

Charting your progress

Dr. Julie Greensmith



Coming up today...

- Three different charting techniques for keeping track of progress
 - Critical Paths and PERT analysis
 - Gantt Charts
 - Milestone planning
- Working example: gantt chart for your project



A NEW AND ACCURATE MAP OF THE WORLD.



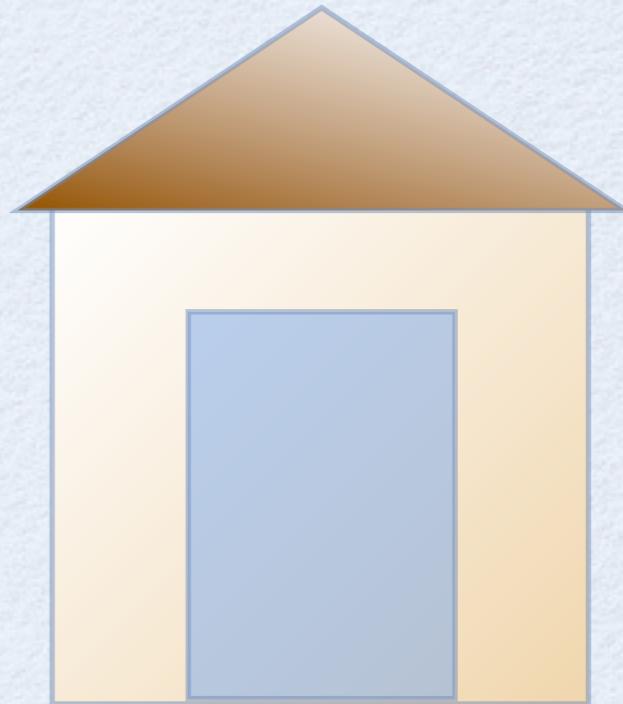
Why do we need charts?

- Essential to know where in a project you are
 - estimation of costs and duration
- Provide a visual representation of progress
 - can be easier to visualise progress
 - Need to know where the project is going, how long it will last, what resources are needed, and what are the risks?
 - Its too much to rely on estimates for all those factors
 - Can be summarised into one interactive chart



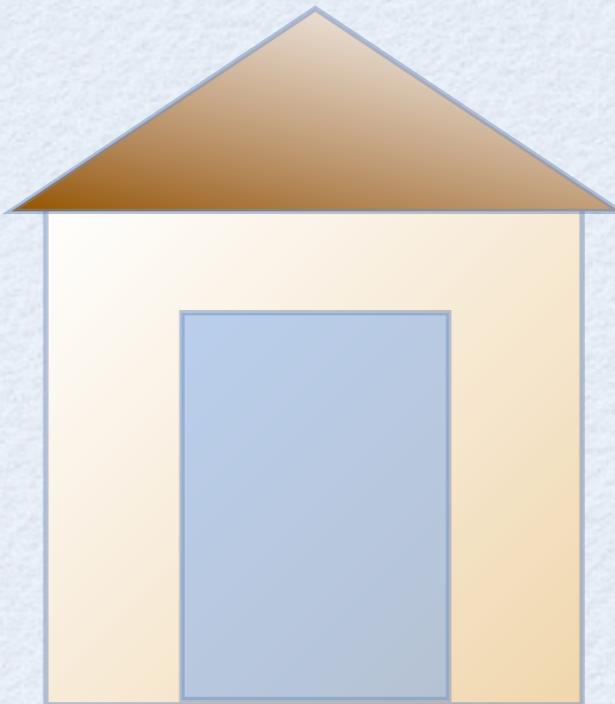
Today's Example

- Building a garden shed (most Gantt chart tutorials strangely talk about shed building???)
- What resources do we need?
- Here is our design:



List of jobs to do

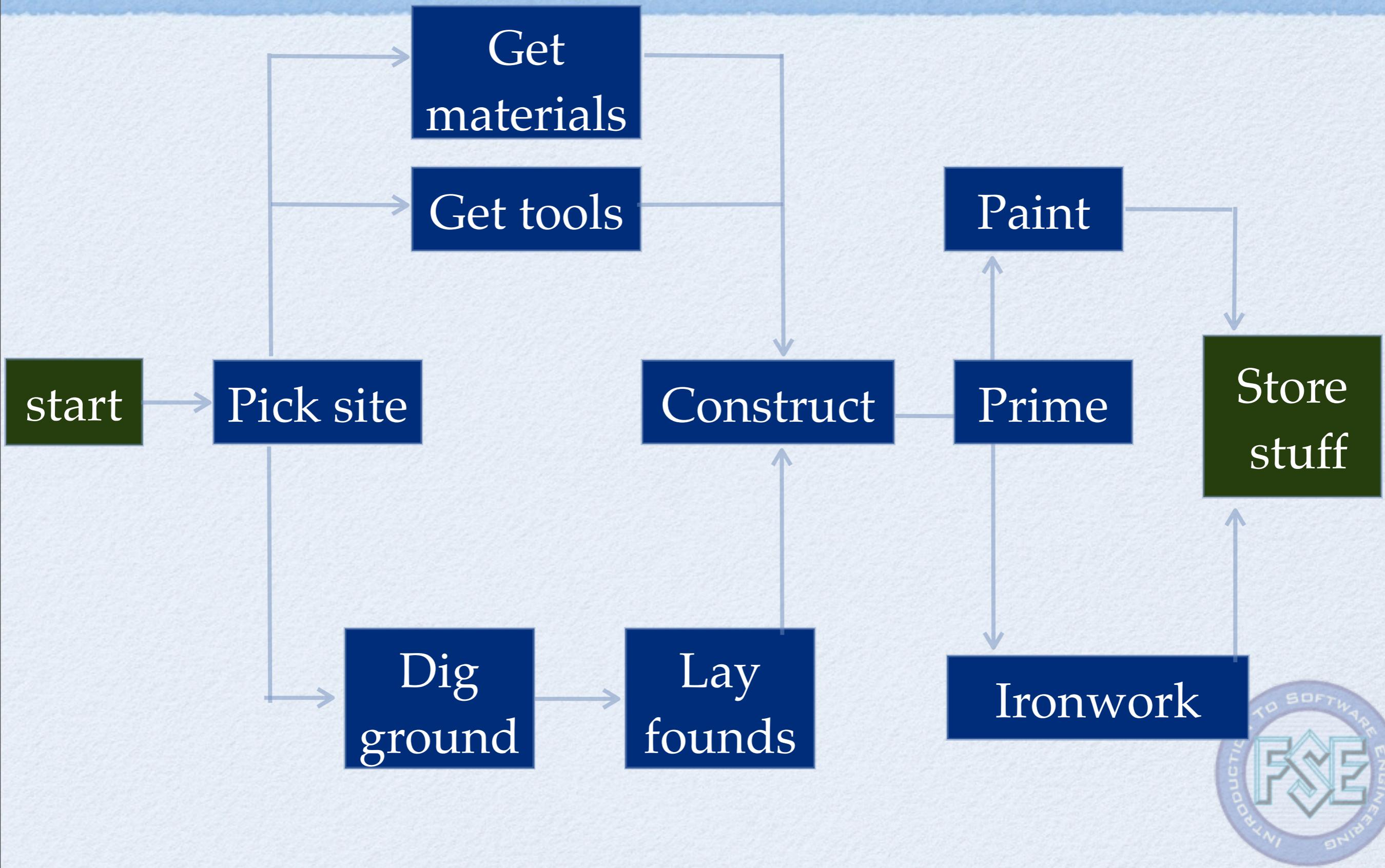
- Pick construction site
- Get materials {wood, glass, plastic guttering, lock, roofing felt, concrete} and buy tools
- Dig ground
- Lay concrete foundations
- Construct shed and fit windows
- Paint shed and apply wood primer
- Attach ironmongery
- Store stuff



The process



Charting your critical path



Paths and PERTS

- Our flow chart is a little bit informal
 - does not give us the duration of each task or the importance but can see the critical tasks
- Graph theory to visualise the critical path through a project
- **PERT = Program evaluation and review technique**
- Edges are activities, nodes are numbered milestones or accomplished tasks
 - can do min/max/realistic estimate for time taken for each node
 - Slack can be introduced to edges that are not on the critical path



Finding the critical path

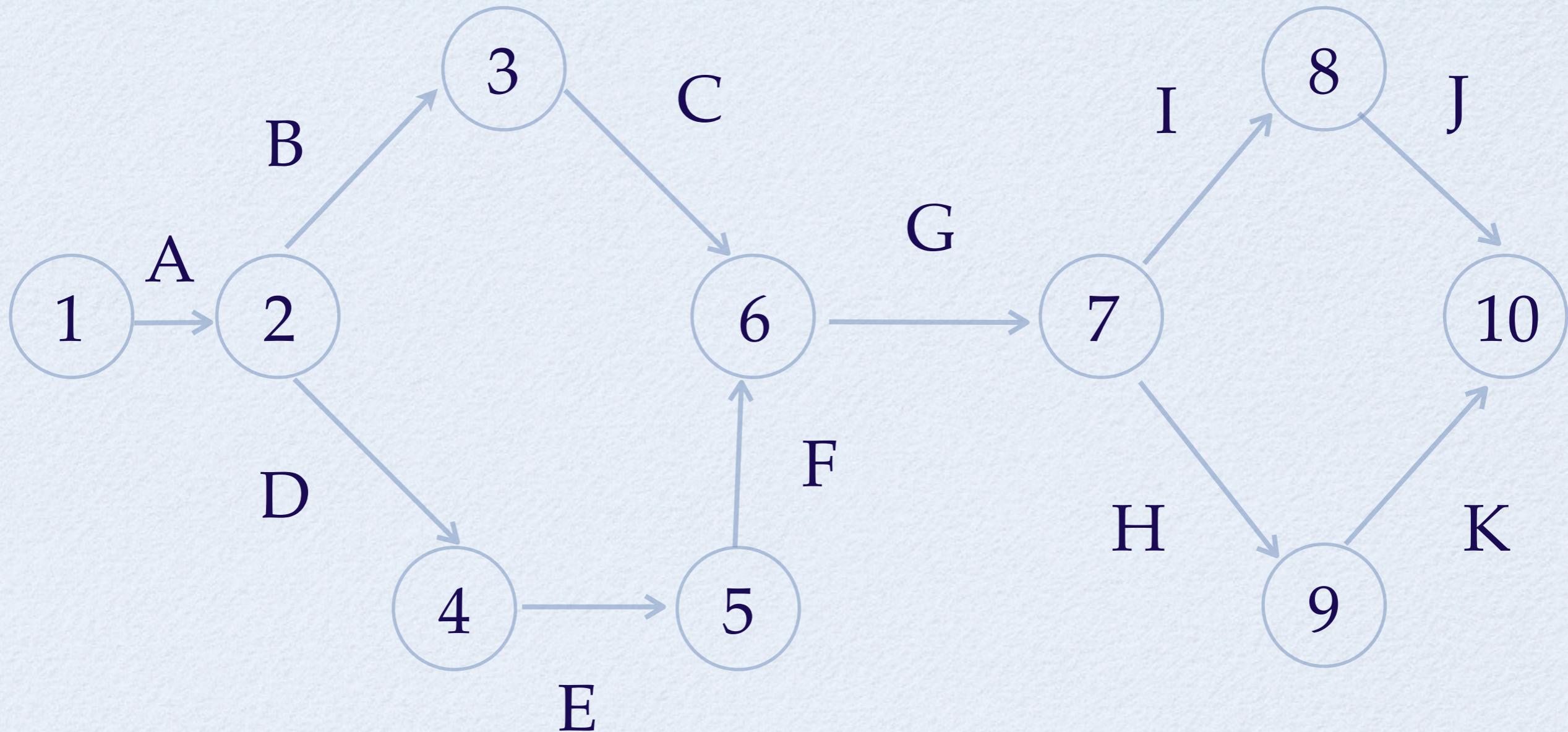
- Construction of the chart also known as the activity network
- Find the earliest possible start for each activity by going forwards through the network
- Find the latest possible start for each activity by looking backwards through the network
- The critical tasks have the equal earliest and latest dates
- Critical task overrun leads to overall project overrun



Rough time estimation

- $t = (\text{min} + (4 \times \text{likely}) + \text{max}) / 6$
- It looks strange but it actually works!
- Can generate pessimistic, optimistic and realistic time goals for any project planned with PERT
- Use it to calculate the *critical path*: the sequence which takes the longest time through the chart





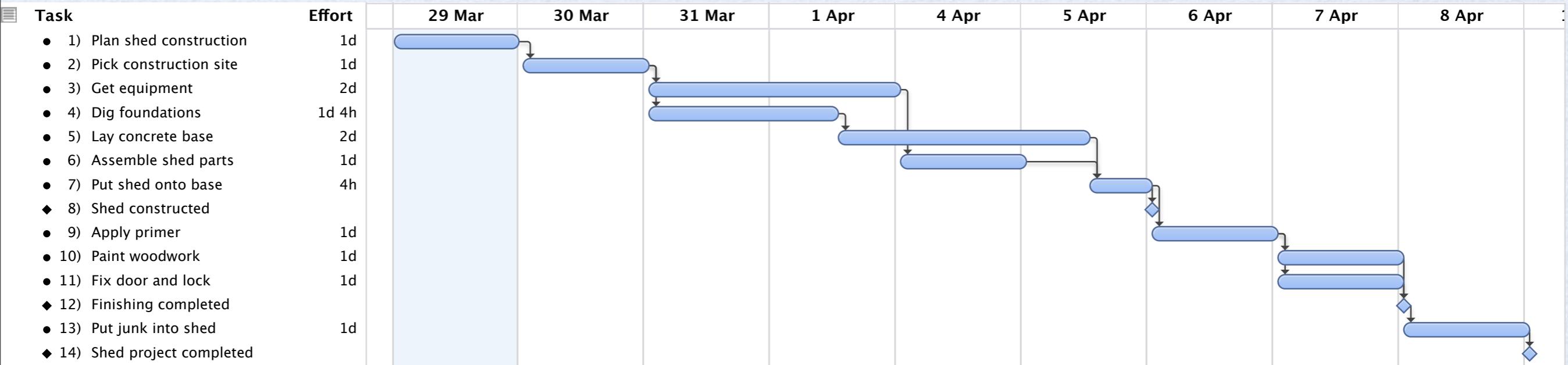
**There will be more on
PERT and CPA in
G52SEM**

Gantt Charts in Context

- Universally produced for practically every project
- Tasks are listed down the side
- Durations of time are represented as bars like a bar chart
- Milestones are added as diamond markers
- Shows duration in parallel
- Software allows you to easily modify timing discrepancies



An Example



Use appropriate software

- MS Project - industry standard, installed in CS Labs
- Omniplan - lightweight and free, good on mac and ipad
- OpenProj - really good open source planning software
- *And many more....pick one and learn it!*



Problems with Gantts

- Assumes that all details of a project are known at the start of a project
- Its difficult to show iterations or iterative stages of a project
- Now with construction through software tools too easy to “fudge” and fiddle with the timings
- Descriptions of tasks are either too vague or too sparse
- Its pretty much the project management version of the waterfall method!!



This is not just theory!

- PERT and Gantt are used all over, in business, in research, and in student projects
 - love them or hate them, you will have to be able to use and understand them (its in your 2nd year SE modules!)
- Project example: 1971, the construction of the Tyne Tunnel
 - the Gantt chart for this was drawn using a “plotter” and a state of the art mainframe computer
 - included the plans all the way down to the security for the Queen when she was at its official opening
 - Still the dominant planning and charting model in industry today and this looks to continue!





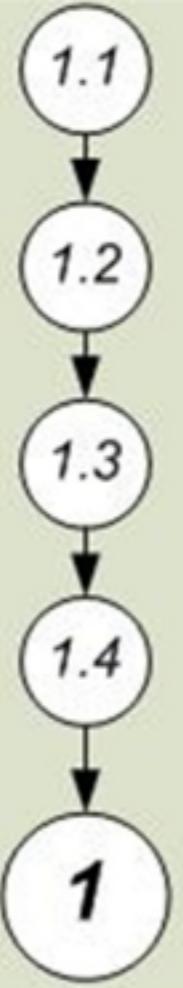
*Tunnel construction
is underway early 60's*



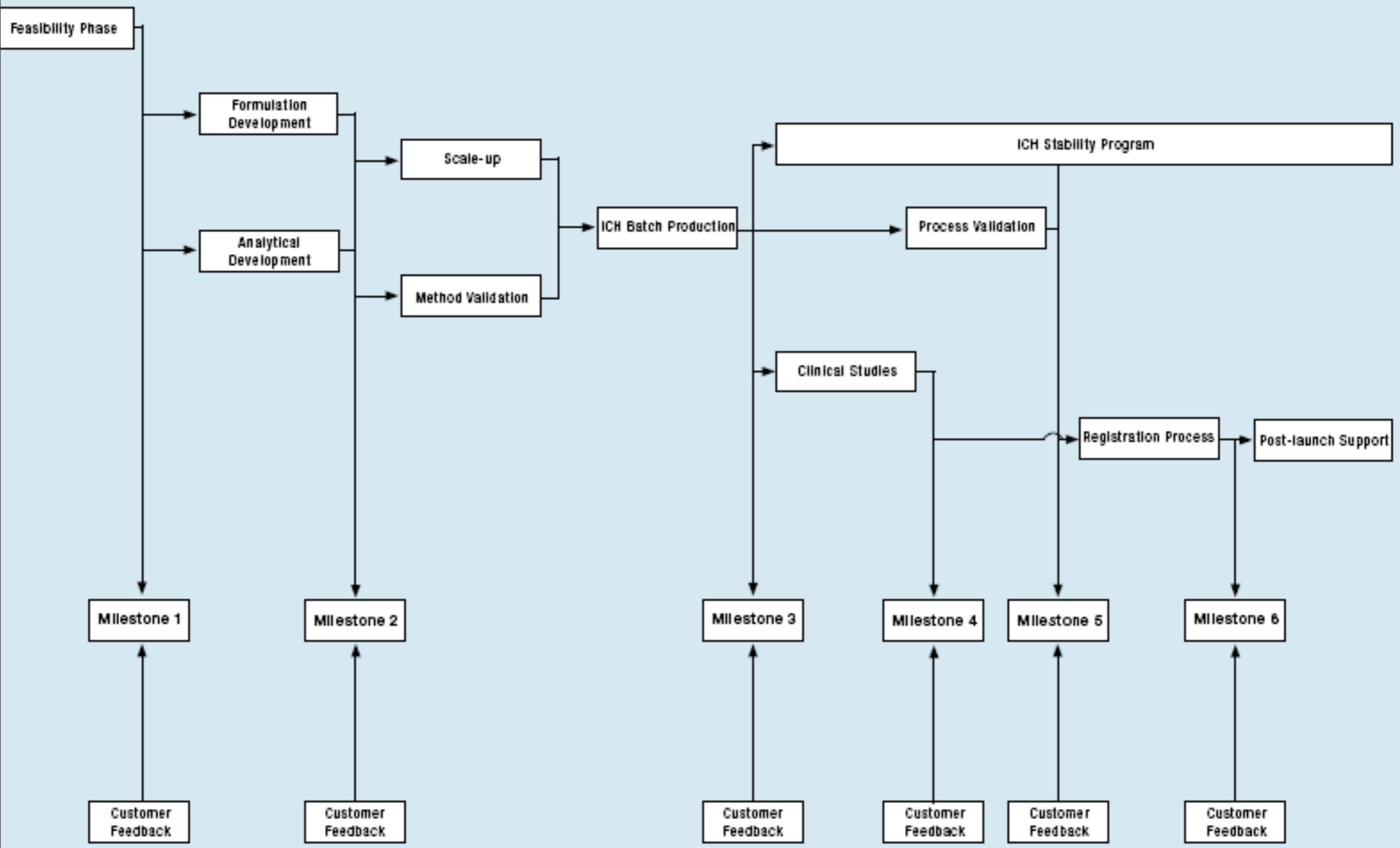
[http://news.bbc.co.uk/local/
tyne_hi/people_and_places/
history/
newsid_8231000/8231446.stm](http://news.bbc.co.uk/local/tyne_hi/people_and_places/history/newsid_8231000/8231446.stm)



Milestone Plans

Project: Develop Policy - Milestone Plan	
PATH	MILESTONES
	<p>1.1 A revised policy outline is agreed by Manager</p> <p>1.2 A working draft policy is prepared to aid stakeholder consultation</p> <p>1.3 Stakeholder consultation has been completed and feedback considered</p> <p>1.4 A final draft is prepared ready for formal submission</p> <p>1 Drafting of the policy is completed</p>





No one method is perfect!

- A slightly less than perfect plan is better than no plan at all
- It is difficult to factor into these charts iterations
 - hence the plans need constant monitoring and vigilance
- These plans are not all encompassing, they are to be treat as a rough guide
 - avoid gluttony
- *Read, review, revise, repeat.....*



Conclusions



memegenerator.net

