الإصدار v6 2020

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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 شيئًا جــديدًا سوى أنــي لخصــت مــادة الاختبار من خلال قراءتـــي لبعض الكـــتب وحــضوري لــبعض الــدورات والمحاضرات لشرح منهج «محترف إدارة المشاريع PMP ». ولا يخفـى على كلِّ مَن اطَّلع على مقرّر الشهادة مدى دَسامتها وتشابكها وترابط جميــع فصولها، فكان هذا الكشكول الذي جمعته لي ولــزملائــي مرجعًا نستذكرُ من خلاله المنهج في الأسابيع الأخيرة قبل موعد اختبارنا.

لكل من أراد الاستفـــادة من هذا الكشكول قد قمـت بكتابتـــه بأسلــوب يسهل على كل من أراد مراجعــــة المنهج واستذكــــاره بقراءة أقـــل عدد كلمات ممكنة، مشيرًا إلى أهم العبارات (المفاتيح) باللون الأحمر. فيا قارئي الكريم إنْ لم تقرأ منهج اختبار «محترف إدارة المشاريع PMP »

عيا قارئي الحريم إن لم تقرآ منهج احتبار «محترف إداره المساريع PMP » من قبلُ، أو لم تحضــر إحدى الــدورات التي تشرحُهـــا، فلن يفيـــــدك هذا الكشكول؛ فإني لم أتطرق فيه لشرح المنهج، فهذا الكشكول للمراجعـــة فقط، إذ تصعب مراجعة الكتاب على المختبر والرجوع له لكبر حجمه.

والداي العزيزان، لولاكما لما وُجِدتُ في هذه الحياة، زرعتما في قلبي حبَّ العلم والمثابرة، والصمودَ مهما كانت الصعوبات، شكرًا لكما ملءَ السماوات الأرض حبًّا وكرمًا، وأسأل الله -سبحانه وتعالى- أن يطيل أعماركمـــــا وأن يعطيكما الصحة والعافية وراحة البال.

كما أشكر زوجتي الغالية وشريكة عمري «نهلة»؛ لتشجيعها وحرصها الدائم والمتواصل لي، وأشكر والدَيْها؛ لمعاونتنا بشكلٍ كبير في تَنشئة وتربية بنتينا «سارا» و«غاده»، فلكما مني أشدُّ كلماتِ الشكر والعرفان، وأسأل الله -تبارك وتعالى- أن يعينني على ردِّ 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 شهــــــادة «محترف إدارة المشاريع PMP »

وأدعوه سبحانه وتعالى أن يكون هذا الكتاب معينًا لك -قارئي الكريم-في مراجعتك واجتيازك لامتحانك.

وصلى الله وسلم على نبينا محمد وآله وصحبه.

تواصل مع*ي ع*بر Linkedin

in

تواصل مع*ي* عبر **Twitter**

أحمر بن سليمان الميمان

2020/8/8

المفرالل

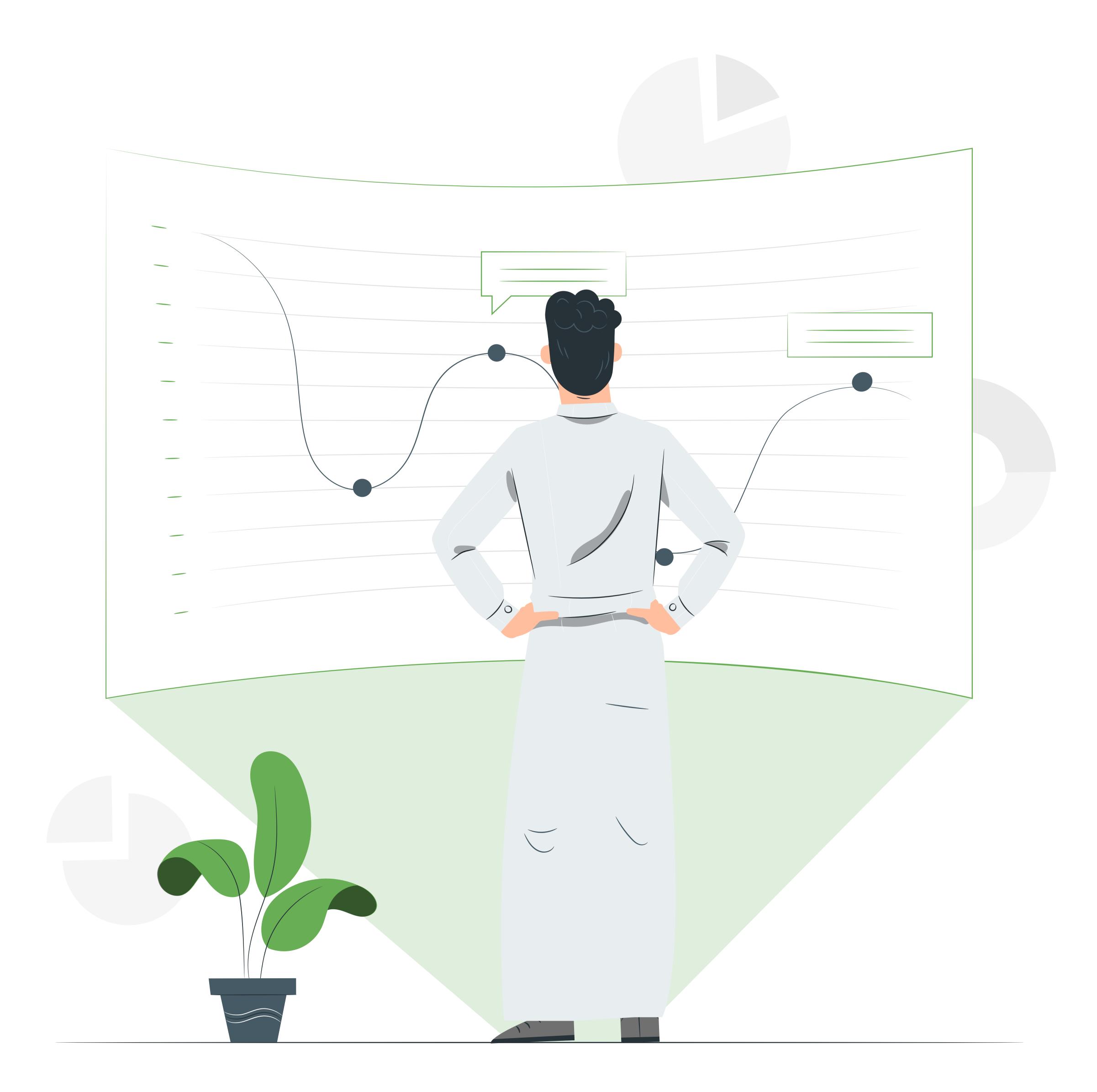
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الفصول الثلاث الأولى

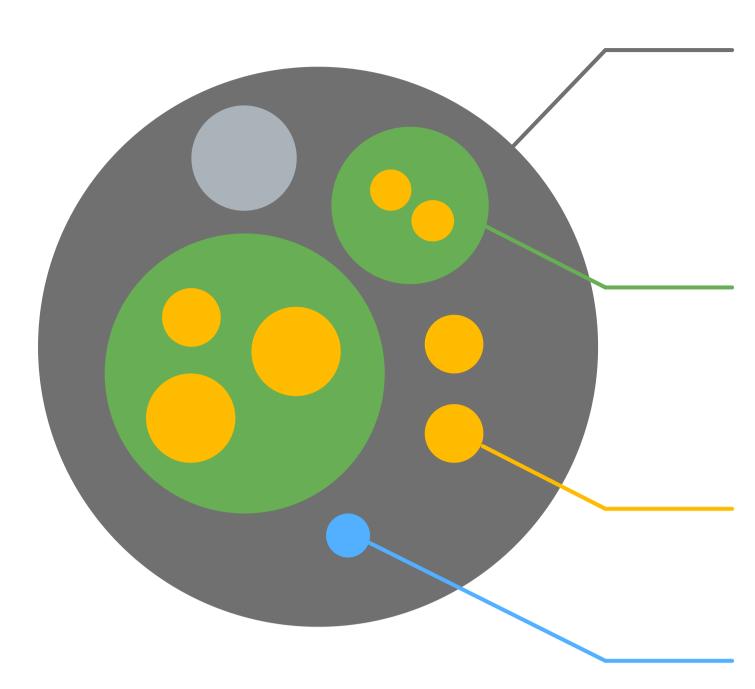
First three chapters

PMBOK 6^{th Ed.} (1–68)



General Definitions

PMP



Portfolio

- Project and program, sub portfolios and operation.
- Achieve strategic objective.

Program

- A group of related projects to obtain benefits.
- Does not contain operation.

Project

• Unique, temporary, drive change, enable Business Value.

Operation

• Ongoing productions, Repeated works.

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.

Work performance data

- Numerical Data
- No analysis or recommendation or charts
- Output from executing processes

Work performance information

- Data after analyzing and forecasting
- Output from M&C processes
- Ex. Change request

Workperformancereport

- Collection of work performance information.
- Presented to stakeholders.

ظروف المشروع والشركة

Enterprise Environmental Factors (EEF)

- Organizational culture.
- Grographic distribution.
- Marketplace conditions.
- Legal restrictions.
- Government or industry standards.
- Enviromental elements.

أصول الشركة

Organizational Process Assets (OPA)

- Lessons learned.
- Historical information.
- Knowledge base.
- Templates.
- Processes, polices, and procedures.

Organic / Simple

- People working side by side.
- Owner is the manager.
- PM authoritty is none.

Functional / Centralized

- Functional manager is responsible.
- Team reports to functional manager.
- PM = Expeditor.

Projectized / Project - oriented

- PM is responsible for everything.
 Team reports to PM.
- PM authority is high.
- After finishing, no home.

Matrix

Weak Matrix

- FM is Higher
- PM is Coordiator

Balanced Matrix

- FM & PM are Equal
- Shares everything
- PM os reponsible for reporting

Strong Matrix

PM is Higher

Supportive - PMO

- Low control.
- Consultive role.
- Templates.
- Best practices.
- Training.
- Access to information.
- Lessons learned.

Controlling - PMO

- Moderate control.
- Supportive type.
- Requires compliance.

Directive - PMO

- High control.
- Manage the project.
- PM reports to PMO.
- Mandatory & enforces.

إدارة كالكلال

Integration Management

PMBOK 6^{th Ed.} (69–128)



Initiating Process

Develop Project Charter

INPUTS

Business documents

Business case

Benefits management plan

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

- Brainstorming
- Focus groups
- Interviews

Interpersonal and team skills

Conflict management

Facilitation

Meeting management

Meetings

OUTPUTS

Project Charter Assumption log

- 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 descreption Key deliverables.
- Overall project risk.
- Summary milestone schedule.
- Preapproved financial resources.
- Key stakeholder list.
- Project exit criteria to close.

Develop Project Management Plan

INPUTS

Project Charter Outputs from other processes EEF OPA

TOOLS & TECHNIQUES

Expert judgment Data gathering

- Brainstorming
- Focus groups
- Interviews
- Interpersonal and team skills
- Conflict management
- Facilitation
- Meeting management
- Meetings

OUTPUTS

Project Management plan

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

Executing Process

Direct & Manage Project Work

INPUTS

Project management plan

Anycomponent

Project documents

Changelog

Lessons learned register

Milestone list

Project communications

Project Schedule

Requiremeents traceability matrix

Riskregister

Risk report

Approved change requests

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

PMIS

Meetings

OUTPUTS

Deliverables

Work performance data

Issue log

Change requests

Project management plan updates

Any components

Project documents updates

Activity list

Assumptionlog

Lessons learned register

Requirements documentation

Risk register

Stakeholderregister

OPA updates

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

Executing Process

Manage Project Knowledge

INPUTS

Project Management Plan

All components

Project documents

Lessons learned register

Project team assignments

Resource breakdown structure

Source selection critieria Stakeholder register

Deliverables

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Knowledge management

Information management
Interpersonal and team skills

Active listening

Facilitation

Leadership

Networking

Political awareness

OUTPUTS

Lessons learned register

Project management plan updates

Anycomponent

OPA updates

• Existing knowledge and creating new knowledge to achieve project objective

Improve project outcome

TOOLS & TECHNIQUES

لادارة المعرفة Knowledge management

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

TOOLS & TECHNIQUES

إدارة المعلومات Information management

• 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 Process

Monitor & Control Project Work

INPUTS

Project Management Plan

All components

Project documents

Assumptionlog

Basis of estimates

Cost forecasts

Issuelog

Lessons learned register

Milestone list

Quality reports

Risk register

Risk report

Schedule forecasts

Work performance information

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data Analysis

Alternatives analysis

Cost_benefit analysis

Earned value analysis

Root cause analysis

Trend analysis

Variance analysis

Decision making

Meetings

OUTPUTS

Work performance reports

Change requests

Project management plan updates

Anycomponent

Project documents updates

Cost forecasts

Issuelog

Lessons learned register

Risk register

Schedule forecasts

- 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.

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Monitor & Control Process

Perform Integrated Change Control

INPUTS

Project Management Plan

- Change management plan
- Configuration management plan
- Scope baseline
- Schedule baseline
- Cost baseline

Project documents

- Basis of estimates
- Requirements traceability matrix
- Risk report

Work performance reports Change requests

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

- Change control tools
- Data analysis
- Alternaties analysis
- Cost_benefit analysis

Decision making

- Voting
- Autocratic decision making
- Multicriteria decision analysis
- Meetings

OUTPUTS

Approved change requests

Project management plan updates

Anycomponent

Project documents updates

Change log

- 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 & requirments.
- 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 ســـــؤال عليها ويطلــــب منك تحديد الخطوة التالية



Closing Process

Close Project or Phase

INPUTS

Project Charter

Project Management Plan

All components

Project documents

Assumption log

Basis of estimates

Changelog

Issue log

Lessons learned register

Milestonelist

Project communications

Quality control measurements

Quality reports

Requirements documentation

Risk regester

Risk report

Accepted deliverables

Business documents

Business case

Benefits management plan

Agreements

Procurement documentation

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data Analysis

Documentanalysis

Regression analysis

Trend analysis

Variance analysis

Meetings

OUTPUTS

Project documents updates

Lessons learned register

Final product, service

Final report

OPA updates

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 الإغلاق هو تأكدك من إستلام Monitor & Control كما أنه عليك التأكد من إغلاق جميع العقود للمقاولين والموردين في مرحلة OPA الخاص بالشركة



إدارة فالكال فالمالكال فالمالكال فالمالكال في المالكال في المالكال

Scope Management



Plan Scope Management

INPUTS

Project Charter

Project Management Plan

Quality Management Plan Project Life Cycle Description Development Approach

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment Data Analysis Alternatives analysis

Meetings

OUTPUTS

Scope Management Plan Requirements Management Plan

- 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

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

تحليل البدائل

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.

Collect Requirements

INPUTS

Project charter

Project management plan

Scope management plan

Requirements management plan

Stakeholder engagement plan

Project documents

Assumptionlog

Lessons learned register

Stakeholderregister

Business documents

Business case

TOOLS & TECHNIQUES

Benchmarking

Focus group

Interviews

Generate new Idea.

Confidential information.

Questionnaires & surveys

Large No. of audience.

Prequalified stakeholders with Experts.

Brainstorming

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Brainstorming

Interviews

Focus groups

Questionnaires and Survey

Benchmarking

Data analysis

Documentanalysis

Decision making

Voting

Multicriteria decision analysis

Data representation

Affinity diagrams

Mind mapping

Interpersonal and team skills

Nominal group technique

Observation / conversation

Facilitation

Context diagram

Prototypes

TOOLS & TECHNIQUES

Voting

التصويت

- Unanimity = all agrees
- Majority = 50% agrees
- Plurality = largest group

TOOLS & TECHNIQUES

Autocratic

One individual takes responsibility.

TOOLS & TECHNIQUES

Multicriteria Making

• Decision Matrix to provide a systematic analytical.

TOOLS & TECHNIQUES

Nominal group

- Enhance brainstorming
- Voting, ranking, prioritization.

TOOLS & TECHNIQUES

Observation

Hidden requirements

OUTPUTS

Requirements documentation Requirements traceability matrix

TOOLS & TECHNIQUES

Facilitation تحليل البدائل

- Bring key Stakeholders to define requirements.
- Cross-functional.

TOOLS & TECHNIQUES

Mind Mapping

 Consolidates ideas from brainstorming and generate newideas

TOOLS & TECHNIQUES

Affinity diagram

 Large no of idea to classified into groups

TOOLS & TECHNIQUES

Context diagram

- Detailed description.
- Visual display.

TOOLS & TECHNIQUES

Prototype

- Early feedback.
- Reduces risk.

OUTPUT

Requirements Traceability Matrix

- Link product requirements from origin to deliverables.
- Managing changes to product scope.

OUTPUT

Requirement Documentation

- Business requirements.
- Stakeholder Requirements.
- Functional & Nonfunctional Requirements.

• Compares other projects & improvements.

- Transition Requirements.
- Project Requirements.
- Quality Requirements.

Define Scope

INPUTS

Project Charter

Project Management Plan

Scope Management Plan

Project Documents

Assumption log

Req. Documentation

Risk Register

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data Analysis

Alternatives analysis

Decision Making

Multicriteria Decision analysis

Interpersonal & Team Skills

Facilitation

Product Analysis

OUTPUTS

Project Scope Statement

Project Documents updates

Assumption log

Req. Documentation

Requirement Traceability Matrix

Stakeholderregister

• 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

INPUTS

Project Management Plan

Scope Management Plan

Project Documents

Scope Statement

Req. Documentation

EEF

OPA

TOOLS & TECHNIQUES

Expert judgment Decomposition

OUTPUTS

Scope Baseline

Project Documents updates

Assumptionlog

Req. Documentation

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).

Monitor & Control Process

Validate Scope

INPUTS

Project Management Plan

Scope Management Plan
Requirements Management Plan
Scope Baseline

Project Documents

Lessons learned register
Quality reports

Requirements traceability matrix

Verified deliverables

Work performance data

TOOLS & TECHNIQUES

Inspection
Decision Making
Voting

OUTPUTS

Accepted deliverables
Work performance information

Project Documents updates

Lessons learned register
Requirements documentation
Requirements traceability matrix

• Formalizing acceptance.

INPUT

Verified Deliverables

Checked in control quality process

TOOLS & TECHNIQUES

Inspection

• Check the deliverables by Customers or sponsor to get the formal acceptance.

OUTPUT

Accepted Deliverables

• Deliverable that meet the acceptance criteria and formally signed off and approved by the customer or sponsor.

OUTPUT

Change Request

• The completed deliverables have not been formally accepted.

Monitor & Control Process

Control Scope

INPUTS

Project Management Plan

- Scope Management Plan
- Requirements Management Plan
- Change Management plan
- Configuration management plan
- Scope Baseline
- Performance measurement Baseline

Project Documents

- Lessons learned register
- Requirements documentation
- Requirements traceability matrix

Work performance data
OPA

TOOLS & TECHNIQUES

Dataanalysis

Variance analysis
Trend analysis

OUTPUTS

Work performance information

Change request

Project Management Plan Update

- Scope Management plan
- Scope Baseline
- Schedule Baseline
- Performance Measurement baseline

Project Documents Update

- Lesson learned register
- Req. Documentation
- Req. traceability Matrix

- 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

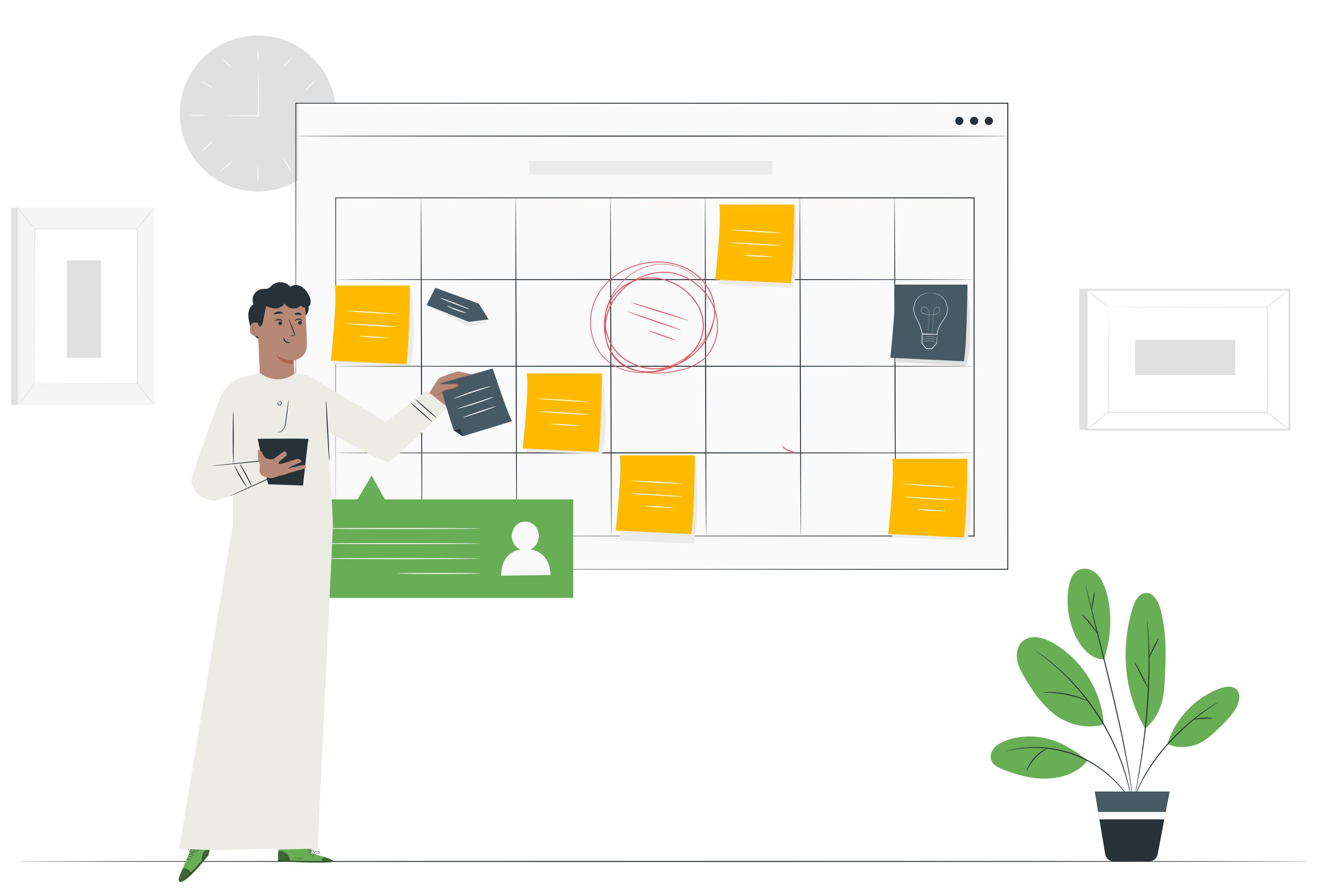
Work Performance Information

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

إدارة الكان

Schedule Management

PMBOK 6^{th Ed.} (173 – 230)



Plan Schedule Management

INPUTS

Project Management Plan

Project Charter

Scope management plan Development approach

EEF

ОРА

TOOLS & TECHNIQUES

Expert judgment
Data Analysis
Meetings

OUTPUTS

Schedule management plan

• 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

INPUTS

Project Management Plan

Schedule management plan Scope baseline

EEF

OPA

TOOLS & TECHNIQUES

Expert judgment Decomposition

Rolling wave planning

Meetings

OUTPUTS

Activity list

Activity attributes

Milestone list

Change requests

Project management plan updates

Schedule baseline

Cost baseline

- 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.

Sequence Activities

INPUTS

Project Management Plan

Schedule management plan Scope baseline

Project documents

Activity attributes

Activity list

Assumption log

Milestonelist

EEF

OPA

TOOLS & TECHNIQUES

Precedence diagramming method Dependency determination and integration Leads and lags

OUTPUTS

Project schedule network diagram

Project documents updates Activity attributes

Activity list

Assumption log

Milestone list

• Identifying and documenting relationship among the project activities.

PMIS

• 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

Discretionary

TOOLS & TECHNIQUES

Mandatory

Hard logic

Dependency Determination

Legally or contractually required

• Inherent in the nature of the work.

Prototype it before it can be tested.

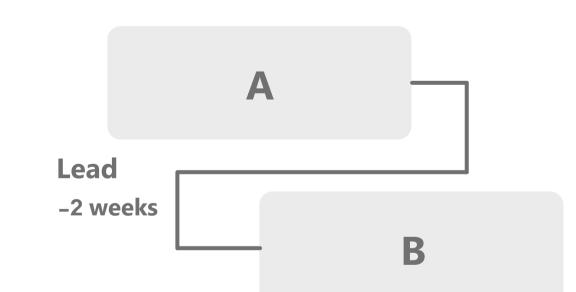
- Preferred logic
- Soft logic
- Best practices.

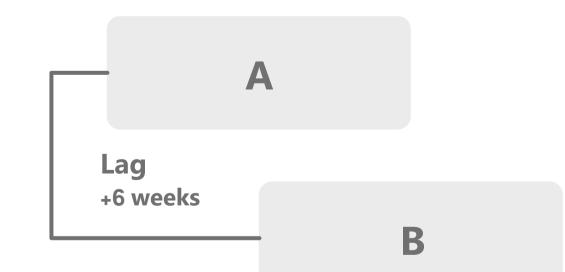
External

TOOLS & TECHNIQUES

leads and lags

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



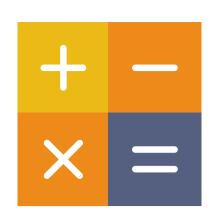


- Relationship between project activities & non-project activities.
- Outside the project team control

Internal

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

Estimate Activity Duration



INPUTS

Project Management Plan

Schedule management plan

Scope baseline

Project documents

Activity attributes

Activity list

Assumption log

Lessons learned register

Milestone list

Project team assignments

Resource breakdown structure

Resource calendars

Resource requirements

Risk register

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Analogous estimating

Parametric estimating

Three_point estimating

Bottom_up estimating

Data Analysis

Alternatives analysis

Reserve analysis

Decision making

Meetings

OUTPUTS

Duration estimates

Basis of estimates

Project documents updates

Activity attributes

Assumption log

Lessons learned register

- 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

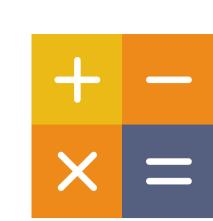
Contingency Reserve

- 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



INPUTS

Project Management Plan

Schedule management plan

Scope baseline

Project documents

Activity attributes

Activity list

Assumption log

Basis of estimates

Duration estimates

Lessons learned register

Milestone list

Project schedule network diagrams

Project team assignments

Resource calendars

Resource requirements

Risk register

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Schedule network analysis

Critical path methods

Resource optimization

Data analysis

What_if scenario analysis

Simulation

Leads and lags

Schedule compression

PMIS

Agile release planning

OUTPUTS

Schedule baseline

Projectschedule

Schedule data

Project calendars

Change requests

Project management plan updates

Schedule management plan

Cost baseline

Project documents updates

Activity attributes

Assumptionlog

Duration estimates

Lessons learned register

Resource requirements

Risk register

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 successor EF presuccessor)
- FF = (LS successor LF 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 القـــيود التي وضعهــا ممــول المشــروع أو إدارة الشركة، فإذا ذكر أنه لا يستطيع زيادة ميزانية المشروع أو زيادة العاملين فاستبعد فورا خيار الـ Crashing

وفي بعض الأوقات يزودك السؤال بتقــارير أداء المشروع CPI فإن كان هناك فائض في الميزانيـــة والمشــروع متأخر عن تـــاريخه المحدد فخيار 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

INPUTS

Project Management Plan

- Schedule management plan
- Schedule baseline
- Scope baseline
- Performance measurement baseline

Project documents

- Lessons learned register
- Project calendars
- Project schedule
- Resource calendars
- Schedule calendars

Work performance data

OPA

TOOLS & TECHNIQUES

Data Analysis

- Earned value analysis
- Iteration burndown chart
- Performance reviews
- Trend analysis
- Variance analysis
- What_if scenario analysis

Critical path method

PMIS

Resource optimization

Leads and lags

Schedule compression

OUTPUTS

Work performance information

Schedule forecasts

Change requests

Project management plan updates

- Schedule management plan
- Schedule baseline
- Cost baseline
- Performance measurement baseline

Project documents updates

- **Assumption log**
- Basis of estimates
- Lessons learned register
- Project schedule
- Resource calendars
- Risk register
- Schedule data
- 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.

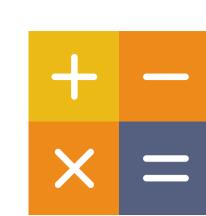


Cost Management

PMBOK 6^{th Ed.} (231–270)



Plan Cost Management



INPUTS

Project Charter

Project Management Plan
Schedule management plan
Risk management plan

FFF

OPA

TOOLS & TECHNIQUES

Expert judgment
Data Analysis
Meetings

OUTPUTS

Cost management plan

• 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

INPUTS

Project Management Plan

Cost management plan
Quality management plan
Scope baseline

Project documents

Lesson learned register
Project schedule
Resources requirements
Risk register

EEF OPA

TOOLS & TECHNIQUES

Expertjudgment

Analogous estimating

Parametric estimating

Three_point estimating

Bottom_up estimating

Data Analysis

Alternatives analysis

Reserve analysis

Cost of quality

PMIS

Decision making

Voting

OUTPUTS

Cost estimates

Basis of estimates

Project documents updates

Assumption log

Lessons learned register

Risk register

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

INPUTS

Project Management Plan

Cost management plan

Resource management plan

Scope baseline

Project documents

Basis of estimates

Cost estimates

Project schedule

Risk register

Business documents

Business case

Benefits management plan

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Expert judgment Cost aggregation

Data analysis

Reserve analysis

Historical information review Funding limit reconciliation

Financing

OUTPUTS

Cost baseline

Project funding requirements
Project documents updates

Cost estimates

Project schedule

Risk register

TOOLS & TECHNIQUES

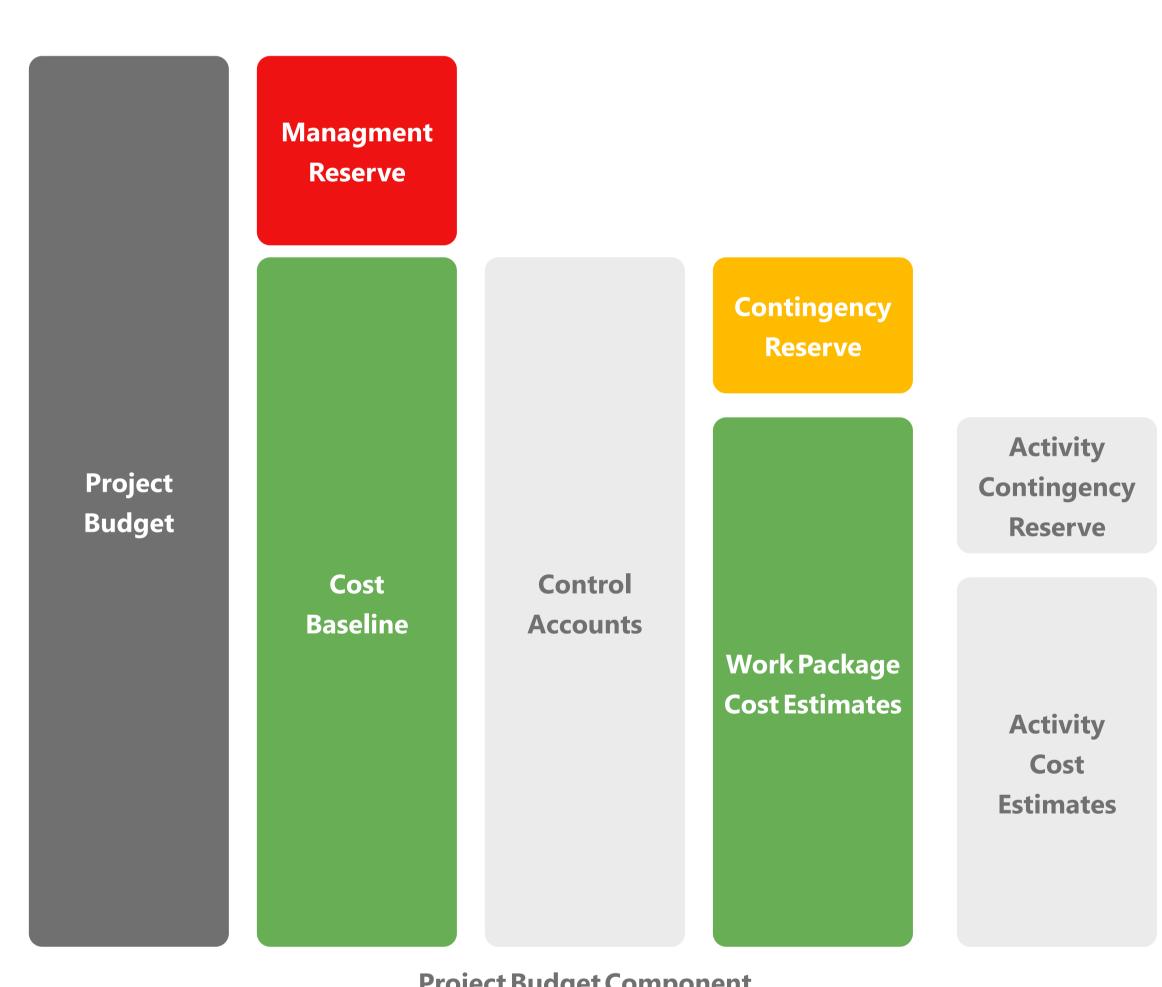
Funding Limit Reconciliation

Reschedule the project activities.

OUTPUT

Cost Baseline

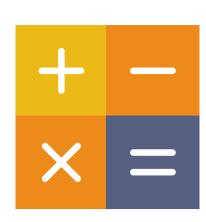
- Approved version of cost.
- Changed through formal change control procedures.
- Basis of comparison.



Project Budget Component

Monitor & Control Process

Control Cost



INPUTS

Project Management Plan

Cost management plan

Cost baseline

Performance measurement baseline

Project documents

Lessons learned register

Project funding requirements

Work performance data

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data Analysis

Earned value analysis

Variance analysis

Trend analysis

Reserve analysis

To_complete performance index PMIS

OUTPUTS

Work performance information

Cost forecasts

Change requests

Project management plan updates

Cost management plan

Cost baseline

Performance measurement baseline

Project documents updates

Assumptionlog

Basis of estimates

Cost estimates

Lessons learned register

Risk register

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)
- o on planned cost

TOOLS & TECHNIQUES

Variance Analysis

CV F\/ **D**\/

- **SV** = EV PV
- behind Schedule

+ Ahead of Schedule

Schedule Variance

• o On Schedule

Cost Variance

- **CV** = EV AC
- + Under Budget
- Overbudget
- o On budget

Schedule Performance Index

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

Cost Performance Index

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

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



إدارة الكوكاك Quality Management

PMBOK 6^{th Ed.} (271–306)



Plan Quality Management

INPUTS

Project Charter

Project Management Plan

Requirements management plan

Risk management plan

Stakeholder management plan

Scope baseline

Project documents

Assumptionlog

Requirements documentation

Requirements traceability matrix

Risk register

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Benchmarking

Brainstorming

Interviews

Data Analysis

Cost_benefit analysis

Cost of quality

Decision making

Multicriteria decision analysis

Data representation

Flowcharts

Logical data model

Matrix diagrams

Mind mapping

Test and inspection planning

Meetings

OUTPUTS

Quality management plan

Quality metrics

Project management plan updates

Risk management plan

Scope baseline

Project documents updates

Lessons learned register

Requirements traceability matrix

Riskregister

Stakeholderregister

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.

Manage Quality

INPUTS

Project Management Plan

Quality Management Plan

Project documents

- Lessons learned register
- Quality control measurements
- Quality metrics
- Risk report

OPA

TOOLS & TECHNIQUES

Data gathering

Checklists

Data analysis

- Alternatives analysis
- Documentanalysis
- Process analysis
- Root cause analysis

Decision making

Multicriteria decision analysis

Data representation

- Affinity diagrams
- Cause-and-effect diagrams
- Flowcharts
- Histograms
- Matrix diagrams
- Scatter diagrams

Audits

Design for X

Problem solving

Quality improvement methods

OUTPUTS

Quality reports

Test and evaluation documents

Change requests

Project management plan updates

- Quality management plan
- Scope baseline
- Schedule baseline
- Cost baseline

Project documents updates

- Issuelog
- Lessons learned register
- Risk register

• 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.

Control Quality

INPUTS

Project Management Plan

Quality Management Plan

Project documents

Lessons learned register

Quality metrics

Test and evaluation documents

Approved change requests

Deliverables

Work performance data

EEF

OPA

TOOLS & TECHNIQUES

Data gathering

Checklists

Check sheets

Statistical sampling

Questionnaires and surveys

Data analysis

Performance reviews

Root cause analysis

Inspection

Testing / product evaluations

Data representation

Cause_and_effect diagrams

Control charts

Histogram

Scatter diagrams

Meetings

OUTPUTS

Quality control measurements

Verified deliverables

Work performance information

Change requests

Project management plan updates

Quality management plan

Project documents updates

Issuelog

Lessons learned register

Risk register

Test and evaluation documents

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

TOOLS & TECHNIQUES

Checklist

• Structured manner.

TOOLS & TECHNIQUES

Checksheet

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

TOOLS & TECHNIQUES

Statistical sampling

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

TOOLS & TECHNIQUES Inspections

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 Deliverable وتقـــوم في هذه العملية المدخل Control Quality أنت كمدير مشروع وفريق العمل بالتأكد من سلامة وصحة الــ Verified deliverable ليخرج بعد التأكد منها.



إدارة الكوارد

Resource Management

PMBOK 6^{th Ed.} (307 – 358)



Plan Resource Management

INPUTS

Project Charter

Project Management Plan

Quality Management Plan Scope baseline

Project documents

Project schedule

Requirements documentation

Risk register

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data representation

Hierarchical charts

Responsibility assignment matrix

Text_oriented formats

Organizational theory

Meetings

OUTPUTS

Resource management plan

Team charter

Project documents updates

Assumption log

Risk register

TOOLS & TECHNIQUES

Responsibility assignment matrix (RAM)

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

TOOLS & TECHNIQUES

Text-oriented formant

• More details for each team member responsibility and skills.

TOOLS & 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 & 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.

Executing Process

Estimate Activity Resource

INPUTS

Project Management Plan

Resource management plan

Scope baseline

Project documents

Activity attributes

Activity list

Assumptionlog

cost estimates

Resource calendars

Risk register

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Bottom_up estimating

Analogous estimating

Parametric estimating

Dataanalysis

Alternatives analysis

PMIS

Meetings

OUTPUTS

Resource requirements

Basis of estimates

Resource breakdown structure

Project documents updates

Activity attributes

Assumption log

Lessons learned register

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.

Executing Process

Acquire Resource

INPUTS

Project Management Plan

Resource management plan
Procurement management plan
Cost baseline

Project documents

Project schedule

Resource calendars

Resource requirements

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Decision making

Multicriteria decision analysis

Interpersonal and team skills

Negotiation

Pre-assignment

Virtual teams

OUTPUTS

Physical resource assignments

Project team assignments

Resource calendars

Change requests

Project management plan updates

Resource management plan

Cost baseline

Project documents updates

Lessons learned register

Project schedule

Resource breakdown structure

Resource requirements

Risk register

Stakeholderregister

EEF updates

OPA updates

- 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.

Develop Team

INPUTS

Project Management Plan

Resource management plan

Project documents

Lessons learned register

Project schedule

Project team assignments

Resource calendars

Team charter

EEF

OPA

TOOLS & TECHNIQUES

Colocation

Virtualteams

Communication technology

Interpersonal and team skills

Conflict management

Influencing

Motivation

Negotiation

Team building

Recognition and rewards

Training

Individual and team assessments

Meetings

OUTPUTS

Team performance assessments

Change requests

Project management plan updates

Resource management plan

Project documents updates

Lessons learned register

Project schedule

Project team assignments

Resource calendars

Team charter

EEF updates

OPA updates

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

TOOLS & TECHNIQUES

Co-location

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

TOOLS & TECHNIQUES

Communication technology

• Ex, email, website, video conference.

TOOLS & TECHNIQUES

Recognition and rewards

• When team moral is low.

TOOLS & TECHNIQUES

Individual and team assessments

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

TOOLS & TECHNIQUES

Influencing

• Gathering information / maintaining mutual trust.

TOOLS & 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 & TECHNIQUES Team Building

Forming

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

Storming

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

Norming

- Begin to work together.
- Learn to trust.



Performing

- Team is interdependent.
- Worksmoothly.
- Effectively.
- Well-organized.



Manage Team

INPUTS

Project Management Plan

Resource management plan

Project documents

Issue log

Lessons learned register

Project team assignments

Team charter

Work performance reports

Team performance assessments

EEF

OPA

TOOLS & TECHNIQUES

Interpersonal and team skills

Conflict management

Decision making

Emotionalintelligence

Influencing

Leadership

PMIS

OUTPUTS

Change requests

Project management plan updates

Resource management plan

Schedule baseline

Cost baseline

Project documents updates

Issuelog

Lessons learned register

Project team assignments

EEF updates

• Tracking team member performance, resolving issues, manage team changes.

TOOLS & TECHNIQUES

Conflict management

Problem solve / Collaborate

- Open dialogue.
- Win win situation.
- Best way.

Smooth / Accommodate

- Agreement.
- Maintain harmony & relationship.

Compromise / Reconcile

- Satisfaction to all parties.
- Temporarily or partially resolve.
- Lose lose situation.

Withdraw / Avoid

- Postponing.
- to be resolved by others.

Force / Direct

- One's viewpoint.
- Authority, power, emergency.
- Win-lose situation.

TOOLS & TECHNIQUES

Emotional intelligence

• To reduce tension & increase cooperation.

TOOLS & TECHNIQUES

Influencing

Maintaining mutual trust.

Monitor & Control Process

Control Resource

INPUTS

Project Management Plan

Resource management plan

Project documents

Issue log

Lessons learned register

Physical resource assignments

Resource breakdown structure

Resource requirements
Risk register

Work performance data

Agreements

OPA

TOOLS & TECHNIQUES

Dataanalysis

Alternatives analysis

Cost_benefit analysis

Performance reviews

Trend analysis

Problem solving

Interpersonal and team skills

Negotiation

Influencing

PMIS

OUTPUTS

Work performance information

Change requests

Project management plan updates

Resource management plan

Schedule baseline

Cost baseline

Project documents updates

Assumptionlog

Issue log

Lessons learned register

Physical resource assignments

Resource breakdown structure

Riskregister

• 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.

إدارة النواصل

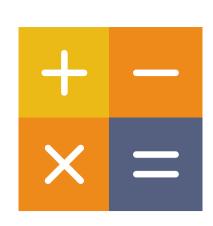
Communication Management

PMBOK 6^{th Ed.} (359–349)





Plan Communication Management



INPUTS

Project charter

Project management plan

Resource management plan Stakeholder engagement plan

Project documents

Requirements documentation Stakeholder register

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Communication requirements analysis

Communication technology

Communication models

Communication methods

Interpersonal and team skills

communication styles assessment

Political awareness

Cultural awareness

Data representation

Stakeholder engagement assessment matrix p30

Meetings

OUTPUTS

Communication management plan

Project management plan updates

Stakeholderengagement plan

Project documents updates

Project schedule
Stakeholder register

Stakeholderregister

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

TOOLS & TECHNIQUES

Communication technology

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

OUTPUT

Communications management plan

Focus on stakeholder authority, power

Focus on stakeholder culture differences,

understanding & reduce misunderstanding.

influence & organization strategy.

Who will send.

TOOLS & TECHNIQUES

TOOLS & TECHNIQUES

Cultural awareness

Political awareness

- 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.

Communication models

TOOLS & TECHNIQUES

- Encode.
- Transmit.

Decode.

- Acknowledge.
- Feedback.

تأكد من قراءتك لسؤال عدد قنوات الإتصال جيدا، فأحيانـــا تعطيك المسألة عدد المعنيين ولكن بدون الأخذ بالحسبان

مدير المشروع فلم يتم عده من المعنيين، ففي هذه الحالة عليك إضافة (+1) على عدد المعنييين ثم إتباع القانون المذكور بالأعلى

Pull

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

Manage Communication

Project management plan Resource management plan Communications management plan Stakeholder engagement plan Project documents Change log Issue log Lessons learned register Quality report Risk report Stakeholder register Work performance reports EEF OPA



OUTPUTS

Project communications

Project management plan updates

Communications management plan

Stakeholder en gagement pla**n**

Project documents updates

Issue log

Lessons learned register

Project schedule

Risk register

Stakeholderregister

OPA updates

- Key benefit = Efficient and effective information flow.
- Effective Communication = Provide Right information to Right Stakeholder in Right Time with Right Format.
- Efficient 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.

INPUT

Changelog

Communicate changes approved or rejected.

TOOLS & TECHNIQUES

Active listening

Understanding, acknowledge, clarifying.

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 Communication

INPUTS TOOLS & TECHNIQUES **OUTPUTS** Work performance information Project Management Plan Expertjudgment Resource management plan **Change requests PMIS** Project management plan updates Communication management plan Data Analysis Stakeholderengagement plan Communications management plan Stakeholder engagement assessment matrix **Project document** Stakeholder engagement plan Interpersonal and team skills Project documents updates Issuelog Observation / conversation Lesson learned register Issuelog Meetings Lesson learned register Project Communications Stakeholderregister Work performance data EEF OPA

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

General Definitions

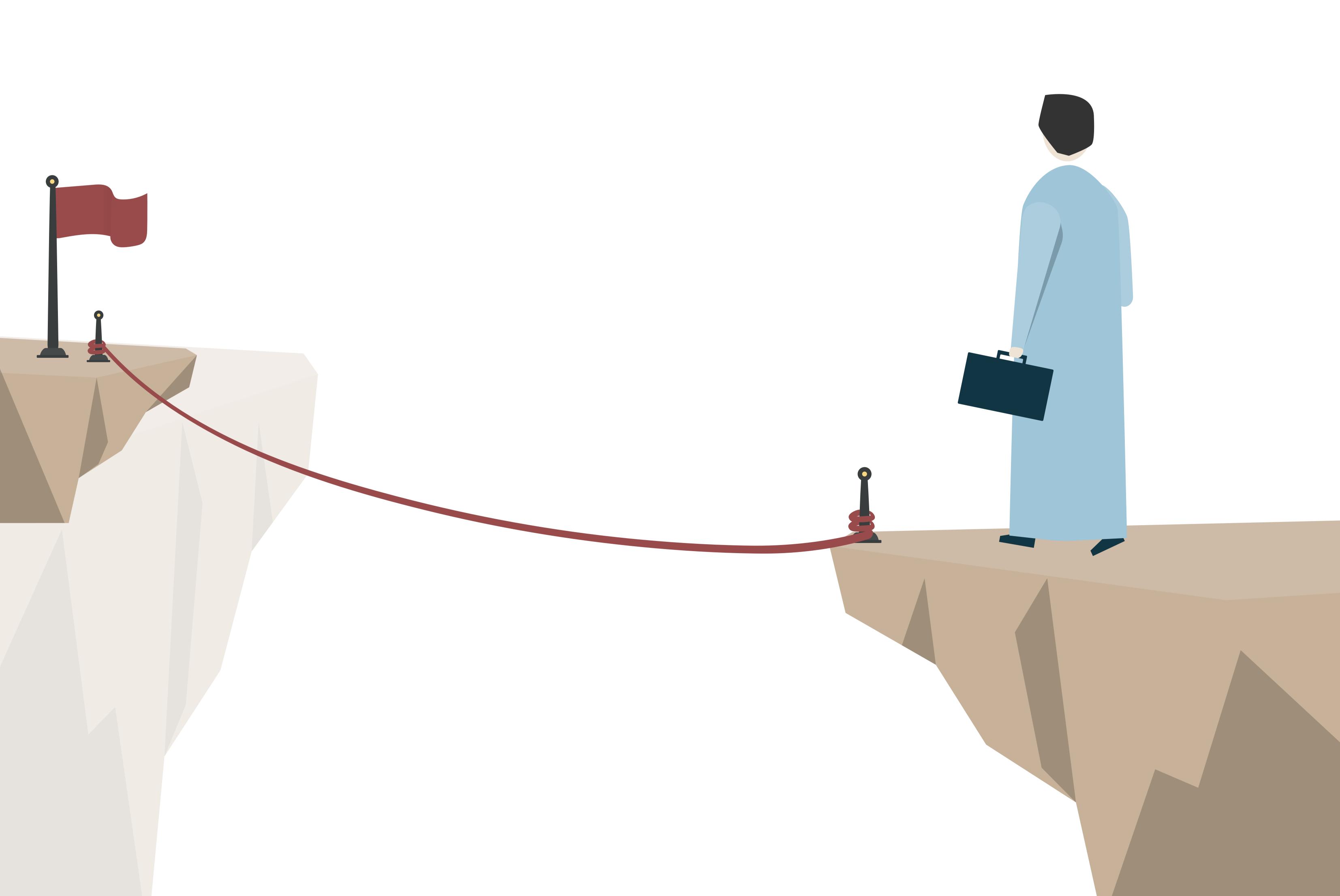
Communication

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 الكولارة الكولار

Risk Management

PMBOK 6^{th Ed.} (395–458)



Plan Risk Management

INPUTS

Project charter Project management plan All components Project documents Stakeholder register EEF OPA

TOOLS & TECHNIQUES

Expert judgment
Data analysis
Stakeholder analysis
Meetings

OUTPUTS

Risk management plan

OUTPUT

بر 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.

Identify Risk

INPUTS

Project management plan

Requirements management plan

Schedule management plan

Cost management plan

Quality management plan

Resource management plan Risk management plan

Scope baseline

Schedule baseline

Cost baseline

Project documents

Assumptionlog

Cost estimates

Duration estimates

Issuelog

Lessons learned register

Requirements documentation

Resource requirements

Stakeholderregister

Agreements

Procurement documentation

EEF

OPA

TOOLS & TECHNIQUES

Expert judgment

Data gathering

Brainstorming

Checklists

Interviews

Data analysis

Root cause analysis

Assumption and constraint analysis

SWOT analysis

Documentanalysis

Interpersonal and team skills

Facilitation

Prompt lists

Meetings

OUTPUTS

Risk register

Risk report

Project documents updates

Assumption log

Issue log

Lessons learned register

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

اطر Risk Register

سجل المخاطر

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

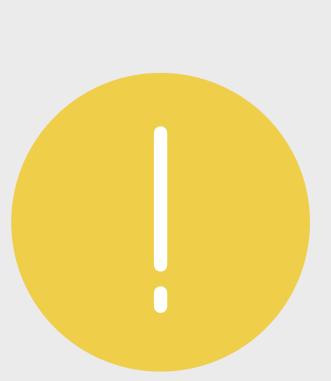
OUTPUT

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

INPUTS

Project Management Plan

Risk management plan

Project documents

Assumption log

Risk register

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Interviews

Data Analysis

Risk data quality assessment

Risk probability and impact assessment

Assessment of other risk parameters

Interpersonal and team skills

Facilitation

Risk Categorization

Data representation

Probability and impact matrix

Hierarchical charts

Meetings

OUTPUTS

Project document updates

Assumption log

Riskregister

Risk report

- 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

مصفوفة احتمالية وتأثير المخاطر Probability&impact matrix

- Grid for mapping.
- Divide into priority groups.

TOOLS & TECHNIQUES

Risk categorization تصنيف المخاطر

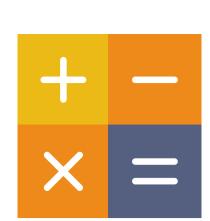
- Categorized by sources of risk.
- Most exposed to the effects of uncertainty.
- More effective risk responses.

TOOLS & TECHNIQUES

المخطط الهرمي Hierarchical chart

- More than two parameters.
- Bubble chart (3d).

Perform Quantitative Risk Analysis



INPUTS

Project Management Plan

Risk management plan

Scope baseline

Schedule baseline

Cost baseline

Project documents

Assumption log

Basis of estimates

Cost estimates

Cost forecasts

Duration estimates

Milestonelist

Resource requirements

Risk register

Risk report

Schedule forecasts

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Interviews

Interpersonal and team skills

Facilitation

Representation of uncertainty

Data Analysis

Simulations

Sensitivity analysis

Decision tree analysis

Influence diagram

OUTPUTS

Project documents updates

Risk report

- 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

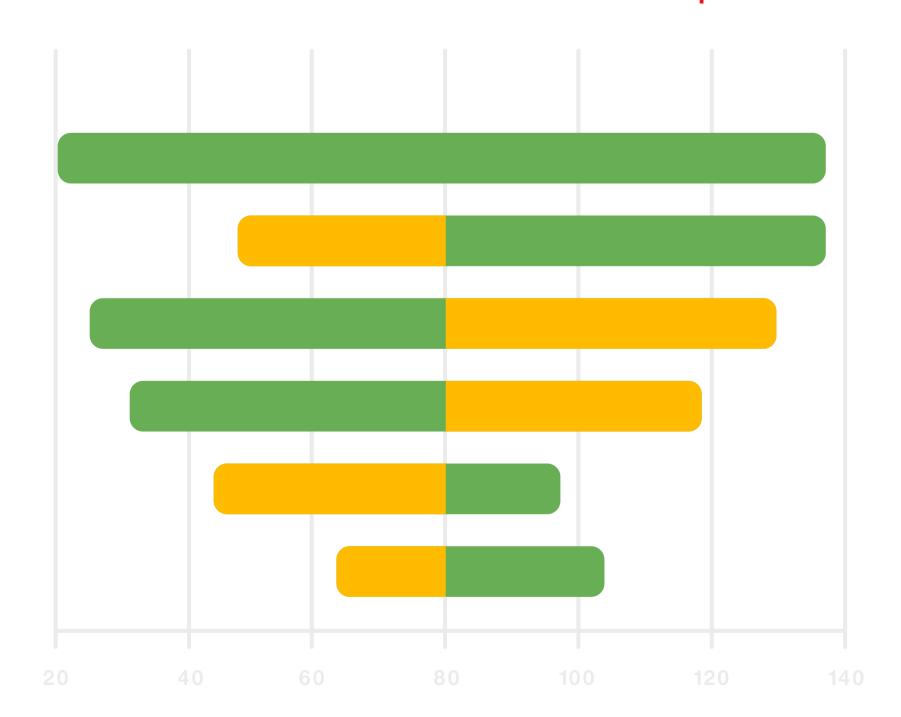
- Monte Carlo.
- Define EAC & End date of project.

TOOLS & TECHNIQUES

Sensitivity analysis

تحليل الاستشعار

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



TOOLS & TECHNIQUES

تحليل القرار Decision tree analysis

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



Plan Risk Responses

INPUTS

Project management plan

Resource management Plan

Risk management plan

Cost baseline

Project documents

Lesson learned register

Project schedule

Project team assignments

Resource calendars

Risk register

Risk report

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Interviews

Interpersonal and team skills

Facilitation

Strategies for threats

Strategies for opportunities

Contingent response strategies

Strategies for overall project risk

Data Analysis

Alternatives analysis

Cost_benefit analysis

Decision making

Multicriteria decision analysis

OUTPUTS

Change requests

Project management plan updates

Schedule management plan

Cost management plan

Quality management plan

Resource management plan

Procurement management plan

Scope baseline

Schedule baseline

Cost baseline

Project documents updates

Assumption log

Cost forecasts

Lessons learned register

Project schedule

Project team assignments

Risk register

Risk report

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
- prototypemore 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.

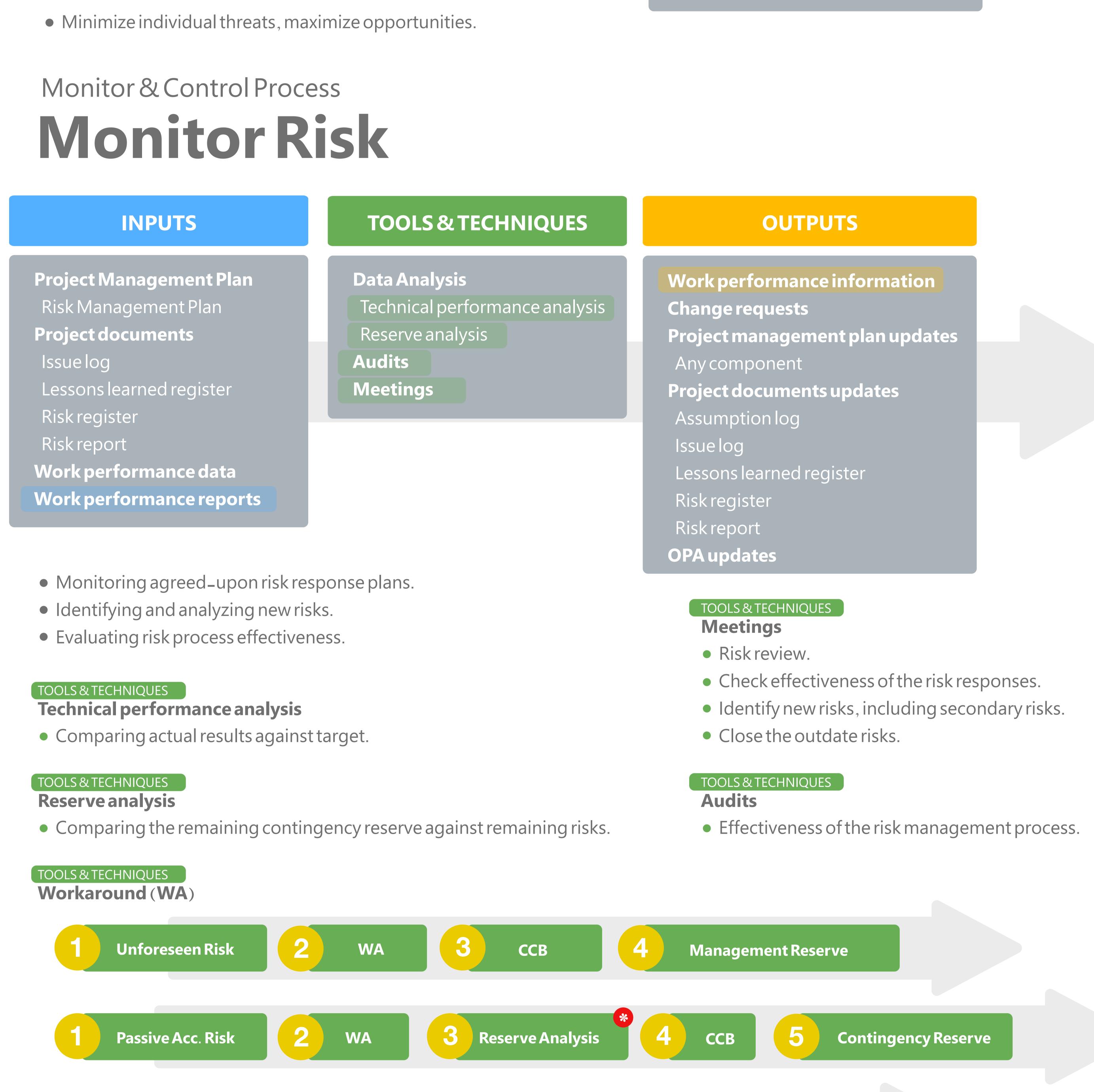
TOOLS & TECHNIQUES

Strategies for overall project risk

- Avoid = negative.
- Exploit = positive.
- Out of risk threshold.

Implement Risk Responses

TOOLS & TECHNIQUES **INPUTS OUTPUTS** Project Management Plan Expertjudgment **Change requests** Interpersonal and team skills Project documents updates Risk Management Plan **Project documents** Influencing Issuelog Lesson learned register Lessons learned register **PMIS** Risk register Project team register Risk report Project team assignments Risk register OPA Risk report



وي حال وجود مبلغ كافي بعد تحليل الإحتياطي فلا داع لتقديم طلب تغيير وبإمكانك تخطي الخطوة رقم CCB 4 في حال وجود مبلغ كافي بعد تحليل الإحتياطي فلا داع لتقديم طلب تغيير وبإمكانك تخطي الخطوة رقم

Contingency Plan

Active Acc. Risk

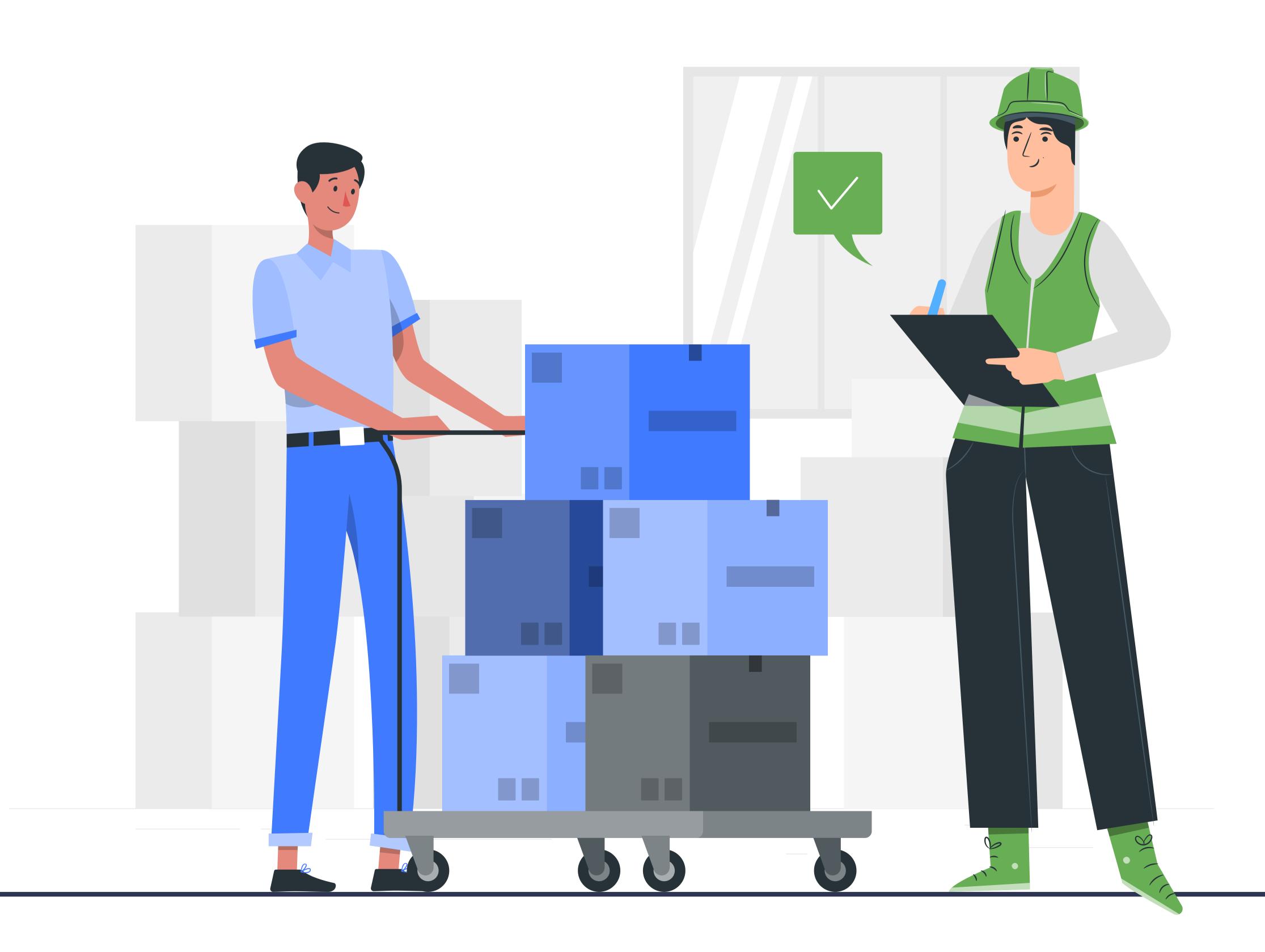
Reserve Analysis

CCB

إدارة عالة كالله

Procurement Management

PMBOK 6^{th Ed.} (459–502)



Plan Procurement Management

INPUTS

Project Charter

Business documents

Business case

Benefits management plan

Project management plan

Scope management plan

Quality management plan

Resource management plan

Scope baseline

Project documents

Milestone list

Project team assignments

Requirements documentation

Requirements traceability matrix

Resource requirements

Risk register

Stakeholderregister

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

Market research

Data Analysis

Make-or-buy analysis

Source selection analysis

Meetings

OUTPUTS

Procurement management plan

Procurement strategy

Bid documents

Procurement statement of work

Source selection criteria

Make_or_buy decisions

Independent cost estimates

Change requests

Project documents updates

Lessons learned register

Milestonelist

Requirements documentation

Requirements traceability matrix

Risk register

Stakeholderregister

OPA updates

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 ســــوء فهــــم أو عدم وضـــوح لبيان الأعمال Procurement SOW لدى الموردين



Conduct Procurement

INPUTS

Project Management Plan

Scope management plan

Requirements management plan

Communications management plan

Risk management plan

Procurement management plan

Configuration management plan

Cost baseline

Project documents

Lessons learned register

Project schedule

Requirements documentation

Risk register

Stakeholderregister

Procurement documentation

Seller proposals

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Advertising

Bidder conferences

Data Analysis

Proposal evaluation

Interpersonal and team skills

Negotiation

OUTPUTS

Selected sellers

Agreements

Change requests

Project management plan updates

Requirements management plan

Quality management plan

Communication management plan

Risk management plan

Procurement management plan

Scope baseline

Schedule baseline

Cost baseline

Project documents updates

Lessons learned register

Requirements documentation

Requirements traceability matrix

Resource calendars

Risk register

Stakeholderregister

OPA updates

• 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.

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.



Monitor & Control Process

Control Procurement

INPUTS

Project Management Plan

Requirements management plan

Risk management plan

Procurement management plan

Change management plan

Schedule baseline

Project documents

Assumption log

Lessons learned register

Milestonelist

Quality reports

Requirements documentation

Requirements traceability matrix

Risk register

Stakeholderregister

Agreements

Procurement documentation

Approved change requests

Work performance data

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Claims administration

Data Analysis

Performance reviews

Earned value analysis

Trendanalysis

Inspection

Audits

OUTPUTS

Closed procurements

Work performance information

Procurement documentation updates

Change requests

Project management plan updates

Risk management plan

Procurement management plan

Schedule baseline

Cost baseline

Project documents updates

Lessons learned register

Resource requirements

Requirements traceability matrix

Risk register

Stakeholderregister

OPA updates

Managing procurement relationships.

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

TOOLS & TECHNIQUES

Inspection

التفتيش

• Inspecting deliverables from procurement.

TOOLS & TECHNIQUES

Audits

التدقيق

• Auditing Procurement for its applied processes.

TOOLS & TECHNIQUES

إدارة المطالبات Claims administrations

- 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.

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



General Definitions

Contracts

Fixed Price

FFP

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



FPIF

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



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



CPIF

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



CPAF

- Cost Plus Award Fee
- Least Common

Time & Material

Time & Means Contract

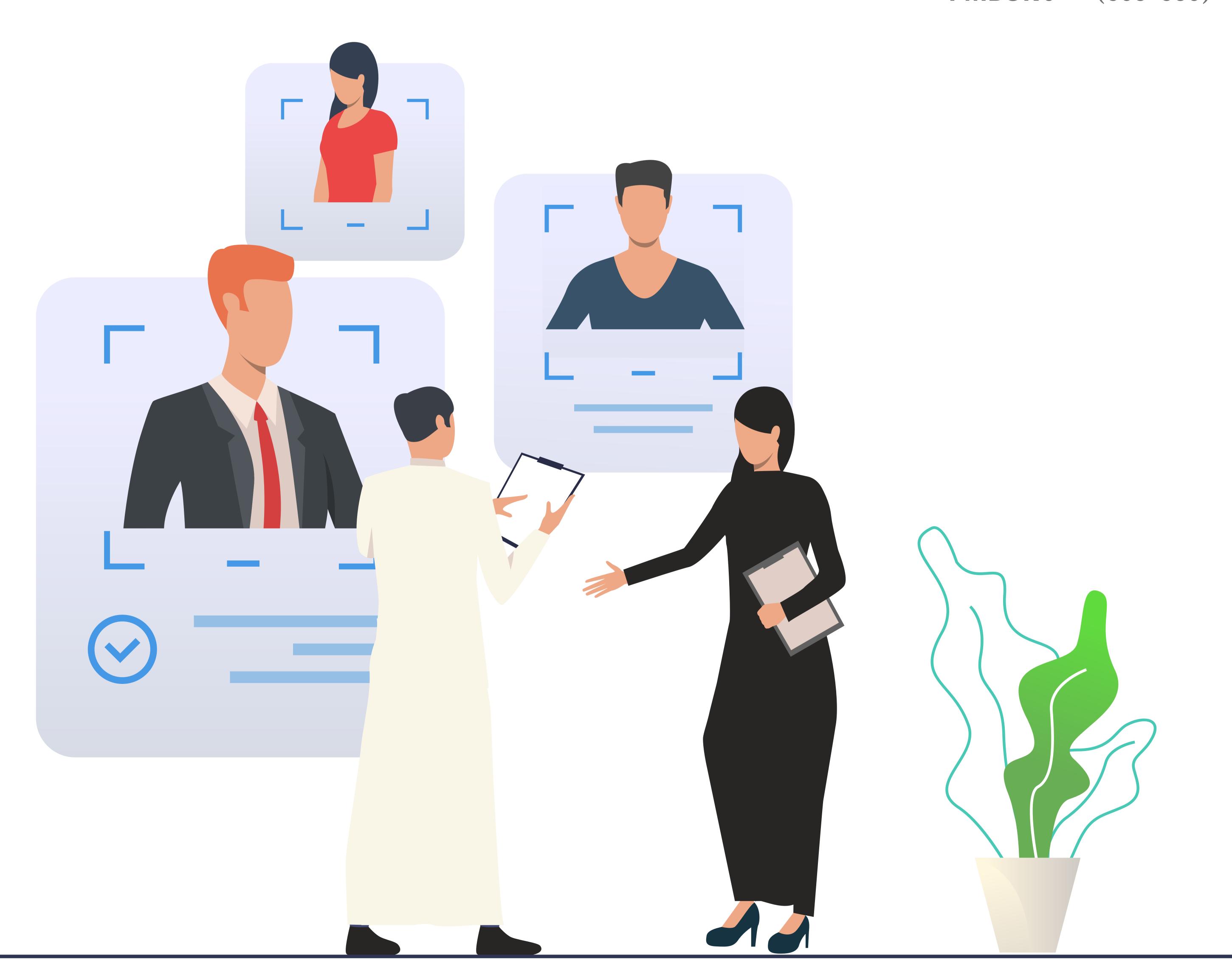
- Staff augmentation
- Acquisition of experts





Stakeholder Management

PMBOK 6^{th Ed.} (503–536)



Initiating Process

Identify Stakeholders

INPUTS

Project charter Business documents

- Business case
- Benefits management plan

Project Management plan

Communications management plan

Project documents

- Changelog
- Issue log
- Requirements documentation

Agreements

EEF

OPA

TOOLS & TECHNIQUES

Expertjudgment

Data gathering

- Questionnaires & surveys
- Brainstorming

Data analysis

Stakeholderanalysis

Data representation

Stakeholder mapping representation

Meetings

OUTPUTS

Stakeholder register

Change requests

Project management plan updates

- Requirements management plan
- Communication management plan
- Risk management plan
- Stakeholderengagement plan

Project Documents updates

- Assumptionslog
- Issuelog
- Risk register

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

سجل المعنيين Stakeholder register

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

في حال دخول معني جديد للمشروع في أي مرحلة كانت، وذكر في السؤال أنه يطالـــب بإضافة خدمة جديدة للمشروع فإننا نبدأ أولا بتحليل الــمعنيين ثم إضــــافته في سجل الــمعنيين ومن ثم الـنظر في طلبــه



TOOLS & TECHNIQUES

Salience model

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

TOOLS & TECHNIQUES

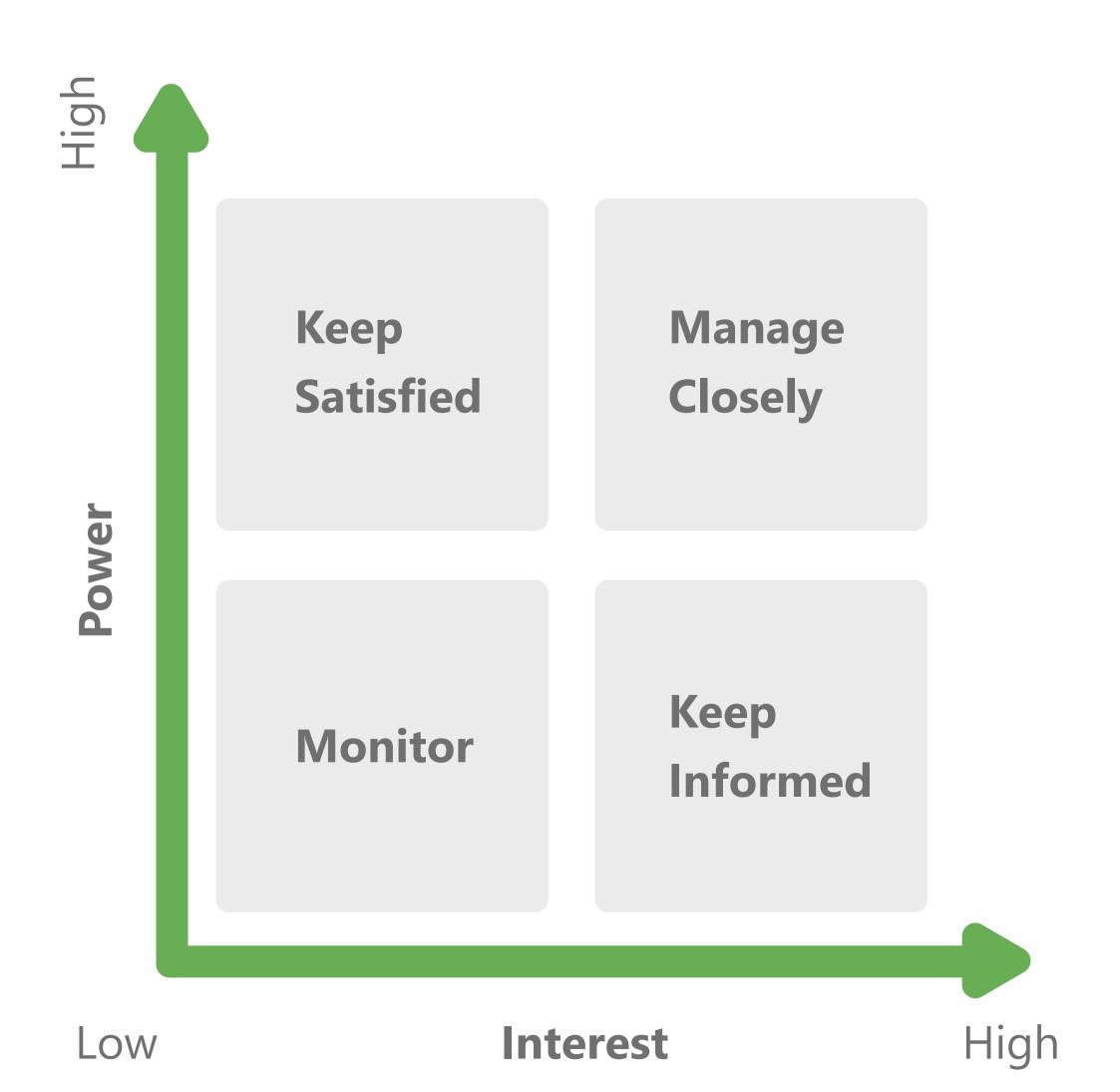
Stakeholder cube

- 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

INPUTS TOOLS & TECHNIQUES **OUTPUTS Project charter** Stakeholder engagement plan Expertjudgment Project management plan **Data gathering** Resource management plan Benchmarking Communication management plan Dataanalysis Risk management plan Assumption & constraint analysis **Project documents** Root cause analysis Assumption log **Decision making** Change log Prioritization / ranking Issue log **Data representation** Project schedule Mind mapping Stakeholder engagement assessment matrix Risk register Stakeholderregister Meetings Agreements EEF **OPA**

• 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

مصفوفة تقييم مشاركة المعنيين Stakeholder engagement assessment matrix

• 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

خطة إشراك المعنيين Stakeholder engagement plan

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

Manage Stakeholders Engagement

TOOLS & TECHNIQUES **INPUTS OUTPUTS** Project management plan Expertjudgment **Change requests** Communication management plan **Communication Skills** Project management plan updates Risk management plan Communications management plan Feedback Stakeholderengagement plan Interpersonal & team skills Stakeholderengagement plan Project documents updates Change management plan Conflict management **Project documents** Cultural awareness Changelog Changelog Issue log Negotiation Observation / conversation Lessons learned register Issuelog Lessons learned register Stakeholderregister Political awareness Stakeholderregister **Ground rules** Meetings EEF **OPA**

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

Monitor & Control Process

Monitor Stakeholders Engagement

INPUTS TOOLS & TECHNIQUES **OUTPUTS** Project management plan **Data analysis** Work performance information Resource management plan Alternatives analysis **Change requests** Communication management plan Root cause analysis Project management plan updates Stakeholderengagement plan Stakeholderanalysis Resource management plan **Project documents Decision making** Communications management plan Multicriteria decision analysis Issuelog Stakeholder engagement plan Lessons learned register Voting Project documents updates Project communications **Data representation** Issue log Stakeholderengagementassessmentskills Risk register Lesson learned register Work performance data **Communication skills** Risk register Feedback EEF Stakeholderregister **OPA** Presentations Interpersonal and team skills Active listening Culturalawareness Leadership Networking Political awareness Meetings

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

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