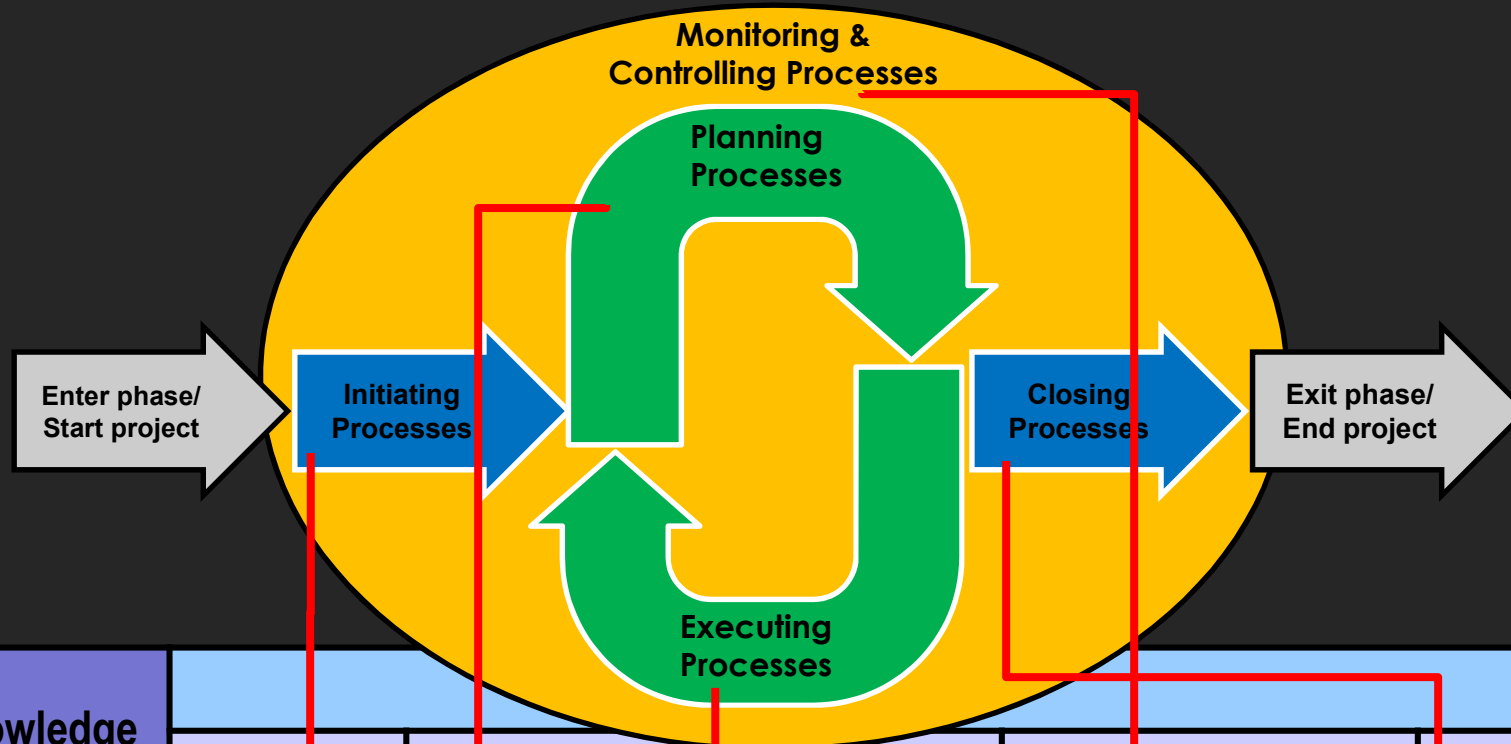


# **#4 Project integration**

**PMBOK 6 Ed. – DEI-**

# Project Integration



Knowledge Area	Project Phases				
	Initiating	Planning	Executing	Monitoring & Control	Closing
Integration	<ul style="list-style-type: none"> <li>• Develop Project Charter</li> </ul>	<ul style="list-style-type: none"> <li>• Develop Project Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Direct and Manage Project Execution</li> <li>• Manage Project Knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor and Control Project Work</li> <li>• Perform Integrated Change Control</li> </ul>	<ul style="list-style-type: none"> <li>• Close Project</li> </ul>

# INTEGRATION

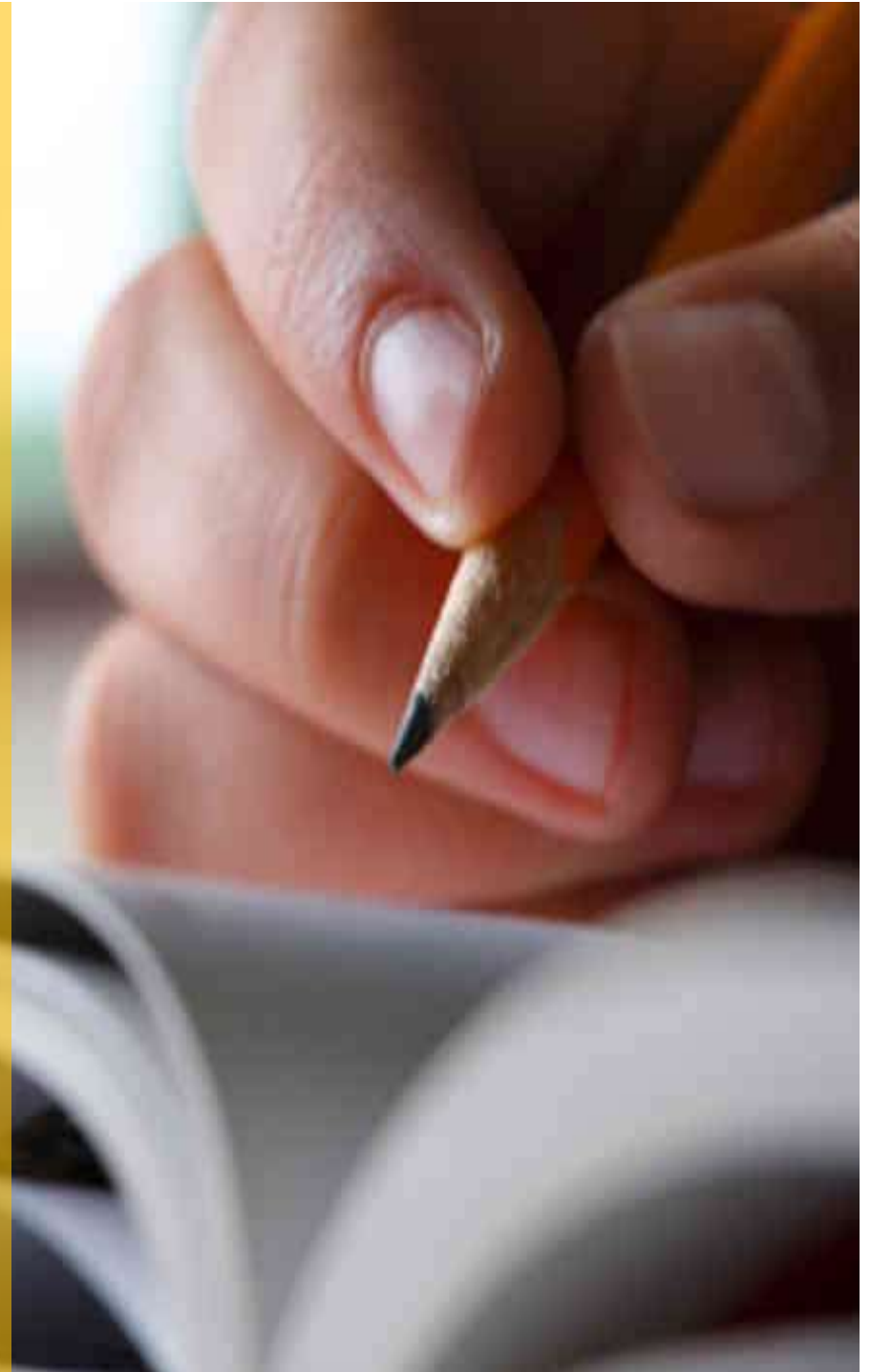
**“to identify, define, combine, unify, and coordinate the various processes and project management activities”**



# 4.1 Develop Project Charter

"A document that **formally authorizes** a project or a phase"

" Documenting **initial requirements** that satisfy the **stakeholder's needs and expectations**"



## Inputs

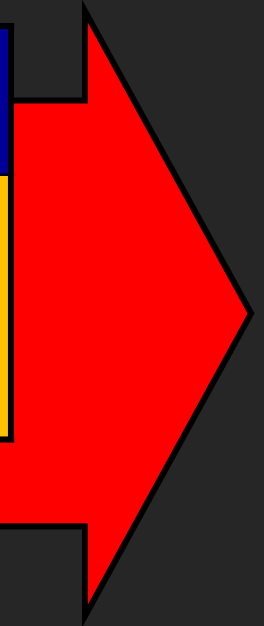
1. Business Documents
  - Benefits management plan
  - Business case
2. Agreement
3. EEF
4. OPA

## Tools & Techniques

1. Expert judgment
2. Data gathering
  - Brainstorming
  - FGD
  - Interview
3. Interpersonal and team skill
  - Conflict management
  - Facilitation
  - Meeting management
4. meetings

## Outputs

1. Project charter
2. Assumptions log



“Project are **authorized** by someone external to the project such as **sponsor, PMO, portfolio steering committee**”

“Project charter can **be created by them or delegated** to Project Manager”



- STATEMENT OF WORK
  - A narrative description of products or services to be delivered by the project.
  - The SOW references:
    - Business need
    - Product scope description
    - Strategic plan

# SOW



# Business case

» Determine whether or not the project **is worth the required investment.**



- Market demand
- Organization need
- Customer request
- Legal
- Technological
- ecological
- Social need



# Benefit management plan

- » a document that captures the organization's desired benefits from project whether economic or intangible
  - » Explain how the benefits will be maximized and sustained



# Project Selection

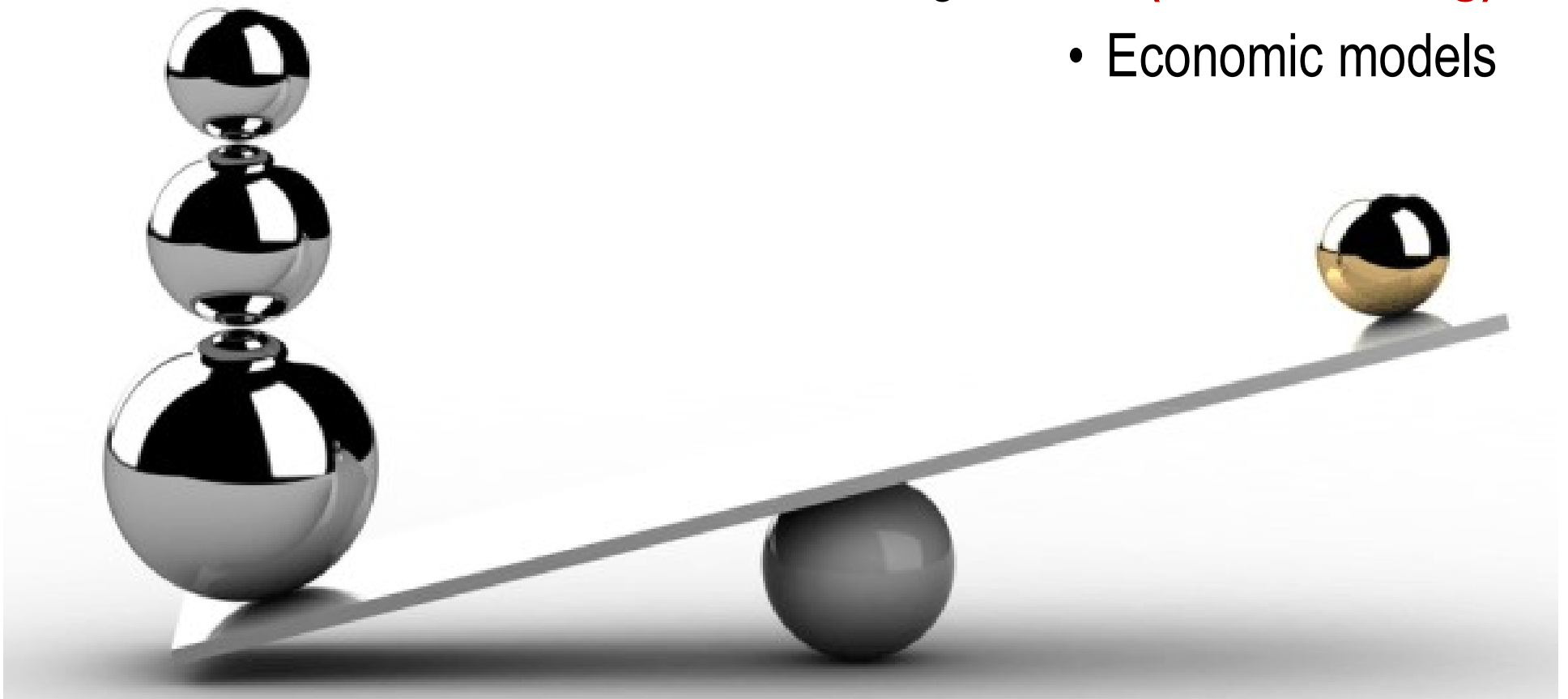
Benefit measurement methods (Comparative approach)

Constrained optimization methods (Mathematical approach)



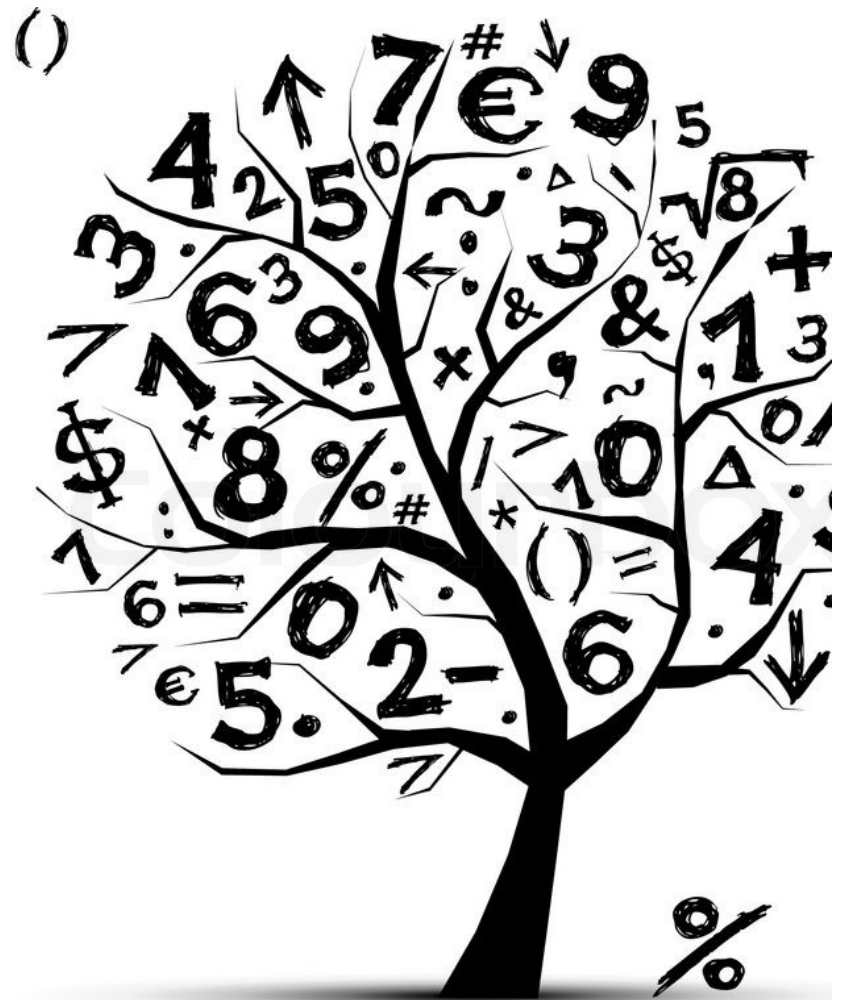
# Benefit measurement methods

- Murder board (**a panel of people** who try to shoot down a new project idea)
  - Peer review
- Scoring models (**Factor Rating**)
  - Economic models



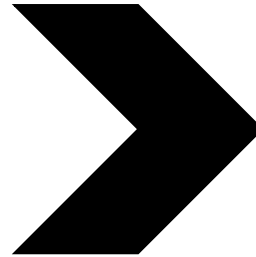
# Constrained optimization methods (Mathematical approach)

- Linear programming
- Integer programming
- Dynamic programming
- Multi-objective programming



# Project Selection – Economic Models

- Present value (PV)
- Net present value (NPV)
- Internal rate of return (IRR)
- Benefit-cost ratio:



**BIGGER THAN  
ZERO**

- Payback Period

**The quicker the better**



# Project Selection – Important Terms

- **Economic Value Added (EVA):**
  - concerned with whether the project returns to the company more value than it costs.
- **Opportunity Cost:**
  - the opportunity given up by selecting one project over another
- **Sunk Costs:**
  - Are expended costs
  - Should not be considered when deciding whether to continue with a troubled project.
- **Law of Diminishing Returns:**
  - after a certain point, adding more input/resource will not produce a proportional increase in productivity

# Project Selection – Important Terms

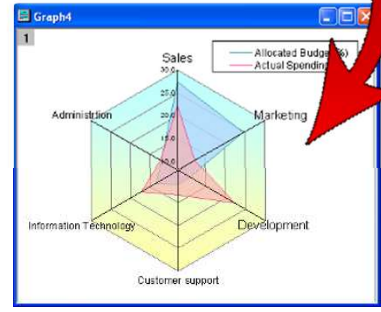
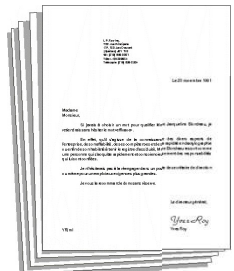
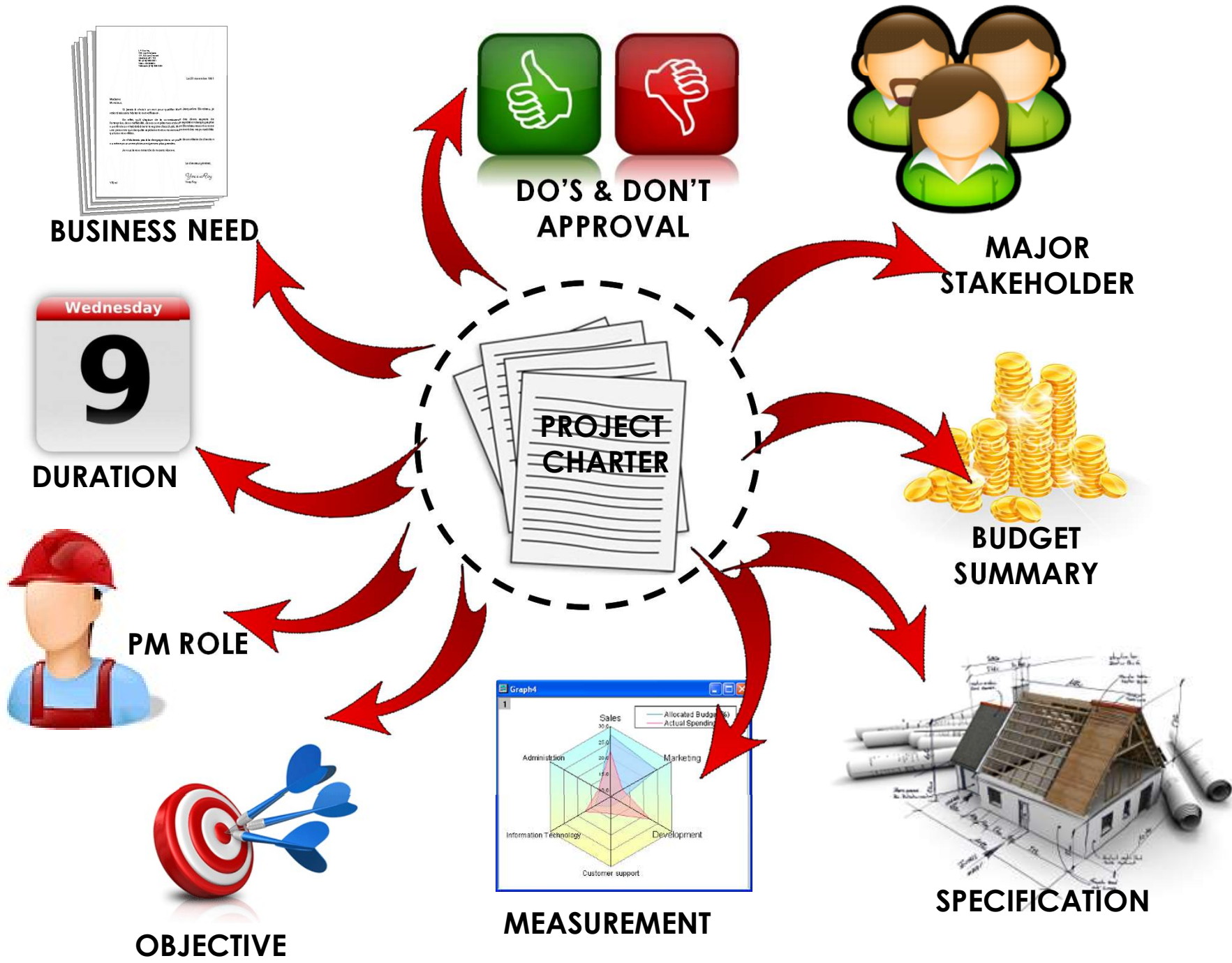
- **Working Capital**
  - current assets minus current liabilities for an organization or
  - amount of money the company has available to invest
- Depreciation
  - **Straight line depreciation**
    - The same amount of depreciation is taken each year.
  - **Accelerated depreciation**
    - Depreciates faster than straight line
    - Two forms: (1) Double Declining Balance, (2) Sum of the Years Digits



# **EXPERT JUDGEMENT**

- Other unit within organization**
- Consultants**
- Stakeholders including customer or sponsor**
- Subject matter experts**
- PMO**
- Industry groups**
- Professional & technical association**





# Project Charter

## To Reduce Canal Cleaning Cost by 50% Project Overview

### Business Case

- Canal is required for water management and transportation in peat land area
- Canal need to be cleaned twice in one rotation due to sedimentation
- Canal cleaning activities are done by contractor with fixed rate USD 3/ meter of canal
- Due to fuel price and spare part cost rising up, contractor propose to increase the rate or they do not want to do canal cleaning activity
- This project to address one of BSC KPI (F.1 Maintain wood delivery budget)

### Problem Statement

**If we accept contractor proposal:**

- Water management operational cost will be higher

**But if we don't accept contractor proposal:**

- Less availability of heavy equipment for canal cleaning
- Low accessibility and costly for firefighting and supervision

### Project Scope

Canal Cleaning activity  
Start : Mapping analysis  
End : Canal cleaned

### Team Selection

**Green Belt:**

Yudha

**Project Sponsor:**

Michaer

**Project Champion:**

Sofyan

**Core Team Members:**

Budi

Sigit

Arumi

Wahju

Guntar

**Subject Matter Experts:**

Brad

LP&C

### Goals Statement

Metric	UOM	Current rate	Goal
Canal cleaning cost	USD/m	3	1,5

### Opportunity Statement

**Hard saving:**

= Baseline x target x canal cleaning plan 2010

= USD 3x 50% x 43,186 m

= **\$ 64,779**

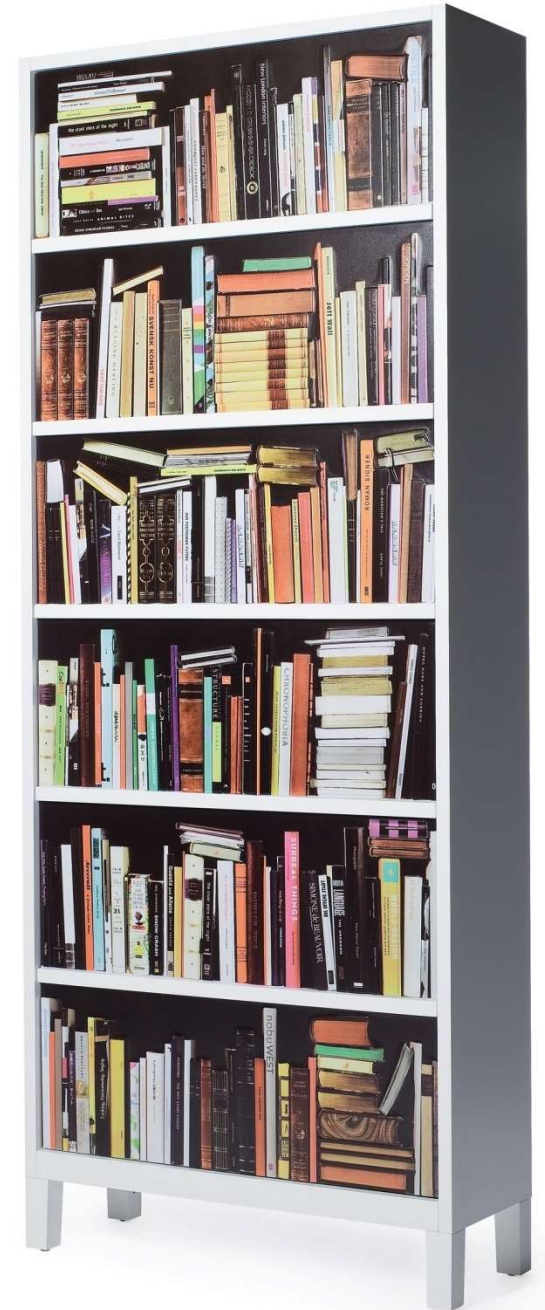
**Intangible benefit:**

- Improve ability to control and firefighting (reduce fire expression)
- Improve accessibility to compartment (reduce waiting time to compartment)

### Project Plan (June – October)

Phase	Start	End
Define	June 1	June 16
Measure	June 18	June 30
Analyze	July 2	July 21
Improve	July 23	Oct 12
Control	Oct 15	Oct 31

- Project Charter, includes:
  - Project **purpose** or justification,
  - Measurable **project objectives** and related success criteria,
  - High-level **requirements**,
  - High-level **project description**,
  - High-level **risks**,
  - Summary **milestone schedule**,
  - Summary **budget**,
  - Project **approval requirements**
  - Assigned **project manager, responsibility, and authority level**
  - Name and **authority of the sponsor** or other person(s) authorizing the project charter.



A close-up photograph of a person's hand holding a silver pen, writing on a document. The background is a blurred blue and white pattern.

# 4.1 Develop Project Management Plan

**“Documenting the actions necessary to define, prepare, **integrate and coordinate all subsidiary plans**”**

**Documenting 10 knowledges area**

## Tools & Techniques

1. Expert judgment
2. Data gathering
  - Brainstorming
  - FGD
  - Interview
3. Interpersonal and team skill
  - Conflict management
  - Facilitation
  - Meeting management
4. meetings

## Inputs

1. Project charter
2. Outputs from planning processes
3. EEF
4. OPA

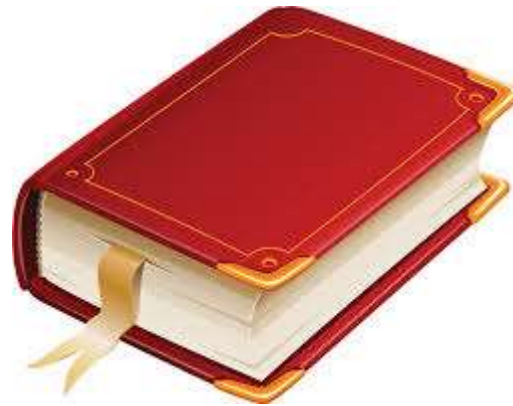
## Outputs

1. Project management plan
- 

# Facilitation Tehcnique

» Brainstorming, meeting, solving the problem,  
conflict resolution

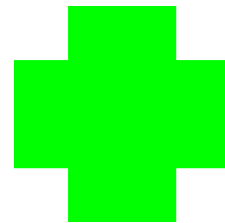




**Project Management Plan**



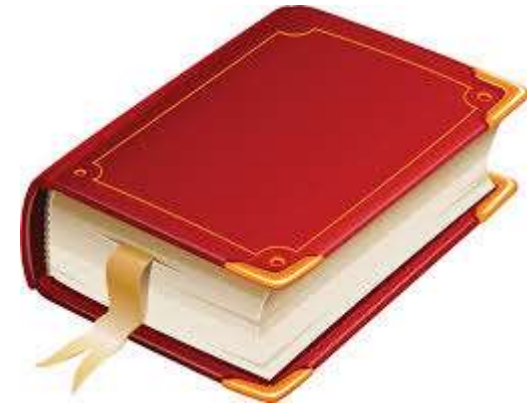
**Project Baseline**



**Subsidiary Plan**



**Analyze the gap or  
Deviation**



**Project Baseline**

**VS**



**Actual**



**scope**



**cost**



**time**



**Planning**

**Baseline**

**Actual**

Approved  
versions

# Baseline

**Project baselines include:**

- **Schedule baseline**
- **Cost performance baseline**
- **Scope baseline**  
*(Performance measurement baseline)*

# Subsidiary

**Subsidiary plan include:**

- **Scope management plan**
- **Requirement management plan**
- **Schedule management plan**
- **Cost management plan**
- **Quality management plan**
- **Process improvement plan**
- **Resource plan**
- **Communications management plan**
- **Risk management plan**
- **Procurement management plan**



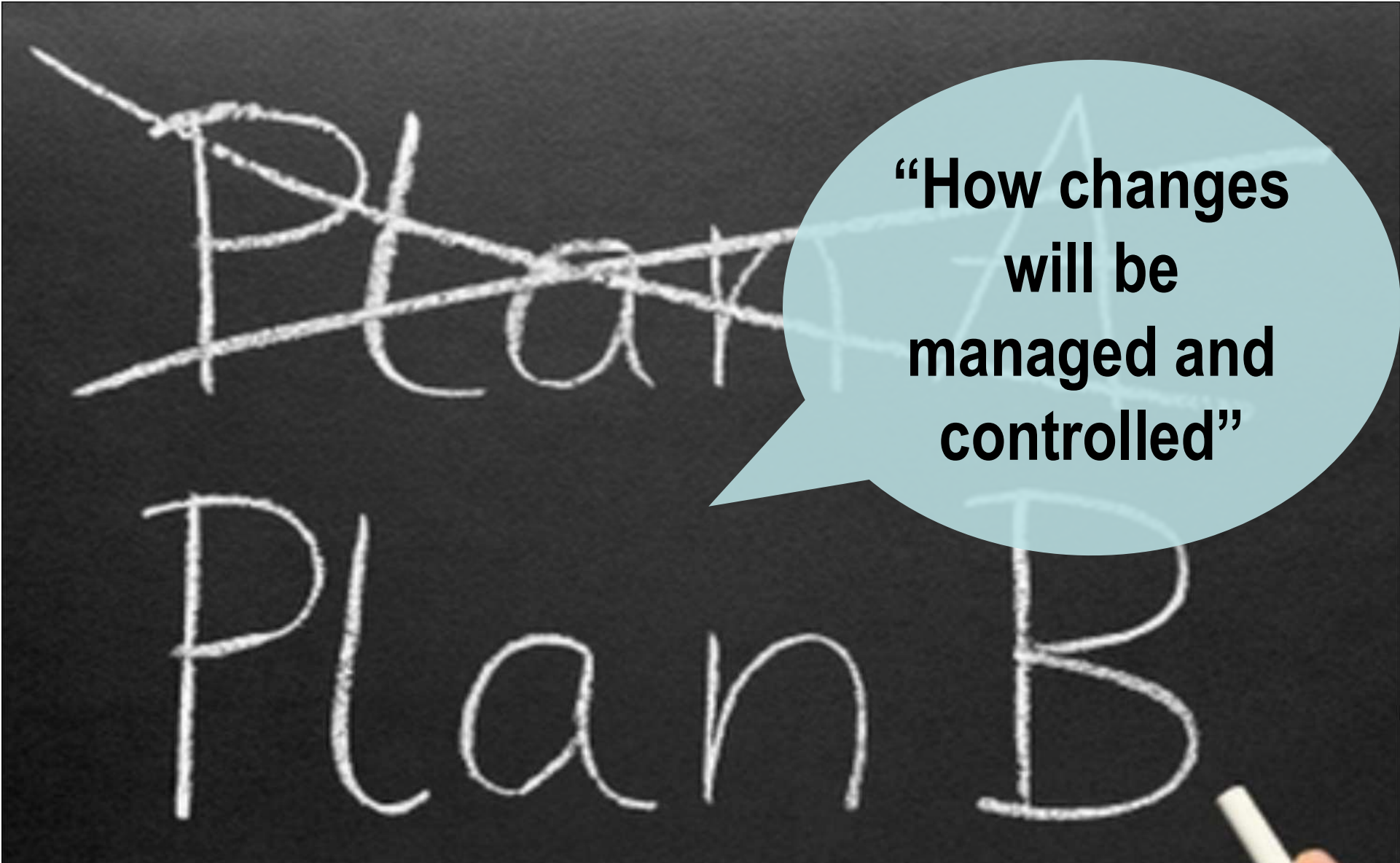
- ## Project Management Plan
- **The strategy** for managing the project
  - Define, plan, manage, and control the project.



**Change management plan**  
**Configuration management plan**  
**Performance Measurement baseline**  
**Project Life cycle**  
**Development approach**  
**Management Reviews**


---

# **Additional Plan**



**“How changes  
will be  
managed and  
controlled”**

**Change Management Plan**

- 
- A group of business professionals are seated around a table in a meeting room, engaged in a discussion. The image is overlaid with a semi-transparent teal box containing a list of bullet points. The background shows a woman on the left, a man in the center, and a woman on the right, all looking towards the center of the table. There are papers, a pen, and a glass of water on the table.
- Change control **procedures** (how and who)
  - The **approval** levels for authorizing changes
  - The creation of a **change control board (CCB)** to approve changes
  - A plan outlining **how changes will be managed and controlled**
  - Who should **attend meetings** regarding changes
  - **Tools** to use to track and control changes

# Configuration Management Plan

- A plan of **making sure everyone know** what version of the scope, schedule etc of the project management plan is the latest version

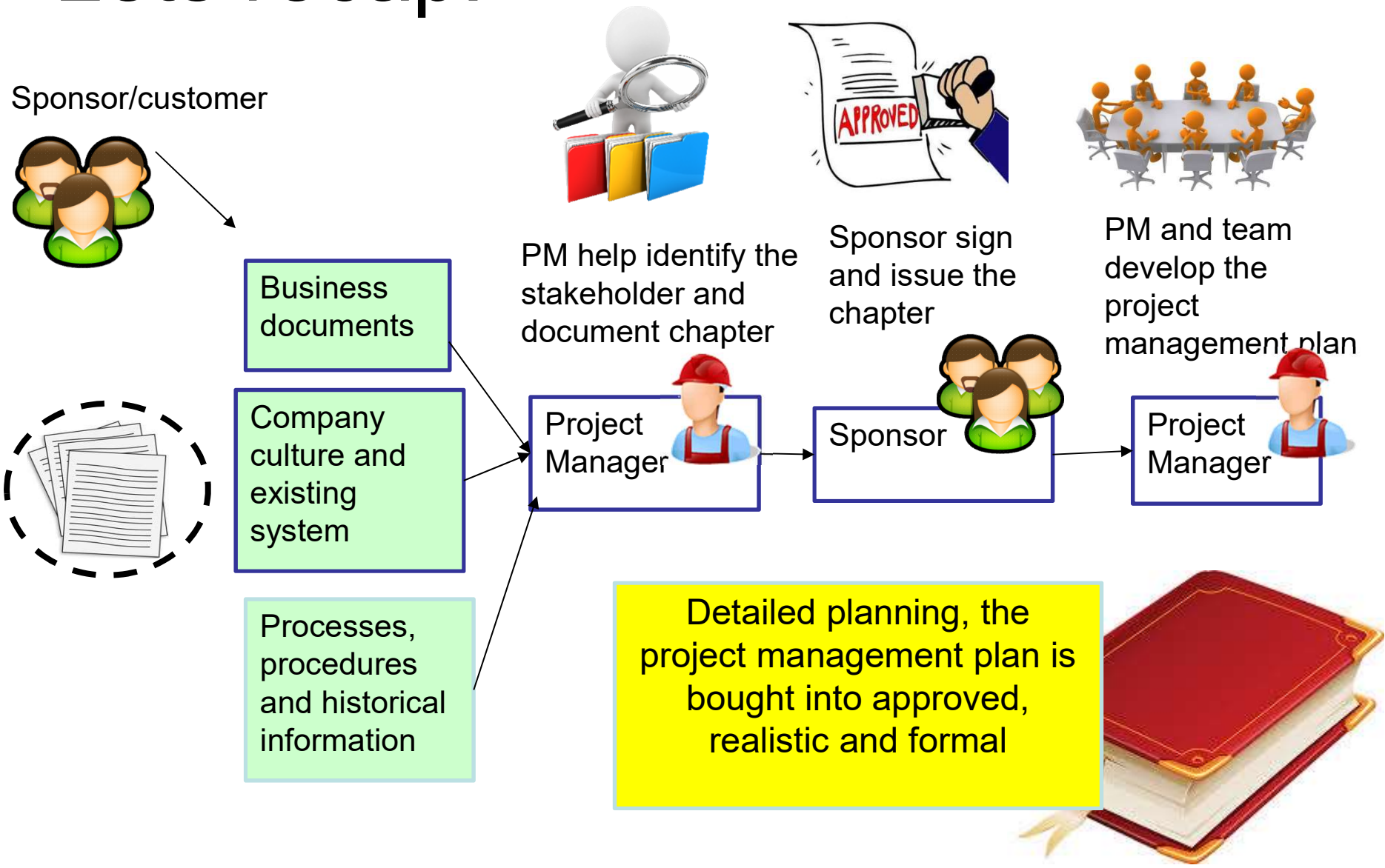


Once the project management plan is **complete**, the sponsor or key stakeholder **review and approve** it





# Lets recap!





Before develop management plan can be completed and executing can begin, **a kick of meeting** should be held!



## 4.3 Direct & Manage Project Execution

**Completing** the activities and deliverable in the project management plan

## Inputs

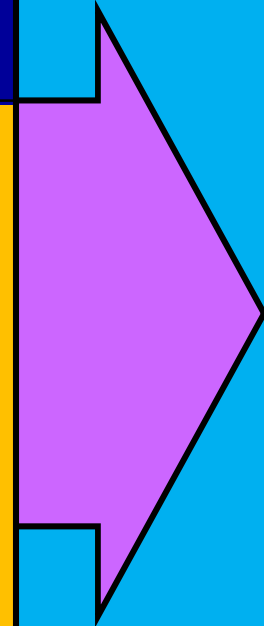
1. Project management plan
2. Approved change request
3. Project Document
4. EEF
5. OPA

## Tools & Techniques

1. Expert judgment
2. Project management information system
3. meeting

## Outputs

1. Deliverables
2. Work performance data
3. Change requests
4. Project management plan updates
5. Issue log
6. Project document updates
7. OPA update



# PROJECT MANAGEMENT PLANS



Baseline + subsidiary  
plan

# PROJECT DOCUMENTS



Memo, project logs, risk  
register, stakeholder  
register, quality metric

**VERSUS**

# Manage project Knowledge



Take advantage of the  
knowledge the organization has  
accumulated over time

## Inputs

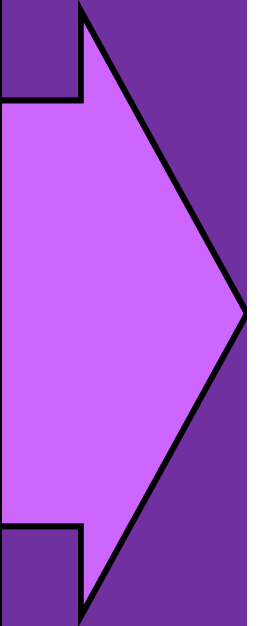
1. Project management plan
2. Deliverables
3. Project Document
4. EEF
5. OPA

## Tools & Techniques

1. Expert judgment
2. Project management information system
3. Knowledge management
4. Information management
5. Interpersonal and team skill

## Outputs

1. Lesson learned register
2. Project management plan updates
3. OPA update

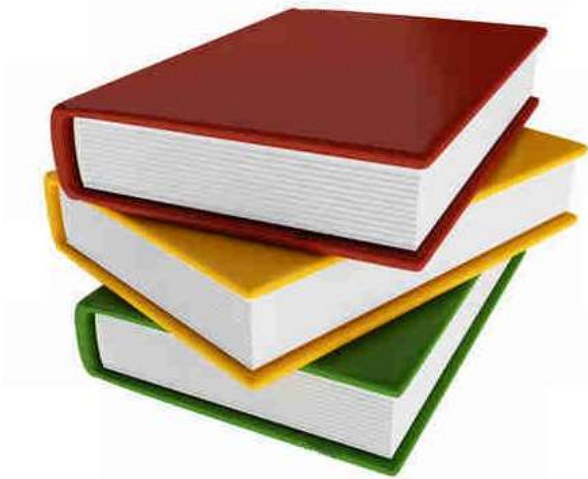


**Sharing** new process, success, etc internally within the project, as well as making that knowledge **accessible**





# Knowledge comprises 2 aspect:



**Explicit knowledge**

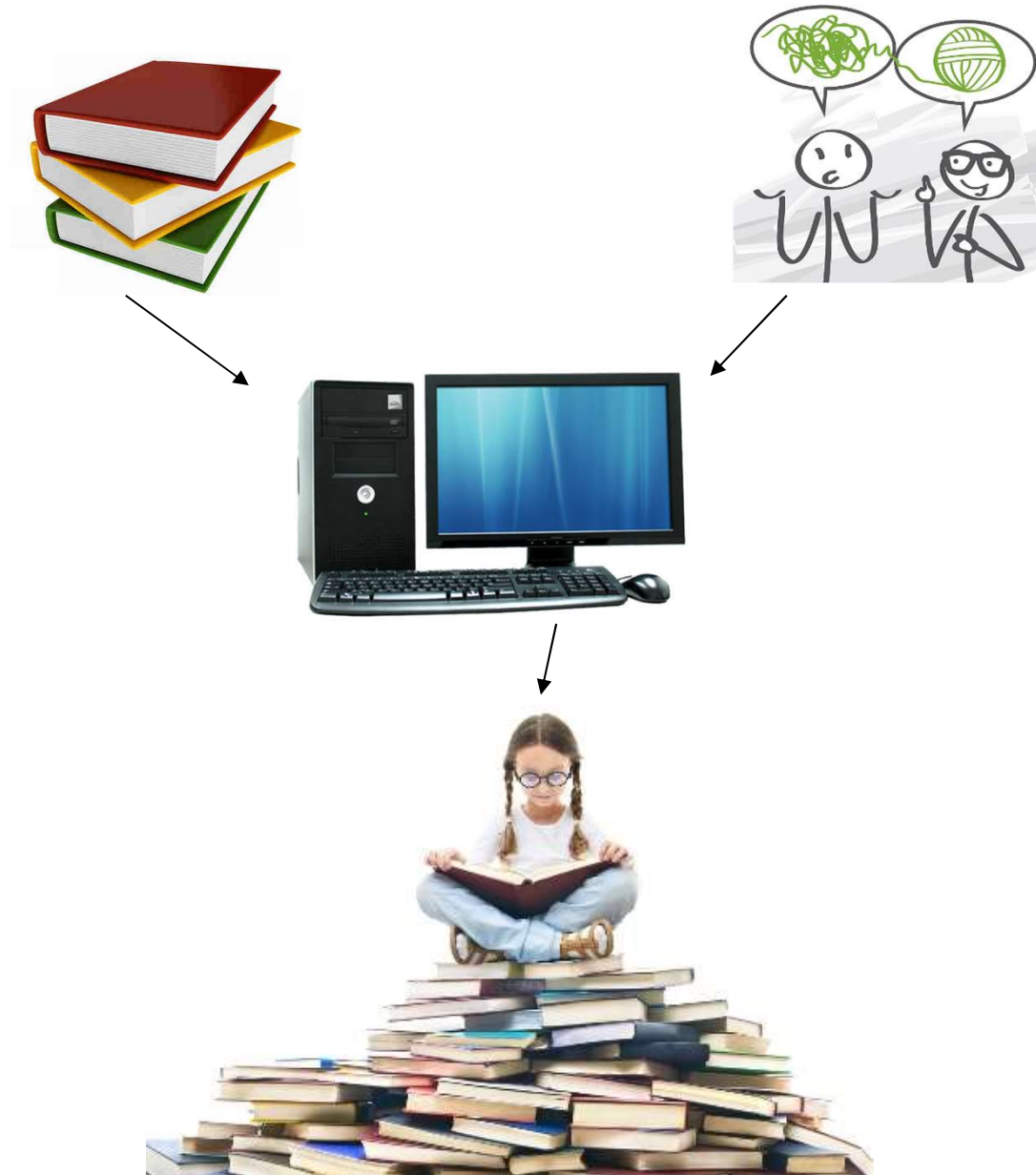
**Words, picture, symbol**



**Tacit knowledge**

**Experience, emotion,  
ability**

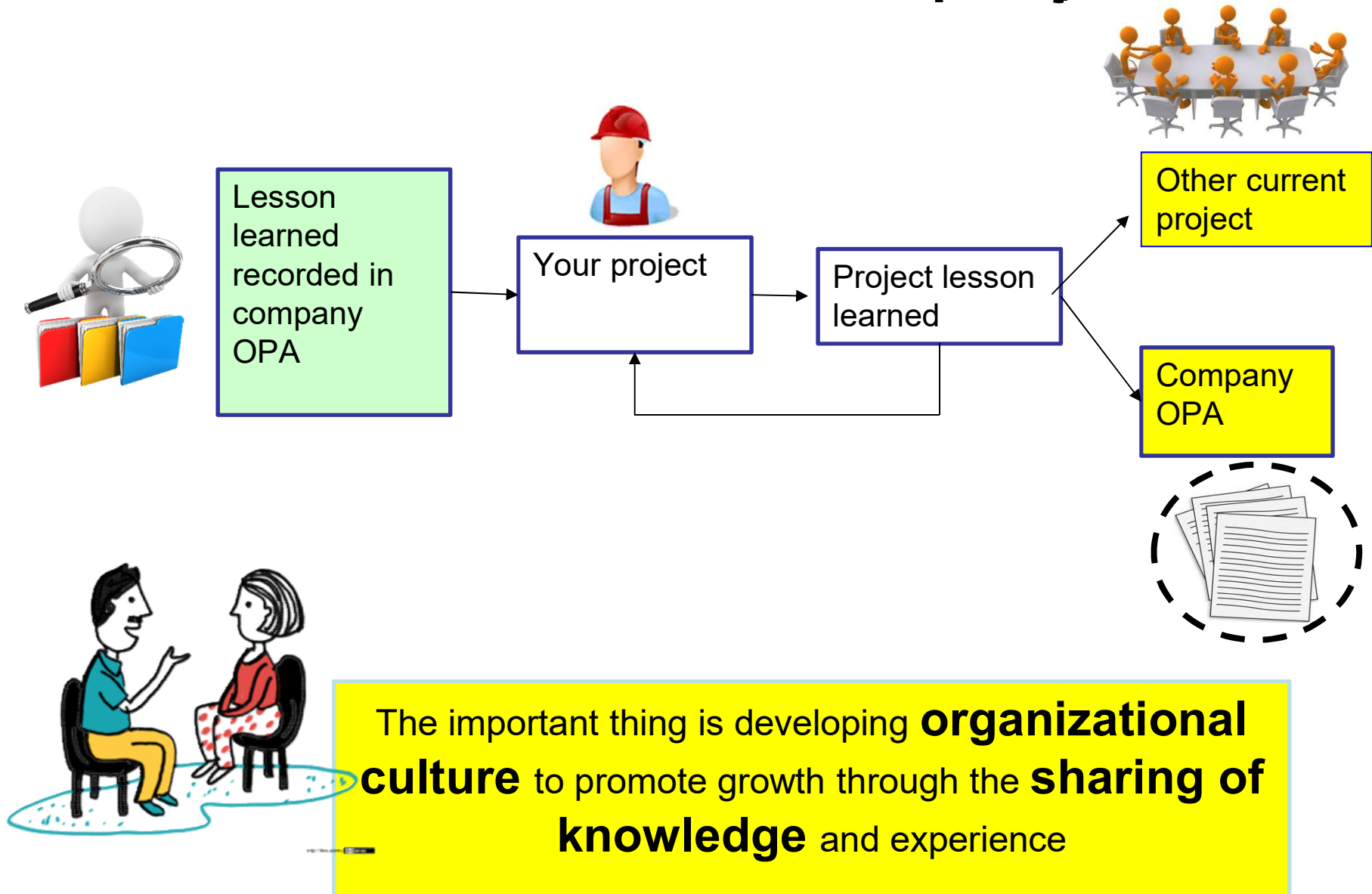
# Knowledge Management



# Lesson Learned Register

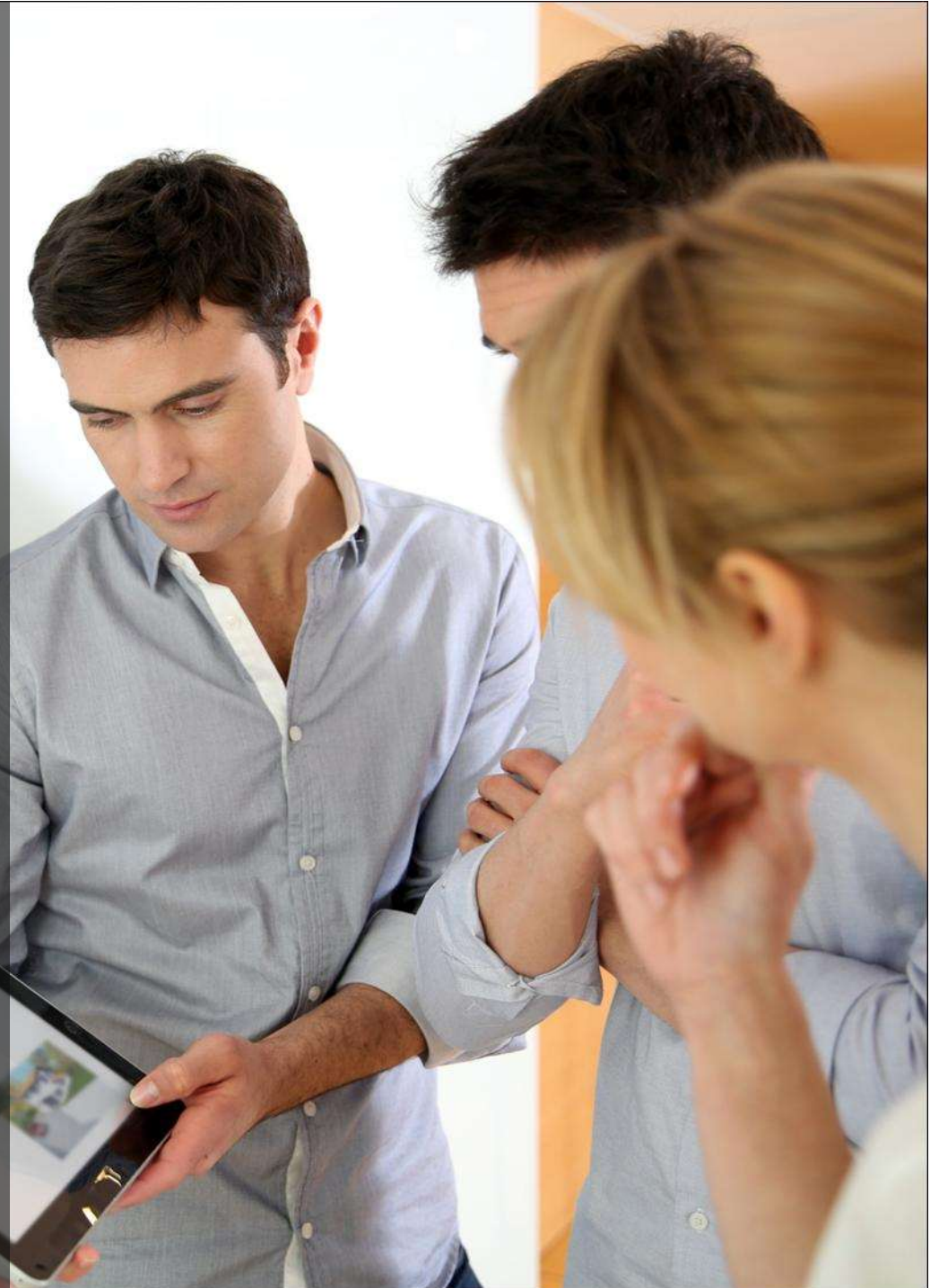
- Technical aspect → what was right or wrong
- Project management → how did we do in wbs creation? Risk planning? Etc.. What did we learn?
- Management → how did I do with communication and leadership as a PM?

# Lesson Learned on a project



## 4.4 Monitor & Control Project Work

What is happening on the project and comparing the actual and forecasted performance to what was planned



## Inputs

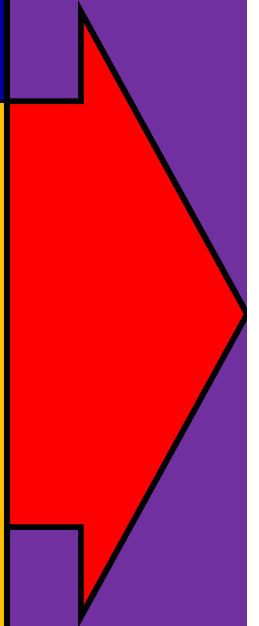
1. Project management
2. Project Documents
3. Agreements
4. Work Performance information
5. EEF
6. OPA

## Tools & Techniques

1. Expert judgment
2. Data Analysis
3. Decision making
4. meeting

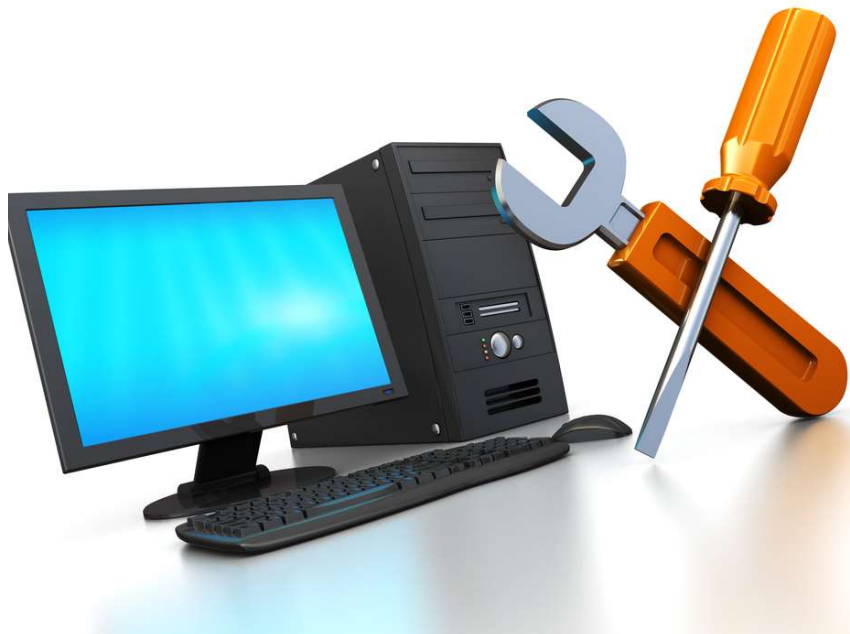
## Outputs

1. Change requests
2. Work Performance report
3. Project management plan updates
4. Project document updates



# Corrective Action

Any action taken to bring expected future project performance in line with project management plan



- Create metric
- Realistic management plan
- Find root cause
- Measure project performance → see *EVM technique*

# Preventive action



- Dealing with anticipated or possible deviations from the performance baseline and other metrics
- The action do not change the baseline
- Example: training, changing resource



# Defect Repair

- Another saying of “Rework”
- When a component does not meet the specification





- All **corrective/preventive/defect repair** action should be **reviewed, approved, rejected or deferred** as part of *Perform Integrated Change Control Process (PIIC)*

# Exercise

- When meeting with the customer to obtain **acceptance of interim deliverables**
- When measuring project performance against the **performance baseline**
- When making sure people are using the **correct process**
- When evaluating whether the **performance reports** are meeting stakeholder needs

**Validate scope**

**Control scope,  
schedule, cost**

**Manage quality**

**Monitor  
communication**

# Exercise

- When working with **project team** **Manage team**
- When assessing **stakeholder relationship** **Manage stakeholder engagement**
- When you notice that there are many **unidentified risks occurring** **Manage risk**
- When evaluating **seller's performance** **Control procurement**
- When evaluating **team member's performance** **Manage team**
- When making sure deliverables meet **quality standards** **Control quality**
- When communicating w/ stakeholder to **resolve issues and manage perception** about the project **Manage stakeholder engagement**

A top-down view of a meeting table with documents, a tablet, and hands pointing at charts. The background is a light blue overlay with a faint grid and circular patterns. The text is centered over the image.

## 4.5 Perform Integrated change control

**Reviewing, approving and managing changes to deliverables, OPA, project documents and the project management plan.**

## Inputs

1. Project management plan
2. Project Documents
3. Work Performance reports
4. Change request
5. EEF
6. OPA

## Tools & Techniques

1. Expert judgment
2. Meetings
3. Decision making
4. Change control tools

## Outputs

1. Approved Change requests
  2. Project management plan updates
  3. Project document updates
- 



**A change** is requested **does not**  
mean it has to be or even should be  
**implemented**

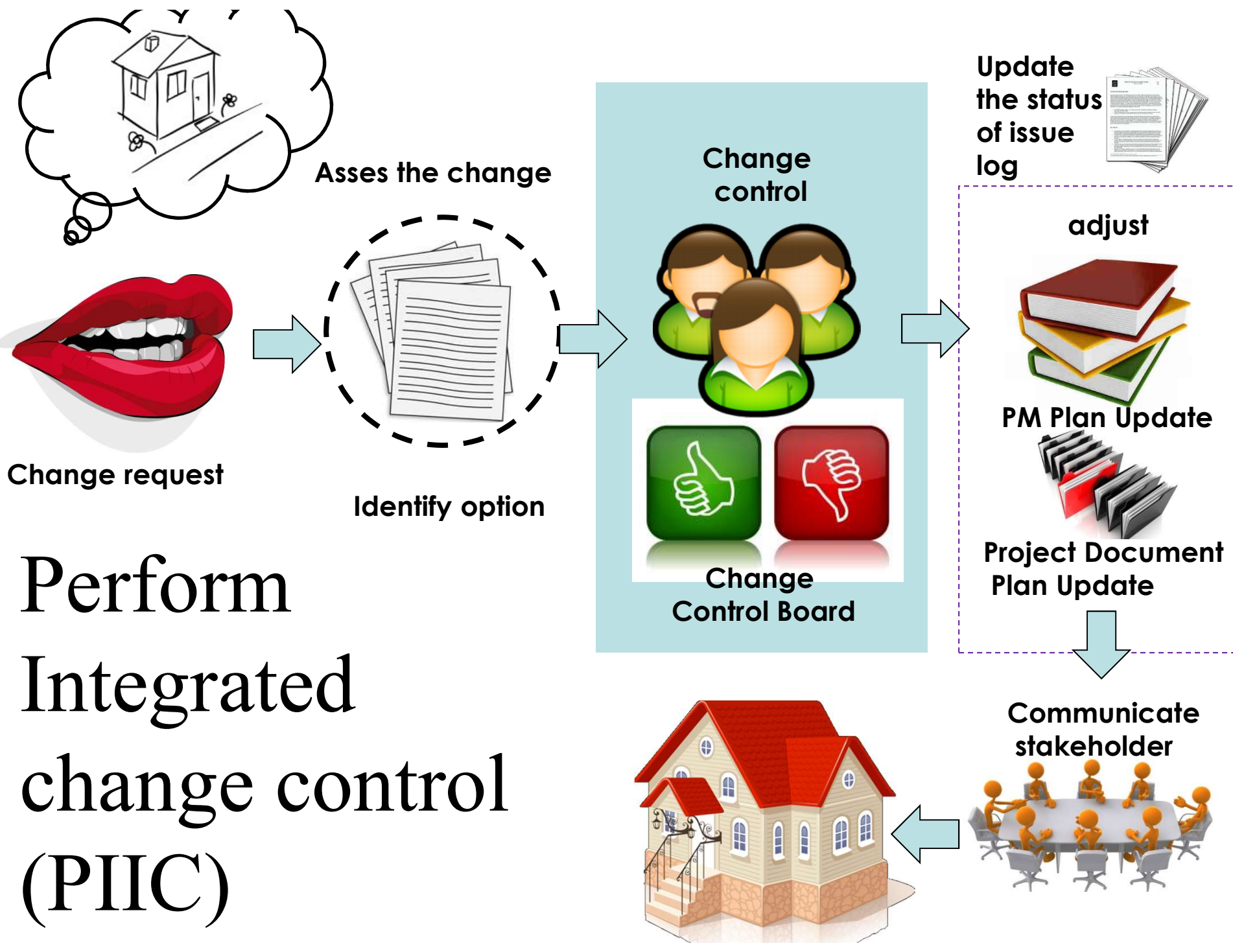
Always look at **the impact of each**  
**change** on all the project constraints

# Process for Making changes


- 1. Evaluate the impact**
2. Identify the options → cutting scope, crashing/fast-tracking
3. Get the CR approved internally
4. Get customer buy in (if required)







# Perform Integrated change control (PIIC)

A photograph of three business professionals in an office setting. On the left, a man in a dark suit and blue tie is shaking hands with a woman in the center. To the right, another woman in a white shirt is smiling. They are standing in front of a modern building with a blue glass facade. The text '4.6 Closing Project' is overlaid in the upper right, and a definition of the closing phase is overlaid in a grey box at the bottom.

## 4.6 Closing Project

**“Finalizing all activities across all of the Project Management Process Groups to formally complete the project or phase”**

## Inputs

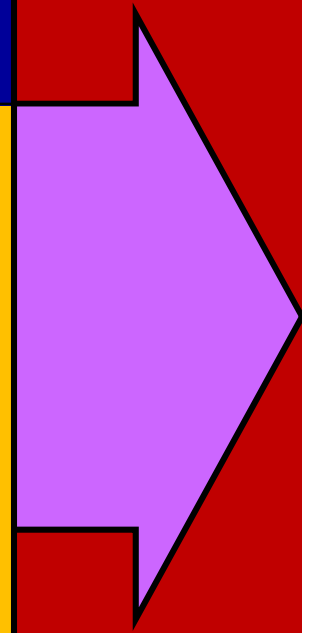
1. Project charter
2. Project management plan
3. Project document
4. Accepted deliverables
5. Business document
6. Agreements
7. Procurement documentation
8. OPA

## Tools & Techniques

1. Expert judgment
2. Data analysis
3. meetings

## Outputs

1. Project Documents update
2. Final product, service or result transition
3. Final report
4. OPA updates

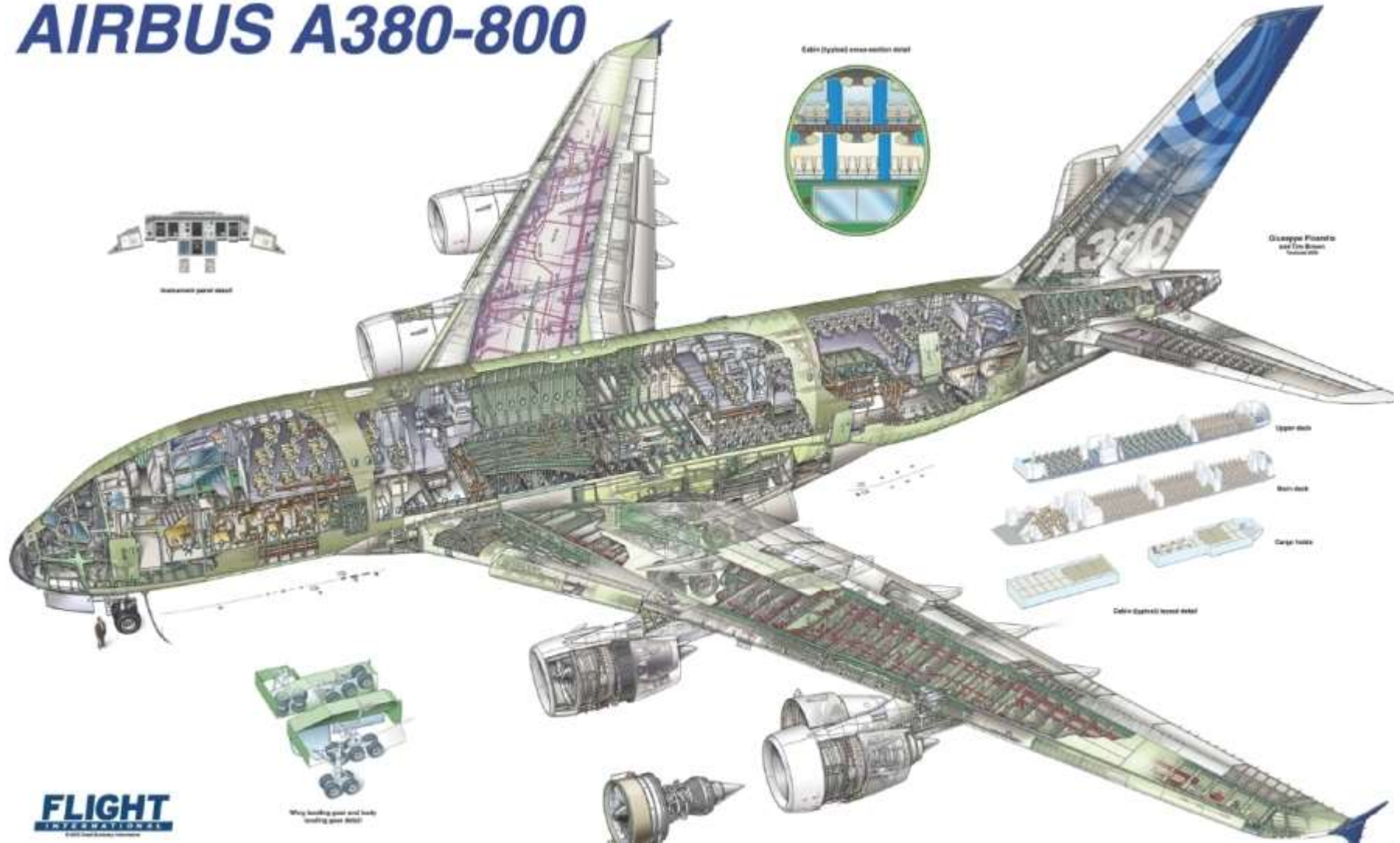


# Closing Project Process



# CASE STUDY

## AIRBUS A380-800



# What went wrong?

- 2 years behind schedule → loss \$6,1 billion
- Cause? Integration-disintegration (no clear project integration)
- Pre-assembly (German) to assembly Line (France) mismatch-CATIA Problem
- Trouble in wiring (harness)



# Try this game

- <https://rmcls.com/process-chart-game-v9>

Next topic:  
Project Scope Management  
**Thank You**