Project Cost Management EV Analysis

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Earned Value Analysis (EVA)

- Is a technique for measuring project performance and progress in an objective manner
- Has the ability to combine measurements of scope, schedule, and cost in a single integrated system
- Uses three fundamental values for each activity:
  1. **Earned Value (EV)**, also known as Budgeted Cost of Work Performed (BCWP), is a measure of work performed expressed in terms of authorized budget for that work. For example, if after 2 days, 60% of the work has been completed, we expect only 60% or less of the authorized budget spent
  2. **Actual Cost (AC)**, also known as Actual Cost of Work Performed (ACWP), is the actual cost incurred for the work performed
  3. **Planned Value (PV),** also known as Budgeted Cost of Work Scheduled (BCWS), is the authorized budget assigned to scheduled work. For example, the total planned budget for a 4-day task is $100. If the status date is third day, then PV is $75. The total PV for a project is known as Budget at Completion (BAC)

[Ref: PMBOK 5th Ed. P/215-226]

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EVA Example

- Consider a 4-day task worth $100 or $25/day. On the end of 3rd day, the resource reported 50% completion only
  - Budget at Completion (BAC) = $100
  - Earned Value (EV) = $50
  - Actual Spent (AC) = $75
  - Planned Value (PV) = $75
  - Cost Variance (CV) = EV minus AC = -$25 (Over Budget)
  - Schedule Variance (SV) = EV minus PV = -$25 (Late or Behind Schedule)
  - Cost Performance Index (CPI) = EV/AC = 0.66 (Productivity Rate of 66%)
  - Schedule Performance Index (SPI) = EV/PV = 0.66 (Progress Rate of 66%)
  - Burn Rate or Budget Utilization = AC/EV = 1.5

- **EVA Interpretations**:
  - A positive CV indicates that you are under budget on a particular task and hence can use a portion of task budget for some other task
  - A positive SV indicates ahead of schedule and hence can use some of the task resources for a task which is late
  - A negative CV or SV means there are problems that require corrective actions
  - Performance Ratios, CPI and SPI can be equal to 1, greater than 1 or less than 1. A value greater than 1, indicates we are ahead of schedule or under budget. A values of less than 1, indicates we are behind or over budget

Forecasting

- **Forecasting Estimate at Completion (EAC)**
  - EAC at the current CPI i.e. the remaining work is assumed to be completed at the same rate as current CPI
    - EAC = BAC / CPI ($151)
  - EAC at the budgeted rate i.e. the remaining work will be completed at the original budgeted rate irrespective of what has happened so far.
    - EAC = AC + BAC – EV ($125)
  - EAC considering both CPI and SPI
    - EAC = AC + [(BAC-EV) / (CPI * SPI)] ($189)
  - EAC = AC + Revised bottom-up ETC (Estimate to Complete remaining work of project)
- ETC (Estimate to Complete project) = EAC - AC OR Re-estimate remaining work from bottom up
- VAC (Variance at Completion of project) = BAC minus EAC
- **To Complete Performance Index (TCPI)** is the calculated projection of cost performance index that must be achieved on the remaining work in order to achieve BAC or EAC
  - TCPI = Work Remaining / Funds Remaining
  - TCPI based on BAC = (BAC – EV) / (BAC – AC)
    - (2.0 i.e. productivity should be 200%)
  - TCPI based on EAC = (BAC – EV) / (EAC – AC)
    - (1.0 i.e. productivity should be 100%) where EAC is $125

Questions

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