

Methodologies and planning fundamentals

Overview

The development of project management theory has been predominantly through the documentation of practical applications by people in the field. In this way, most of project management is founded on positive theory. There is very little normative theory. Out of this documentation has come a series of methodologies. None of these methodologies vary greatly and once a grasp is obtained of one, it is easily transferred to the other. This session will take participants through several of the project management methodologies that exist including the Project Management Body of Knowledge (PMBoK), Projects In a Controlled Environment Version 2 (PRINCE2), Theory of Constraints and sub-sets of these methodologies like Earned Value and Critical Path Method (CPM).

Probably the most unique component project management brings to business is its use of Critical Path Method. Developed in the 1950s as a tool in managing the time phased component in the construction of the first Nuclear Submarine, CPM has become the main planning tool of the project manager. This session will take you through this method with a practical example that all participants will take part in. The development of this method through such methodologies as the theory of constraints has enabled some practitioners to halve the time component of a project and hence significantly reduce the costs and bring forward benefits realisation.

The session will be run using an experiential learning philosophy. A case study will be handed out and participants will be asked to work in groups to complete the activities involving developing a work breakdown structure, completing a critical path analysis and discussing the results of the network.

Learning outcomes

The learning outcomes of the session are:

1. Describe the various project management methodologies that are practiced in business today including:
 - a. The 9 functional areas of the PMBoK
 - b. The fundamental principal behind PRINCE2
 - c. When to use theory of constraints versus earned value
2. Build a work breakdown structure
3. Construct a network diagram
4. Calculate the critical path
5. Calculate the float of non-critical activities
6. Explain what a GANTT chart is
7. Discuss the implications of critical path method for time, cost and human resource management of a project

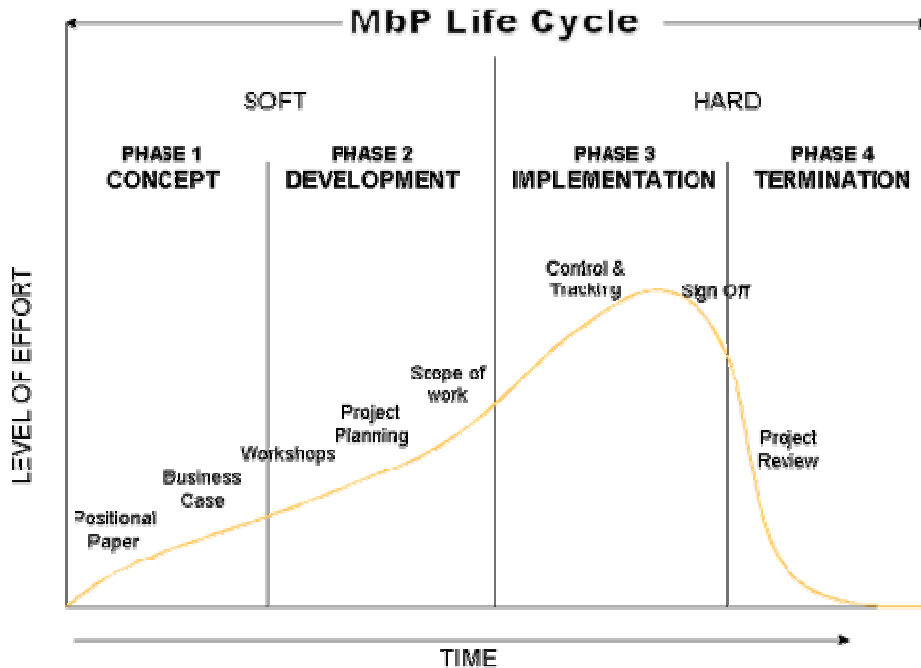
Project Management Methodologies and Concepts

We have already discussed the concept of Managing by Project; we'll now turn our attention to other more specific methodologies that cover specific areas of the Managing by Project philosophy. Some of these methodologies are mutually exclusive; others can actually complement each other. The methodologies we are going to cover, and the area they focus on, are:

Methodology	Area	Benefits	Weaknesses
The guide to the Project Management Body of Knowledge (PMBok)	Focuses on the 9 functions of project management. Has very little on project selection, strategy and change management. Focuses on the technical tools and processes of project management.		
The theory of constraints (TOC)	Can be used in any are of operational context. In a project management context, it focuses on resource and time management aiming to reduce the time taken to complete a project by directing resources in the most efficient way possible. This is achieved by analysing all work currently being performed and identifying where the constraint or critical chain of activities is.		
PRINCE2	PRINCE stands for Projects in a Controlled Environment. This methodology is a very deep process that focuses on project delivery. At core to its method is clear project governance, detailed product descriptions and subsequent work package definition.		
Earned Value (EV)	Used to analyse the progress of a project to assist in determining the amount of effort required to maintain the projects time frame and deliverables.		

Managing by Project Methodology

Project Life Cycle



The Managing by Project project life cycle is based on 4 phases: Concept, Development, Implementation and Close Out.

The time portion for each phase will vary from project to project, and as can be seen by the graph, the level of resources required increases over time, to peak at the hard implementation phase, when all aspects of the "build" activities are being completed.

Concept & Initiation Workshops can be held to assist in scoping a project in the first 2 phases.

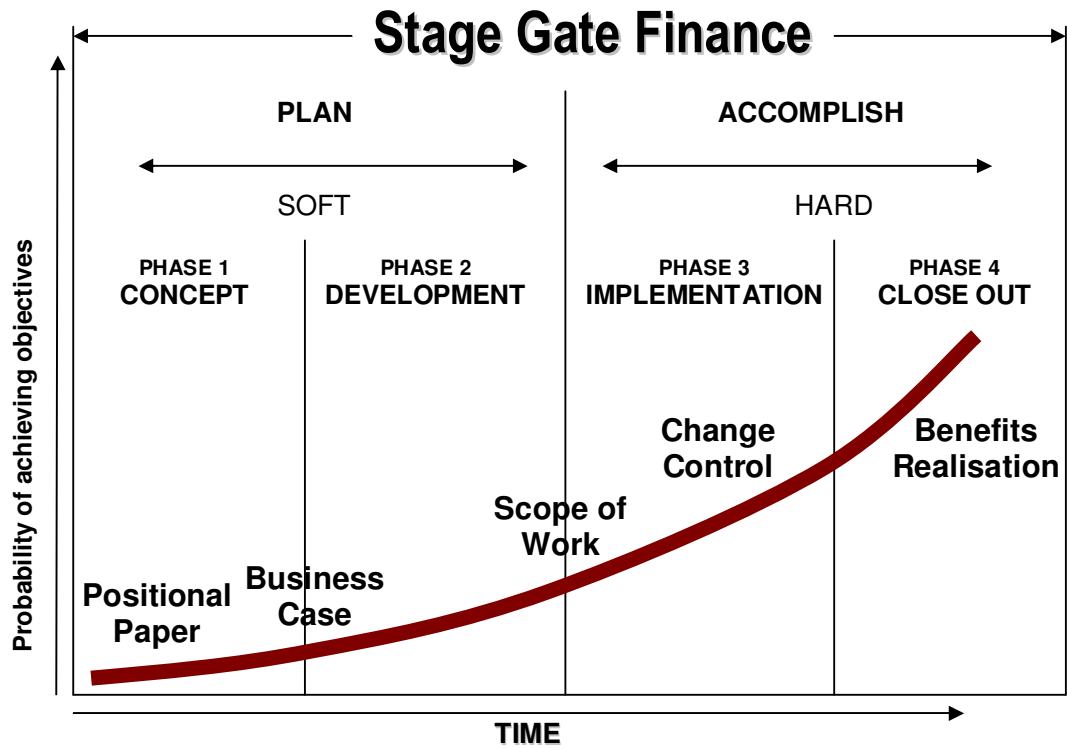
Recognition of this effort curve allows for management to establish a larger portfolio of projects in the concept phase, ready to execute on those projects that will definitely add the most value.

Document Name	Lifecycle phase created in	Integration with life cycle	Further information
Positional Paper	Concept	Development, Implementation and Close Out. Incorporating the post project review.	<ul style="list-style-type: none"> The project stems from this paper and its relevance is tested throughout by the completion of documents and alignment back to the idea. It is the starting point for the development phase of the project intertwined within the business case.
Business Case	Concept	Development, Implementation and Close out. Plus benefits review 6 to 12 month after the project has been implemented.	<ul style="list-style-type: none"> The Business Case is the crucial or the principal document of the project. It compiles all the relevant data and emphasises the importance and acceptability of the project, it is the gate way for the shift to the development phase. Central to the benefits review carried out 6-12months post implementation. Some companies hold their sponsors to the benefits highlighted for up to five years after the project has been implemented. However, any adjustment to scope must be reflected in the business case as well to ensure the benefits are still apparent or if changed are adjusted accordingly and signed off.
Concept Scope of Work Concept Scope of Work(cont)	Development	Implementation, Close Out	<ul style="list-style-type: none"> Strategic thinkers identify sub projects and core teams, what is in and out of the project. They have already bought into the project by being a part of the workshop, this means that executives in the chain of command can offer valuable support to the project manager. However executives can prove to be informative, supportive or obstructive if the project manager does not exercise caution in regards to communication and therefore should carry out a thorough stakeholder analysis and communication plan
Macro Scope of Work (SOW)	Development	Implementation, Close Out and project review	<ul style="list-style-type: none"> The MSOW is the second compulsory living document of the projects life cycle.

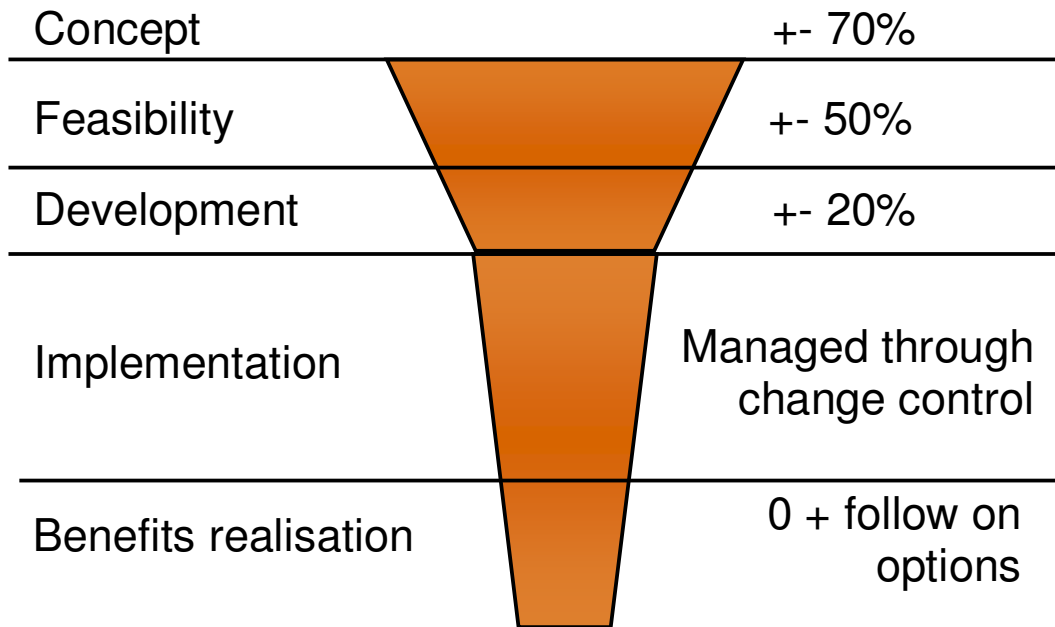
Document Name	Lifecycle phase created in	Integration with life cycle	Further information
			<ul style="list-style-type: none"> • It integrates the positional paper, business case feasibility and the concept scope of work, and drafts this into the 'project manager's bible' if you like of the project. • It is used as a quality control tool when there are discrepancies in the original scope, or where changes are to be made to the existing one, it is a reference guide. • It incorporates the risks identified in previous documents and highlights more. • It is completed within 24 hours of the workshop and is to be signed off by all relevant stakeholders. • It leads to risk management plans being drafted. • Its sub projects are broke up into sub project initiation workshops.
Sub Project Scope of Work	Development	Implementation, Close Out and project review	<ul style="list-style-type: none"> • Breaks up the sub projects and follows the agenda of the MSOW for the individual sub projects. • Is the Sub project managers' bible. • It breaks down the sub project into pieces of work • Its deliverable is part of the overall project.
Project Plan	Development	Implementation, Close Out	<ul style="list-style-type: none"> • Created in a planning workshop, breaking down the pieces of work into tasks, a work breakdown structure(WBS) • The WBS is transferred into a network diagram to identify the critical path • Identifies the tasks individual float and is valuable especially if you are using the theory of constraint philosophy and need to divert resources from one task to another.
Budget	Development	Implementation, Close Out	<ul style="list-style-type: none"> • Budget forecast for the completion of the project managed by the project manager and financial controller. • Collates the sub project budgets managed by the sub project manager into the macro budget

Document Name	Lifecycle phase created in	Integration with life cycle	Further information
			<ul style="list-style-type: none">• Macro budget should be inline with the Business Case forecasts

Stage Gate Finance



Variability of Objectives



If a non-blame culture of cross functional risk management is established then projects can be submitted with known variability estimated and tracked over time. Standard tolerance levels like those in the slide can be established. For example if a project will bankrupt the business if it hits -70% at concept phase, it is unlikely that it will have all its costs upfront, so it still may be worthwhile completing feasibility, but a narrower variability range should be aimed at (eg: 20%). Management always has the option to abandon, so it is unlikely that the worst case scenario will ever happen, but more about that later.



How it all fits together within the lifecycle

Innovation is the hot topic of the decade, companies are changing the creativity chain to allow all staff members to present ideas and organisations are putting in reward programs to remunerate the creator for their idea if successfully chosen and implemented.



Throughout MbP there are many documents created that create quality control through identification of scope, risks, issues and many other areas that are intricate areas of project management. The concept phase of the managing by project lifecycle encourages innovation as well as process through the presenting of ideas in the form of a positional paper which is signed off by a sponsor /person of authority that supports the idea. The positional paper is presented to the executive committee and if approved moves to the next stage of the phase and a 'business case' drafted.

Summary

Each area of the MbP lifecycle integrates with the next, and the importance of the sequence of documents within the lifecycle enables companies and



organisations the like to ensure that all staff follows a procedure to set about changing the way projects are created, developed and implemented. This process changes more than just the way projects are run; it starts to have an effect on the culture within.

Managing By Project creates buy in from the top of the organisation all the way through to the shop floor, it encourages each person to understand what the company is trying to achieve through its vision and realisation of the part they play.

For projects MbP allows all relevant personnel from cross functional areas of the organisation to be involved right from the beginning through the planning stages via unique facilitated workshops, thus reducing costs and time.

One of the major benefits is the scope is identified and all involved understand what the project is truly about. What is in and out and the risks identified.

The process of prioritisation of projects enables easier strategic direction to be made when problems arise; executives look at the level of priority and can then divert the necessary funds and human resources to the most prevalent project minimising the affect to others in the portfolio.

Methodology	Integration	Comments
Prince 2	Use the product description to pass information onto team members to ensure they understand what their deliverable is.	The important factor is all these methodologies have parts within that can be useful and if you take something from one and it add to your current methodology then you will only enhance your ability to deliver the project effectively.
PMBok	All nine functions can be integrated into any methodology. Each of the functions have a set process eg: Function Time the process is; Plan, execute, review Tools used; Gant chart	



Activity – List the documents that are used in the Stage Gate process and what cycle they are created in.

Roles, Responsibilities and Accountabilities

Role definition for projects is a crucial component and often overlooked. Roles, responsibilities and accountabilities must be clearly defined for all involved in projects. Once the roles are defined, the governance structure can be put in place. This form of quality control eliminates confusion and assists in positive communication for the project manager and team. The table below provides the roles and definitions.

Role	Responsibilities	Accountabilities
Project Sponsor	1. Commits the necessary resources to the project, including human resources, technology and finances.	<ul style="list-style-type: none"> • Availability of project resources, including human resources, technology and finance.
	2. Authorisation and acceptance of the project in order that the project may commence.	<ul style="list-style-type: none"> • Sign off of the Business Case, Scope of Work, Budget and Plan
	3. Authorisation and/or decline of Scope Change Requests.	<ul style="list-style-type: none"> • Sign off of Scope Change Request Form, with a justification for either the approval or decline. If the change is approved, the necessary budget and Plan changes also need to be approved.
	4. Conflict resolution.	<ul style="list-style-type: none"> • Project continues as conflicts resolved to avoid delays.
	5. Sign off and acceptance of the deliverables of the project, as well as the ultimate sign off of the project.	<ul style="list-style-type: none"> • Completed and signed "Project Completion" certificates and acceptance of deliverables.
	6. Monitors overall progress of the project and communicates progress and issues to Executive Management and Stakeholders.	<ul style="list-style-type: none"> • Regular attendance of Macro Project Meetings. • Regular presentations and/or meetings with Executive Management and Stakeholders.
Project Customer	1. Active participation in the Macro Project Scoping sessions in order to communicate the exact requirements and specification for the Project Deliverables.	<ul style="list-style-type: none"> • Signs off the Macro Project Scope of Work.
	2. Monitoring of Project progress and accuracy during the life cycle of the Project.	<ul style="list-style-type: none"> • Regular communication with the Project Sponsor and Macro Project Manager, as well as the regular attendance of Macro Project meetings.
	3. Acceptance of the Deliverables of the Project for the ongoing usage, maintenance or support of those Deliverables.	<ul style="list-style-type: none"> • Signs off the "Project Completion" certificates and acceptance of Deliverables. • Signs off the Project.
Project Supplier	1. Active participation in the Macro Project Scoping sessions in order to communicate the exact requirements and specification for the Project Deliverables.	<ul style="list-style-type: none"> • Signs off the Macro Project Scope of Work.
	2. Monitoring of Project progress and accuracy during the life cycle of the Project.	<ul style="list-style-type: none"> • Regular communication with the Project Sponsor and Macro Project Manager, as well as the regular attendance of Steering Committee meetings.

	3. Commitment to the Deliverables of the Project to the quality level specified maintenance or support of those Deliverables.	<ul style="list-style-type: none"> • Signs off the “Project Completion” certificates and acceptance of Deliverables. • Signs off the Project.
Macro Project Manager	1. Participation in the Macro and Sub-Project scoping sessions, including the planning and budgeting. 2. Monitoring, tracking and controlling of the Macro Project.	<ul style="list-style-type: none"> • Signs acceptance of the Macro and Sub-Project Scope of Works, Plan and Budget. • Maintained Macro Scope of Work. • Maintained Macro Project Plan. • Maintained Macro Project Budget. • Designed and maintained Key Performance Indicators (KPIs). • Delivery of Macro Project Deliverables within the agreed times, cost and quality. • Meeting of Project Milestones. • Completion of the Macro Project on time, on budget, on quality. • Adherence to the Project Management methodology. • Issue Resolution and Management. • Risk Management. • Scope Change Control.
	3. Management, co-ordination and support of Sub-Projects.	<ul style="list-style-type: none"> • Ensure delivery of Sub-Projects according to Macro Project requirements. • Scheduled and implemented Macro Project Team builds and training, as applicable.
	4. Project Progress Communication.	<ul style="list-style-type: none"> • Successfully conducted and minuted Macro Project meetings, as per the agreed meeting schedule and format. • Macro Project Progress Reports. • KPI Reports and/or Graphs. • Issue/Exception Reports.
Project Finance Manager	1. Prepares the Business Case and Business Benefits for the project to ensure that the project is feasible and viable. 2. Facilitates the budgeting process of the Macro and Sub-Projects, and prepares the budgets for sign off.	<ul style="list-style-type: none"> • Signed off and presented Business Case. • Signed off and presented Business Benefits. • Signed off Macro and Sub-Project budgets including sunk cost, incremental and Capex specific budgets.
Project Quality Manager	1. The establishment of a project deliverable audit schedule and the execution thereof. 2. Project process reviews. 3. Regular review and maintenance of Project Risk Schedule.	<ul style="list-style-type: none"> • Maintained Audit Schedule. • Audit reports. • Signed Deliverable Sign offs. • Process Review Reports. • Maintained Risk Schedule, and managed Project Risks.

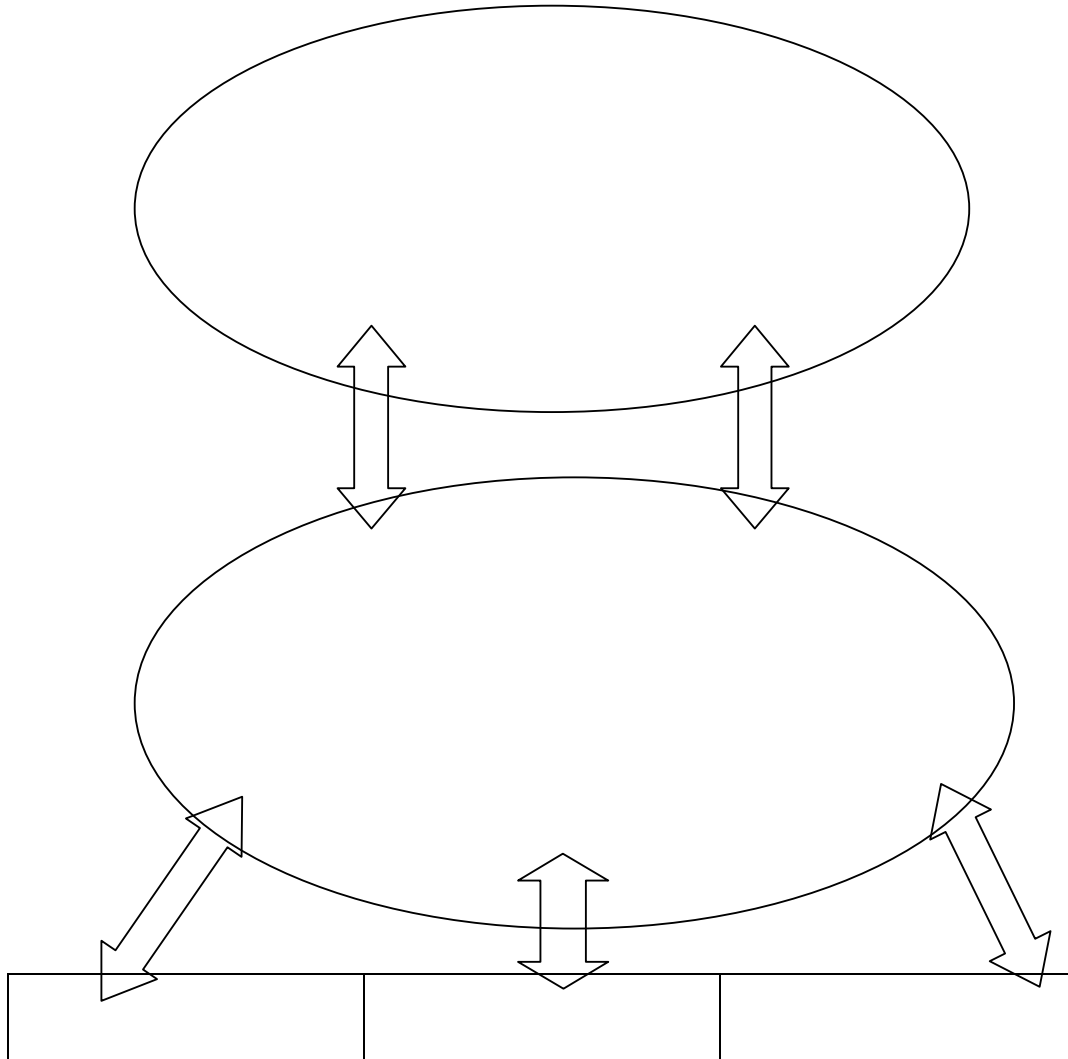
Sub Project Manager	1. Participation in the Sub-Project scoping sessions, including the planning and budgeting.	<ul style="list-style-type: none"> • Signs off the Sub-Project Scope of Work, Plan and Budget.
	2. Monitoring, tracking and controlling of the Sub-Project.	<ul style="list-style-type: none"> • Maintained Sub-Project Scope of Work. • Maintained Sub-Project Plan. • Maintained Sub-Project Budget. • Maintained Sub-Project Key Performance indicators (KPIs). • Delivery of Sub-Project Deliverables within the agreed times, cost and quality. • Meeting of Sub-Project Milestones.
	3. Management and co-ordination of Sub-Project Team.	<ul style="list-style-type: none"> • Delivery of Major Tasks according to Sub-Project delivery requirements. • Scheduled and implemented Sub-Project teambuilds and training, as applicable.
	4. Sub-Project Communication.	<ul style="list-style-type: none"> • Successfully conducted and minuted Sub-Project meetings, as per the agreed meeting schedule and format. • Sub-Project Progress Reports. • Sub-Project KPI Reports and/or Graphs. • Issue/Exception Reports.
Project Facilitator	1. Scoping of the project, including Project Concept Workshop, Project Initiation Workshop, Sub-Project Initiation Workshop and Re-scoping Workshops.	<ul style="list-style-type: none"> • Signed off Scopes of Work, including: Concept, Macro and Sub-Projects Scope of Work.
	2. Monitoring and reporting on the progress of the project according to the agreed Project scope and methodology.	<ul style="list-style-type: none"> • Facilitation Report. • Mentoring and advising on the methodology as applicable.
	3. Mentoring and guiding the Macro and Sub-Project Managers, as required.	<ul style="list-style-type: none"> • Experienced and confident Macro and Sub-Project Managers.
Project Administrator	1. The set-up and ongoing maintenance of the Program Office for the project.	<ul style="list-style-type: none"> • The co-ordination and maintenance of the office venue, furniture and equipment, as authorised and provided by the Macro Project Sponsor. • The implementation and maintenance of a manual and an electronic filing system for macro and sub-project master documentation. • The implementation of all software and methodology templates.
	2. The scheduling and minuting of macro and sub-project meetings.	<ul style="list-style-type: none"> • Maintained macro and sub-project meeting schedule. • Accurate and signed off minutes distributed within 24 hours. • Scheduling & arrangement of macro project meeting venues. • The preparation and distribution of agendas and attachments.

		<p>as applicable.</p> <ul style="list-style-type: none"> • The issuing of meeting notifications, as applicable. • Consolidated Macro Project Progress Report for completion by Macro Project Manager.
	3. The consolidation of the Sub-Project Progress Report details into a Macro Project Progress Report for completion by the Macro Project Manager.	
	4. The updating of the macro project plan, as required.	<ul style="list-style-type: none"> • Updated macro project plan, for approval by Macro Project Manager.
Key Representative/ Team Member	<p>1. Active participation in the scoping of Macro and/or Sub-Projects, as applicable.</p> <p>2. Input to, and <i>participation in</i>, Macro and/or Sub-Project delivery.</p>	<ul style="list-style-type: none"> • Signs acceptance of the Macro and/or Sub-Project Scope of Work. • Contribution of skills or knowledge as required by Macro and/or Sub-Project tasks. • Attendance of Macro and/or Sub-Project meetings.
Project Planner	<p>1. Facilitates the Planning process of the Macro and Sub-Projects, and prepares the plans for sign off. This includes the following sessions:</p> <ul style="list-style-type: none"> • Sub-Project Planning Sessions • Macro Project Planning Session. <p>2. Maintains the Macro and/or Sub-Project Plans during the lifecycle of the project, if required.</p>	<ul style="list-style-type: none"> • Signed off Macro and Sub-Project PERT charts. • Signed off Macro and Sub-Project GANTT charts. • Signed off Task Sheet. • Provide electronic copy of all Project Plans to the Macro and Sub-Project Managers, as required, for the ongoing maintenance and tracking thereof. • Accurately maintained Macro and/or Sub-Project Plans.



Activity - Governance Model

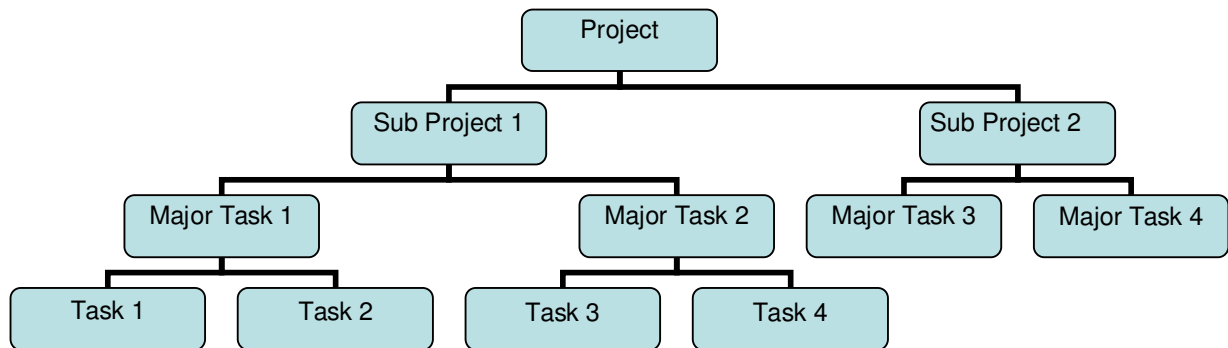
Fill in the details as you discuss the governance model; remember you are looking at who reports to whom within your project and again providing a clear definite structure for the all;



The Work Breakdown Structure (WBS)

- A family tree of project activities
- A graphical display of work to be done
- The foundation for developing the Network diagram

The work breakdown structure (WBS) defines the total scope of the project, work not in the WBS is outside the scope of the project. The WBS is often used to develop a common understanding of the scope of the project, in a workshop environment. It's graphical nature, and ability to be created via post-it notes on a flip chart allows the structure to be easily developed in a group environment.



- Each Level in the WBS represents an increasingly detailed description of the project. Each block in the WBS is assigned a unique number to identify it.
- The WBS should be explicit and easily understood.
- All schedules should follow the WBS.

Developing a work breakdown structure (WBS)

- Step 1: Take Initiation workshop output
- Step 2: Create task list
- Step 3: Assign resources
- Step 4: Estimate effort
- Step 5: Work into graphical representation

Task Lists

A task list is one type of project plan. A task list resembles the work breakdown structure, but tasks are captured as an indented list. Each task captures:

- A description of what the task is
- Expected duration (average duration should be no more than 5 days)
- It's expected start and end dates
- Resources assigned to the task
- Predecessors of the task

Gantt Chart guidelines

- Milestones to show:
 - Major dependencies
 - Major financial
 - All Sign Off deliverables
- Tasks should average 5 day duration
- Task structure match WBS

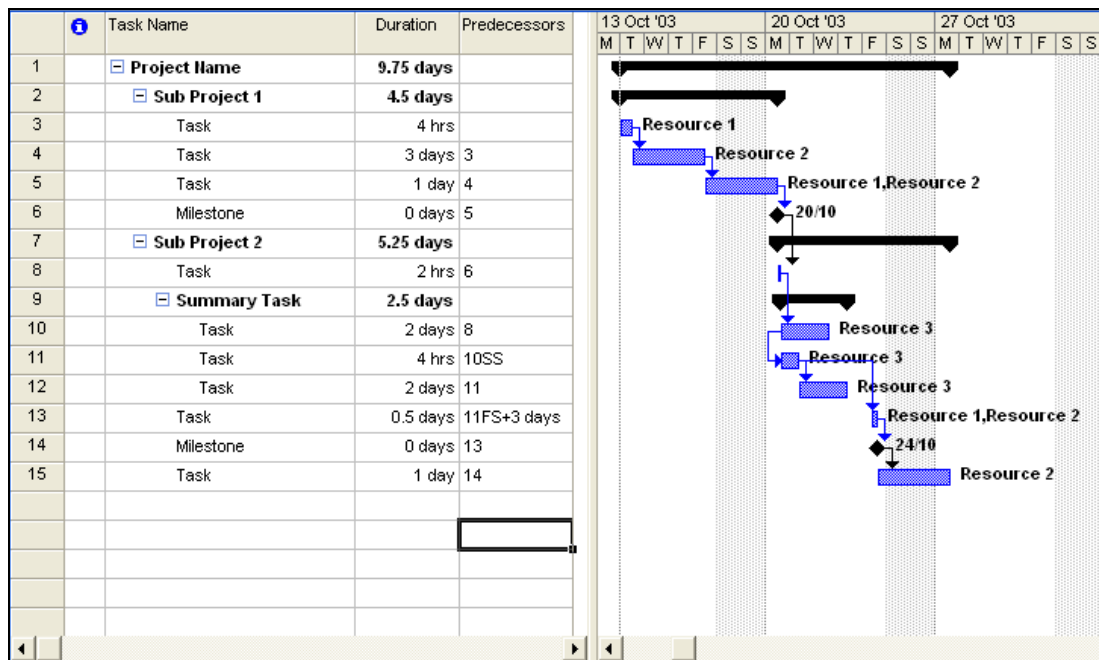
A Gantt chart should have all major dependency milestones, financial milestones and deliverable milestones. A dependency milestone is the date a deliverable is required from another project for your project to continue on its merry way.

It is the project manager's responsibility to track progress of all dependency milestones and ensure the issues and potential delays are incorporated into risk management plans, issues logs and scope change requests.

Financial milestones are those dates where benefits are expected to come to fruition, or costs are expected to peak. It is essential the project costs are tracked and monitored so that the cost constraint is managed effectively.

Tasks in a project Gantt chart should be no longer than 5 days duration. It is very difficult to track and monitor progress on a project where tasks extend over more than one week.

The task structure developed in the Gantt should be exactly as developed in the WBS in the initiation workshop.

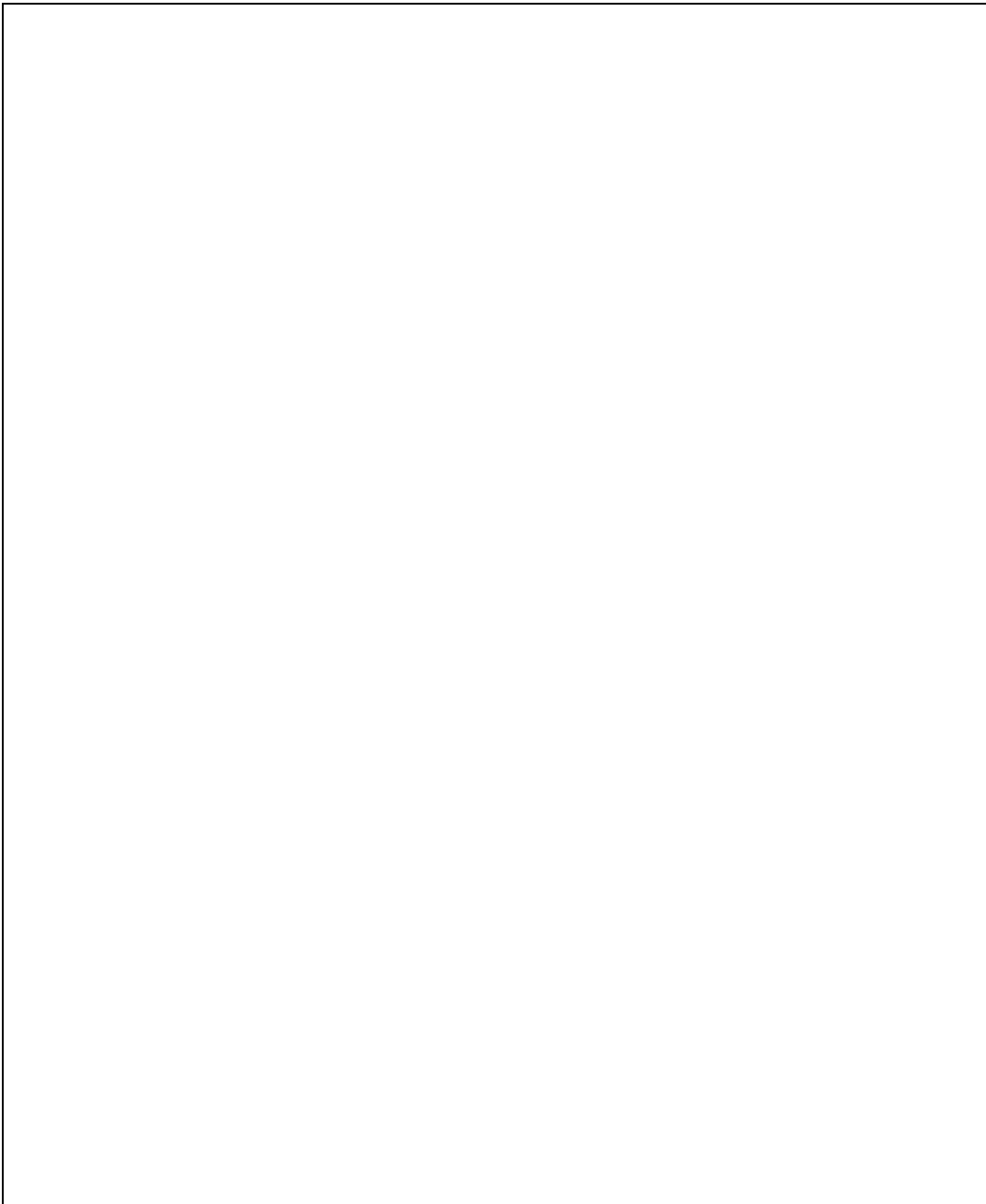




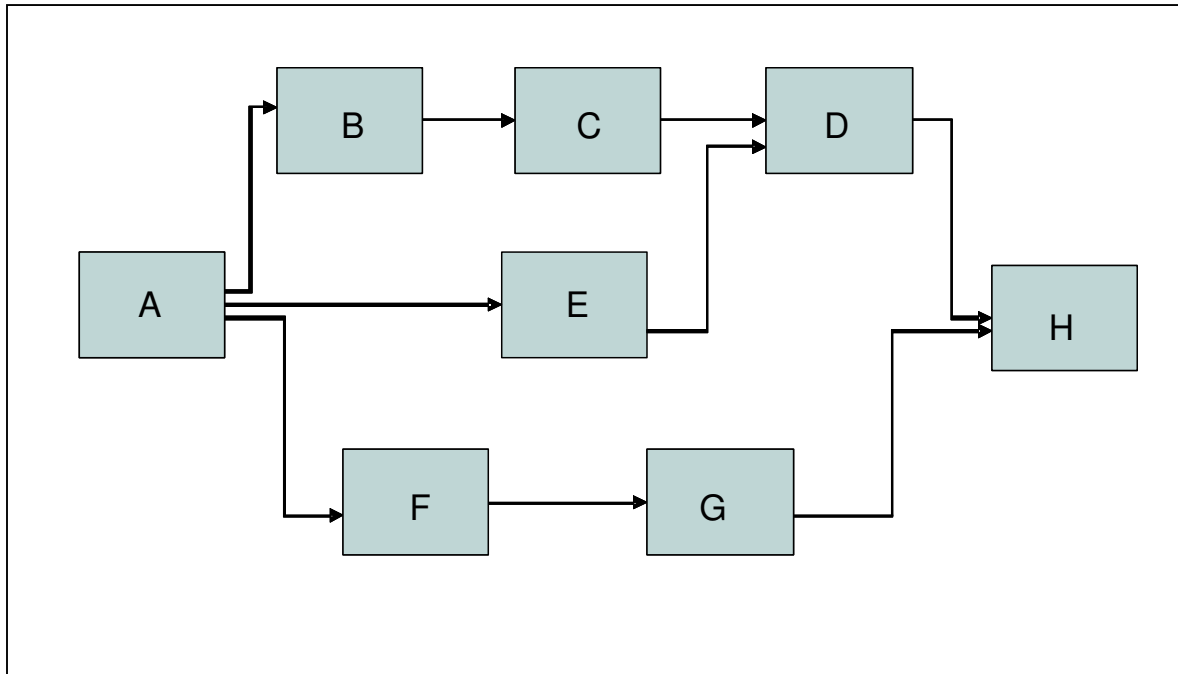
Develop a work breakdown structure

Using the table below draw up a work breakdown structure:

Task ID	Task	Predecessor	Duration	Resource
1	CPA Conference			
1.1	Engage			
1.2	Conduct			
1.3	Assess			
1.1.1	Invitations			
1.1.2	Applications			
1.1.3	Speakers			
1.2.1	Presentations			
1.2.2	Networking			
1.3.1	Survey			
1.3.2	Project Review			
1.1.1.1	Write Invitations			
1.1.1.2	Send Invitations			
1.1.2.1	Receive applications			
1.1.2.2	Receipt Money			
1.1.3.1	Invite Speakers			
1.1.3.2	Book Speakers			
1.1.3.3	Receive papers			
1.1.3.4	Compile manual			
1.1.3.5	Print Manual			
1.2.1.1	Speakers Introduction			
1.2.1.2	Speakers Presentation			
1.2.2.1	Set up tables			
1.2.2.2	Prepare food and drinks			
1.2.2.3	Serve food and drinks			
1.2.2.4	Clean up			
1.3.1.1	Write Survey			
1.3.1.2	Send Survey			
1.3.1.3	Collate and analyse results			
1.3.2.1	Set review workshop agenda			
1.3.2.2	Conduct workshop			
1.3.2.3	Collate results			



Network Diagram



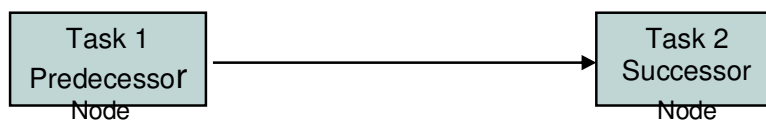
The network diagram is used for:

- Strategic planning
- Control/ Reporting
- Change Management

A network diagram is a schematic display of the projects activities and the logical relationships among them. The network diagram can be produced manually or using project planning software.

The diagram is used for strategic planning as it highlights such things as critical activities, predecessors and successors and the total duration of the project. It is also used to control and report progress as well as a change management aid. By highlighting the impact of a movement in task duration's on other tasks, a network diagram quickly highlights when milestone dates change.

Task Relationships



Nodes are used to represent the activity/task within a project. Arrows indicate dependencies or links. The diagram has a logic flow to it. Each node is connected by an arrow, which shows the predecessor and successor of two activities.

The longest path of the network from start to finish is the critical path. The total duration of the critical path is the total duration of the project.

There are four types of dependencies:

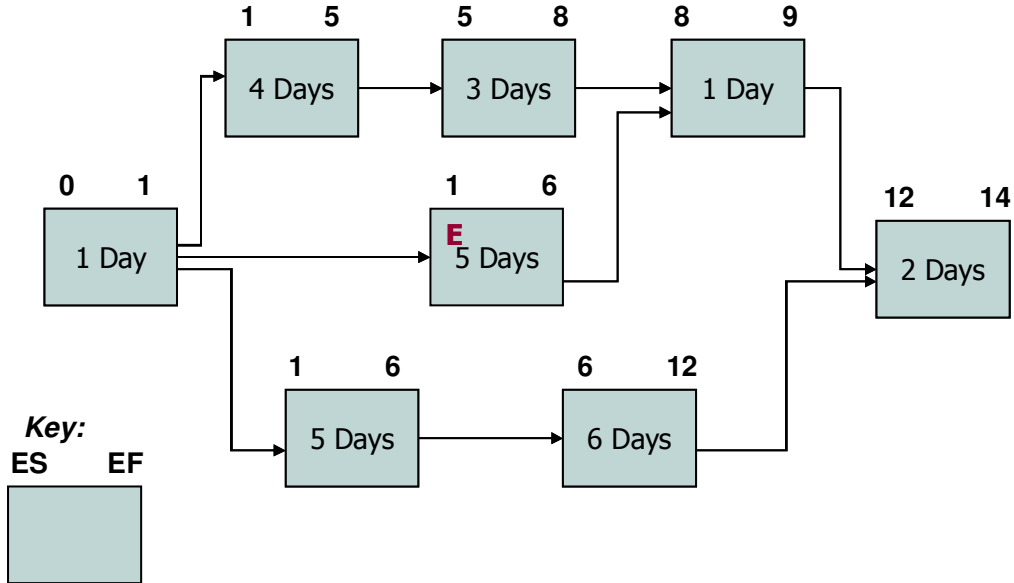
- FS- Predecessor must finish to allow successor to start
- SS- Predecessor must start to allow successor to start
- FF- Predecessor must finish to allow successor to finish
- SF- Predecessor must start to allow successor to finish

The finish-to-start relationship is the most commonly used. Start to finish relationships are rarely used.

Working out the 'Critical Path' in your network diagram requires a forward and backward to be completed.

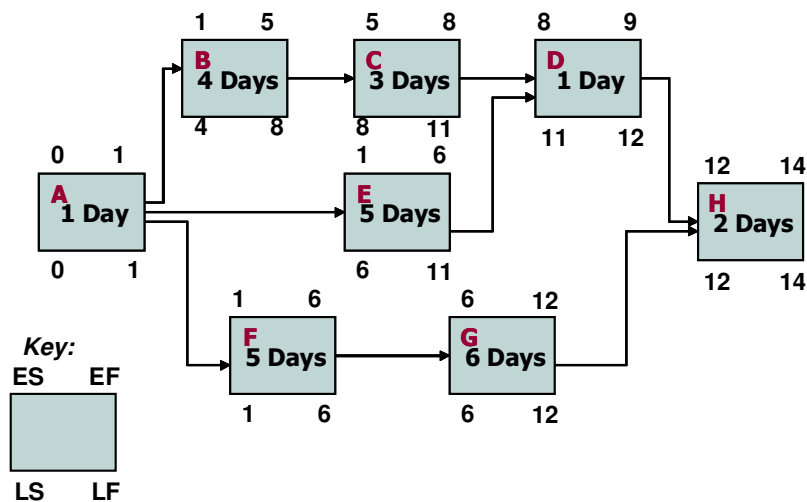
Forward Pass

- Work left to right
- Start at project start
- Add durations on each node
- Calculate early start and early finish for each activity
- When more than one path converges, take the highest value forward



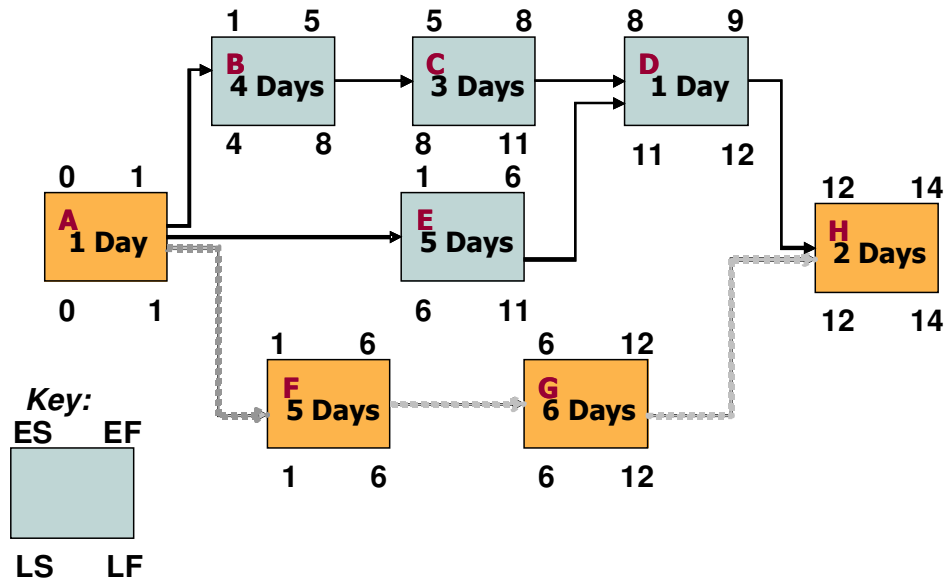
Backward Pass

- Work right to left
- Start at project end
- Subtract duration along each path
- Calculate late start and late finish for each activity
- When more than one path converges take the lowest value backward



Late Finish (LF) Duration = Late Start (LS)

Critical Path





Network Diagram

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