

ISS CQRC RPS

Process Groups

Knowledge Areas

work info (WBS) → WBS (WBS)

	Initiating	Planning	Executing	M&C	Closing
Integration	Charter	develop PM plan	Project work Project knowledge	→ msc Change control	Close
Scope		Plan Scope Requirements Define Scope WBS		Validate scope Control scope	
Schedule		Plan Schedule Define activities sequence activities Activity durations Develop schedule		Control Schedule (EVM) WPI	
Cost		plan Cost Estimate Determine Budget		Control costs (EVM)	
Quality		Plan QM	Manage quality (audits) QA	Control quality (inspections)	
Risk Resource		Plan Resources ^(PACD) Estimate Activity Resources	Acquire team Develop Manage Team	Control Resources	
Communication		Plan	Manage	Monitor	
Risk		Plan risk mgt Identify risks Qualitative Quantitative Risk responses	Implement risk responses	Monitor (audits) Risk review	
Procurement		Plan (make/buy)	Conduct (select seller)	Control (pay)	
Stakeholder	Identify	Plan Engagement	Manage	Monitor	

PMO → Supportive

→ Controlling

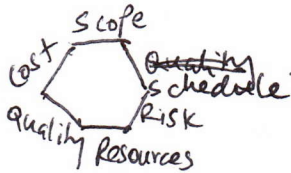
→ Directive - PM reports to PMO

Governance → Structure
→ People
→ Information

Functional
Projectized

~~Hybrid~~ Matrix
Hybrid

- organic / simple for small owner-operated org



PMI Code of Conduct → Responsibility
→ Respect
→ Fairness
→ Honesty

12 PM principles guide behavior across 8 performance domains
Stakeholders Dev approach & life cycle planning measurement
Team Project work Uncertainty Delivery.

- Project documents are created during the 49 processes & are not part of PM plan.
33 total

Data gathering → Analysis → Representation → Decision making
- Brainstorming - Alternative - Fishbone / cause & effect - voting
- Interviews - RCA - Histograms - multicriteria
- Focus groups - variance - Flow charts - Autocratic
- Checklist - Trend - Mind mapping
- Qs & surveys - Affinity diagram
- Benchmarking - Burn charts - Audits
- Design for X
- Scatter diagrams

Voting → majority vs plurality.
(election)
US President

- Work performance data is raw data. Outputs of Executing processes
" information is usually an output of MPC processes
" reports →

Business documents (i.e., Business Case + Project Benefits Mgmt plan) + Agreements → Project Charter
Assumption Log is an output of develop charter process along with charter.

Stakeholder cube - interest, power, influence
Salience model - Power, urgency, legitimacy
Directions of influence - ↑ ↓ → ←

Scope baseline → Project scope statement + WBS + WBS Dictionary
Rolling wave planning is used in Define Activities
Sequence activities → Analogous, Parametric, 3-point, Bottom-up, SS/FS/FF/SF
Estimate duration → PERT ⇒ $(O + 4M + P) / 6$; triangle ⇒ $(O + P + M) / 3$; SD ⇒ $(P - O) / 6$
Develop schedule → Schedule network analysis (critical path, critical chain, what-if)
→ Resource optimization (flatten / level) Time resources read Monte-Carlo
→ Schedule compression (crashing / Fast track) followed by smoothing
→ Agile release planning (resources / parallel)
level → change start/end dates
Flatten - smooth the peak loads to avoid
Smoothing →

Estimate Cost → Definitive -5% to +10%
→ Budget -10% to +25%
→ Rough order of magnitude -25% to +75%.

COQ - All costs incurred over the life of product ensuring it meets product quality.
- Conformance, prevention, appraisal, non-conformance, failure costs.

RAM, RACI used as tools in Plan Resource Mgmt

SWOT - used in Identify Risks

Quantitative risk analysis → simulations (Monte Carlo)
→ represent uncertainty (p distributions, triangular/beta dist)
→ Sensitivity analysis (Tornado charts)
EMV → Influence diagrams

Risk responses - Escalate, Avoid, Transfer, Mitigate, Accept
if positive → Escalate, Exploit, Share, Enhance, Accept
Decision Tree - make or buy

Contract types → Fixed price
→ Cost Reimbursable
→ Time & material

Plan Procurement - RFI, RFP, RFQ, IFB

Stakeholder engagement - Unaware, Resistant, neutral, Supportive, Leading

Executing

Manage quality - Affinity diagrams, Cause & effect (Ishikawa / Fish bone), Histograms,

Develop Team - Forming, Storming, Norming, Performing, Adjourning (Tuckman)

- Maslow (psychological, safety, social, esteem, self-actualization)

- Herzberg - if expected hygiene factors not there, can only demotivate

- McGregor's Theory X - is bad. Need to be micromanaged.

Theory Y - is good. People are self-led.

- Theory Z - increased loyalty at workplace. Steady employment.

- Expectancy theory - behave based on what they expect as a result

- McClelland's need theory - Achievement, Power, Affiliation

- Forms of power - Reward, Expert SME, Legitimate, Referant, Punishment

- OSCAR situational leadership

- Drexler/Sibbet team performance model

Manage Team - Conflict mgmt (Problem solving, Forcing, Compromising, Smoothing, withdrawal)
confronting win-win win-lose lose-lose lose-lose yield-lose

- Student Syndrome

- Parkinson's Law - work expands

- Self-protection

- Sandbagging - under promise, over deliver

- Dropped baton - one team finishes when other not ready

Monitor & Control

- Change Requests + Work Performance Reports are common outputs of M&C.
- Accept deliverables in validate scope (output)
- Verified deliverables is output of Control quality. These are reviewed with the customer or sponsor to receive formal acceptance during validate scope. Done at the same time or after Control quality.
- Control costs
 - Earned value, Variance, Trend, Reserve
 - TCPI
 - Cost forecasts
- EVM is a series of formulas to calculate cost & schedule progression

BAC = Total budget

PV = Planned % complete $\times$ BAC

EV = Actual % $\times$ BAC

AC = Sum of cost for given period

$CV = EV - AC$

$CPI = EV / AC$

$SU = EV - PV$

$SPI = EV / PV$

$EAC = BAC / CPI$

$ETC = EAC - AC$

$VAC = BAC - EAC$

$TCPI = (BAC - EV) / (BAC - AC)$

$CPI = 0.93$ means project is 7% over budget at present

$SPI = 0.98$ means about 2% behind schedule at current time

$ETC = \$200$ means we need \$200 more currently to finish rest of project

$VAC = -\$300$ means when project is over will need \$300 more to finish off

$TCPI = 1.04$ means we need to work 4% harder to finish within budget

Agile (Scrum, XP, Kanban, Lean)

Feature driven, iterative

Agile manifesto
4 values
12 principles

- Individuals & interactions over processes & tools
- working software over comprehensive documentation
- customer collaboration over contract negotiation
- Responding to change over following a plan

Customer/PO → Product Backlog → Sprint Planning → Sprint Backlog → Sprint (1-4 weeks) → Sprint/Iteration → Sprint Review (Demo) → Sprint Retrospective (2 hrs) → Product Increment → Product Backlog

Scrum based on 3 pillars - Transparency, inspection, adaptation

Scrum Artifacts - Product increment, Product backlog, Sprint backlog

XP - small releases, customer tests, collective code ownership, sustainable pace, TDD

Seven wastes of lean

Five Kanban principles - visualize workflow, Limit WIP, Manage flow, explicit policies, collaboration

pull vs push - pull better

ROI, IRR, NPV for financial value.

- Value prioritization
- Simple
 - MoSCoW
 - Monopoly money
 - 100-point method
 - Dot or multi voting
 - Kano analysis - Delighters / Satisfiers / Dissatisfiers / Indifferent

Cumulative flow diagrams - show bottlenecks

Agile chartering - 5 Ws (Who, What, When, Where, Why)

- Green zone - red zone

- Brainstorming - quiet writing, round-robin, free-to-all

Collaborative games - Remember the future, prune product tree, Speedboat

- Levels of conflict - problem to solve, disagreement, contest, Crusade, World war

- Co-located teams - 33 feet max

Team performance

- Burn charts → up (how much has been done)
→ down (work remains to be done)
- velocity charts (Avg points)

- User stories should be "INVEST"

- Iteration H/hardening done at dev iteration end to cleanup code/documentation (after multiple dev iterations)

- Spikes → Architectural - proof of concept
→ Risk-based - reduce or eliminate risk.

- Technical debt - backlog of work caused by not doing regular cleanup

$$\text{cycle time} = \frac{\text{WIP}}{\text{Throughput}}$$

- Kaizen - PDCA

- A negative risk when materialized becomes an issue

- Quality is about meeting acceptance criteria for deliverables & satisfying stakeholder expectations and fulfilling project & product requirements.

- Complexity

- Human behavior
- System behavior
- Uncertainty & ambiguity
- Technological innovation

