



Information Management Master

Project

Management

Module 4

Fall/Spring



Rosemary Obi
rosemary.obi@epita.fr



Project Management



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Project Management

Importance of project management

- **Introduction to Project Management**
- **Integration Management**
- **Perimeter management**
- **Time management**
- **Cost management**
- **Quality and Human Resources Management**
- **Communication and risk management**
- **Purchasing and Stakeholder Management**
- **Ethics and professional conduct**
- **Agile Project Management Methodology**

Project Management

Quality Management



Project Management

Important points in QM

- 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

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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

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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

Note:

- ISO 9000:2000 refers to the ISO 9000 family of standards that were released in the year 2000.
 - ISO 9000 is a set of international standards for quality management and quality assurance.

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Shewhart and Deming Plan-Do-Check-Act

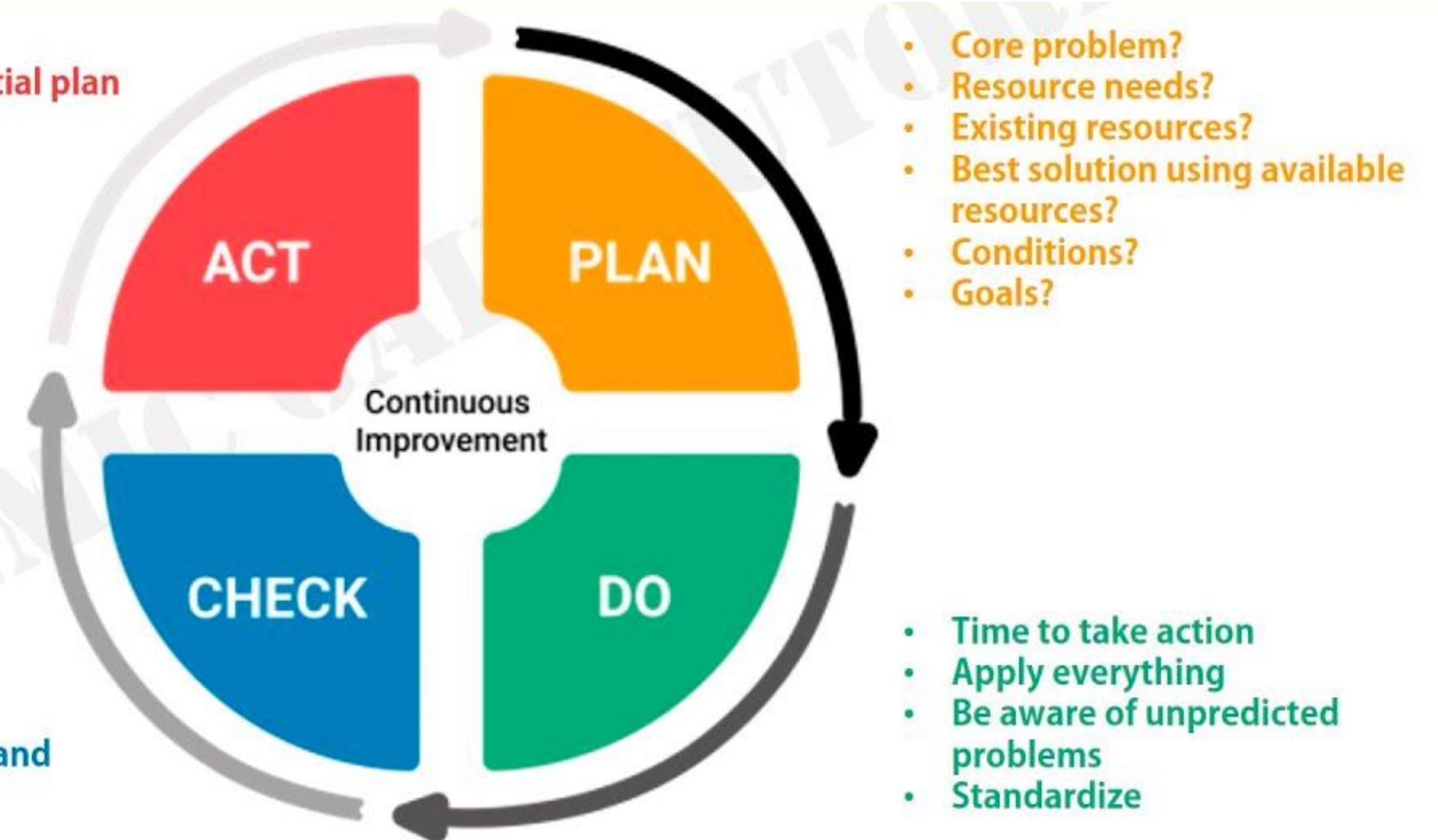
The PDCA cycle, also known as the Deming Cycle or Shewhart Cycle, **founded by Walter A. Shewhart and W. Edwards Deming hence the name Shewhart and Deming Plan-Do-Check-Act.**

It is a four-stage iterative management method used for continuous improvement in quality and performance.



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- Proceed and apply your initial plan
- New standard baseline



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In a nutshell

- **Plan:** Identify and analyze the problem, and plan for improvement.
- **Do:** Implement the planned changes on a small scale to test their effectiveness.
- **Check:** Assess the results of the implemented changes and collect relevant data.
- **Act:** Take appropriate actions based on the results, either by standardizing the improvement or by revising the plan and repeating the cycle.



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Benefits



- **Continuous Improvement**
- Systematic Approach to Problem-Solving.
- Data-Driven Decision Making
- Prevention of Issues
- Standardization of Processes
- Employee Involvement and Empowerment
- Customer Satisfaction
- Adaptability to Change
- Cost Savings

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Uses

- As a model for continuous improvement.
- When starting a new improvement project.
- When developing a new or improved design of a process, product or service.
- When defining a repetitive work process.
- When planning data collection and analysis in order to verify and prioritize problems or root causes.
- When implementing any change.

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Kaizen Principle

- Kaizen is a Japanese term that means "change for the better" or "continuous improvement, emphasizing small, incremental changes to processes, products, or services. It involves the entire organization and encourages a culture of ongoing improvement.
 - The goal of Kaizen is to enhance efficiency, quality, and overall performance by involving all members of an organization in the improvement process.

kai **zen**

改善

change good



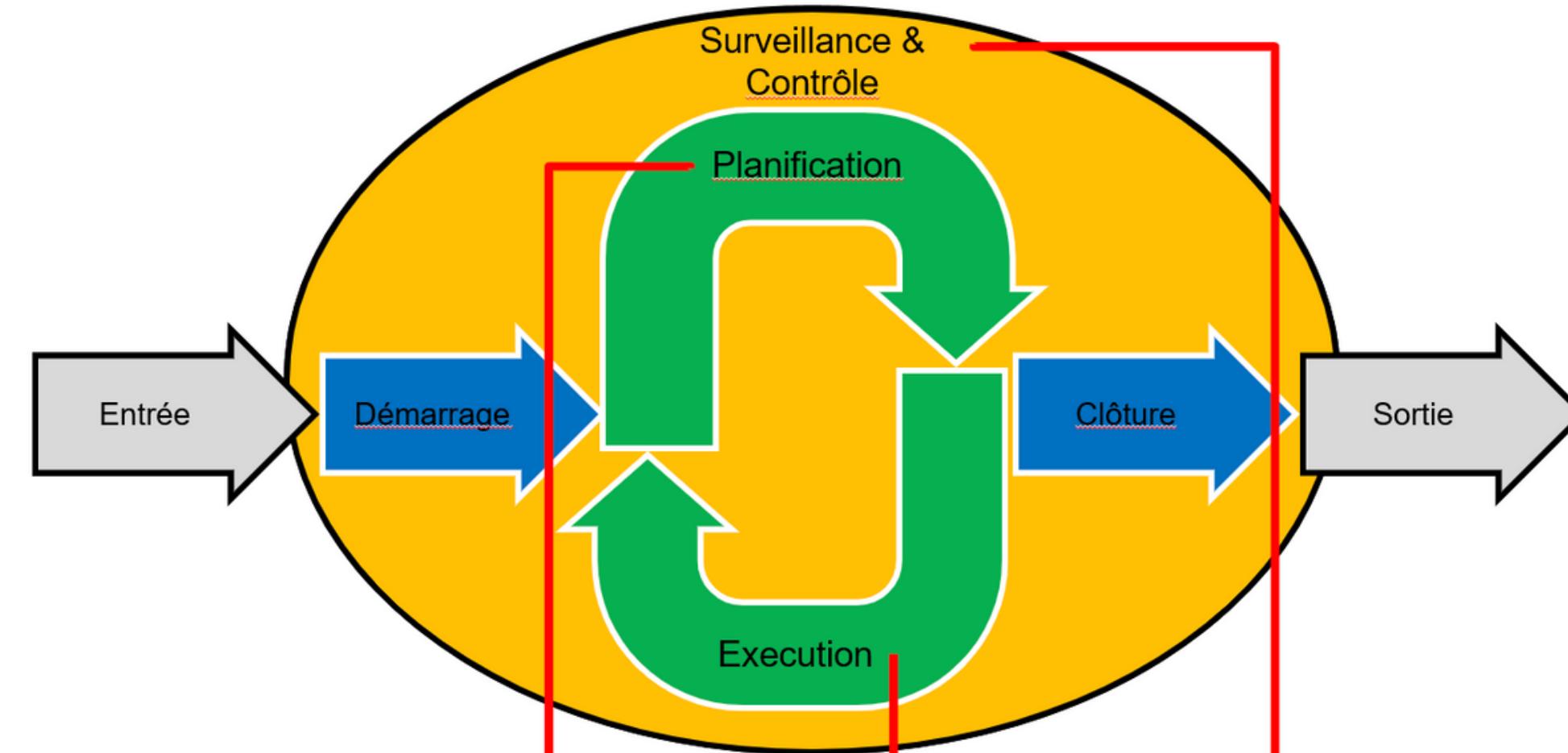
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Kaizen Principle and the Plan-Do-Check-Act (PDCA) cycle

- KAIZEN process was established as a sequential process of events based on PDCA (Plan-Do-Check-Action) cycle.
- The Kaizen principle and the Plan-Do-Check-Act (PDCA) cycle are both fundamental concepts in the realm of continuous improvement and quality management.
- Organizations often integrate these concepts, using the PDCA cycle as a tool within the broader framework of Kaizen to drive sustained improvements in quality and processes. PDCA is the rotary engine that powers Kaizen.



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

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Quality Management Process

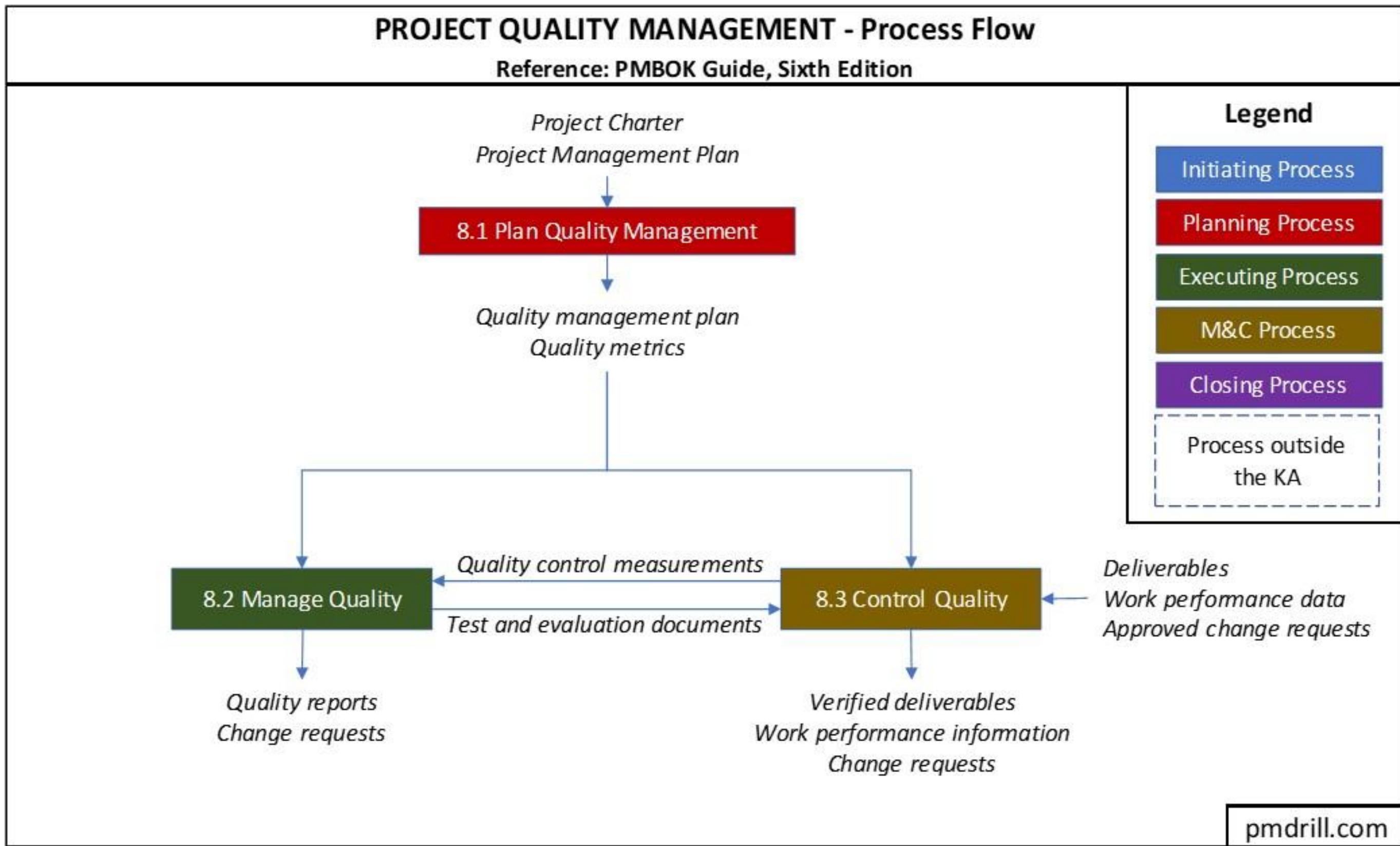
- **8.1 Quality planning**
 - To identify the quality standards applicable to the project and to determine how to meet them
- **8.2 Implement quality assurance**
 - Periodic evaluation of the overall performance of the project against quality standards
- **8.3 Implement quality control**
 - Monitoring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

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Quality Control

- **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

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Some tools and techniques of quality control

- Six Sigma
- Quality control diagrams
- Ishikawa diagrams
- Tests
- Maturity models
- ISO 15504 Standards (also known as SPICE – Software Process Improvement and Capability Determination)

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Six Sigma 6σ

- Six Sigma is a data-driven methodology and set of techniques for improving processes by eliminating defects and reducing variability.
- “Six Sigma” means the process produces no more than 3.4 defects per million opportunities (DPMO) – i.e., 99.99966% defect-free performance.
- It was first developed by Motorola in the 1980s and popularized by General Electric (GE).

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Six Sigma 6σ

- The name "Six Sigma" reflects the goal of achieving a level of quality where the process produces extremely few defects, errors, or variations.
- The sigma (σ) symbol represents the standard deviation, a statistical measure of the spread of data points in a process.
- A process operating at Six Sigma is capable of producing 99.99966% defect-free products or services.

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Six Sigma Chart

Sigma Level	Percentage Yield	Percentage Defects	Defects Per Million Opportunities (DPMO)
1	30.85%	69.15%	691,462
2	69.15%	30.85%	308,538
3	93.32%	6.68%	66,807
4	99.38%	0.62%	6,210
5	99.977%	0.023%	233
6	99.99966%	0.00034%	3.4

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Definition of DPMO, Defect and Opportunity

- **DPMO** represents the number of defects that could occur per million opportunities in any given process, thus providing a standardized measure for evaluating process performance and quality across different industries and scales of operation.
- Six Sigma defines a **defect** as any process output or product that does not meet the predetermined specifications or customer expectations. It is an anomaly or deviation from the desired state, potentially leading to decreased customer satisfaction, increased costs, and, in some instances, risks to health and safety.
- An **opportunity** refers to each instance or point in a process where a defect could occur. It represents the specific elements or steps in a process that are critical for maintaining the desired level of quality and evaluates them to determine the presence or absence of defects.

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Calculation of DPMO

- To calculate DPMO, you need to know the following three variables:
 - D: Number of Defects identified in the process.
 - U: Number of Units produced or processed.
 - O: Number of Opportunities for a defect per unit.

DPMO Formula:

- $DPMO = (D/UO) \times 1,000,000$

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Example

A company manufactures 1,000 smartphones.

Each phone has 5 opportunities for a defect (e.g., screen, battery, camera, buttons, charging port).

After inspection, 12 defects are found in total.

Steps

Identify known values

- Number of defects = 12
- Number of units = 1,000
- Opportunities per unit = 5
- Multiplier = 1,000,000

Now plug in the values

- $DPMO = (D/UO) \times 1,000,000$
- DPMO = 2,400

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Interpretation of the DPMO value

- A DPMO of 2,400 means that for every 1,000,000 opportunities, there are 2,400 defects.

This corresponds roughly to a Sigma Level of about 4.3, which indicates a good process, but there's still room for improvement toward Six Sigma (3.4 defects per million).

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Estimate the Sigma Level

- To convert **DPMO to Sigma**, we use statistical standard deviation logic (based on the **normal distribution curve**).

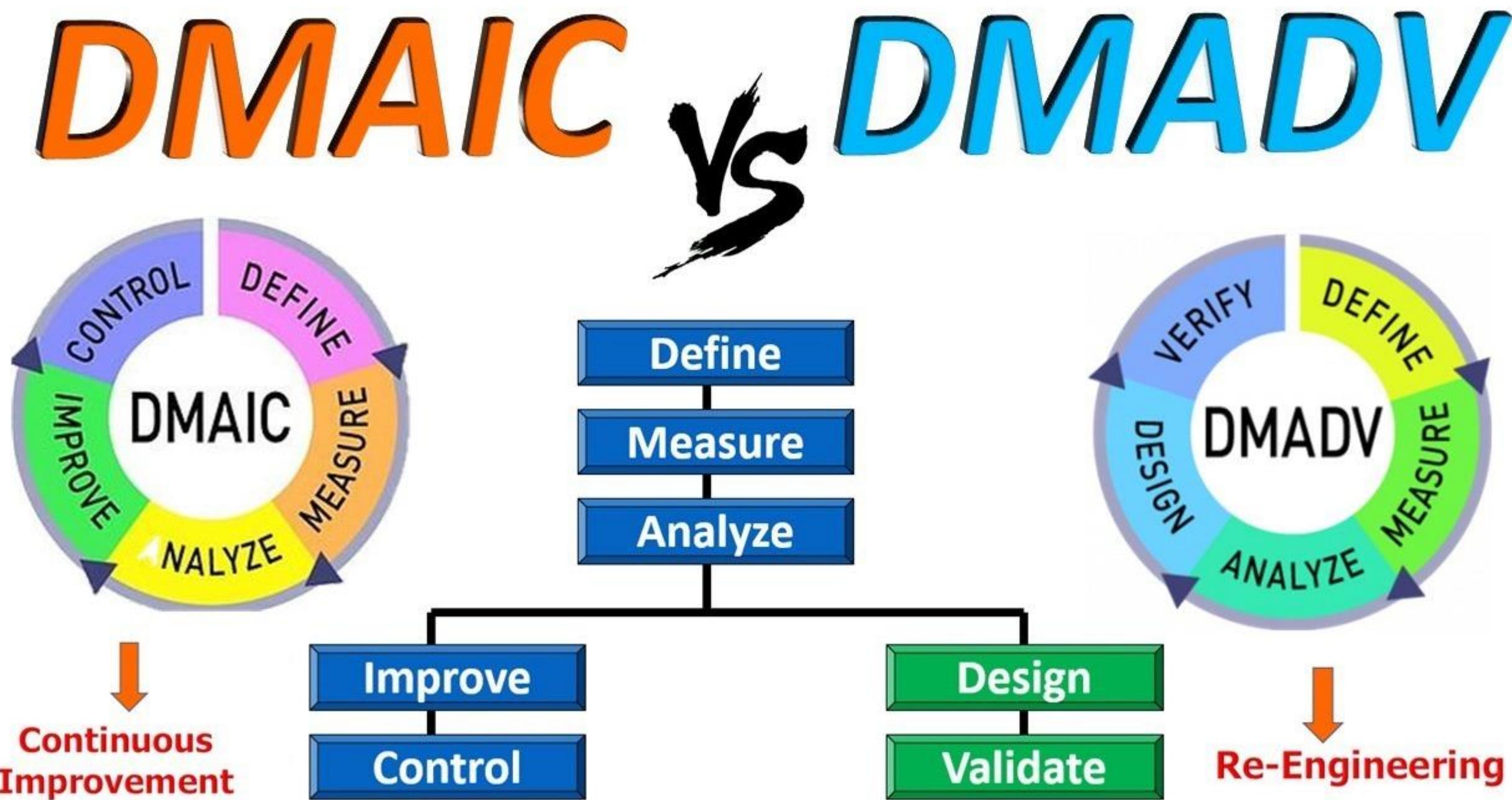
Simplified approach:

- Check on the Six Sigma Conversion Table via [HERE](#)

So the Sigma Level of 2,400 DPMO $\approx 4.3\sigma$

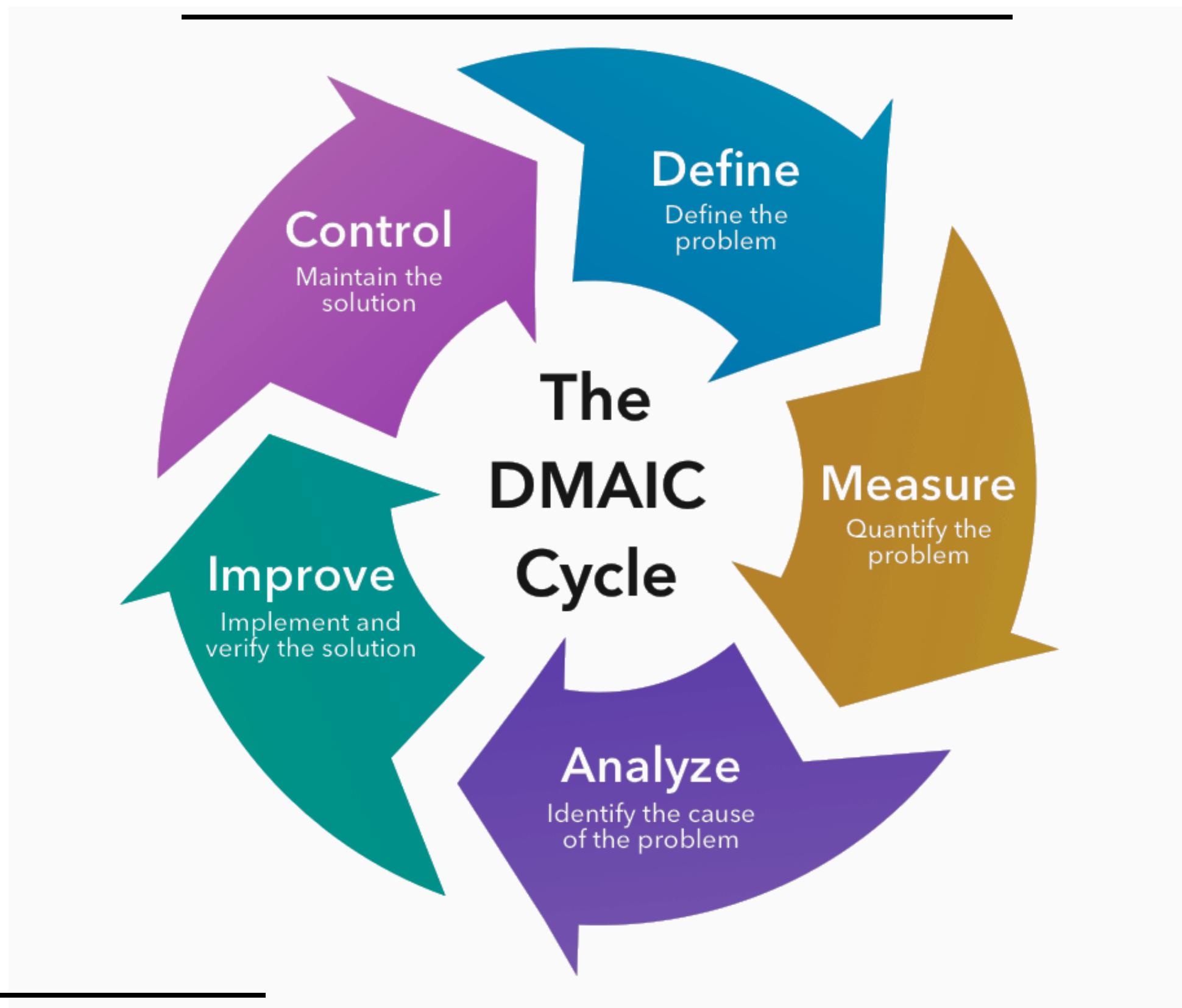
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Six Sigma Methodologies



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Six Sigma Methodologies



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Six Sigma Process

Phase	Purpose	Example
Define	Identify the problem, project goals, customer needs.	"Reduce billing errors in the invoicing system."
Measure	Collect data to understand current performance.	Track number and types of billing errors.
Analyze	Identify root causes of defects.	Use Fishbone Diagram or Pareto Chart.
Improve	Implement solutions to remove root causes.	Automate data entry validation.
Control	Sustain improvements through monitoring and control plans.	Establish control charts for monthly billing error rate.

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Control Diagrams

- Determine if a process is stable and has a predictable performance.
- Answers the question: are the process results within acceptable limits?
- Used to monitor and control a process over time by plotting data points and statistically analyzing them for patterns or trends.
 - By plotting data points on a chart, such as X-bar and R charts, organizations can assess whether their processes are within acceptable limits.

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Purpose of Control Diagram

To track process behavior and detect trends, shifts, or abnormal variations.

To differentiate between:

- **Common causes:** natural, random variation inherent to the process.
- **Special causes:** unexpected variation from specific, identifiable factors.

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Structure of a Control Chart

Element	Description
X-axis	Time or sequence of samples (e.g., days, batches, shifts).
Y-axis	Measured quality characteristic (e.g., temperature, defect rate).
Center Line (CL)	Process mean or average performance.
Upper Control Limit (UCL)	Usually set at +3σ above the mean.
Lower Control Limit (LCL)	Usually set at -3σ below the mean.
Data Points	Individual measurements plotted over time.

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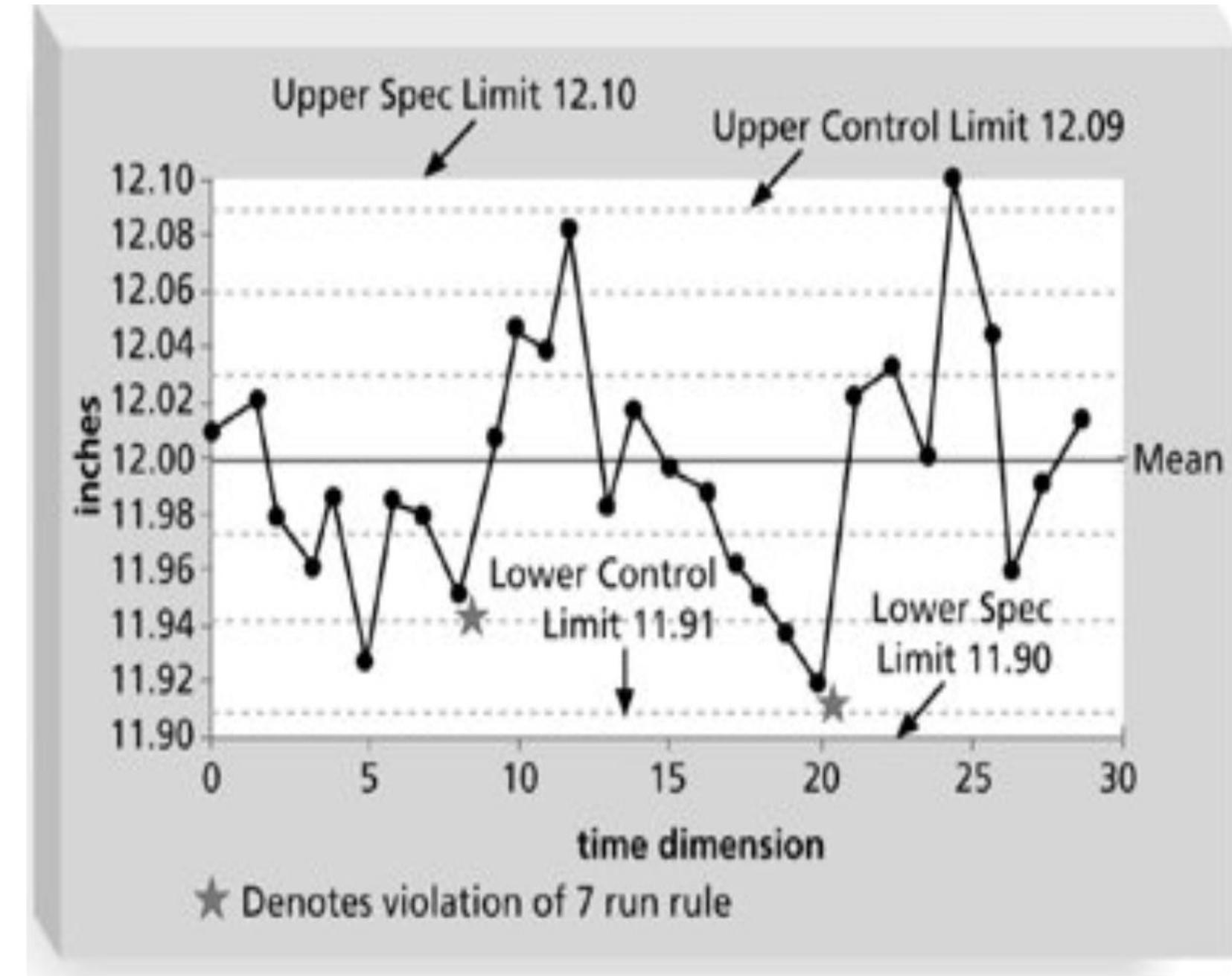
Control Diagrams

- **Process is in control:**

Points fluctuate randomly within control limits; only common causes present.

- **Process is out of control:**

Points fall outside control limits or show non-random patterns (e.g., trends, cycles, runs).



The goal of using control charts is to monitor the stability of a process

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Cause-effect diagram (Ishikawa)

- The Ishikawa Diagram, developed by Kaoru Ishikawa, is a visual quality management tool used to identify, explore, and display all possible causes of a specific problem (effect). It helps teams trace issues back to their root causes rather than treating surface symptoms.
- Helps find the potential cause of a problem. Also called Fishbone diagram, it illustrates how various factors might be related to problems.

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Cause-effect diagram (Ishikawa)

Purpose

- To **analyze the root causes** of defects, variations, or failures in a process.
- To **organize brainstorming** during quality problem-solving.
- To **support continuous improvement** by focusing corrective actions on true causes.

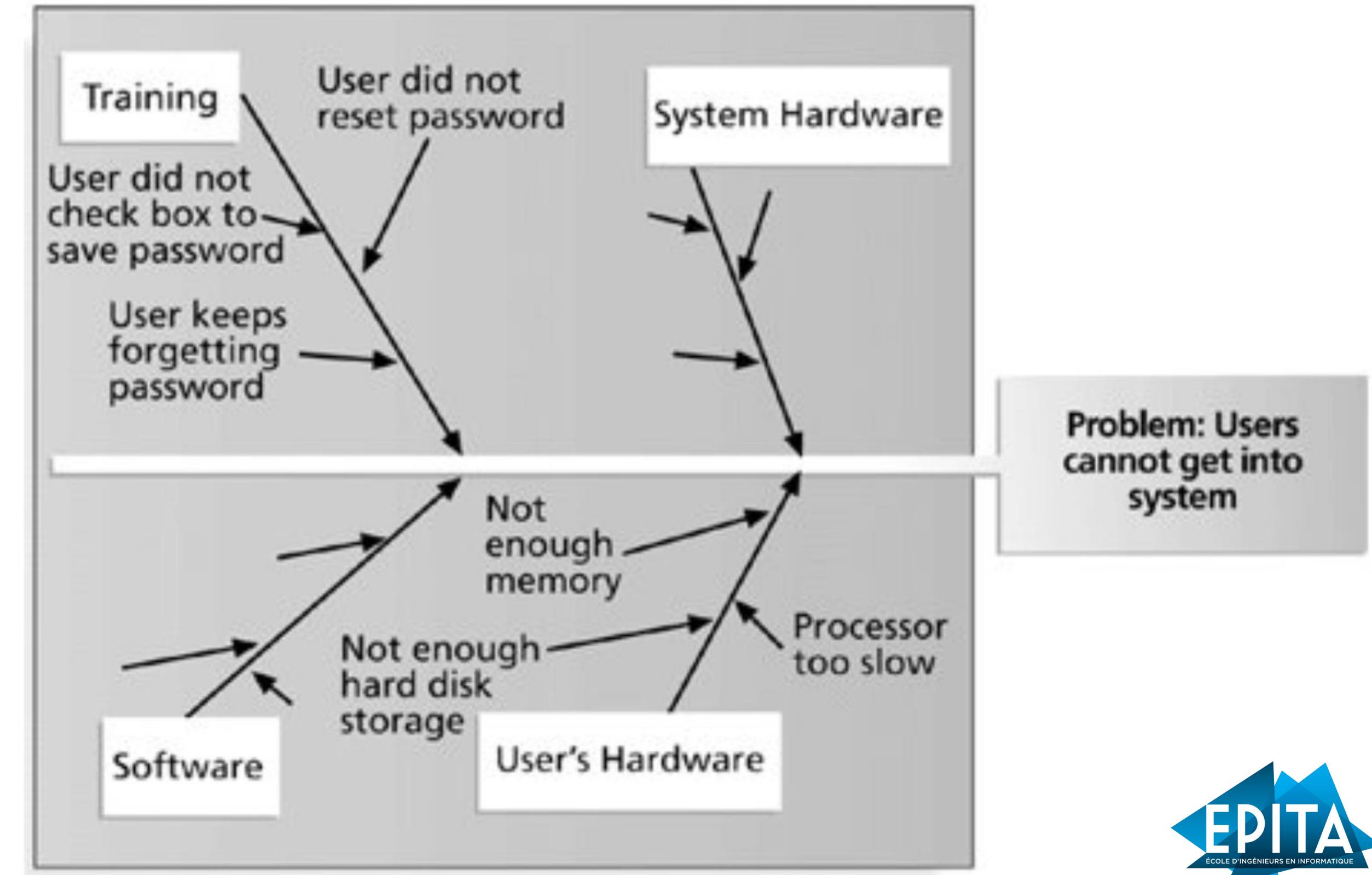
Structure

- The “**head**” of the fish = the **problem statement or effect** (e.g., “Low Product Quality”).
- The “**bones**” = **major categories of causes** contributing to the problem.
- The **sub-branches** = **detailed potential causes** within each category.

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Cause-effect diagram (Ishikawa)

Ishikawa diagrams often follow the "Six M's": manpower, machinery, methods, materials, measurement, and mother nature.



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Cause-effect diagram (Ishikawa)

How to Use:

- Gather the team and brainstorm all possible causes of a defect or issue.
- Categorize them into areas like Methods, Machines, Materials, People, etc.
- Analyze the diagram to trace the root cause and mitigate it.

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Pareto

- A Pareto Chart is a bar and line graph combination used to identify and prioritize the most significant causes of problems or defects in a process.
It is based on the Pareto Principle, which states that 80% of problems arise from 20% of causes.
- Named after **Vilfredo Pareto**, an Italian economist who observed that **80% of Italy's wealth was owned by 20% of the population**.
In quality terms; a small number of causes typically account for most defects or complaints.

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Pareto

- ***80% of effects come from 20% of causes.***
- In Six Sigma projects, Pareto Analysis is often conducted during the "Analyze" phase (within the DMAIC methodology) to identify the key drivers of defects or quality issues.
- The Pareto Principle serves as a valuable tool for allocating resources efficiently and driving continuous improvement initiatives.

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Pareto

- **Pareto Analysis:** Pareto Analysis is a technique used to prioritize problems or issues based on their importance.
 - **Pareto Charts:** Pareto Charts are graphical representations of Pareto Analysis results. They consist of bars arranged in descending order to illustrate the relative frequency or impact of different categories or factors.

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Pareto

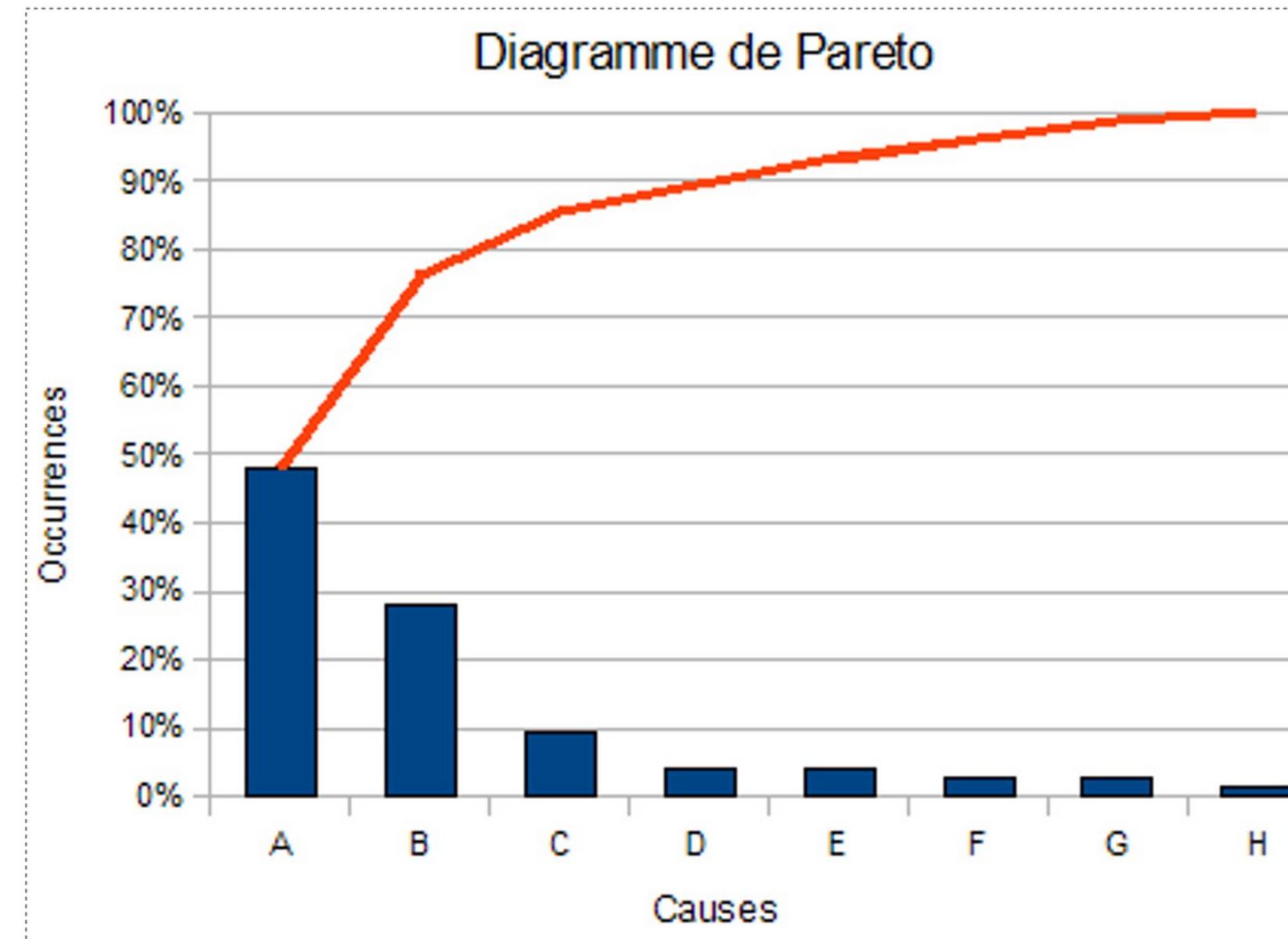
How to Use:

- Collect data on defects, errors, or issues.
- Rank causes by frequency or impact.
- Create a Pareto chart to visualize the most critical problems.
- Focus efforts on the top contributors to maximize improvement with minimal effort.

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Pareto

80% of effects come from 20% of causes. The principle suggests that, in many situations, a small number of factors or inputs contribute to the majority of the results or outputs.



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Pareto Example

Cause	Frequency
Late Delivery	45
Damaged Product	25
Wrong Item	15
Poor Packaging	10
Billing Error	5

Step 1: Arrange from highest to lowest frequency.

Step 2: Calculate cumulative percentage.

Step 3: Plot bars (causes) and line (cumulative %).

Result:

“Late Delivery” and “Damaged Product” account for about **70% of total complaints**; so improving logistics and packaging will yield the biggest quality gains.

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More Examples

- Project Delays: In project management, it's common for about 80% of project delays to be caused by 20% of factors, such as resource constraints, scope changes, or communication breakdowns.
- Sales: In many businesses, approximately 80% of sales come from 20% of customers. These high-value customers may be repeat buyers, large clients, or those who purchase premium products or services.

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Tests

- In project quality management, **tests** are **systematic activities used to evaluate deliverables or processes** to ensure they **meet specified requirements and quality standards** before acceptance.
- Activity which consists of 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

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Tests

- 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

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ISO Standards

- ISO 15504 Standards (also known as SPICE – Software Process Improvement and Capability Determination)
- Process Capability Assessment: ISO 15504 provides a framework for assessing the capability of an organization's software development processes.
- It provides a structured approach to process improvement that contributes to higher-quality software products.
- ISO 15504 helps organizations establish robust foundations for delivering high-quality software solutions.

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Class question

- **If you consider a diagram to determine the potential causes, which one will you use?**
- A. Control diagram
 - B. Pareto diagram
 - C Fishbone diagram/Ishikawa
 - D Checklist

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Class question

- **If you consider a diagram to determine the potential causes, which one will you use?**
- A. Control diagram
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 - C **Fishbone diagram/Ishikawa**
 - D Checklist

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Class question

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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Class question

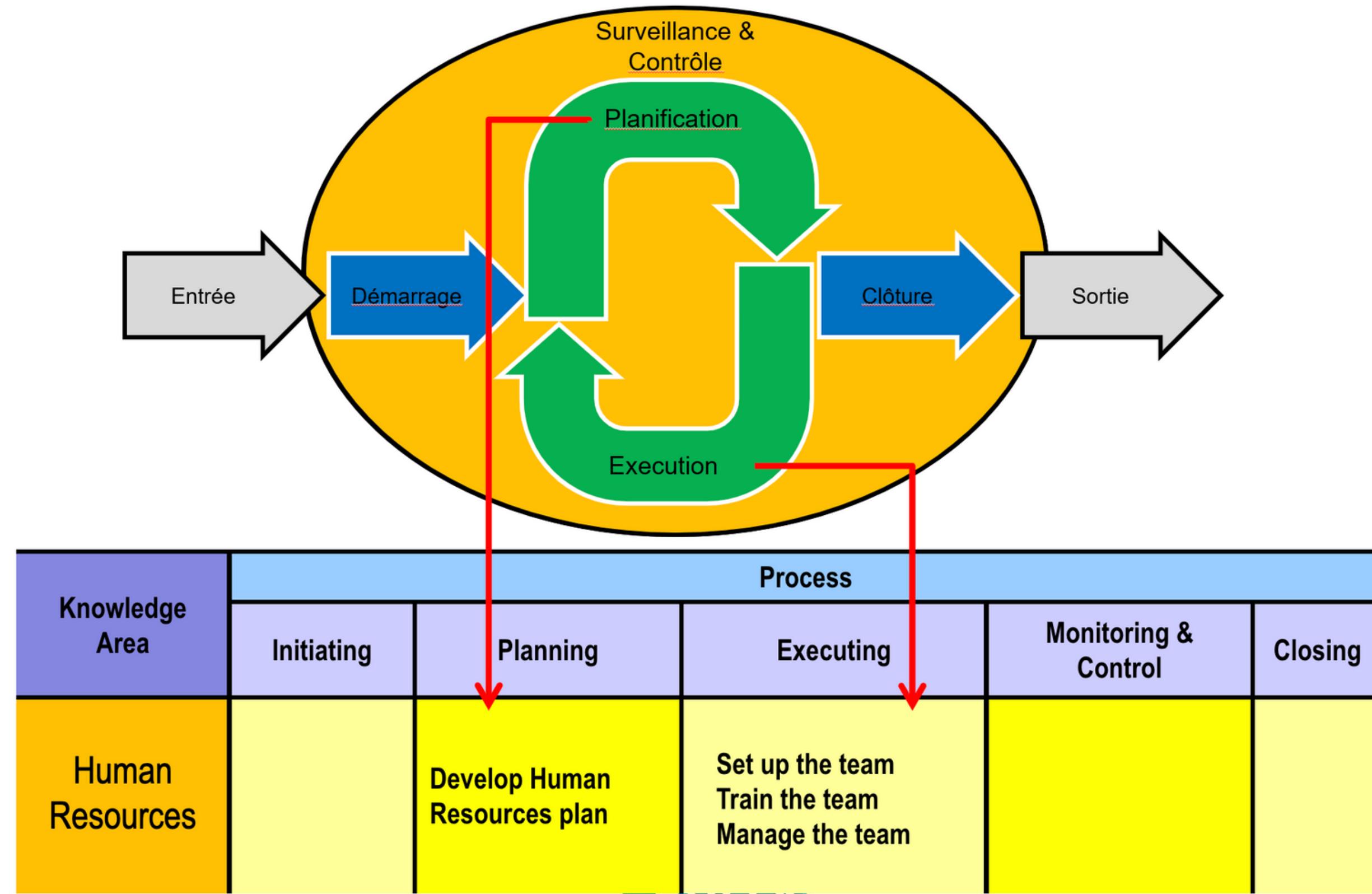
- **What is the best definition of Kaizen's principle?**
- a) Define quality processes and verify that they are used
- b) **Continuous improvement**
- c) Verification of product quality
- d) Have a quality management plan

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Human resources



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Human Resources Management Process

- **9.1 Develop the Human Resources Plan**
 - Identify and document roles, responsibilities, and competencies required, report relationships, and create 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

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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

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RACI Matrix



Click [Here](#) for Video

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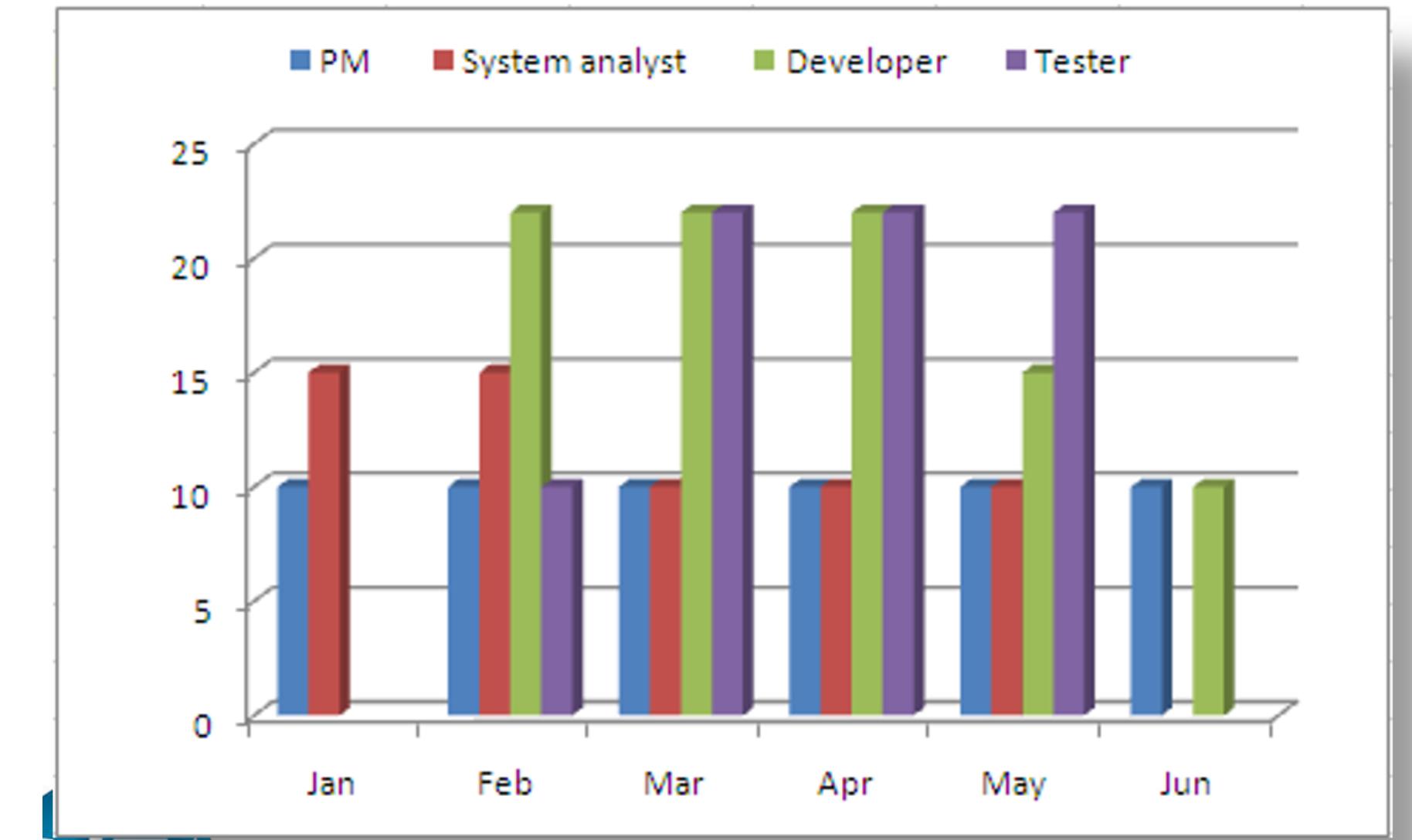
Benefits of RACI Matrix

- Role clarity
- Improved communication
- Increased accountability
- Risk reduction
- Conflict resolution
- Efficiency and Productivity
- Alignment with objectives

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Human Resources Management Plan

- Human Resources Plan includes but is 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



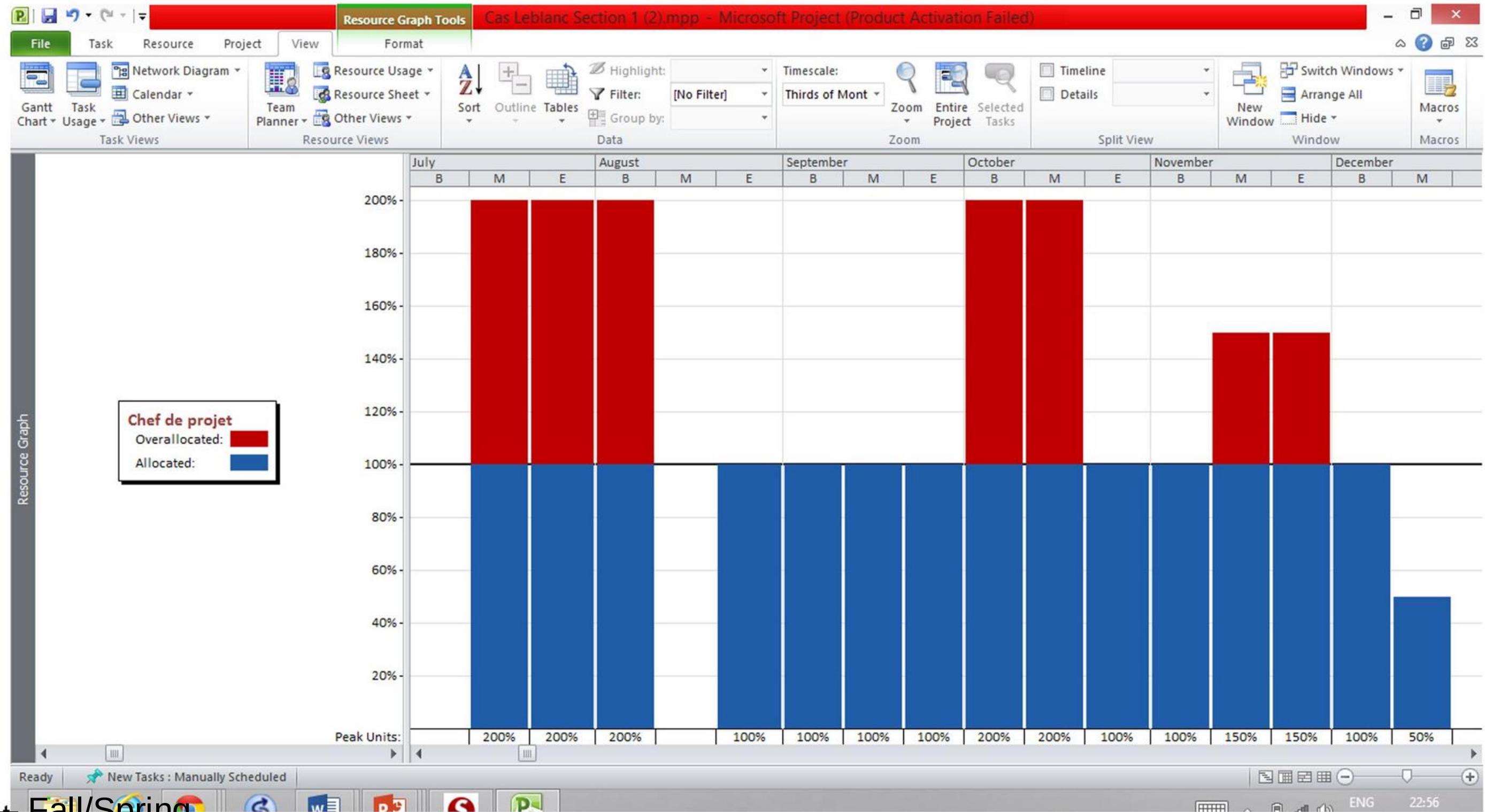
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Resource allocation

- 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.

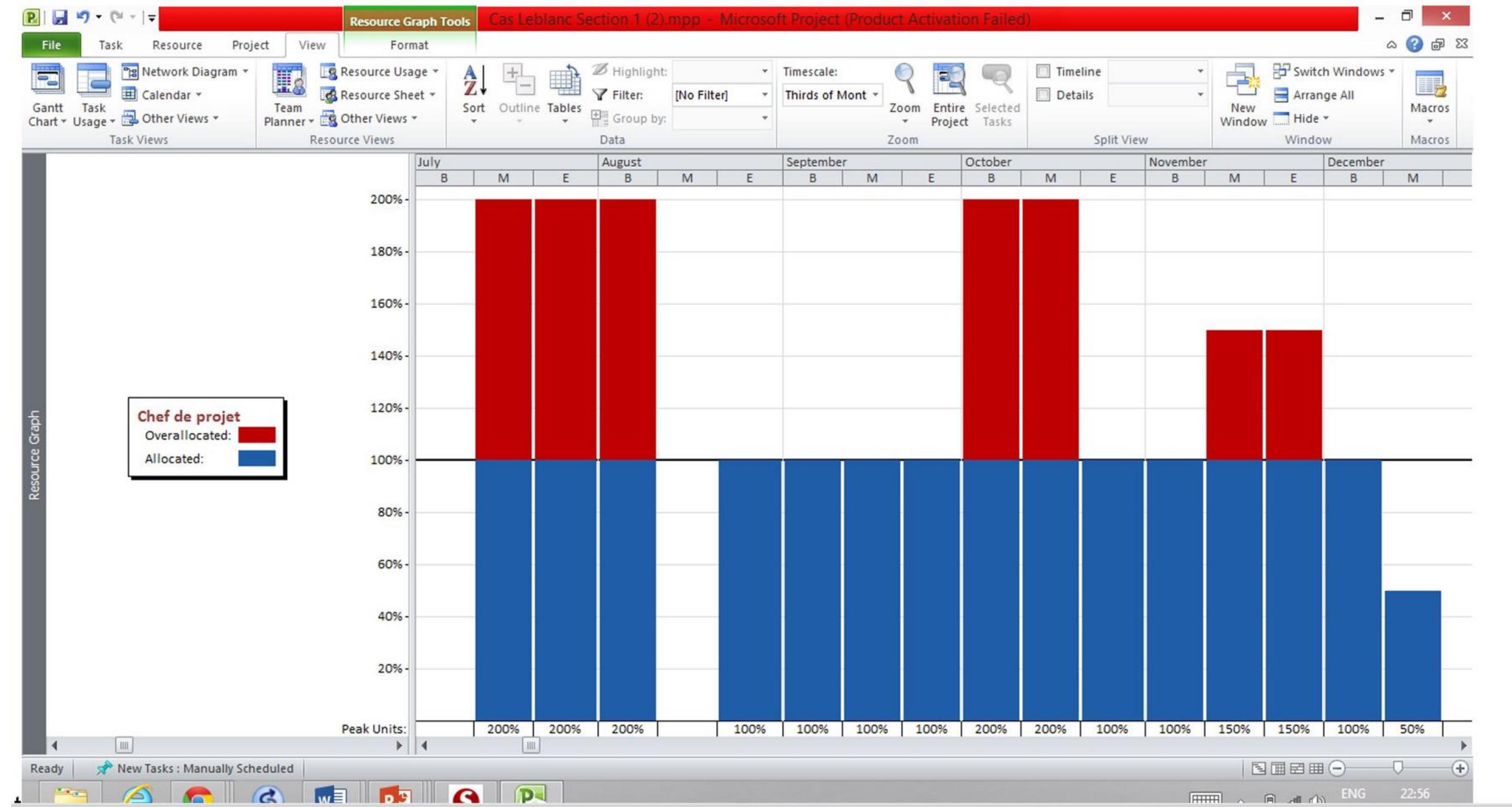
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Find the mistake



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Mistake: Resource over-allocation after scheduling a project



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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**

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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



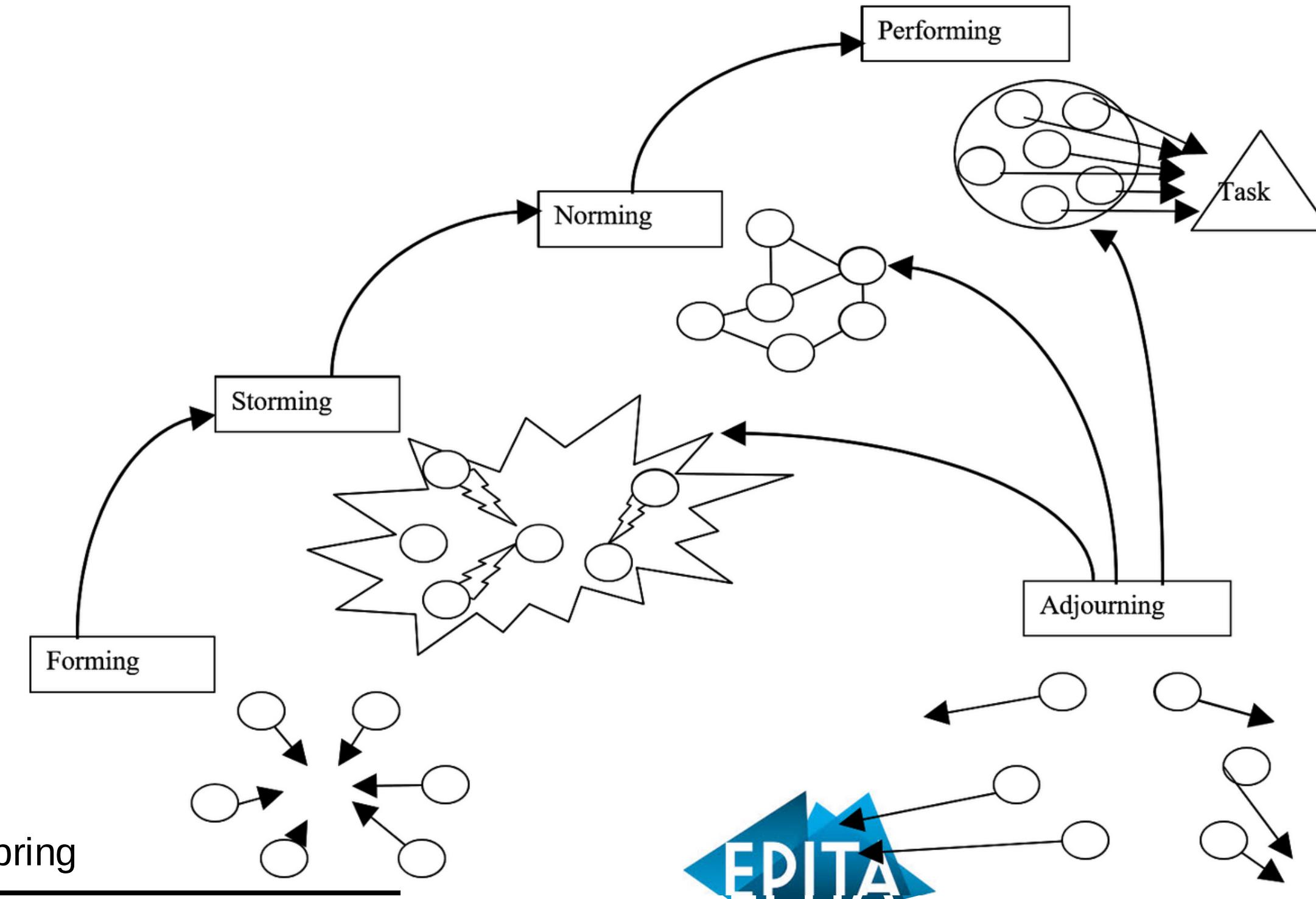
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Stages of development of a group (Tuckman, 1965)

- **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

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Stages of development of a group (Tuckman, 1965)



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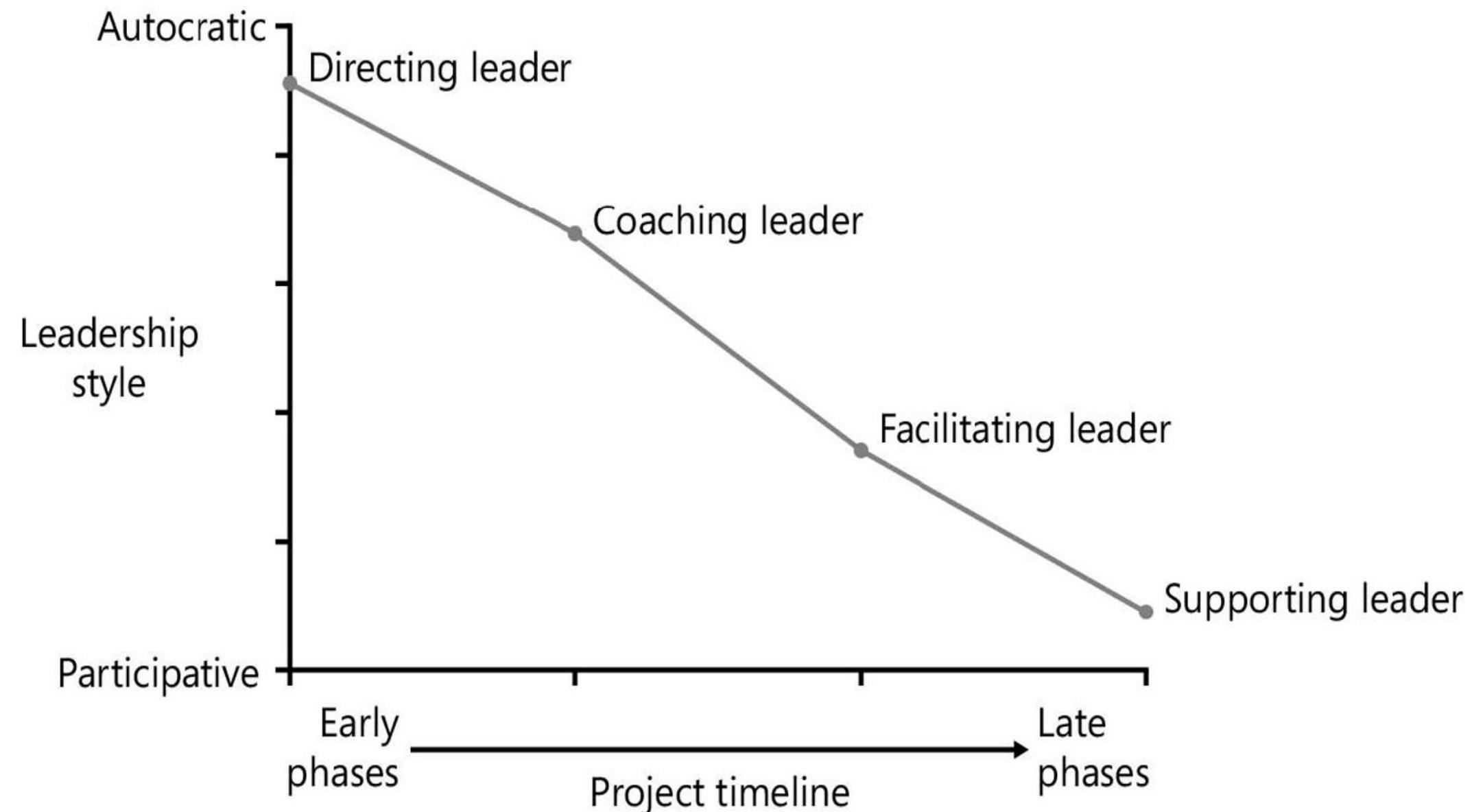
Conflict management

- 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 is scheduling issues
- Conflict is better resolved by those involved in the conflict.

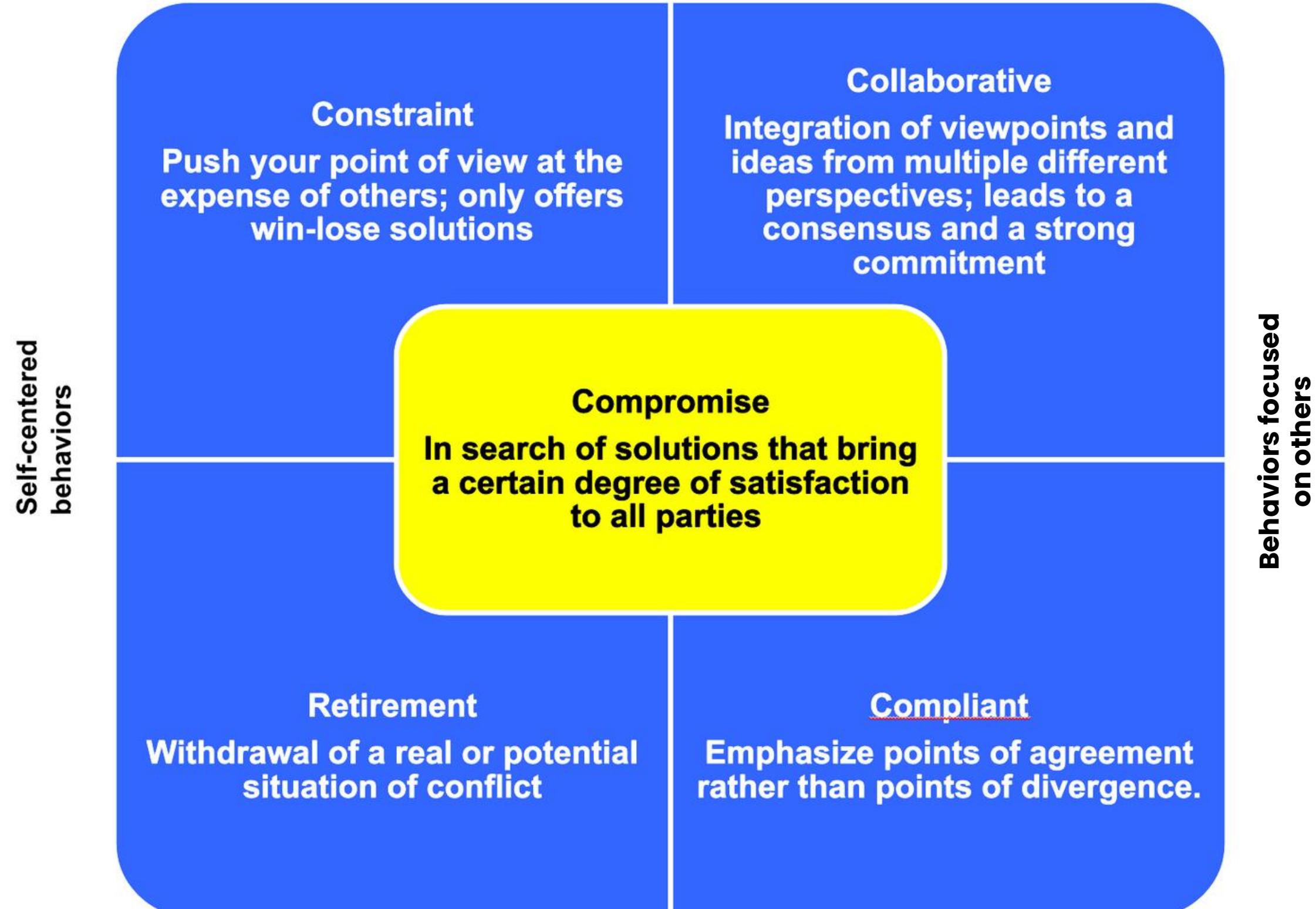


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Different types of management are needed at different stages of a project



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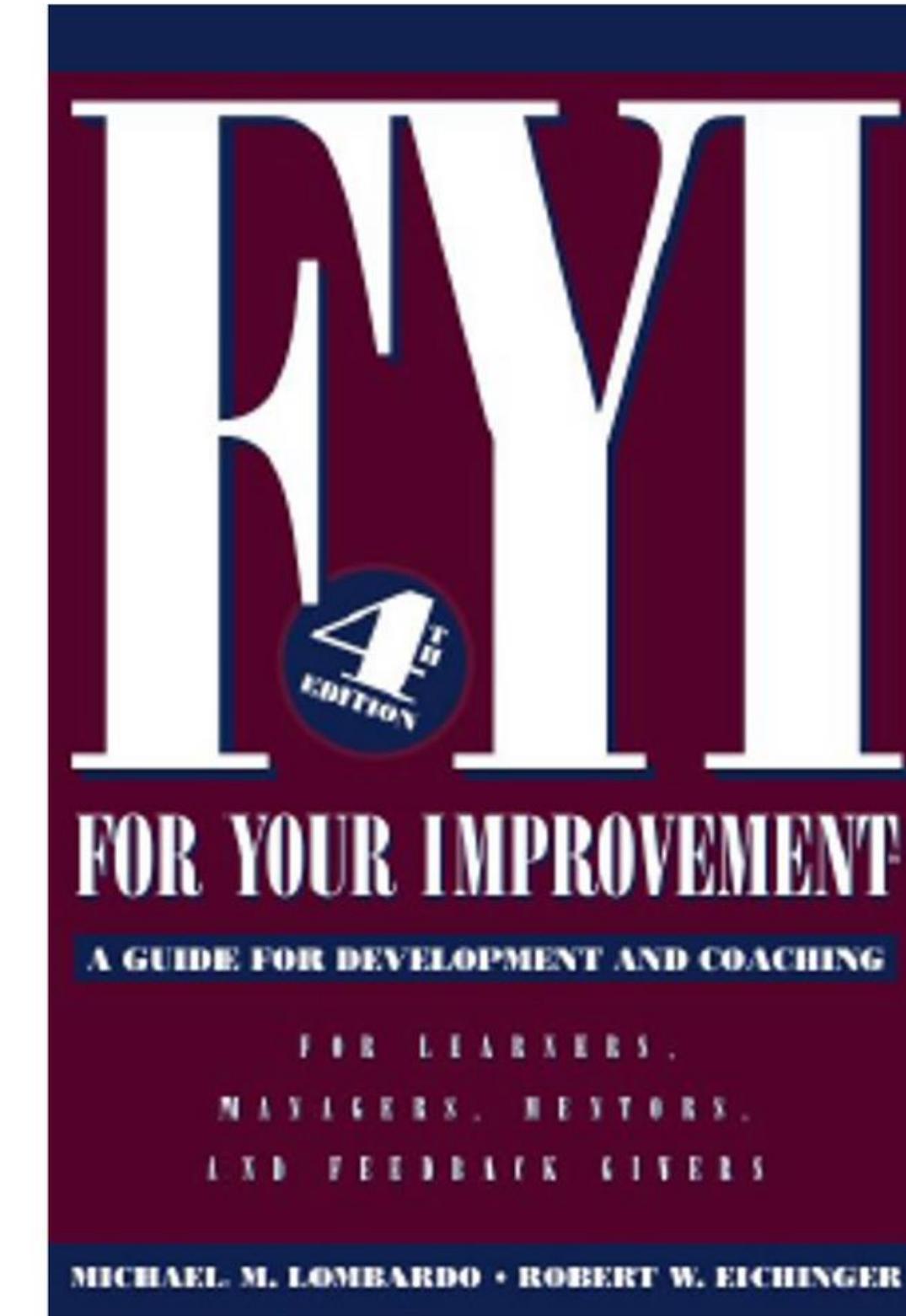


Confront & Solve problems
Treat the conflict as a problem to be solved by examining alternatives
Requires a "give and take" attitude and an open dialogue.

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FYI Lominger

- **Example : Planning**
- **Card : Motivating others**
- **FYI (For Your Improvement) is a series of leadership and development resources developed by Lominger, a talent development consultancy.**
- **The FYI toolset includes books, cards, and other materials that provide insights, strategies, and practical tips for personal and professional growth.**



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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.

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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.

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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 did you use?

- a) Compromise
- b) Collaborative
- c) Constraint
- d) Retirement

Project Management

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 did you use?

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c) Constraint

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Project Management

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

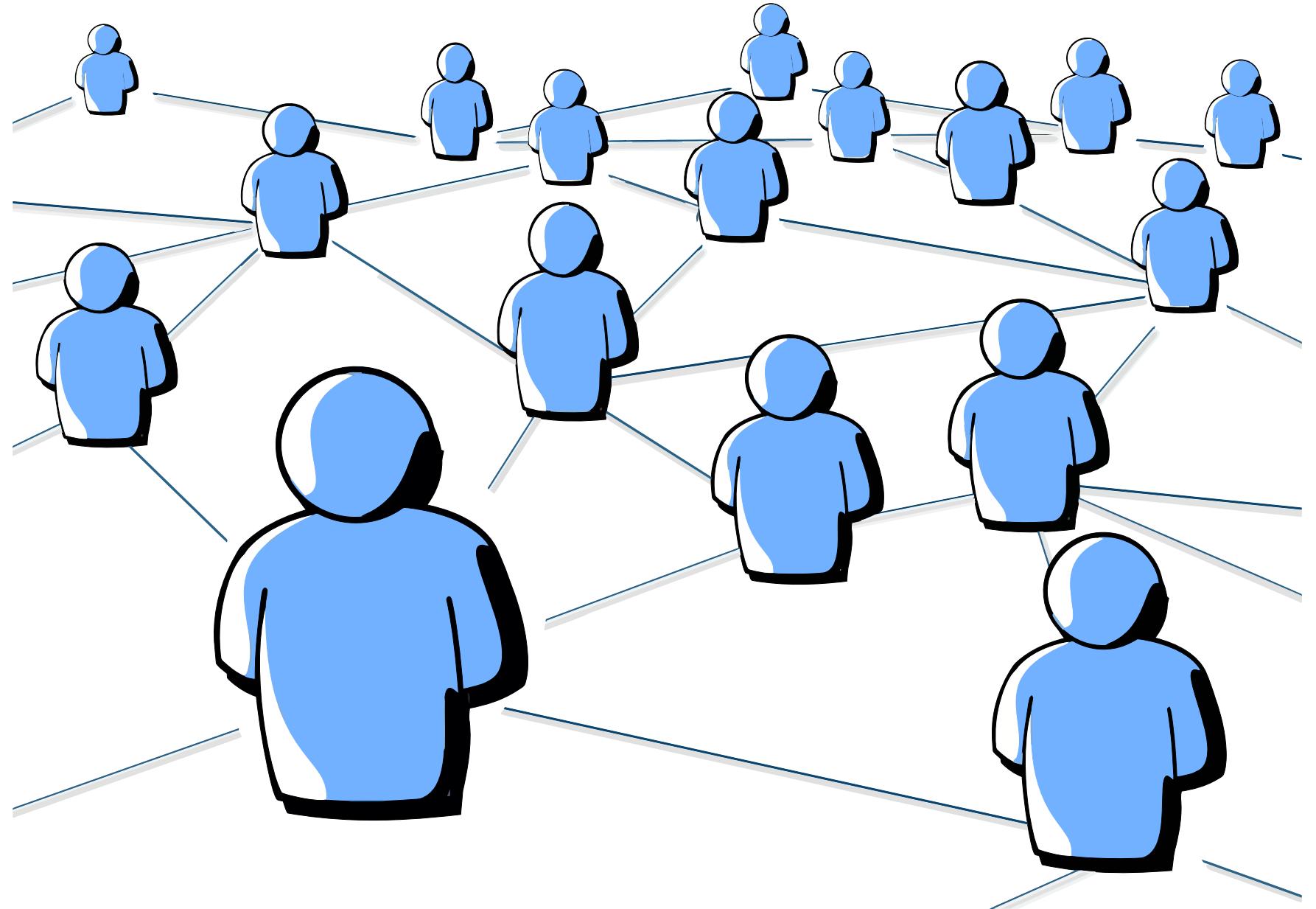
Project Management

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Communication Management



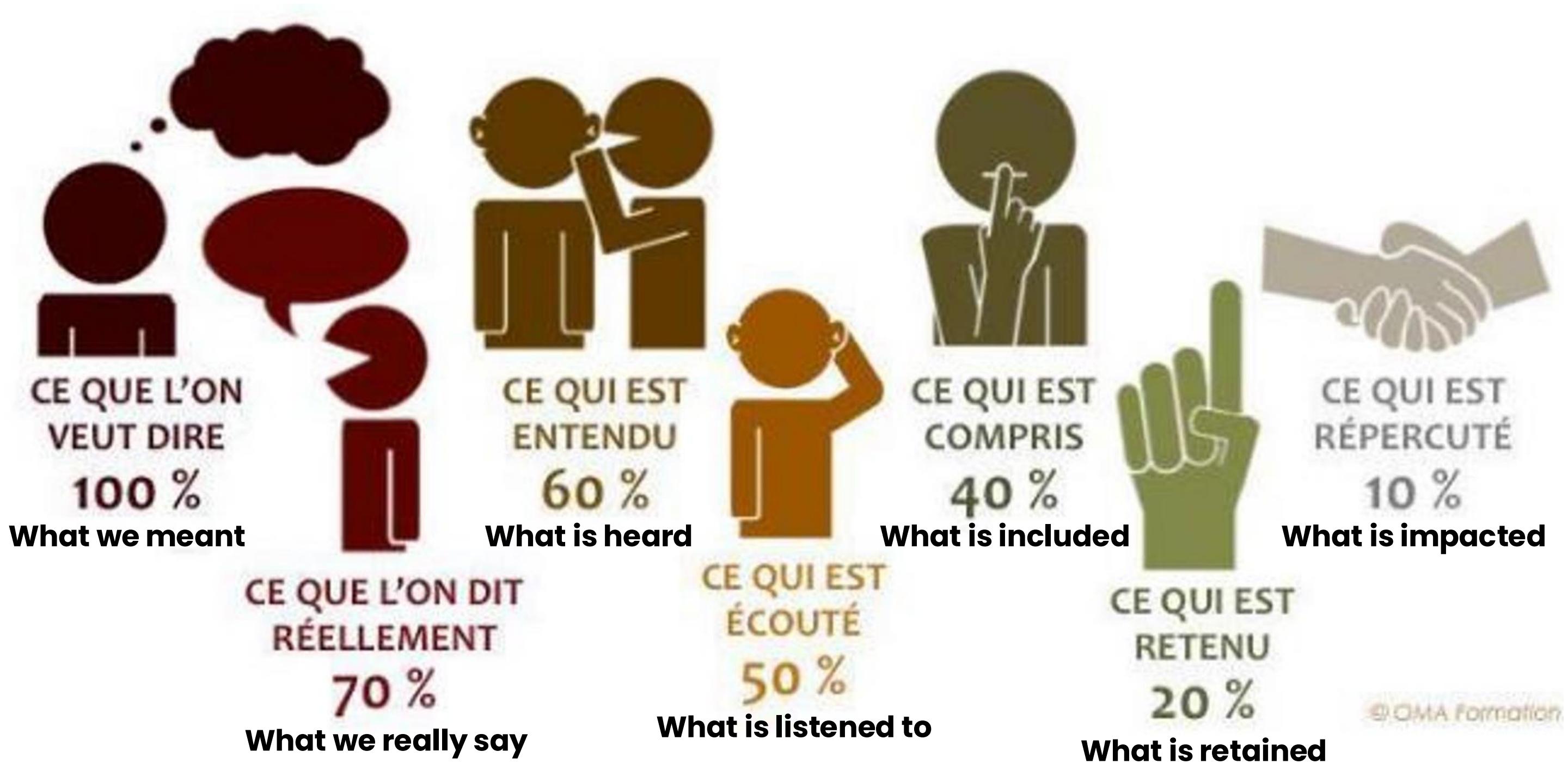
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Objectives of this course

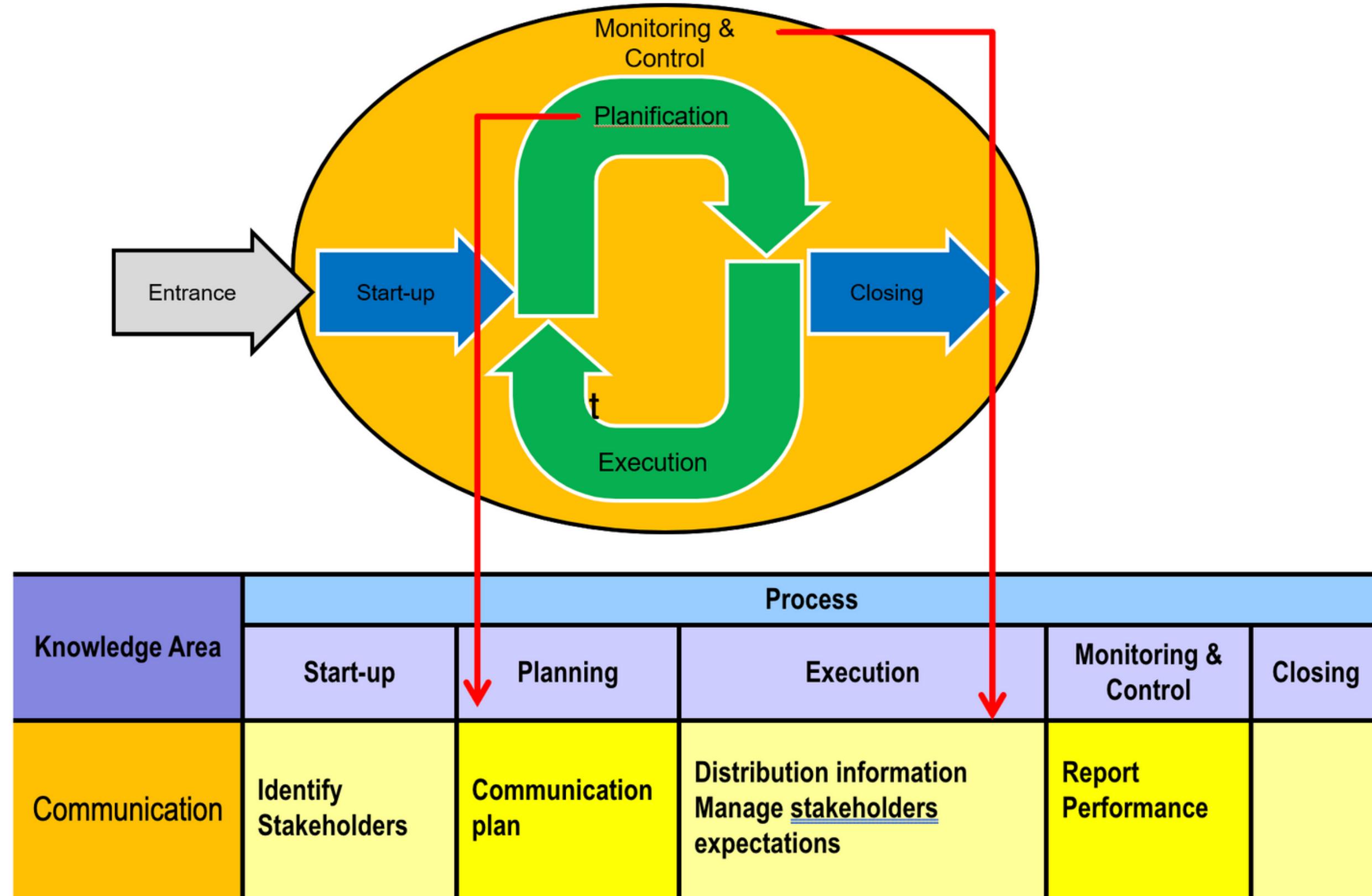
- Understand what is good management of project communications
- Know the different methods that improve the management of project communications
- Understand the different methods of communication
- Understand what is risk and its importance in project management
- Know how to identify and measure the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

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Communication Management



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Communication management process



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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 Stakeholder's expectations

- Work with stakeholders to meet their needs, and resolve problems as they arise

5. Report performance

- Collect and distribute information about project performance

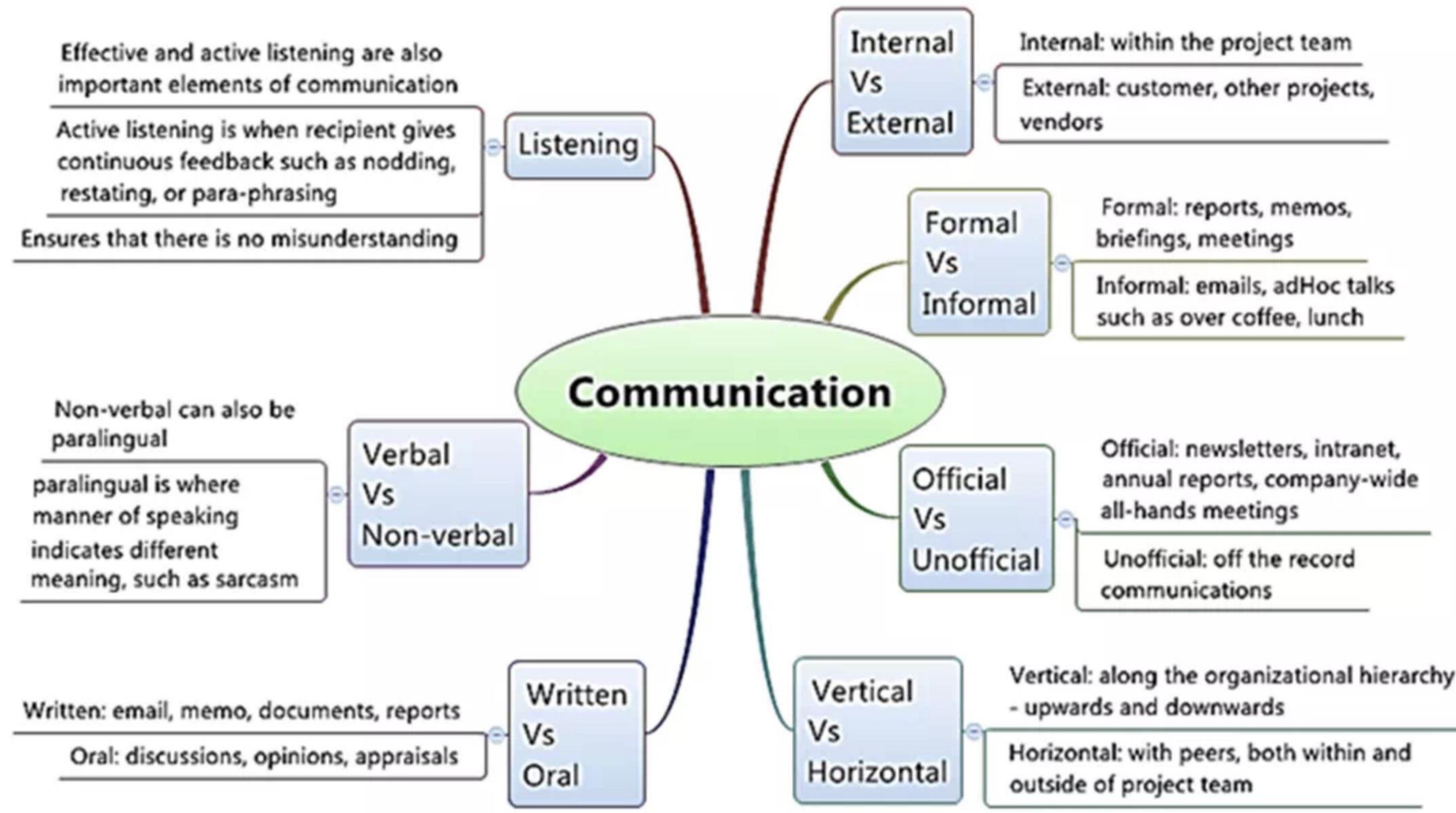
Project Management

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

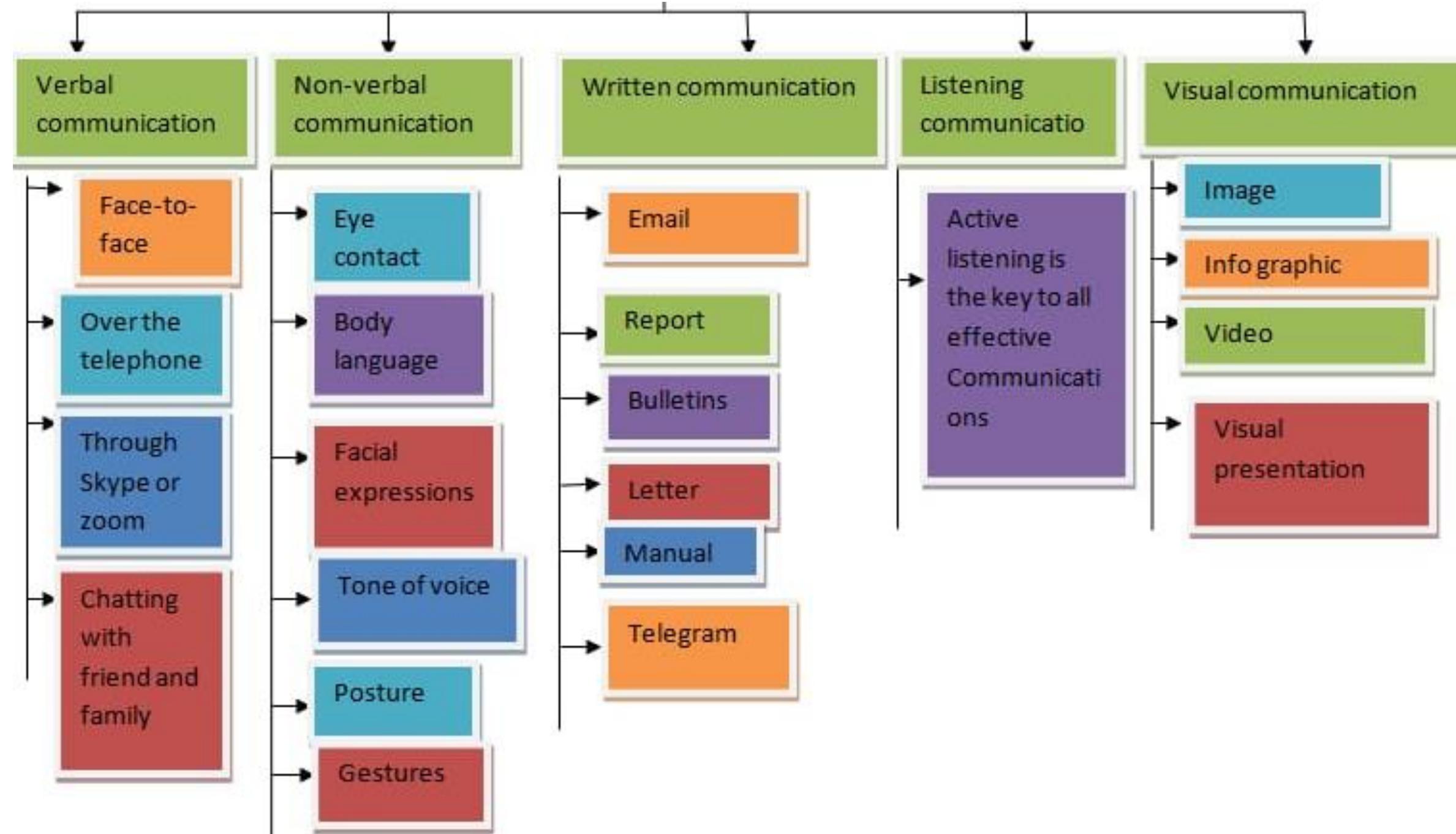
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Communication management



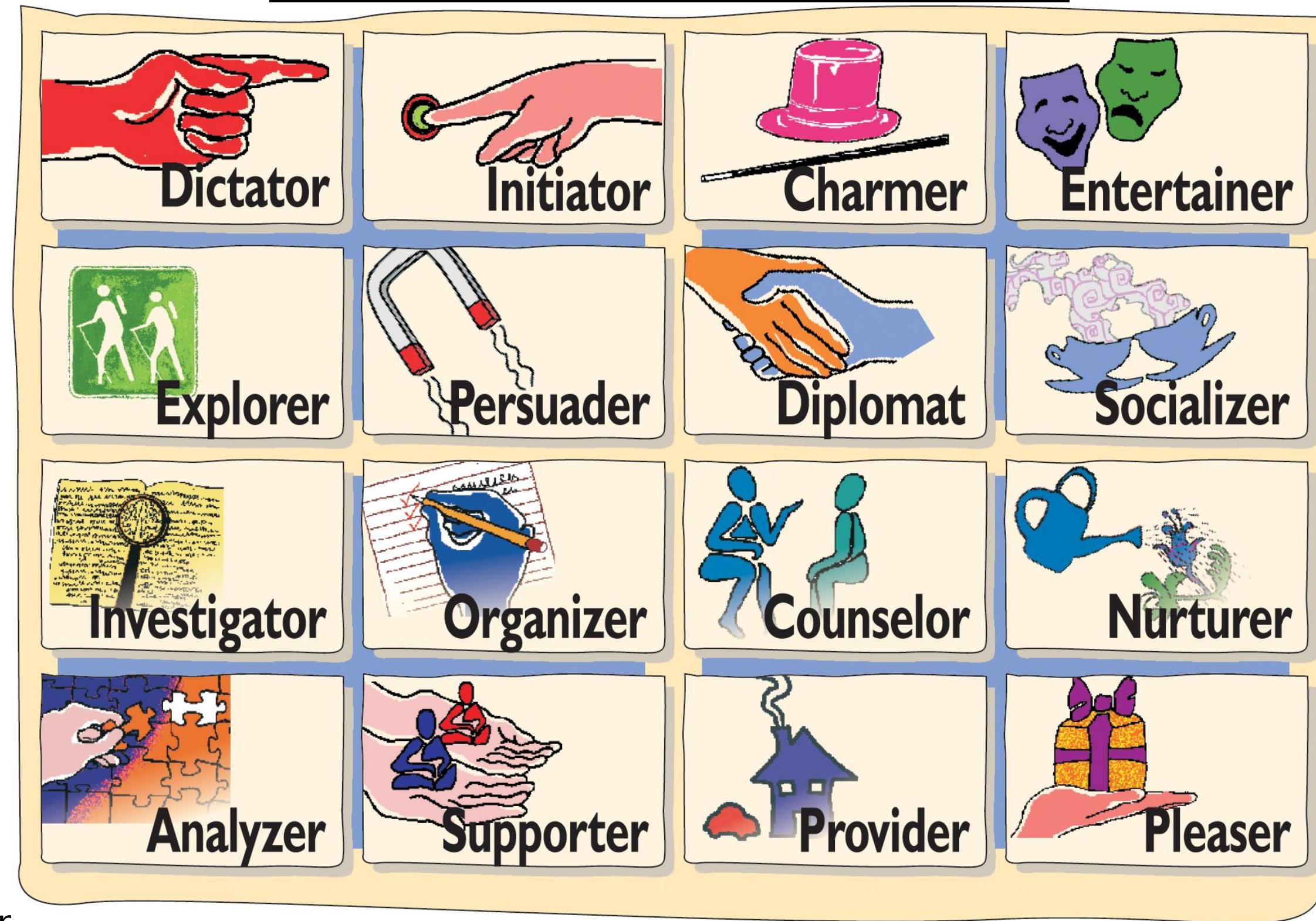
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Communication Styles



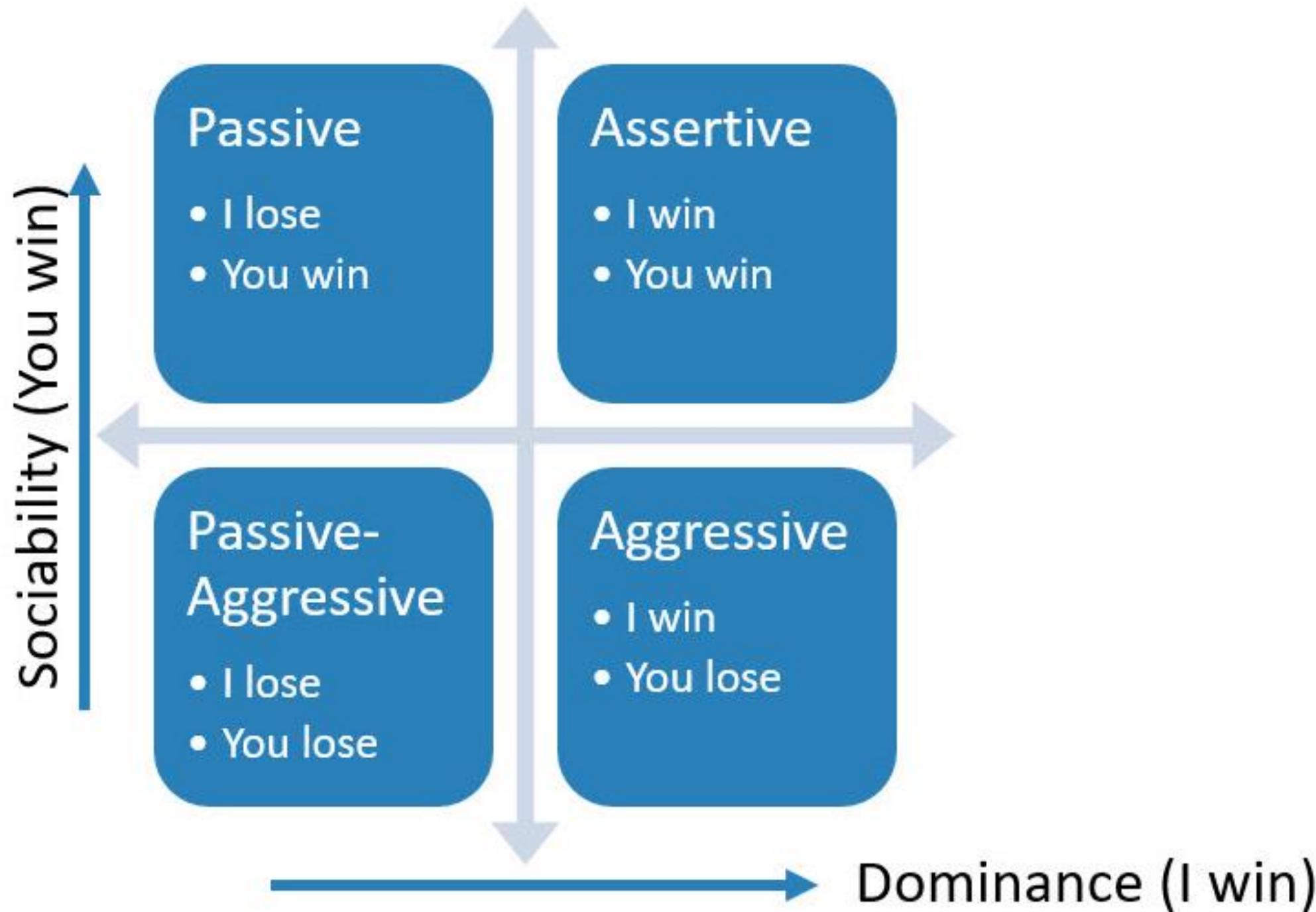
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Communication management



Project Management

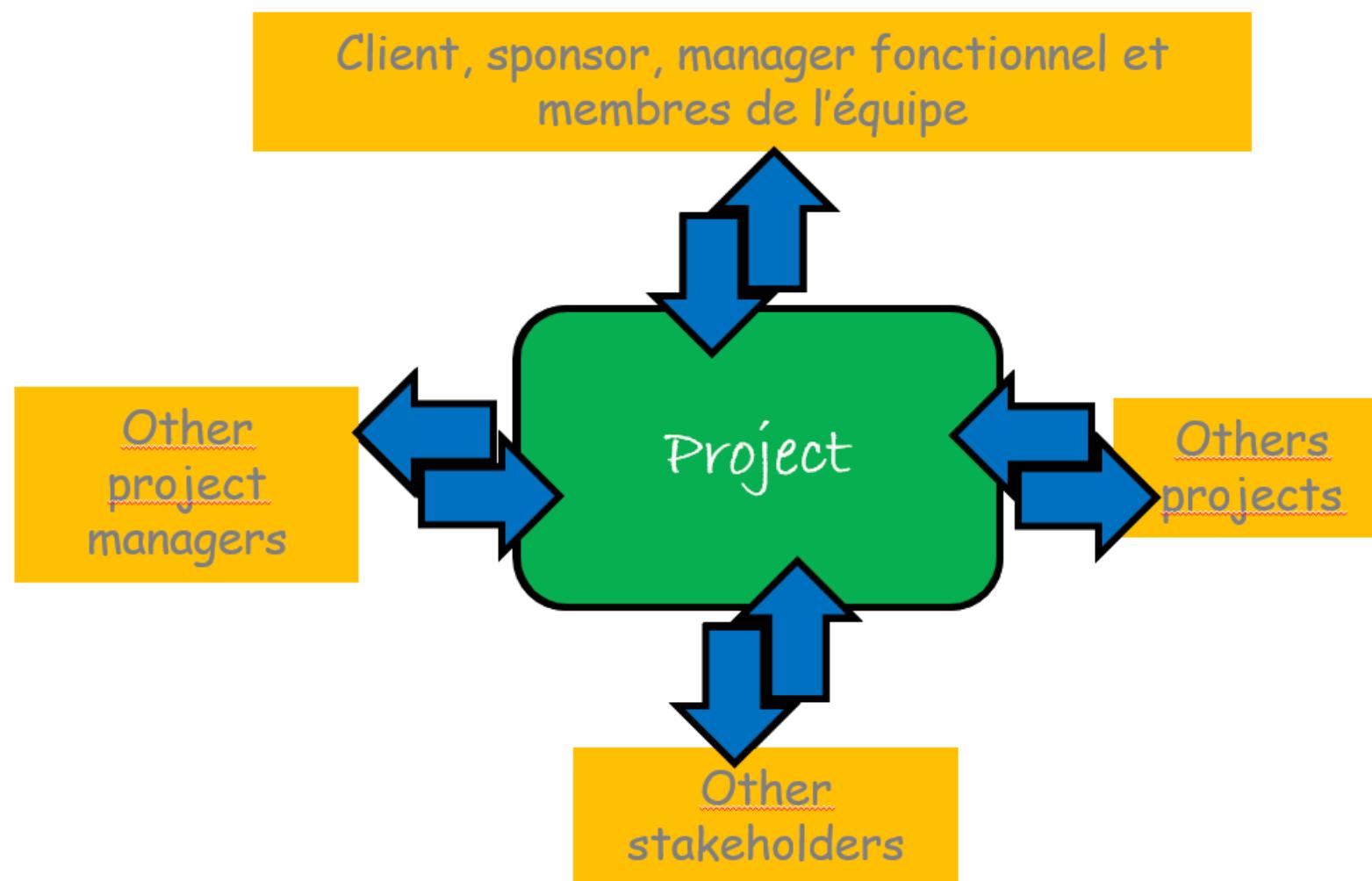
Communication Styles



Project Management

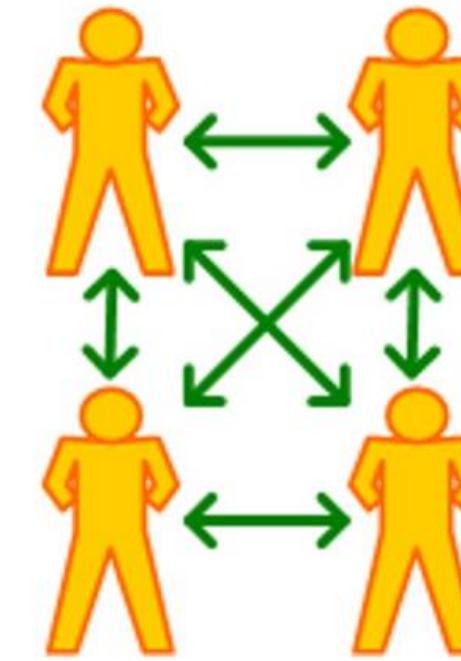
Communication needs

Communication in all directions



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

Consider the number of communication channels



Formula for The number of potential communication channels in a project

Number of Channels =

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

N is the number of stakeholders

Project Management

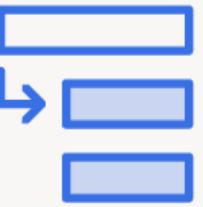
Communication Methods

- **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**

Project Management

Communication Management

The 5Ws



What:

What information is essential for project completion?



What:

What needs to be communicated and in how much time?



What:

What type or format should be used to communicate?



Who:

Who needs information?



Who:

Who is responsible for delivering information?

Project Management

Communication Planning

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

Project Management

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 Management

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

Activities of the week, Deliverables	
G	As planned

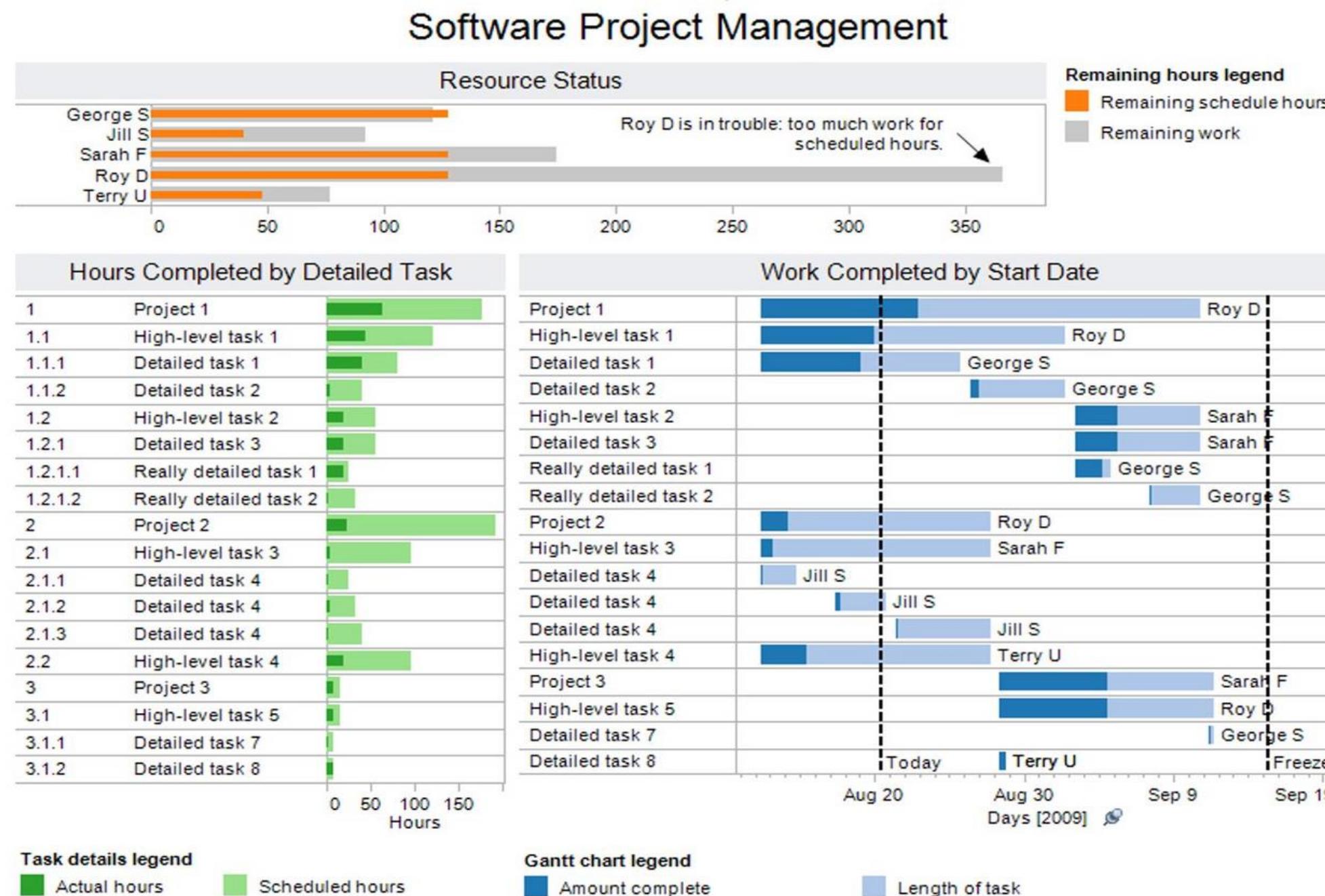
 G As planned  Y A risk  R Ethic Problem

Achievements and Strengths
<ul style="list-style-type: none">123
Importants problems and risks
<ul style="list-style-type: none">123

	Budget	Périmètre	Ressources	Delays
Project				
Task 1				
Task 2				
Task 3				

Project Management

Sample Project Management Dashboard



Project Management

Example of a scorecard in portfolio management

Lancer a a+b tout ouvert 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

Project Management

Benefits of effective communication

1. Enhanced team productivity 

2. Improved team morale 

3. Conflict resolution 

4. Innovation and creativity 

5. Builds trust and credibility 

Project Management

**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

Project Management

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

a) 17

$$\text{Number of Channels} = \frac{17 \times (17-1)}{2}$$

b) 136

$$\text{Number of Channels} = \frac{17 \times 16}{2}$$

c) 272

$$\text{Number of Channels} = \frac{272}{2}$$

d) 34

$$\text{Number of Channels} = 136$$

So, there are 136 potential channels of communication among the 17 stakeholders in the project.

Project Management

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

Project Management

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

Project Management

Risk Management



Project Management

Benefits of Project Risk Management

Can you guess?



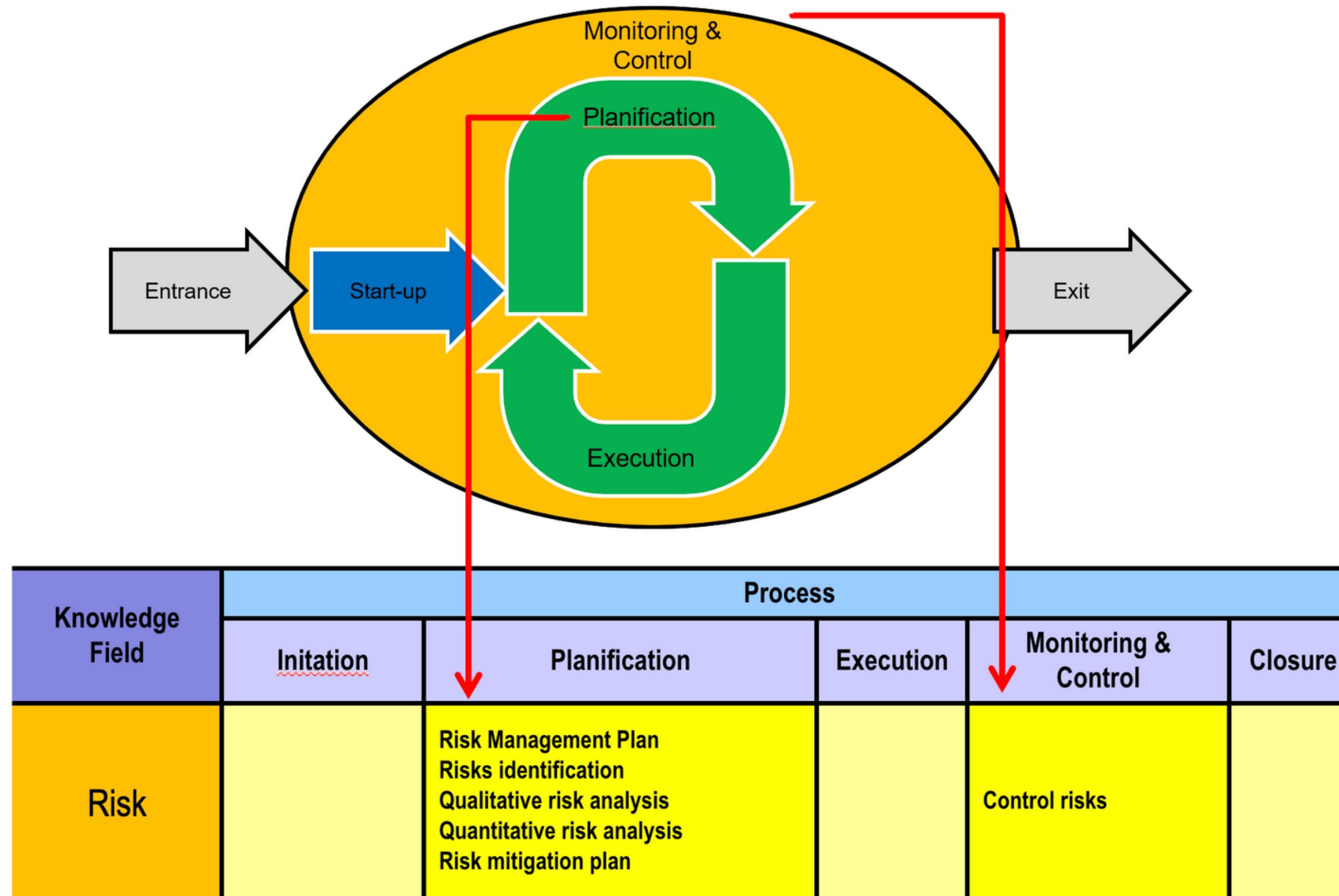
Project Management

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
- Supporting Project Management Plan
- Preparing Project Teams to Identify Risks
- Helping Reduce the Impact of Risks
- Reducing the Surprises
- Increasing Communication
- Better Decision Making
- Better Escalation Management
- Planning Accurate Budget Estimation
- Supporting Future Projects



Project Management



Project Management

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 Management

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

Project Management

Definitions

- **Unexpected**
 - **Unidentifiable virtual event**
 - **Virtual events are identifiable but not quantifiable**
- **Risk**
 - **Identifiable and quantifiable virtual event**
- **Problem**
 - **Virtual events 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**

Project Management

Exogenous risks

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



Project Management

Endogenous risks

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



Project Management

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: Experts participate anonymously, the use of a questionnaire facilitator; consensus can be reached in a few turns; Help reduce the bias in the data and prevent the 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 from previous similar project
 - Analysis of the Assumption: to identify the risk of inaccuracy, instability, inconsistency, and incompleteness.
- SWOT analysis – Strengths, Weaknesses, Opportunities, Threats.

Project Management

Risks identification

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



Project Management

Common Risks

Features	High Risk	Low Risk
Duration	More than 1 year	Less than 3 months
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	Both the project team and 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

Project Management

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



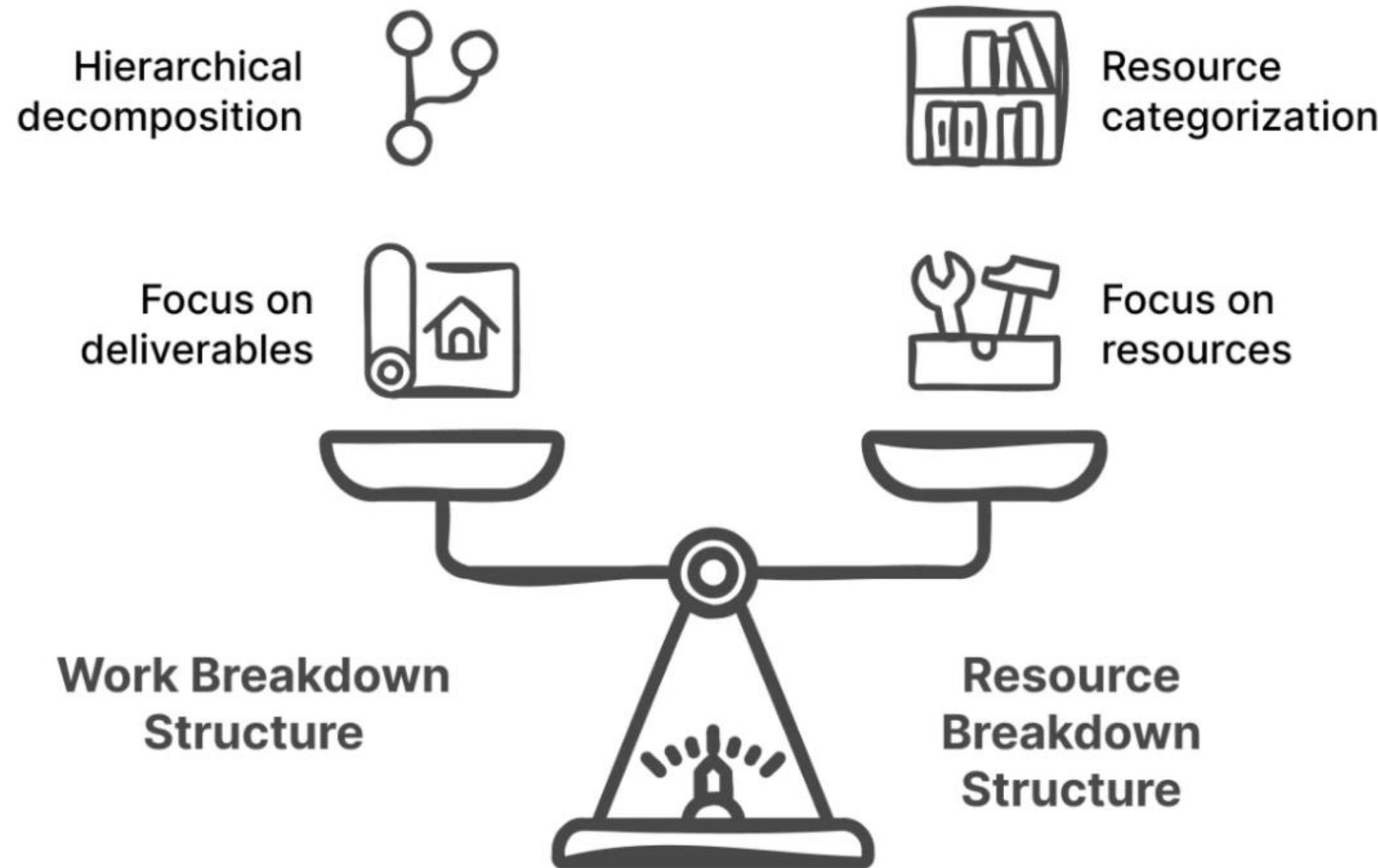
Project Management

Risk breakdown structure



Project Management

WBS vs RBS



Project Management

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.

Project Management

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: an important problem that will cause project slippages
 - 5: critical: can cause the project to stop

Project Management

Probability and Impact Matrix

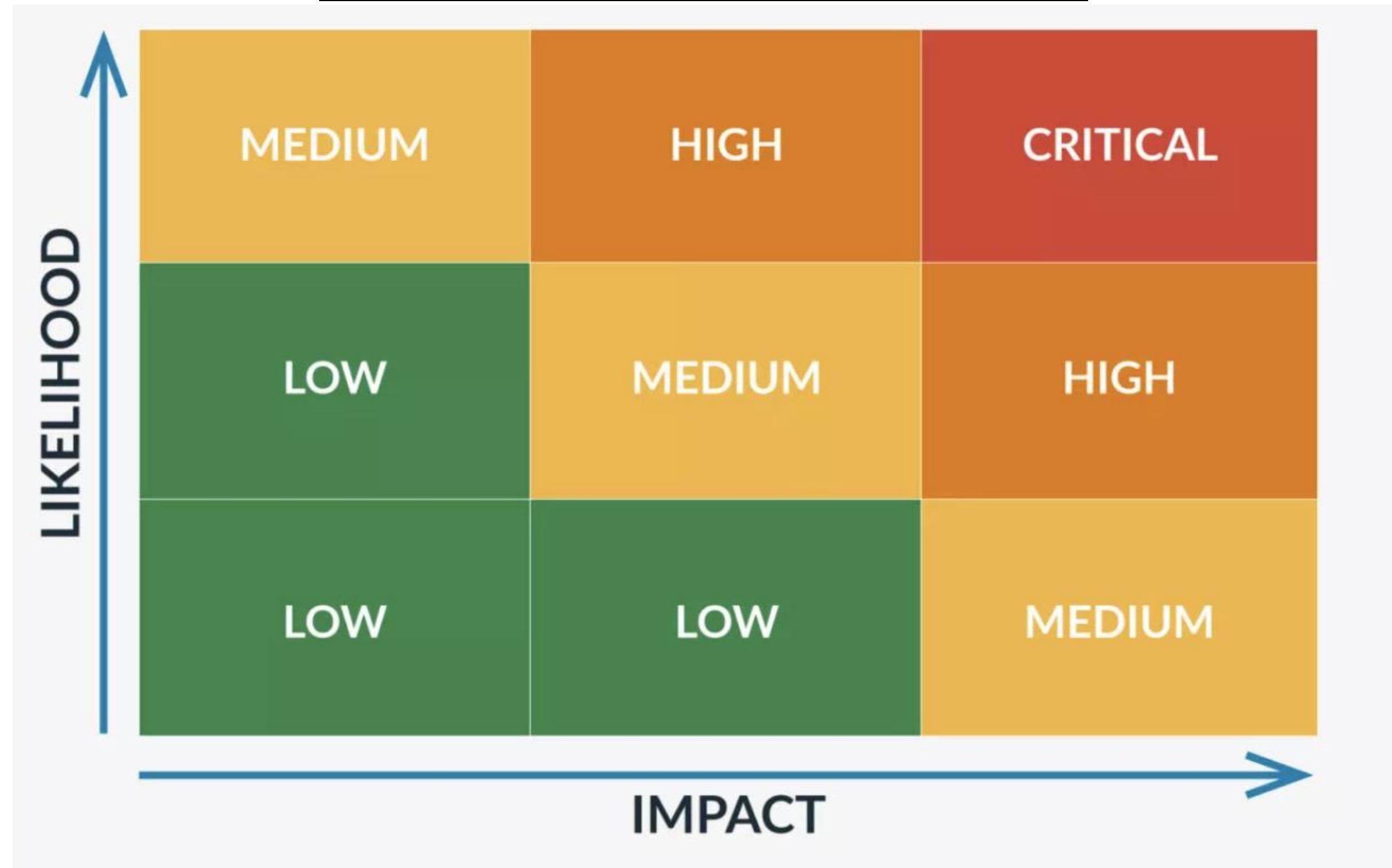
- The probability and impact matrix (PI Matrix) is a qualitative risk analysis tool that helps you rank risks using both their chances of occurring and their impact. You define the probabilities and impacts of all identified risks using a cardinal or ordinal scale and enter the PI Matrix to get the risk rating.
- The PI Matrix has two key components – probability and impact assessment. Probability is the likelihood of a risk occurring, while impact measures the consequences of that risk on project objectives. By combining these assessments, you can calculate risk ratings.

		Probability and Impact Matrix			
		Catastrophic - 4	Critical - 3	Marginal - 2	Negligible - 1
Probability	Frequent - 4	High (16)	High (12)	Serious (8)	Medium (4)
	Probable - 3	High (12)	Serious (9)	Serious (6)	Medium (3)
	Remote - 2	Serious (8)	Serious (6)	Medium (4)	Low (2)
	Improbable - 1	Medium (4)	Medium (3)	Low (2)	Low (1)

Probability and Impact Matrix Template

Project Management

Risk Matrix



Project Management

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



Project Management

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**



Project Management

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



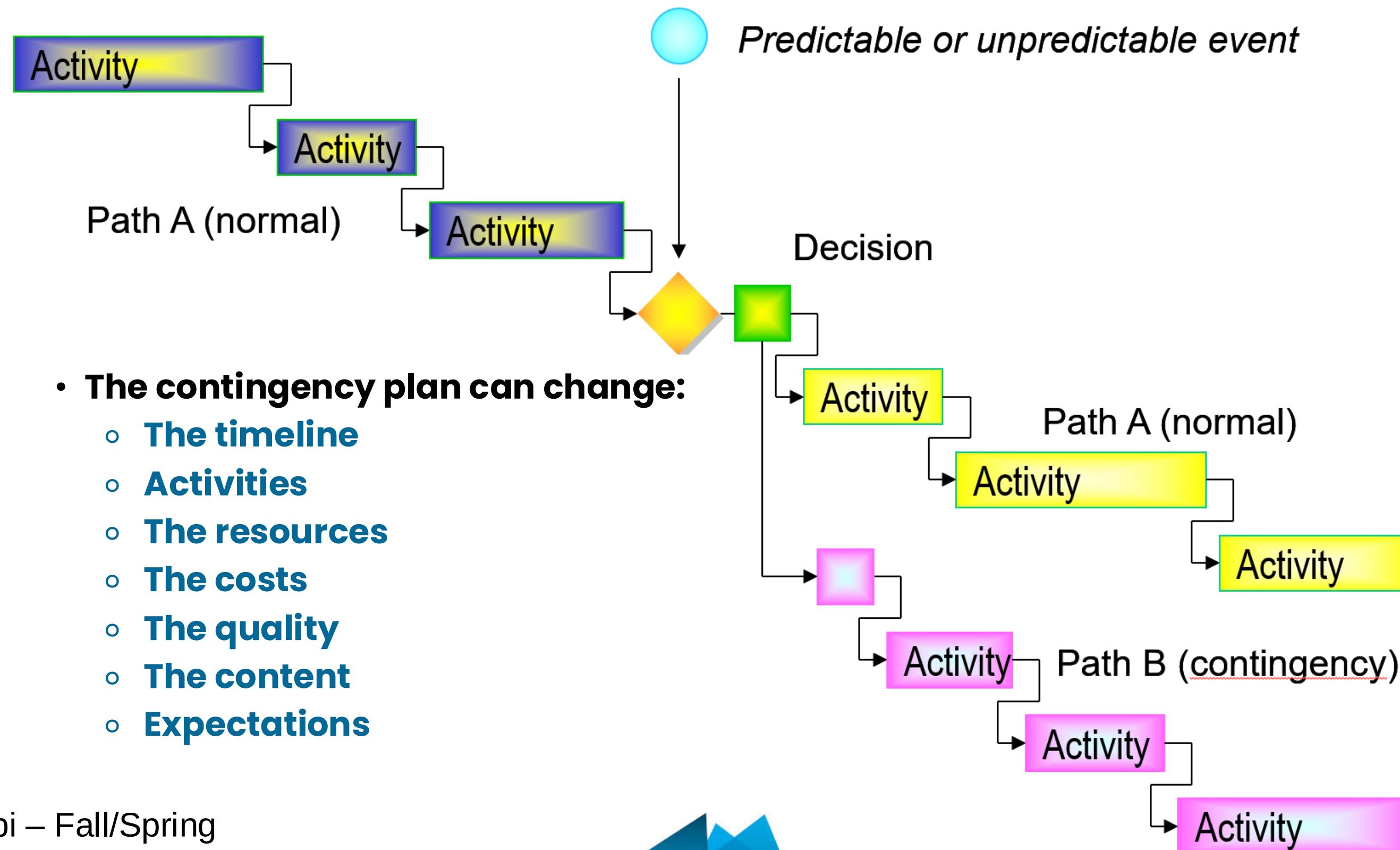
Project Management

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**

Project Management

Contingency plans



Project Management

Template for creating a Contingency Plan

Step 1: Identify Potential Risks

The first step involves identifying potential threats that could disrupt your organization's operations. This includes natural disasters, cyberattacks, supply chain disruptions, and other unforeseen events.

Step 2: Conduct a Business Impact Analysis

Once you have identified potential risks, assess their impact on critical business functions. Determine which operations are most essential and how disruptions could affect your organization's ability to continue providing services.

Step 3: Develop Recovery Strategies

Based on your risk assessment and business impact analysis, develop strategies to mitigate the impact of disruptions. This may involve creating contingency plans for critical functions, identifying alternative resources, and establishing procedures for restoring operations.

Step 4: Create a Communication Plan

A well-defined communication plan is essential for effective crisis management. Outline protocols for internal and external communication to ensure that stakeholders are informed and coordinated during a disruption.

Step 5: Test and Maintain the Plan

Regular testing and maintenance are crucial to ensure the plan's effectiveness. Conduct tabletop exercises and drills to identify weaknesses and refine the plan. Additionally, periodic reviews and updates are necessary to reflect changes in the organization and its environment.

Project Management

What do you 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

Project Management

What do you 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

Project Management

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 will you use?

- a) The Delphi technique
- b) Brainstorming
- c) SWOT analysis
- d) Root cause analysis

Project Management

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