Estimating Activity Time

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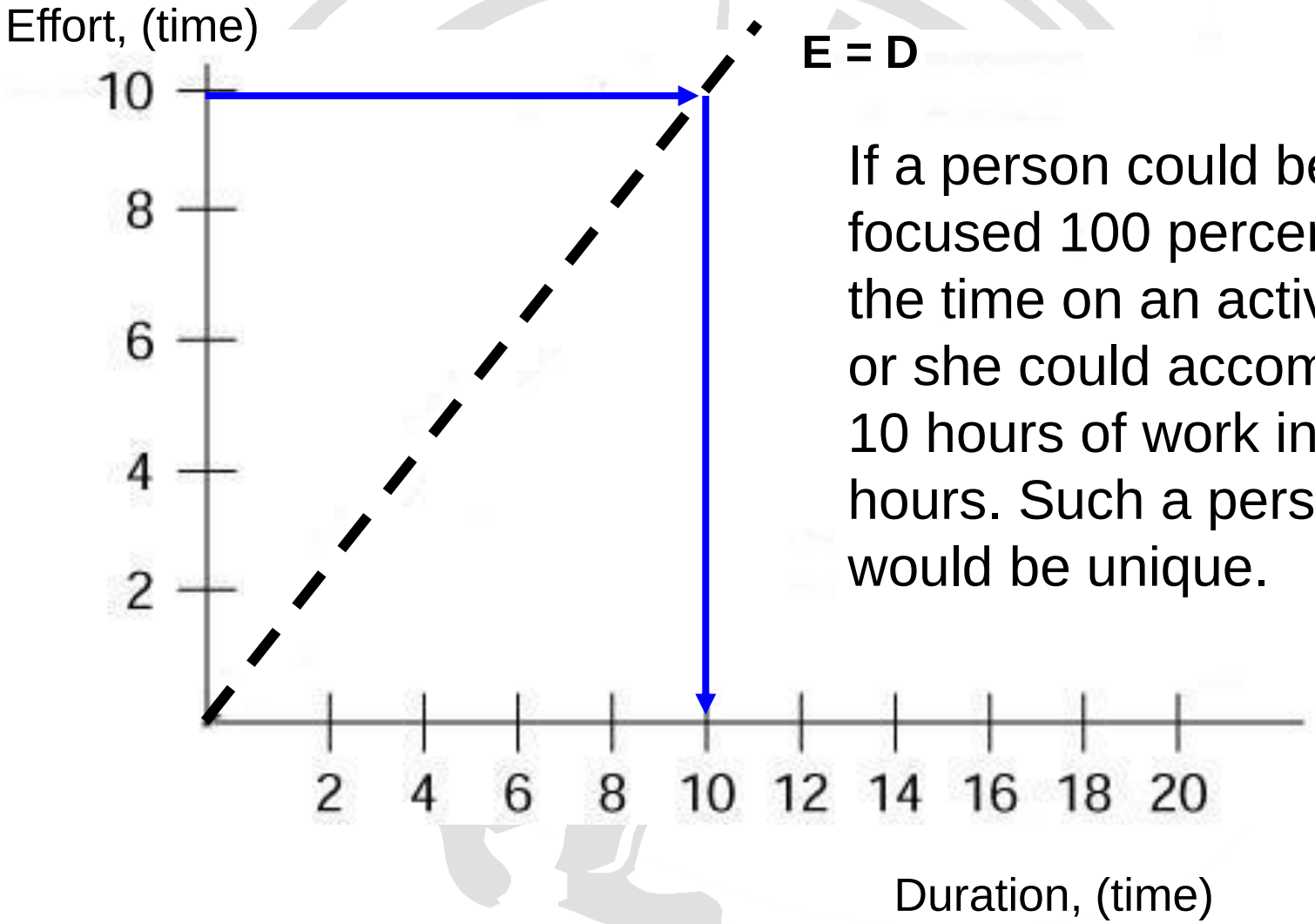
Duration

Clock time taken from starting till ending the activity

Effort

Labor time required to complete an activity

Estimating Duration



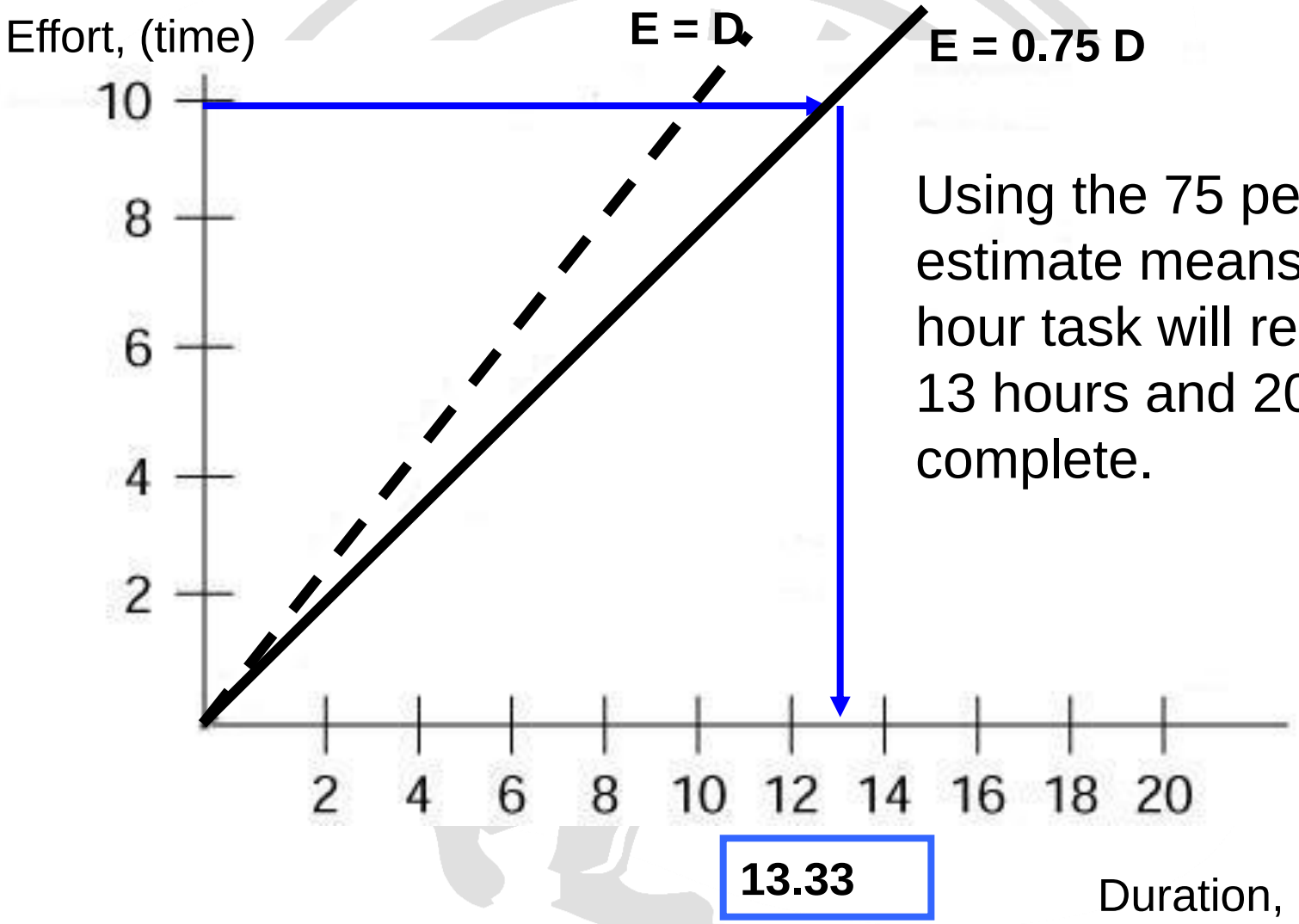
If a person could be focused 100 percent of the time on an activity, he or she could accomplish 10 hours of work in 10 hours. Such a person would be unique.

Estimating Duration

- For what is more likely is that his or her work will be interrupted by email, phone call, meetings, coffee breaks, socializing, and so on.
- Several estimates for the percent of a person's day that he or she can devote to an activity work have been made. Past data indicates a range of ***66*** to ***75*** percent.

i.e., effort = 0.66 - 0.75 duration

Estimating Duration



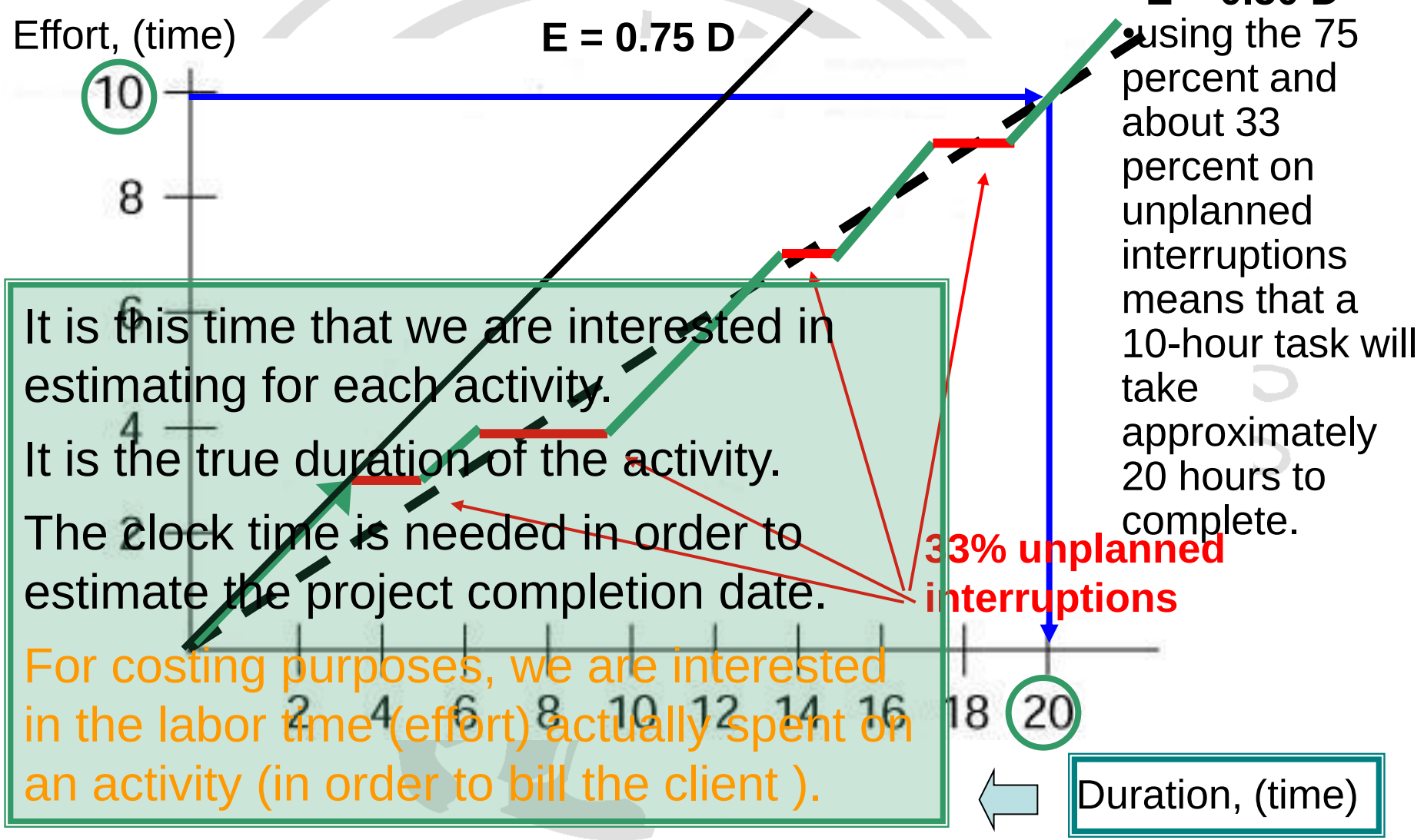
Using the 75 percent estimate means that a 10-hour task will require about 13 hours and 20 minutes to complete.

Estimating Duration

- For worst case scenario is that his or her work will be interrupted by ***unplanned interruptions***, such as:
  - Time delays due less effort exerted
  - a systems crash,
  - power interrupts,
  - random events of nature,
  - the boss stopping in to visit on an unrelated matter,
  - Get stuck in departmental work.
- By experience use the 75 percent and about 33 percent on unplanned interruptions.

i.e., $E = 0.75\ D - (0.33)\ 0.75\ D \approx 0.50\ D$

Estimating Duration



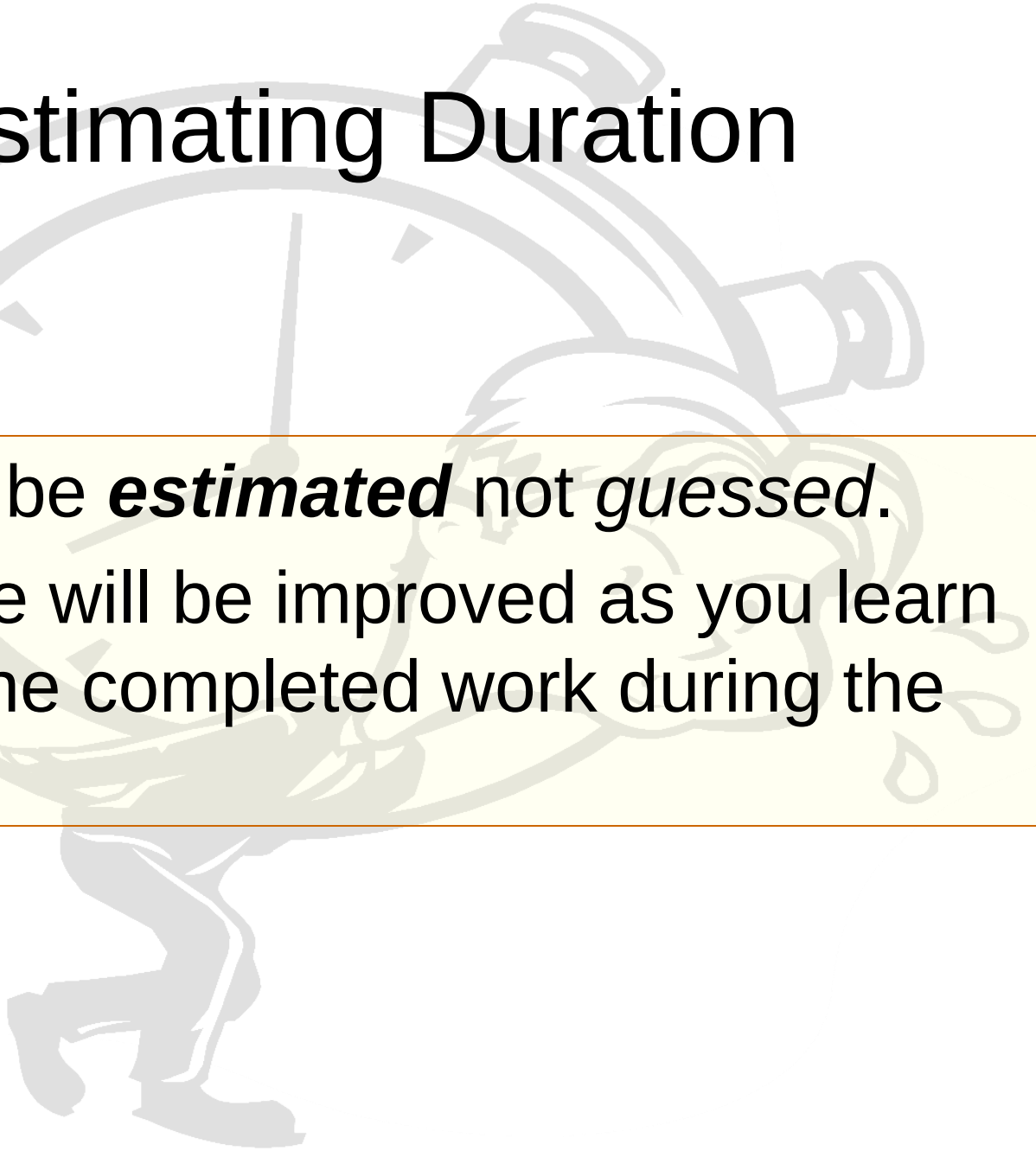
It is this time that we are interested in estimating for each activity.

It is the true duration of the activity.

The clock time is needed in order to estimate the project completion date.

For costing purposes, we are interested in the labor time (effort) actually spent on an activity (in order to bill the client).

Estimating Duration



Time has to be ***estimated*** not *guessed*.

The estimate will be improved as you learn more from the completed work during the time.

Estimating Duration

Six Methods for Estimating Activity Duration

- Extrapolating Based on Similarity to Other Activities
- Studying Historical Data
- Seeking Expert Advice
- Applying the Delphi Technique
- Applying the Three-Point Technique
- Applying the Wide-Band Delphi Technique

Estimating Duration

1. Extrapolating Based on Similarity to Other Activities

- Some of the activities in your WBS may be similar to activities completed in other projects.
- Your or others' recollections of those activities and their duration can be used to estimate the present activity's duration.
- In some cases, this process may require extrapolating from the other activity to this one, but in any case, it does provide an estimate.
- In most cases, using the estimates from those activities provides estimates that are good enough.

Estimating Duration

2. Studying Historical Data

- Every good manager should keep a notebook that records the estimated and actual activity duration. This historical record can be used on other tasks. The recorded data becomes your knowledge base for estimating activity duration. *This technique differs from the previous technique in that it uses a record, rather than depending on memory.*
- In some more sophisiticated tasks regression models can be used in time estimation.

Estimating Duration

3. Seeking Expert Advice

- When the task involves a breakthrough technology or ***a technology that is being used for the first time*** in the organization, there may not be any local experience or even professionals skilled in the technology within the organization.
- In these cases, you will have to appeal to outside authorities. Vendors may be a good source, as are non-competitors who use that technology.

Estimating Duration

4. Applying the Delphi Technique

- The original version used a small panel of experts (say, five or six) who were asked for their estimate independently of one another.
- The results were tabulated and shared with the panel, who were then asked for a second estimate.
- A third estimate was solicited in the same manner.
- The average of the third estimate was the one chosen.
- Note that the original approach does not involve any discussion or collaboration between the panel members.
- In fact, they weren't even aware of who the other members were.

Estimating Duration

5. Applying the Three-Point Technique

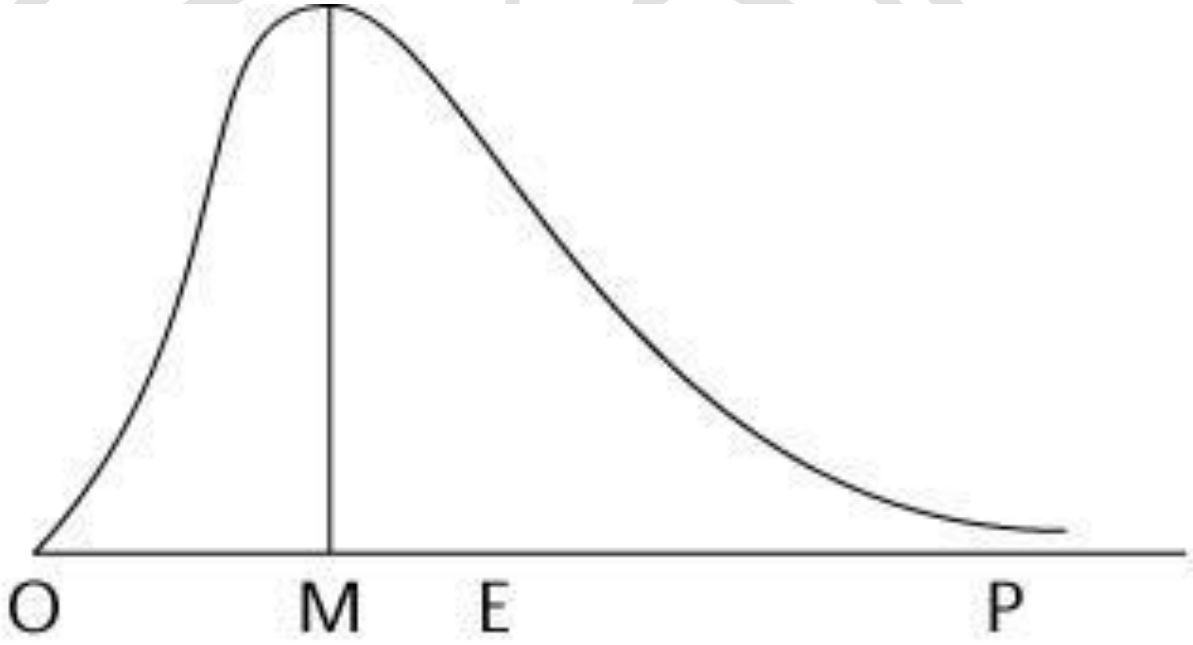
•To use the method, you need three estimates of activity duration:

Optimistic: The optimistic time is defined as the shortest duration one has had or might expect to experience given that everything happens as expected.

Pessimistic: The pessimistic time is that duration that would be experienced (or has been experienced) if everything that could go wrong did go wrong, yet the activity was completed.

Most likely: The most likely time is that time usually experienced.

Three-Point Technique



O: Optimistic
P: Pessimistic
M: Most Likely

$$E = \frac{O + 4M + P}{6}$$

Estimating Duration

4. Applying the Wide-Band Delphi Technique

- Combining the Delphi and three-point methods results in the wide-band Delphi technique.
- It involves a panel, as in the Delphi technique. In place of a single estimate, the panel members are asked, at each iteration, to give their optimistic, pessimistic, and most likely estimates for the duration of the chosen activity.
- The results are compiled, and any extreme estimates are removed. Averages are computed for each of the three estimates, and the averages are used as the optimistic, pessimistic, and most likely estimates of activity duration.

Wide-Band Delphi Technique

Original Estimates

Best	Likely	Worst
10, 8, ~~21~~, 7, ~~4~~, 9	20, 19, 21, ~~10~~, 22, ~~30~~	~~65~~, 42, 39, ~~22~~, 44, 49

Average [excluding outriders]

Best	Likely	Worst
8.5	20.5	43.5

Deriving Expected Estimate

$$\text{Expected} = \frac{BC + 4 \times L + WC}{6}$$

$$(22) = \frac{8.5 + 4 \times 20.5 + 43.5}{6}$$