

الإصدار v6  
2020

أحمد بن سليمان الميمان

كشكول

PMP

محترف إدارة المشاريع

Project Manager Professional

## رسالة الكاتب

الحمد لله رب العالمين، والعاقبة للمتقين، والصلاة والسلام على أشرف الأنبياء والمرسلين، نبينا محمد وعلى آله وصحبه أجمعين، أما بعد؛

...

فإني في حقيقة الأمر لم أقدم شيئاً جديداً سوى أنني لخصت مادة الاختبار من خلال قراءتي لبعض الكتب وحضوري لبعض الدورات والمحاضرات لشرح منهج «مُحترف إدارة المشاريع PMP». ولا يخفى على كل من اطلع على مقرّر الشهادة مدى دسامتها وتشابكها وترايط جميع فصولها، فكان هذا الكشكول الذي جمعته لي ولزملائي مرجعاً نستذكر من خلاله المنهج في الأسابيع الأخيرة قبل موعد اختبارنا.

لكل من أراد الاستفادة من هذا الكشكول قد قمت بكتابته بأسلوب يسهل على كل من أراد مراجعة المنهج واستذكّاره بقراءة أقل عدد كلمات ممكنة، مشيراً إلى أهم العبارات (المفاتيح) باللون الأحمر. فيا قارئ الكريم إن لم تقرأ منهج اختبار «مُحترف إدارة المشاريع PMP» من قبل، أو لم تحضر إحدى الدورات التي تشرحها، فلن يفيدك هذا الكشكول؛ فإني لم أتطرق فيه لشرح المنهج، فهذا الكشكول للمراجعة فقط، إذ تصعب مراجعة الكتاب على المختبر والرجوع له لكبر حجمه.

والداي العزيزان، لولاكما لما وُجدتُ في هذه الحياة، زرعتما في قلبي حبّ العلم والمثابرة، والصمودَ مهما كانت الصعوبات، شكراً لكما ملءَ السماوات الأرض حباً وكرماً، وأسأل الله -سبحانه وتعالى- أن يطيل أعماركما وأن يعطيكما الصحة والعافية وراحة البال.

كما أشكر زوجتي الغالية وشريكة عمري «نهلة»؛ لتشجيعها وحرصها الدائم والمتواصل لي، وأشكر والديها؛ لمعاونتنا بشكل كبير في تنشئة وتربية بنتينا «سارا» و«غاده»، فلكما مني أشدُّ كلماتِ الشكر والعرفان، وأسأل الله -تبارك وتعالى- أن يعينني على ردّ جميلكما علينا.

ولكما -زميلاي الفاضلان- عمرو الصعر وخالد السقا؛ فلولا الله ثم إعانتكما وحثكما لي وتشجيعي لما حصلت على هذه الشهادة، فأشكر وأبارك لكما تحقيق هدفنا بالحصول على شهادة «مُحترف إدارة المشاريع PMP»

وأدعوه سبحانه وتعالى أن يكون هذا الكتاب معيئاً لك -قارئ الكريم- في مراجعتك واجتيازك لامتحانك. وصى الله وسلم على نبينا محمد وآله وصحبه.

أحمد بن سليمان الميمان

2020/8/8



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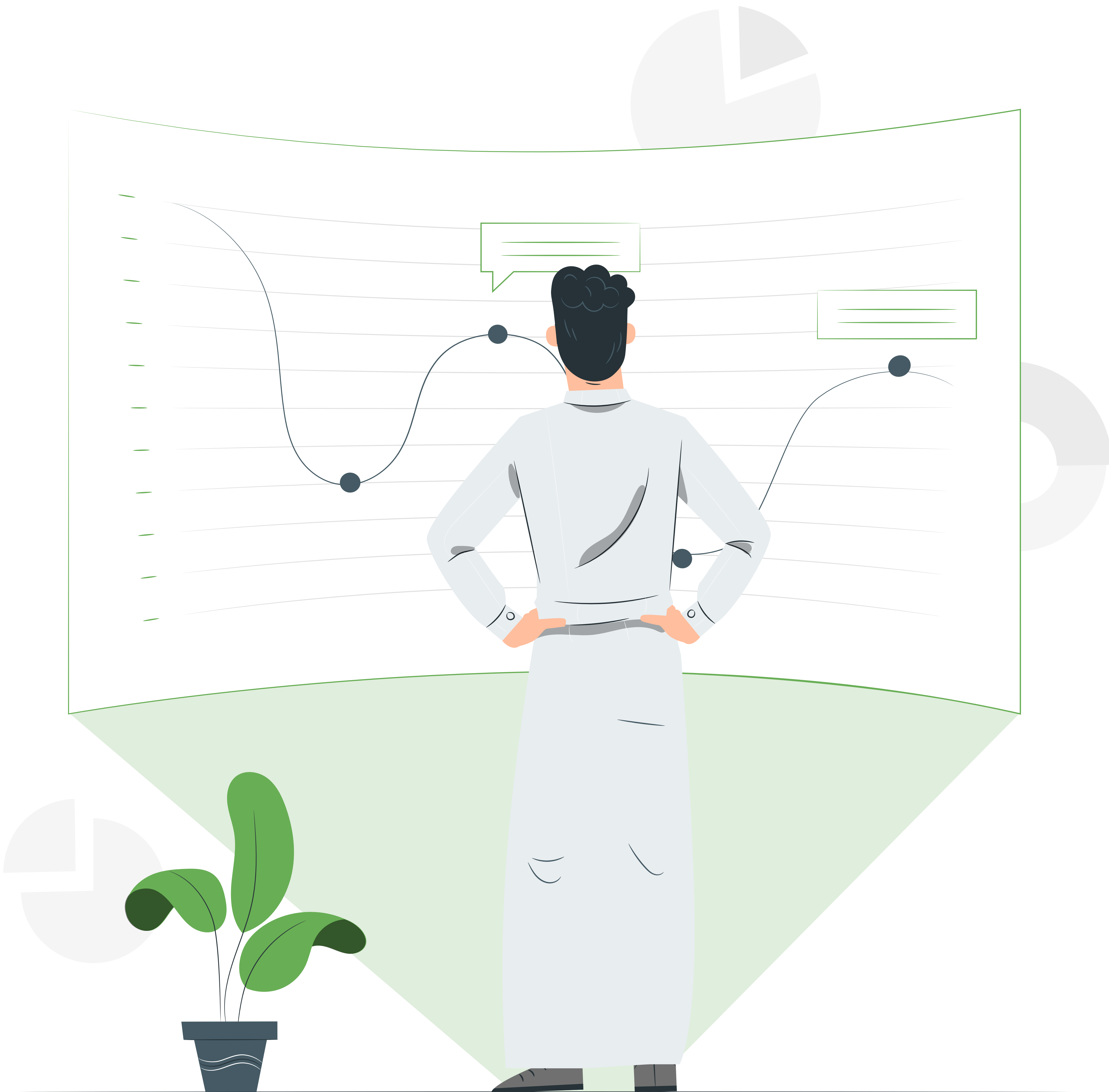
Stakeholder Management

الفصول  
1,2,3

# الفصول الثلاث الأولى

## First three chapters

PMBOK 6<sup>th</sup> Ed. (1-68)





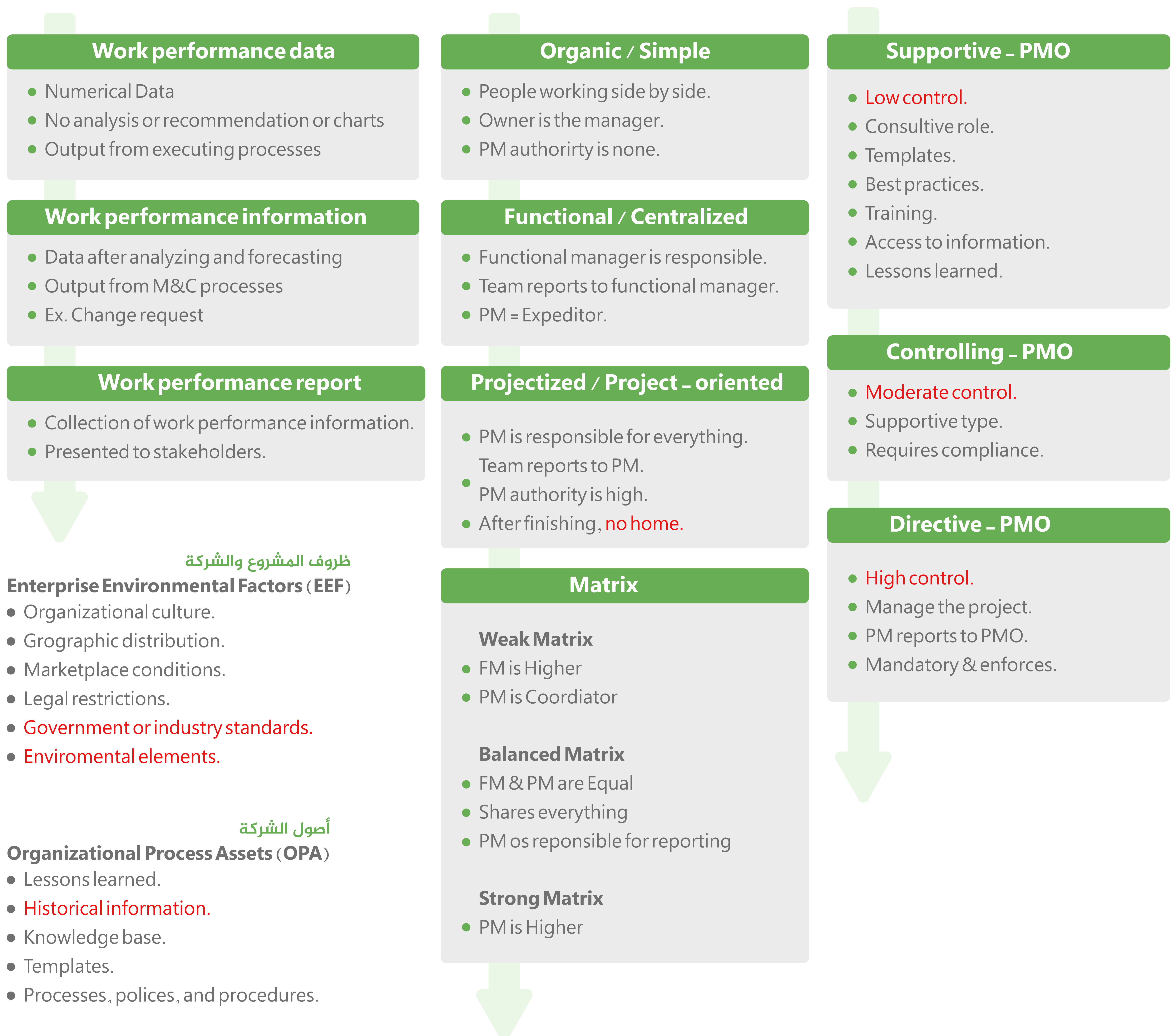
## General Definitions

# PMP



### Organizational Project Management (OPM)

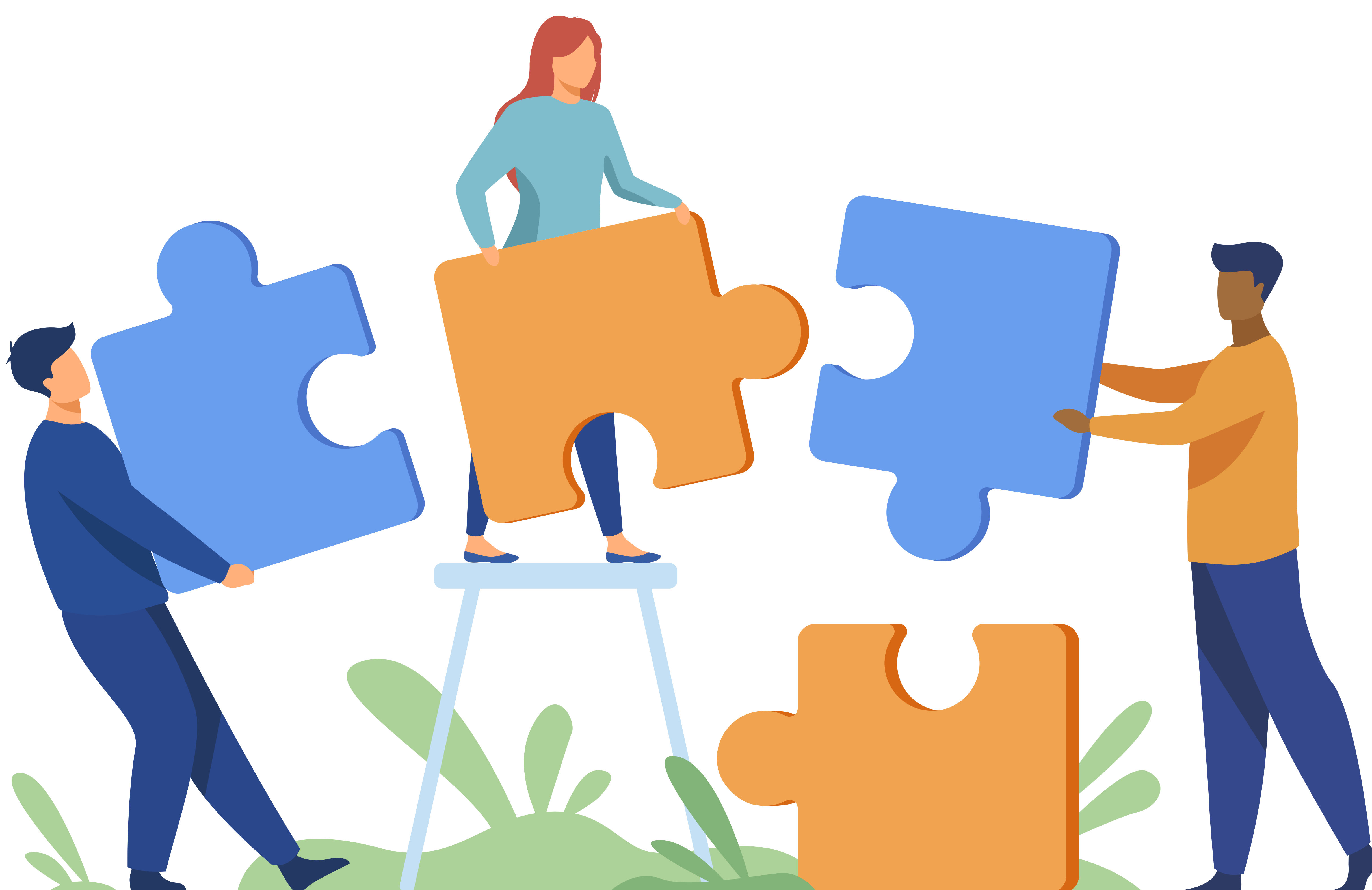
- Make sure all project, programs, portfolios are aligned with the organization strategies to achieve strategic goals.
- Ensure the organization undertakes the right projects.



# إدارة التكامل

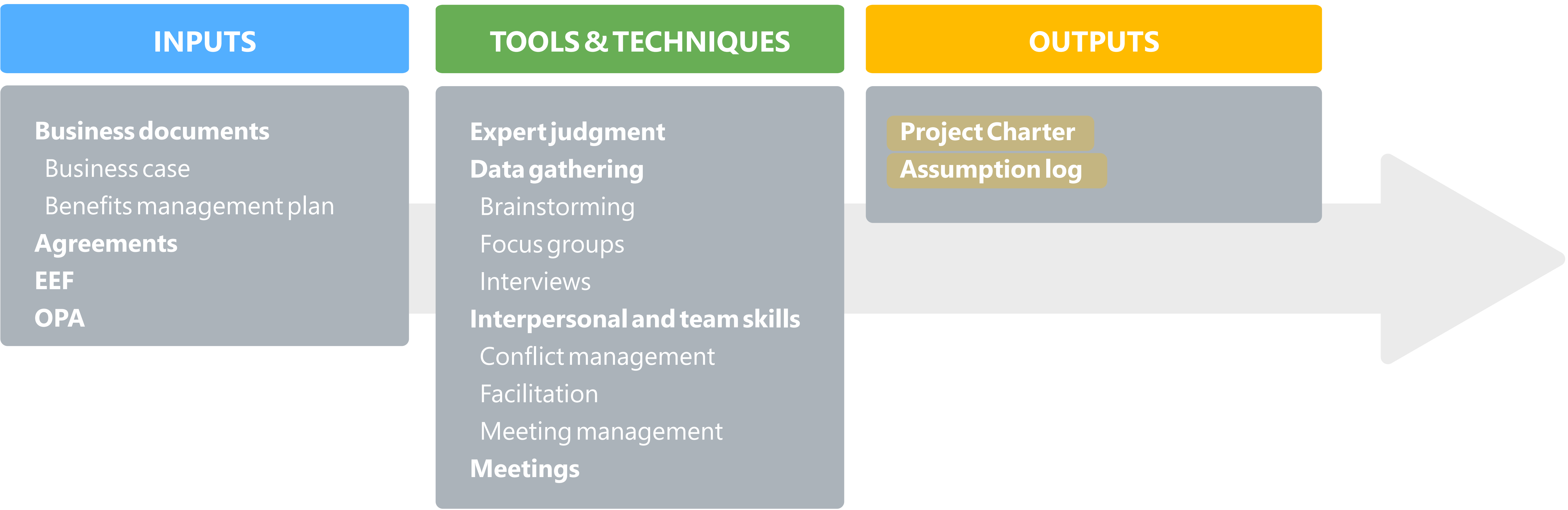
## Integration Management

PMBOK 6<sup>th</sup> Ed. (69–128)



Initiating Process

# Develop Project Charter



- Developing a document that **formally authorize the existence of a project**.
- Provide Project Managers with the **authority to use resources**.
- Direct link between the project and strategic objectives.
- Formal record of the project.
- Show organizational commitments.

INPUT

**Business document**

- Business case (feasibility study).
- Benefit management plan.
- Project Managers can't modify, but only recommend to sponsor.
- Includes (assumptions, constraints, risks, roles, responsibility, milestones, Stakeholders).

INPUT

**Assumption log**

- Low level detailed assumptions, constraints.
- High level of assumptions, constraints are mentioned in business case then in project charter.

OUTPUT

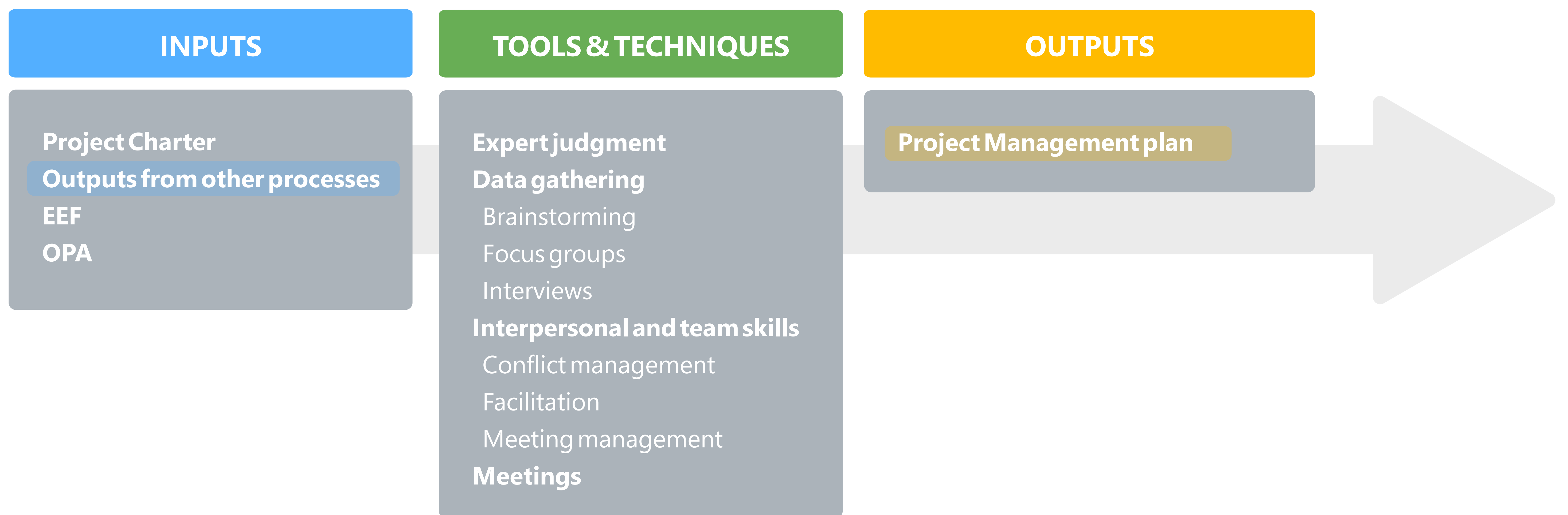
**Project charter**      **ميثاق المشروع**

- **Project purpose**.
- Measurable project objective.
- **High level requirements**.
- High level description Key deliverables.
- **Overall project risk**.
- Summary milestone schedule.
- Preapproved financial resources.
- **Key stakeholder** list.
- Project exit criteria to close.



## Planning Process

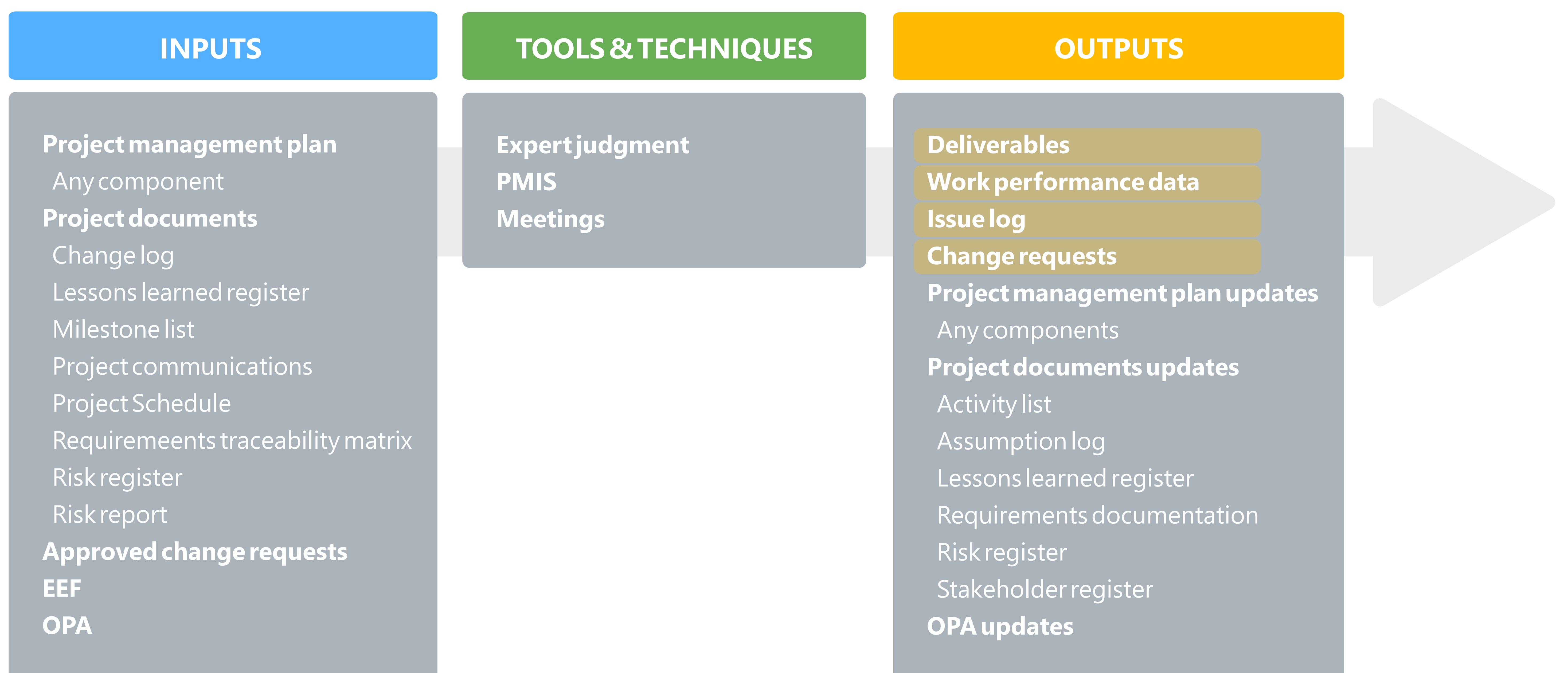
# Develop Project Management Plan



- Coordinating all plan components.
- Production of a comprehensive document.
- How the work will be performed.

## Executing Process

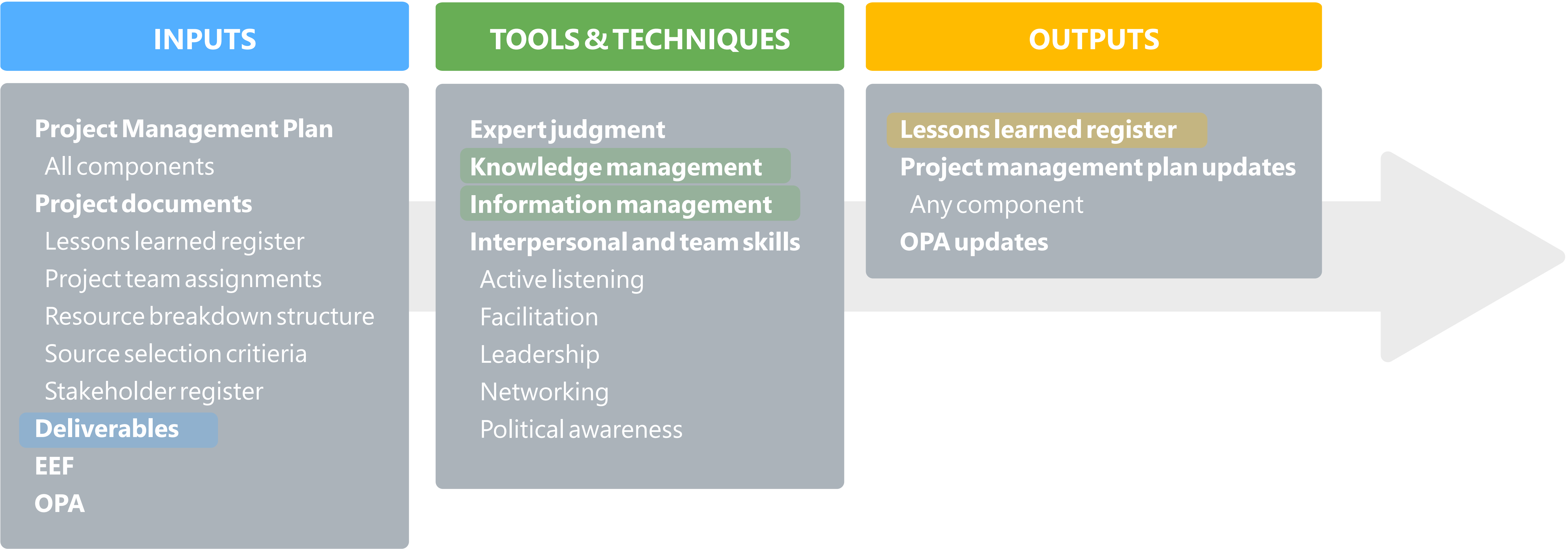
# Direct & Manage Project Work



- Leading and performing the work defined in project management plan.
- Implementing the approved changes.
- Achieve project's objectives.
- Improving the probability of project success.



# Manage Project Knowledge



- Existing knowledge and creating new knowledge to achieve project objective
- Improve project outcome

**TOOLS & TECHNIQUES**  
**Knowledge management** إدارة المعرفة

- Share **Tacit knowledge**.
- **Ideas**, believes, experience.
- Seminars & conferences & workshops & meetings.

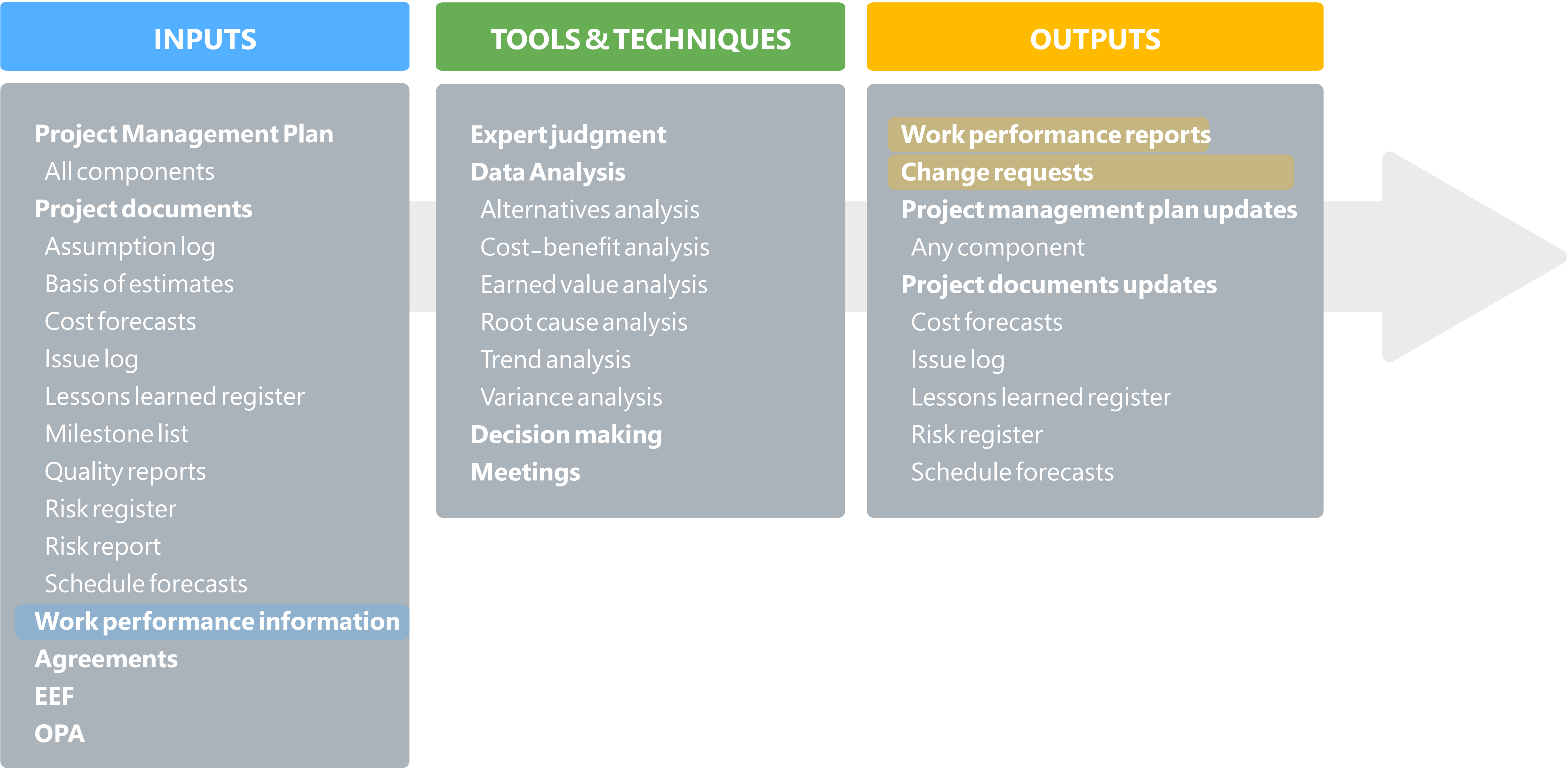
**TOOLS & TECHNIQUES**  
**Information management** إدارة المعلومات

- Sharing simple / **unambiguous** / clear / **explicit knowledge**  
Photos, number, lesson learned register.

**OUTPUT**  
**Lesson learned register** سجل الدروس المستفادة

- All team is working on it.
- At the end of a project or phase , the information is transferred to OPA called lessons learned repository.

# Monitor & Control Project Work

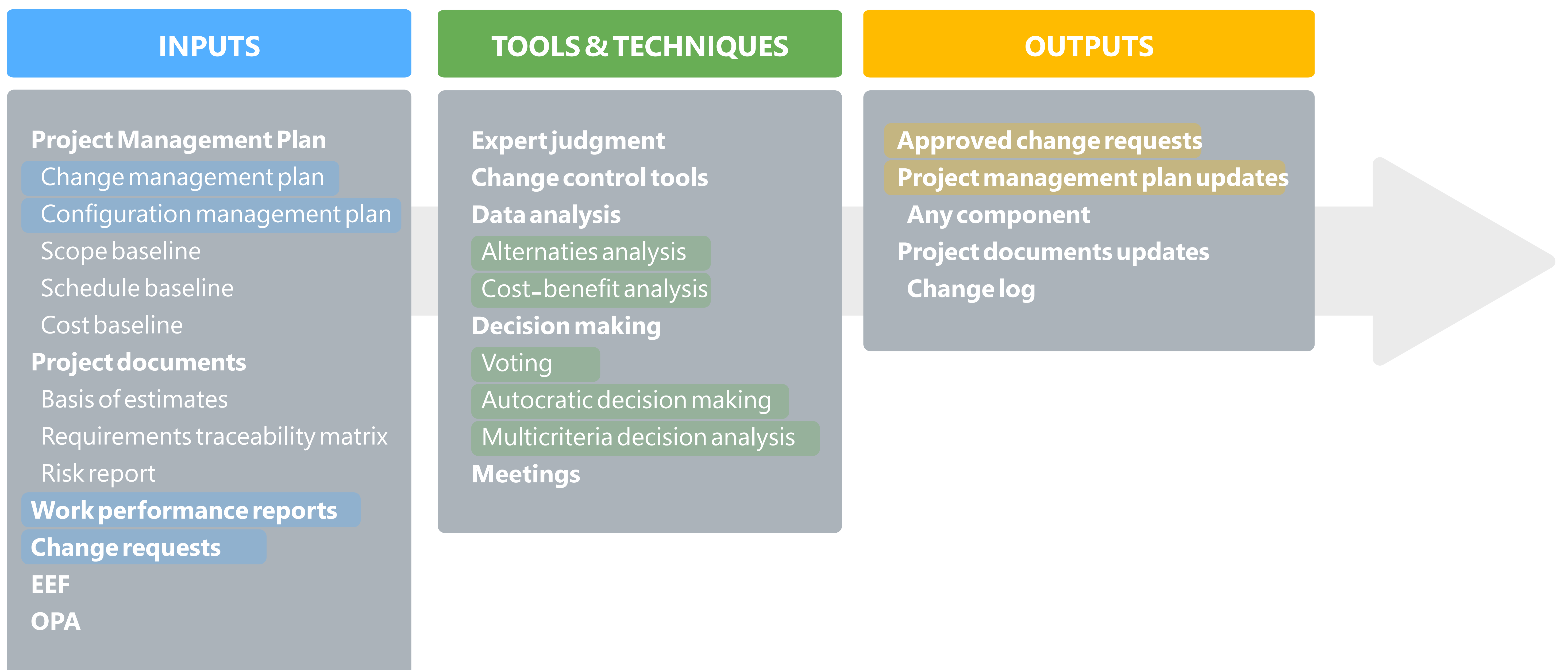


- Reviewing & reporting the overall progress t meet the performance objective.
- Allow stakeholders to understand the current state of the project.
- **Monitor**: Collecting and measuring evaluating the performance.
- **Control**: Determine corrective or preventive actions, re-planning & follow up.
- **Preventive action**: Ensure the future performance of project work is aligned with project management plan – Part of Change request.
- **Corrective action**: Re-aligns the performance of project work with project management plan – Part of Change request.
- **Defect repair**: Modifies nonconforming product component stakeholder refused item – Part of Change request.



## Monitor &amp; Control Process

# Perform Integrated Change Control



- Review all change request, approving / rejecting.
- All change request goes here.
- All approved or rejected CR goes to change log.
- Must take approval from sponsor if he is not in the CCB.

## INPUT

**Change management plan**

- Direction for managing the Change control process.
- How to make Change request.
- Responsibilities of the CCB.

## INPUT

**Configuration management plan**

- Describe the configuration items.

**Steps of change request**

- Receive formal change request from stakeholder.
- Meets with Stakeholder to understand reasons & requirements.
- Analyzing the impacts of Change request on project constraints.
- Meets with Stakeholder to inform him about the impacts.
- Send change request to Change Control Board.
- Send Change Request to Sponsor ( if he is not part of CCB).
- If Approved >> record it in Change log.
- Update Project management plan (starting with baselines).
- Inform Key stakeholder.
- Implement the Approved Change request by team.

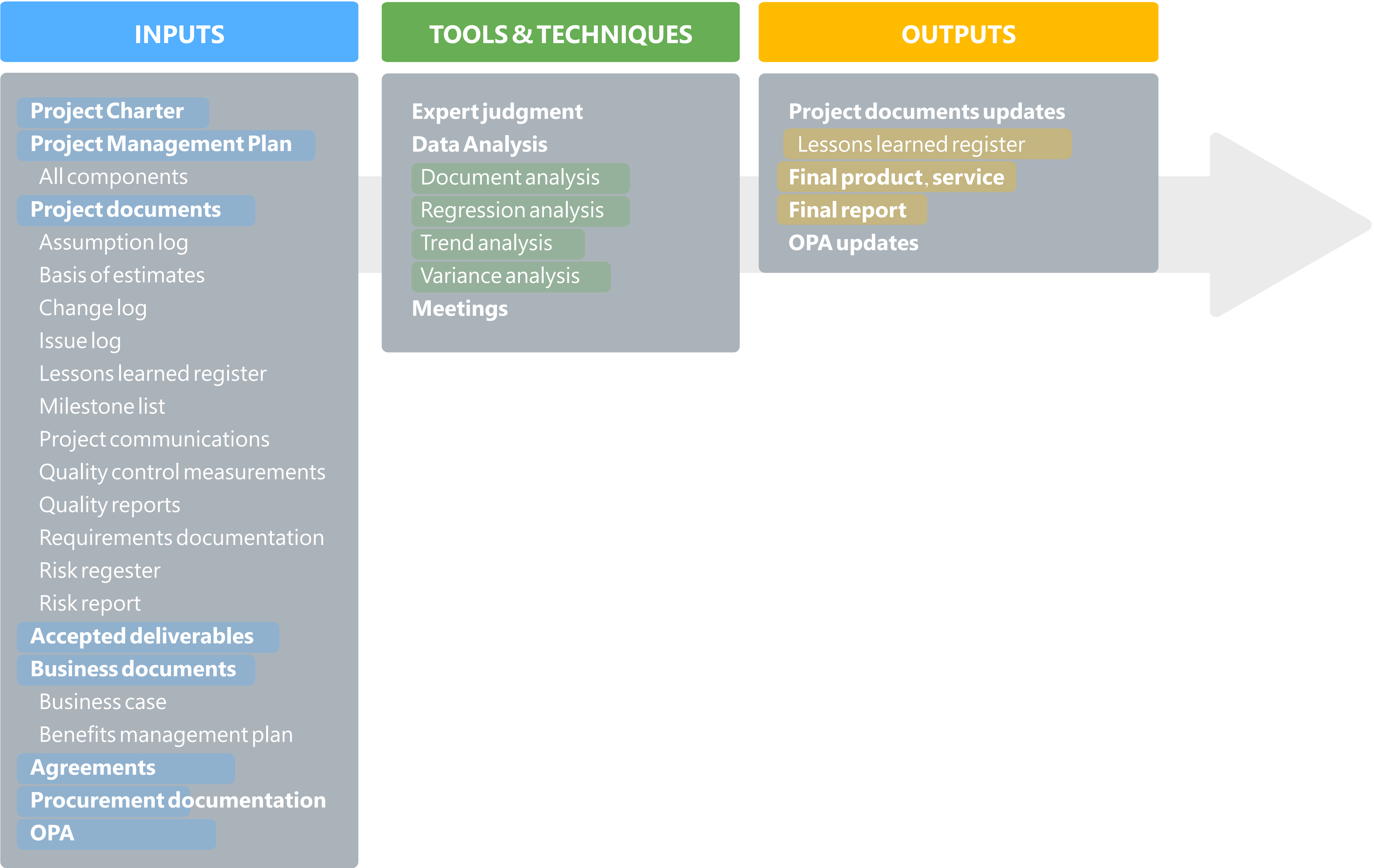
عليك استيعاب هذه الخطوات بترتيبها المذكور  
فكثيرا ما يأتي سؤال عليها ويطلب منك  
تحديد الخطوة التالية





Closing Process

# Close Project or Phase



- TOOLS & TECHNIQUES
- Variance analysis**
- Compare actual and planned work.

- TOOLS & TECHNIQUES
- Document analysis**
- Collect lessons learned.

- TOOLS & TECHNIQUES
- Regression analysis**
- Analysis interrelationship between different variables.
  - Scatter diagram.

- Finalizing all activities.
- Information is archived.
- Plan work is completed.
- Releasing team.
- No EEF in closing .

- OUTPUT
- Final report**
- Summery level desc. of project
  - Summary of the validation
  - Summary of how the final product achieved business needs
  - Summary of any risk or issue
  - Objective of scope schedule, cost, and quality.

أهم المهام التي عليك معرفتها في عملية الإغلاق هو تأكدك من إستلام **Accepted deliverables** من عملية **Control Scope** كما أنه عليك التأكد من إغلاق جميع العقود للمقاولين والموردين في مرحلة **Monitor & Control** وعليك أيضًا التأكد من تدوين جميع الدروس المستفادة في سجلها وحفظها في الـ **OPA** الخاص بالشركة



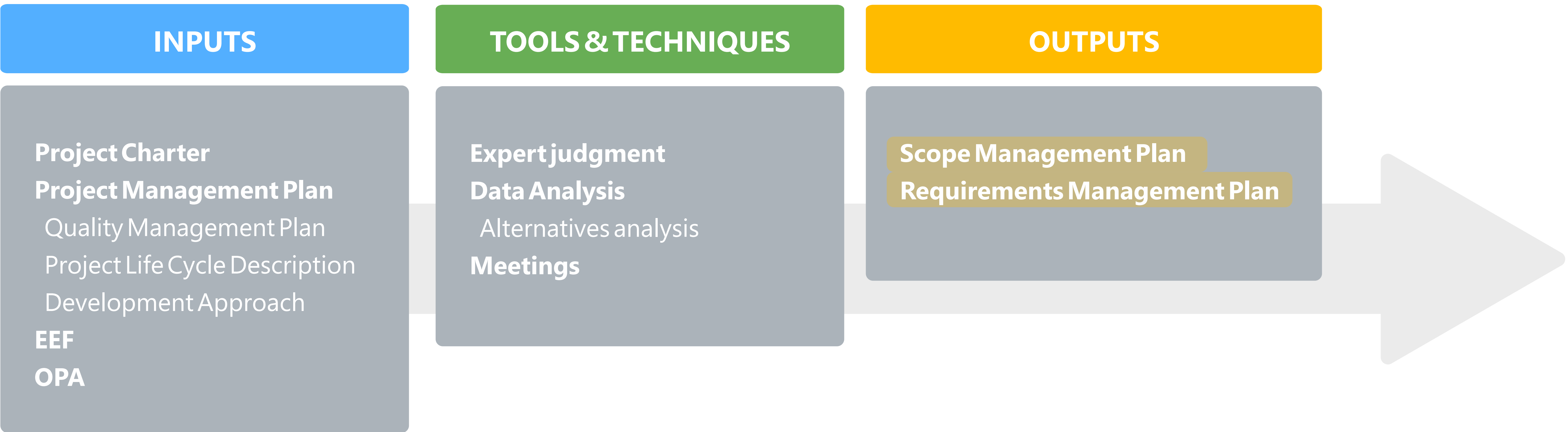
# إدارة النطاق

## Scope Management

PMBOK 6<sup>th</sup> Ed. (129–172)



# Plan Scope Management



- How to define, manage and control scope.
- How to select requirements.
- **Product scope:** features & functions of the product or service (product specs).
- **Project scope:** work performed to deliver product or services.

TOOLS & TECHNIQUES

**Alternative analysis**      تحليل البدائل

- Various ways of collecting req, creating product, validating scope.

TOOLS & TECHNIQUES

**Meetings**

- Project manager, project sponsor and selected team members.

OUTPUT

**Scope Management Plan**

- Process to prepare Project scope statement
- Process that enables the creation of WBS
- How Scope baseline will be approved
- How formal acceptance deliverables will be obtained.

OUTPUT

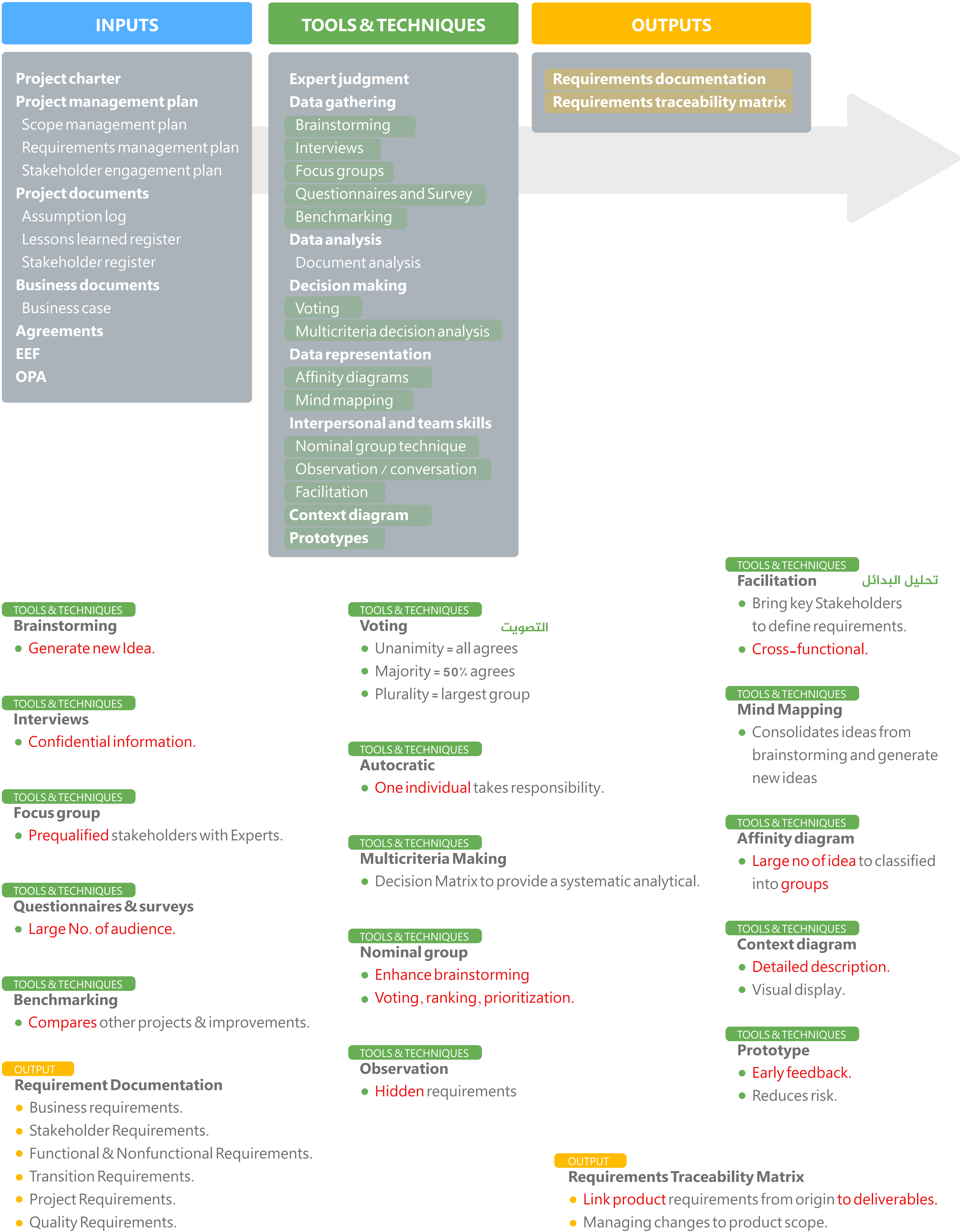
**Requirement Management Plan**

- How project requirements will be analyzed, documented, and managed.



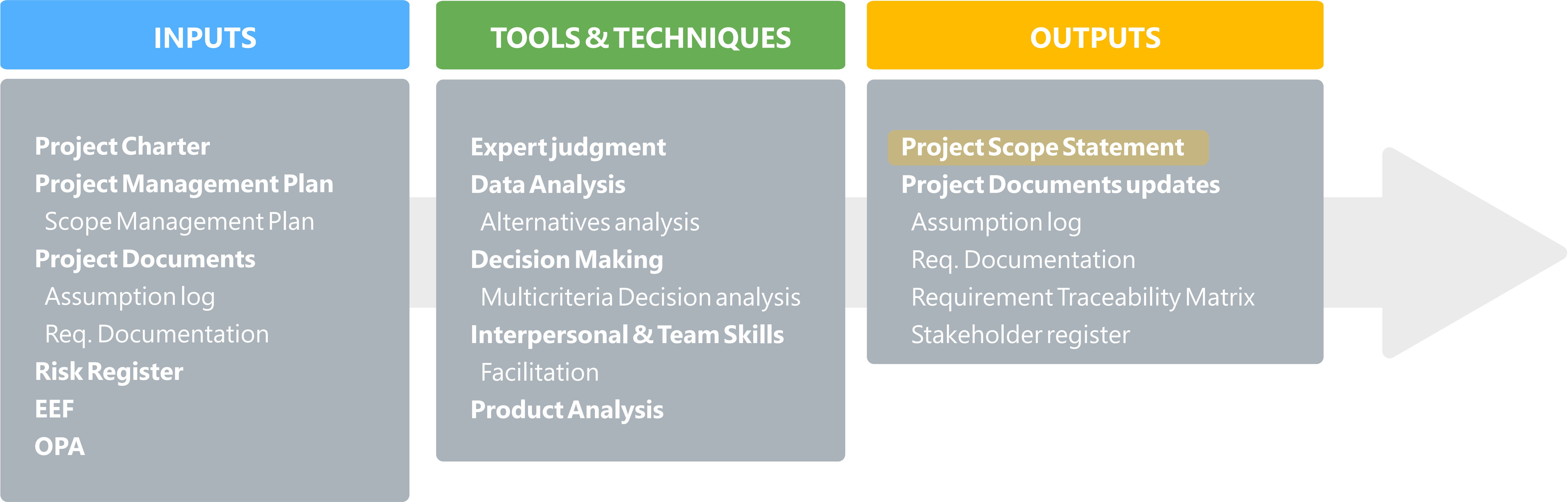
Planning Process

# Collect Requirements



Planning Process

# Define Scope



- Developing **detailed description** of the project and product.

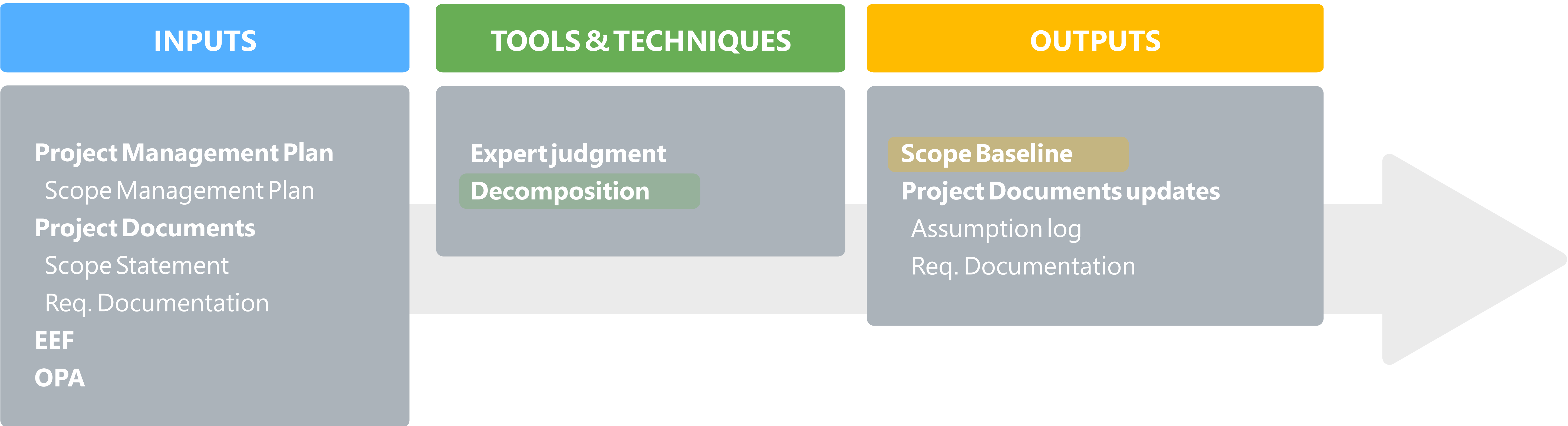
OUTPUT

**Project Scope Statement**

- Product scope description.
- Acceptance criteria.
- Deliverables (summary level, great details , major deliverables).
- Exclusions.
- Constraints.
- Assumptions.

Planning Process

# Create WBS



TOOLS & TECHNIQUES

**Decomposition**

- **Subdividing project scope** & deliverables into smaller, more manageable components.
- **Work package:** Lowest level.

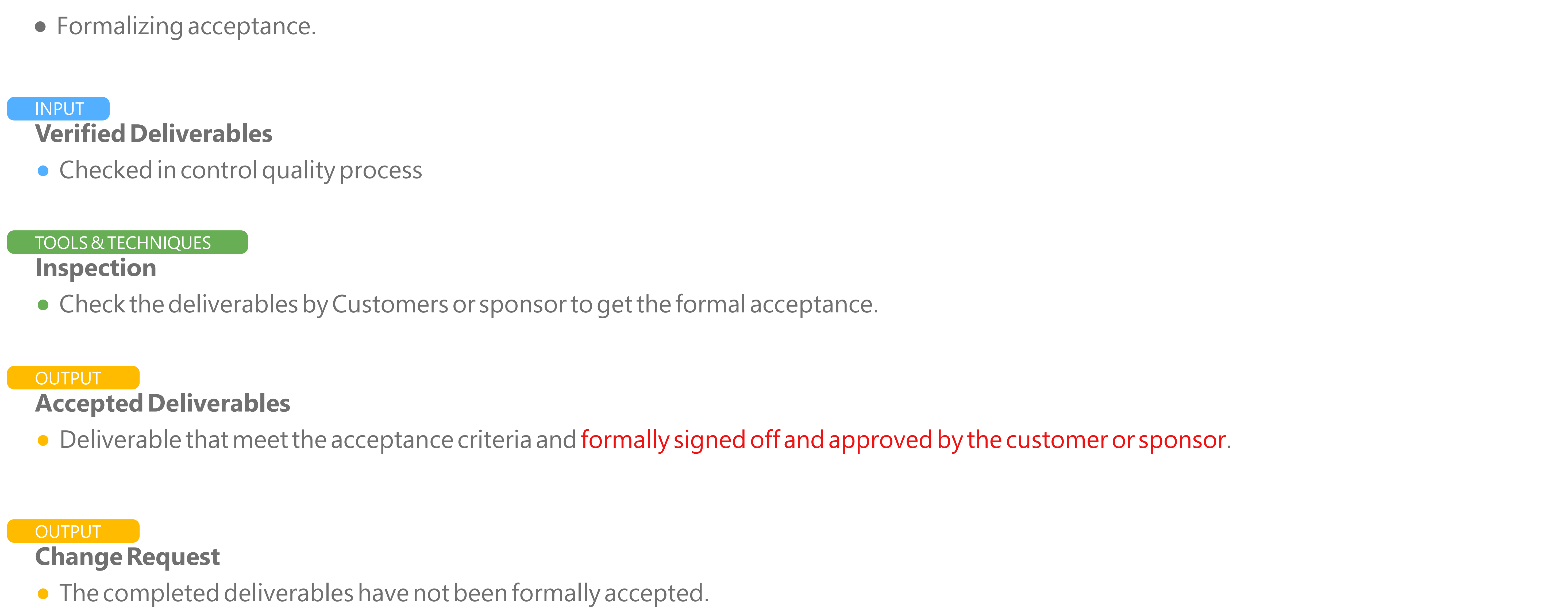
OUTPUT

**Scope Baseline**

- **Approved version of scope statement.**
- Change only through CCB.
- **Basis for comparison.**
- Part of Project management plan.
- Contain: Scope Statement.
- Contain: WBS (Hierarchical decomposition of the total scope).
- Contain: WBS Dictionary (detailed deliverable activity, scheduling information).



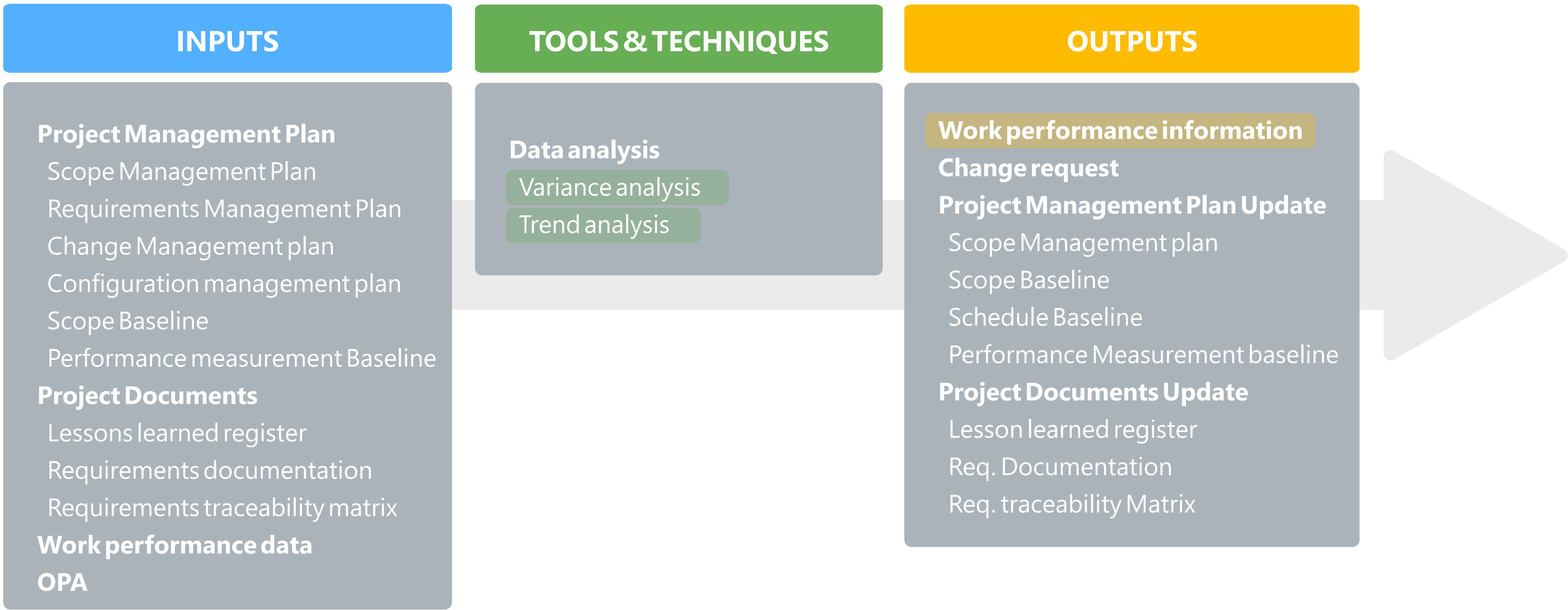
# Validate Scope





Monitor & Control Process

# Control Scope



- Monitoring status of project scope, and managing changes to the scope baseline.
- Benefit is to maintain scope baseline
- **Gold plating**: Giving extra features for free.
- **Scope Creep**: Uncontrolled expansion to product or project scope without adjustments to time cost and resources.

TOOLS & TECHNIQUES

**Variance Analysis**

- Compare the baseline to the actual results.
- If the variance is within the threshold amount or if corrective or preventive actions is appropriate.

TOOLS & TECHNIQUES

**Trend Analysis**

- Project performance **over time**, to determine if it is improving or not.

OUTPUT

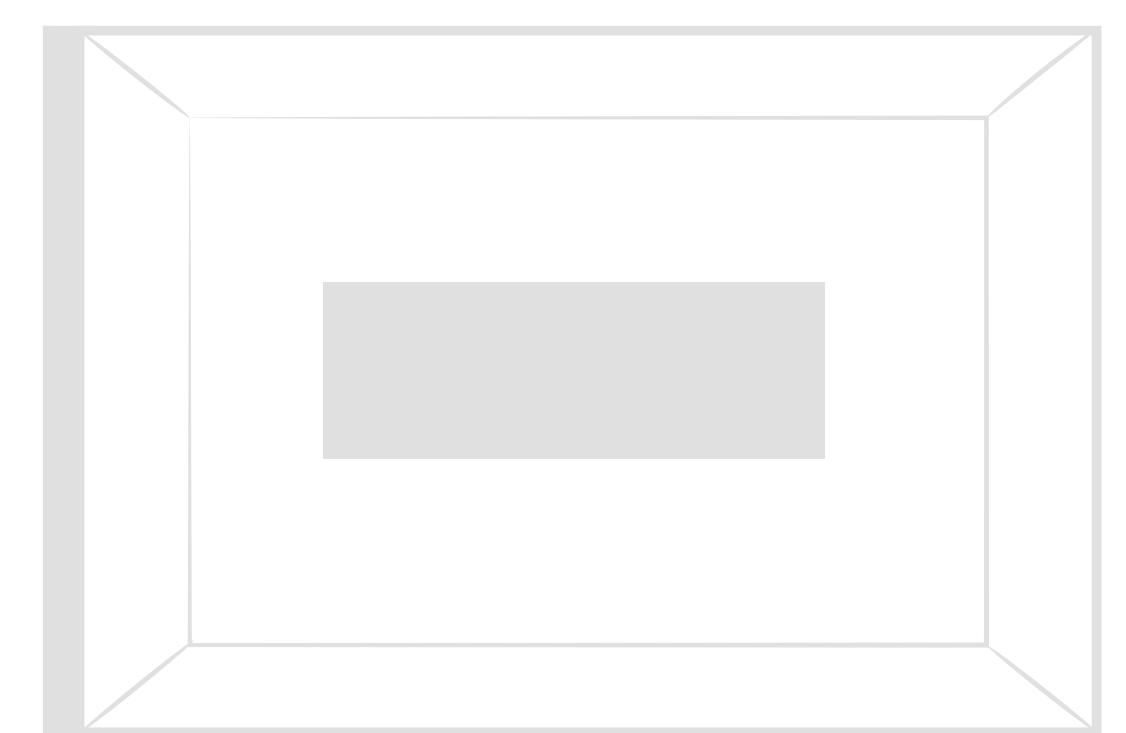
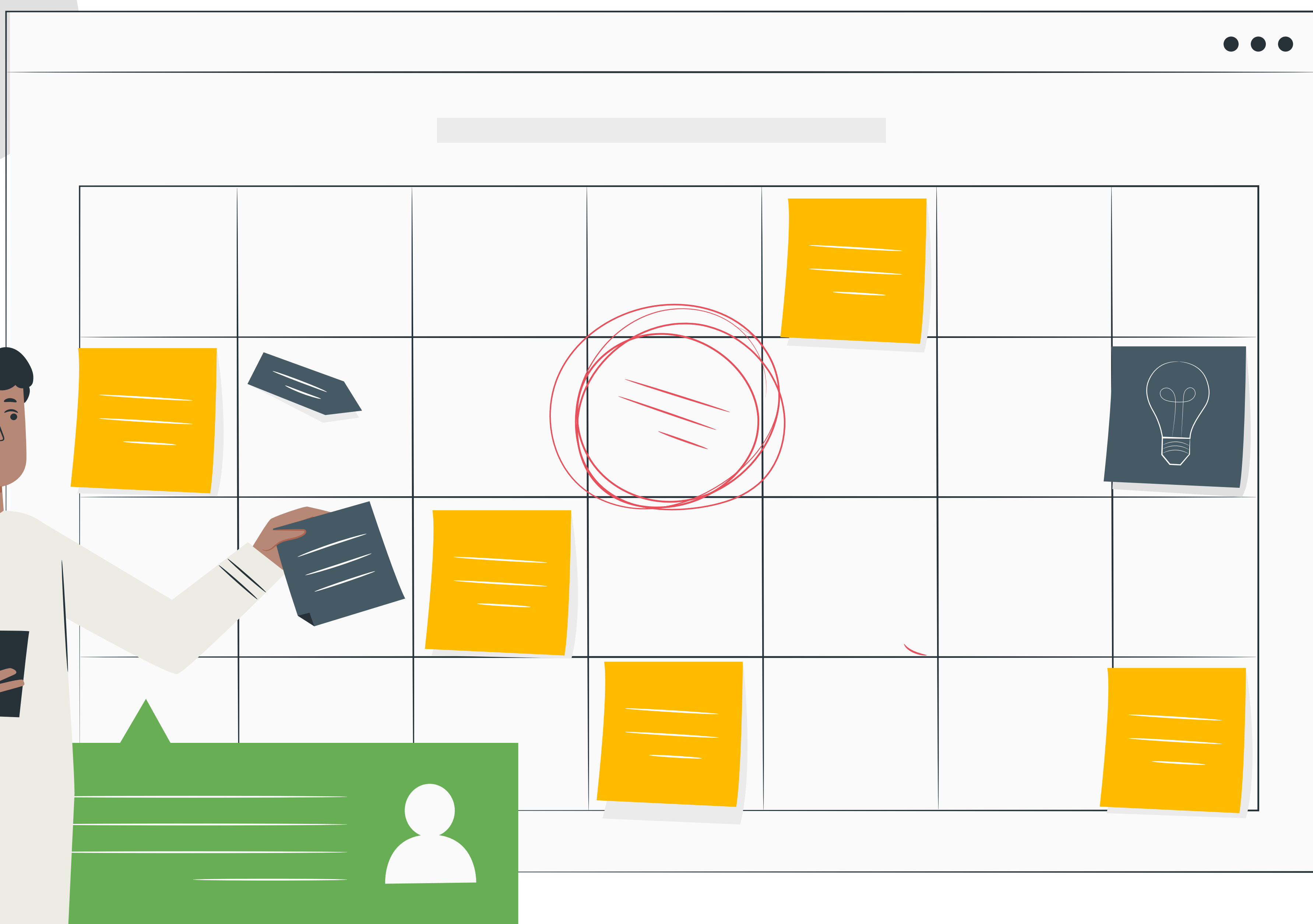
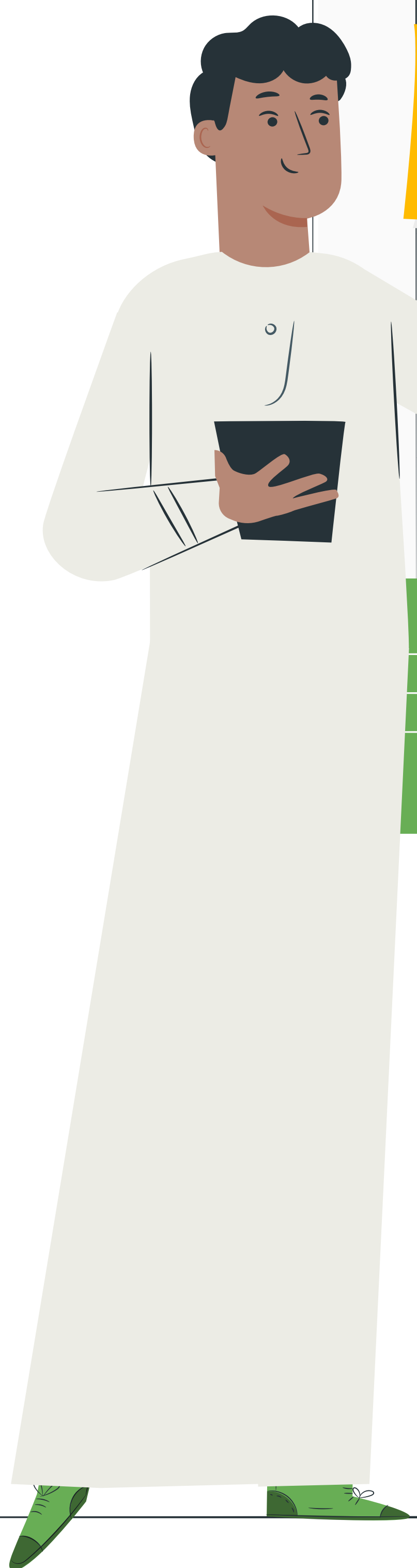
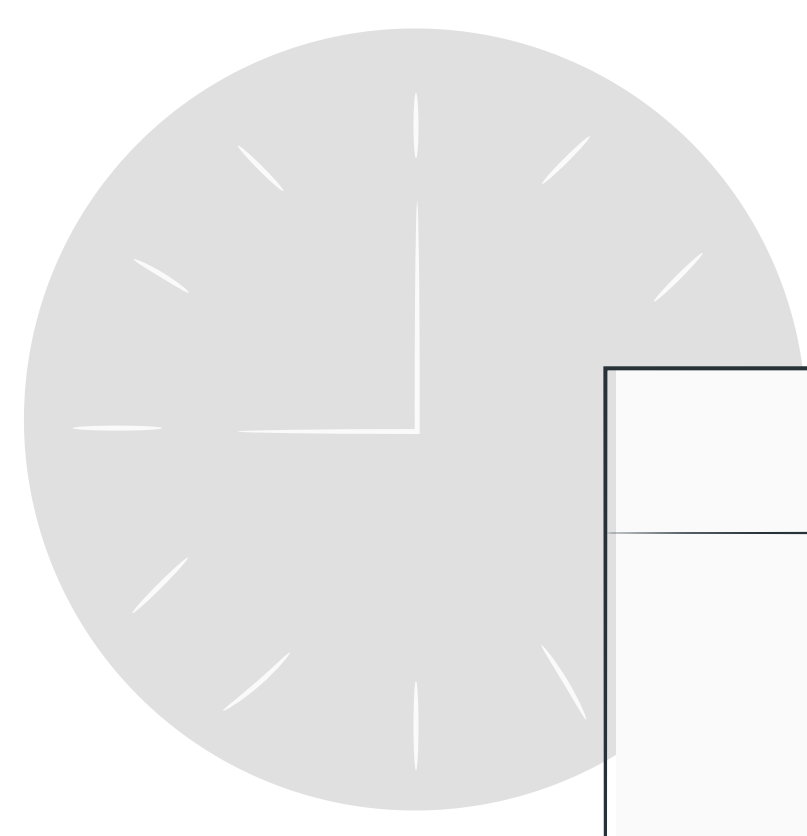
**Work Performance Information**

- Including Categories and analysis for all project measurements from work performance data.

# إدارة الجدولة

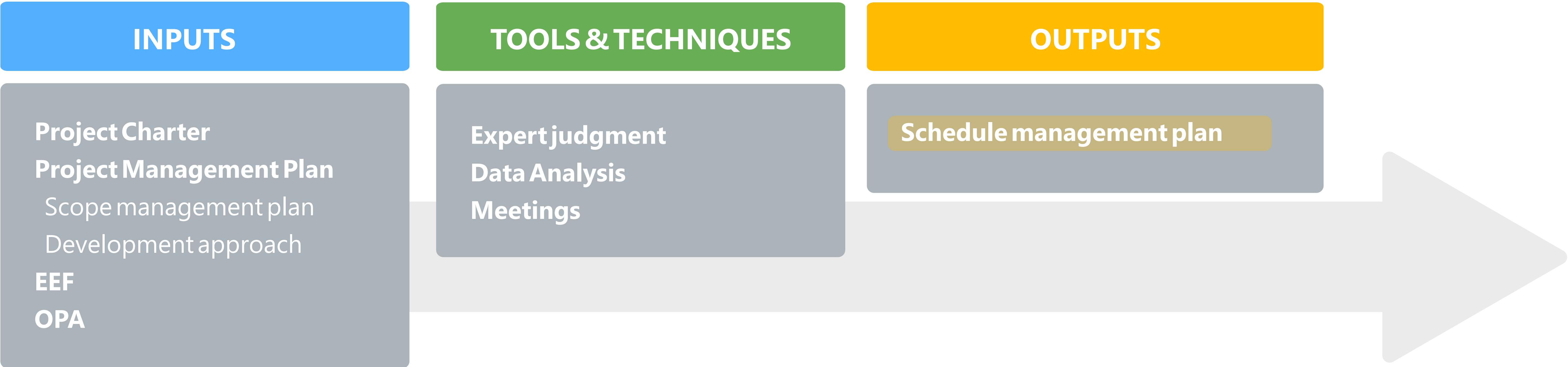
## Schedule Management

PMBOK 6<sup>th</sup> Ed. (173 – 230)



Planning Process

# Plan Schedule Management



- How to plan manage and control schedule.

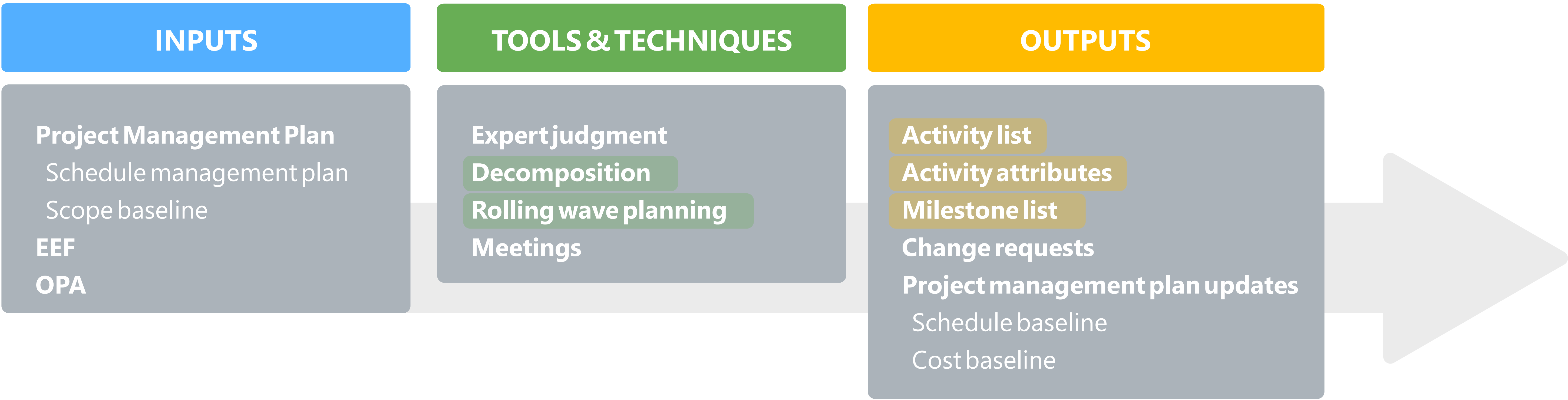
OUTPUT

**Schedule management plan**

- Level of accuracy
- Units of measure
- Control thresholds
- Rules of performance measurement ch7
- Reporting formats
- Project schedule model development

Planning Process

# Define Activities



- Identifying and documenting specific actions.
- To decomposes work packages into schedule activities.

TOOLS & TECHNIQUES

**Decomposition**

- The work packages within EBS is decomposed to produce activities.

TOOLS & TECHNIQUES

**Rolling Wave Planning**

- Iterative / progressive elaboration.
- **Near** term is planned **in details**.
- **Future** term is planned at **higher level**.

OUTPUT

**Activity list**

- Includes the schedule activities required on the project.

OUTPUT

**Activity attributes**

- More details for activities list & its components.

OUTPUT

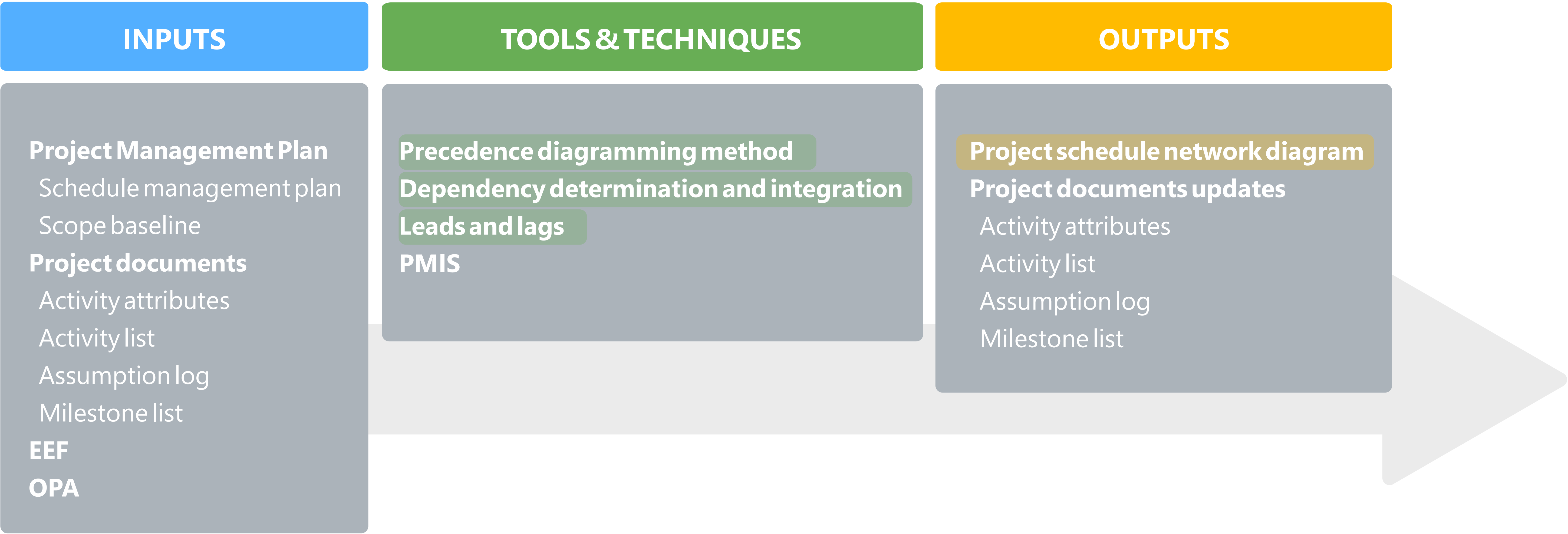
**Milestone list**

- Significant point or event in a project.
- zero duration.



Planning Process

# Sequence Activities



- Identifying and documenting relationship among the project activities.
- Defines the logical sequence of work.

TOOLS & TECHNIQUES

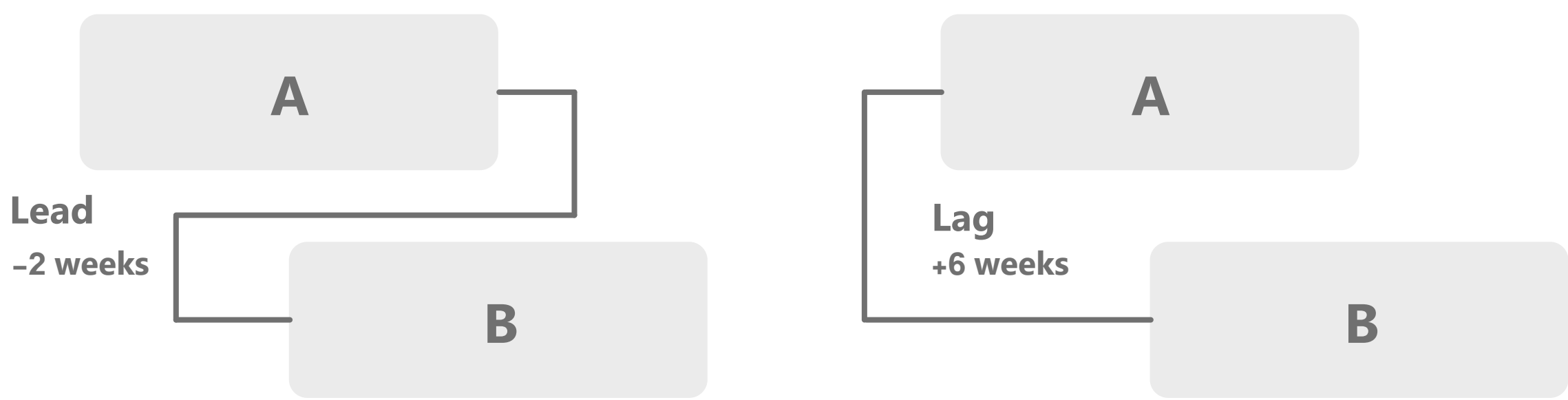
**Precedence diagramming method (PDM)**

- Constructing a schedule model.
- Represented by node.
- **Predecessor activity**: activities that comes before a dependent activity.
- **Successor activity**: activities that comes after another activity.
- (FS) Finish to Start: Most Common
- (FF) Finish to Finish
- (SS) Start to Start
- (SF) Start to Finish: Least Common

TOOLS & TECHNIQUES

**leads and lags**

- Lead = **Overlap** (-).
- Lag = **Delay** (+) waiting time between activities.



TOOLS & TECHNIQUES

**Dependency Determination**

**Mandatory**

- Legally or contractually required
- Inherent in the nature of the work.
- Hard logic
- Prototype it before it can be tested.

**Discretionary**

- Preferred logic
- Soft logic
- Best practices.

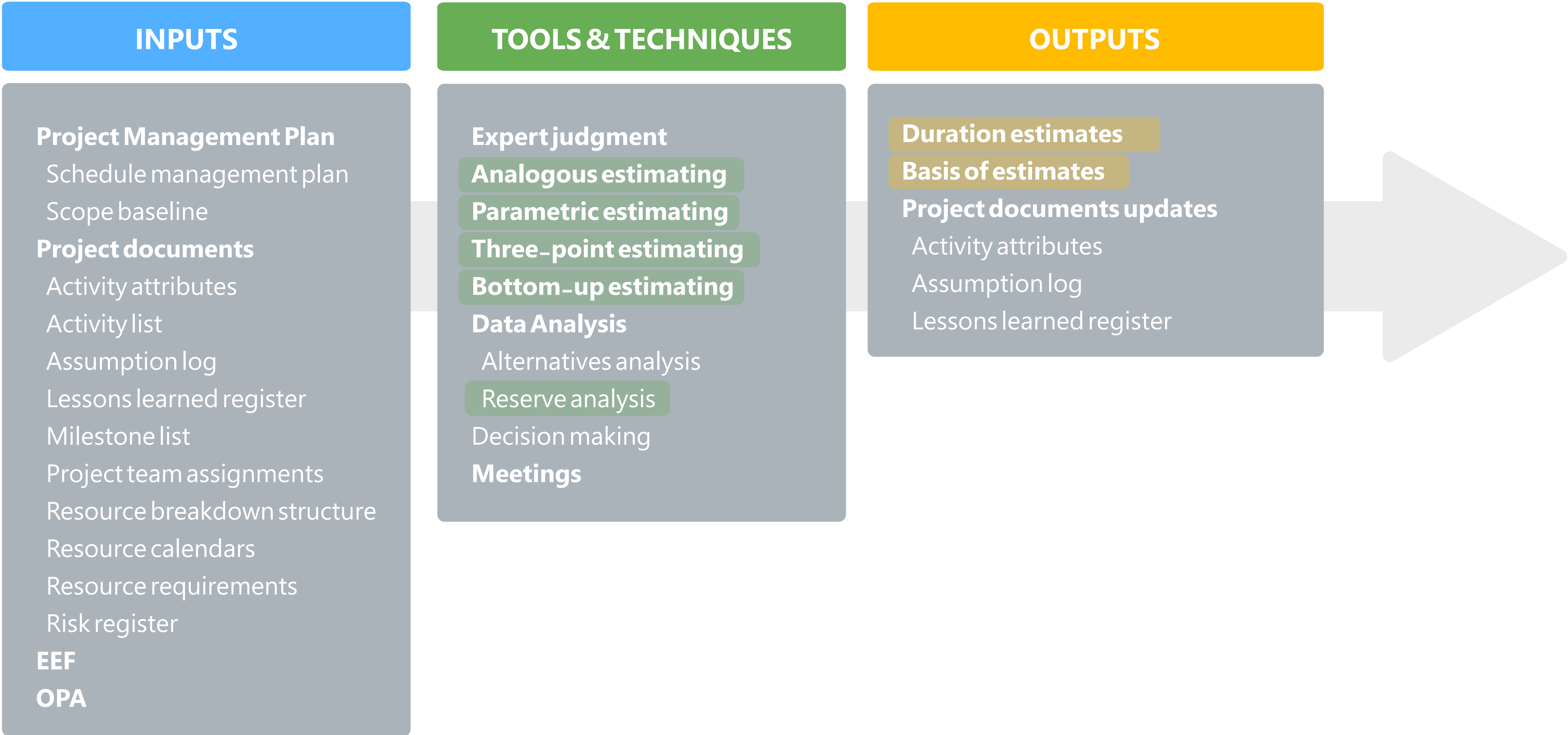
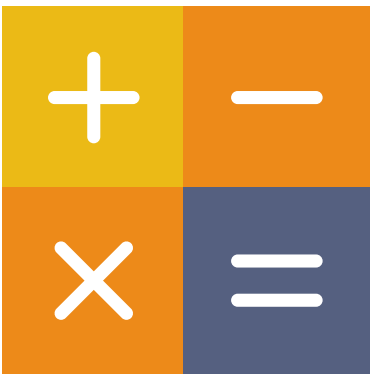
**External**

- Relationship between project activities & non-project activities.
- Outside the project team control

**Internal**

- Relationship between project activities.
- Inside the project team control

# Estimate Activity Duration



- Estimating the number or work periods needed to complete individual activities with estimated resources
- The amount of time each activity will take to complete.

TOOLS & TECHNIQUES

### Analogues Estimating

- **Historical Data** from **similar project**.
- **Fast Estimating**, **low accuracy**, low cost.
- Used in case limited information.

TOOLS & TECHNIQUES

### Parametric Estimating

- **Historical Data + other variables**.

TOOLS & TECHNIQUES

### Bottom-up Estimating

- Aggregating the estimates of the lower level components of **WBS**.
- **Highest accuracy**

TOOLS & TECHNIQUES

### Three-point Estimating

- Uncertainty & Risk.
- Triangle distribution formula.
- **tE = (tO + tM + tP) / 3**
- tO = Optimistic, best case senario.
- tM = Most likely.
- tP = Pessimistic, worst case senario.

TOOLS & TECHNIQUES

### Reserve Analysis

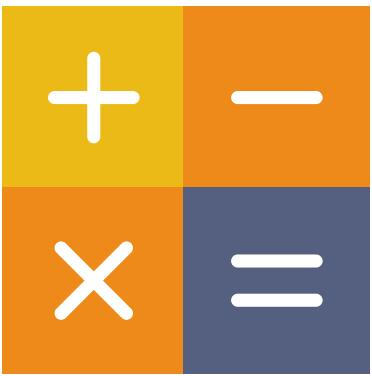
Contingency Reserve

- Part of schedule Baseline.
- Under PM control.
- **Known / Unknown**.

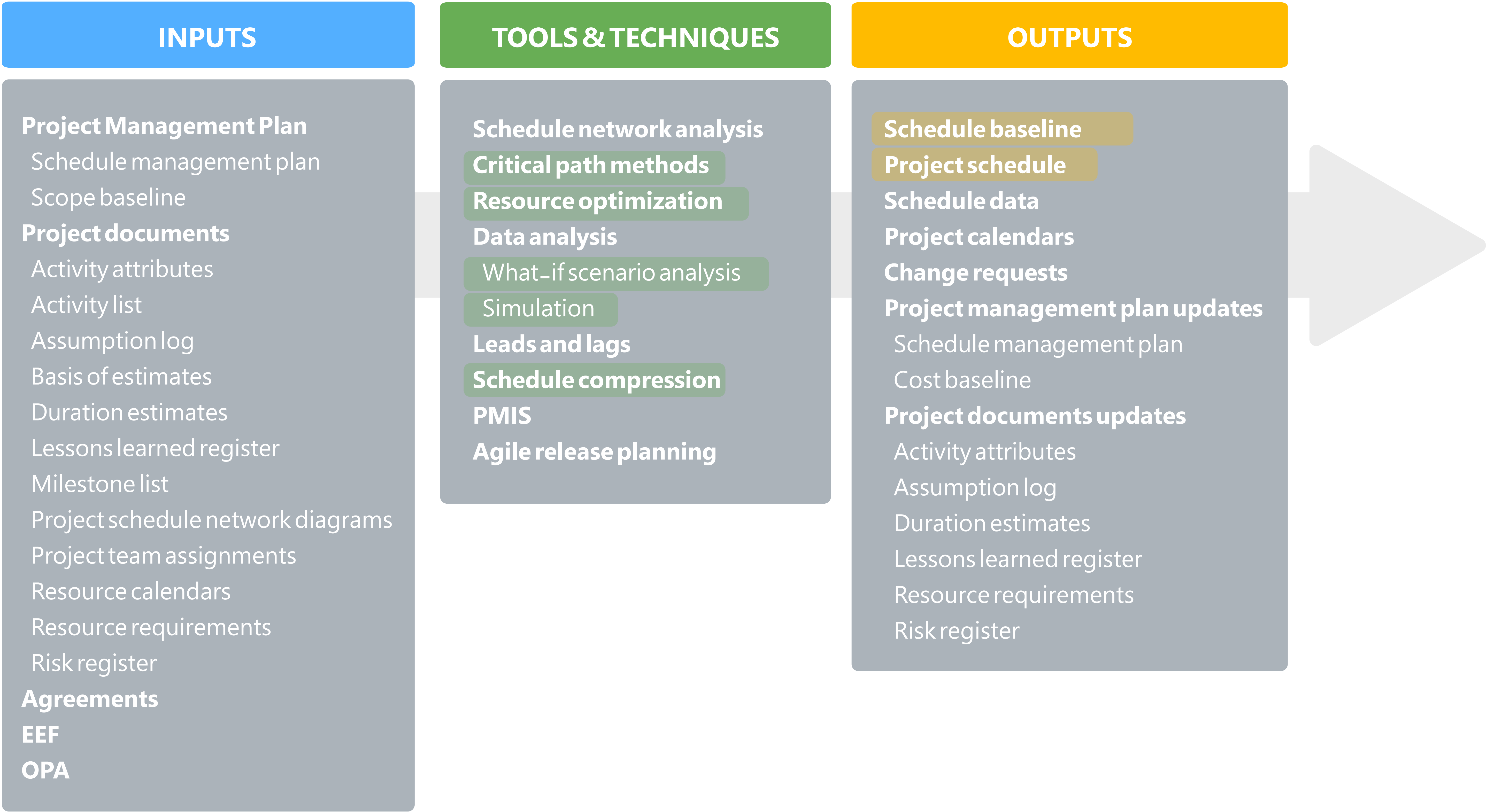
Management Reserve

- Not part of Schedule Baseline.
- Under Top Management Control.
- **Unknown / unknown**.
- Unforeseen works.
- CCB must be applied.





# Develop Schedule



TOOLS & TECHNIQUES

Critical Path Method

- Estimating the **minimum project duration**.
- **Longest path**.
- **Zero** flexibility / floating.
- Without any resource’s limitations.

(TF) Total Float

- Delaying in activity **without delaying** the **project schedule**.
- Zero on critical path.
- $TF = (LS - ES) = (LF - EF)$

(FF) Free Float

- Delaying in activity **without delaying** the **ES of successor**.
- $FF = (ES_{\text{successor}} - EF_{\text{presuccessor}})$
- $FF = (LS_{\text{successor}} - LF_{\text{presuccessor}})$

TOOLS & TECHNIQUES

Resource Optimization

Resource leveling

- Adjust start & finish dates based on resource availability & constraints.
- Increase project duration.
- May change the critical path.

Resource Smoothing

- Adjust start & finish dates which have floating only.
- no changes to project schedule nor critical path

TOOLS & TECHNIQUES

Schedule compression

Crashing

- Adding resources
- Increase in cost
- Works on critical path activities.

Fast Tracking

- Work in parallel.
- No increase in cost.
- May cause Re-work.
- Increase risk & uncertainty.



تأكد قبل الإجابة على السؤال من القيود التي وضعها ممول المشروع أو إدارة الشركة، فإذا ذكر أنه لا يستطيع زيادة ميزانية المشروع أو زيادة العاملين فاستبعد فوراً خيار الـ **Crashing**.

وفي بعض الأوقات يزودك السؤال بتقارير أداء المشروع **CPI** فإن كان هناك فائض في الميزانية والمشروع متأخر عن تاريخه المحدد فخير الـ **Crashing** هو الأنسب.

OUTPUT

Schedule Baseline

- Approved version of schedule.
- Changed through formal CCB.
- Basis of comparison.

OUTPUT

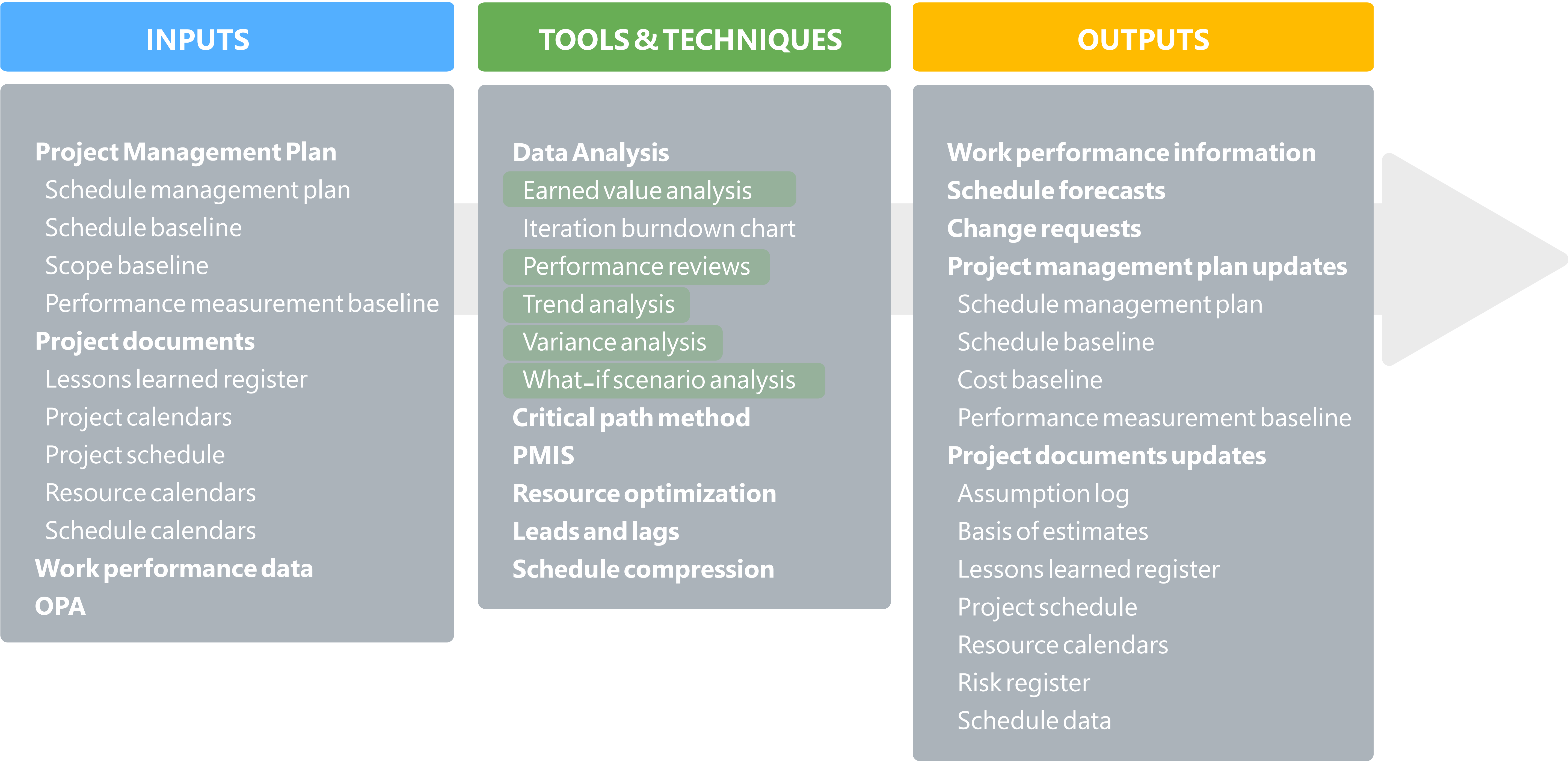
Project Schedule

- **Milestone Chart** = for **Senior Management** (low detailed).
- **Bar Chart** = for team (high detailed) (**Gantt Chart**).



Monitor & Control Process

# Control Schedule



- Monitoring the status of the project to update project schedule & manage changes to the schedule baseline.
- Maintaining schedule baseline.

TOOLS & TECHNIQUES

**Earned Value analysis**

- Evaluate the variation to schedule Baseline using SV & SPI.

TOOLS & TECHNIQUES

**Performance Review**

- Measure & compare schedule performance vs schedule baseline.

TOOLS & TECHNIQUES

**Trend Analysis**

- Examines project performance **over time** to check if performance is improving or not.

TOOLS & TECHNIQUES

**Variance Analysis**

- **Compare the baseline to the actual results.**
- To determine if the variance is within the threshold amount or if corrective or preventive actions is appropriate.

TOOLS & TECHNIQUES

**What-if scenario analysis**

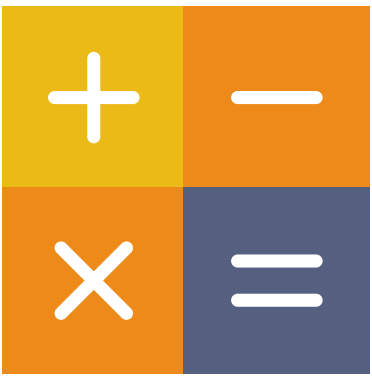
- Process of evaluating **scenarios** to predict their effect, positive or negative on project objectives.
- Example: Strike, Material Delivery, Change in Permit.

# إدارة التكاليف

## Cost Management

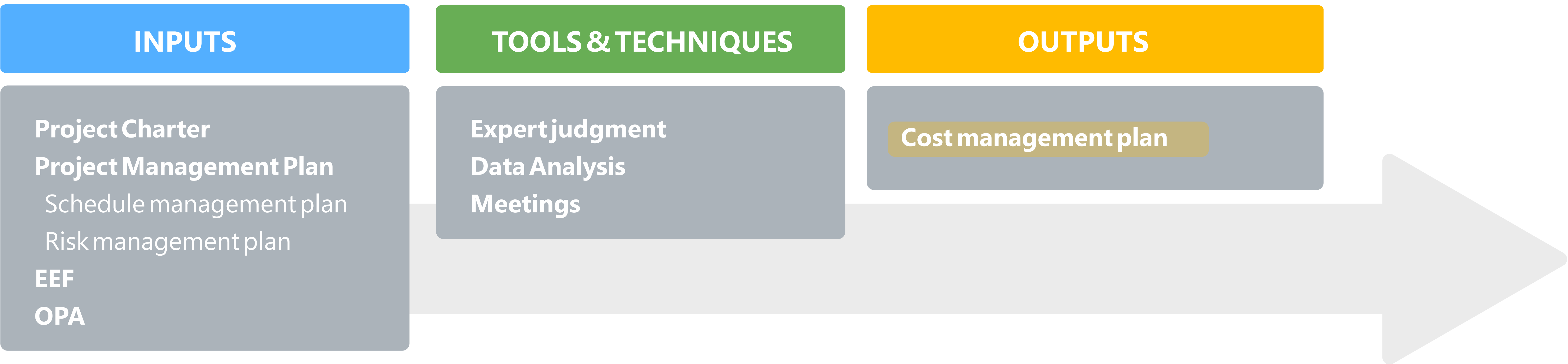
PMBOK 6<sup>th</sup> Ed. (231–270)





Planning Process

# Plan Cost Management



- How the project cost will be managed.

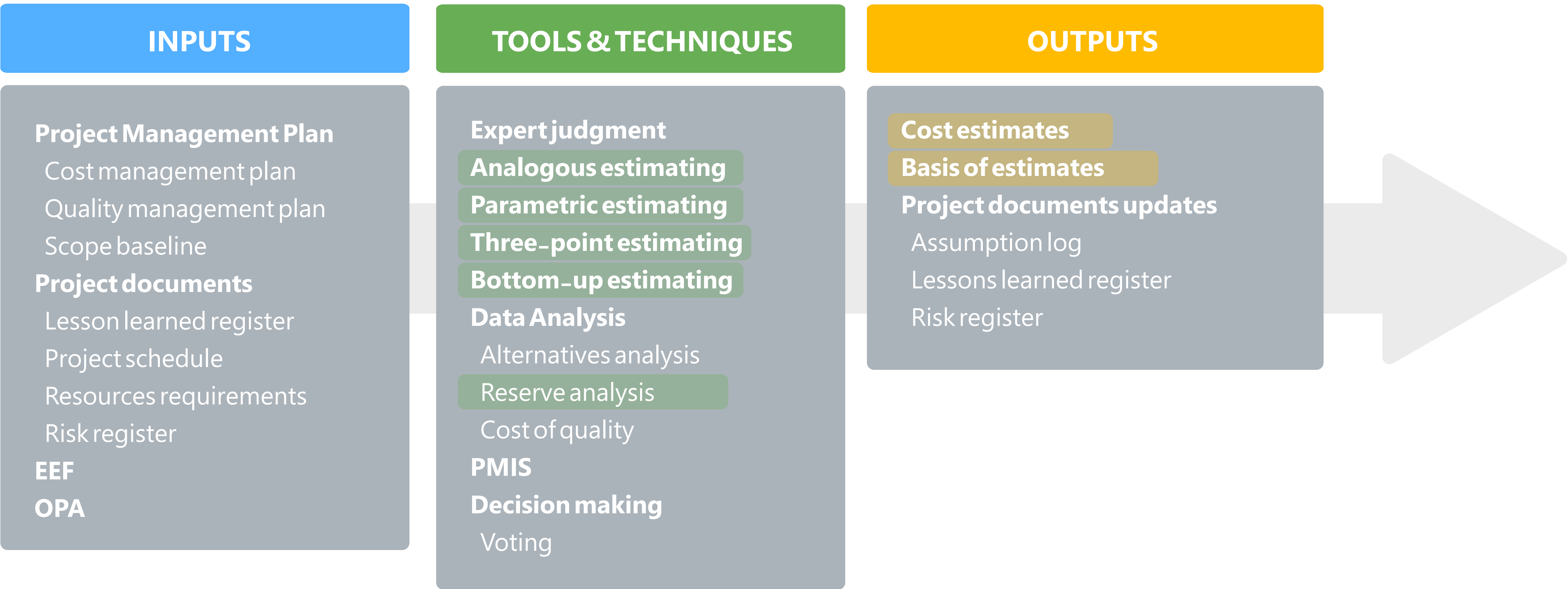
OUTPUT

**Schedule management plan**

- Level of accuracy.
- Units of measure.
- Control thresholds.
- Rules of performance measurement.
- Reporting formats.

Planning Process

# Estimate Cost



- Develop the approximation of cost.
- Determines the monetary resources required for the project.

TOOLS & TECHNIQUES

**Three-point estimating**

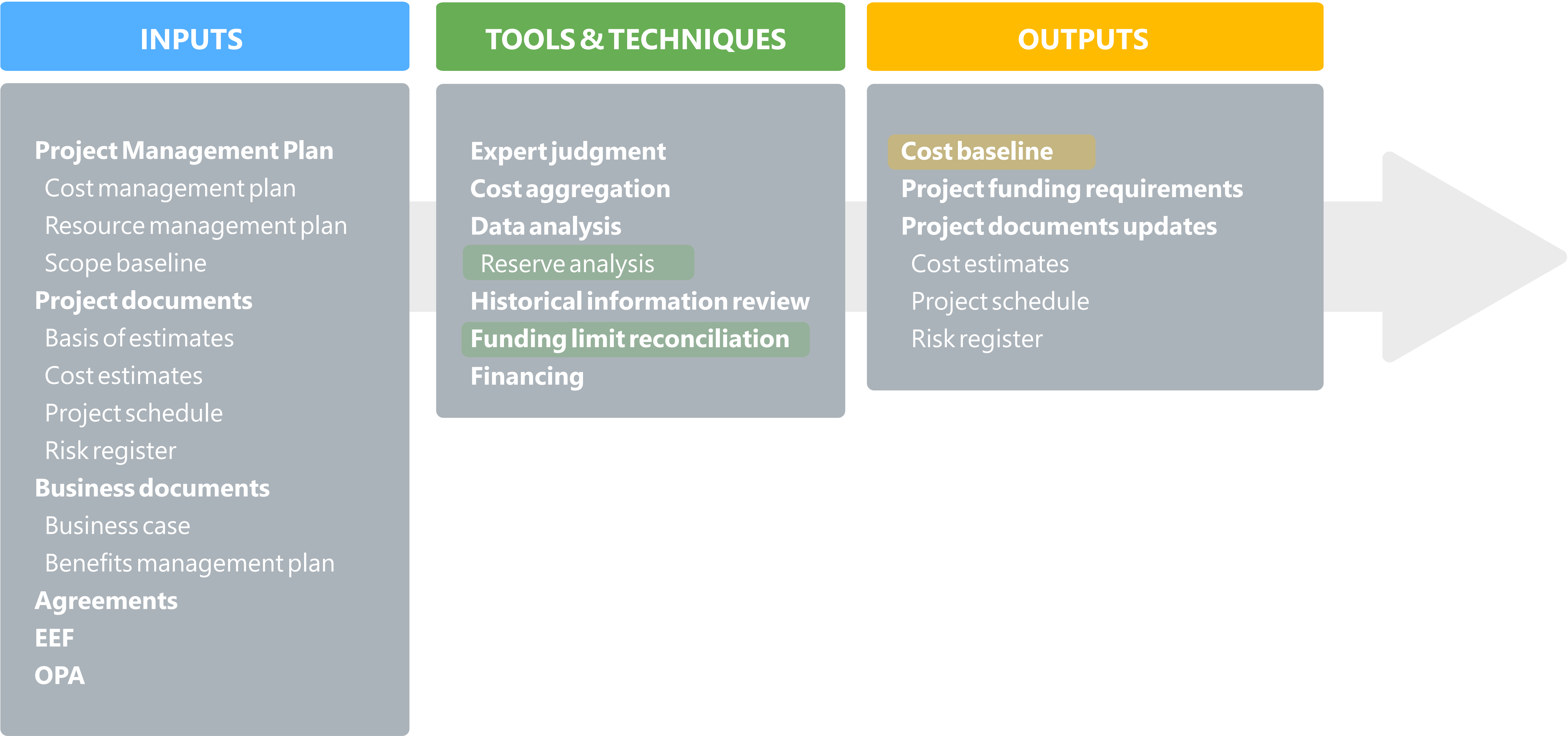
- **Tringle distribution formula (linear)** =  $cE = (cO + cM + cP) / 3$
- **Beta (Pert) (curve)** =  $cE = (cO + 4cM + cP) / 6$

في حال لم يذكر في السؤال أي معادلة  
مطلوب منك استخدامها فإننا نستخدم  
معادلة BETA لأنها أكثر دقة .





# Determine Budget



TOOLS & TECHNIQUES

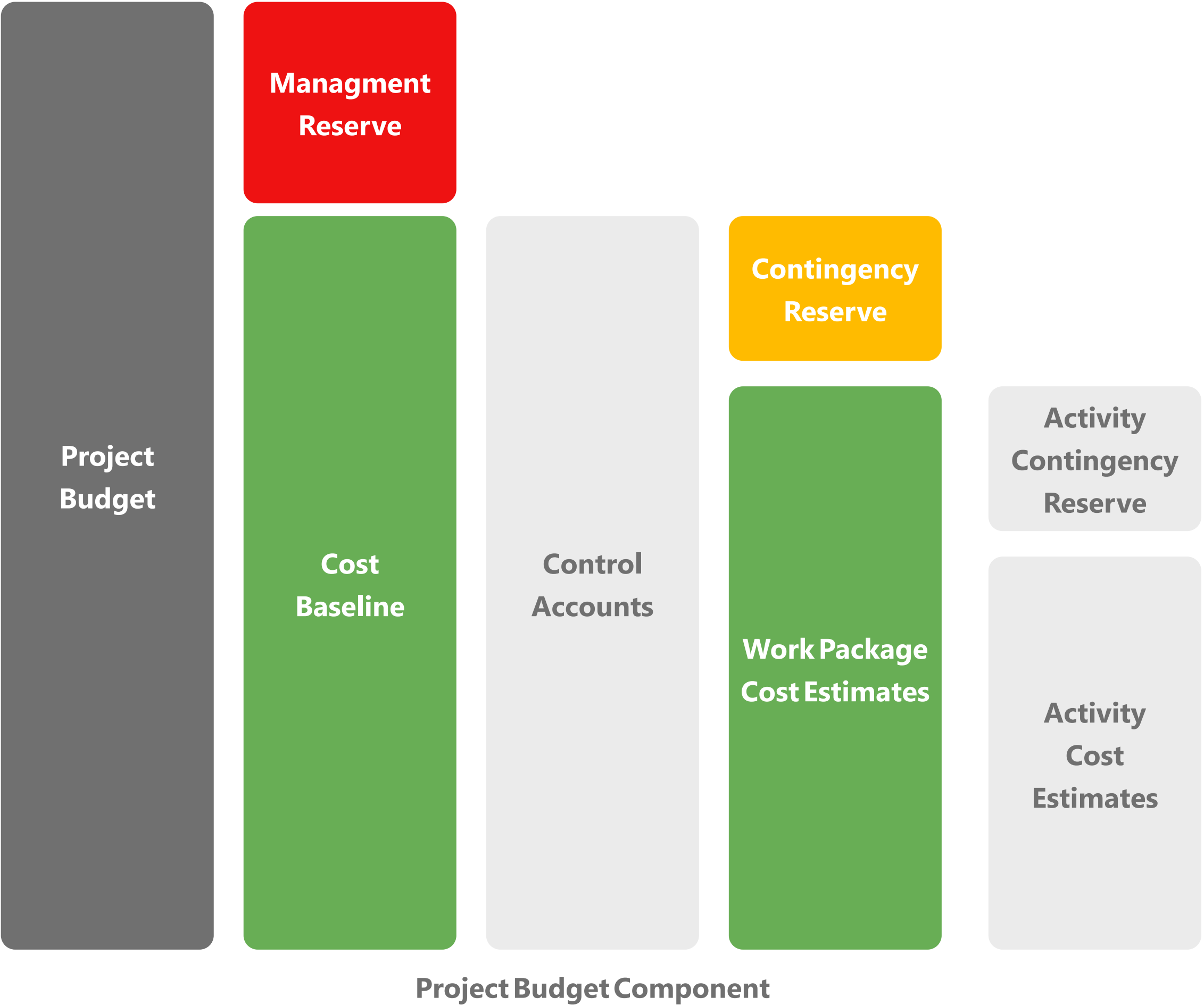
Funding Limit Reconciliation

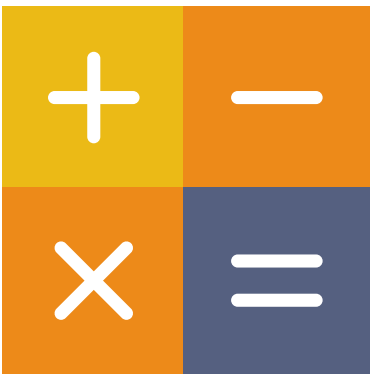
- Reschedule the project activities.

OUTPUT

Cost Baseline

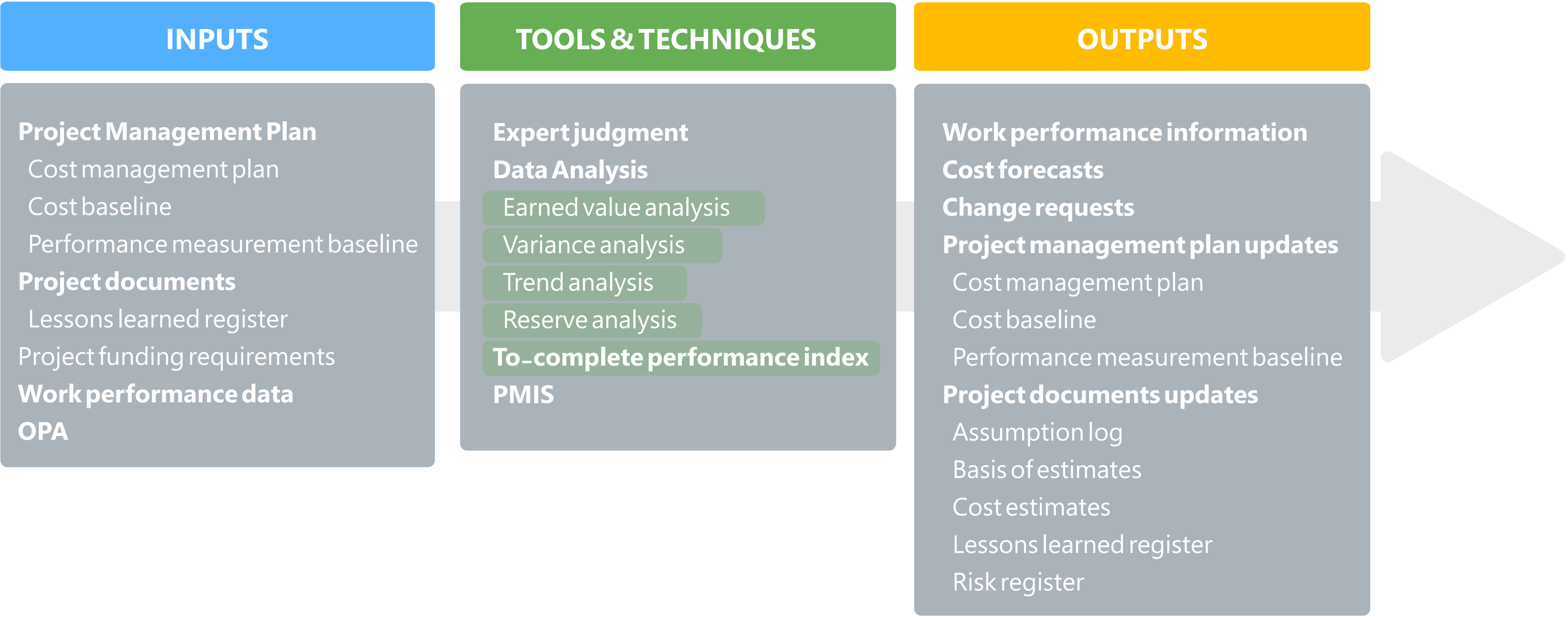
- Approved version of cost.
- Changed through formal change control procedures.
- Basis of comparison.





Monitor & Control Process

# Control Cost



TOOLS & TECHNIQUES

Earned Value analysis

- Evaluate the Variation to schedule & Cost baseline.
- **Planned Value (PV)** The value of the planned work to be completed at a point in time.
- **Earned Value (EV)** The Value of all the Completed Work (Earned) to a point in time.
- **Actual Cost (AC)** The Actual Cost of all the work completed at a point in time.

TOOLS & TECHNIQUES

Trend Analysis

- **EAC** = AC + (BAC – EV)  
If future work will be accomplished at the planned rate.
- **EAC** = BAC / CPI  
If CPI is expected to be the same for the remainder or the project.
- **EAC** = AC + [(BAC – EV) / (SPI \* CPI)]  
If both CPI & SPI influence the remaining work.
- **EAC** = AC + Bottom-up ETC  
If initial plan is no longer valid, new estimation is required.

TOOLS & TECHNIQUES

Estimate to completion (ETC)

- **ETC** = EAC – AC

TOOLS & TECHNIQUES

To Complete Performance Index (TCPI)

- **TCPI** = (BAC – EV) / (BAC – AC)
- A measure of the cost performance that must be achieved with the remaining resources.
- Expressed as the ratio of the cost to finish the outstanding work to the budget available.
- >1 Harder to complete (bad)
- <1 Easier to complete (good)

TOOLS & TECHNIQUES

Variance At Completion (VAC)

- **VAC** = BAC – EAC
- + under planned cost (good)
- – Over planned Cost (bad)
- 0 on planned cost

TOOLS & TECHNIQUES

Variance Analysis

Schedule Variance

- **SV** = EV – PV
- + Ahead of Schedule
- – behind Schedule
- 0 On Schedule

Cost Variance

- **CV** = EV – AC
- + Under Budget
- – Over budget
- 0 On budget

Schedule Performance Index

- **SPI** = EV / PV
- >1 Ahead of Schedule
- <1 behind Schedule
- 1 On schedule

Cost Performance Index

- **CPI** = EV / AC
- >1 Under of budget
- <1 Over Budget
- 1 On Budget

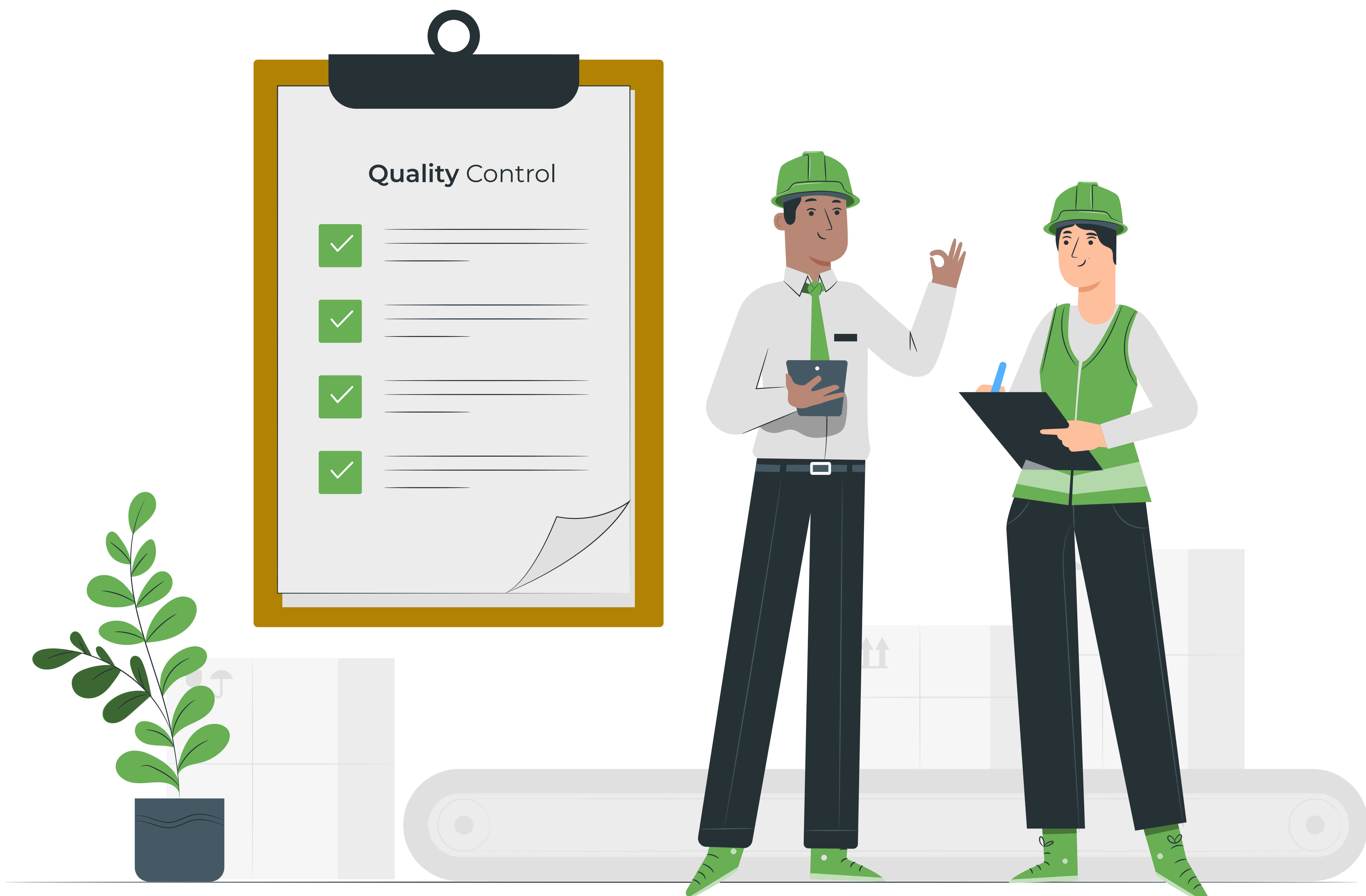
إذا كان الرقم موجب (+) أو أكبر من واحد (>1) فالمشروع في حالة جيدة. والعكس في قانون TCPI .



# إدارة الجودة

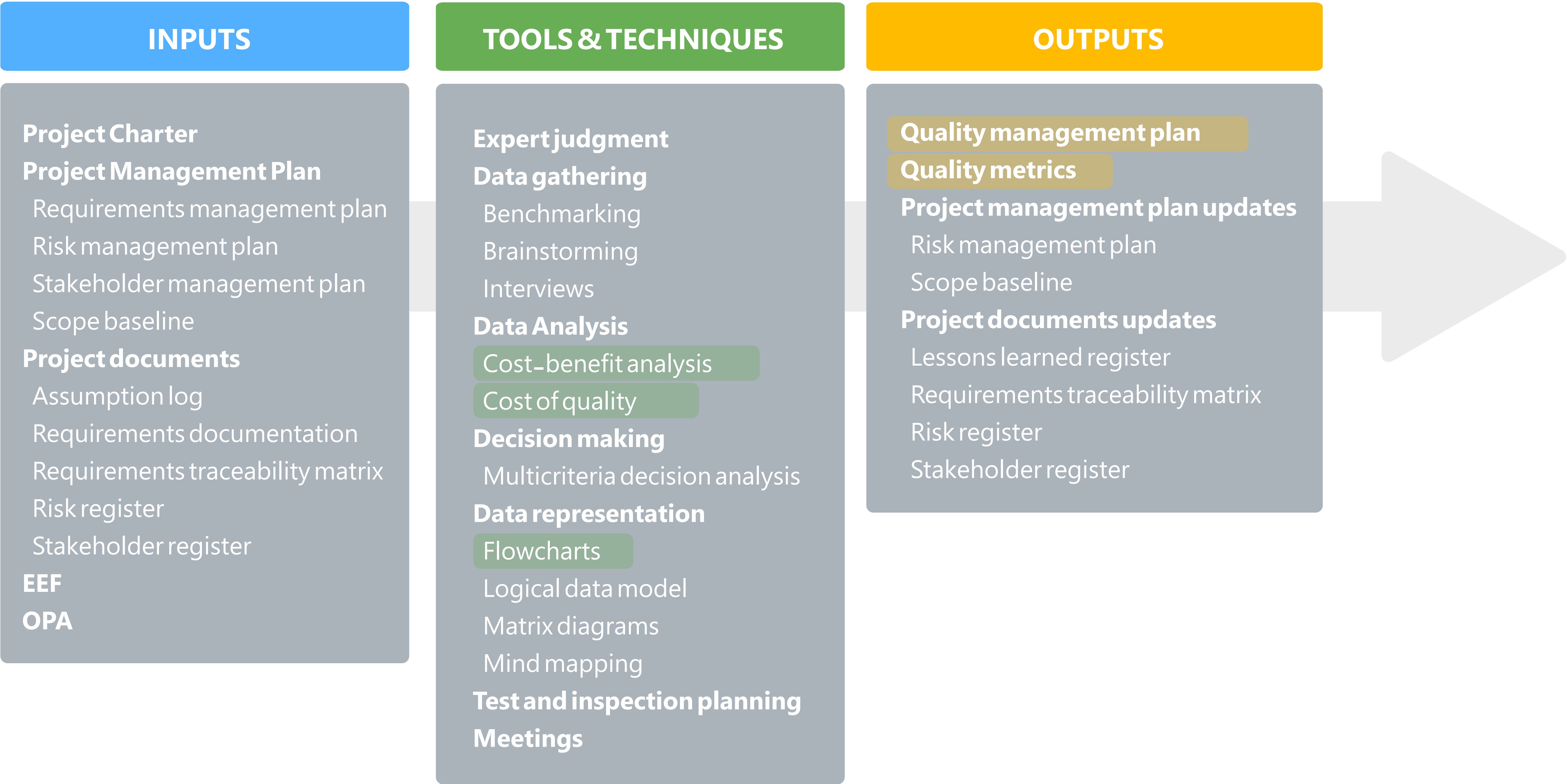
## Quality Management

PMBOK 6<sup>th</sup> Ed. (271–306)





# Plan Quality Management



TOOLS & TECHNIQUES

Cost benefit analysis

- Used to estimate the strengths and weakness to determine the best alternatives.
- Comparing the quality cost to the expected benefits.
- Increase productivity & SH satisfactions
- Reduce Re-work & Cost.

TOOLS & TECHNIQUES

Flow Chart

- **Process map.**
- Display the **sequence of steps.**
- Useful in understating and estimating Quality cost.
- SIPOC model (supplier , inputs, process, outputs, customers).

OUTPUT

Quality Management plan

- Quality standards.
- Quality objectives.
- Quality roles and responsibilities.
- Project deliverables.
- Quality tools.

OUTPUT

Quality Metrics.

- How the control quality process will verify compliance.
- Ex: CPI , Failure rate, N. of defects, customer satisfaction rate

TOOLS & TECHNIQUES

Cost of Quality

Cost of Conformance

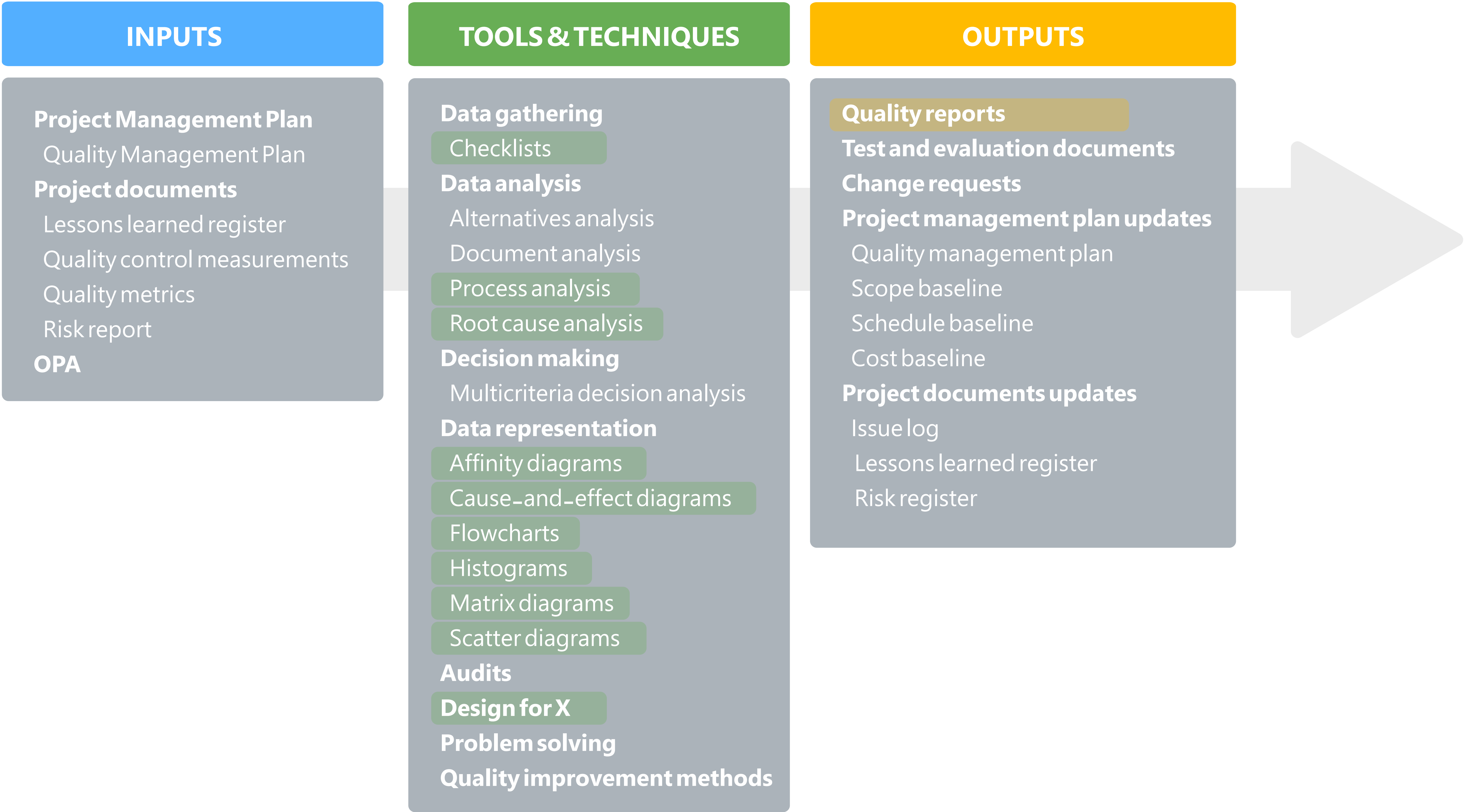
- **During the project to avoid failure.**
- **Prevention costs**
  - Training, Equipment
- **Appraisal Cost**
  - Testing , inspections

Cost of Non-Conformance

- **During & after project because of failure.**
- **Internal**
  - Rework - Scrap
- **External**
  - Liabilities, Warranty , Business lost.

Planning Process

# Manage Quality



- Increase the probability of meeting the quality objectives.
- Manage quality data and results from the control quality process.
- To reflect the overall quality status of the project to the stakeholders.

TOOLS & TECHNIQUES  
**Alternative analysis**  
• Evaluate options

TOOLS & TECHNIQUES  
**Document analysis**  
• Analyze different documents.

TOOLS & TECHNIQUES  
**Flow charts**  
• Series of steps that lead to a defect.

TOOLS & TECHNIQUES  
**Matrix diagrams**  
• Strength of relationships.

TOOLS & TECHNIQUES  
**Audits**  
• Process, policies, procedures.  
• Usually external team.

TOOLS & TECHNIQUES  
**histograms**  
• Show number of defects.  
• Show ranking of the cause of defects.  
• Numerical data

TOOLS & TECHNIQUES  
**Root cause analysis (RCA)**  
• Analysis tool.  
• Reason that causes a variance.

TOOLS & TECHNIQUES  
**Cause and Effect Diagram**  
• Representation tool.  
• Fishbone, why-why, ishikawa.  
• Root cause.

TOOLS & TECHNIQUES  
**Process analysis**  
• Process improvements.  
• Non value added activities.

TOOLS & TECHNIQUES  
**Scatter Diagrams**  
• Relationship between two variables.

TOOLS & TECHNIQUES  
**Pareto**  
• No. of defect.  
• By frequency of occurring (from upper to lower).  
• (20-80) rule.

TOOLS & TECHNIQUES  
**Problem solving**  
• Defining the problem.  
• Root cause.  
• Generating solutions.  
• Choosing the best solutions.  
• Implementing the solutions.  
• Verifying effectiveness.

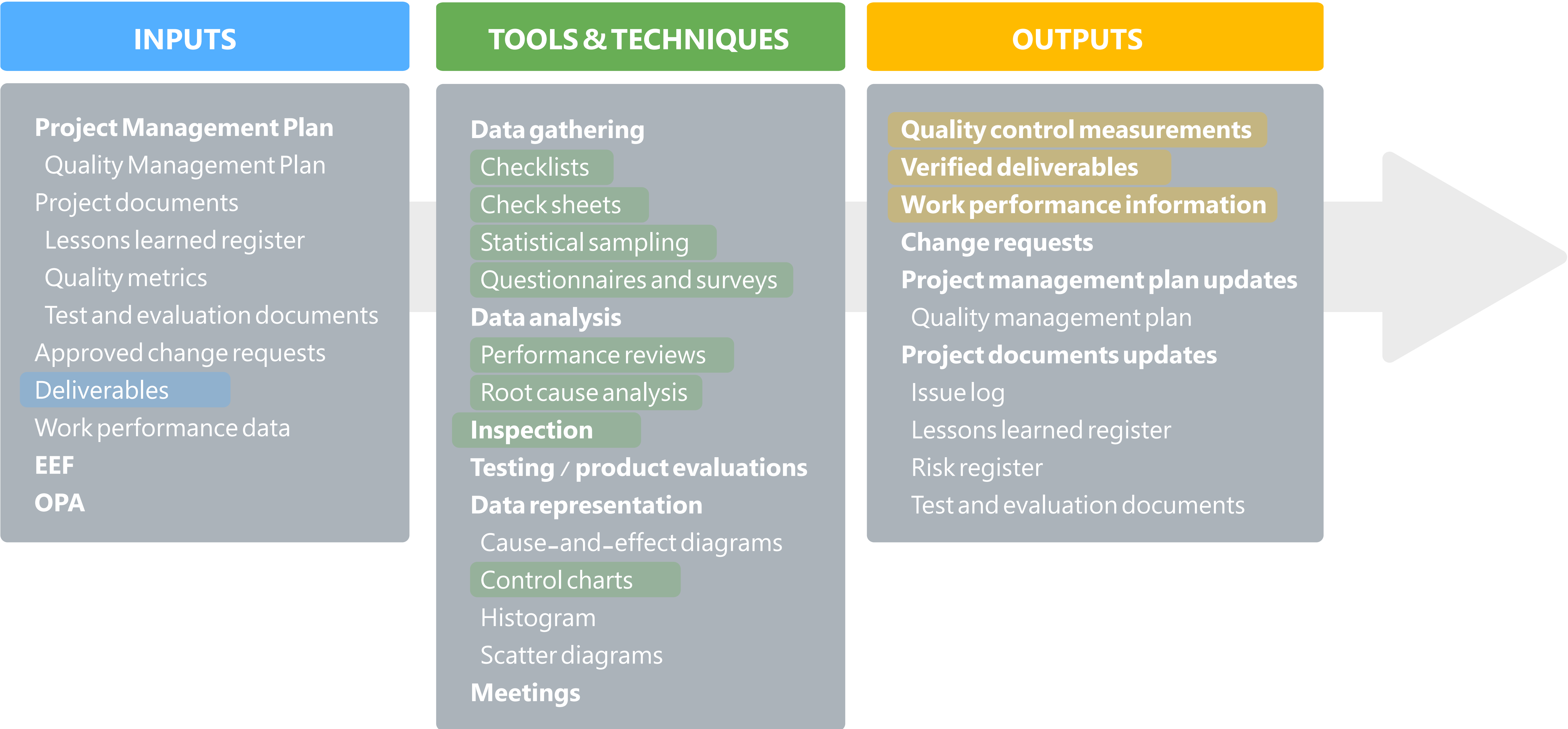
TOOLS & TECHNIQUES  
**design for X**  
• Improve product final characteristics.

OUTPUT  
**Quality reports**  
• Recommendations.  
• Quality control management.  
• Summary of finding from control quality process.



Planning Process

# Control Quality



- Monitoring and recording results.
- Assess performance and ensure the project outputs are completed.
- Verify the project deliverables.

TOOLS & TECHNIQUES

**Checklist**

- **Structured manner.**

TOOLS & TECHNIQUES

**Check sheet**

- **Tally sheet.**
- Useful data about a potential quality problem.

TOOLS & TECHNIQUES

**Statistical sampling**

- **Part of population.**
- **Fast.**
- Tight time.

TOOLS & TECHNIQUES

**Inspections**

- The **examination** of a deliverables / products.

TOOLS & TECHNIQUES

**Control chart**

- Determine if process is stable or not stable.
- One point is out control limit.
- 7 continuous points are between mean & control limit.

TOOLS & TECHNIQUES

**Performance review**

- **Compare** and analyze **quality metrics** against **actual results**.

OUTPUT

**Verified deliverables**

- **Determine the correctness of deliverables.**

تستلم في هذه العملية المدخل Deliverable الناتج من عملية Direct & Manage Project Work وتقوم في هذه المرحلة Control Quality أنت كمدير مشروع وفريق العمل بالتأكد من سلامة وصحة الـ Deliverable ليخرج بعد التأكد منه كـ Verified deliverables وينتقل كمدخل في مرحلة Validate Scope ليقوم المعنيين بمعايintها والتأكد منها .





# إدارة الموارد

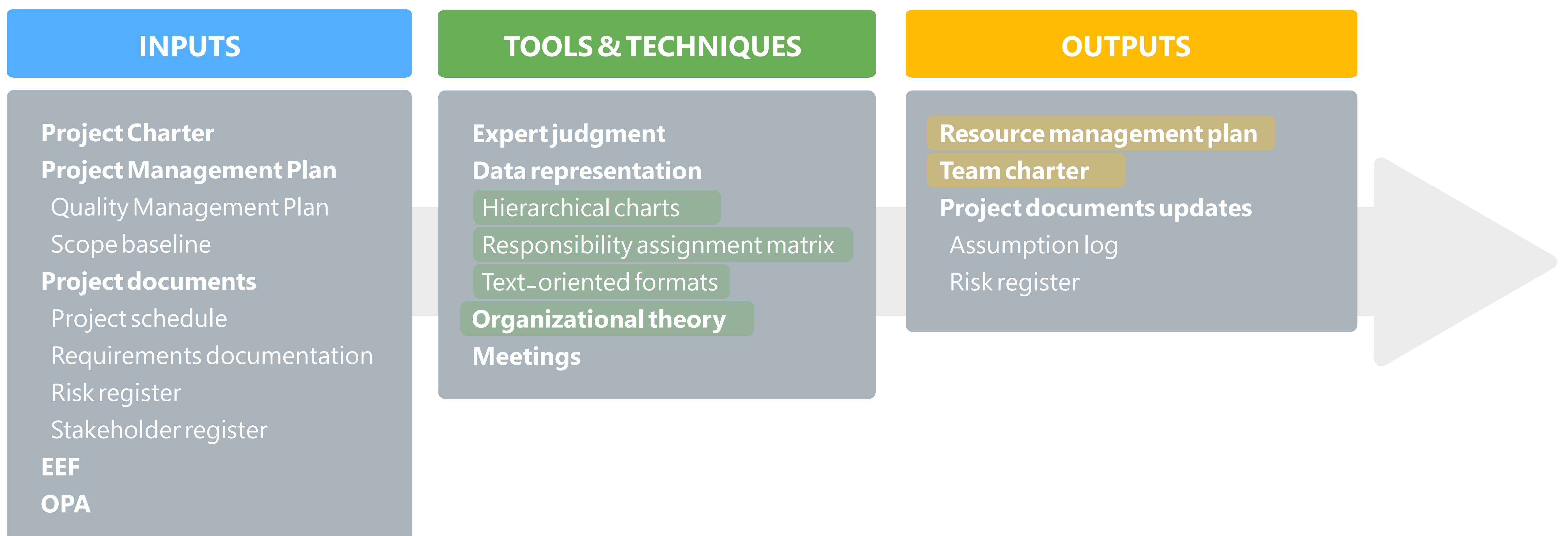
## Resource Management

PMBOK 6<sup>th</sup> Ed. (307 – 358)



## Planning Process

# Plan Resource Management



## TOOLS &amp; TECHNIQUES

**Responsibility assignment matrix (RAM)**

- Shows each **team member Activities** & Work Package & **Roles & Responsibilities**.
- R: Responsible
- A: Accountable
- C: Consult
- I: Inform

## TOOLS &amp; TECHNIQUES

**Text-oriented formant**

- **More details** for each team member responsibility and skills.

## TOOLS &amp; TECHNIQUES

**Organizational theory**

- Who will report to whom, who will solve the occurred problem.

## OUTPUT

**Resource management plan**

- Identification of resources.
- Acquiring resources.
- Training.
- Roles & Responsibility.

## OUTPUT

**Team Charter**

- Operating as a guideline for the team.
- Team value.
- Communication guideline.
- Decision making criteria and process.
- **Conflict resolution process.**
- **Meeting guideline.**
- Team agreement.

## TOOLS &amp; TECHNIQUES

**Hierarchical chart****Organization Breakdown structure (OBS)**

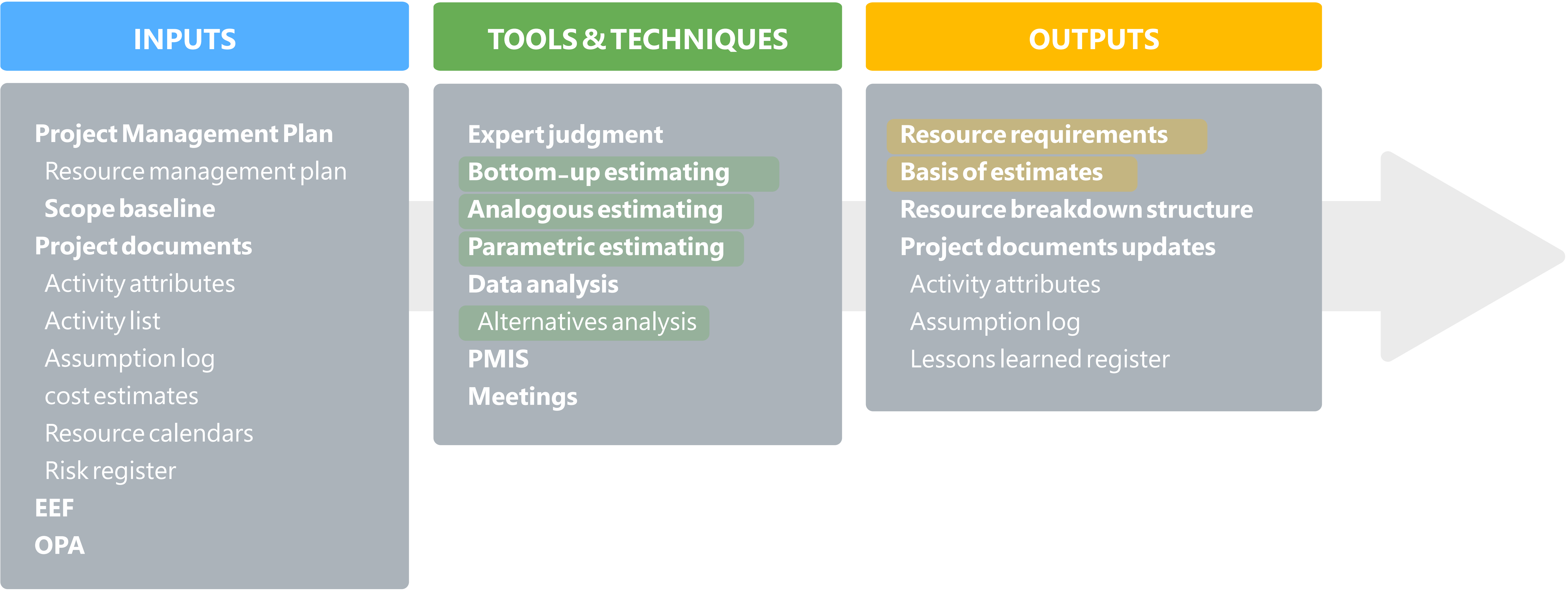
- Divide the organization as **department**.
- Ex. HR, Technical, Fin.
- Work package & responsibilities are under each department.

**Resource Breakdown Structure (RBS)**

- Divide project as **Categories**.
- Ex. Team, material, equipment.
- Details are under each category to be used later with WBS.



# Estimate Activity Resource



OUTPUT

**Resource requirement**

- Identify the types and quantities of resources required for each work package.

OUTPUT

**Basis of estimate**

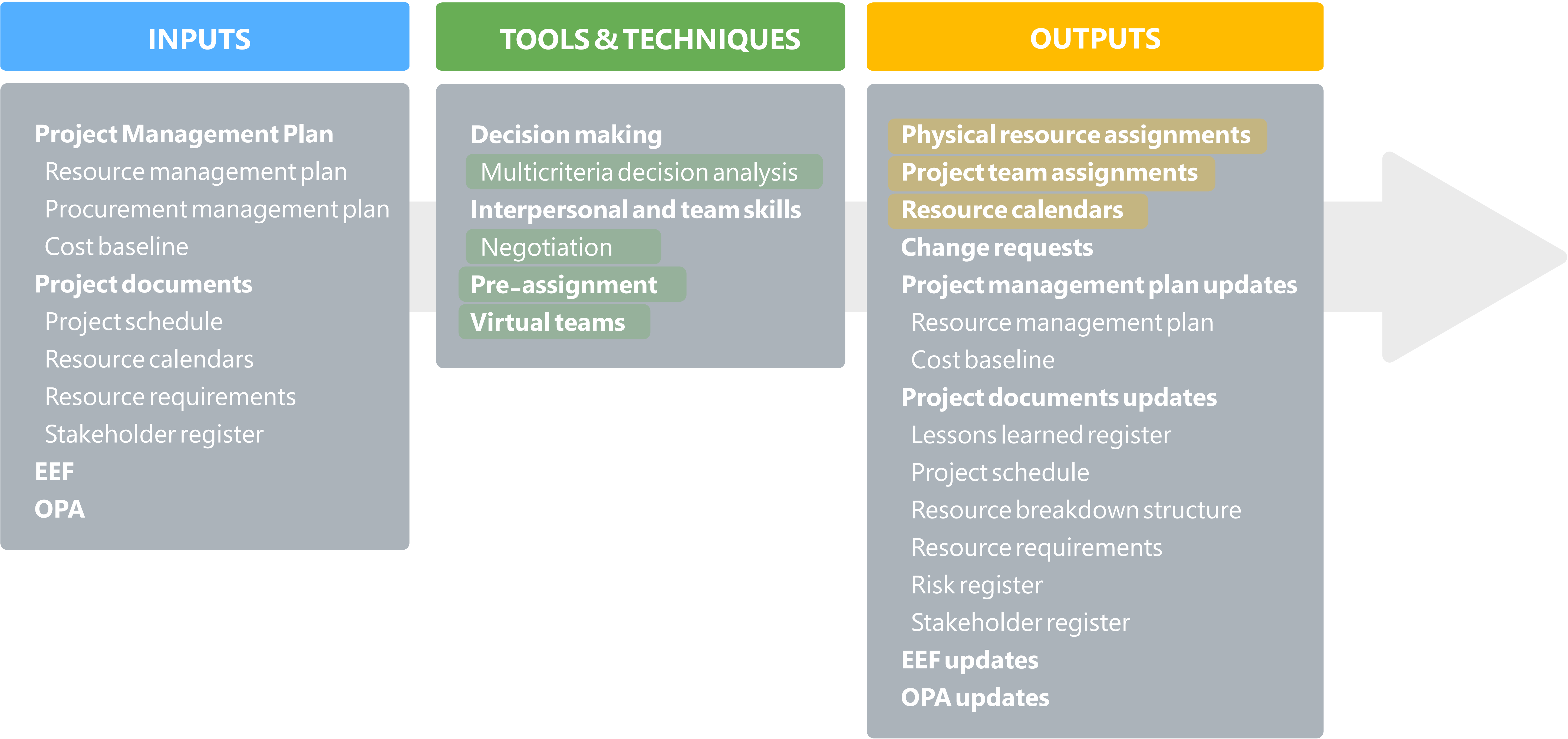
- Clear & complete understanding of how the resource estimate was derived.

OUTPUT

**Resource Breakdown Structure (RBS)**

- Divide project as Categories.
- Details are under each category to be used later with WBS.

# Acquire Resource



- Obtaining team members, facilities, equipment, materials, suppliers, to complete project work
- Guide the selection of resources and assign them to their activities.

TOOLS & TECHNIQUES

**Multicriteria decision analysis**

- Select physical resources or the project team using: (Availability, Cost, Ability, Experience, etc)

- TOOLS & TECHNIQUES
- Negotiation**
- Negotiate to acquire resource first with:
  - Functional manager.
  - Other Project management teams within Organization.
  - External organization & supplier.

- TOOLS & TECHNIQUES
- Pre-assignment**
- When a resource for a project are **determined in advance**.
  - Experts needed.
  - **Mentioned in Project charter**.

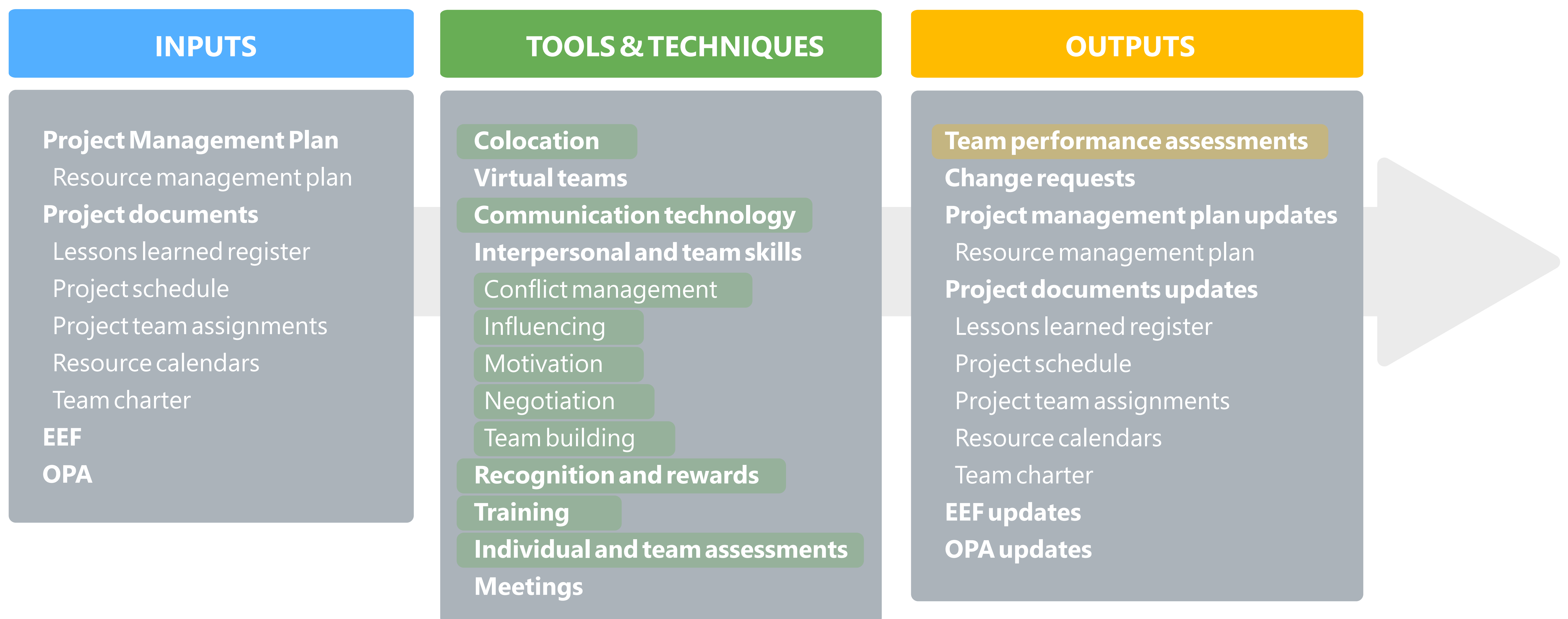
- TOOLS & TECHNIQUES
- Virtual team**
- Not located in the same place (**different Geographic areas**).
  - Add special expertise.
  - **Decrease project cost as decrease the travelling cost**.
  - Communication through emails , video conference.

- OUTPUT
- Resource calendar**
- **Working days, shifts, business hours, holidays**.
  - **Resource availability**.



## Executing Process

# Develop Team



- Improving competencies, team member interactions, team environment
- Improve team work, motivate employees, reduce attrition, improve project performance.

## TOOLS &amp; TECHNIQUES

**Co-location**

- Team are in the **same location** to increase the benefits of their activities.

## TOOLS &amp; TECHNIQUES

**Communication technology**

- Ex, email, website, video conference.

## TOOLS &amp; TECHNIQUES

**Recognition and rewards**

- When **team moral is low**.

## TOOLS &amp; TECHNIQUES

**Individual and team assessments**

- Give the PM insights / ideas of Strengths & weaknesses areas to assess the team.

## TOOLS &amp; TECHNIQUES

**Influencing**

- Gathering information / maintaining mutual trust.

## TOOLS &amp; TECHNIQUES

**Negotiation**

- Trust and harmony among the team members.

## OUTPUT

**Team Performance Assessments**

- Improvement in skills.
- Reduce staff turnover.
- (Can decide if) extra training is required.
- (Can decide if) change is needed to improve performance.
- (Can decide if) new resources is more suitable for project.

## TOOLS &amp; TECHNIQUES

**Team Building****Forming**

- Team meets.
- Learn their formal roles.
- Not open.

1

**Storming**

- Team not collaborative
- Begins to address the project work.

2

**Norming**

- Begin to work together.
- Learn to trust.

3

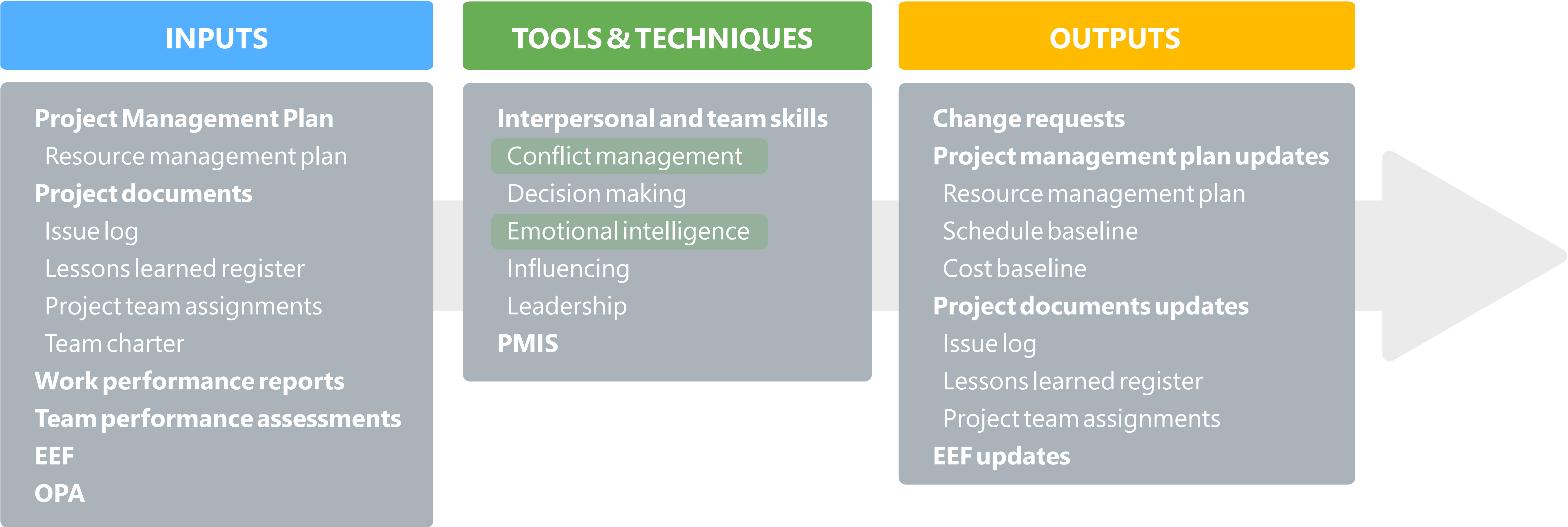
**Performing**

- Team is interdependent.
- Work smoothly.
- Effectively.
- Well-organized.

4

Executing Process

# Manage Team



- **Tracking team member performance**, resolving issues, manage team changes.

TOOLS & TECHNIQUES

**Conflict management**



TOOLS & TECHNIQUES

**Emotional intelligence**

- To **reduce tension** & increase cooperation.

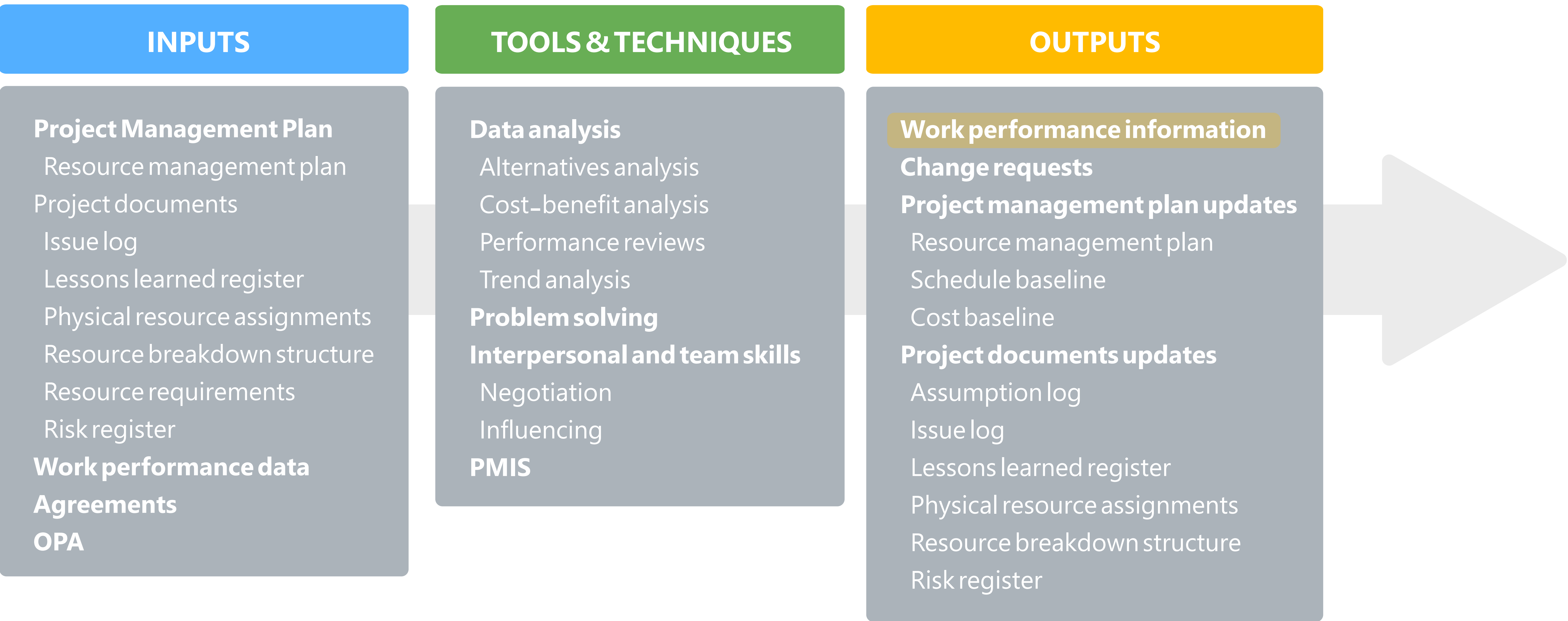
TOOLS & TECHNIQUES

**Influencing**

- Maintaining mutual trust.

Monitor & Control Process

# Control Resource



- Ensuring the physical resources assigned and allocated to the project are available as planned at the right time and in the right place and are release when no longer needed.



فصل

10

إدارة

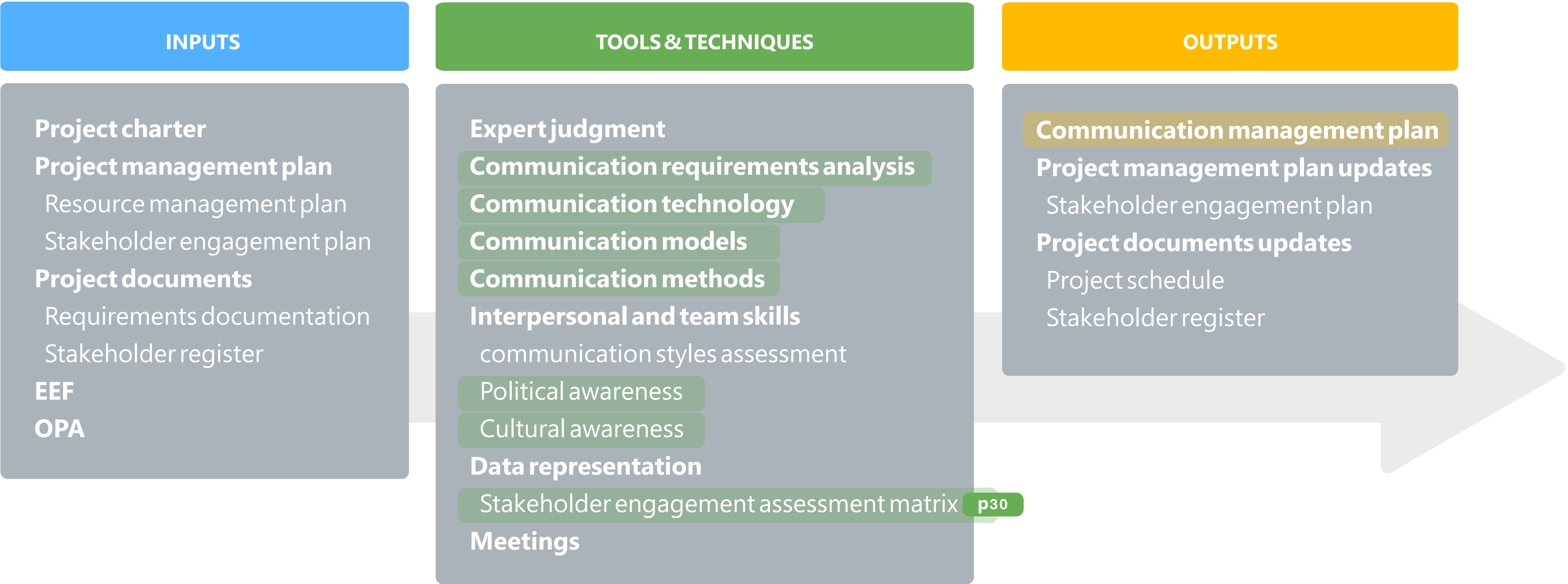
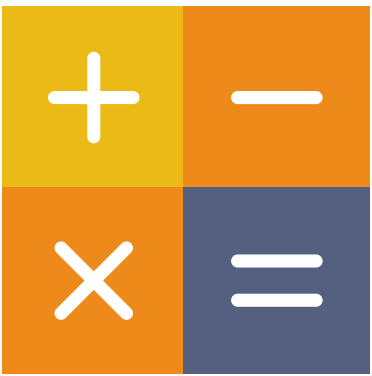
# التواصل

Communication Management

PMBOK 6<sup>th</sup> Ed. (359–349)



# Plan Communication Management



TOOLS & TECHNIQUES

Communication requirements analysis

- Communication channels no. =  $N(N-1)/2$
- N = no. of project stakeholders.

TOOLS & TECHNIQUES

Communication methods

Interactive

- Interviews
- Meetings
- Phone calls
- Urgent actions
- Change request
- Face to face method
- Most effective way

Push

- Letters
- MEMO
- Email
- Voice mail
- Faxes
- Sending report to certain
- Stakeholders

Pull

- Large volume
- Large audience
- Website
- Dashboard
- Lesson learned / opa
- e-learning

TOOLS & TECHNIQUES

Communication technology

- Urgency
- Frequency
- Availability
- Ease to be used
- Language
- Confidential information

TOOLS & TECHNIQUES

Communication models

- Encode.
- Transmit.
- Decode.
- Acknowledge.
- Feedback.

TOOLS & TECHNIQUES

Political awareness

- Focus on stakeholder authority, power influence & organization strategy.

TOOLS & TECHNIQUES

Cultural awareness

- Focus on stakeholder culture differences, understanding & reduce misunderstanding.

OUTPUT

Communications management plan

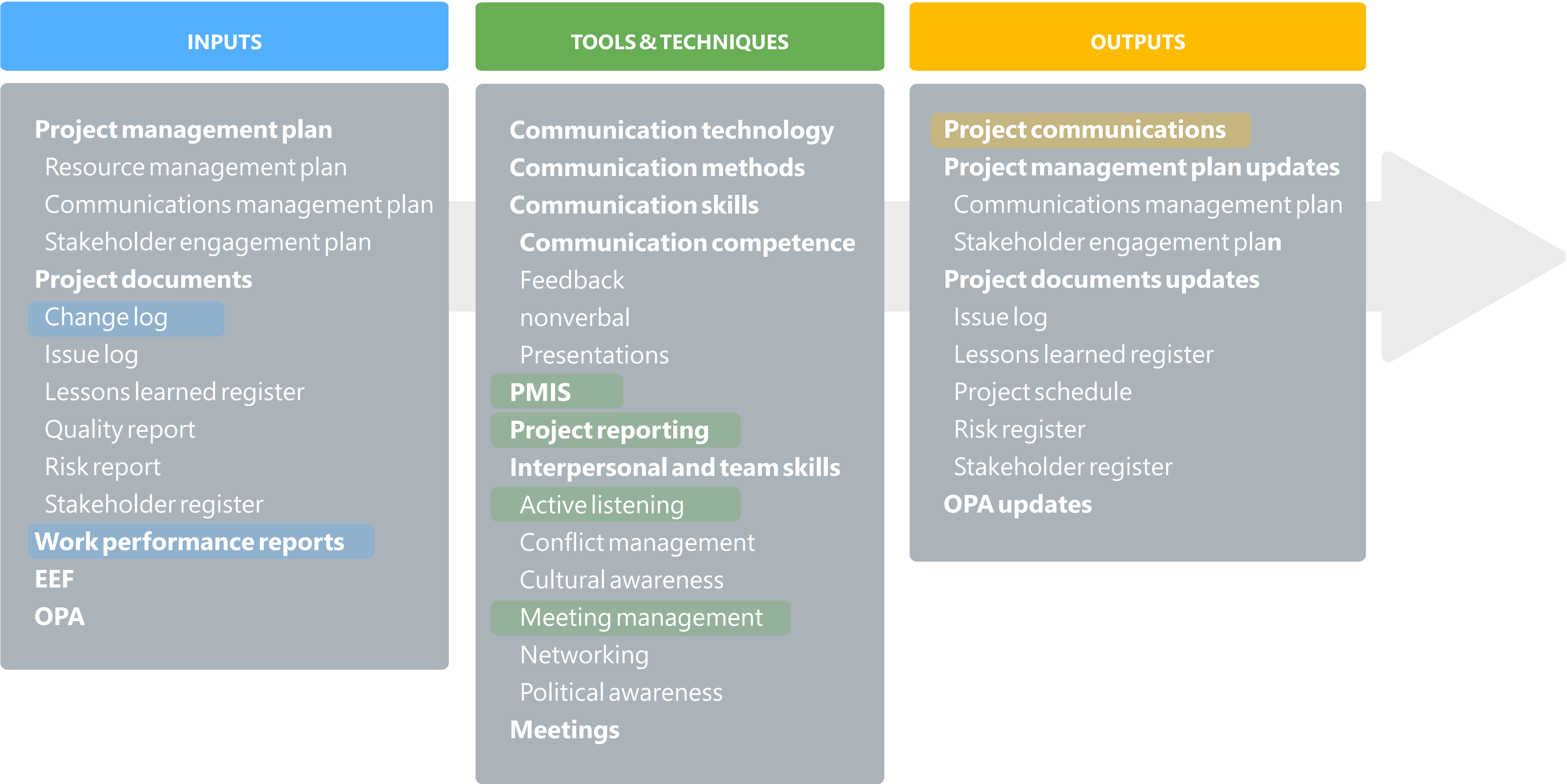
- Who will send.
- Who will receive.
- What will be sent.
- When will be sent.
- Why will be sent.
- How will be sent.
- How many time will be sent.
- Escalation process in case any conflict.

تأكد من قراءتك لسؤال عدد قنوات الإتصال جيدا، فأحيانا تعطيك المسألة عدد المعنيين ولكن بدون الأخذ بالحسبان مدير المشروع فلم يتم عدّه من المعنيين، ففي هذه الحالة عليك إضافة (1+) على عدد المعنيين ثم إتباع القانون المذكور بالأعلى





# Manage Communication



- Key benefit = Efficient and effective information flow.
- Eff~~e~~ctive Communication = Provide **Right** information to **Right** Stakeholder in **Right** Time with **Right** Format.
- Eff~~i~~cient Communication = Provide required information Only.

INPUT

**Work performance reports**

- Distributing reports to stakeholders as defined in the communication management plan.

TOOLS & TECHNIQUES

**PMIS Project management information system**

- Distribute the information to stakeholders using many tools.

TOOLS & TECHNIQUES

**Project Reporting**

- Collecting and distributing project information to stakeholder with suitable format.

**Progress Report**

Report about **accomplished / finished** works.

VS.

**Status Report**

Report about **Current** work.

TOOLS & TECHNIQUES

**Meeting Management**

- Prepare agenda including objectives.
- Start & End time.
- Invitation.
- Stay on topic.
- Manage any conflict.
- Record all actions.

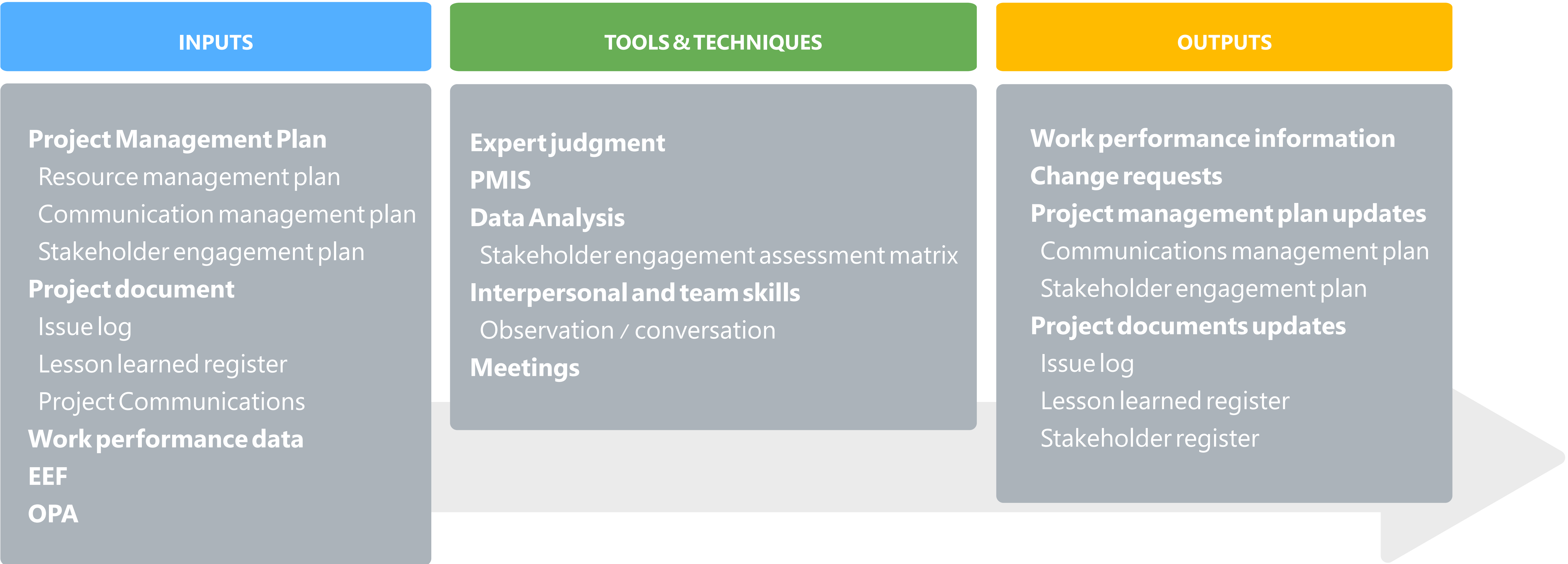
OUTPUT

**Project Communication**

- Performance Reports.
- Deliverable status.
- Schedule progress.
- Cost Reports.

Monitor & Control Process

# Monitor Communication



- Ensuring the information needs of the project and its stakeholder are met.
- Key benefit : Optimal information flow.

General Definitions

# Communication

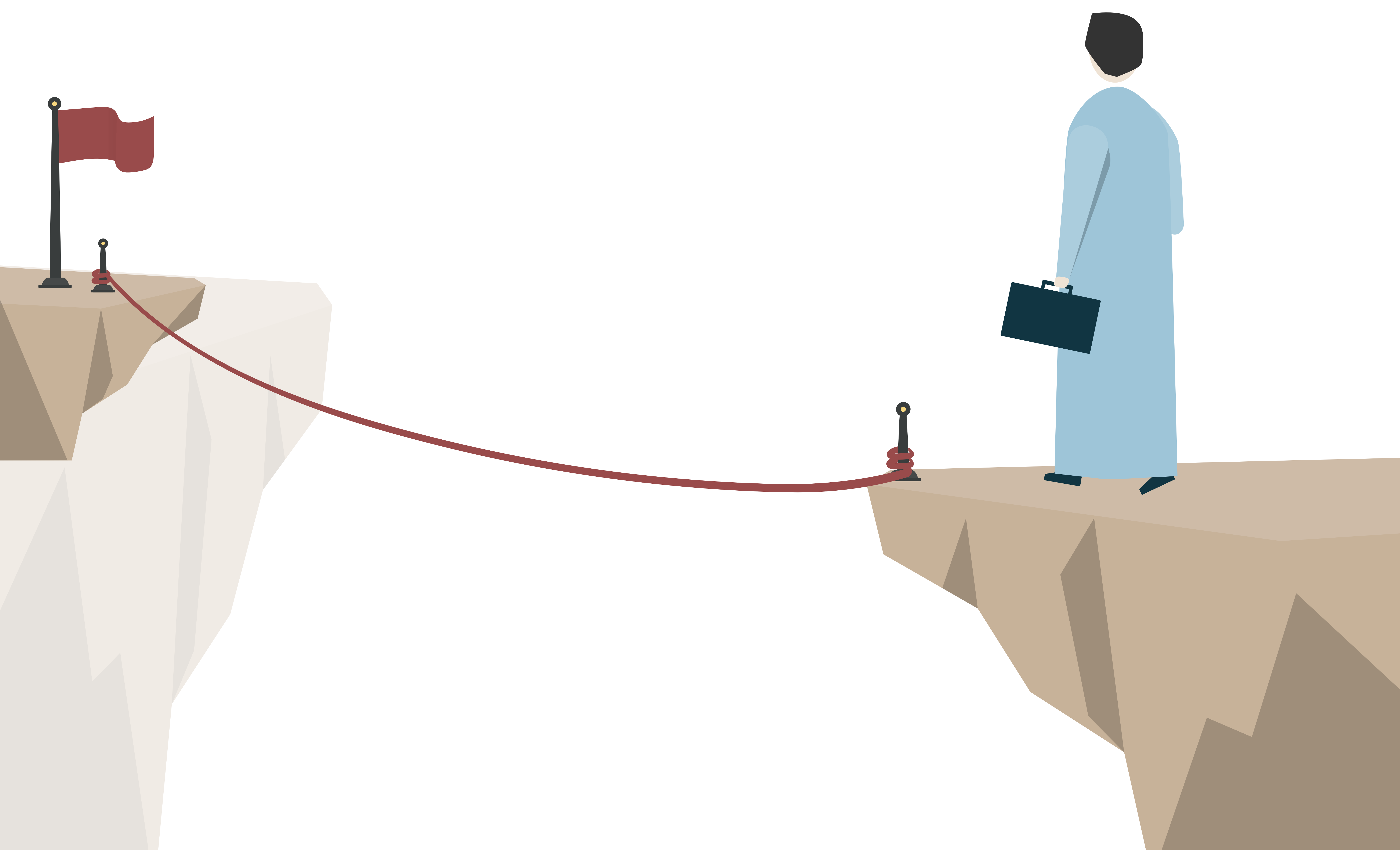
Formal	Reports, memo, letters, formal meeting
Informal	Emails, social media, websites.
Official	Annual report, reports to government.
Unofficial	Between teams, building trust & relationships.
Verbal	Words, voice inflections.
Nonverbal	Body language, actions, voice tone.
Internal	With team, stakeholder within the organization.
External	With customers, vendor and supplier.
Upward	With senior management stakeholders.
Nonverbal	Body language, actions, voice tone.
Downward	With team who will contribute to work.
Horizontal	With project manager or team.



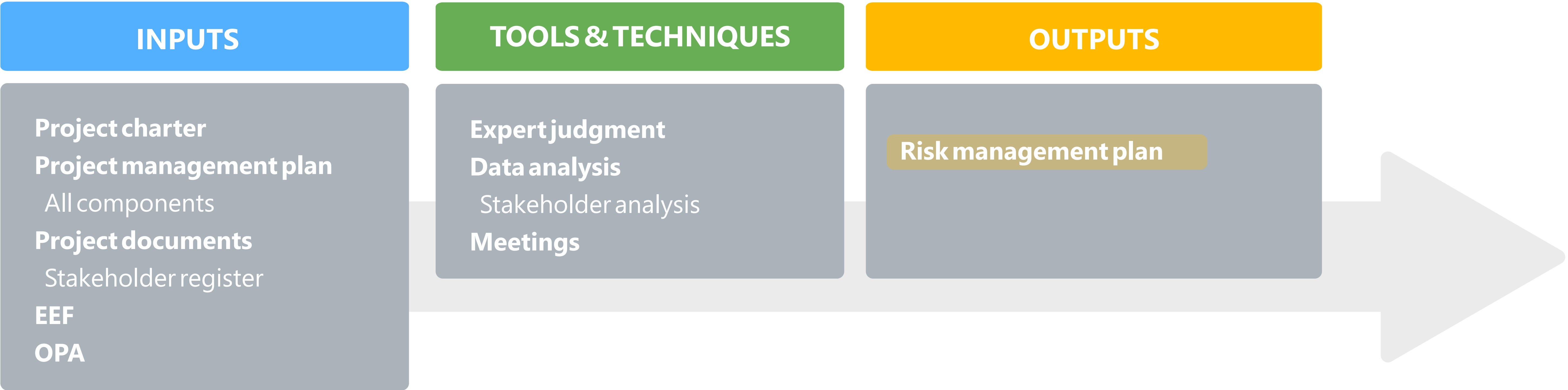
# إدارة المخاطر

## Risk Management

PMBOK 6<sup>th</sup> Ed. (395–458)



# Plan Risk Management



OUTPUT

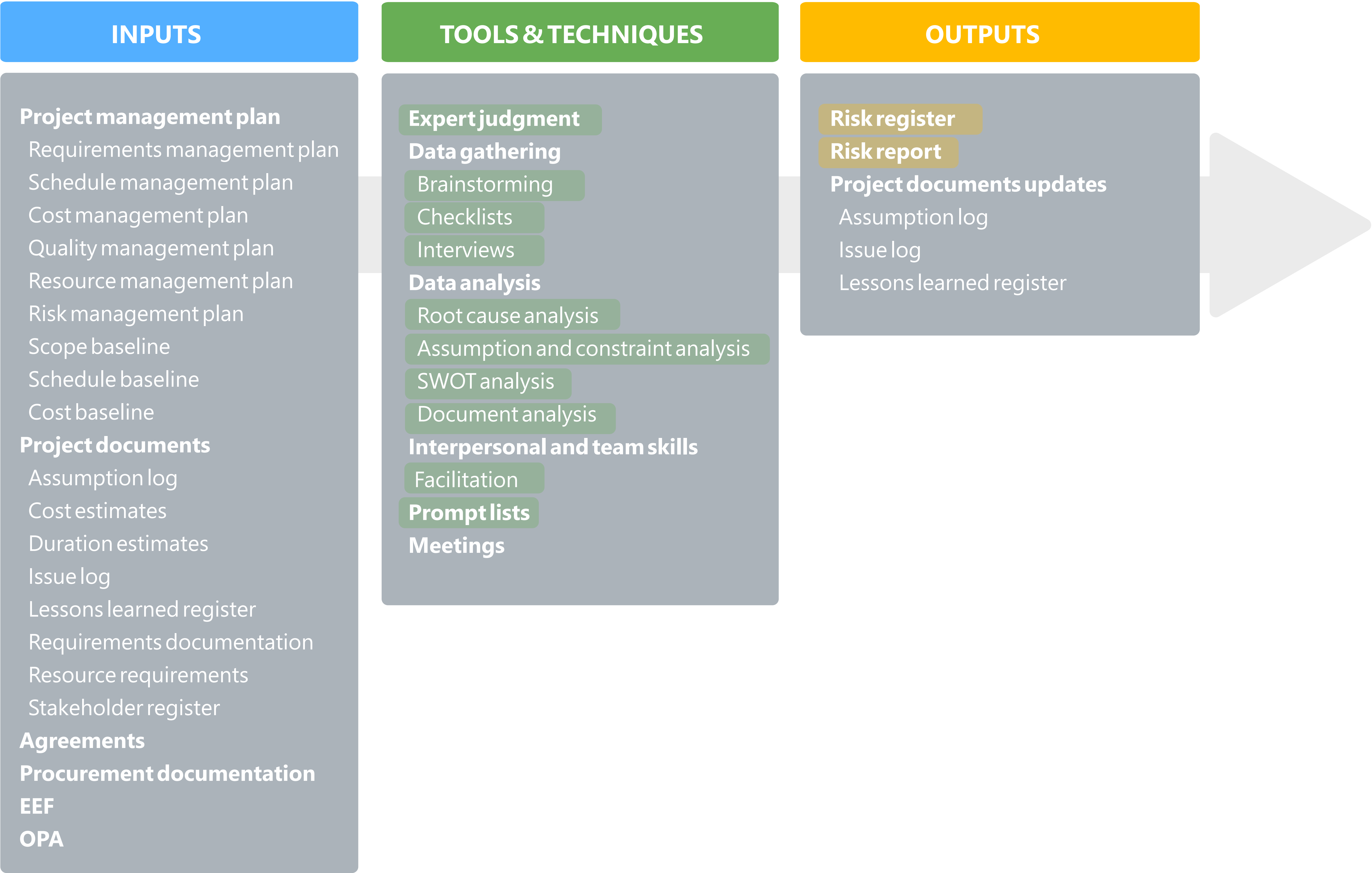
**Risk management plan**      خطة إدارة المخاطر

- Risk Strategy.
- Methodology.
- Roles & Responsibilities.
- Funding.
- Timing.
- Risk Categories.
- Stakeholder **risk appetite**.
- Definitions of risk probability.
- Reporting formats.
- Tracking.



Planning Process

# Identify Risk



TOOLS & TECHNIQUES

Root Cause analysis

- Identify risk root cause & preventive actions.

TOOLS & TECHNIQUES

SWOT Analysis

- Strength, Weakness, Opportunity, Threats.

TOOLS & TECHNIQUES

Facilitation

- Setting with key stakeholders to identify risk.

TOOLS & TECHNIQUES

Prompt list

- Source of overall risk & predetermined risk categories

OUTPUT

Risk Register سجل المخاطر

- List of identified risk
- Individual risk
- Risk owner
- Potential risk response

OUTPUT

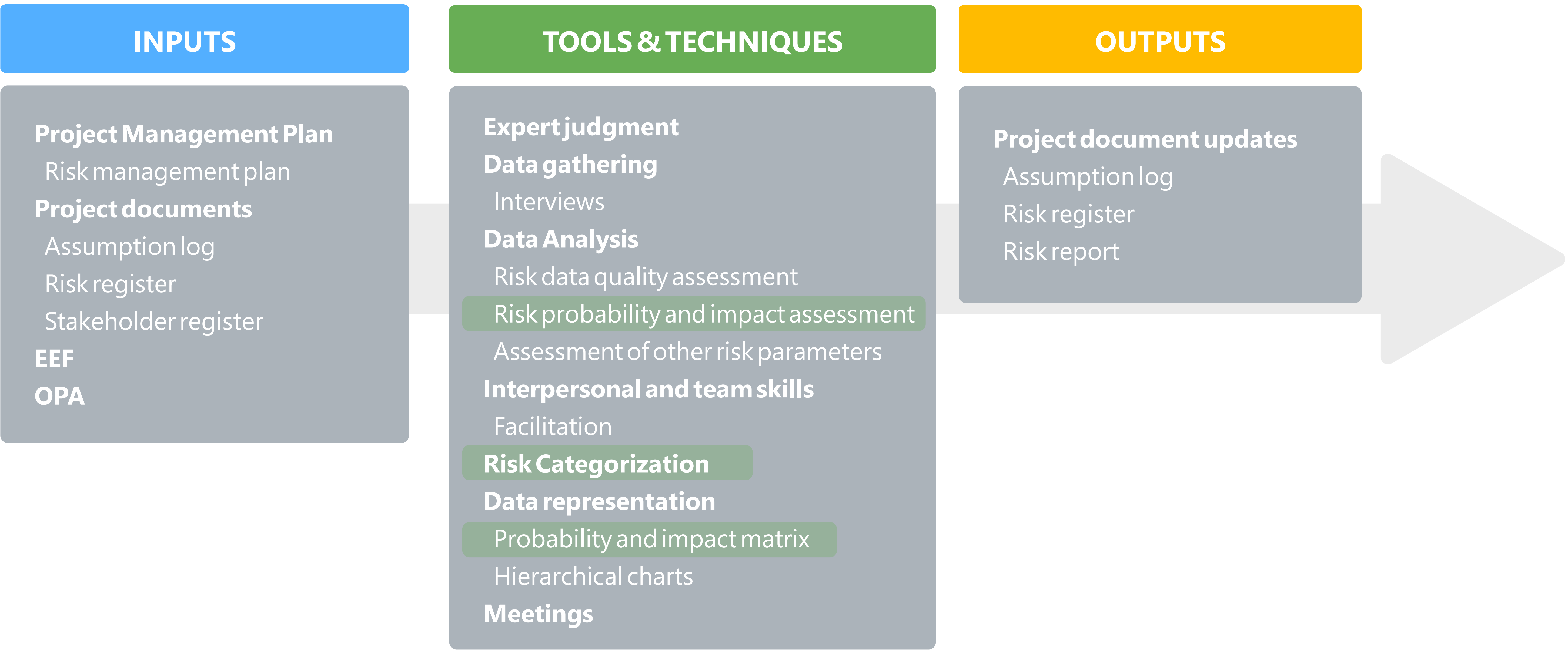
Risk Report تقرير المخاطر

- Source of overall project risk
- Summary of individual project risk.

تأكد من الحالة الزمنية للمشكلة في السؤال  
فإن كانت مستقبلية أي أنه خطر لم يحدث أو يقع حتى الآن فتسجل في سجل المخاطر Risk register  
وفي حالة وقوعها فإنها تسجل في سجل المشكلات Issue log



# Perform Qualitative Risk Analysis



- Prioritizing individual project risks.
- Assessing their **probability of occurrence**.
- **Focuses efforts on high priority risk.**

- TOOLS & TECHNIQUES**  
**Risk probability and impact assessment**    تقييم احتمالية وتأثير المخاطر
- The **likelihood** that a specific risk will occur.
  - Negative and positive risks

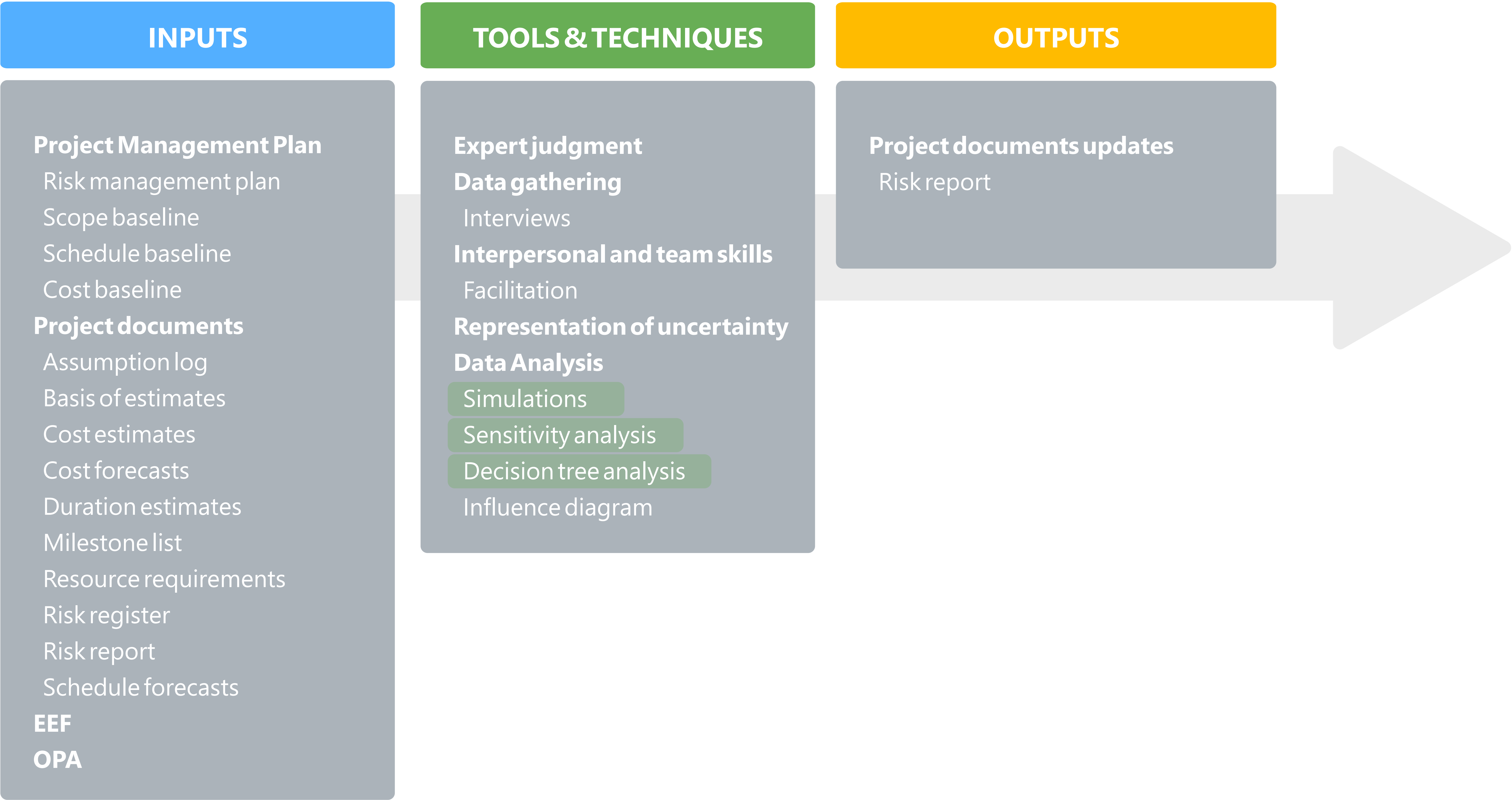
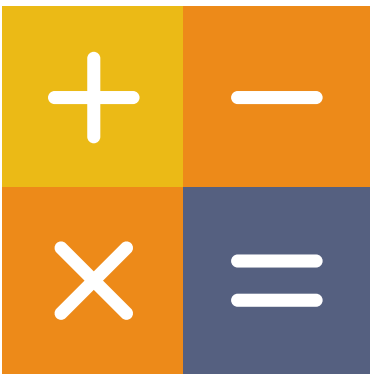
- TOOLS & TECHNIQUES**  
**Probability & impact matrix**    مصفوفة احتمالية وتأثير المخاطر
- Grid for mapping.
  - Divide into **priority groups**.

- TOOLS & TECHNIQUES**  
**Risk categorization**    تصنيف المخاطر
- Categorized by sources of risk.
  - Most exposed to the effects of uncertainty.
  - **More effective risk responses.**

- TOOLS & TECHNIQUES**  
**Hierarchical chart**    المخطط الهرمي
- **More than two parameters.**
  - Bubble chart (3d).



# Perform Quantitative Risk Analysis



- Numerically analyzing the individual and overall risks.
- Quantifies overall project risk exposure.
- Not required for every project, just for large project.

TOOLS & TECHNIQUES

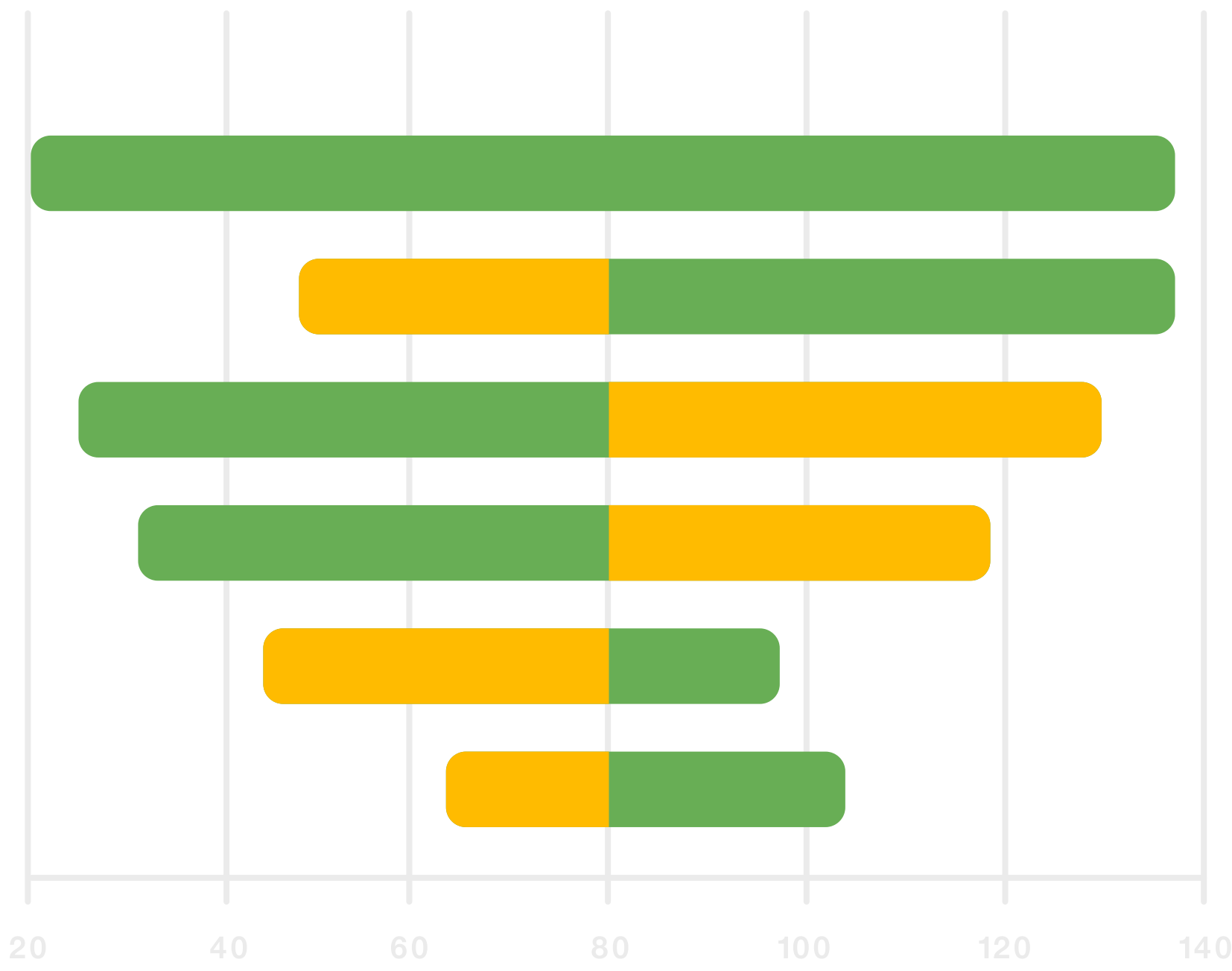
**Simulation** المحاكاة

- Monte Carlo.
- Define EAC & End date of project.

TOOLS & TECHNIQUES

**Sensitivity analysis** تحليل الاستشعار

- Tornado Diagram.
- Define which risk has the most potential impact on project outcome.



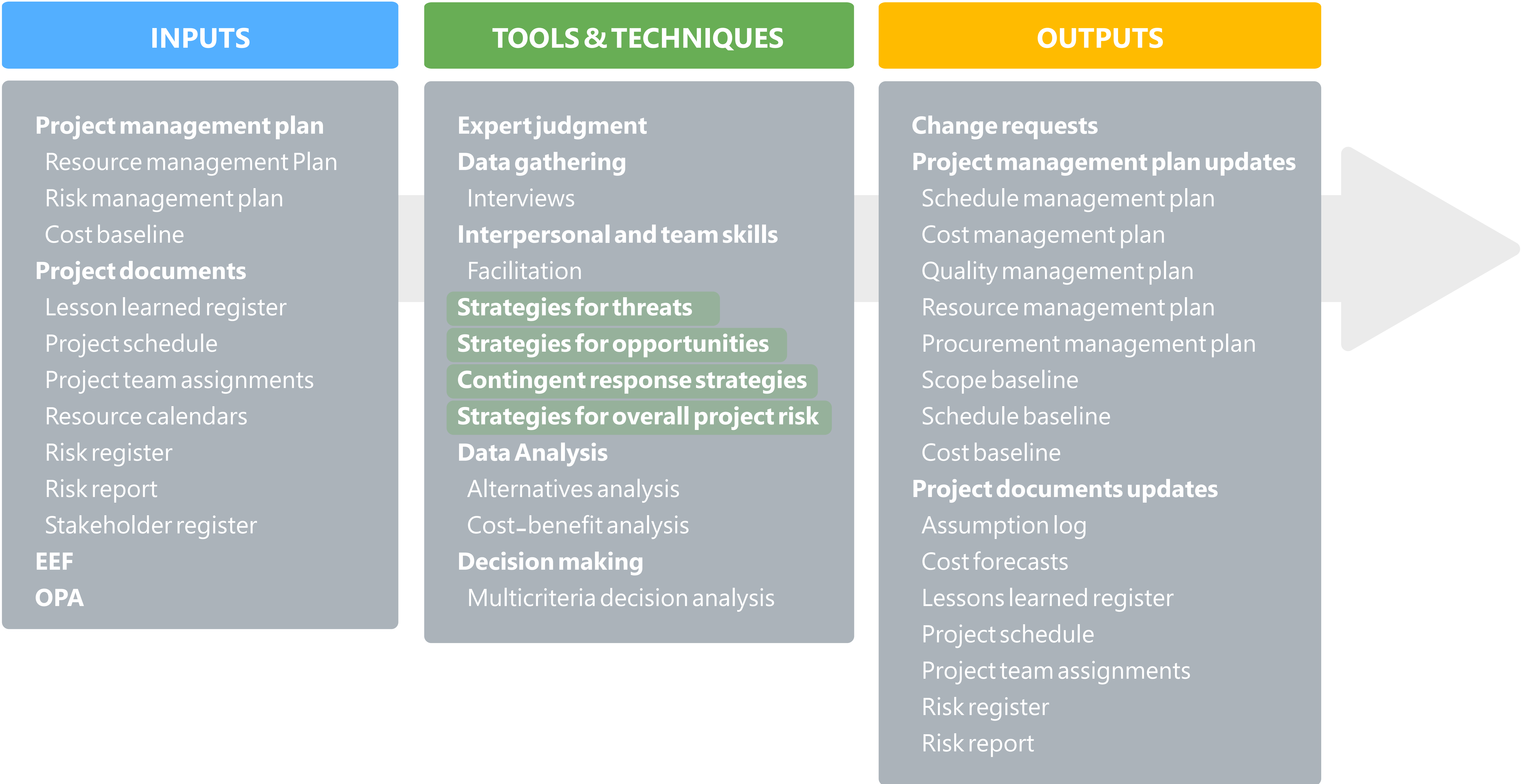
TOOLS & TECHNIQUES

**Decision tree analysis** تحليل القرار

- Done depending on impact (I) & probability (P)
- Expected Monetary Value ( $EMV = \sum (P \times I)$ )
- Select the highest value

Planning Process

# Plan Risk Responses



TOOLS & TECHNIQUES

**Strategies for threats**

**Escalate**

- Threat is out of scope
- Program or portfolio level not PM

**Avoid**

- Remove the threat from scope
- Order change Request

**Transfer**

- Move threats to third party
- Insurance, warranty, guarantee

**Mitigate**

- Reduce threat probability & impact
- Using stable contractor
- prototype
- more tests.

**Accept**

- Acknowledge
- Active acceptance**
- contingency reserve
- Passive acceptance**
- Risk register (watch list)

TOOLS & TECHNIQUES

**Strategies for opportunities**

**Escalate**

- Opportunity is out of scope
- Program or portfolio level not PM

**Exploit**

- Get the opportunity
- Increase resource
- new technology
- talented resource

**Share**

- Transfer ownership to third party
- Partnership, joint venture

**Enhance**

- Increase the opportunity
- probability and impact

**Accept**

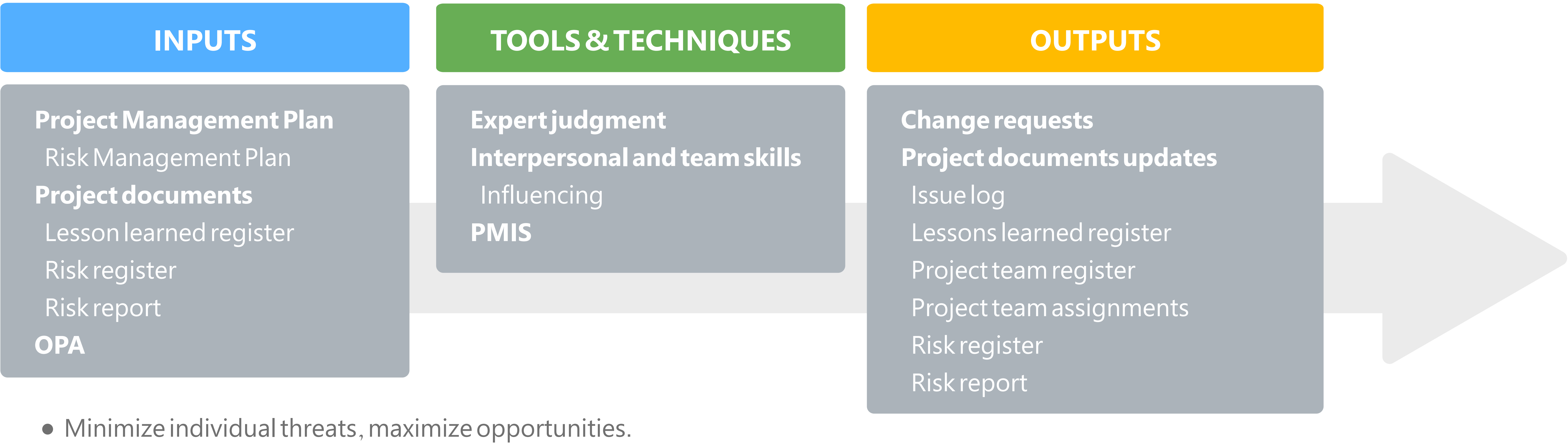
- Acknowledge
- Active acceptance**
- contingency reserve
- Passive acceptance**
- Risk register (watch list)

- Developing options.
  - Selecting strategies.
- TOOLS & TECHNIQUES
- Contingent Response strategies**
- Certain events.
  - Plan A = contingency plan.
  - Plan B = fallback plan.
- TOOLS & TECHNIQUES
- Strategies for overall project risk**
- Avoid = negative.
  - Exploit = positive.
  - Out of risk threshold.



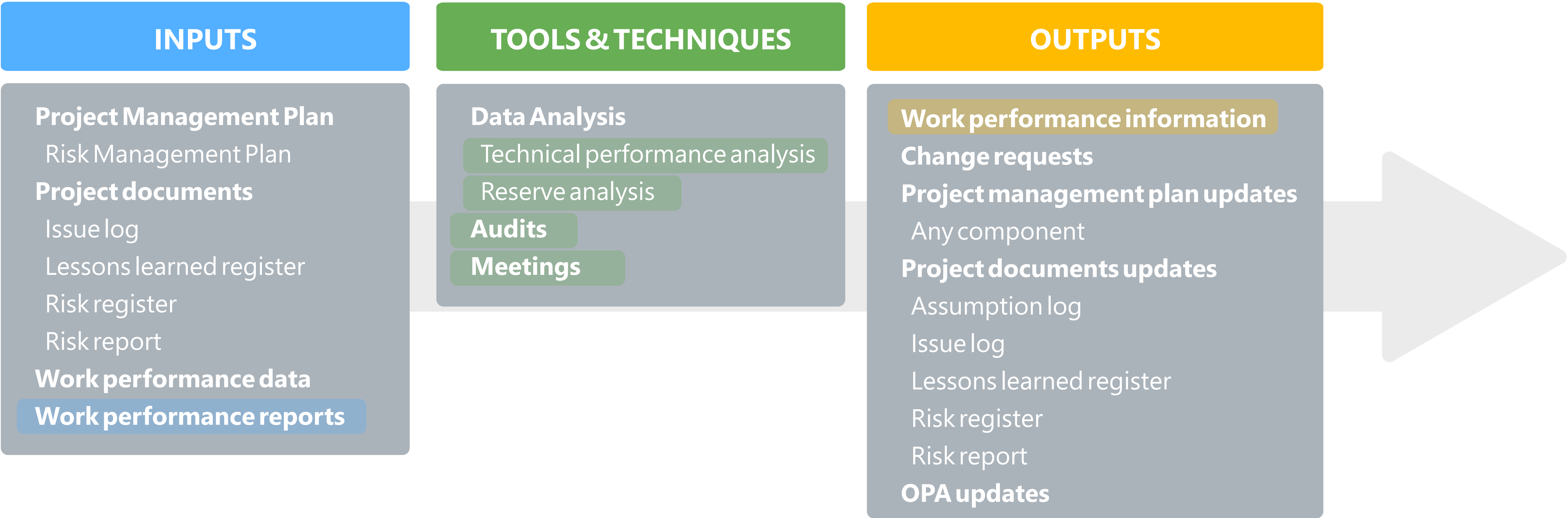
Executing Process

# Implement Risk Responses



Monitor & Control Process

# Monitor Risk



- Monitoring agreed-upon risk response plans.
- Identifying and analyzing new risks.
- Evaluating risk process effectiveness.

TOOLS & TECHNIQUES

**Technical performance analysis**

- Comparing actual results against target.

TOOLS & TECHNIQUES

**Reserve analysis**

- Comparing the remaining contingency reserve against remaining risks.

TOOLS & TECHNIQUES

**Workaround (WA)**

TOOLS & TECHNIQUES

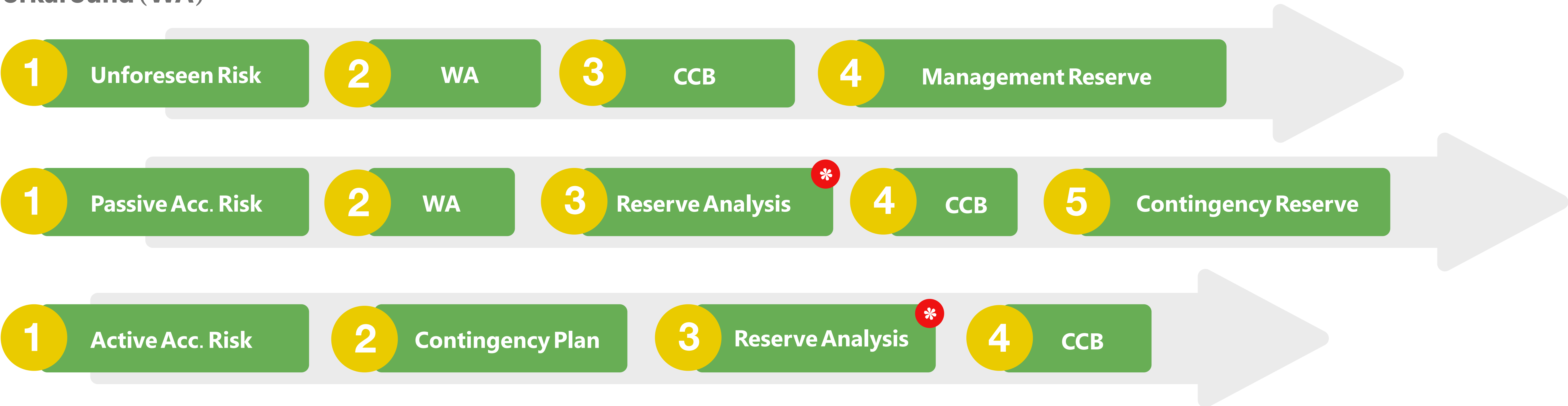
**Meetings**

- Risk review.
- Check effectiveness of the risk responses.
- Identify new risks, including secondary risks.
- Close the outdate risks.

TOOLS & TECHNIQUES

**Audits**

- Effectiveness of the risk management process.



1

Passive Acc. Risk

2

WA

3

Reserve Analysis

4

CCB

5

Contingency Reserve

1

Active Acc. Risk

2

Contingency Plan

3

Reserve Analysis

4

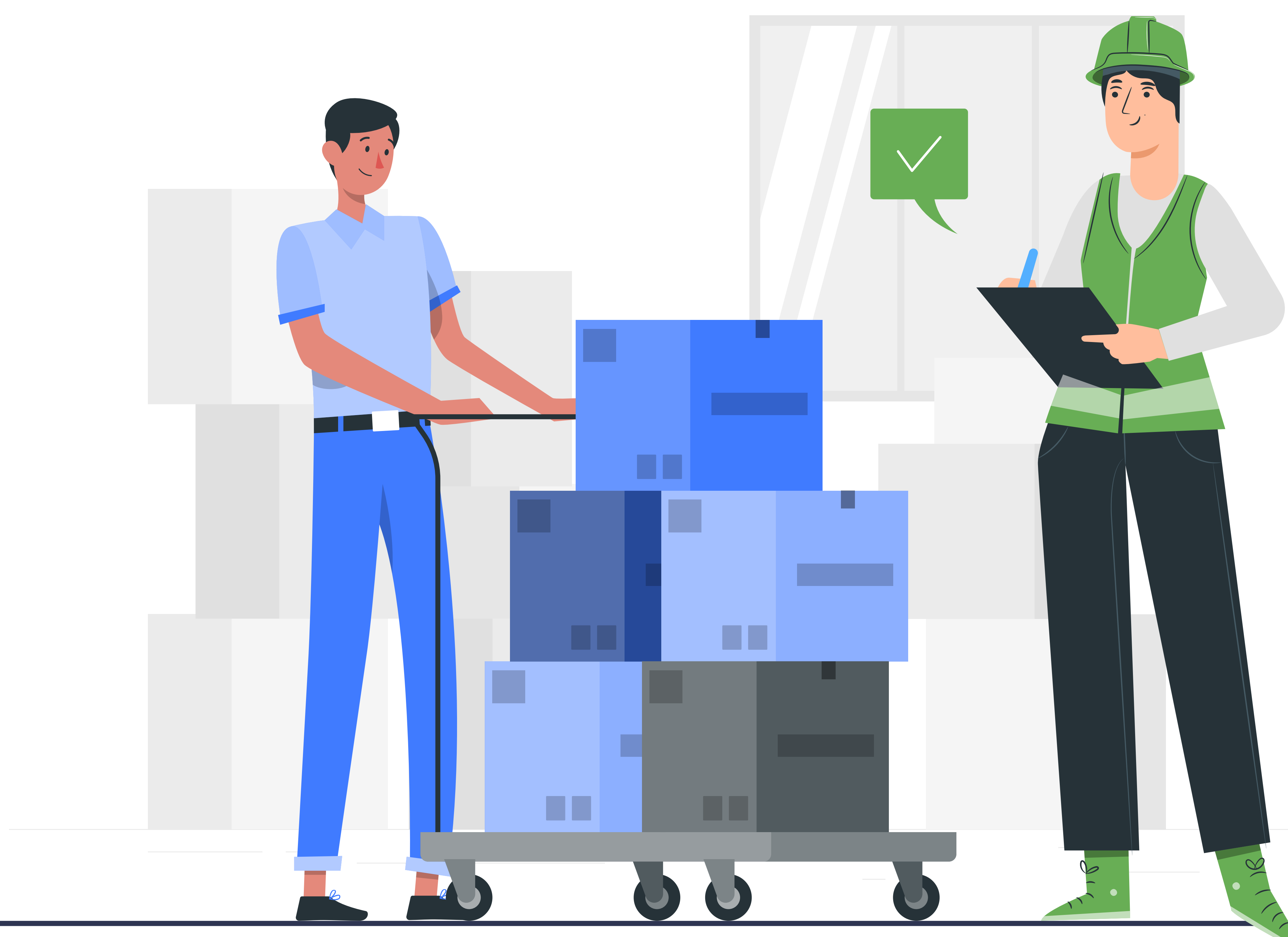
CCB

❖ في حال وجود مبلغ كافٍ بعد تحليل الإحتياطي فلا داع لتقديم طلب تغيير وإمكانك تخطي الخطوة رقم 4 CCB

# إدارة التوريد

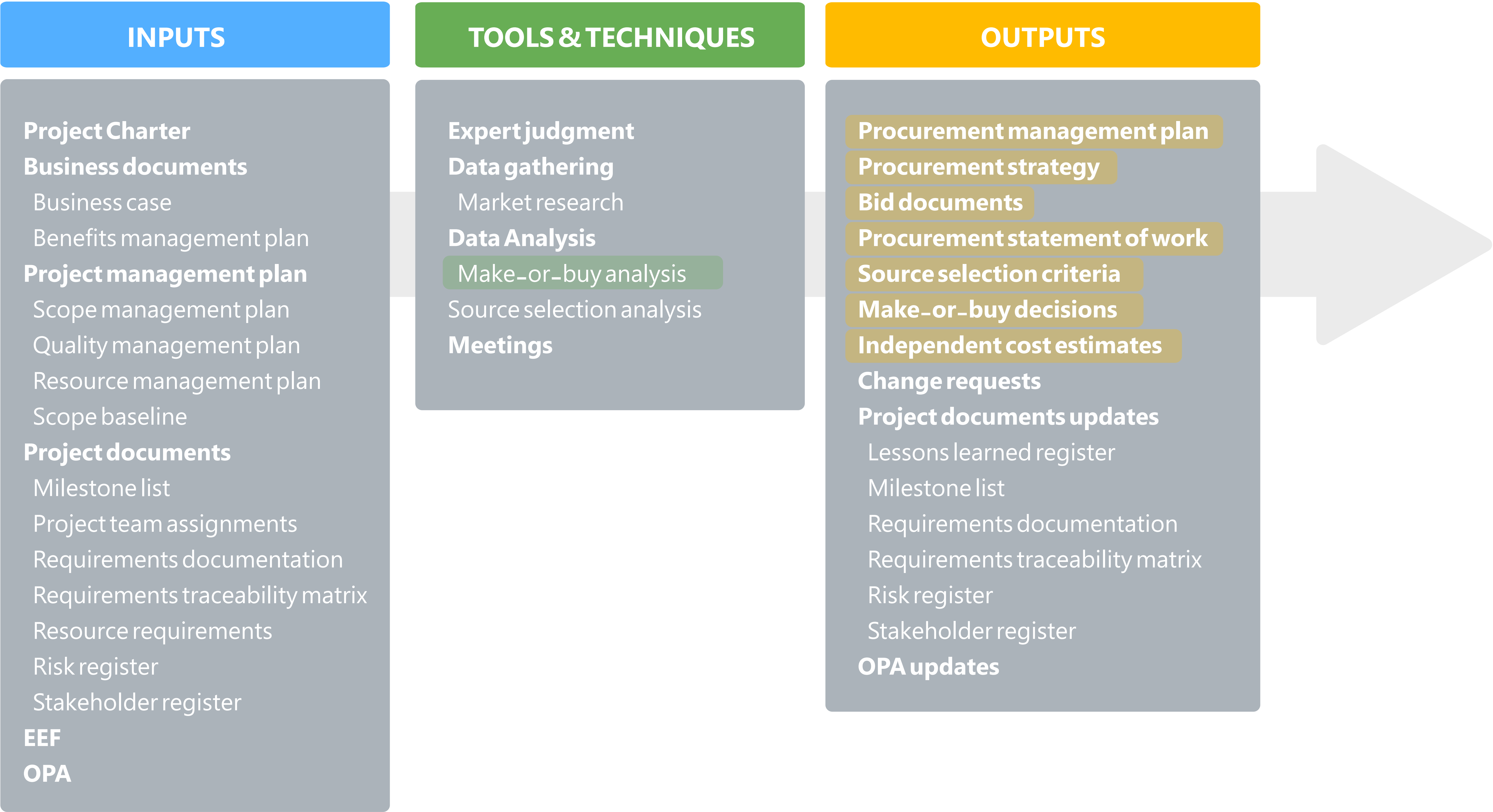
## Procurement Management

PMBOK 6<sup>th</sup> Ed. (459–502)





# Plan Procurement Management



OUTPUT

Procurement management plan

- How procurement will be managed.
- Pre-qualified sellers.
- Constraints and assumptions.
- Time frame for key procurement activities.
- Stakeholders roles regarding procurement.
- Currency.
- Procurement metrics to be used to manage contracts.

OUTPUT

Procurement SOW

- Detailed data which will be sent to contractor.
- Specifications.
- Required quality.
- Contractor tasks.
- Definition for Submission schedule.

OUTPUT

Make or Buy decision

- Depends on make-or-buy analysis.

OUTPUT

Independent cost estimate

- In large project, outside estimate to benchmark

OUTPUT

Procurement strategy

- Delivery methods.
- Contract payment types.
- Procurement phases.

OUTPUT

Bid document

- Request for information (RFI).
- Request for quotation (RFQ).
- Request for proposal (RFP).

OUTPUT

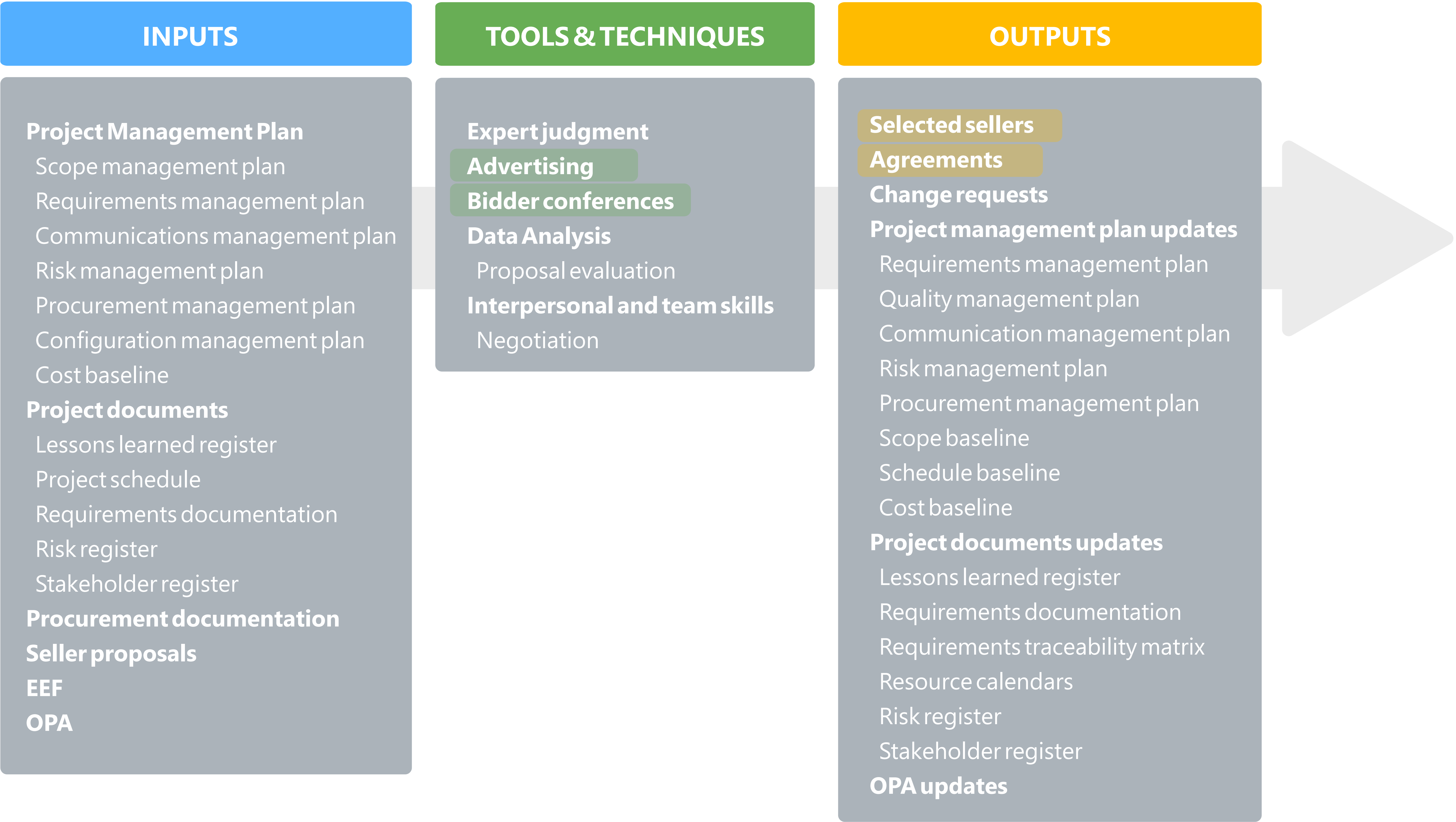
Source selection criteria

- Capability and capacity.
- Product cost and life cycle cost.
- Technical & management experience.
- Key staff qualification.
- Financial stability.

إذا وجد إختلاف كبير في أسعار الموردين، فيغلب الظن وجود سوء فهم أو عدم وضوح لبيان الأعمال Procurement SOW لدى الموردين



# Conduct Procurement



- **Obtaining seller responses.**
- **Selecting a seller.**
- **Awarding a contract.**
- Qualified seller / negotiation / legal agreement.

TOOLS & TECHNIQUES

**Bidder conference**

- Prior to proposal submittal.
- **All bidder must be present at the same time.**
- Ensure n bidder receive special treatment.
- Ensure understanding of the procurement.

TOOLS & TECHNIQUES

**Interpersonal and team skills**

- Negotiation is led by a member of procurement team.
- Someone with the authority to sign contract.

OUTPUT

**Agreement**

- SOW.
- Schedule, milestone.
- Performance reporting.
- Inspection, quality.
- Warranty.
- Incentive and penalties.
- Insurance.
- General terms and conditions.
- Change request handling.
- Termination clause.
- Alternative dispute resolution mechanisms.

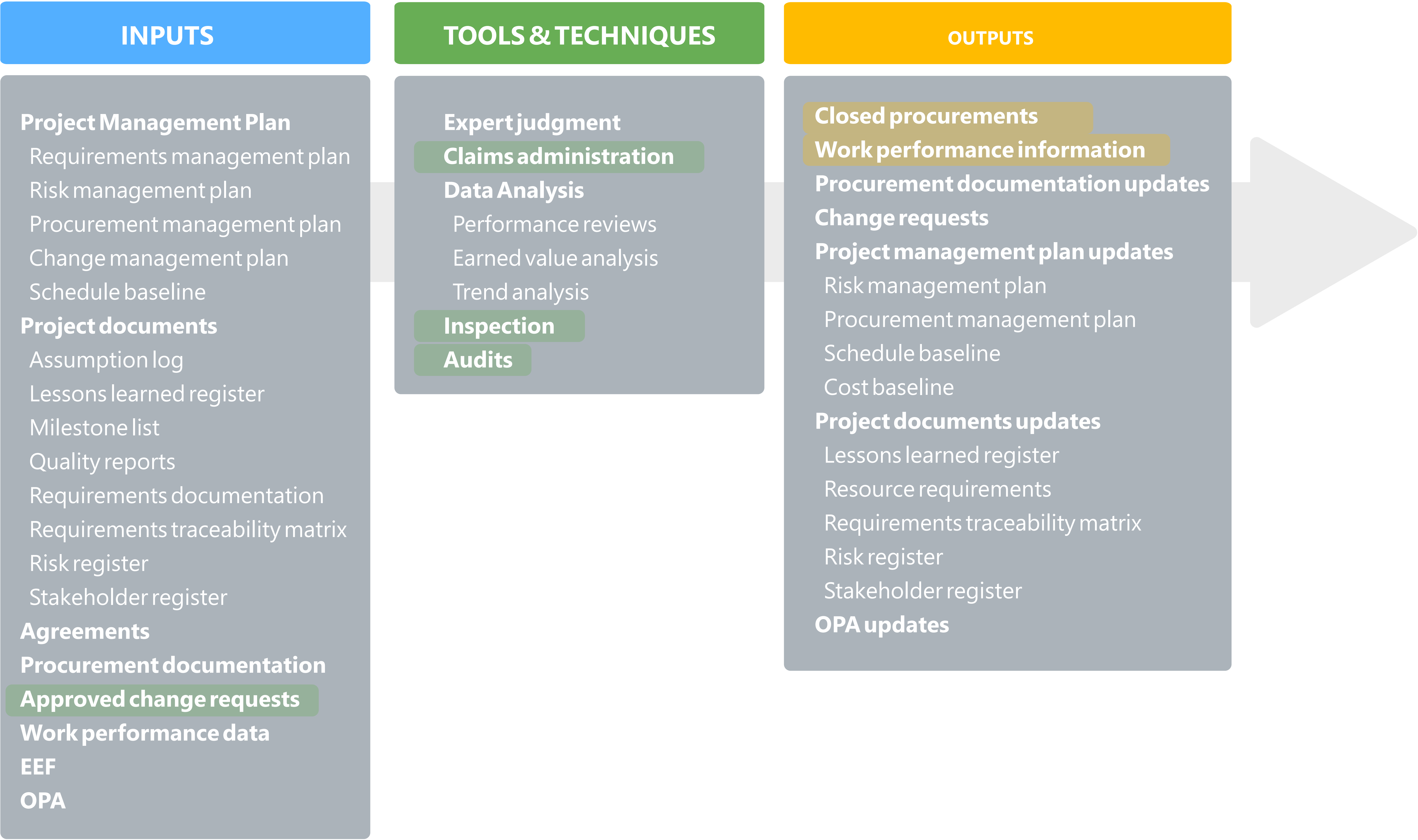
في حال وجود أي خلافات أو مناقشات بعد توقيع العقد فإنه يتم الأخذ بالأحكام والشروط المذكورة بالعقد المبرم بين الطرفين Agreement بغض النظر عن سياسات الشركة وأحكامها





Monitor & Control Process

# Control Procurement



- Managing procurement relationships.
- Monitoring contract performance.
- Making changes, and corrections.
- **Closing contracts.**
- Performance meet the projects requirements.

TOOLS & TECHNIQUES

**Claims administrations** إدارة المطالبات

- In case there is a change request.
- Follow agreement terms firstly to solve the claims, then ADR as mentioned in agreement.
- **Negotiation** is the **best and first** in all claims and dispute.

OUTPUT

**Closed procurement** إغلاق المشتريات والعقود

- The project management team should have approved all deliverables prior to closure.
- Procurement administrator, provides the seller with formal written notice that the contract has been completed.

TOOLS & TECHNIQUES

**Inspection** التفتيش

- **Inspecting deliverables** from procurement.

TOOLS & TECHNIQUES

**Audits** التدقيق

- Auditing Procurement for its **applied processes**.

إنهاء التعاقد مع الموردين يتم في مرحلة Monitor & Control process وليس في مرحلة الإغلاق Closing process  
وعليك كمدير المشروع التأكد من إغلاق جميع العقود مع الموردين قبل البدء في مرحلة الإغلاق Closing process



# Contracts

## Fixed Price

FFP

- Firm Fixed Price
- Well defined scope
- WBS
- Transfer of Threat or Risk
- All risks on seller

VS

FPIF

- Fixed Price Incentive Fee
- Long time project
- Inflation in price

VS

FPEPA

- Fixed Price with Economic price adjustments.
- Long Time Project
- Inflation in price

## Cost Plus – Cost Reimbursable

CPFF

- Cost Plus Fixed Fee
- Risk on Buyer
- No Risk on Seller

VS

CPIF

- Cost Plus Incentive Fee
- Fast Track project
- No experience
- Sharing in profits between Buyer & Seller

VS

CPAF

- Cost Plus Award Fee
- Least Common

## Time & Material

Time & Means Contract

- Staff augmentation
- Acquisition of experts

FFP إذا كان النطاق والمتطلبات واضحة تماما وتبحث عن أقل العقود خطورة فأفضلها  
CPIF وفي حال كانت غير واضحة فأقل العقود خطورة هو





# إدارة المعنيين

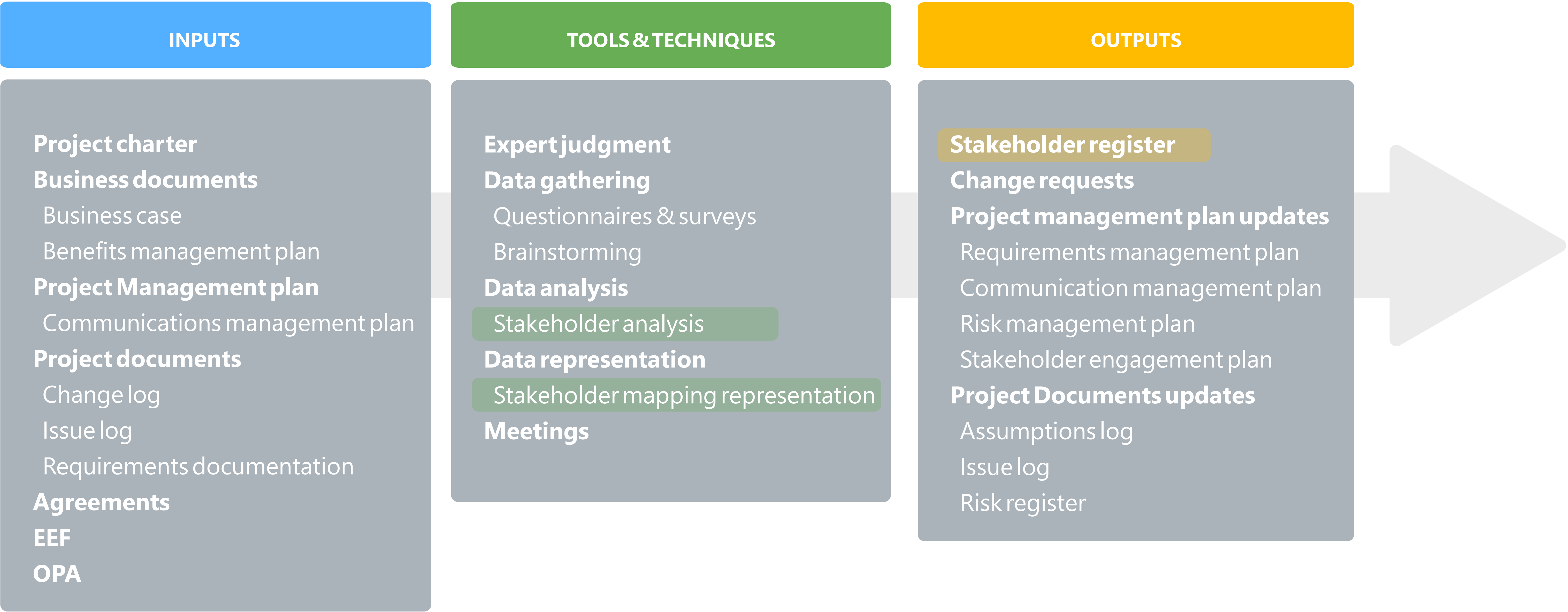
## Stakeholder Management

PMBOK 6<sup>th</sup> Ed. (503–536)



Initiating Process

# Identify Stakeholders



TOOLS & TECHNIQUES

Stakeholder analysis تحليل المعنيين

- **First step** in case any **new Stakeholder**.
- Includes all information (Roles, Expectations, Attitude ...).
- Stakeholder stakes (Interest, Rights, Ownership, knowledge).

TOOLS & TECHNIQUES

Direction of influence

- **Upward**: customer, sponsor, seniors management.
- **Downward**: project team, specialists.
- **Outward**: suppliers, end-users, gov.
- **Sideward**: PM, Functional managers.

TOOLS & TECHNIQUES

Prioritization

- **Large number**.
- Stakeholder changing frequently.
- Relationship and Project team are complex.

OUTPUT

Stakeholder register سجل المعنيين

- Identification information.
- Assessment information.
- Stakeholder classification.

في حال دخول معني جديد للمشروع في أي مرحلة كانت، وذكر في السؤال أنه يطالب بإضافة خدمة جديدة للمشروع فإننا نبدأ أولاً بتحليل المعنيين ثم إضافته في سجل المعنيين ومن ثم النظر في طلبه



TOOLS & TECHNIQUES

Salience model

- Classify Stakeholder ( **Power - Urgency - Legitimacy** ).
- Large number and complex.

TOOLS & TECHNIQUES

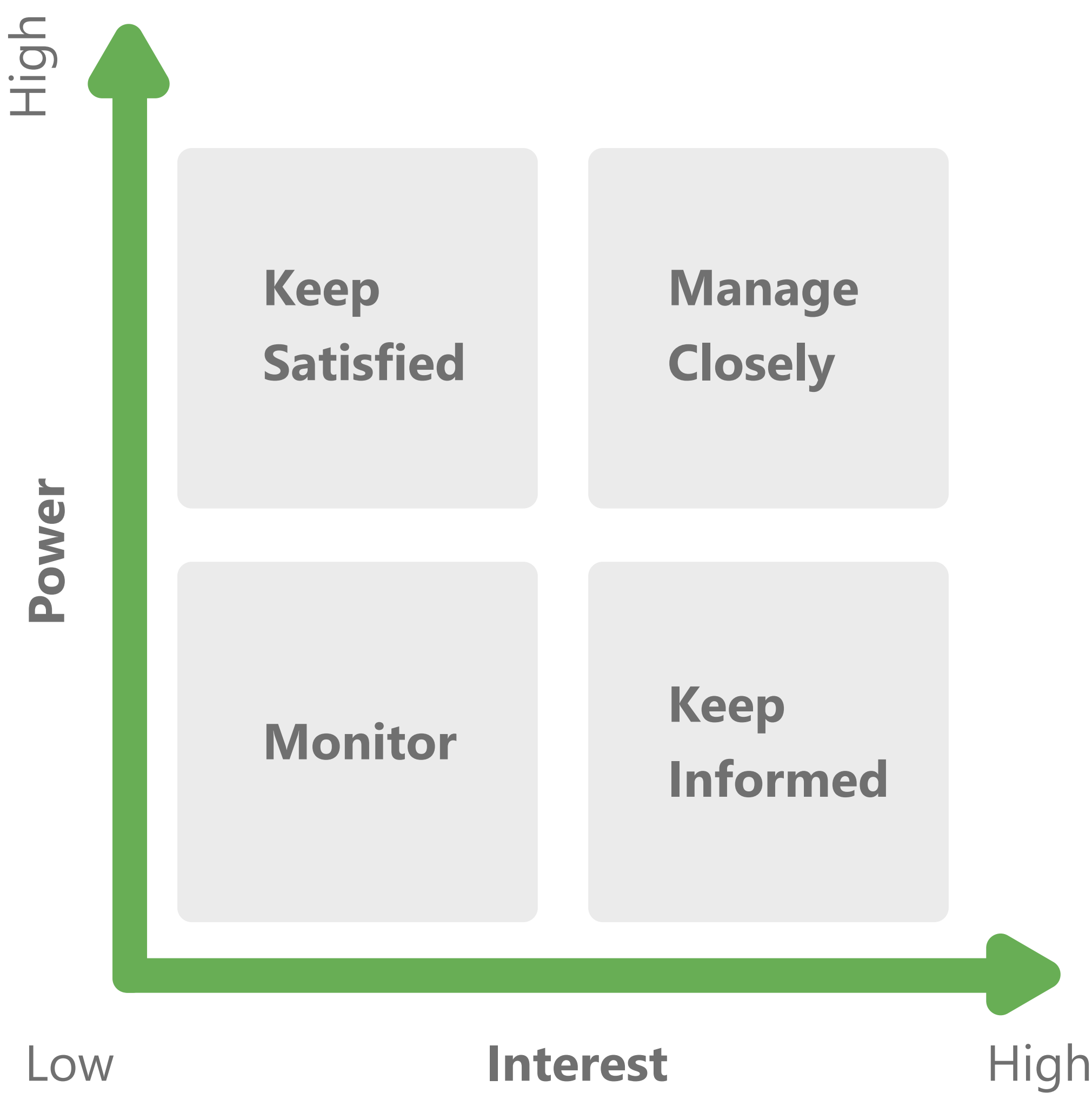
Stakeholder cube

- 3d model.
- Improve classification of stakeholders.
- **Best method**.

TOOLS & TECHNIQUES

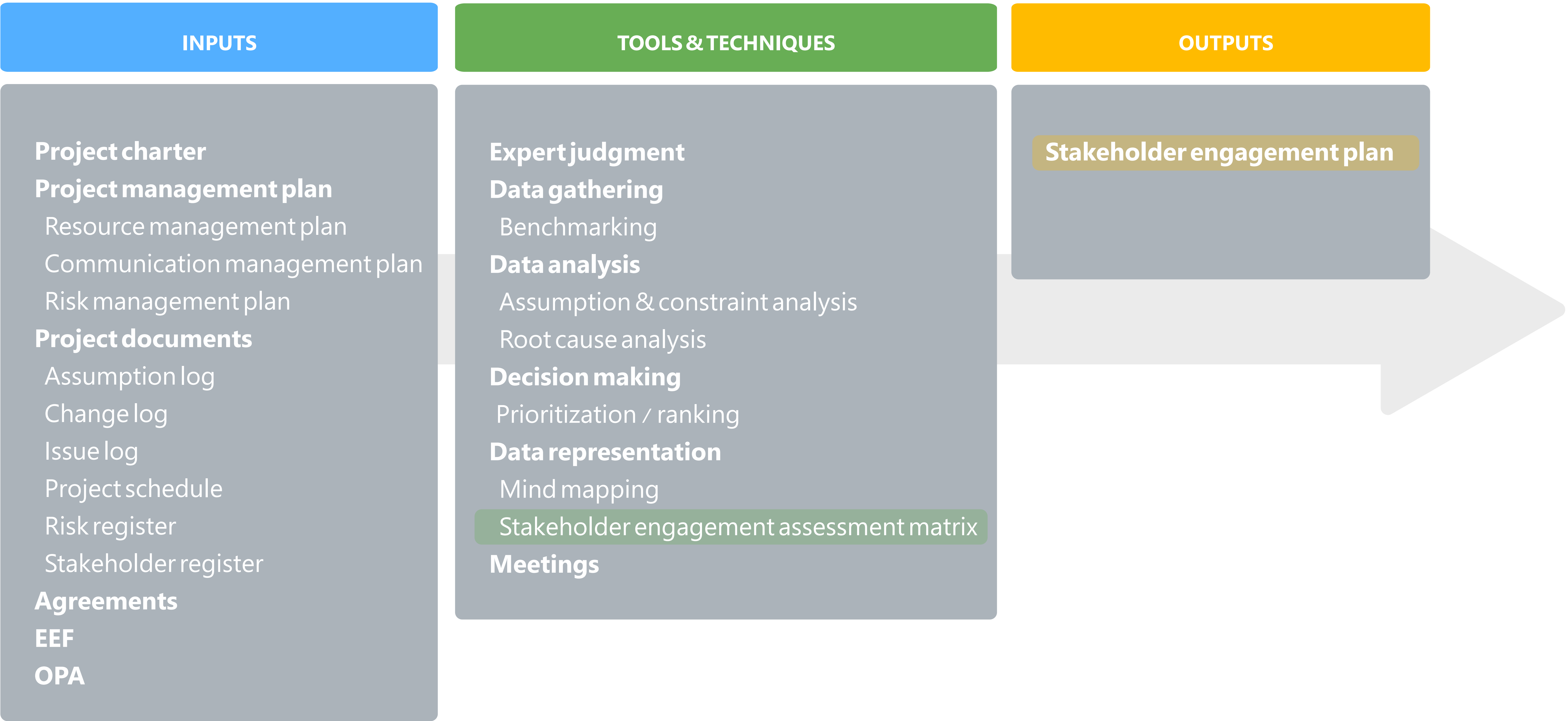
Stakeholder mapping representation تصنيف المعنيين

- **Power**: authority.
- **Interest**: concern.
- **Influence**: involvement.
- **Impact**: ability to change.





# Plan Stakeholders Engagement



- The process of developing **approaches** to involve stakeholders based on their **needs, expectations, interests**, as well as their **potential impact** on the project.

TOOLS & TECHNIQUES

**Stakeholder engagement assessment matrix** مصفوفة تقييم مشاركة المعنيين

- Comparison between **Current** ( C ) & **Desired** ( D ) engagement level.

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C		D		
Stakeholder 2		C		D	
Stakeholder 3			C, D		

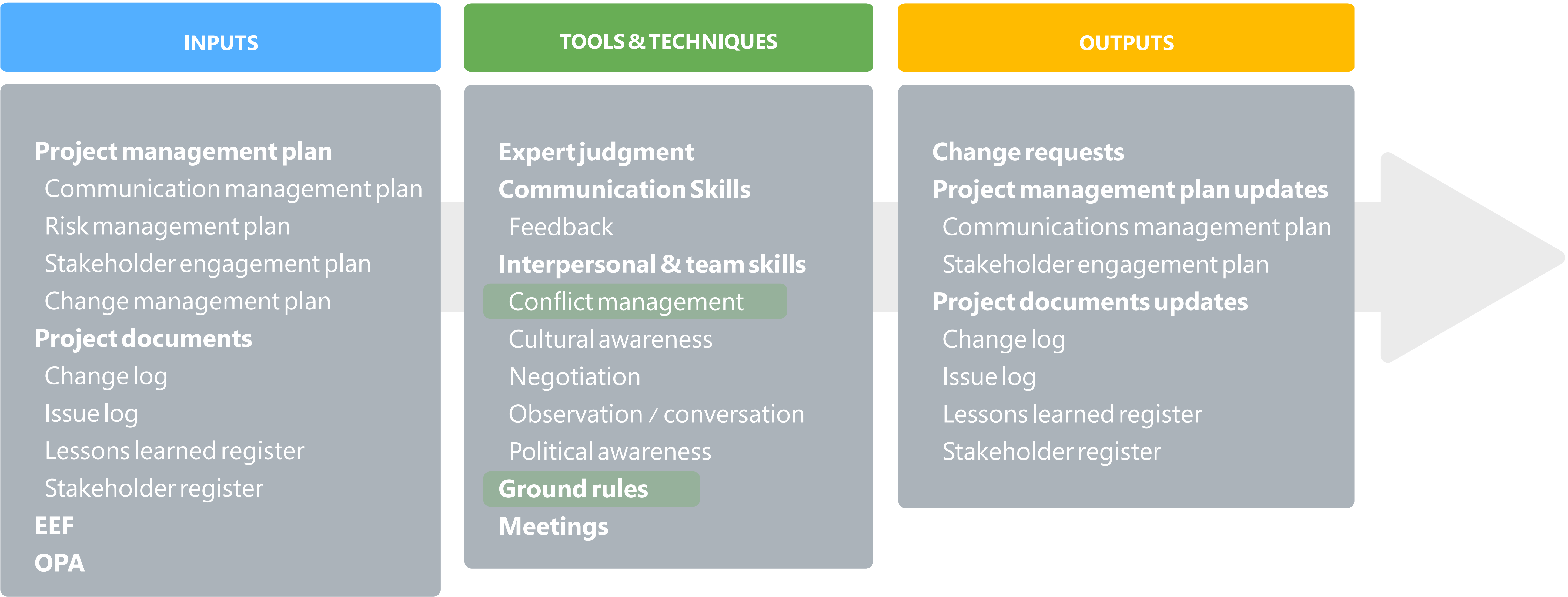
OUTPUT

**Stakeholder engagement plan** خطة إشراك المعنيين

- Identify **specific strategies** and **actions** for **engaging** with individual or group of **stakeholders**.
- To improve stakeholder involvement in **decision making**.

Executing Process

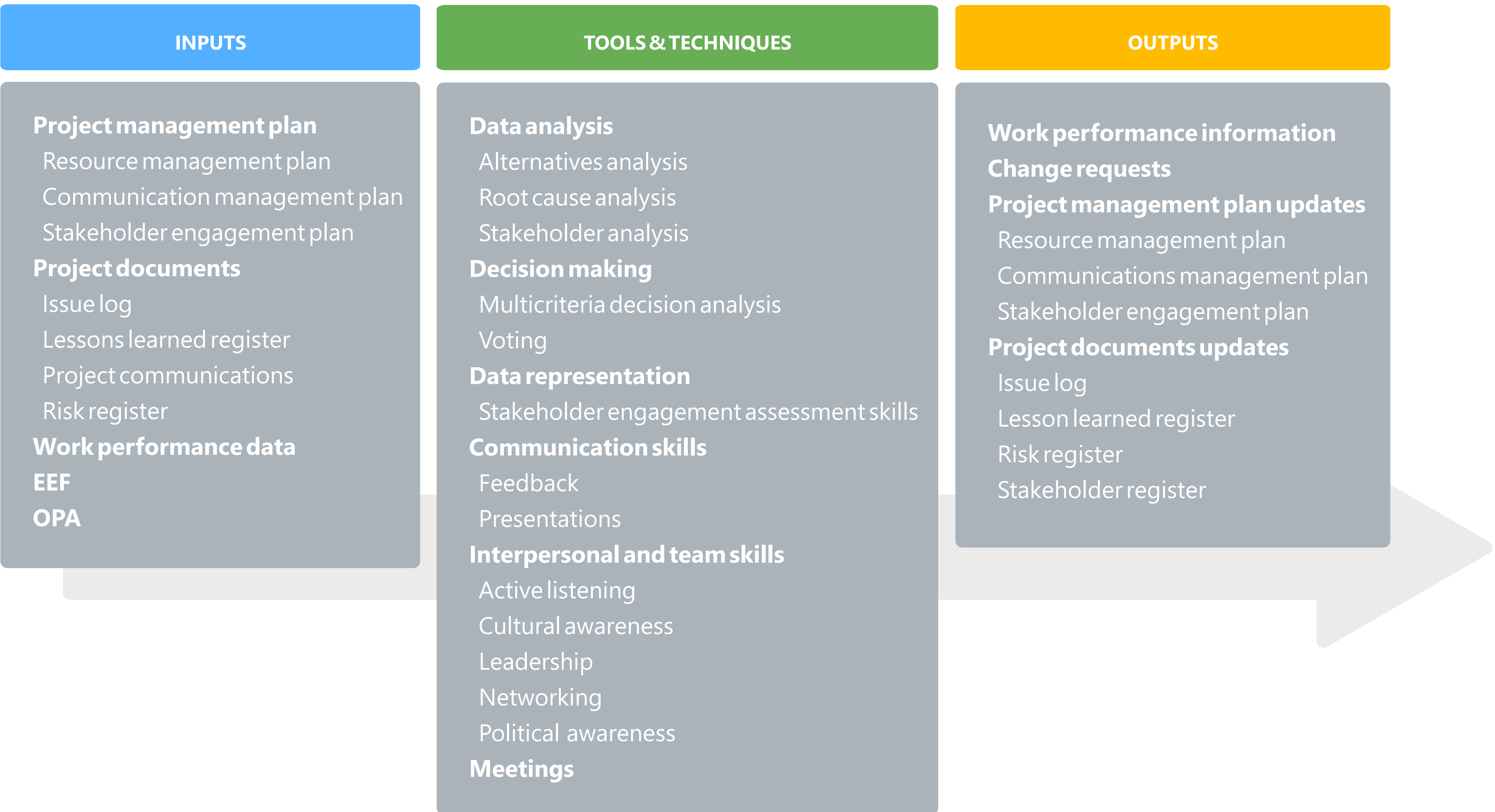
# Manage Stakeholders Engagement



- **Communicating** and **working with Stakeholders** to meet their **needs**.
- Increase support and minimize resistance from Stakeholders.

Monitor & Control Process

# Monitor Stakeholders Engagement



- Monitoring stakeholders relationships.
- Maintains or **increase the efficiency and effectiveness** of stakeholder engagement activities.



