Project Planning & Control

Lesson 3
Piling Activity Example, Applicability of different methods to Estimate Activity Duration

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Example 3 – Piling

- Consider drilling for a cast in situ pile using a winch for a bridge. One abutment rests on soft soil, whereas other on soft rock.
  - Number of piles per abutment – 20
  - Length of each pile – 15m
  - Working time for the winch is 10 hours a day
  - Normal productivity of a winch – 1.5m/hr
  - Productivity soft rock – 0.5m/hr
- Calculate the duration for piling of each abutment.

Example 3 – Solution

- Normal production for winch

  1.5*10= 15m/day

- For Abutment on soft soil (Normal Productivity)

Duration = Quantity/Production = No. Piles x Length / Production

$= 20*15/15$

$= 20days$

Example 3 – Solution

- Factored production for winch (soft rock)

  0.5*10= 5m/day (Factor 1/3)

- For Abutment on soft rock (Factored Productivity)

Duration = Quantity/Production = No. Piles x Length / Production

$$= 20*15/5$$

$$= 60days$$

Example 3 – Working Time Factor

- Factor for working time

  Actual Working hours/Ideal Working hours

  8.5/10 = 0.85

Actual Duration = Ideal Duration/Working time Factor

–For Abutment on soft soil

=20/0.85 ~ 24days

–For Abutment on soft rock

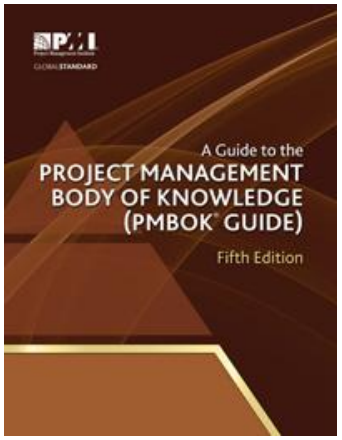
=60/0.85 ~ 71days

Productivity Independent Duration

- Certain activities in construction have fixed methods and resource requirements

- These activities are standardized and their duration are largely independent of productivity

Activity Duration Estimating

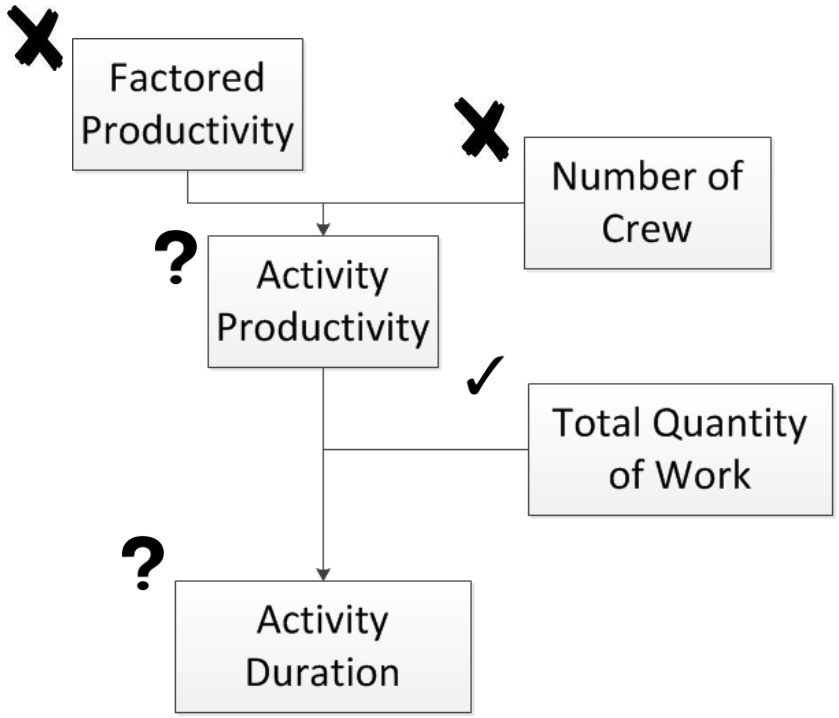


6.4.2 Tools & Techniques

- Expert Judgment (Heuristic)
- Analogous Estimating (Data + Heuristic)
- Parametric estimating
- Three Point Estimate (Uncertainty)
- Reserve analysis (Buffer)

Expert - Heuristic Estimates

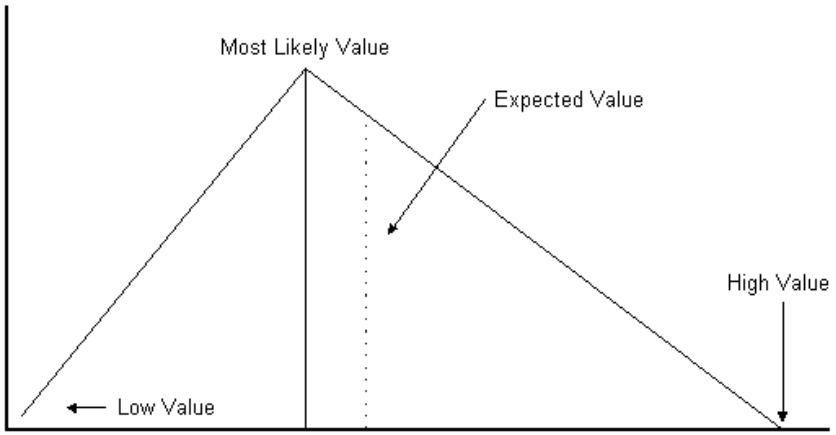
- Experience based technique, it is used when exhaustive estimation based on detailed mathematical formulas is impractical.

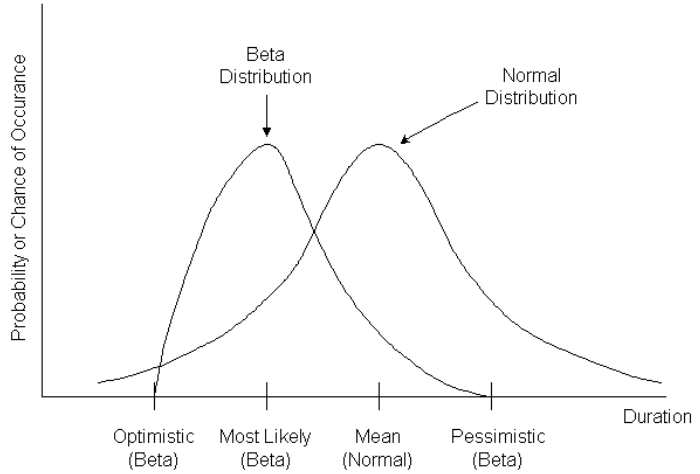


Uncertain Duration

- Probabilistic duration distribution is used to account for the uncertainty in activity duration estimation.

- Here the duration of a particular activity is assumed to be a random variable that follows a certain distribution as shown in the figure below





Summary

- Methods to Estimate Activity Duration
- Examples on parametric methods & factors which influence production/productivity.
- Applicability of different methods