



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).

■ ***Example 1***

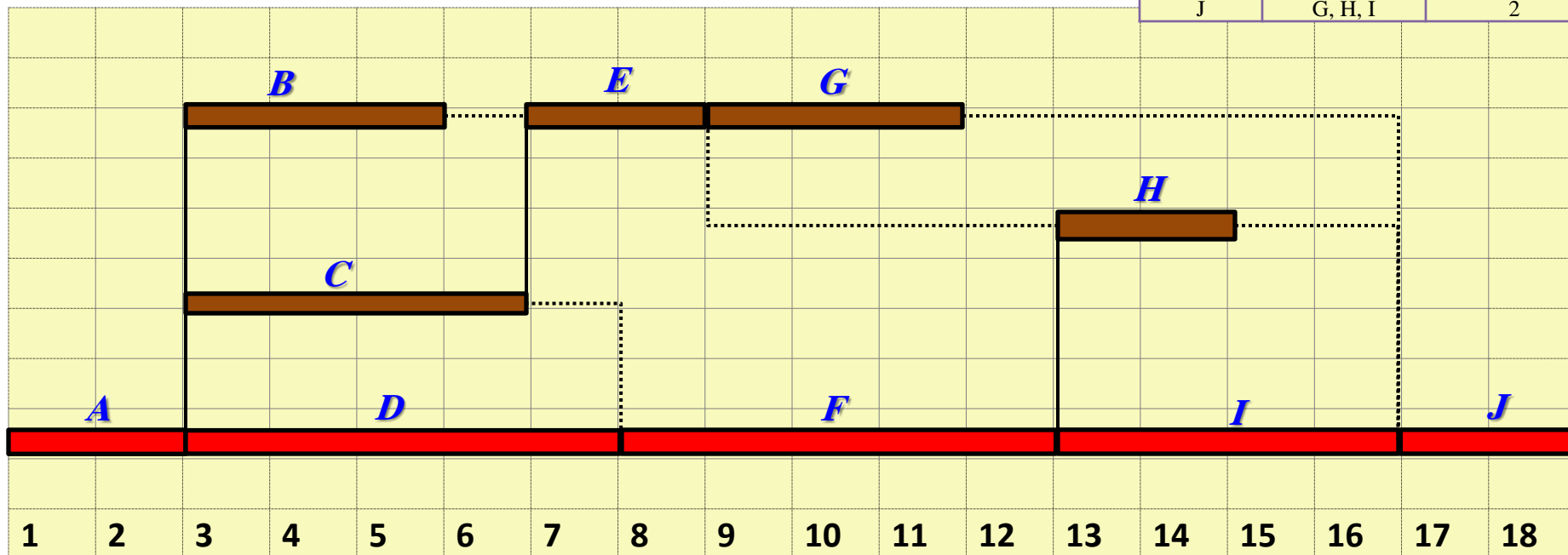
The following activity list represents the job logic and the durations of activities for a small engineering project. Draw a time- scaled network for the project, determine project time and calculate the activities float times.

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 1

Time-scaled Diagram

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



- 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	1	0	0	0	5	2	0	0

■ ***TIME-SCALED DIAGRAM: Explained***

- ❑ ***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: Explained*

- ❑ *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: Explained***

- ❑ ***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: Explained***

➤ **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.

Example2: TSN A market survey

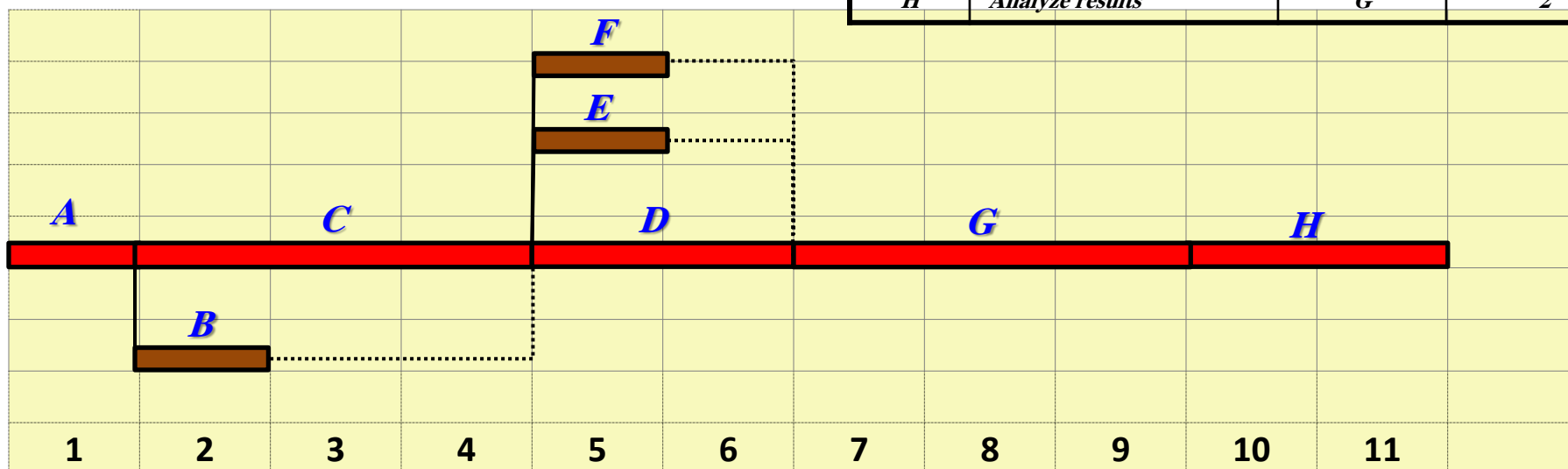
The following activity list represents the job logic and the durations of activities for a market survey project. Draw a time- scaled network for the project, determine project time and calculate the activities float times.

<i>Activity</i>	<i>Description</i>	<i>predecessors</i>	<i>Duration, week</i>
<i>A</i>	<i>Plan survey</i>	<i>—</i>	<i>1</i>
<i>B</i>	<i>Hire personnel</i>	<i>A</i>	<i>1</i>
<i>C</i>	<i>Design questionnaire</i>	<i>A</i>	<i>3</i>
<i>D</i>	<i>Train personnel</i>	<i>B, C</i>	<i>2</i>
<i>E</i>	<i>Select samples of customers</i>	<i>C</i>	<i>1</i>
<i>F</i>	<i>Print questionnaire</i>	<i>C</i>	<i>1</i>
<i>G</i>	<i>Conduct survey</i>	<i>D,E,F</i>	<i>3</i>
<i>H</i>	<i>Analyze results</i>	<i>G</i>	<i>2</i>

Example 2

Time-scaled Diagram

Activity	Description	predecessors	Duration, week
A	Plan survey	—	1
B	Hire personnel	A	1
C	Design questionnaire	A	3
D	Train personnel	B, C	2
E	Select samples of customers	C	1
F	Print questionnaire	C	1
G	Conduct survey	D,E,F	3
H	Analyze results	G	2



- Project completion time = **11** working days
- Critical Path: **A, C, D, G, H.**

Activity	A	B	C	D	E	F	G	H
Total float	0	2	0	0	1	1	0	0
Free float	0	2	0	0	1	1	0	0