Professional Certificate in Project Budgeting and Cost Management

Unit 5: Earned Value Analysis and Management

Earned Value Analysis (EVA) is a project management technique used to measure project performance and progress in an objective manner. It integrates scope, schedule, and cost data in a single integrated system, providing a comprehensive view of project performance.

Key Terms and Vocabulary:

1. Planned Value (PV): Also known as Budgeted Cost of Work Scheduled (BCWS), PV represents the authorized budget for the work that is scheduled to be completed by a certain date. It is the sum of all the budgeted costs for the activities that should have been completed by a given date, based on the project schedule.
2. Earned Value (EV): Also known as Budgeted Cost of Work Performed (BCWP), EV represents the budgeted cost for the work that has actually been completed by a certain date. It is the sum of all the budgeted costs for the activities that have actually been completed by a given date, based on the project scope.
3. Actual Cost (AC): Also known as Actual Cost of Work Performed (ACWP), AC represents the cost incurred in performing the work that has actually been completed by a certain date. It is the sum of all the actual costs incurred in performing the activities that have actually been completed by a given date.
4. Schedule Variance (SV): SV is the difference between EV and PV. It measures the amount of work completed compared to the amount of work scheduled to be completed, and indicates whether the project is ahead of or behind schedule. A positive SV indicates that the project is ahead of schedule, while a negative SV indicates that the project is behind schedule.
5. Cost Variance (CV): CV is the difference between EV and AC. It measures the amount of work completed within budget compared to the actual cost of completing that work, and indicates whether the project is under or over budget. A positive CV indicates that the project is under budget, while a negative CV indicates that the project is over budget.
6. Schedule Performance Index (SPI): SPI is the ratio of EV to PV. It measures the efficiency of the project schedule and indicates whether the project is ahead of or behind schedule. An SPI greater than 1.0 indicates that the project is ahead of schedule, while an SPI less than 1.0 indicates that the project is behind schedule.
7. Cost Performance Index (CPI): CPI is the ratio of EV to AC. It measures the efficiency of the project cost and indicates whether the project is under or over budget. A CPI greater than 1.0 indicates that the project is under budget, while a CPI less than 1.0 indicates that the project is over budget.
8. Estimate at Completion (EAC): EAC is the estimated total cost of completing the project. It can be calculated using different methods, such as EAC = AC + (BAC - EV), where BAC is the Budget at Completion.
9. Estimate to Complete (ETC): ETC is the estimated cost to complete the remaining work. It can be calculated using different methods, such as ETC = EAC - AC.
10. Variance at Completion (VAC): VAC is the difference between the BAC and the EAC. It represents the estimated cost variance at the end of the project.
11. To-Complete Performance Index (TCPI): TCPI is the cost performance required to achieve a given BAC or

EAC. It can be calculated using different methods, such as TCPI = (BAC - EV) / (BAC - AC) or TCPI = (EAC - EV) / (BAC - AC).

Practical Applications:

Earned Value Analysis can be used to:

* Monitor and control project performance
* Identify and address performance issues early
* Improve communication and collaboration among project stakeholders
* Provide a basis for corrective action
* Forecast future project performance

Example:

Suppose a project has a BAC of $100,000, and the following data is available after 4 months:

* PV = $40,000
* EV = $35,000
* AC = $38,000

Using Earned Value Analysis, the following metrics can be calculated:

* SV = EV - PV = $35,000 - $40,000 = -$5,000 (indicating that the project is behind schedule)
* CV = EV - AC = $35,000 - $38,000 = -$3,000 (indicating that the project is over budget)
* SPI = EV / PV = $35,000 / $40,000 = 0.875 (indicating that the project is behind schedule)
* CPI = EV / AC = $35,000 / $38,000 = 0.921 (indicating that the project is over budget)

Based on these metrics, corrective action may be necessary to get the project back on track.

Challenges:

Earned Value Analysis has some limitations and challenges, such as:

* It requires accurate and up-to-date data on project scope, schedule, and cost
* It may be difficult to apply to complex or agile projects
* It may not be suitable for projects with high levels of uncertainty or risk
* It may not take into account non-financial factors, such as quality or customer satisfaction

Despite these challenges, Earned Value Analysis remains a powerful tool for project budgeting and cost management, providing a structured and objective approach to measuring project performance and progress.