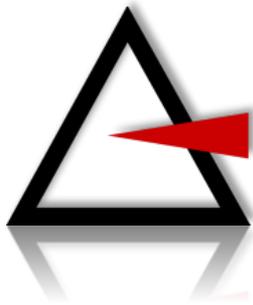


# Project Management

## Topic 4.4

### Estimating Time & Resources



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# Estimating Resources

- Defines for each activity the required type and quantity of material, people, equipment and supplies
- Three basic approaches
  - Expert judgment
  - Published estimating data
  - Bottom up estimating

# Alternative Analysis

## Considers resource alternatives

- Various capabilities and skills
- Different size or type of machines
- Different tools or methods
- Different materials
- Potential out-sourcing or in-sourcing

# Estimating Duration

- Made by person most familiar with and preferably part of activity work unit
- Consider the following:
  - Activity scope
  - Resource type and skills
  - Resource quantity
  - Resource calendar
- Estimates improve as detail increases

# 4.4.1 Roundtable Exercise



## Time Estimates

- How long will it take to do a task when you are asked?  
How do you arrive at your answer?
- Do you ever add in extra time? Why?
- What are the consequences of being under or over your estimate?

**Share your thoughts in roundtable discussion**

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# Analogous Estimating

- Estimate based on durations from prior similar activity and adjusted for differences
- Use with limited info (e.g. concept phase)
- Utilizes historical data and expert judgment
- Low cost and low time, but less accurate
- Use for partial or total project
- Works in conjunction with other methods

# Parametric Estimating

- Applies mathematical relationship to project parameters (e.g. yards of concrete, tons of steel) to compute duration
- Yields higher accuracy depending on quality of underlying formulas
- Use for partial or total project
- Works in conjunction with other methods

# Three Point Estimates

- Also known as Program Evaluation & Review Technique (PERT)
- Incorporates uncertainty and risk
- Uses three estimates  
 $t_m$  – most likely;  $t_o$  – optimistic;  $t_p$  - pessimistic
- Expected  $t_e = (t_o + 4t_m + t_p)/6$
- Can be more accurate and gives range of uncertainty ( $t_p - t_o$ )

# Reserve Analysis

- Duration estimates frequently include added time (reserve or buffer) for uncertainty
- Reserve time should be clearly identified
- Reserve is reduced as more info develops
- Extra time is determined by the following:
  - Percentage of total activity duration
  - A fixed amount of time
  - Conducting a quantitative analysis

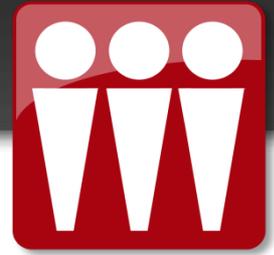
## 4.4.2 Team Exercise



# Duration Estimates

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## 4.4.3 Team Exercise



# Networks, Paths & Interfaces

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