



Time Planning and Control

Time-Scaled Network

■ Processes of Time Planning and Control

1. Visualize and define the **activities**.
2. Sequence the activities (**Job Logic**).
3. Estimate the **activity duration**.
4. **Schedule** of the project or phase.
5. Allocate and balance **resources**.
6. Compare target, planned and actual dates and **update** as necessary.
7. **Control** the time schedule with respect to **changes**.

■ TIME-SCALED DIAGRAM

- ❑ The original project network is **not** plotted to a time scale.
- ❑ When drawing a time-scaled diagram, two time scales can be used: one in terms of working days and the other as calendar dates.
- ❑ Each activity is shown as a **one dimensional line** rather than as a two dimensional box.
- ❑ The horizontal length is equal to its estimated time **duration** (beginning at its ES and ending with its EF values).

■ TIME-SCALED DIAGRAM

- ❑ **Vertical solid (dashed) lines** indicate sequential **dependence** of one activity on another.
- ❑ In effect, time-scaled networks are merely extensions of bar charts.
- ❑ When an activity has an early finish time that precedes the earliest start of activities following, the time interval between the two is the **free float** of the activity.
- ❑ **Float times** are shown as **horizontal dashed lines**.

■ TIME-SCALED DIAGRAM

- ❑ Free float or activity float is the amount of time that an activity's completion time may be delayed *without affecting the earliest start of succeeding activity.*
- ❑ Total float or path float is the amount of time that an activity's completion may be delayed *without extending project completion time.*
- ❑ Total float or path float is the amount of time that an activity's completion may be delayed *without affecting the earliest start of any activity on the network critical path.*

■ TIME-SCALED DIAGRAM

- ❑ **Activity float** is “**owned**” by an individual activity, whereas **path or total float is shared by all activities along a slack path.**
- ❑ Total path float time for activity (i-j) is the total float associated with a path.

■ TIME-SCALED DIAGRAM

➤ Advantages of Time-scaled Diagram

- ❑ Very suitable device for **checking daily project needs** of different resources, and for the advance detection of conflicting demands among activities for the same resource.
- ❑ Useful for project **financial management** applications.

➤ Disadvantages of Time-scaled Diagram

- ❑ Because it is drawn by manual drafting methods, the level of effort needed to modify and update them is very large.
- ❑ **Dependencies** among activities are not always so obvious as they are on the activity on node network.

■ Example

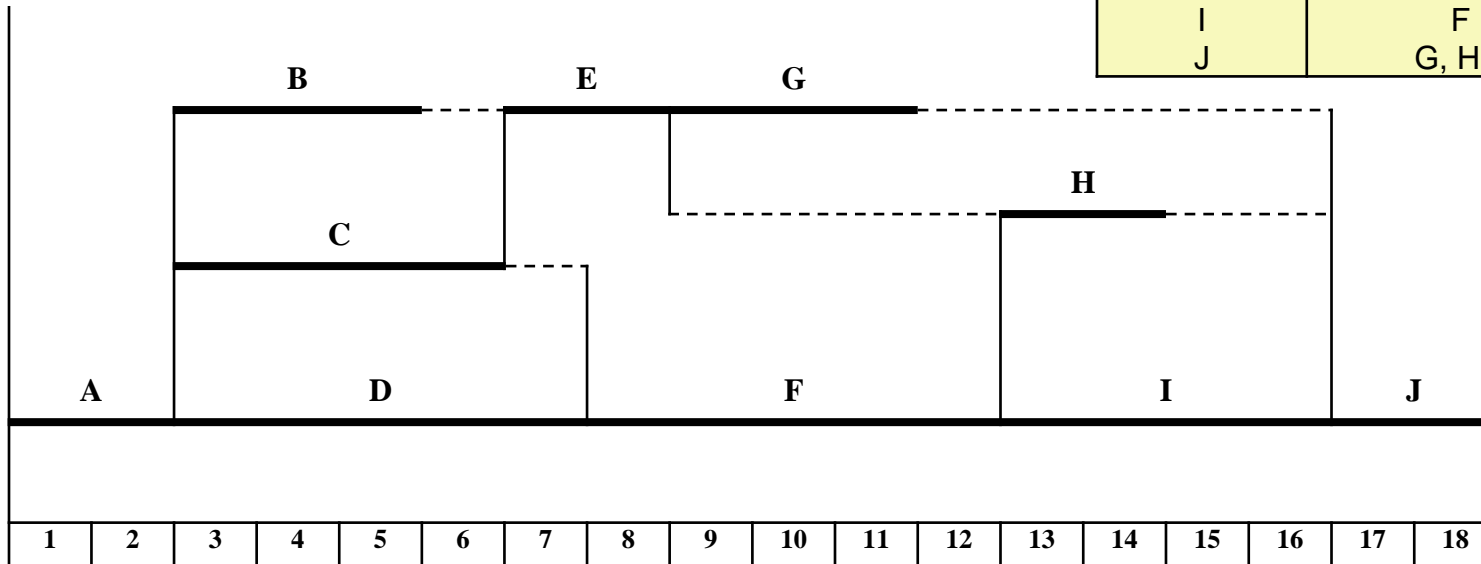
The following activity list represents the job logic and the durations of activities for a small engineering project. Draw a time- scaled network for the project, determine project time and calculate the activities float times.

Activity	Depends on	Duration (day)
E	B, C	2
B	A	3
C	A	4
G	E	3
F	C, D	5
A	None	2
H	E, F	2
D	A	5
I	F	4
J	G, H, I	2

Example

Time-scaled Diagram

Activity	Depends on	Duration (day)
E	B, C	2
B	A	3
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A	None	2
H	E, F	2
D	A	5
I	F	4
J	G, H, I	2



- Project completion time = **18** working days
- Critical Path: A, D, F, I J.

Activity	A	B	C	D	E	F	G	H	I	J
Total float	0	6	1	0	5	0	5	2	0	0
Free float	0	1	0	0	0	0	5	2	0	0