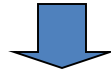# Planning - CHARTS

What is project management?

It is the process by which a project is planned and implemented *efficiently* and *effectively*

It involves 4 basis steps:

Interpret the

VISION

Produce a

PLAN

IMPLEMENT

The plan

CLOSE

And reflect

Implementation

What are the issues?

First essential – project design

- Understand what is required – the spec.

- Communicate when necessary (this is the most common reason why projects fail)

Second essential – procurement

- Do you have what you need?

Assuming you do understand exactly what is required and ***you have access to everything that is required for a successful outcome***, they you can proceed to develop a practical means by which the project can be brought to a successful closure.

Representations of project plans

In developing a practical plan to enable you to implement a project you need to consider three factors:

- The individual activities we need to perform

- Their logical dependency upon one another

- Time

First consider logic and task dependencies only. This involves 2 symbols:

Activity

Dependence

The objective here is to produce the best logic possible ignoring custom and "practice", based upon the rule no activity can start until all activities upon which it depends have finished.

What about task duration?

You do not have an unlimited time to complete any activity and, therefore, to make sure everything is finished on time, it is essential that every activity has an estimate of duration associated with it.

That is, you will need to make numerical estimate today of some future event. How is this possible?

- The aim is to *reduce* risk not eliminate it

- Don't feel bad about getting it wrong

- Learn!

Estimating durations - theory

First remember 2 basic principles:

- *Parkinson's Law* – work expands to fill the available space

- *Pareto's Rule* – The significant items in a group frequently constitute a relatively small proportion of the total items in the group

OR

20% of the tasks give 80% of the results

Remember:

Typically, time spent in planning saves 4 times as much time in execution

Estimating durations - practice

- Start with the element of the project that you are most confident with

- Divide project into groups of similar activities – similar durations?

- Be consistent – use this to minimize uncertainty

- Compare different tasks – how do tasks A and B compare? Same, more or less time?

- Don't consider your plan as fixed – iterate during execution to pull in the boundaries and reduce uncertainty

NB Your plan is a practical tool

Are your estimates reliable?

The biggest problem with project planning is correctly estimating how long it will take actually to finish a task

Everybody underestimates

Why? We all work on the basis of the best-case scenario

To do this properly, you need to estimate:

The most likely value - MLV

An optimistic value - OV

A pessimistic value - PV

Planning estimate:

(4xMLV + OV + PV)/6

What goes wrong?

- Changes in the perceived requirement

- Lack of project definition – detail is important

- Lack of resources

- Failure to estimate required durations correctly

- External time constraints

- Work in several responsibility areas

- No contingencies

In general, it is a good idea to try to:

- Identify points of high risk well in advance and, then, develop contingencies

- Build in an end "float" at the planning stage.

Project representations

So, we've now looked at the 2 basic elements of project management – logic and time. There are now a number of different methods by which these can be combined to give a graphical representation of the complete project.

In the work you will do, a simple Gantt chart will suffice. However, this does not demonstrate well the process of project management – particularly in extreme cases like:

TASK 1: Decide what to do

TASK 2: Do it

TASK 3: Write it up

This is not a good plan!

Network time analysis

- This involves a logic diagram

- It includes estimates of duration

- Includes a forward pass

- Earliest start + Duration = Earliest end

- Includes a backward pass

- Latest end – Duration = Latest start

- Includes the concept of a float

- Latest finish – duration – earliest start = float

- Introduces the concept of a ***critical path***. At all points along the critical path, the float is zero

The significance of the critical path is that if you delay ***any*** task on the critical path, you delay the ***complete project***
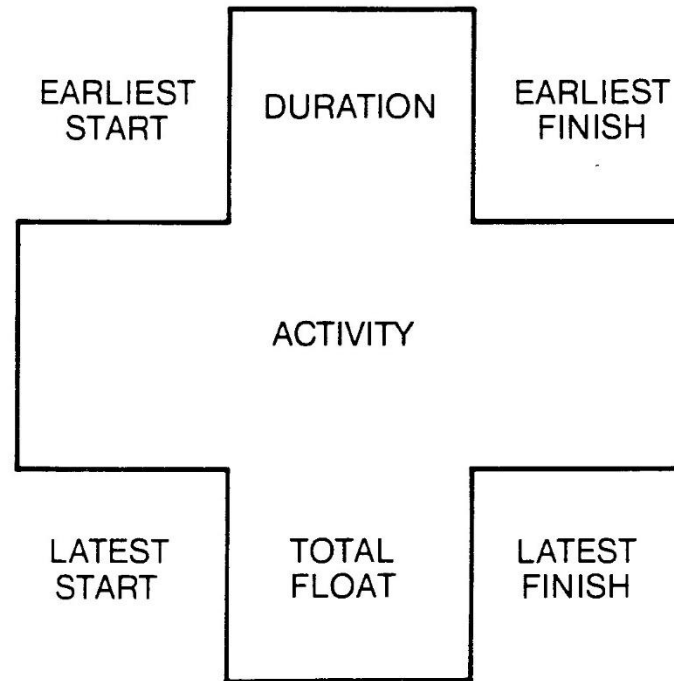
Now, let's look at an engineering application of how this can be used. Here we will consider the overhaul of a steam pipeline.

Steam pipe repair

First, list the activities that need to be performed and decide who needs to perform each task.

NB Brainstorm

Activity	Days	Person
Planning	1	Manager
De-activate line	1	Rigger
Erect scaffolding	4	Rigger
Strip lagging	2	Rigger
Examine/measure	2	NDT
Prepare materials list	2	Admin.
Obtain welding/cutting gear	7	Admin
Erect lifting gear	4	Rigger
Remove old pipes	10	Welder
Obtain new pipes	6	Admin
Obtain new valves	8	Admin
Obtain lagging	5	Admin
Obtain paint	5	Admin
Assemble new pipe	1	Rigger
Place new pipe	2	Rigger
Weld new pipe	2	Welder
Fit valves	3	Fitter
Pressure test pipe	1	NDT
Lag pipe	4	Rigger
Remove lifting gear	1	Rigger
Force dry lagging	1	
Paint	6	Painter
Dismantle scaffolding	3	Rigger
Clear site and re-activate	2	Rigger

The plan
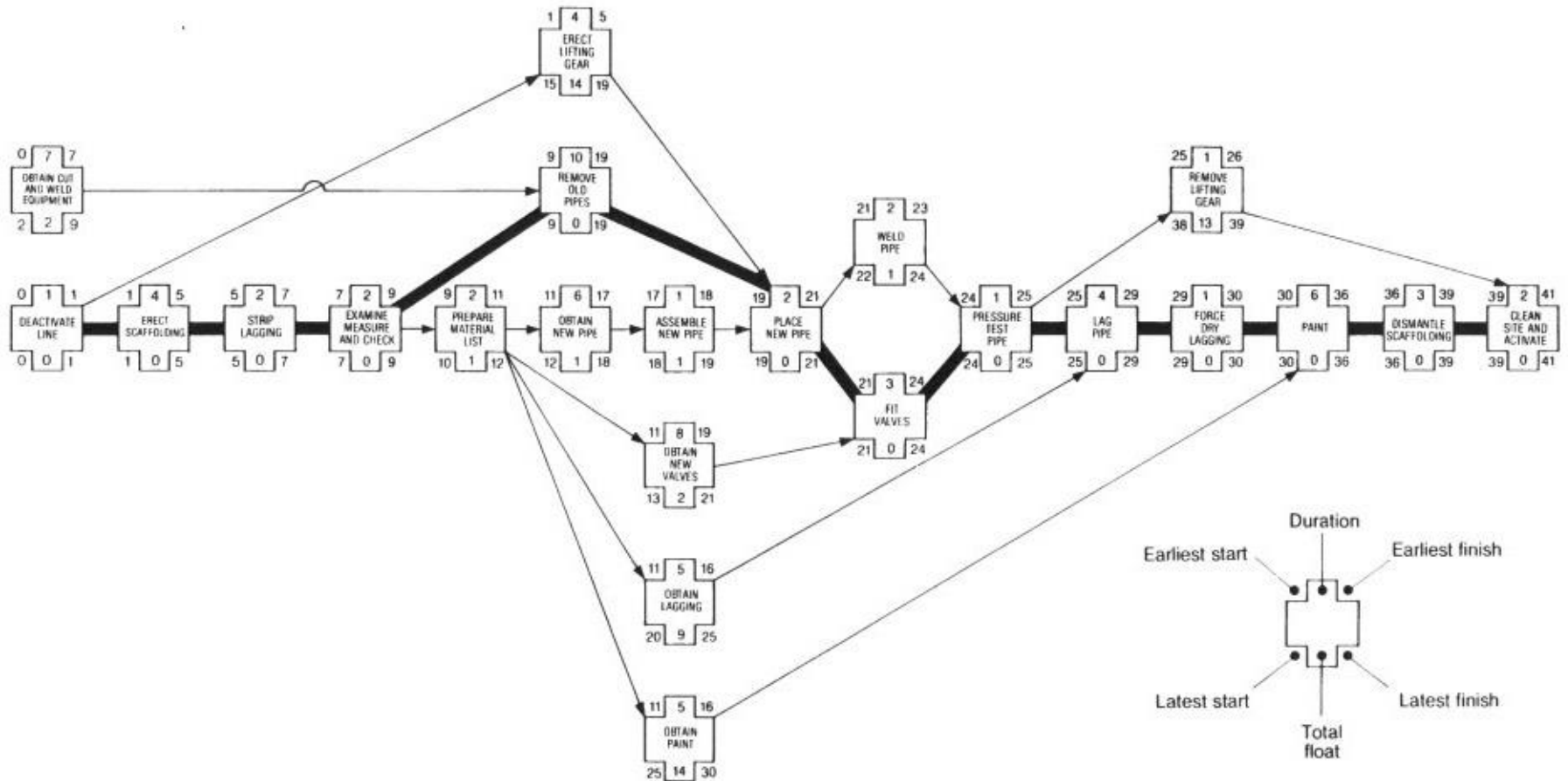
Looking at the central
portion in more detail ...
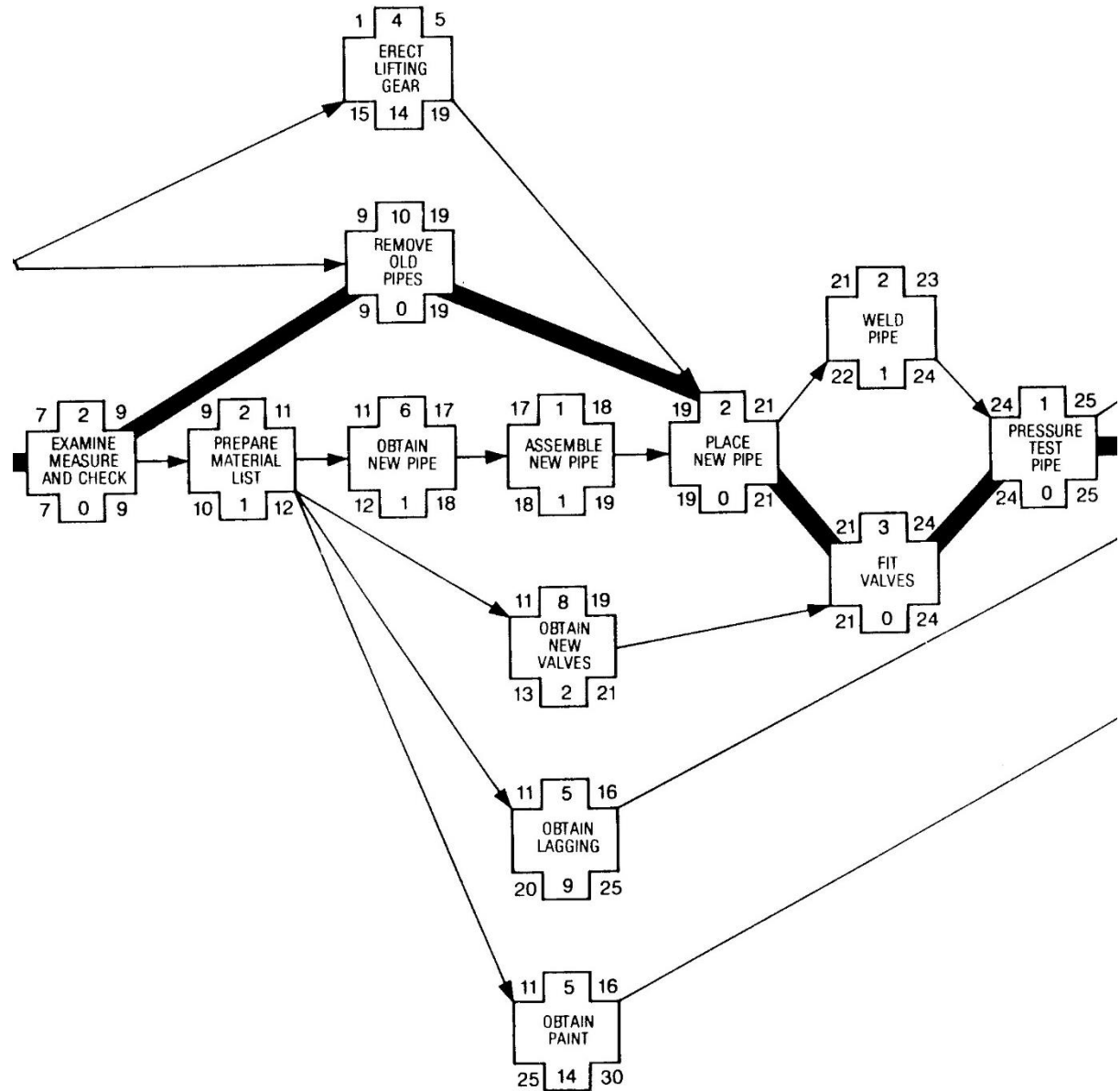
You can see:

- Dependencies and
  durations

- The critical path

- Examples of floats off the critical path

The Gantt chart

Where you will be working on a project, either alone or as part of a team, you will need to plan the work programme

Gantt Charts are one means of representing the whole project graphically. Their purpose is:-

- To represent the tasks that need to be accomplished

- To display the duration associated with each

- To display personal responsibilities within the structure

- To identify key milestones

- Will the work be finished on time?

Producing Gantt Charts

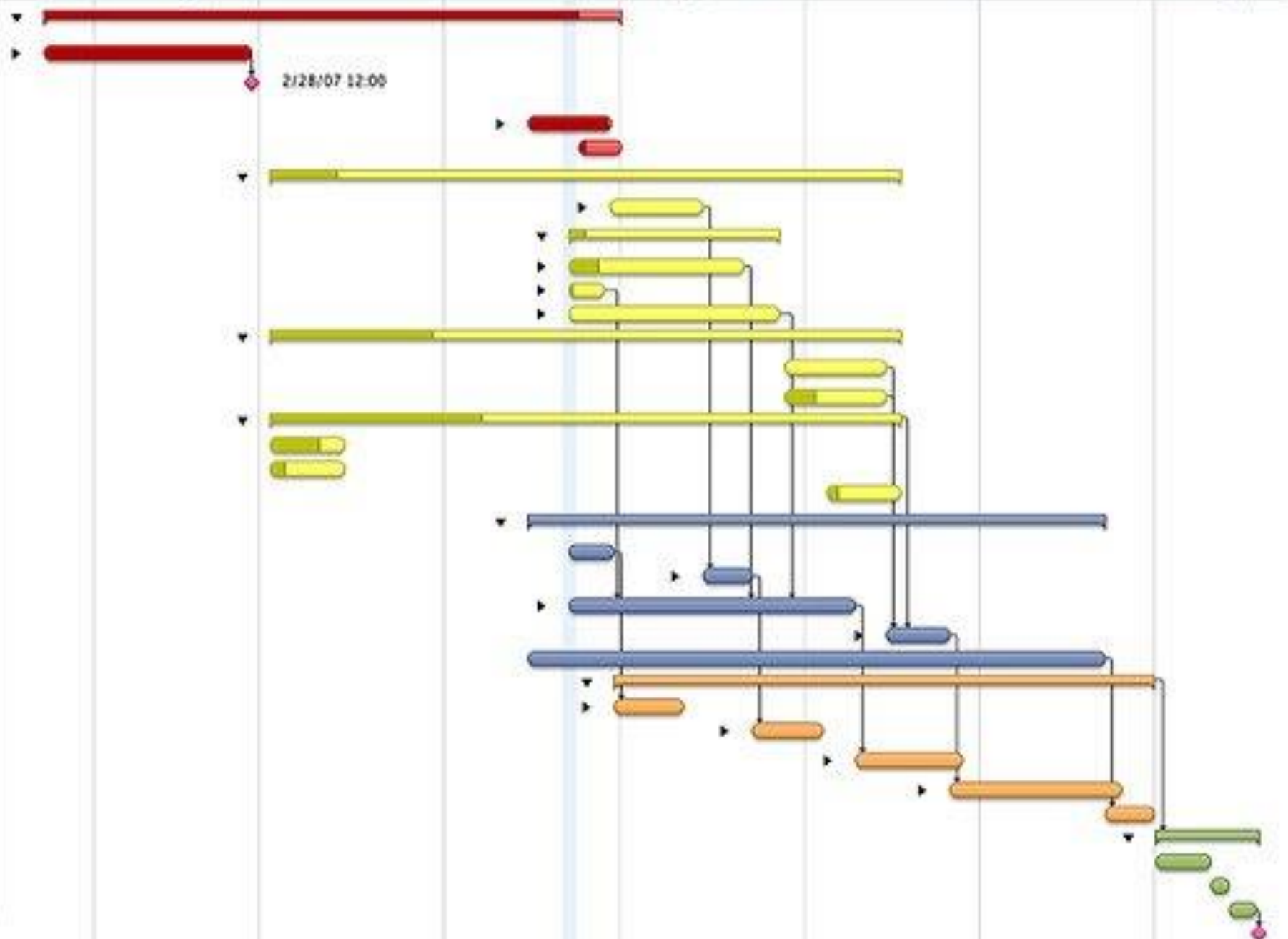Gantt Charts can be produced in a number of different ways

- Project management software

- Histogram displays in spreadsheet software (eg *MS Excel*).

- *MS Word* tables

Route to a successful project

If you understand the aims and objectives of your project, you should be able to identify and summarise the pertinent published literature.

Can you write a page (with references) that summarises WHY you are doing the project?

If you understand the purpose of the project, you should be able to define the activities and resources you will need?

Can you write a page that summarises WHAT you are going to do and HOW these activities will enable you to draw a conclusion that is pertinent to the aims and objectives of your project?

If you understand the enabling activities and resources, you should be able to sort these into a logical order of tasks and their dependencies

Can you produce a Gantt chart?