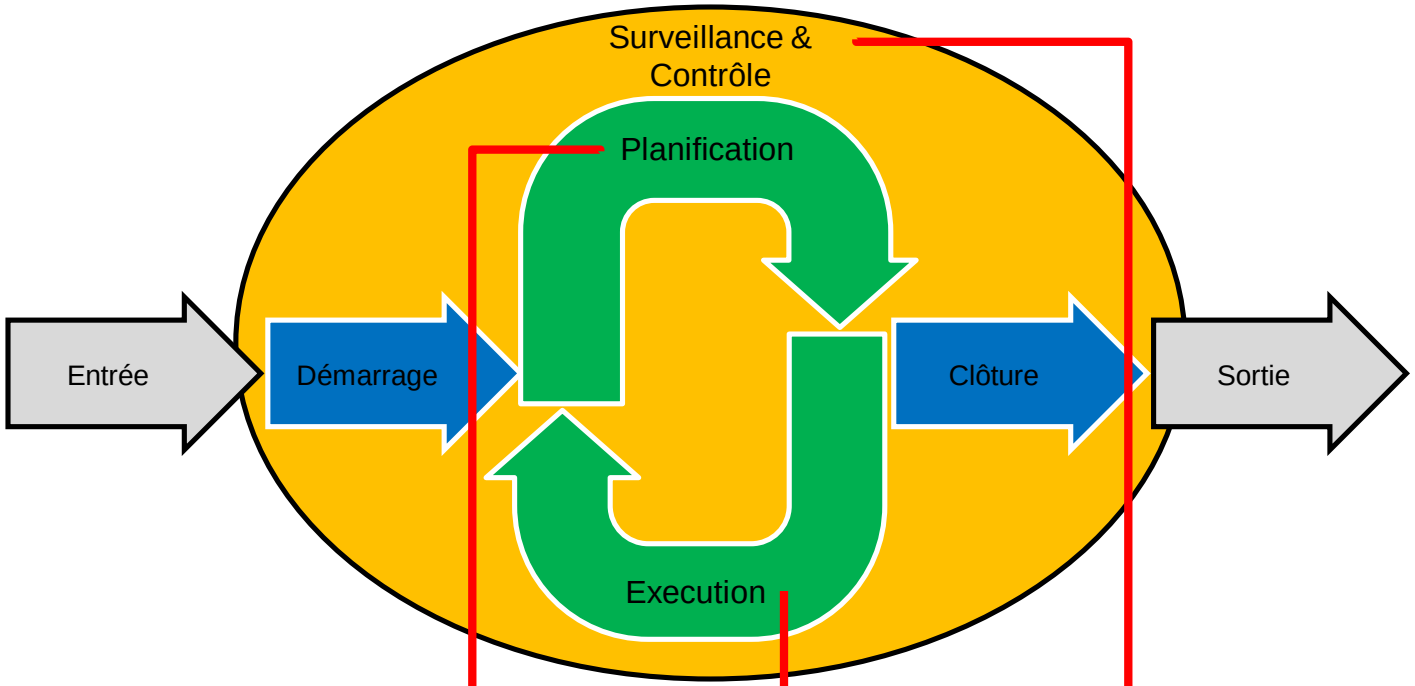
Definition of Quality

- **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

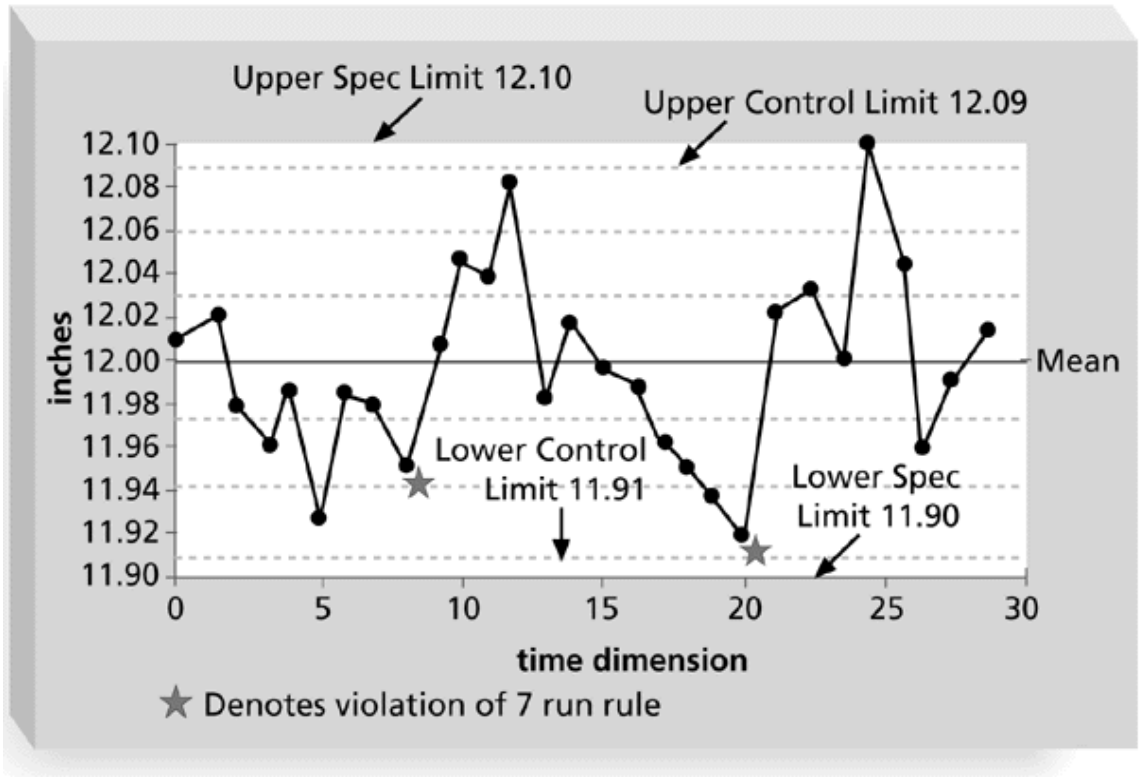
- **Six Sigma is a structured management method aimed at improving the quality and efficiency of processes.**
- **The Six Sigma method was first applied to industrial processes before being extended to all types of processes, including administrative, logistical, commercial and energy saving.**

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

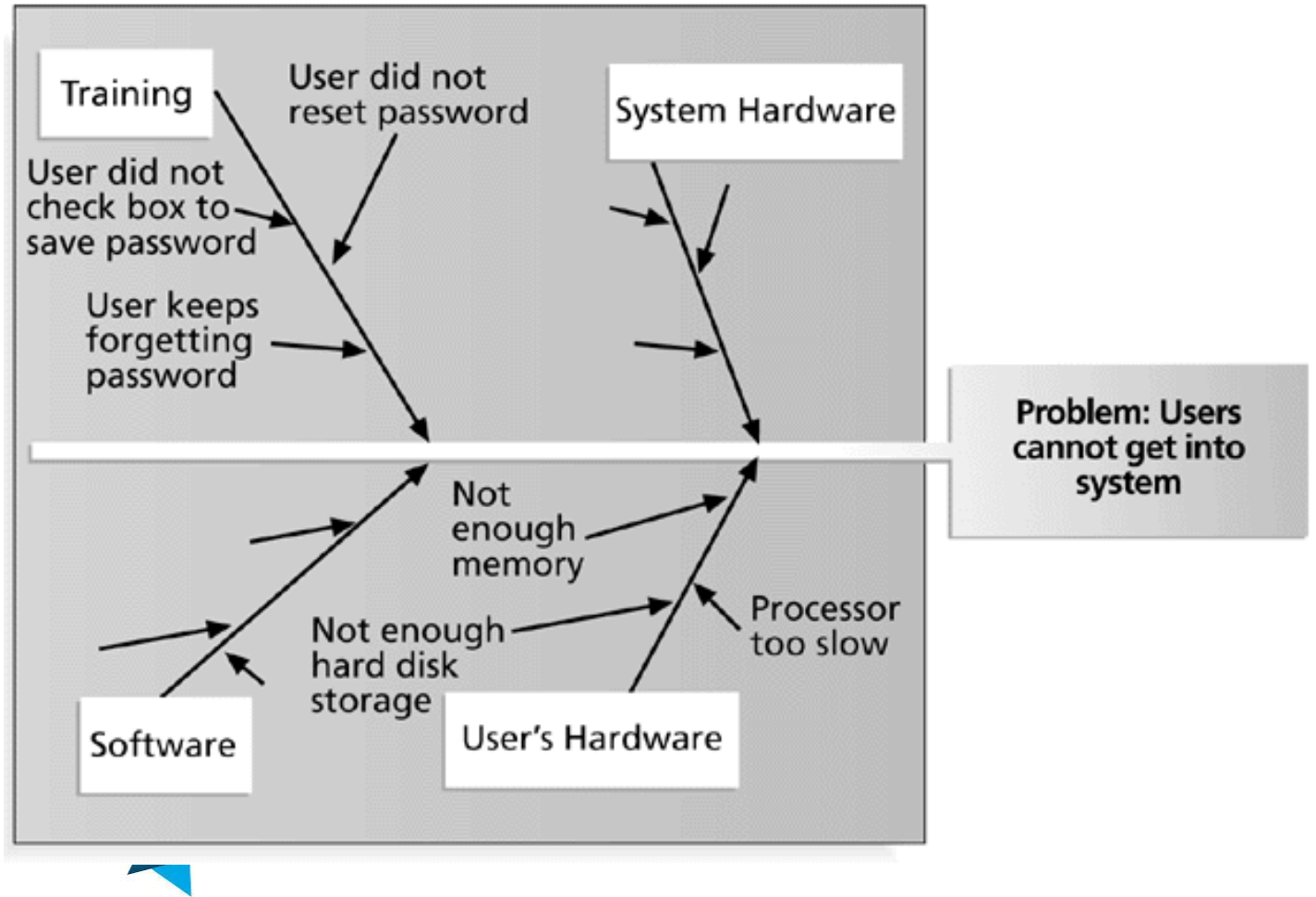
Control diagrams

- **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

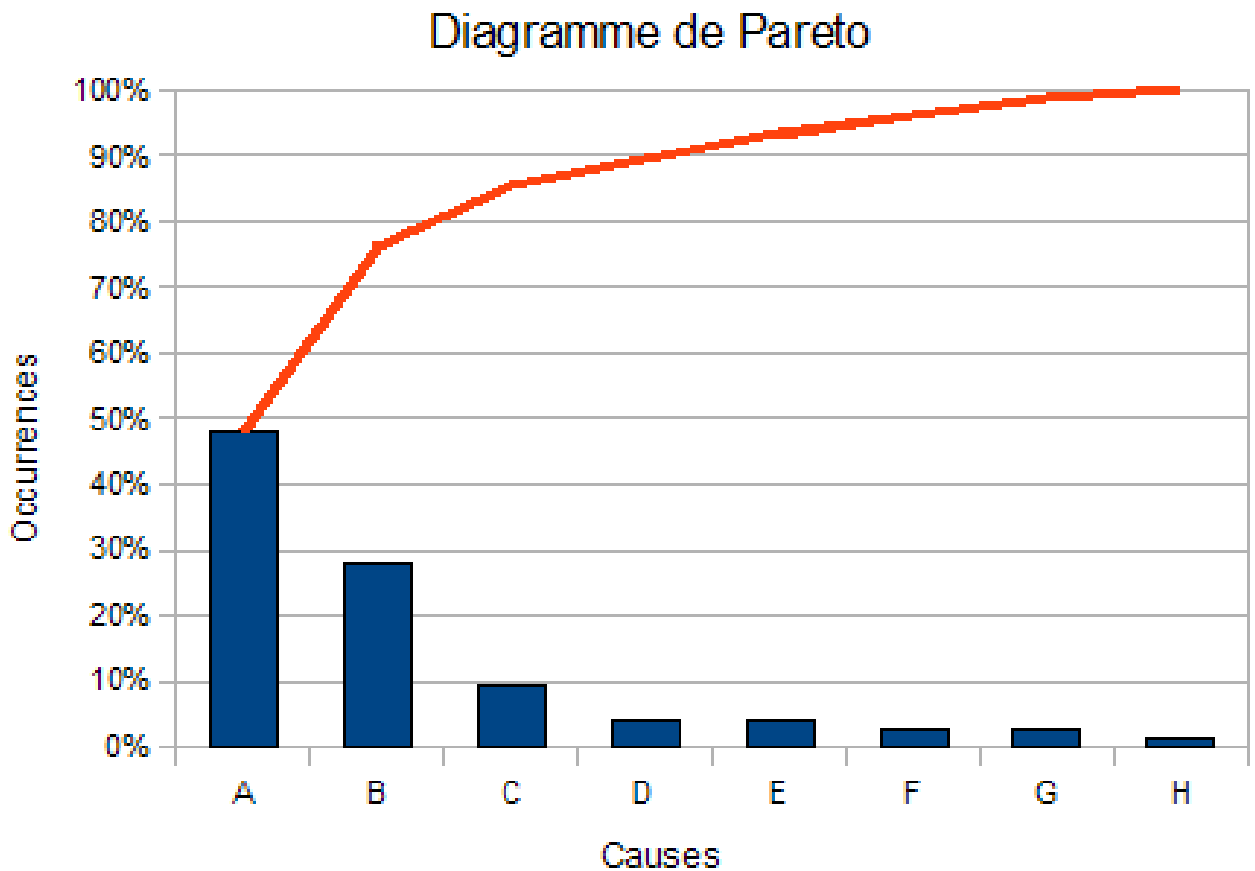


Diagramme de Pareto
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Occurrences
A
B
C
D
E
F
G
H
Causes


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**

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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**

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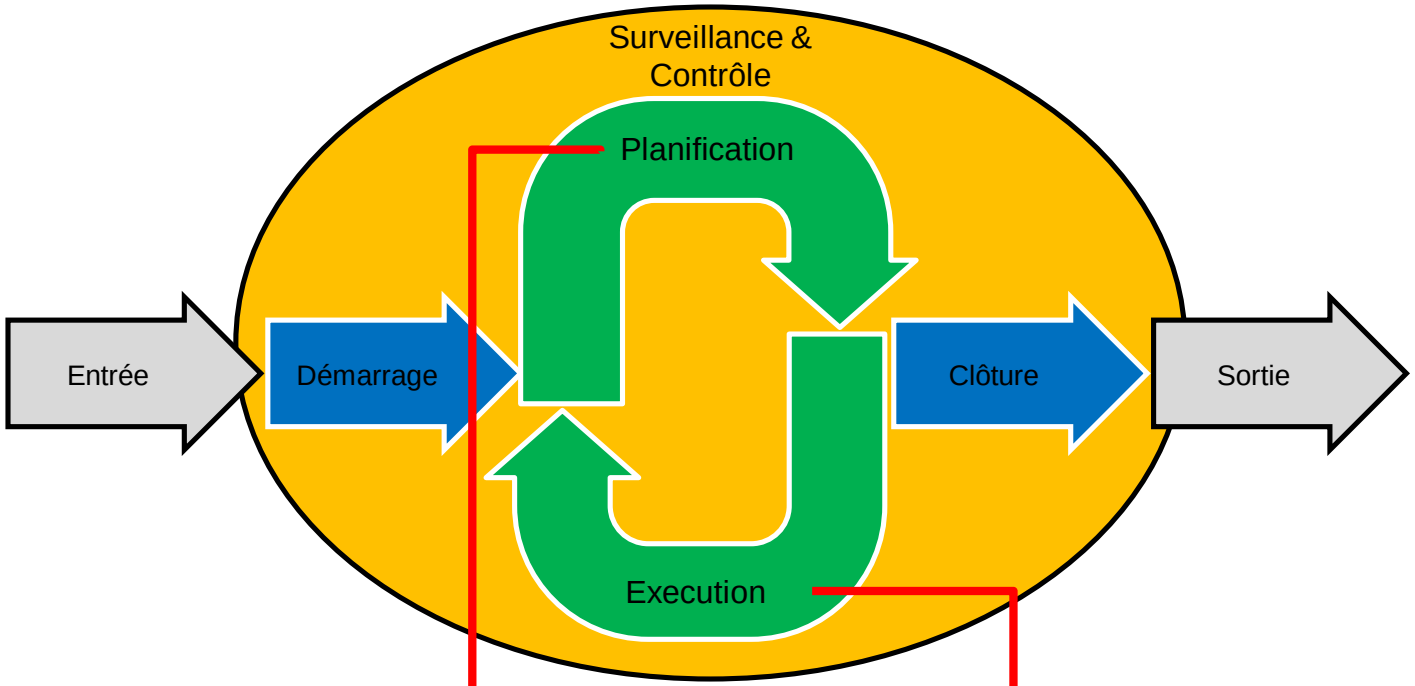
Human resources

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

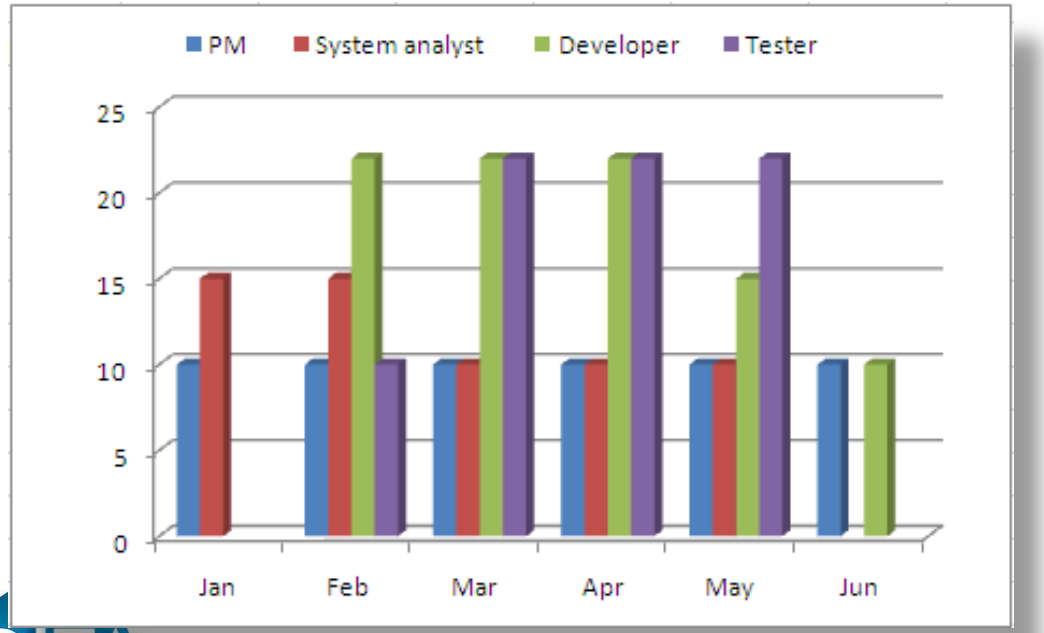
	Richard	Camille	Louis	Juliette	Nicolas
Define	A	R	I	I	I
Design	I	A	R	C	C
Program	I	A	R	C	C
Test	A	I	I	R	I

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

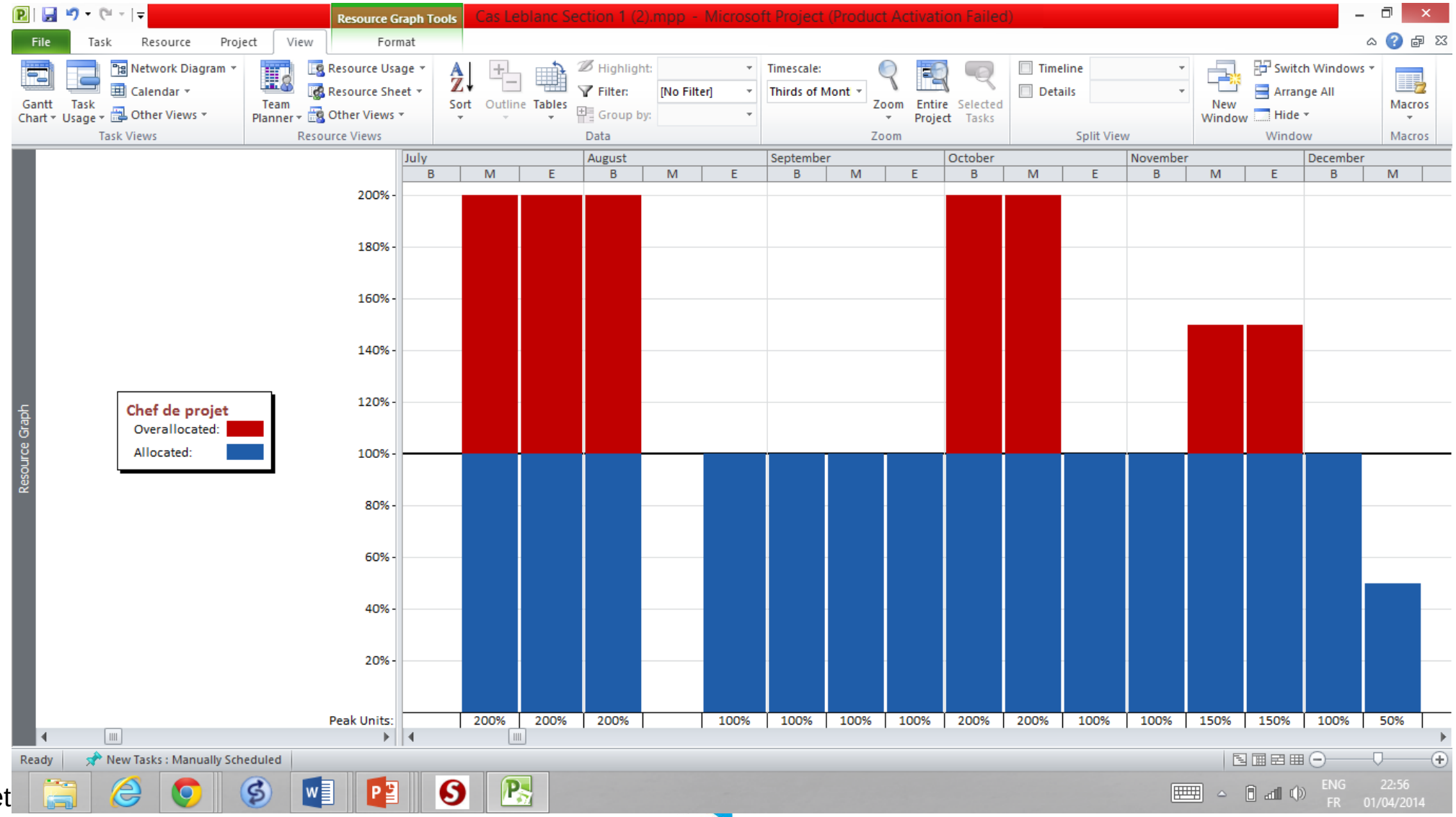
- **Human Resources Plan includes but not limited to**
  - **Roles and responsibilities**
  - **skills**
- **Organization chart of the project**
- **Resource Management Plan**
  - **Assignment of persons**
  - **Resource calendars**
  - **Reallocation plan**
  - **Training plan**
  - **Recognition and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

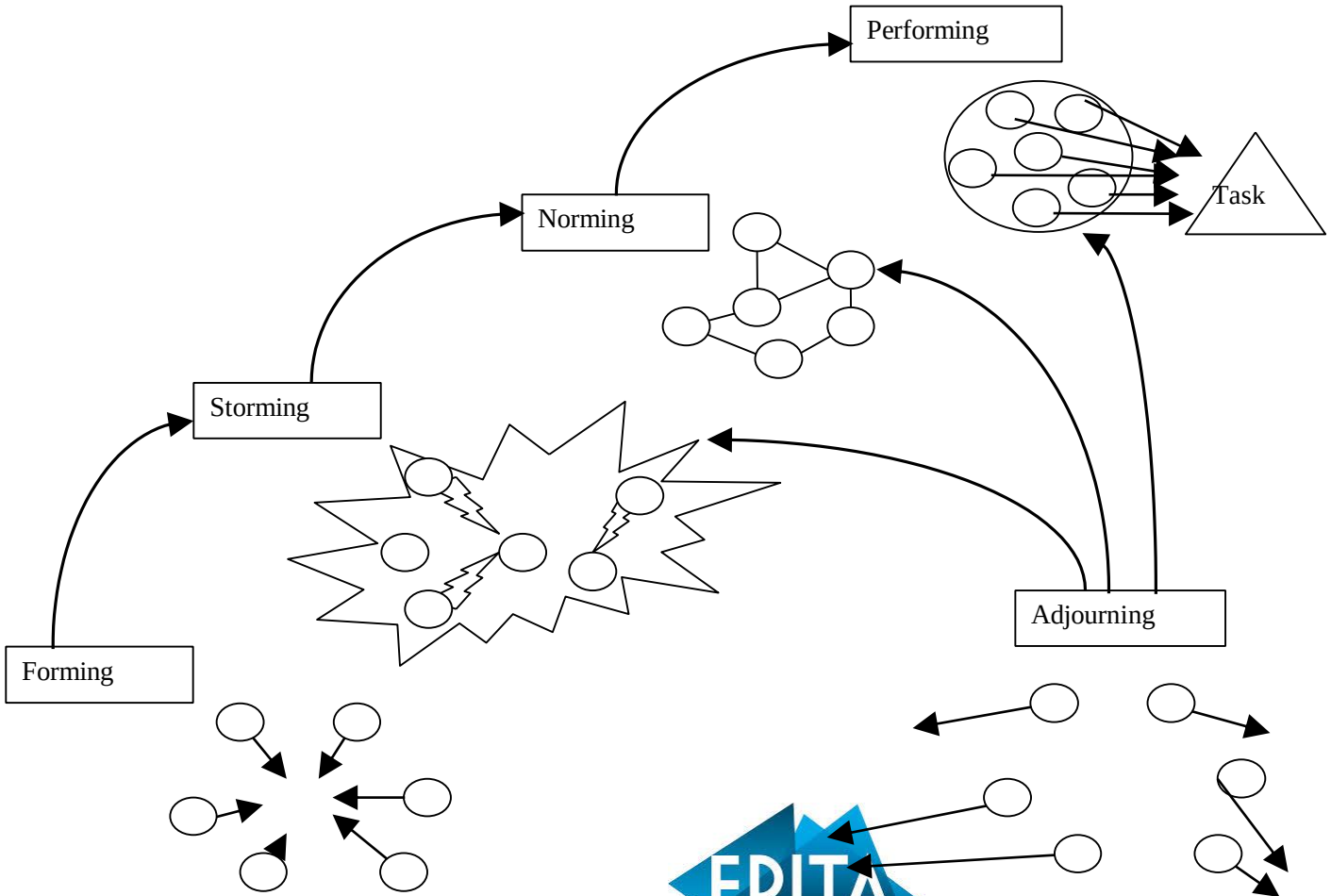
Form the project team – virtual teams

- **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**

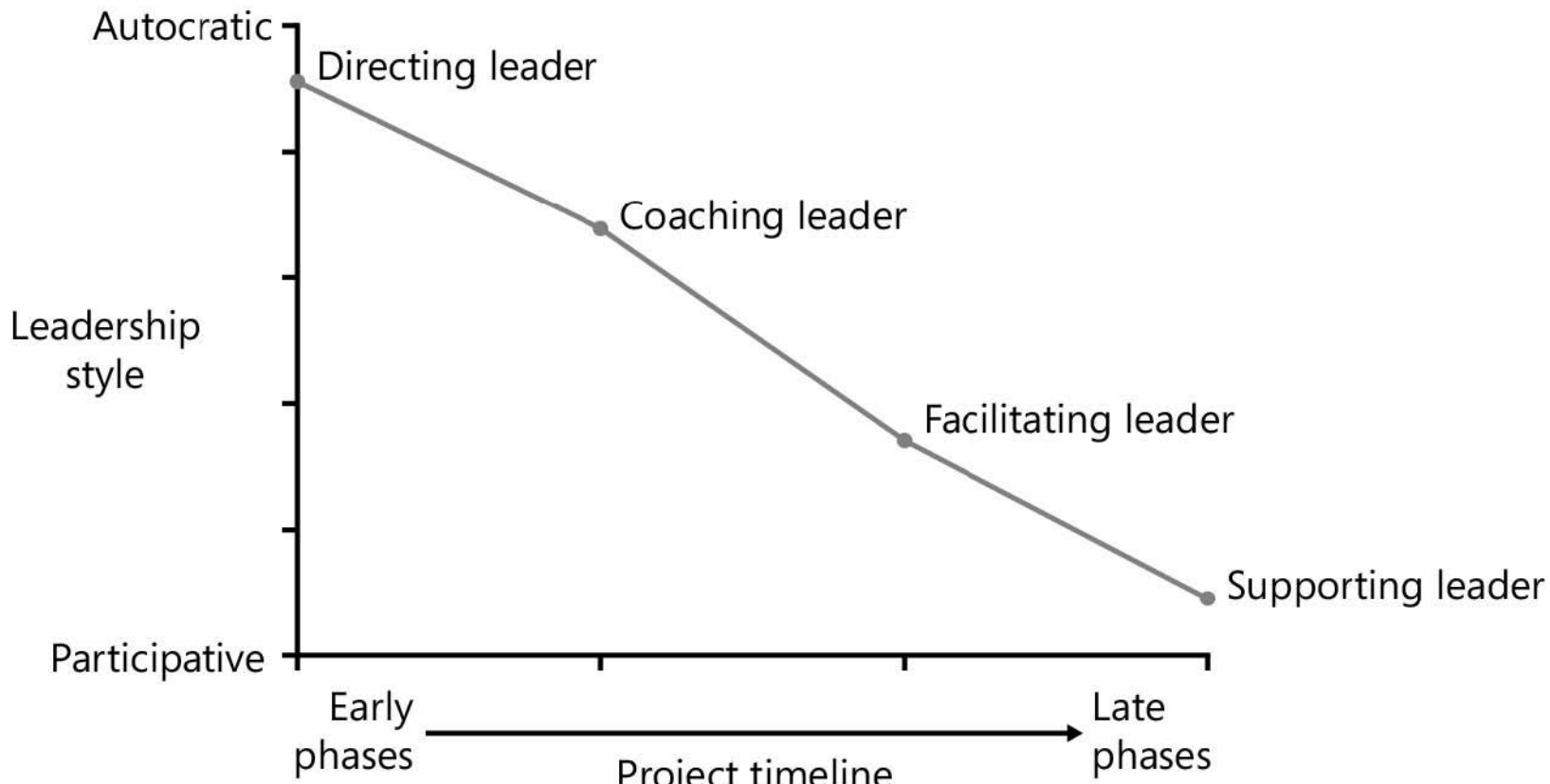
Stages of development of a group (Tuckman, 1965)



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



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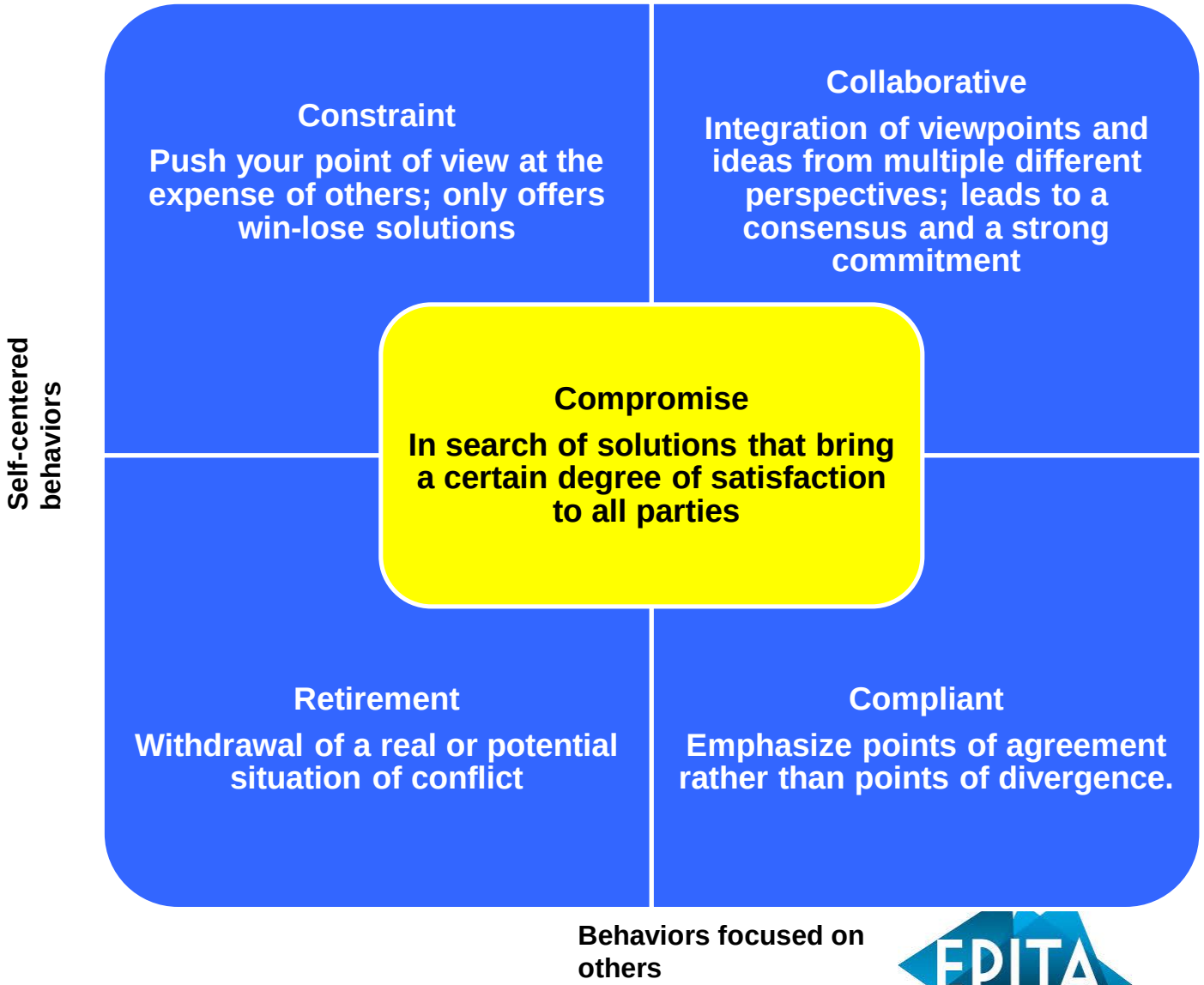


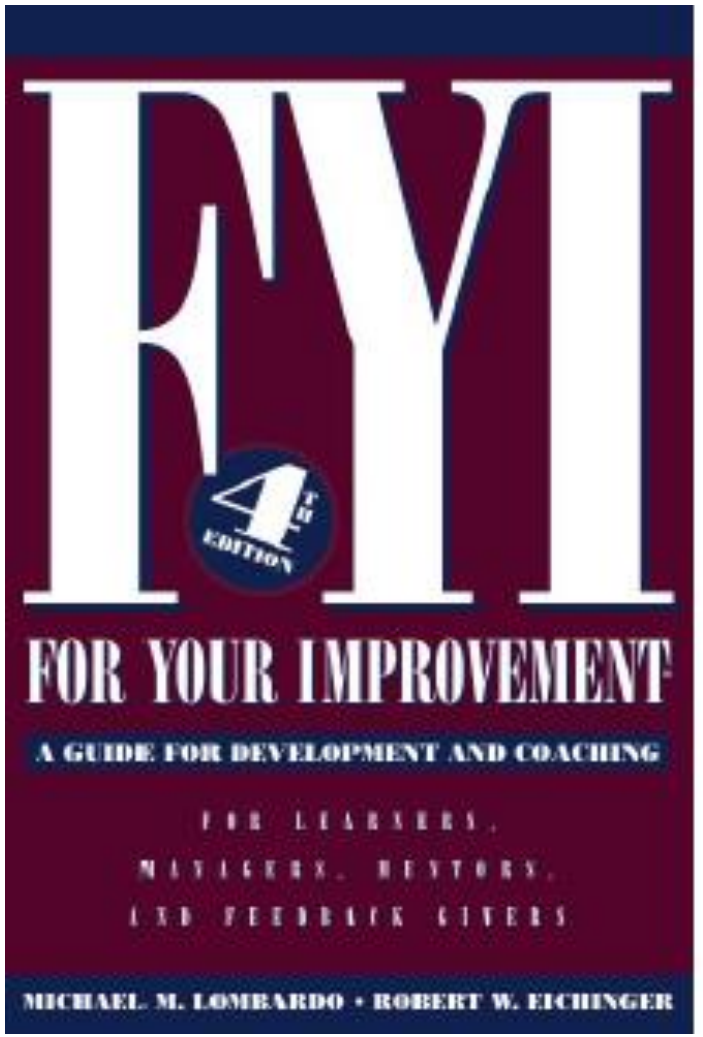
Confront & Solve problems

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**

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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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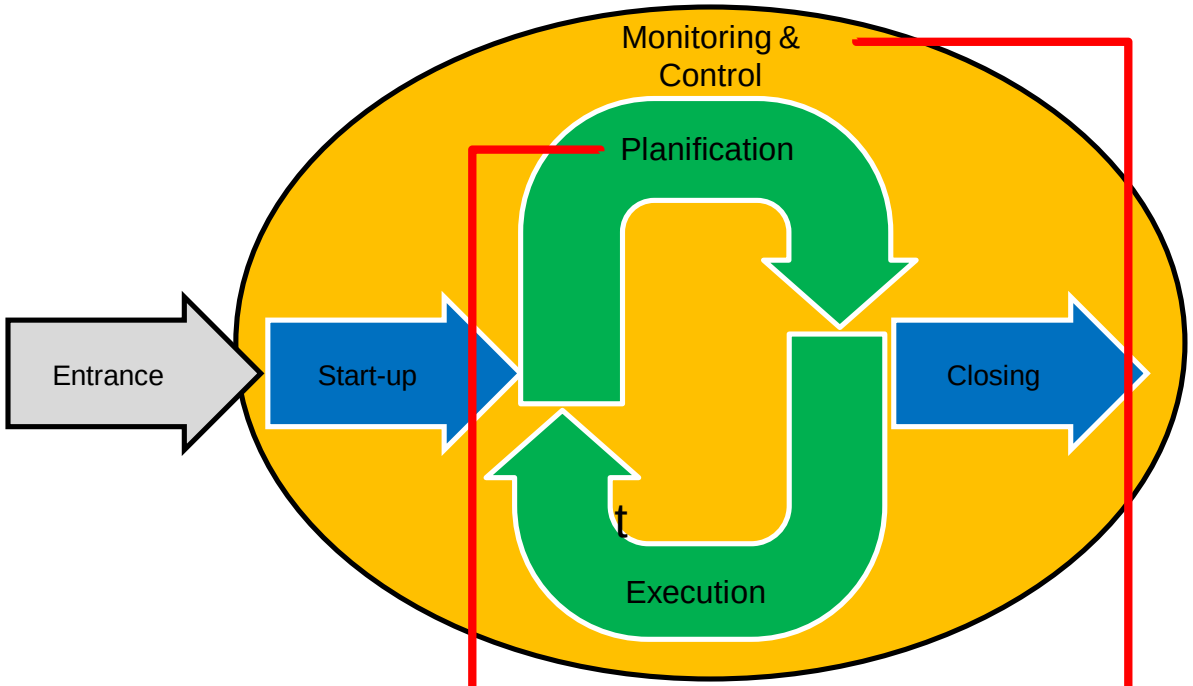
Communication Management

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

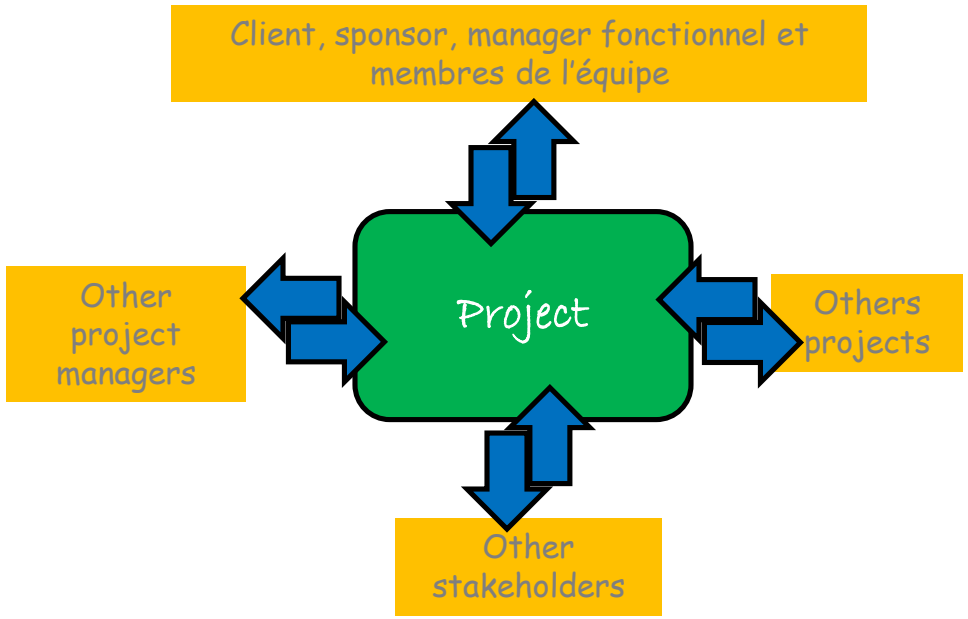
- **1. Stakeholders identification**
  - **Identify the people affected by the project, document their interests, involvement and the potential impact on the success of the project**
- **2. Communication planification**
  - **How to define the needs of stakeholders (in terms of communication), and how 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**

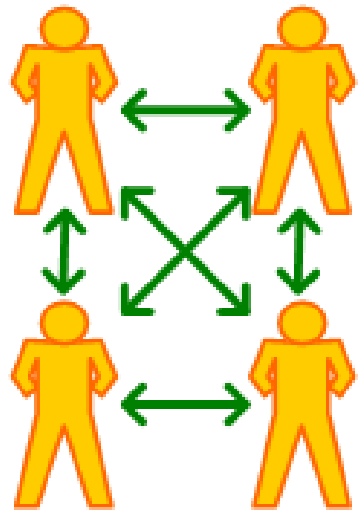
Communication needs

- **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				

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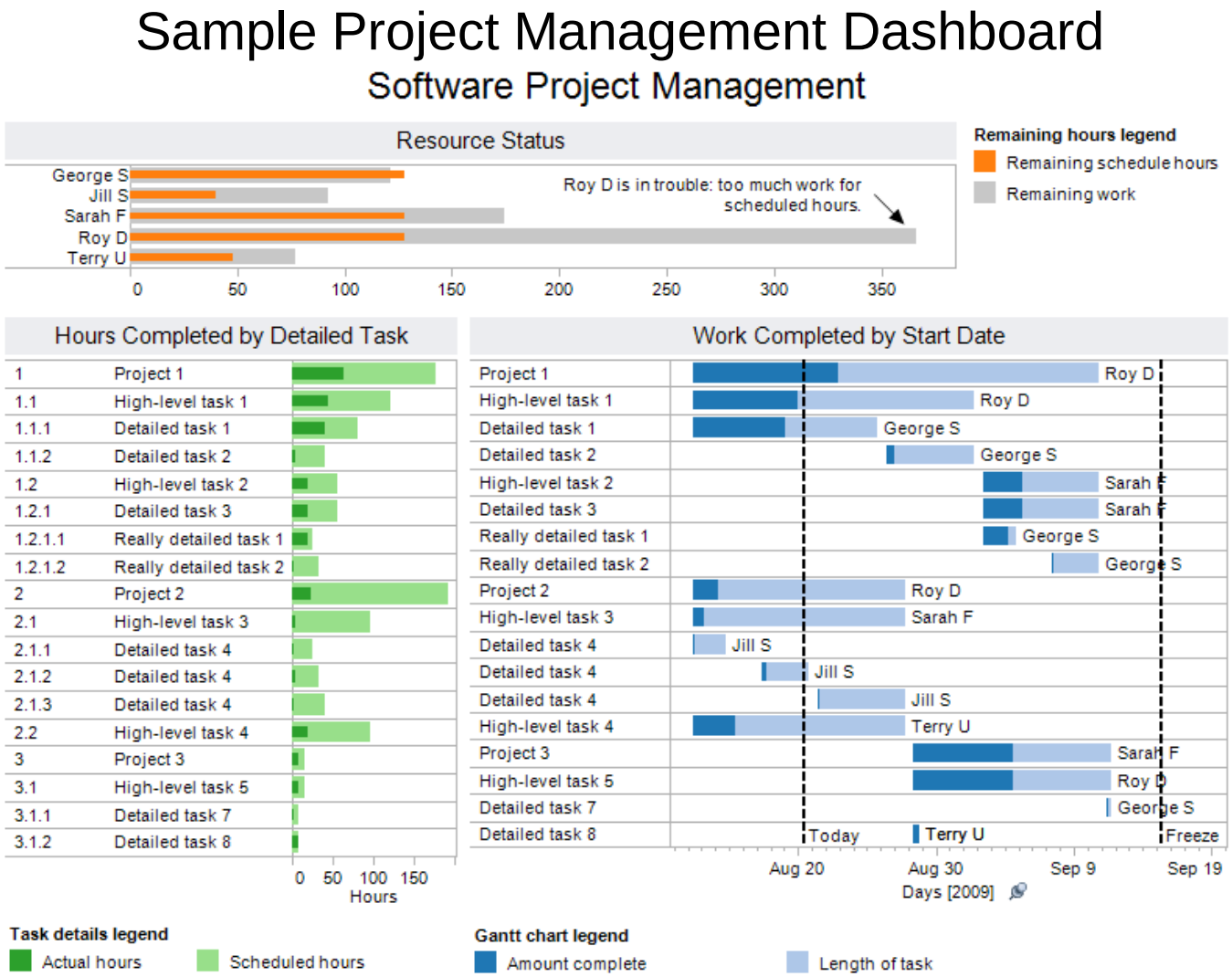
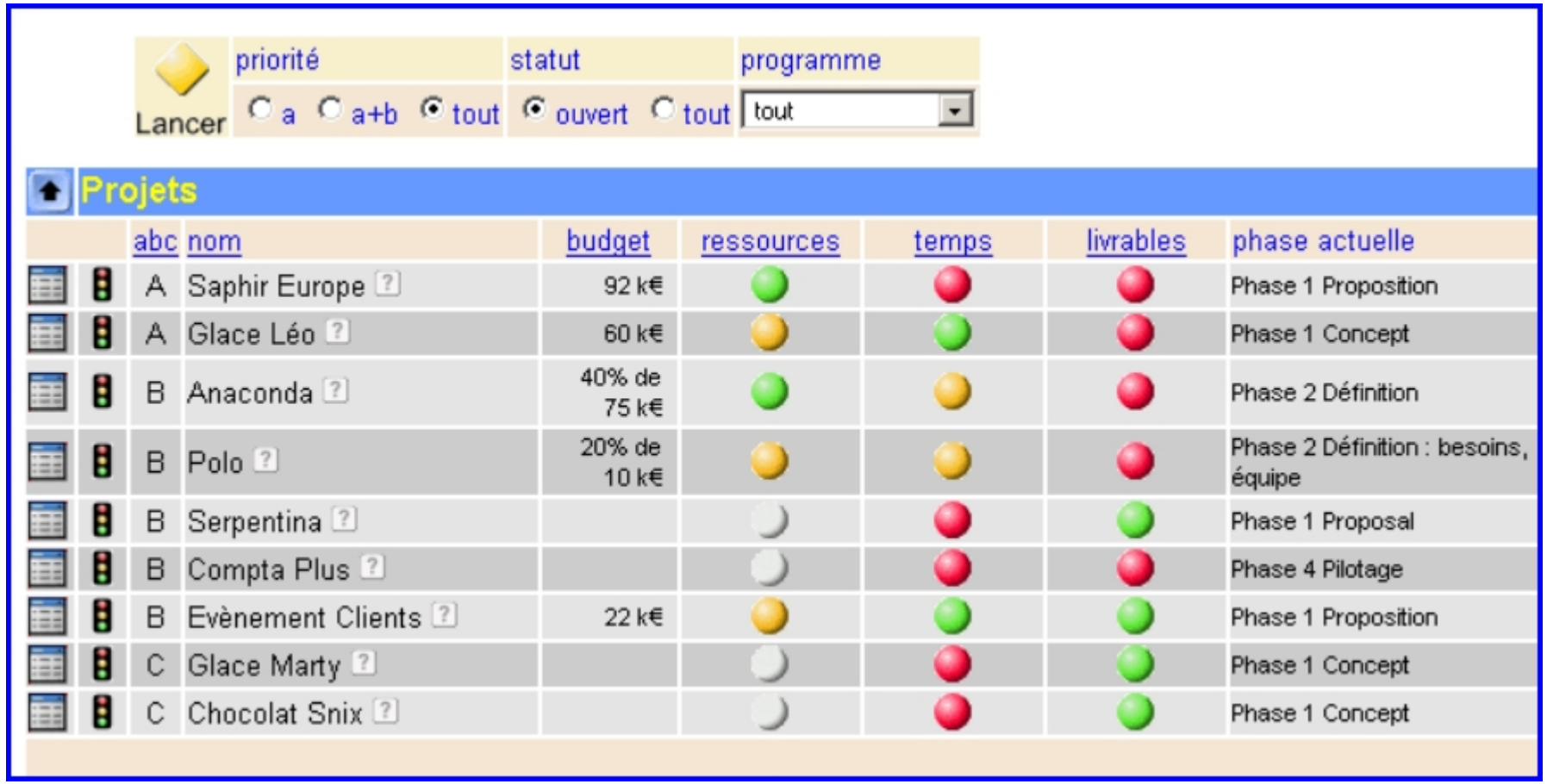


Olivier Berthet – December 21

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**

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Risk Management

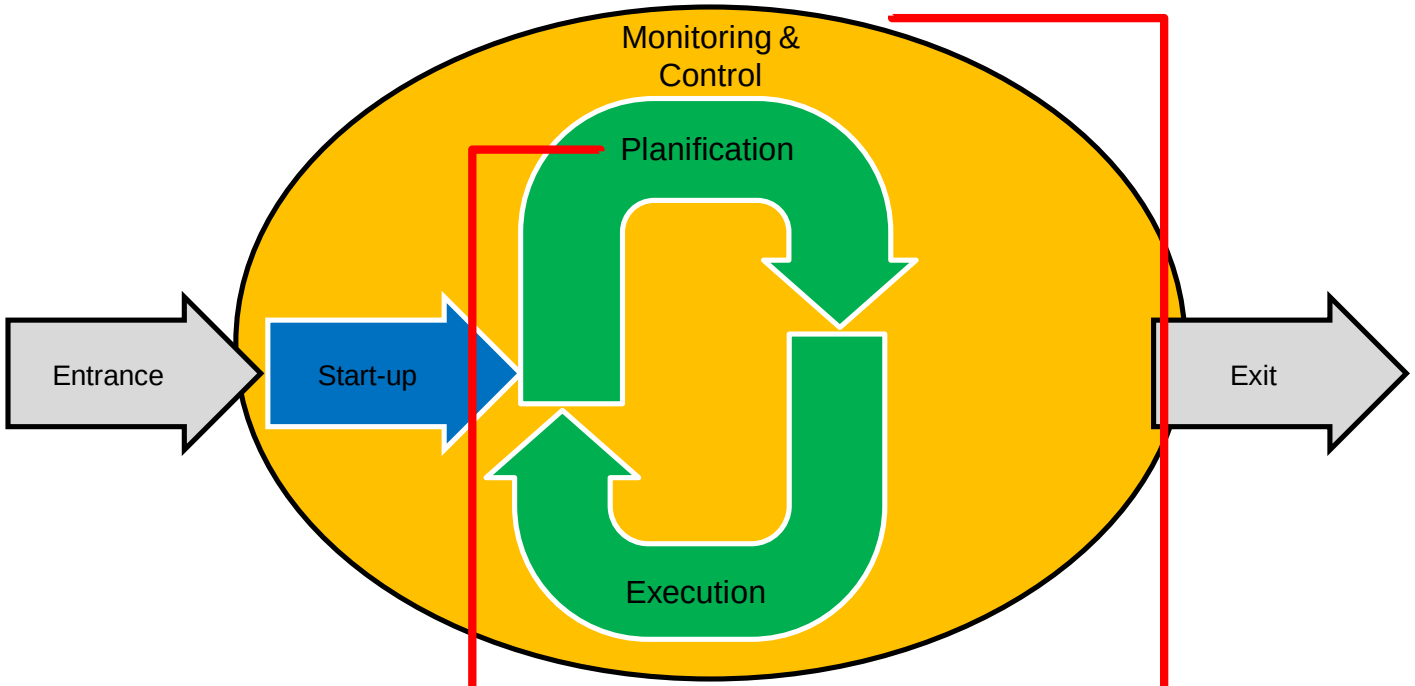
Benefits of Project Risk Management

- **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**

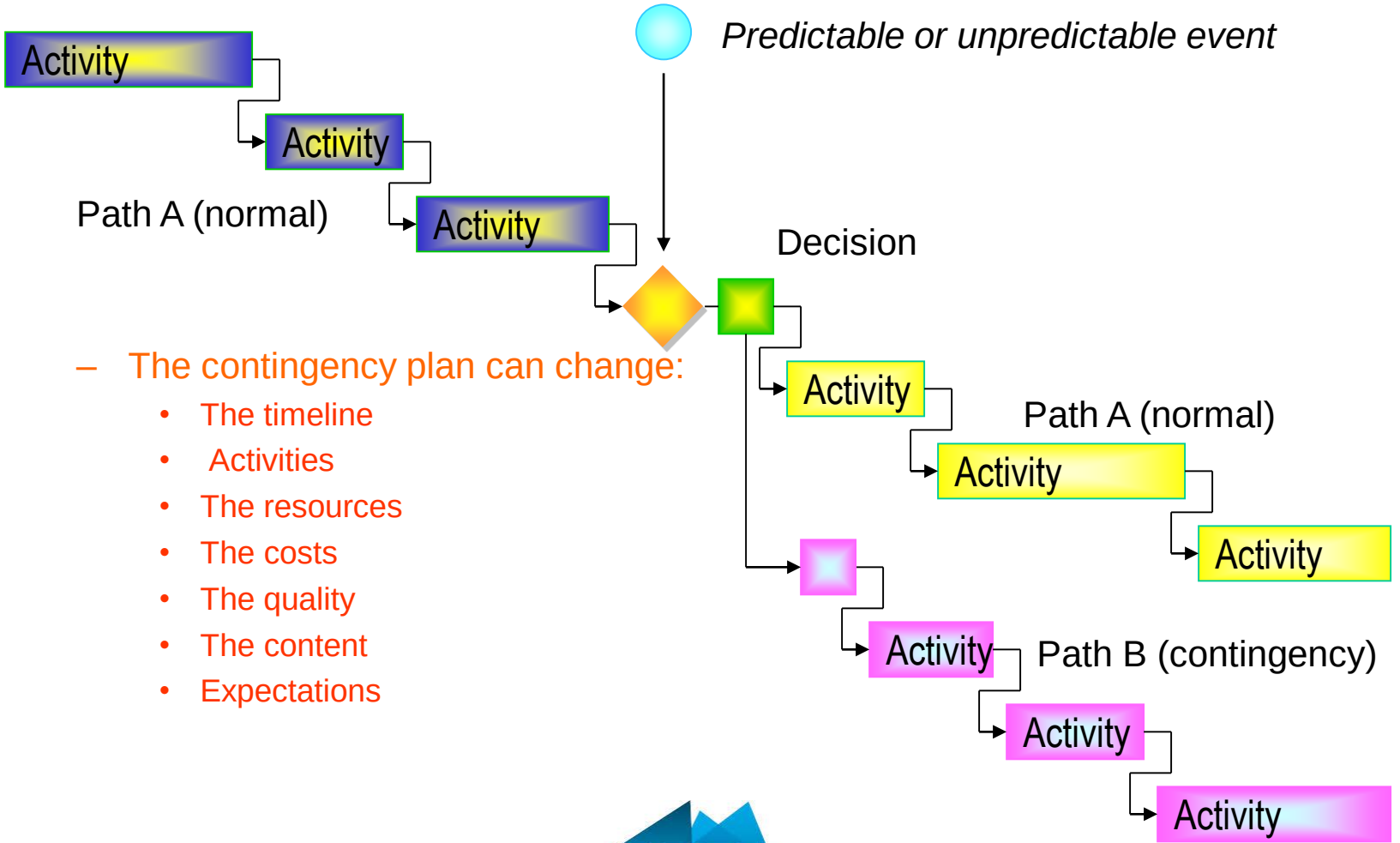
Response to negative risks

- **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**

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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**

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