

# Project Management Skills

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# Today's intended learning outcomes....

*'Have a knowledge and understanding of management techniques that may be used to achieve engineering objectives'*

- Have an understanding of Project Management processes and why they are important.
- Know of some Project Management tools that are available and how you might use them.

# What is a project and why does it need managing?

Tasks Scope Skills  
Cost Unique Resources Temporary Programme Goal



<https://www.pop-science.co.uk/blog/blog/project-management-august15>

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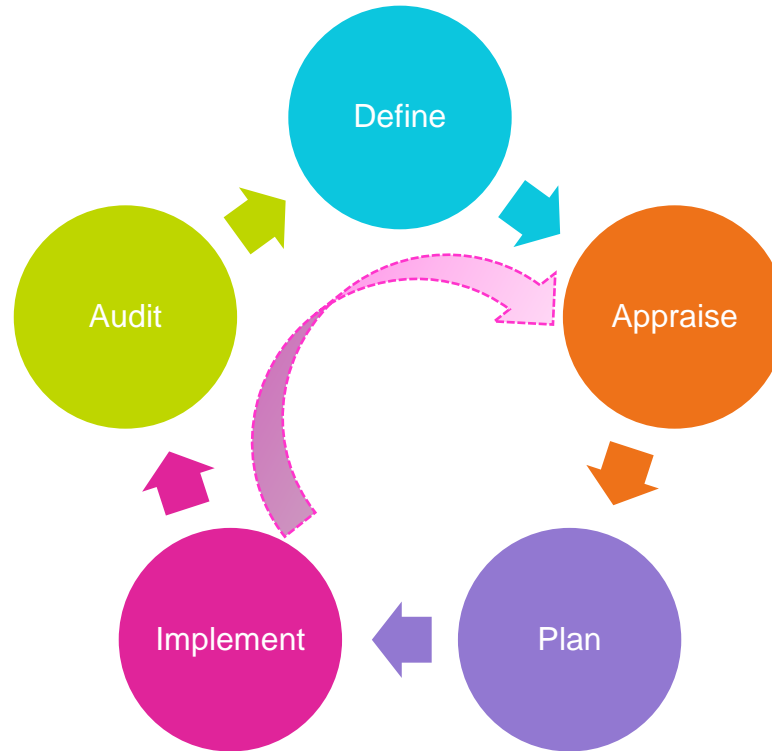
# Why do we need project management skills as Engineers?

- Plan your own work and that of others
- Identify critical paths and interdependencies
- Manage information, time, resources and money
- How a project develops and deliverables
- Decision making and problem solving

# What is Project Management?

- Planning for effective project implementation.
- Managing the planning and organisation of tasks, people and resources.
- Managing teams and develop staff to meet changing technical and managerial needs.

# Stages of Project Management



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# Project Definition

- What are you going to do?
  - What are the deliverables?
  - What is the timescale?
  - What activities are required?



<https://www.clockshark.com/Blog/12-proven-time-management-tips-construction-project-managers/>

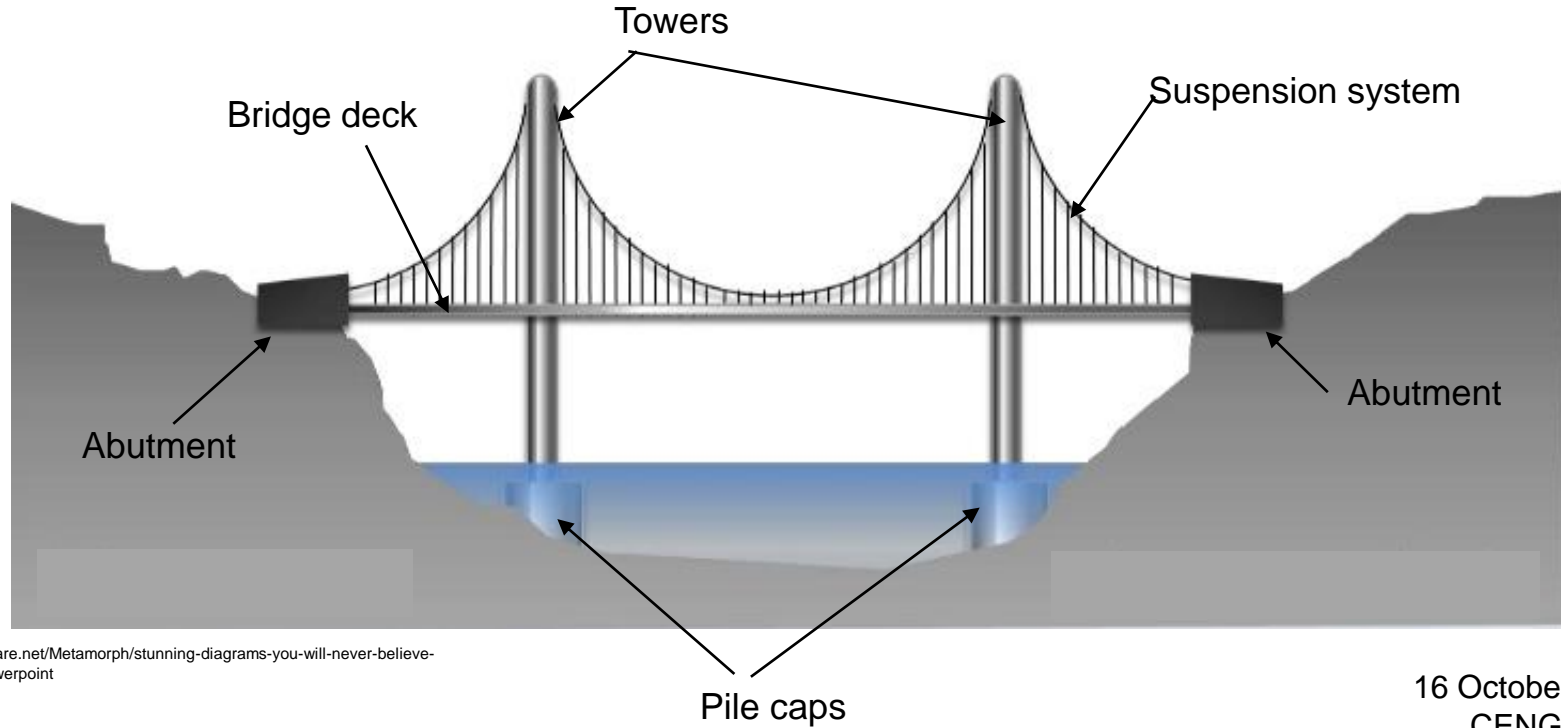
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# Work Breakdown Structure

- Clear and accurate statement of the scope of works
- A rational way to subdivide the work into discrete packages
- A tool that can be used to develop resource requirements, programme and cost plan
- A good place to start!



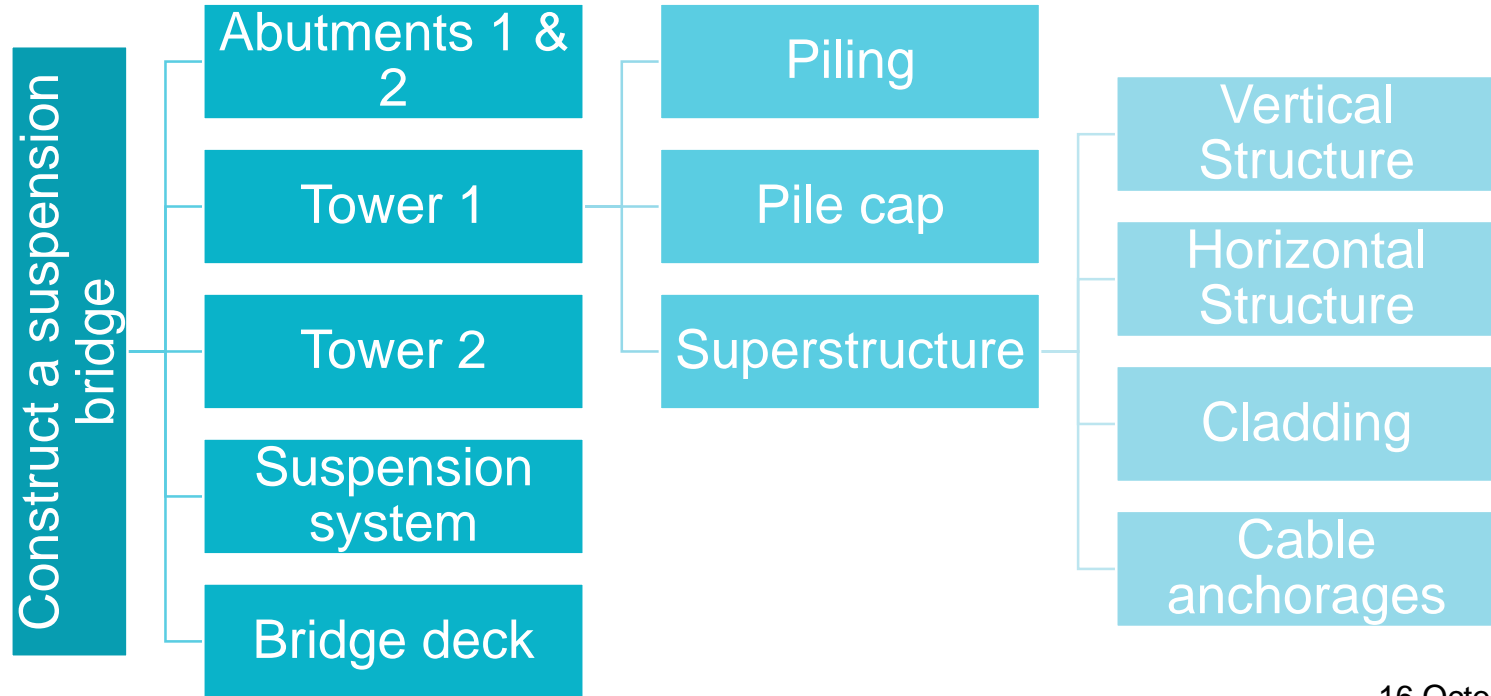
# Work Breakdown Structure



<https://www.slideshare.net/Metamorph/stunning-diagrams-you-will-never-believe-were-created-in-powerpoint>

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# Work Breakdown Structure




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# Project Appraisal

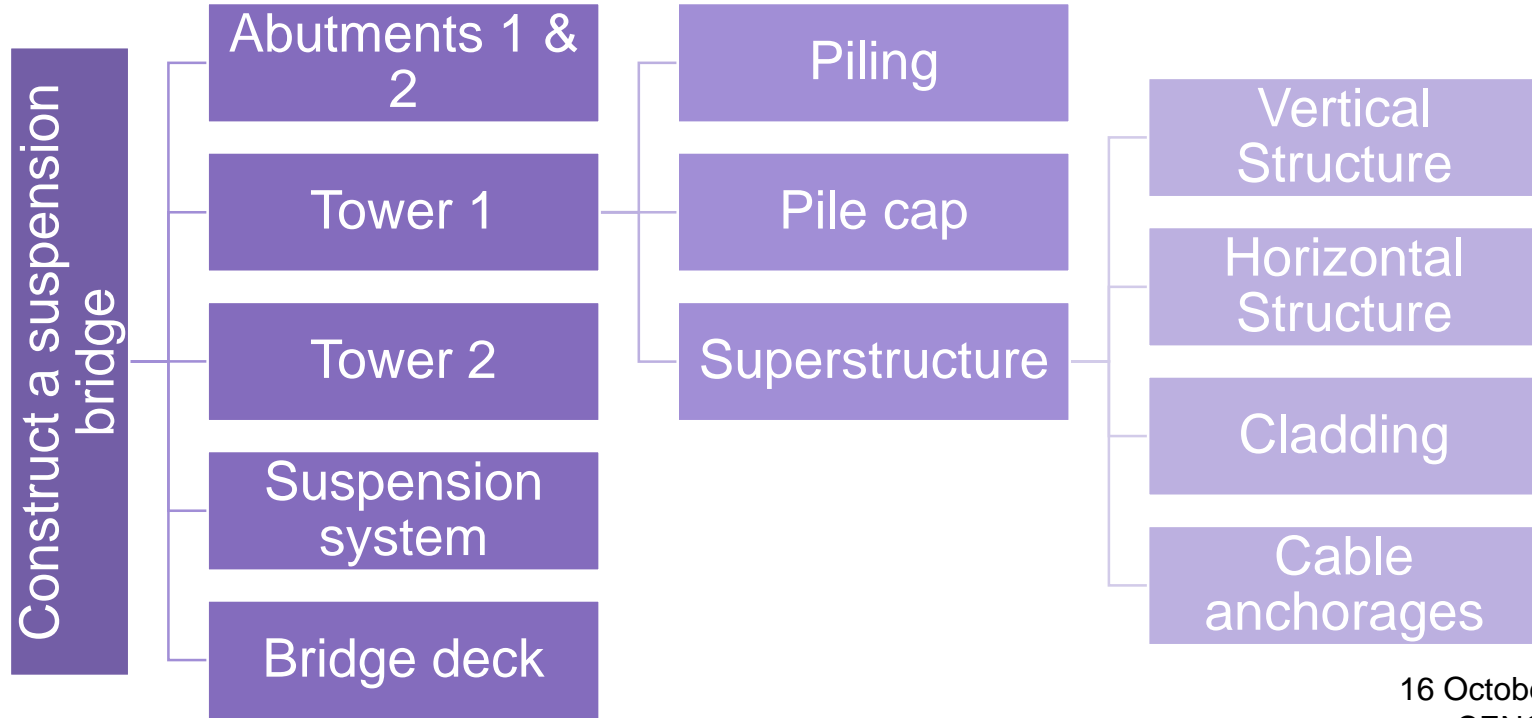
- Is this a project we want to do??
  - Does it meet your corporate & personal/team objectives?
  - Does it match your skills & expertise?
  - Is it in a desired growth area for you?
  - What are the risks? Can they be mitigated?
  - What about profit and cash flow?

# Project Planning

- A balance of creativity and logic
  - Brainstorm
  - Creative thinking techniques
  - Consider the make-up of your team
  - Look outward, what do other businesses do?
  - Planning is also an **iterative process**...
- 
- ```
graph LR; A[A balance of creativity and logic] --> B[Brainstorm]; A --> C[Resources];
```
- Resources
  - Deliverables
  - Milestones
  - Programme
  - Cash flow/financing
  - Monitoring and control

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# Work Breakdown Structure

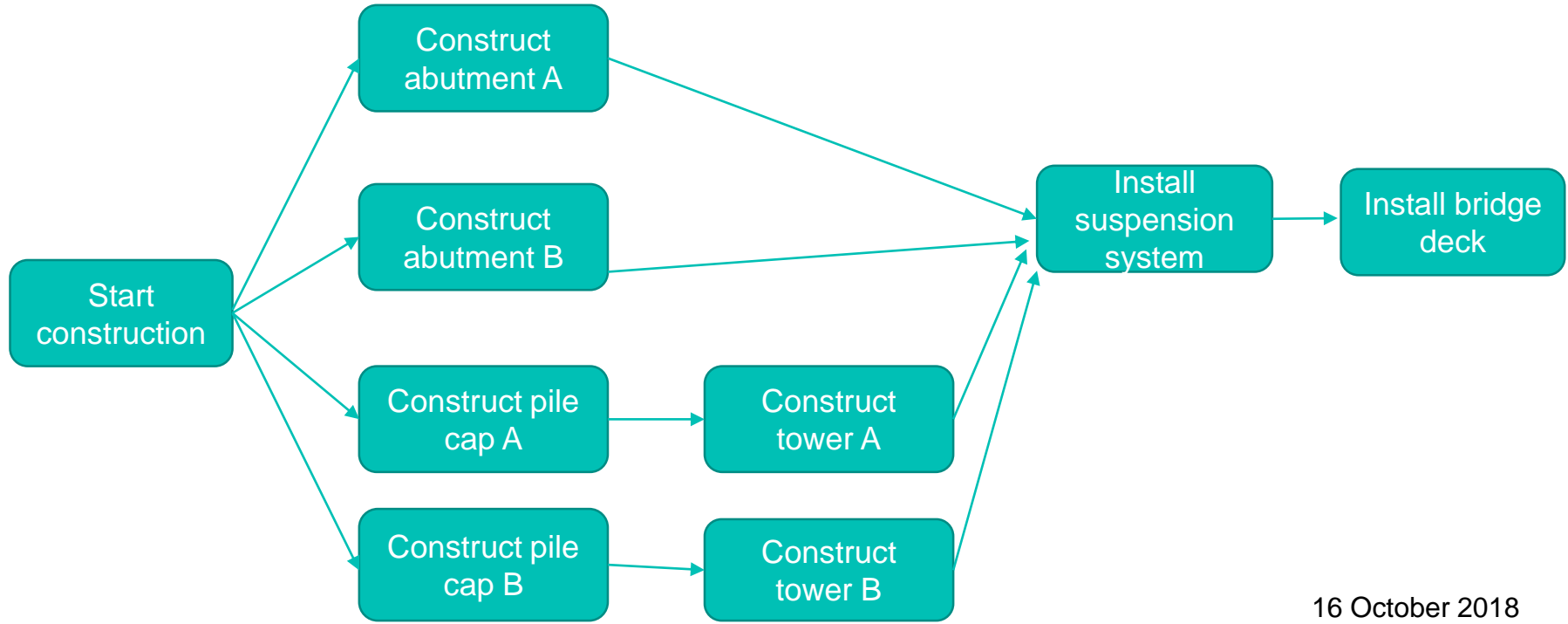


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# Network Analysis

- Bridge deck cannot be laid before suspension system is in place
- Suspension system requires both towers and abutments to be constructed first
- Construction of each pile cap and tower are independent operations
- Construction of each abutment are independent operations

# Network Analysis



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# Programme & Resources

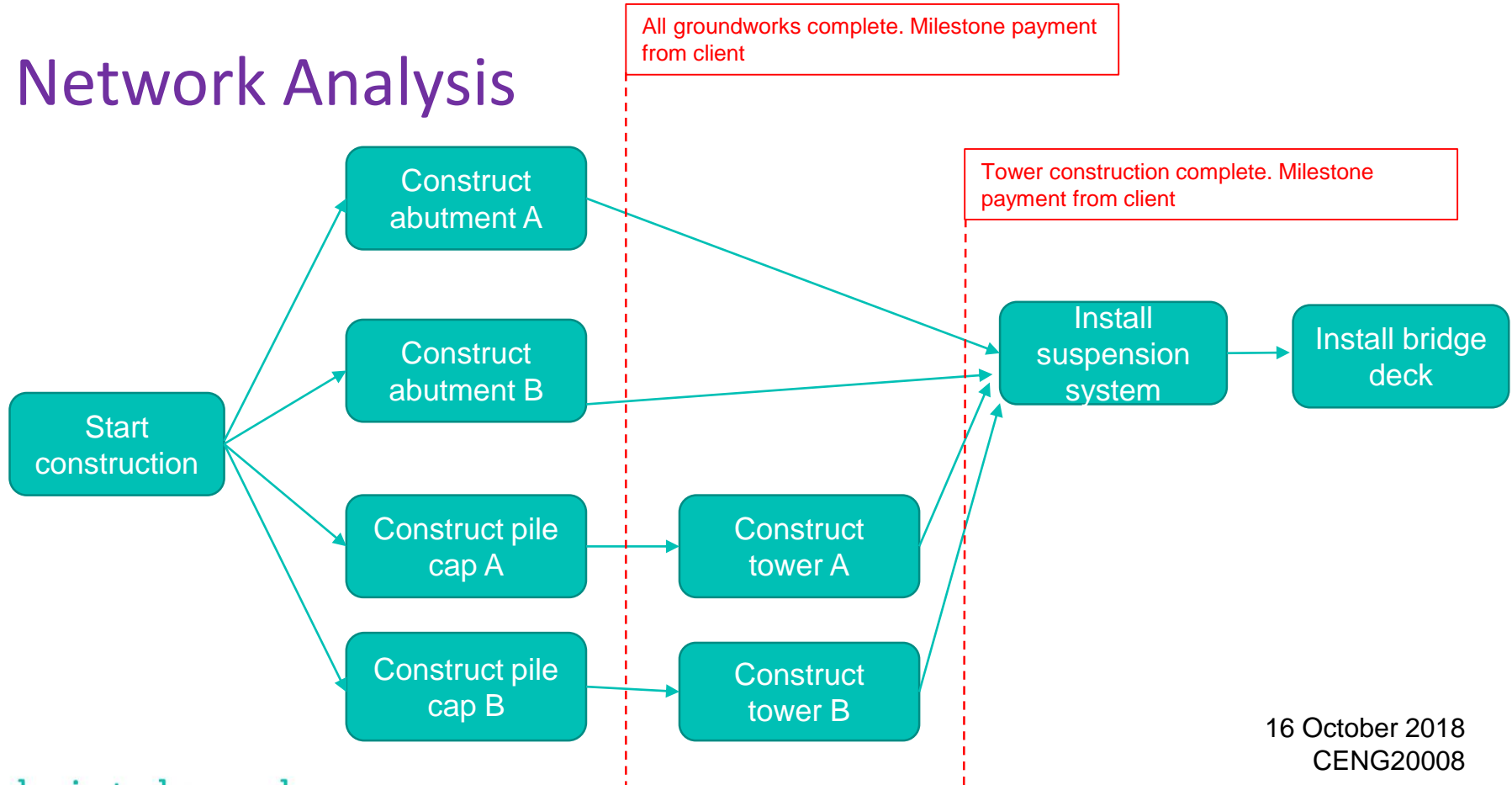
- Do you have a defined timescale? i.e. submission deadline?
  - what resources are required to complete the project within this time scale?
- Do you have defined resources?
  - how long will it take these resources to complete the project?



# Programme & Resources

- The programme is an outcome of the planning process, not the plan
- How long will each sub-activity and activity take to complete?
- What resources do you need to complete each?
- What 'milestones' are there along the way and when do you need to hit them in order to finish to programme?
- This helps you to identify the 'critical path' i.e. activities that have to be complete in order for others to start

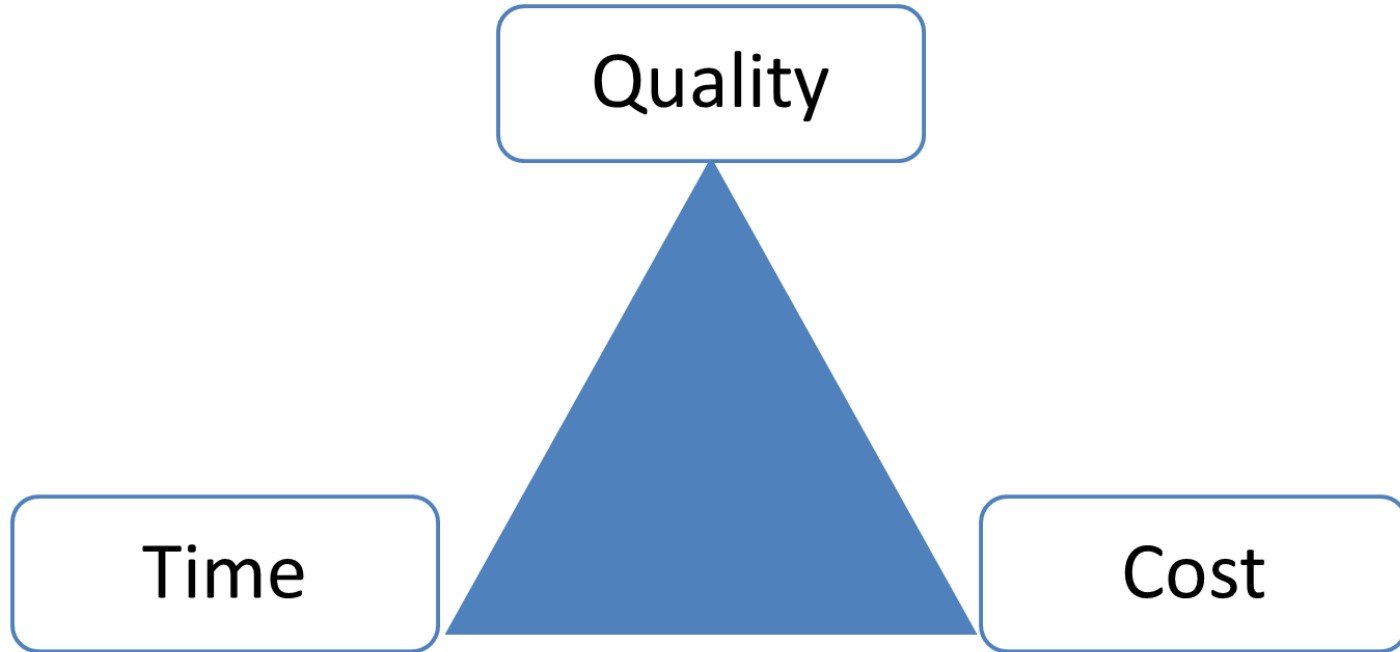
# Network Analysis



# Cost Plan

- You now know the resources and durations to complete the project
- How much do these resources cost?
- Start at the bottom with costs for sub-activities, roll them up to build up costs for activities above
- Once the project starts you can follow the same method for actual costs
- Costs from labour (time), materials, equipment, facilities...

# Project Implementation



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# Project Implementation

- What does a Project Manager need to do?
  - Clarify team roles
  - Establish lines of communication
  - Manage inputs
  - Manage risks
  - Manage outputs

Reporting  
Document storage  
information sharing  
Gateway reviews  
Performance measures  
Risk management

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# Project Implementation



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# Change Management

- Start with a clearly defined brief (use your WBS)
- Change management notice
  - Expected additional time, resources and costs
- Agreement with client before you start working on the change
- Beware of scope creep!

# Audit Project Performance

- What has gone well?
- Why?
- What could be improved upon?
- How?
- What else could we have done?



# Closing Thoughts

- Project Management is complex and often underrated
- Proper preparation and planning prevents poor performance
- As Engineers you are very well equipped to do this;
  - Logical
  - Rational
  - Methodical
- Random approaches to planning lead to failure

*Planning is an unnatural process; it is much more fun to do something. The nicest thing about not planning is that failure comes as a complete surprise, rather than being preceded by a period of worry and depression.*

Sir John Harvey-Jones

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