

PART TWO

Threat Response Options

Risk Priority	Basic Responses
7, 8, 9	Accept risk
4, 5, 6	Prepare contingency plan
2, 3	Mitigate or transfer risk
1	Avoid, eliminate or prevent risk

‘Mitigate’ is sometimes described as treat, abate, reduce, counter, contain or minimise. ‘Transfer’ (also referred to as deflect, outsource, spread, shift or share) means to contract the risk to another party who is better able and/or motivated to manage it. Transfer might also mean taking out insurance or bonding (ie, bank guarantee).

Qualitative Risk Analysis Matrix

The matrix is impact since we can usually estimate this more accurately than we can probability.

		IMPACT				
		VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH
LIKELIHOOD	VH					
	H					
	M					
	L					
	VL					

Quantitative Risk Analysis Matrix

A similar matrix is used for time.

		COST IMPACT (\$)				
		UNDER 6K	6-10K	11-15K	16-20K	OVER 20K
PROBABILITY (%)	OVER 60					
	45-60					
	30-44					
	15-29					
	0-14					

Example of Quantitative Measures

Impact Scale	Time (days)	Cost (\$000)	Quality
Very High	Exceeds 20	Exceeds 200	Functionality reduced by more than 20%
High	11 - 20	101 - 200	Functionality reduced by 11 – 20%
Medium	4 - 10	51 - 100	Functionality reduced by 4 – 11%
Low	1 - 3	10 - 50	Functionality reduced by 1 – 3%
Very low	Less than 1	Less than 10	Functionality reduced by less than 1%

Impact scales need to be set for each project. Quality impact might also be described by conformance with specifications. Functions may be prioritised.

Contingency Calculations

Risks	Impact		Probability		Contingency (\$K)
A	-\$2K	x	0.1	=	\$0.2K
B	-\$4K	x	0.2	=	\$0.8K
C	-\$7K	x	0.4	=	\$2.8K
D	+\$3K	x	0.2	=	+\$0.6K
E	-\$5K	x	0.3	=	\$1.5K
F	-\$6K	x	0.5	=	\$3.0K
					\$8.3K

Probability theory tells us that the likelihood of say risks A and C both occurring in same project is only 4% since : $10\% \times 40\% = 4\%$ chance.

Contingency reserve is typically controlled by sponsor/project manager for identified risks and is often reduced as project proceeds.

Management reserve if established is held by the sponsor for unidentified risks – those that without warning go bump in the night!

'Buy-in' Tactics

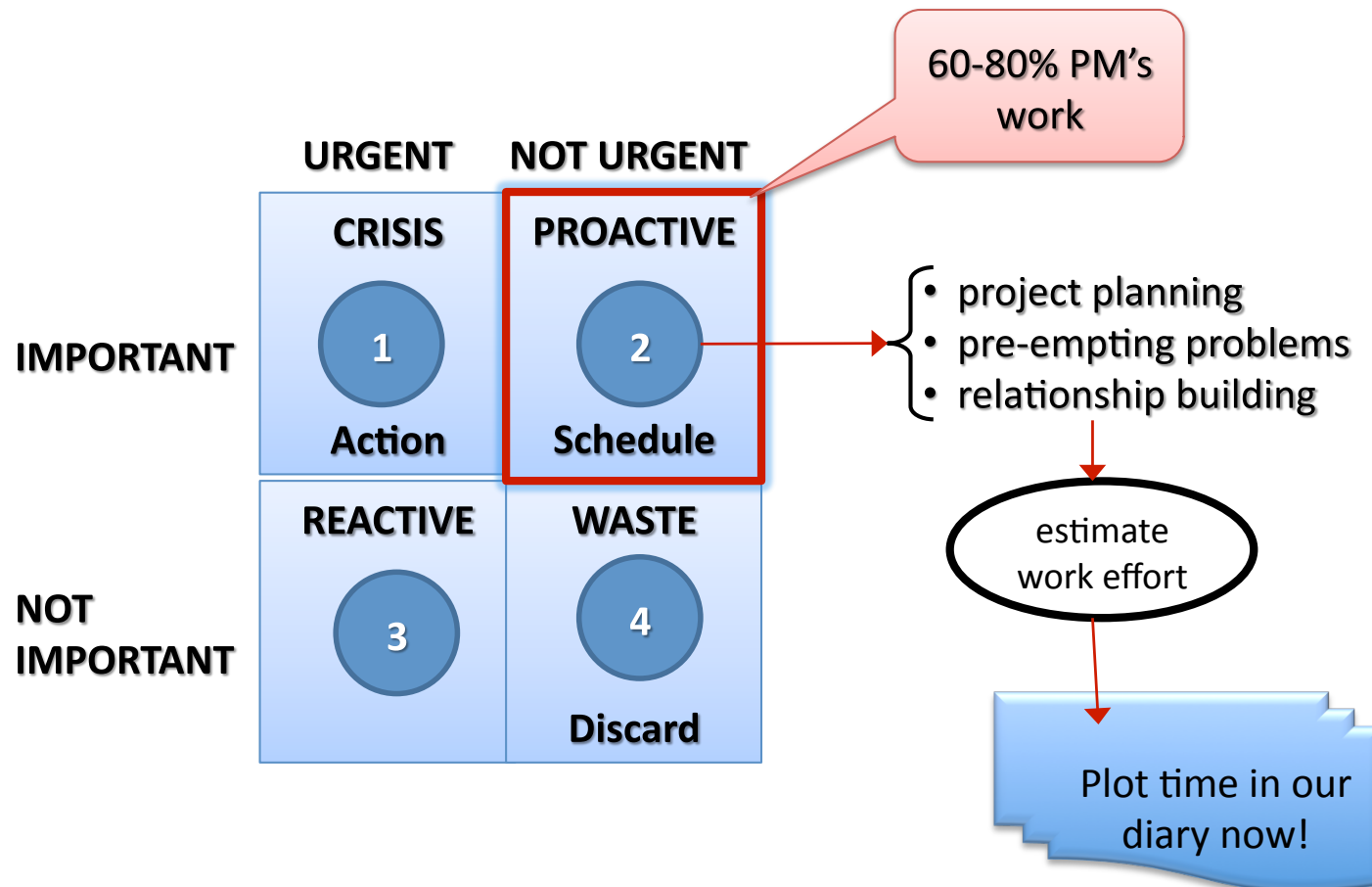
- Involve team members / engage their line managers
- Sell benefits - *WIIFM*
- Be positive yourself (but do quickly escalate issues beyond your authority to resolve with your recommendations)
- Make it fun / enjoyable / interesting
- Successes - publish and celebrate them
- Recognise / reward evidence of buy-in
- Be approachable, welcome ideas and keep everyone regularly updated
- Anticipate resistance / objections

More 'Buy-in' Tactics

- Explain consequences of project failure!
- Get the CEO to sign-off the project charter and distribute it early and widely.
- Manage team's performance and provide positive individual reports.
- Practise one-on-one, day-by-day, feedback and avoid bad surprises.
- Have their line managers relieve them of non-project work or have such work reassigned or postponed.
- Get visible and powerful advocates / supporters / champions and a sponsor who has time available and a high level of organisational influence and interest in our project.

Personal Time Management

Stephen Covey's Matrix



Some Top Motivators

- Advancement/Promotion
- Development/Learning
- Pay/Financial Reward
- Job Security
- Variety of Work
- Challenge
- Achievement
- Recognition
- Relationships
- Autonomy/Freedom

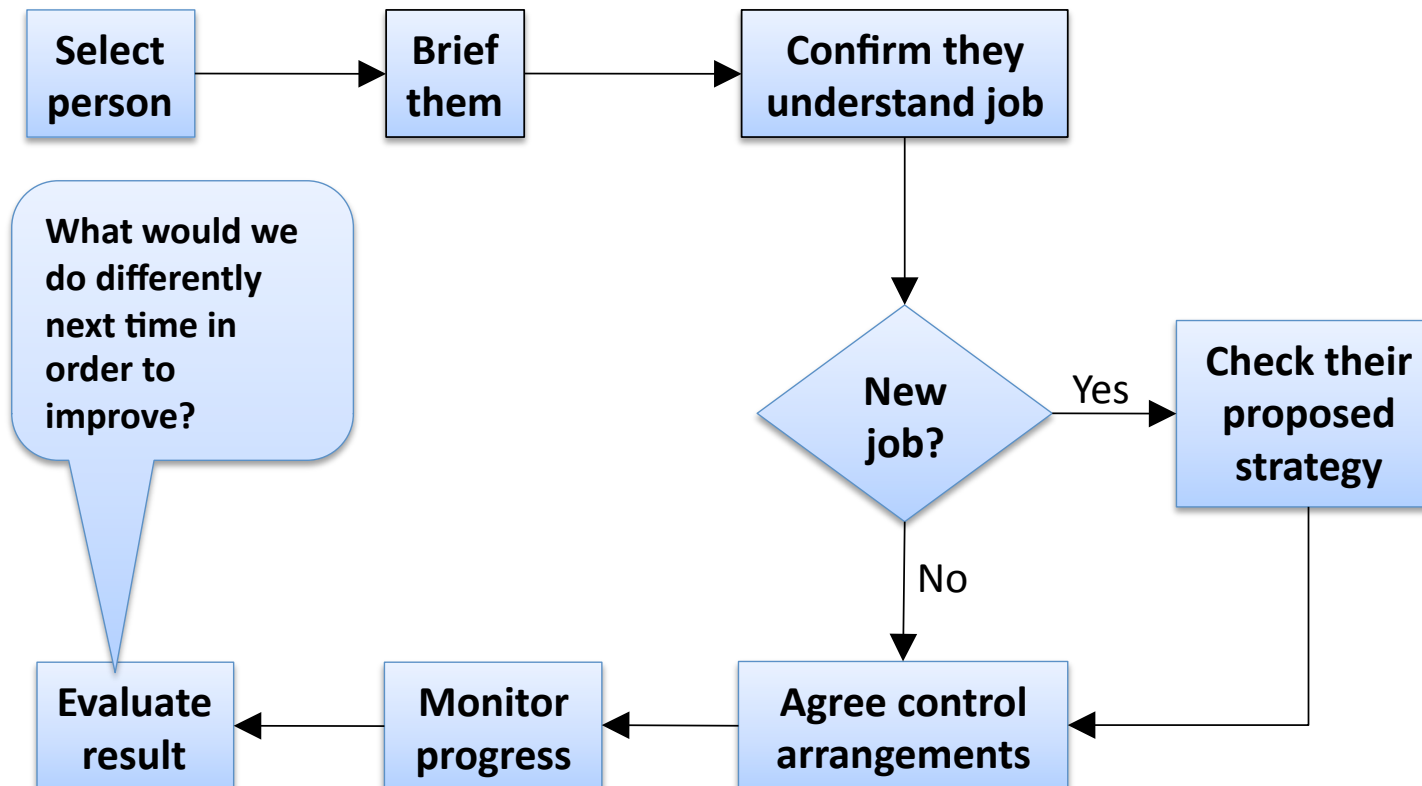
Work Package Description

A work package (WP) may be likened to a small project that is delegated or contracted to a project team member for completion. Its description may include:

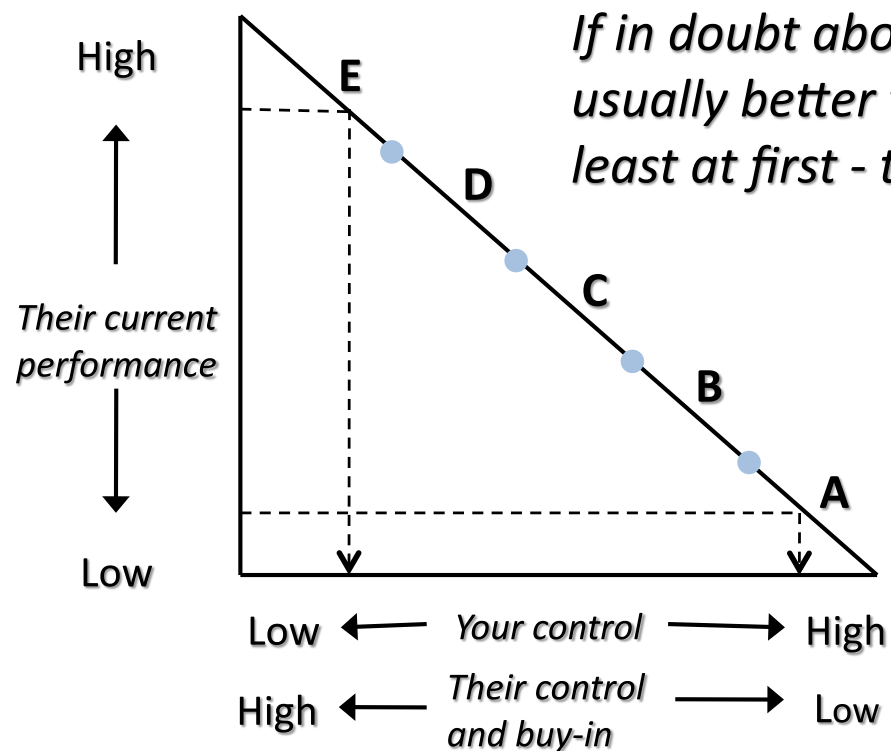
- Identification number.
- Predecessor, successor and related WPs.
- Deliverable specification.
- Time and cost constraints.
- Threats and opportunities.
- Meetings, auditing and reporting requirements.

If the work package is outsourced a contractual agreement will normally be required before work starts.

Delegation Process



Delegation Continuum



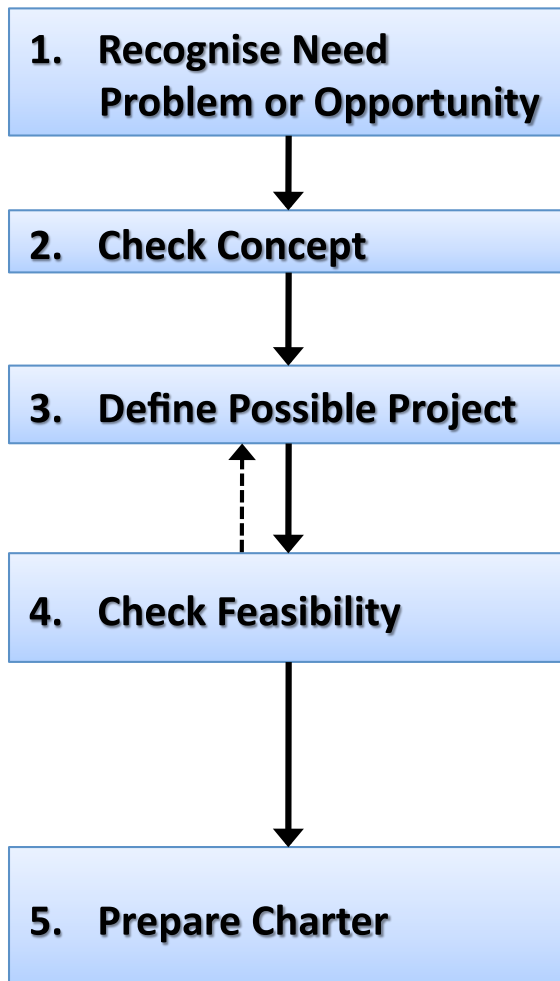
- A "I'll decide." (autocracy)
- B "We'll discuss. I'll decide."
- C "We'll discuss. We'll decide."
- D "We'll discuss. You decide."
- E "You decide." (empowerment)

Welcome Back!

TIME	DAY ONE	DAY TWO	DAY THREE
9:00	Project management basics	A busy day when we analyse the project conception and development phases, practising various tools and techniques – WBS, estimating, network diagrams, Gantt charts, resource scheduling, pre-empting problems, and trade-off analysis.	Project execution and finish phases.
10:30			
10:45	Team project exercise		Team project planning and presentation exercise.
12:30			
1:15	Project lifecycle and framework		
2:45			
3:00	Essential people skills		
4:30			Finish-up Administration

Project Management Framework

Conceive Phase



Since there is no progress without projects, we encourage ideas for projects. Such ideas aren't necessarily top-down in origin. Beware of cynics and idea squashers!

But not all ideas are suitable. An early check against basic criteria is needed to weed out the more obvious duds.

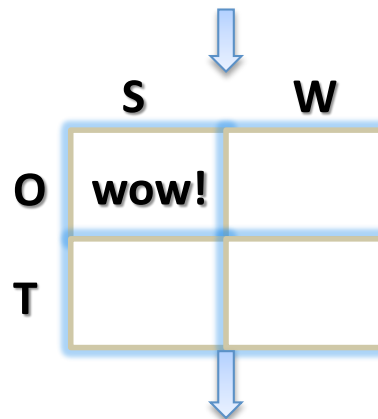
Describe possible project in sufficient detail with reasonable accuracy to enable its feasibility to be objectively assessed.

Possible project is evaluated against weighted selection criteria such as strategic fit, benefits, costs, risk and resource availability. The project proposition might be suitable, unsuitable or need to be redefined. A Business Case is usually prepared.

A Project Charter (ie, proposal, brief, terms of reference) is prepared, authorised and distributed. Its approval by the sponsor formally appoints the PM and authorises project planning to start. Logs and filing system established by PM.

Strategic Alignment or Fit

Confirm organisation's vision
mission/purpose and core values



Strengths (*internal*)
Weaknesses (*internal*)
Opportunities (*external*)
Threats (*external*)



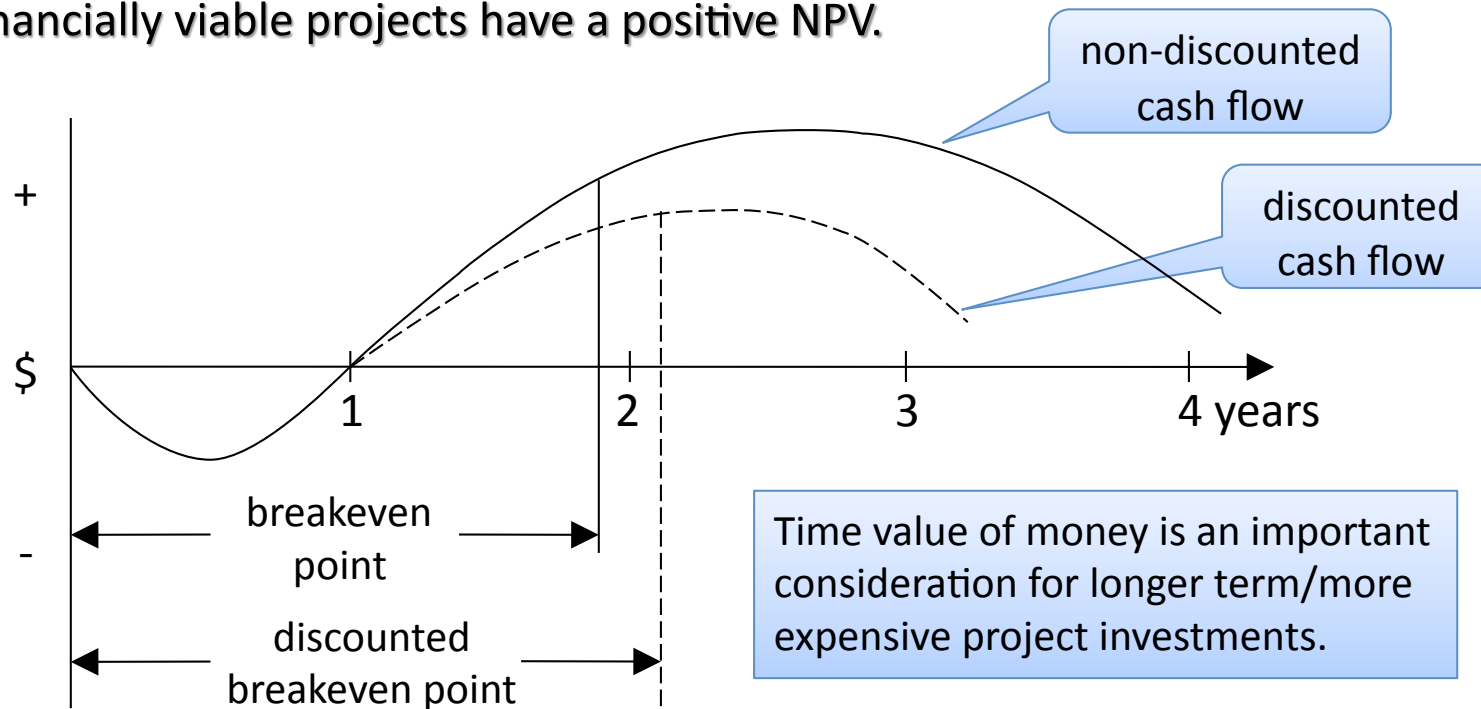
A DILBERT MOMENT



If indeed your organisation has no strategic plan, then developing one should be your first project.

Net Present Value (NPV)

Financially viable projects have a positive NPV.



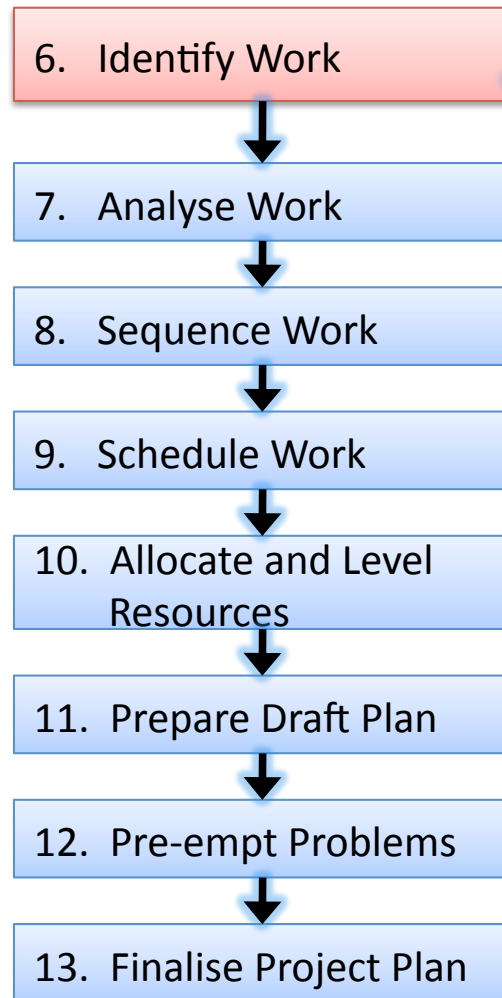
Estimated future cash flows are discounted at the prevailing discount (hurdle) rate to help determine a project's financial viability and breakeven point.

Net Present Value Example Calculation

The project is to purchase a new machine. Given the estimated net cash flows and a discount rate of 9%, the purchase will be marginally profitable.

YEAR	NET CASH FLOWS	DISCOUNT RATE (9%)	PRESENT VALUE
1	(\$10,000) x	1.000000 =	(\$10,000.00)
2	\$3,000 x	0.917431 =	\$2,752.29
3	\$3,500 x	0.841680 =	\$2,945.88
4	\$3,500 x	0.772183 =	\$2,702.64
5	\$3,000 x	0.708425 =	\$2,125.28
		NPV =	\$526.09

Develop Phase



Given an approved project charter, the PM usually holds a project kick-off meeting at which:

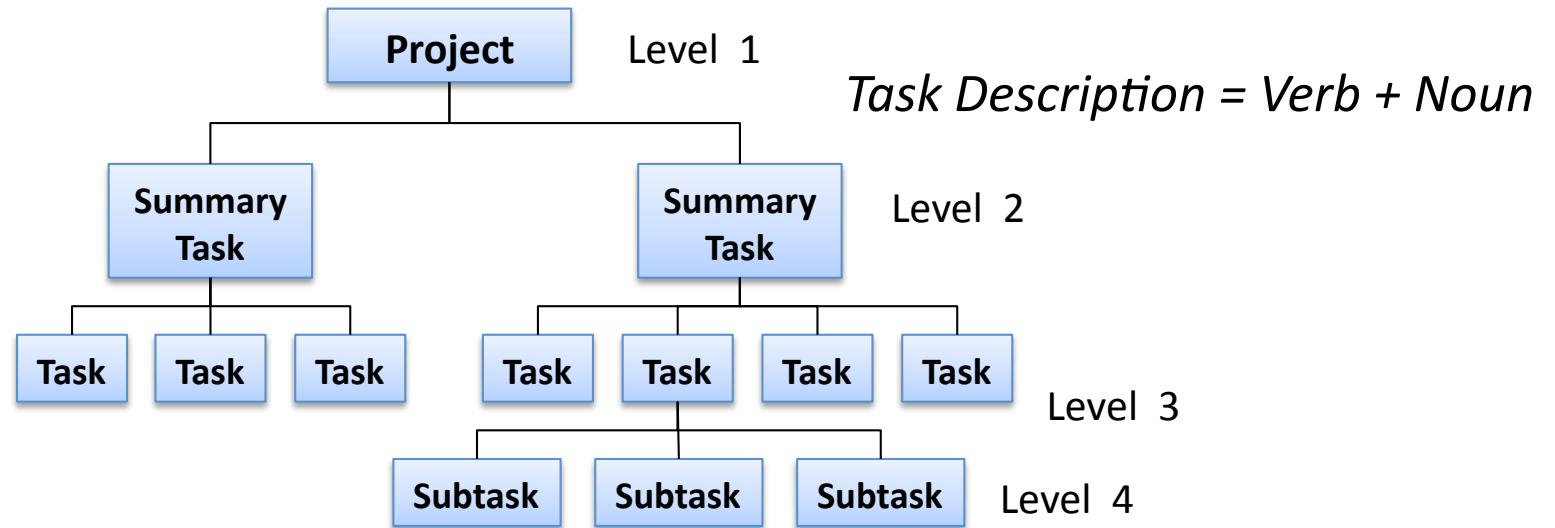
1. Project sponsor would typically emphasise the project's importance, discuss the charter, planning constraints / limits of authority, issue escalation and progress reports.
2. Project planning team would determine their modus operandi and set their team rules or contract.
3. The planning team brainstorm / mindmap the work to be undertaken to achieve project goal within parameters stated in charter. The result is a Work Breakdown Structure (WBS), which is essentially a family tree of work chunks, each level of breakdown producing smaller chunks (ie, work packages or WPs). Post-it Notes are useful to develop and illustrate this decomposition process. Work chunks are best described in verb-noun format (eg, 'write report', 'dig hole' etc). The resultant WBS elements may then be codified for easy on-going reference.

Team Contract

This agreement might contain clauses such as we will:

- be open and honest with each other
- decide as a team on the best way to communicate and keep each other informed
- focus on problem solving; not blaming
- use only constructive criticism
- practice participatory planning, problem solving and decision-making.

Work Breakdown Structure (WBS)



Why break down work?

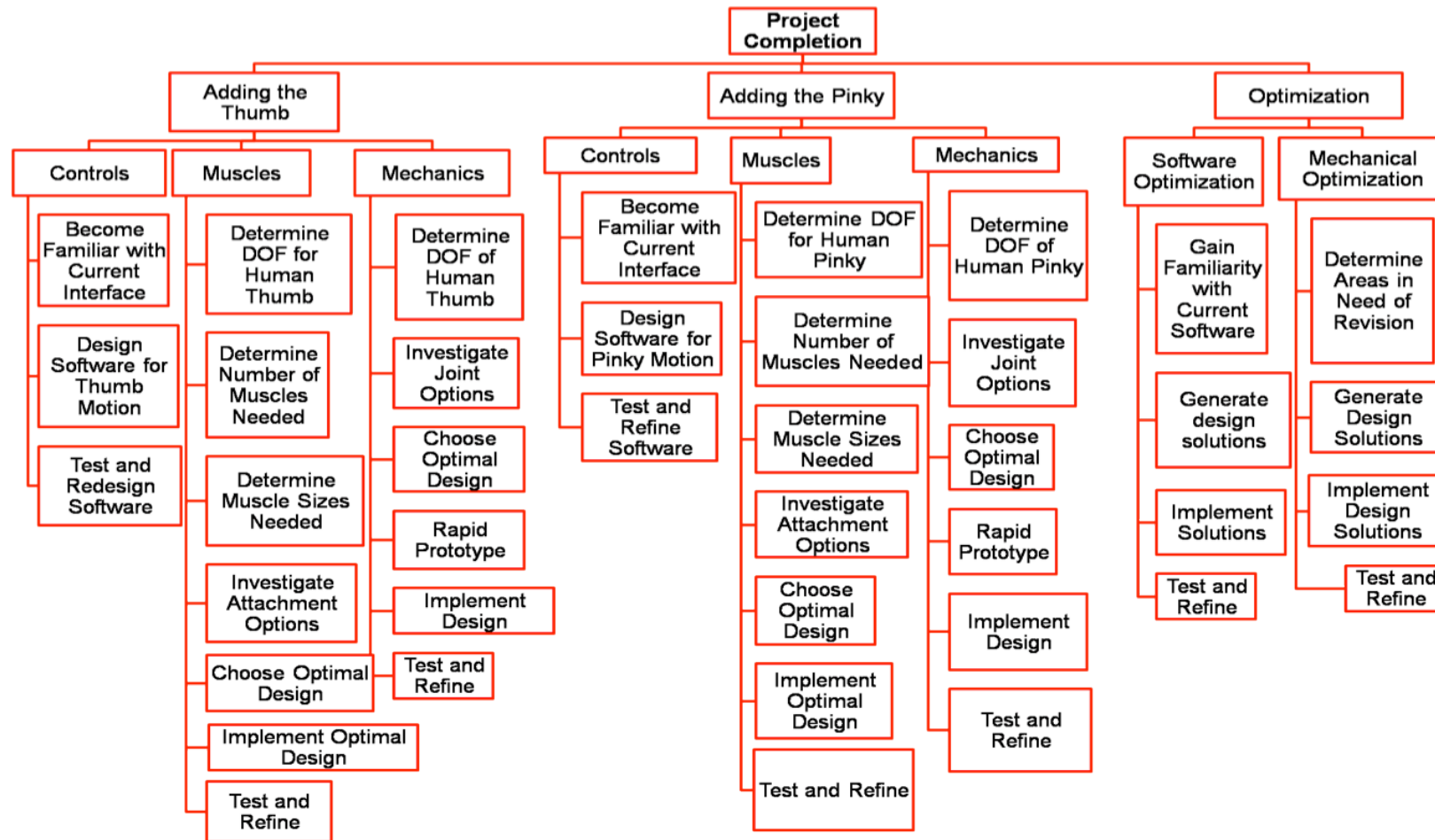
- to further describe work scope and enable layered planning and more accurate estimating
- to isolate risky work for special attention
- to enable work package (WP) assignments
- to measure progress by work packages
- to codify work packages for easy reference

How far do we break down work?

- depends on project size – large, medium, small
- previously assigned milestones
- until clearly defined delegation-size work chunks emerge (not further at project level)
- until WP time or cost limits reached

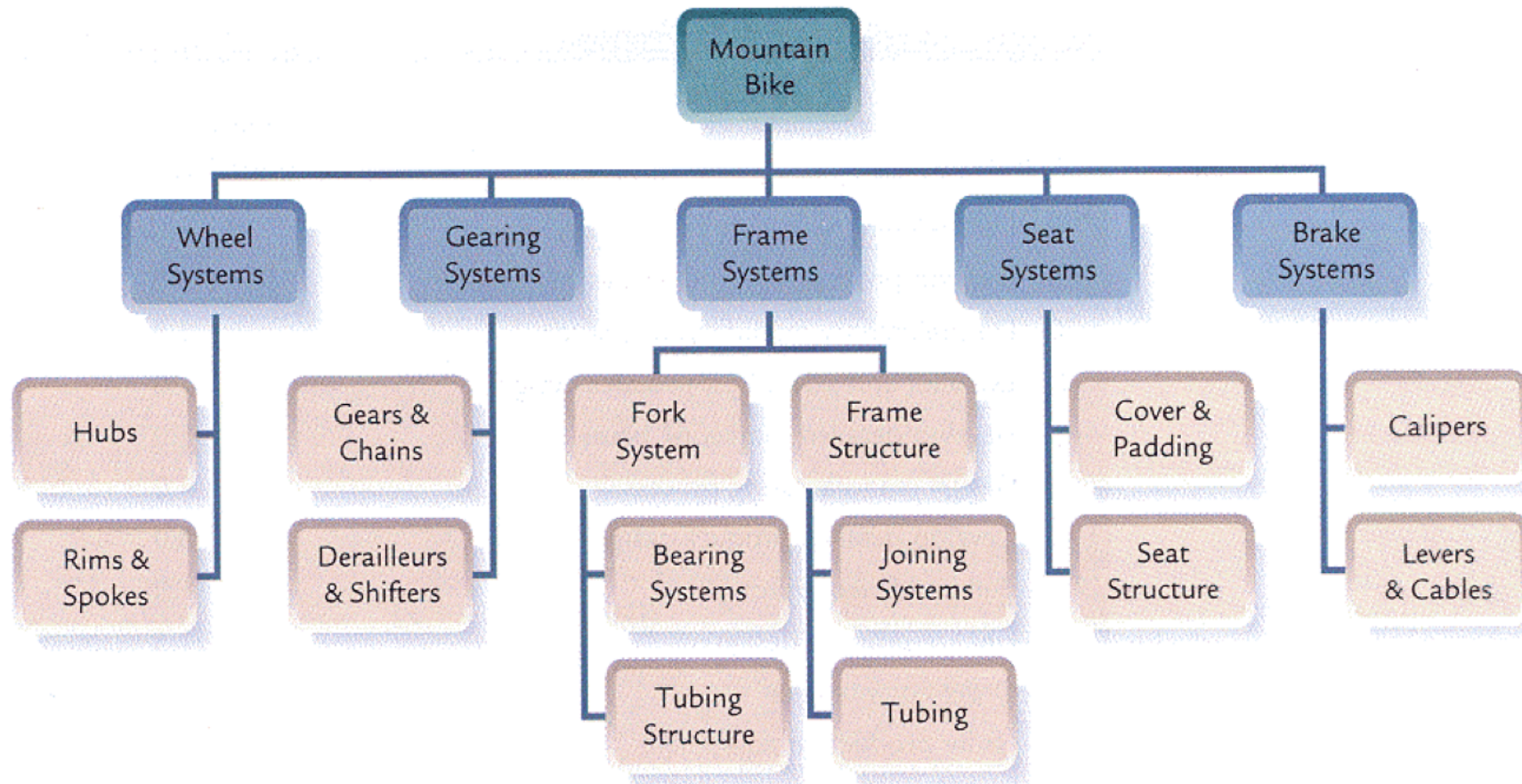
Example WBS

A WBS is not a project plan, a schedule nor a chronological listing. It shows what is to be done, not how or when.



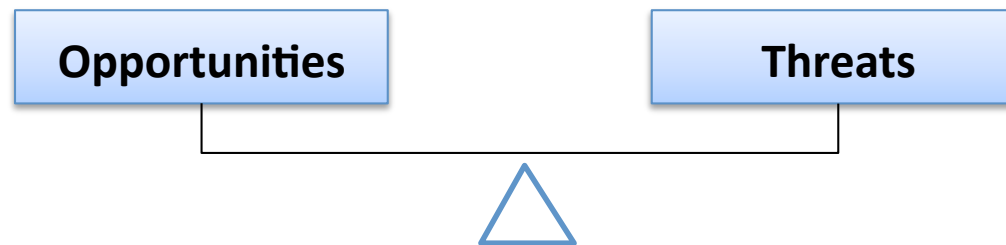
Example Product Breakdown Structure (PBS)

Product Description = Noun



Outsourcing Work Packages

Once the project is 'chunked', we may need to outsource some work and/or procure some material from external sources. Outsourcing work and purchasing outside expertise and/or materials presents both opportunities (to be exploited) and threats (to be avoided or minimised).



For government, more expensive purchases require tendering. This process is sometimes managed as a separate procurement project, perhaps as part of a programme. Also, contracts need to be agreed to help ensure that opportunities are realised and threats of contracting are avoided or minimised. The resultant contract is a risk management tool.

The advantages and disadvantages of contracting are best realised or avoided through selecting the right consultant/contractor /supplier, rather than through over reliance on contractual terms and remedies. 'Due diligence' is about evaluating prospective providers. A written contract must be agreed and signed before work or supply starts, but not before the project plan is approved.

Some Contracting Risks

Contract clauses usually exploit or mitigate the risks of outsourcing.

Opportunities

- Fixed cost
- Fresh perspective
- Easier to hire and fire
- Frees up own resources
- Avoid undesirable jobs
- We can learn from them
- Impress our client contract
- Penalties can apply
- No capital investment
- We can be selective
- They want future contracts

Threats

- Ability over-rated
- Lack of schedule flexibility
- Time and cost of tendering
- Security and confidentiality
- Demotivate own staff
- Deskill own organisation
- No priority attention
- Less control (subcontractors)
- Scope creep
- Market vulnerability
- Learn at our expense

Exploiting Outsourcing

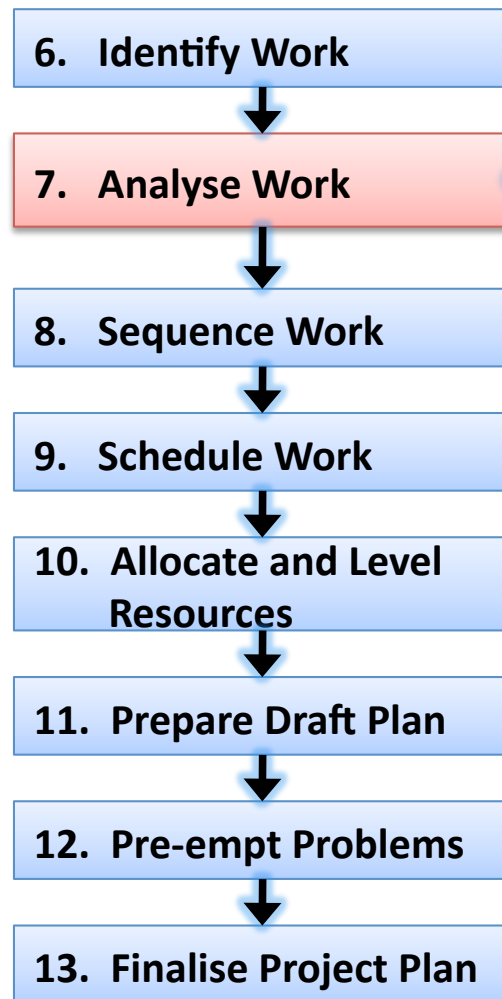
“Bob, a star programmer with a US software company was fired for outsourcing his own project work to a Chinese software company for a fifth of his salary. The company had awarded Bob numerous bonuses for his excellent work. ”

Sunday Star Times

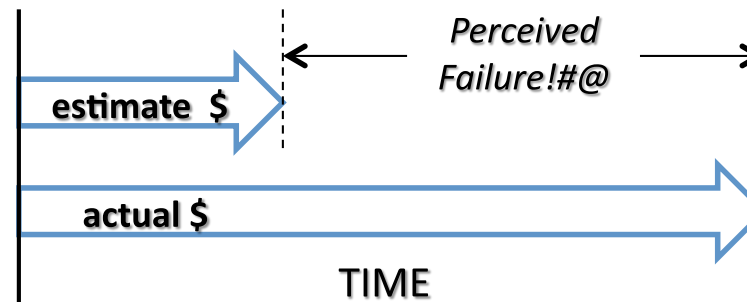
20 January 2013

I guess Bob crossed the line where he was exploiting his company, rather than his company exploiting him!

Develop Phase



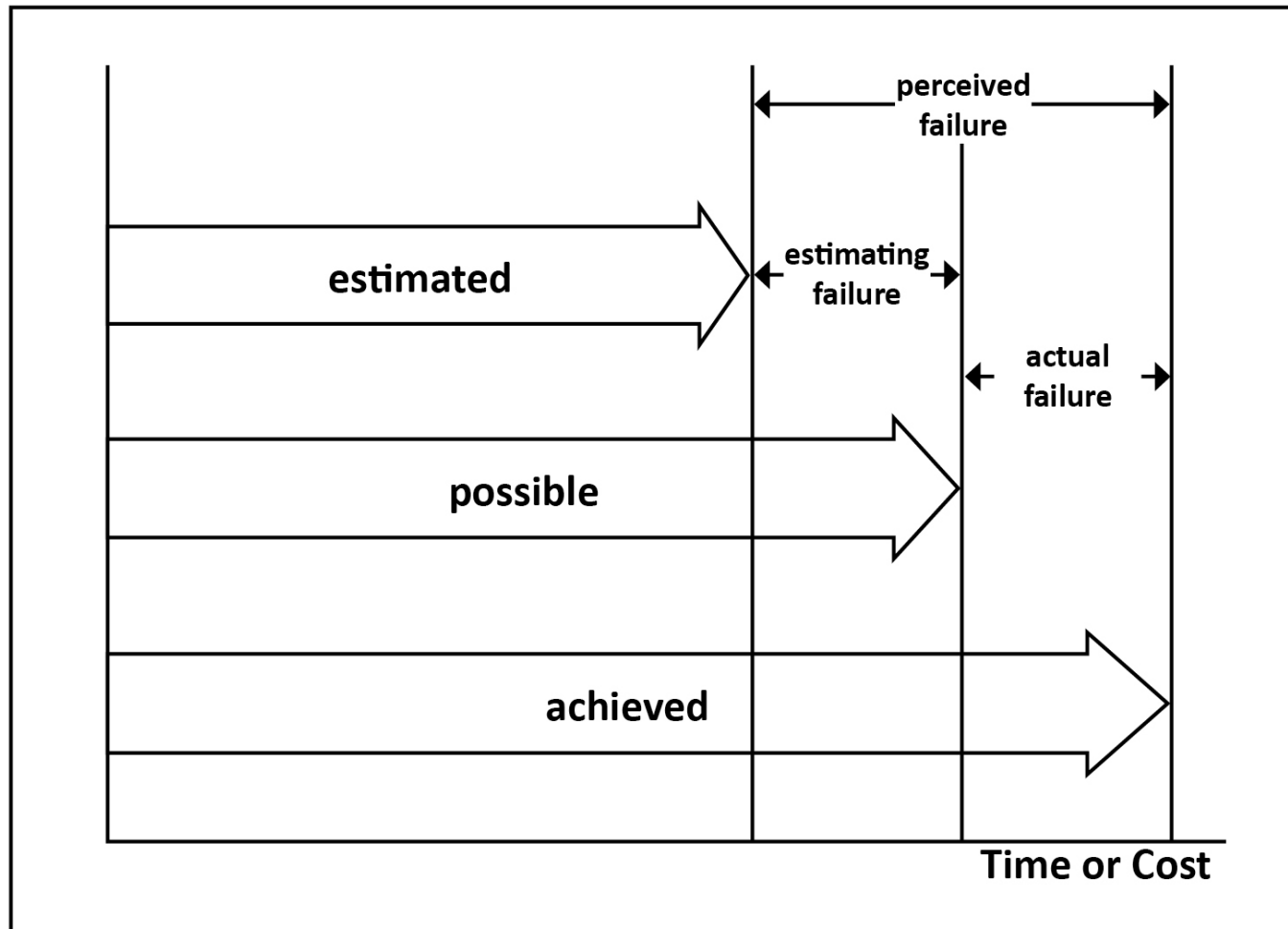
'Chunking' the project enables those people with the requisite skill-sets to more accurately estimate resource needs, work effort, duration and cost at WP level, to produce a project 'bottom-up' budget (estimate) of +25% to -10% accuracy (PMI), against which our financial performance might be assessed!



PMI Estimate Accuracy Ranges

Level	Type	Accuracy
1	Order of Magnitude	-25% to +75%
2	Budget Estimate	-10% to +25%
3	Definitive Estimate	-5% to +10%

Failure – Perceived and Actual



Estimating Tools and Techniques

- Ask the experts and know their tendencies
- Don't confuse elapsed time, duration and work-effort
- Check with those who have done it before
- Use normal work-package team sizes for estimates
- Review relevant reports/historical data
- Conduct trials or dummy runs or build prototypes
- Consult published productivity data
- Check you've identified all the work to be done
- Focus on longer duration and more expensive tasks – Pareto Principle (80:20 Rule)
- Adopt phased estimates (ie, rolling wave strategy)
- Allow for the unexpected – Murphy!
- Learn with experience – update estimating databases

More Estimating Tools and Techniques

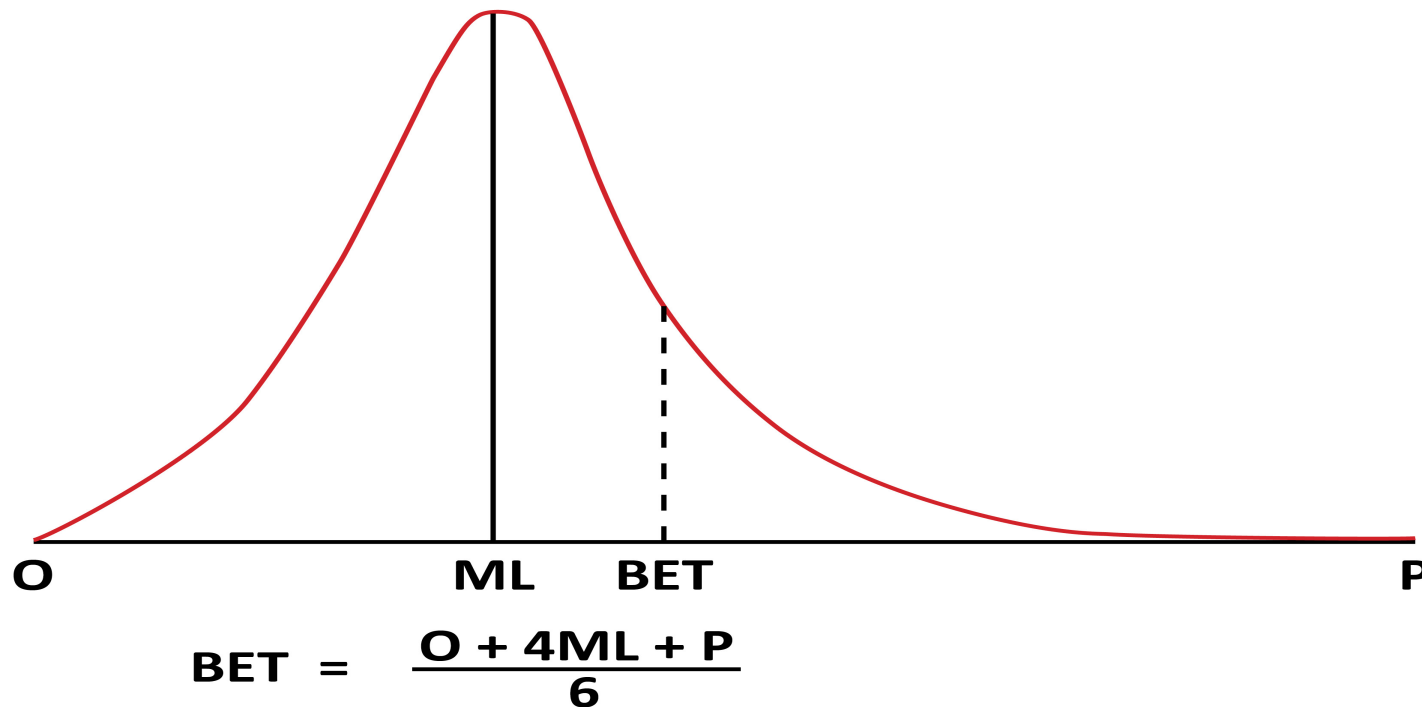
- Identify all factors that will affect time (eg, weather, weekends, work hours, holidays, skill levels, machine variations, industrial action, sickness, fatigue, staff turnover, etc)
- Find out current labour and material costs, insurance rates, interest rates, exchange rates etc for costing purposes
- Don't plan to do overtime
- Develop a spreadsheet
- Document estimate assumptions
- Include estimate date and indication of estimate accuracy
- Don't reduce estimate without commensurate scope reduction
- Provide estimators with feedback on variance
- Apply the Delphi technique
- Use PERT formula
- Use broad-band Delphi technique

A Dilbert Moment



PERT Formula

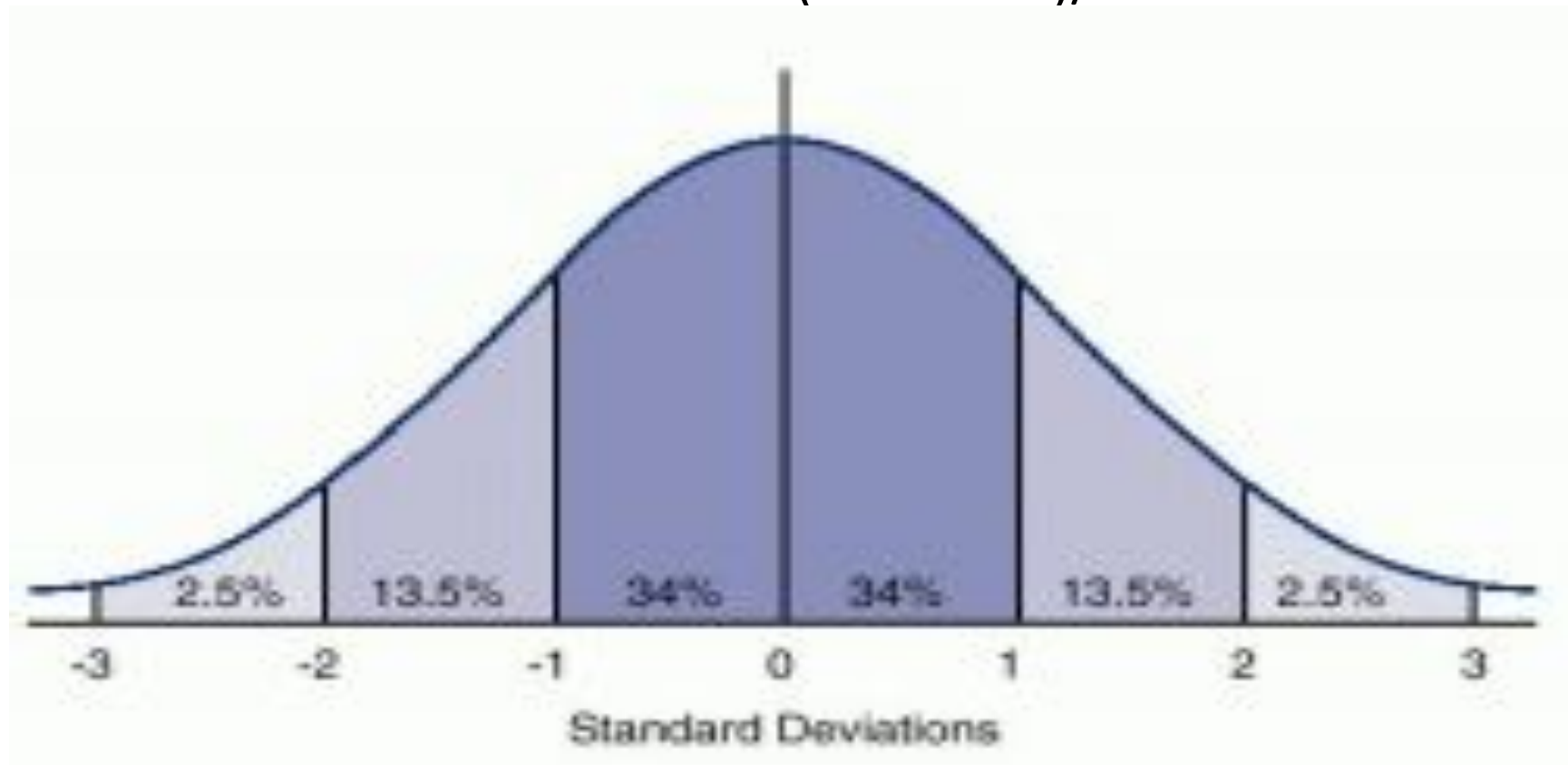
PERT (Programme Evaluation and Review Technique), developed during the US Polaris Missile Project 1960, provides a weighted average estimate given estimated Optimistic (O), Most Likely (ML) and Pessimistic (P) durations. This Beta frequency distribution recognises that there is a limit to how quickly a job might be completed, but little limit to how long it could take. Standard Deviation is $P - O/6$.



Derivation of PERT

$$\text{BET} = (16\% \times O + 68\% \times L + 16\% \times P)/100\%$$

which is about $(O + 4L + P)/6$



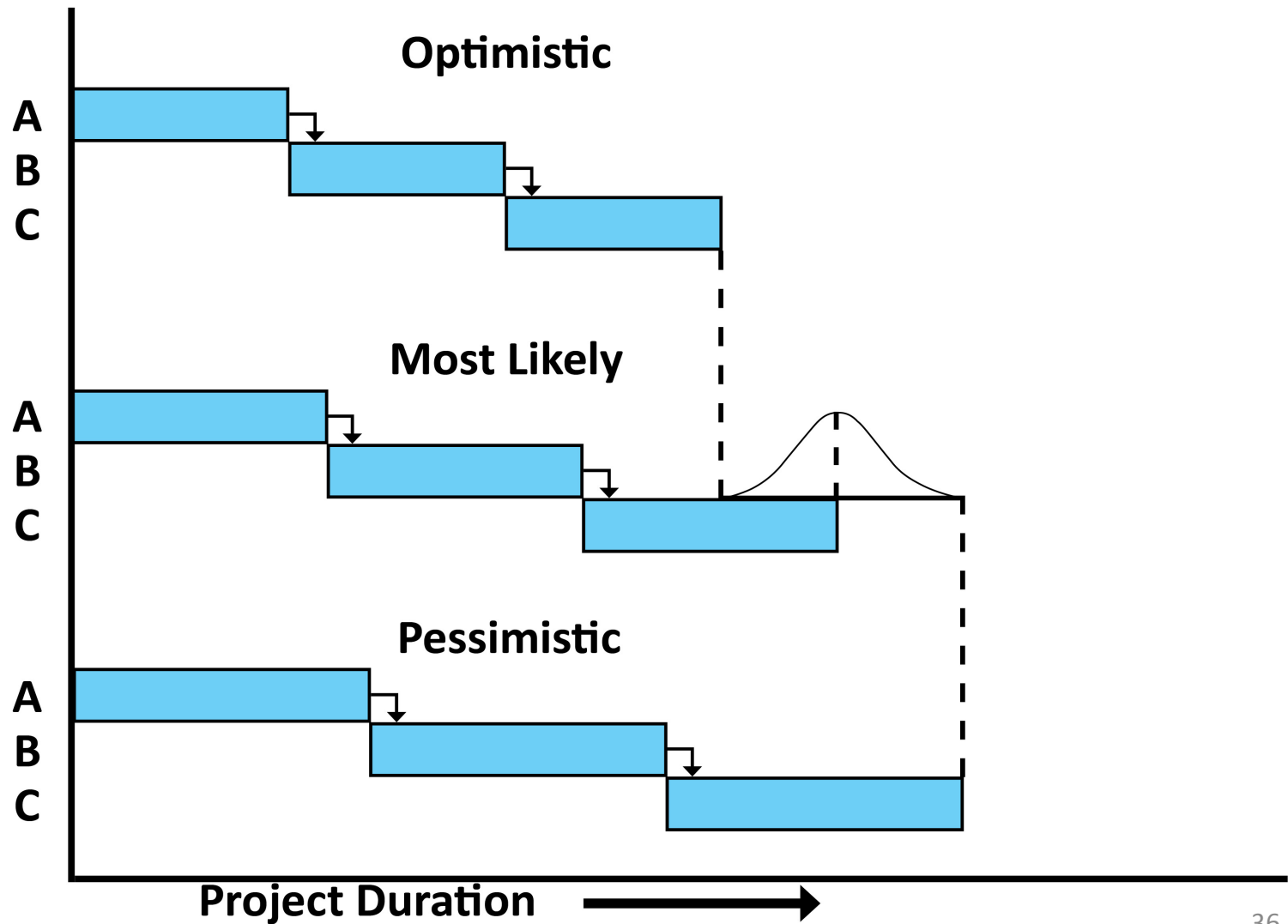
PERT Exercises

$$BET = (O + 4L + P) / 6$$

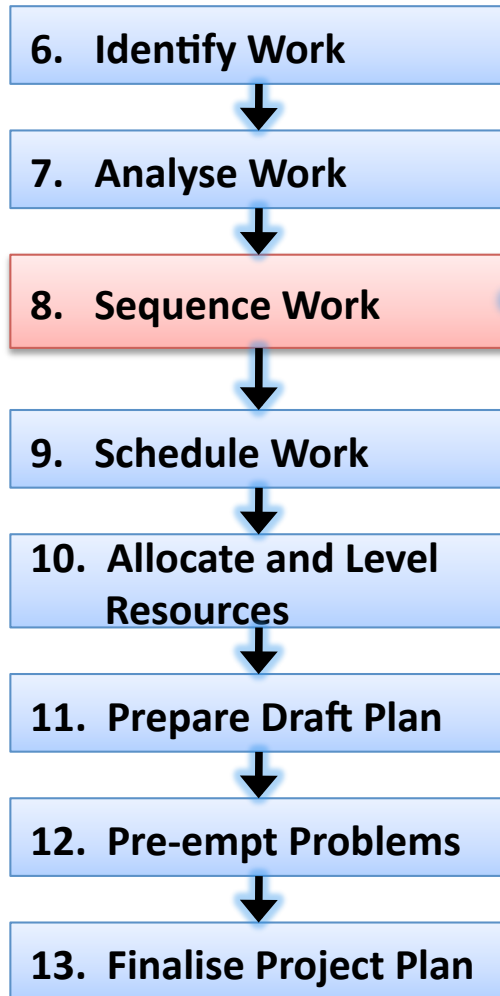
What is the Best Estimate of Time (BET) given:

1. $P = 20$, $L = 10$, and $O = 6$?
2. $P = 126$, $L = 180$, and $O = 300$?

PERT and Project Schedule



Develop Phase

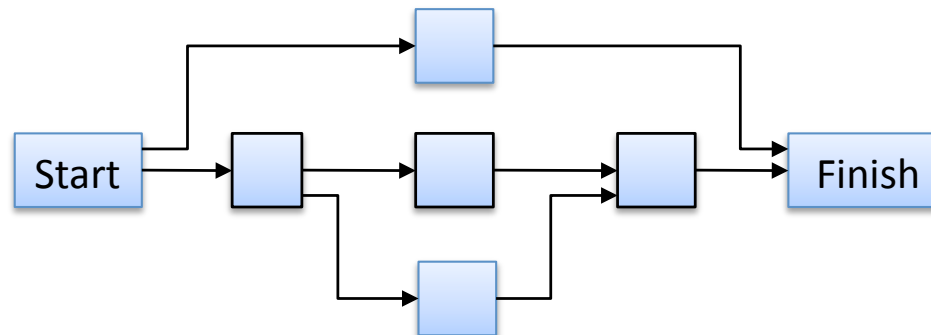


Now we consider the 'logic' of the project, which recognises that some tasks can't be undertaken until other tasks have been started or completed. These task relationships are illustrated by a Network Diagram that enables us to:

- identify critical path/tasks and estimate project duration
- assign milestones and undertake sensitivity analyses
- determine float time (slack time) for non-critical tasks

Such diagrams are often prepared using Post-it Notes on a whiteboard or paper before using scheduling software .

'Float' is the amount of time by which we can delay a task without delaying the project completion date.



Critical Path

‘Critical path’ is an often misunderstood term. It dictates project duration. A critical task is on the critical path. It is critical in terms of project completion time.

Our project’s critical path is important since:

- It tells us the shortest time in which our project can be completed.
- It shows us those tasks, which if delayed, will cause a delay to our entire project.
- It shows us those tasks that must be completed more quickly in order to accelerate project completion.

A project can have more than one critical path, and sometimes the critical path changes during project execution when actual task durations become apparent.

Develop Phase

6. Identify Work



7. Analyse Work



8. Sequence Work



9. Schedule Work



10. Allocate and Level Resources



11. Prepare Draft Plan



12. Pre-empt Problems



13. Finalise Project Plan

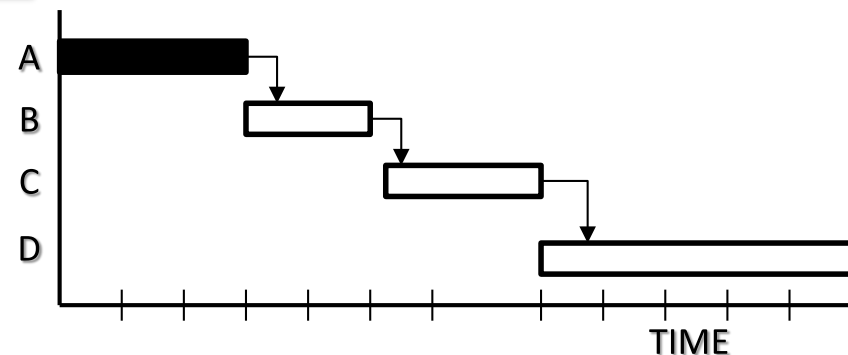
Now we convert our Network Diagram into a Task Schedule that shows what tasks are to be undertaken over what periods.

The schedule might be in table format or illustrated as a Gantt chart. Scheduling software is very useful. MS Project is the most widely used package.

Table Format

Task	Dur	Float	ES	EF	LS	LF
A						
B						
C						

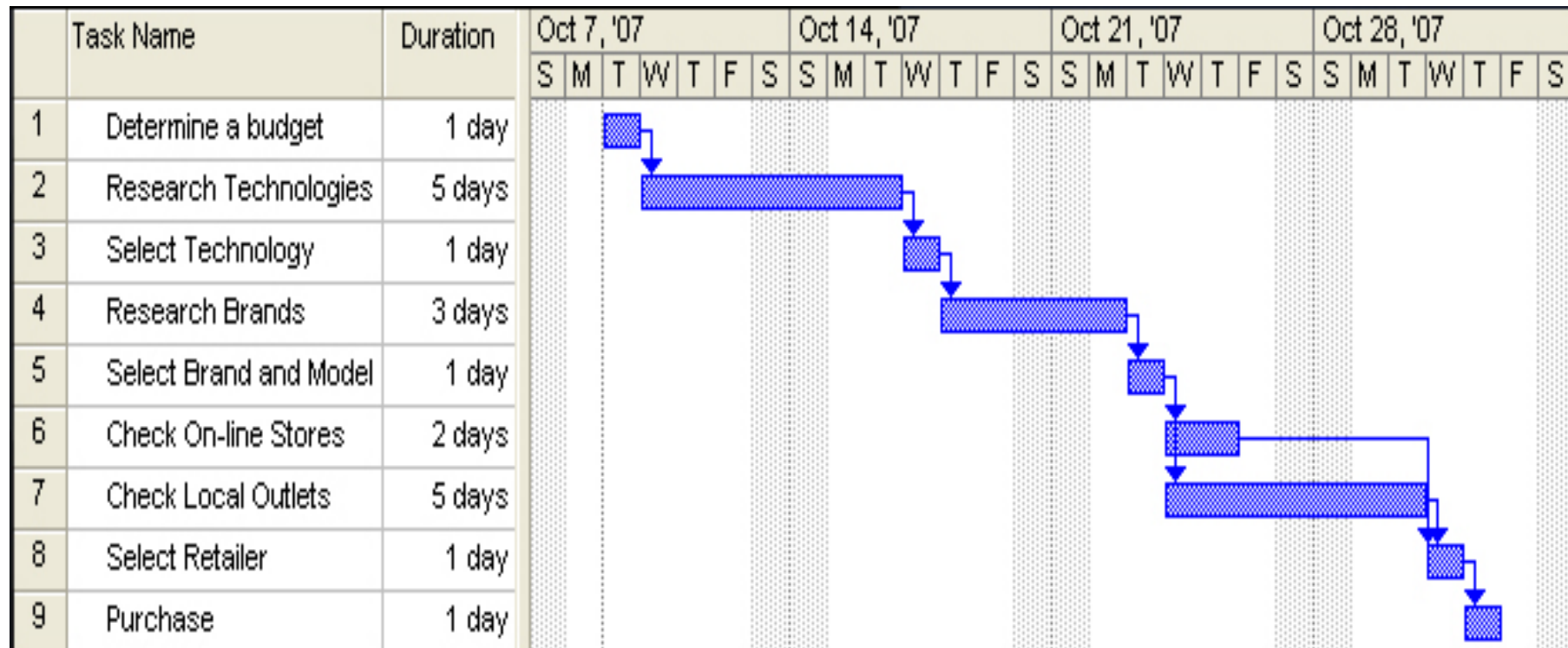
Gantt Chart



Gantt Chart (MS Project)

God Alone kNows The Truth

This Gantt chart, named after its inventor Henry Gantt, depicts a simple project schedule where only Task 6 has float. All other tasks are critical.



Free PM Software

Project management applications are usually centered around Gantt charts, where each task is represented by a timeline. This visual is linked to resources and synchronised to a calendar.

Because of its brand and its place in the market, Microsoft Project is the most popular product, but is fairly expensive, especially if you just want to use it for some simple projects.

Here are some popular open-source applications that you could Google and download free:

GanttProject
OpenProject
OpenWorkbench
Ganttter
jxProject

Better check first with your IT Manager if you propose to use any of these products at work.

A Dilbert Moment



Develop Phase

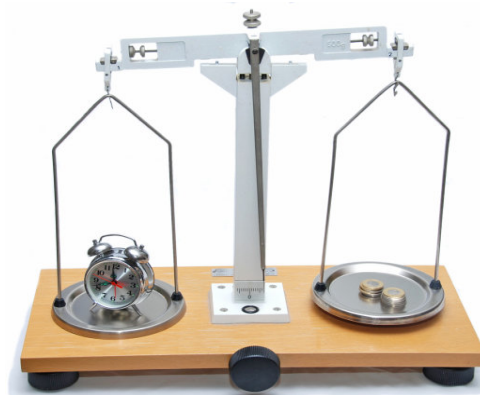
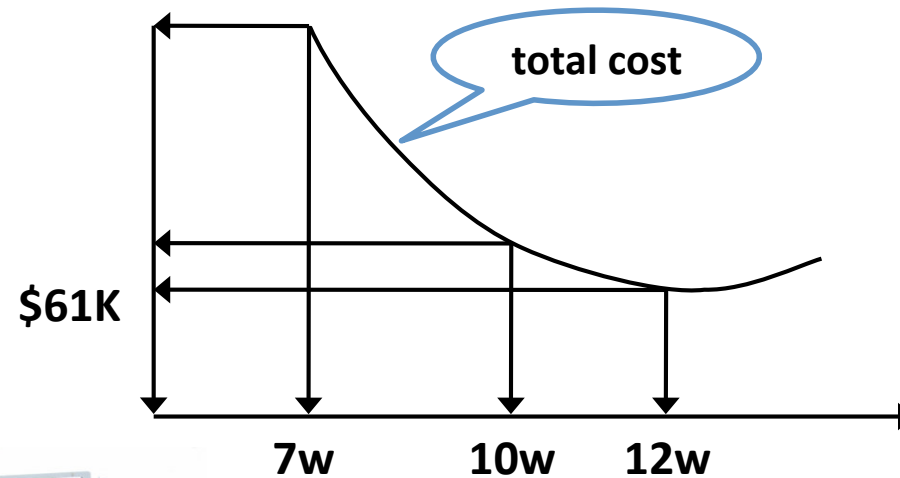
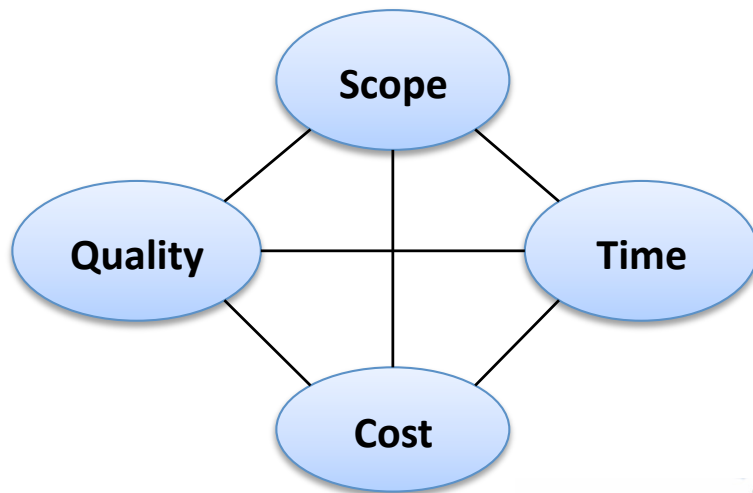


Having prepared our Task Schedule, we now check the actual availability of resources and identify any resource shortfalls or overloading. Such resourcing problems may be resolved or reduced by the following practices, usually applied in this order:

1. Reschedule non-critical tasks (NCTs) using float.
2. Extend NCTs using float (ie, take longer over work).
3. Split NCTs using float (which may increase total work effort).
4. Remove non-essential task dependencies to create more float and thus revisit above possible solutions 1,2 and 3.
5. Get more productive resources (rather than just add more).
6. Subject project parameters to a 'trade-off analysis'.
7. Add shifts and/or work longer hours (but sometimes for a diminishing return).

The deliverable from Step 10 is a Resource Schedule that itemises resource needs - who, what and when - the basis for our Procurement Plan. Given that sometimes tendering and long lead-times are involved, procurement might now be initiated, but no contracts should be finalised/signed until the project plan is formally approved by the project sponsor.

Trade-off Exercise



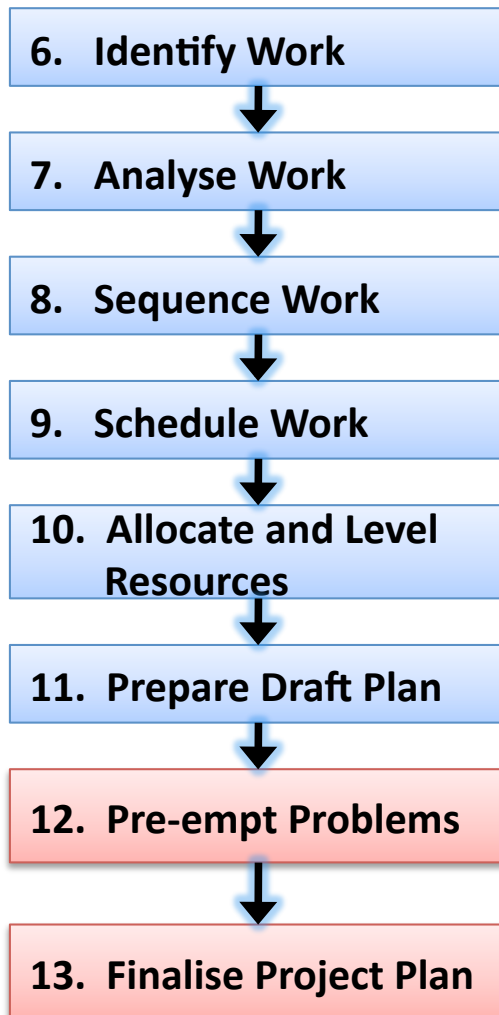
Develop Phase



Comprehensive Project Plan Checklist 'The Framework' Appendix 8

- Title Page
- Distribution List
- Amendments
- Contents
- Executive Summary
- Project Purpose(s)
- Project Goal(s)
- Planning Assumptions
- Scope – Inclusions and Exclusions
- External Dependencies
- Final Deliverable(s)
- Project Constraints
- Key Stakeholders & Roles
- Project Organisation
- Benefits Realisation Plan
- Network Diagram
- Schedule/Gantt Chart
- Work Package Descriptions
- Procurement Plan
- Management of Variations
- Monitoring and Control
- Quality Management Plan
- Project Budget
- Cash-flow Forecast
- Risks and Issues Management
- Health and Safety
- Stakeholder Management PI
- Public Relations Plan
- User Training
- Project Closure and Evaluation
- Document Control
- Approvals/Authorisations

Develop Phase



Although risk management must be continuous throughout the project lifecycle, Step 12 is one important occasion when key stakeholders are invited to assess the draft project plan and identify potential implementation problems. The project plan might then be amended to eliminate or keep identified risks to within acceptable tolerances prior to project implementation.

While Step 13 is to 'Finalise Plan' (or baseline) for approval, in reality the project plan is often subject to frequent revision as the project proceeds and unforeseen good and bad realities are revealed. Careful project plan version control is therefore essential.

Once the Sponsor approves the plan in part or total, the project is usually implemented without delay. However, detailed planning may reveal unexpected problems, or circumstances may have changed since project conception, such that project implementation is now postponed or the project is cancelled.

Risk Response Summary

THREATS

- **Avoid** – to prevent or eliminate the risk impact and/or probability.
- **Accept** – to do nothing since the risk is minimal or no other responses are suitable.
- **Transfer** – to shift or share risk responsibility with a third party better able to manage the threat.
- **Mitigate** – to reduce risk impact and/or probability.

OPPORTUNITIES

- **Exploit** – to aggressively increase the risk impact and/or probability.
- **Accept** – to do nothing since the risk is minimal or no other responses are suitable.
- **Share** – to shift or share risk ownership another party better able to manage the opportunity.
- **Enhance** – to strengthen risk impact and/or opportunity.

Wow – You Came Back!

TIME	DAY ONE	DAY TWO	DAY THREE
9:00	Project management basics	A busy day when we analyse the project conception and development phases, practising various tools and techniques – WBS, estimating, network diagrams, Gantt charts, resource scheduling, pre-empting problems, and trade-off analyse.	Project execution and finish phases.
10:30			Team project planning and presentation exercise.
10:45	Team project exercise		
12:30			
1:15	Project lifecycle and framework		
2:45			
3:00	Essential people skills		
4:30			Finish-up Administration

Project Management Framework

Execute Phase

14. Procure Resources

Once the project plan is approved, resource procurement contracts can be let.

15. Assign Work

Project work packages are formally delegated or outsourced (ie, contracted out) and work commences.

16. Monitor Progress

Once underway we check for variance (difference between planned and actual progress) and take corrective action where needed or re-plan the project.

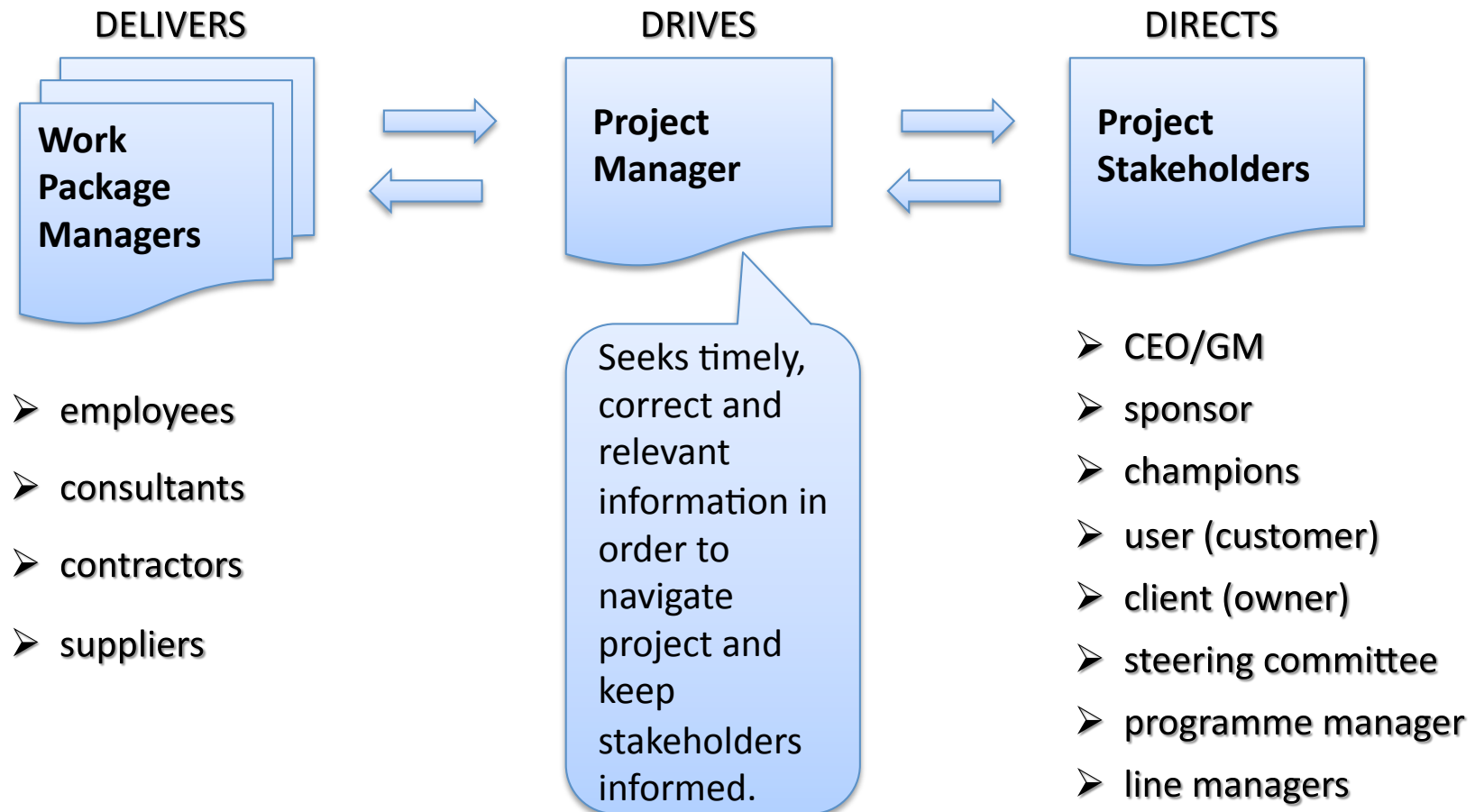
17. Manage Execution

We manage the work, stakeholders, variations, risks and issues, documentation, report progress, and lead the project team.

18. Produce Final Deliverables

We check the completed final deliverable(s) against acceptance criteria and prepare for handover.

Information Flows



Monitoring Progress

There is a trade-off between cost to monitor progress and value of resultant information. Project control should be cost-effective and the need to monitor project performance will typically be influenced by:

- priority of project
- size of resource commitment
- cross-project dependencies
- allowable tolerance limits and parameter priorities
- previous experience with similar projects, or same consultants, contractors and employees (confidence measure)
- stakeholder expectations
- risk assessment
- legislation
- consequences of failure
- project complexity
- project novelty

What to Monitor

- planning assumptions
- symptoms of risk
- deliverables
- variances and trends to schedule, cost, quality
- resources – people, materials, equipment
- resolution of issues
- processes – control, communications, quality, health and safety, variations, payments, problem solving, stakeholder management, risk and issues
- relationships
- security – physical and intellectual property
- cash flow
- external factors

Monitoring Tools and Techniques

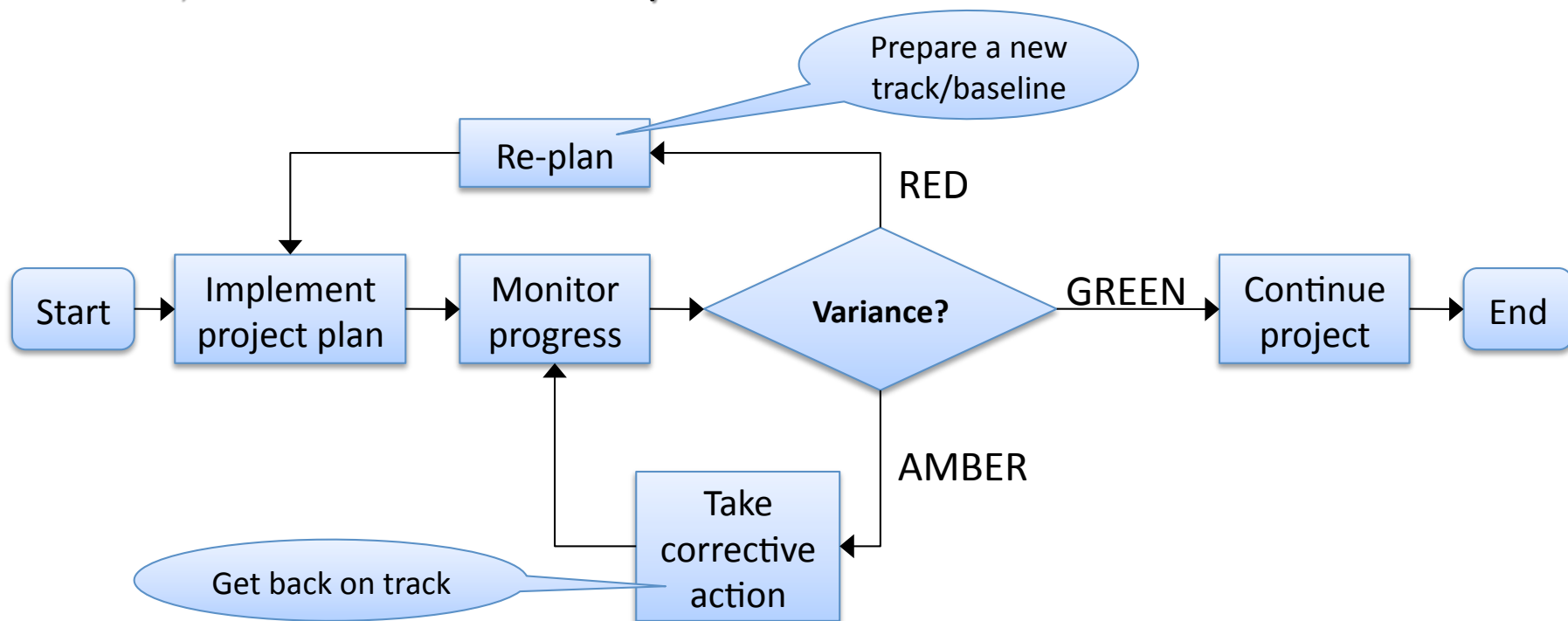
- risk/opportunities log
- issues log
- lessons learned log
- change log
- accident register
- progress reports
- status reports
- exception reports
- site visits
- variance reports
- milestone slip charts
- personal contact
- interviews
- questionnaires
- sampling and testing
- meetings
- audits and reviews
- prototypes and trials
- checklists
- telephone conferences
- video conferences
- structured walk through
- demonstrations
- simulations
- benchmarking
- peer reviews
- earned value analysis

A Dilbert Moment



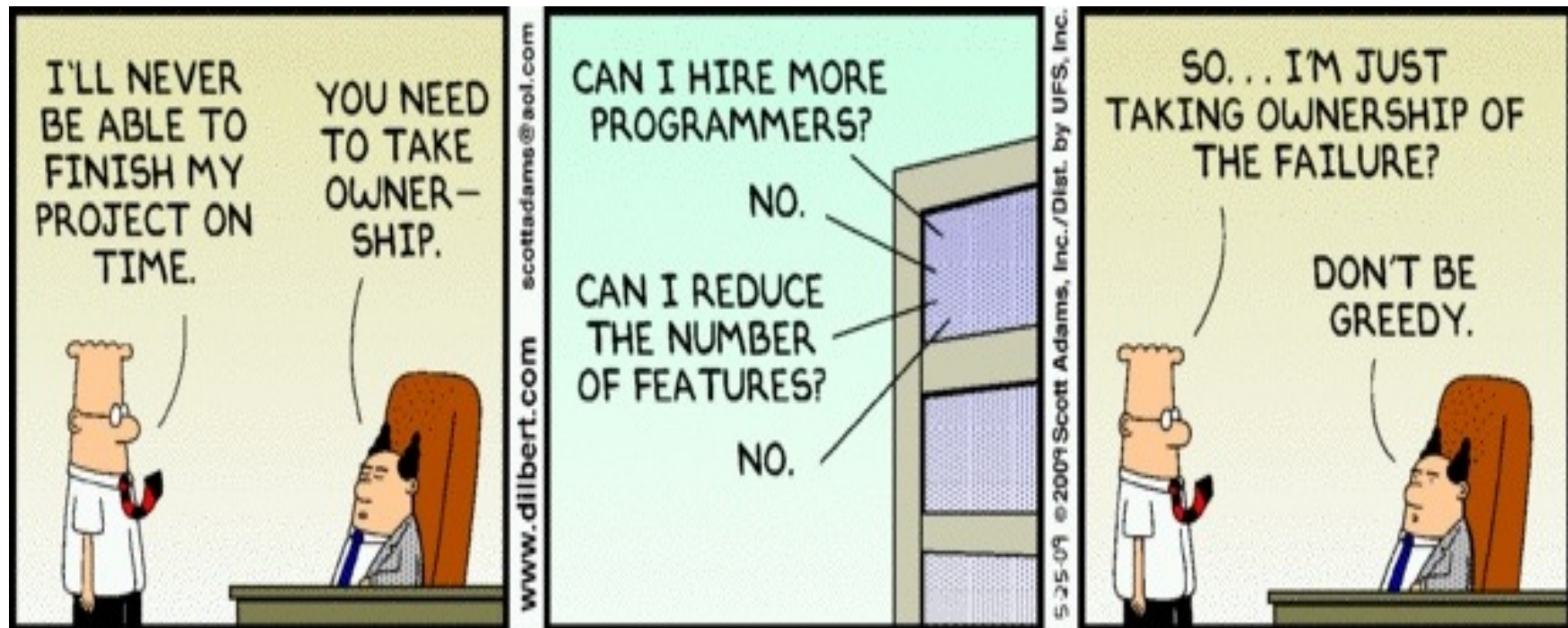
Managing Variance

Should variance look to move beyond predetermined and acceptable tolerance limits, corrective action is usually needed.



Re-planning or corrections that are likely to exceed parameters (and any contingency provisions) in current Charter first need sponsor's approval and issue of updated Charter.

A Dilbert Moment



Overcome Schedule Slippage

- Renegotiate milestones, finish date, work scope and/or performance standards.
- Deploy more resources and/or more productive resources. Brooks' Law states that adding more resources to an already late project further slows the work.
- Stand down any trainees and poor performers.
- Apply the 'minimum float' rule.
- Redeploy resources to focus effort on critical and near-critical path tasks.
- Undertake more work concurrently (fast-tracking), overlap, break dependencies.
- Work overtime and/or contract out work.
- Impose late completion penalties (eg, liquidated damages).
- Set incentives for early or on-time completion and productivity improvements.
- Accept partial delivery (ie, postpone less-essential work).

A Dilbert Moment

Brooks' Law : "Adding people to a late project makes it later."



Reduce Over-Expenditure

- Check schedule progress. Ahead of schedule work incurs early unexpected expenditure.
- Renegotiate project budget, work scope, specifications, pay rates and material costs.
- Minimise order quantities and/or purchase economical order quantities (EOQ).
- Sell off excess inventory for immediate cash injection. Avoid stockpiling. Practice JIT.
- Substitute cheaper processes, labour, materials and equipment.
- Eliminate advances, deposits, rework, wastage, theft, spoilage and scope creep.
- Have more progress payments from client. Delay own payments (ie, improve cash flow).
- Optimise schedule/budget. An ambitious schedule is usually an expensive schedule.
- Shun perfection and extra audits. Curb ultra-perfectionists. Settle for 'good enough'.
- Ensure all charges against project are accurate, legitimate and properly authorised.
- Review delegated financial authorities. Centralise financial approvals. Vet all purchases.
- Ensure payments are only made for satisfactory completed work. Apply retentions.

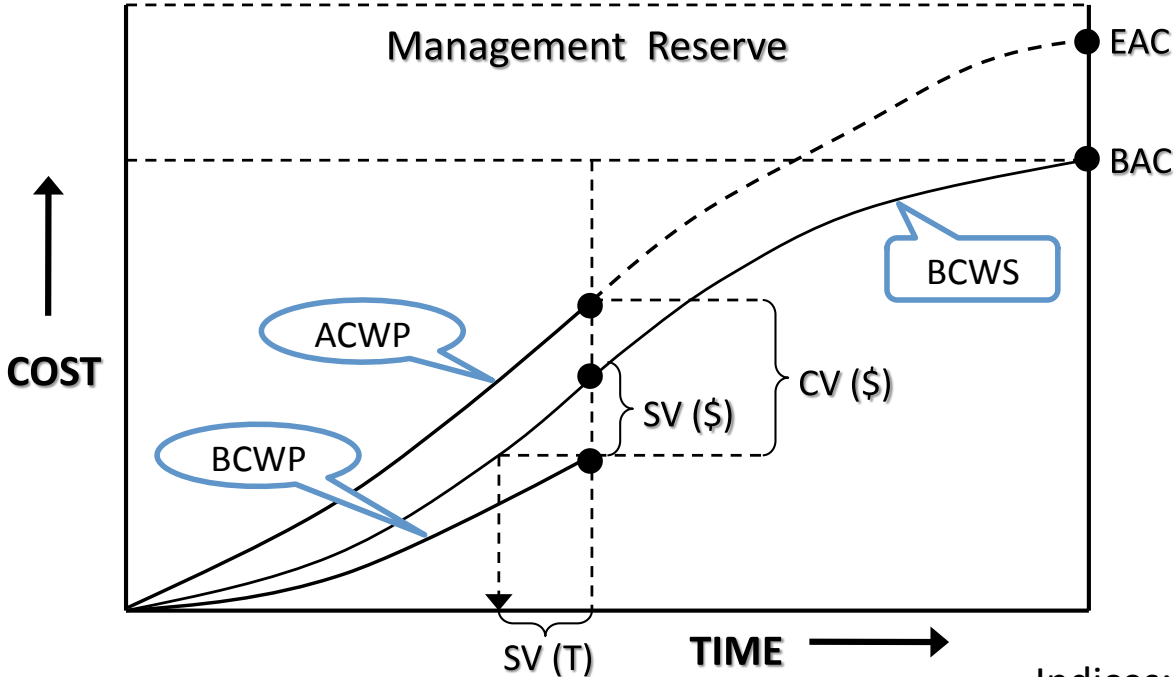
Risk Trade-Off Exercise

The client wants this 12 week project completed in 10 weeks. What minimum extra expenditure will now be needed to mitigate the risk of late completion? (And how about 7 weeks?) First, draw the network diagram.

TASK ID	IMMEDIATE PREDECESSOR	NORMAL DURATION	NORMAL COST \$K	CRASH DURATION	CRASH COST \$K	EXTRA COST / WEEK \$K
A	Nil	3	5	2	10	5
B	Nil	6	14	4	26	6
C	Nil	2	2.5	1	5	2.5
D	A	5	10	3	18	4
E	C	2	8	2	8	N/A
F	A	7	11.5	5	17.5	3
G	B,D,E	4	10	2	24	7

Earned Value Analysis (EVA)

EVA is a method of measuring progress. It links cost and schedule performance.



Indices:

Variance:

$$SV = BCWP - BCWS$$

$$CV = BCWP - ACWP$$

Estimate at Completion (EAC)

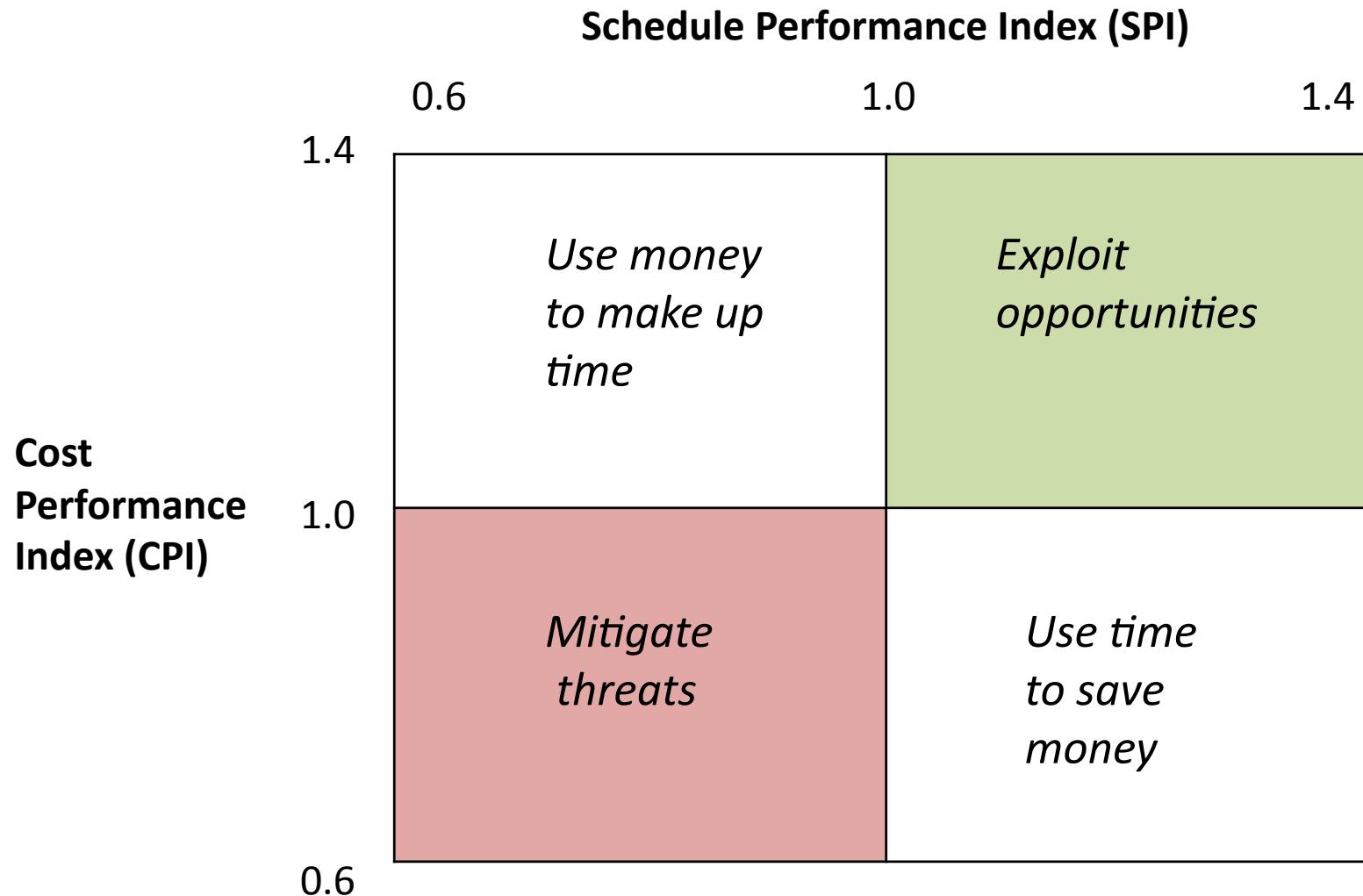
$$EAC = BAC / CPI$$

$$\text{SPI} = \text{BCWP} / \text{BCWS}$$

$$\text{CPI} = \text{BCWP} / \text{ACWP}$$

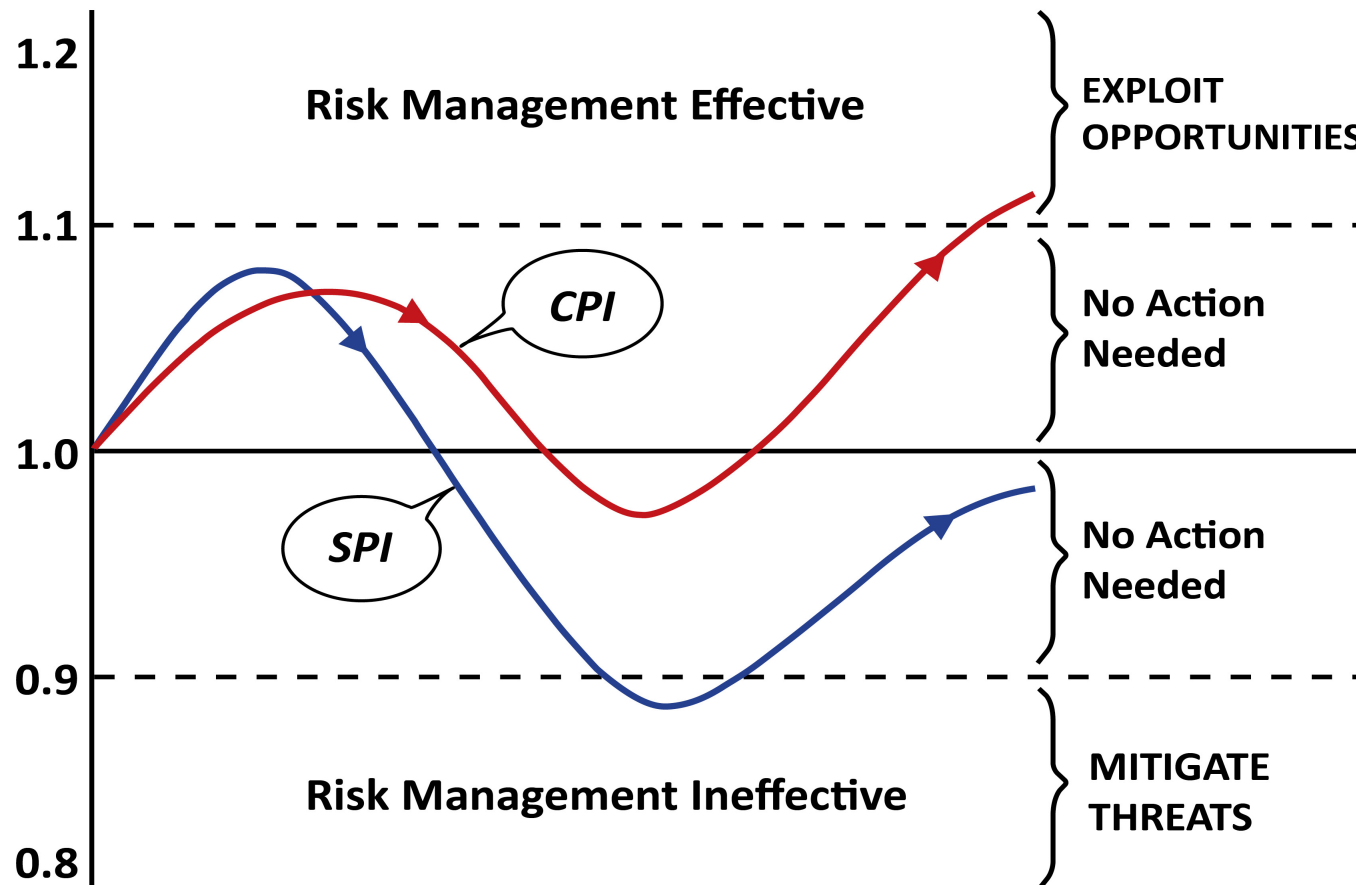
$$\text{CR or CSI} = \text{SPI} \times \text{CPI}$$

Project Performance and Risk Responses



Project Performance Thresholds

CPI and SPI indicate project risk management effectiveness. The “No Action” zones bounded by broken lines show permitted tolerances, which in this example is $\pm 10\%$ for both SPI and CPI.



Project Management Framework

Finish Phase

19. Obtain Sign-off



20. Close Project



21. Evaluate Project



22. Prepare Post-Project Report



23. Review Benefits

On handover there may be feature-by-feature checks to realise practical completion and sign-off.

Closing the project is often poorly done and is best treated as a 'project within the project' when we identify, plan and complete everything needed to properly close the project.

One approach is to assess performance in terms of 6Ps – purpose, people, politics, parameters, processes and products. We also complete the lessons learned log.

A comprehensive report on project performance is prepared and published, with conclusions and recommendations that may include suggestions for updating the project management methodology and estimating databases.

Periodically after product launch the sponsor/client checks with customers/users the extent to which business case benefits are being realised – a key measure of project success. Debugging and enhancement projects may follow.

Lessons Learned

Every project can help us run future projects better, but often we neglect to formalise lessons learned identification and recording. Common mistakes are:

- There is no lessons learned log, or if we do have one it's not conveniently available, properly completed, or it's used to chastise people.
- Lessons learned means admitting our less than perfect performance.
- We assume that lessons learned have already been learned, don't apply to us or to future projects – after all each project is unique.
- We only attempt to recall lessons at project completion, rather than document them at the time as we progress through the project lifecycle.
- We've already moved on to other pressing endeavours.
- Lessons learned are personal and are therefore not included in our post-project report or made available to others in our organisation.

Weighted-Attributes Decision Matrix

This tool may be used whenever we have options (alternatives) to evaluate and select from, which in project management might include decisions about such issues as:

- Which product to use or procure?
- Which tender to accept?
- Which supplier/contractor/consultant to employ?
- Which project to select?

For example, basic steps for procurement by tender:

1. Recognise the need for competitive tendering
2. Identify appropriate selection criteria (attributes)
3. Prioritise selection criteria (using 'paired comparisons' tool)
4. Assign a numerical value (weight) to each criterion representing its relative importance
5. Invite solutions (eg, RFP or RFT), shortlist solutions, and possibly have presentations
6. Score each acceptable solution against all selection criteria
7. Multiply scores by weights and sum these to determine best solution
8. Break equal totals by applying the Pareto Principle
9. Agree details with successful tenderer, undertake due diligence, sign contract.
10. Advise the unsuccessful and retain all documentation for at least seven years.

THE END

