Grail

Professional Services

Earned Value Management

Case Study

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Earned Value Management Constructs (1)

- Planned Value (PV): Where we plan to be at any point in time with respect to schedule, scope, and cost
- Actual Cost (AC): How much money (resource) has been expended at a given point in time (think *actual checking account* or *actual checkbook*)

Project Management Institute, A Guide to the Project Management Body of Knowledge, PMBOK® Guide) – Sixth Edition, Project Management Institute Inc., 2017, Pages 261-265.

Earned Value Management Constructs (2)

- Earned Value (EV): What is the value of the thing being built at a given point in time (what could we get for the thing on *eBay*)
- Earned Schedule (ES):
  - Behind Schedule: When was the current value of the project supposed to have been achieved (on what date in the past)?
  - Ahead of Schedule: When is the current value of the project supposed to be achieved (on what date in the future)?

Project Management Institute, A Guide to the Project Management Body of Knowledge, PMBOK® Guide) – Sixth Edition, Project Management Institute Inc., 2017, Pages 261-265, 233.

Build a Sports Car

- Build your own sports car in a shop
- Allocate $100,000 to build the sports car
- Allocate 360 days to build the sports car

Checking the Status of the Project at 180 Days

- Checking the cost management plan (part of the project management plan), we should have spent $50,000 (leaving $50,000 in the checking account) at 180 days.
- Checking the scope management plan (part of the project management plan), the sports car should have a frame with four wheels attached and an engine installed at 180 days.

Congruence

- If the project management plan is being executed perfectly, at 180 days we should have a frame with four wheels attached and an engine installed.
- The value of a frame with four wheels attached and an engine installed is $50,000. Put another way, if we sold this frame on *eBay* (at cost) with four wheels attached and an engine installed, we would get $50,000.

Scenario 1: Progress Check at 180 days

- Scope Management Plan (planned value $50,000):
  - Frame
  - Four Wheels
  - Engine
- Actual Scope (earned value $30,000):
  - Frame
  - Four Wheels
  - NO Engine
- BAD: Earned value $30,000 should have been achieved in 120 days.

Schedule Variance (SV) BAD

- SV = Earned Schedule - Actual Time
- Earned Schedule = 120 days
- Actual Time = 180 days
- SV = 120 - 180
- SV = -60 days

Schedule Performance Index (SPI) BAD

- SPI = Earned Schedule / Actual Time
- Earned Schedule = 120 days
- Actual Time = 180 days
- SPI = 120 / 180
- SPI ≈ .67 (schedule management is poor)

SV = ES – AT
SPI = ES / AT

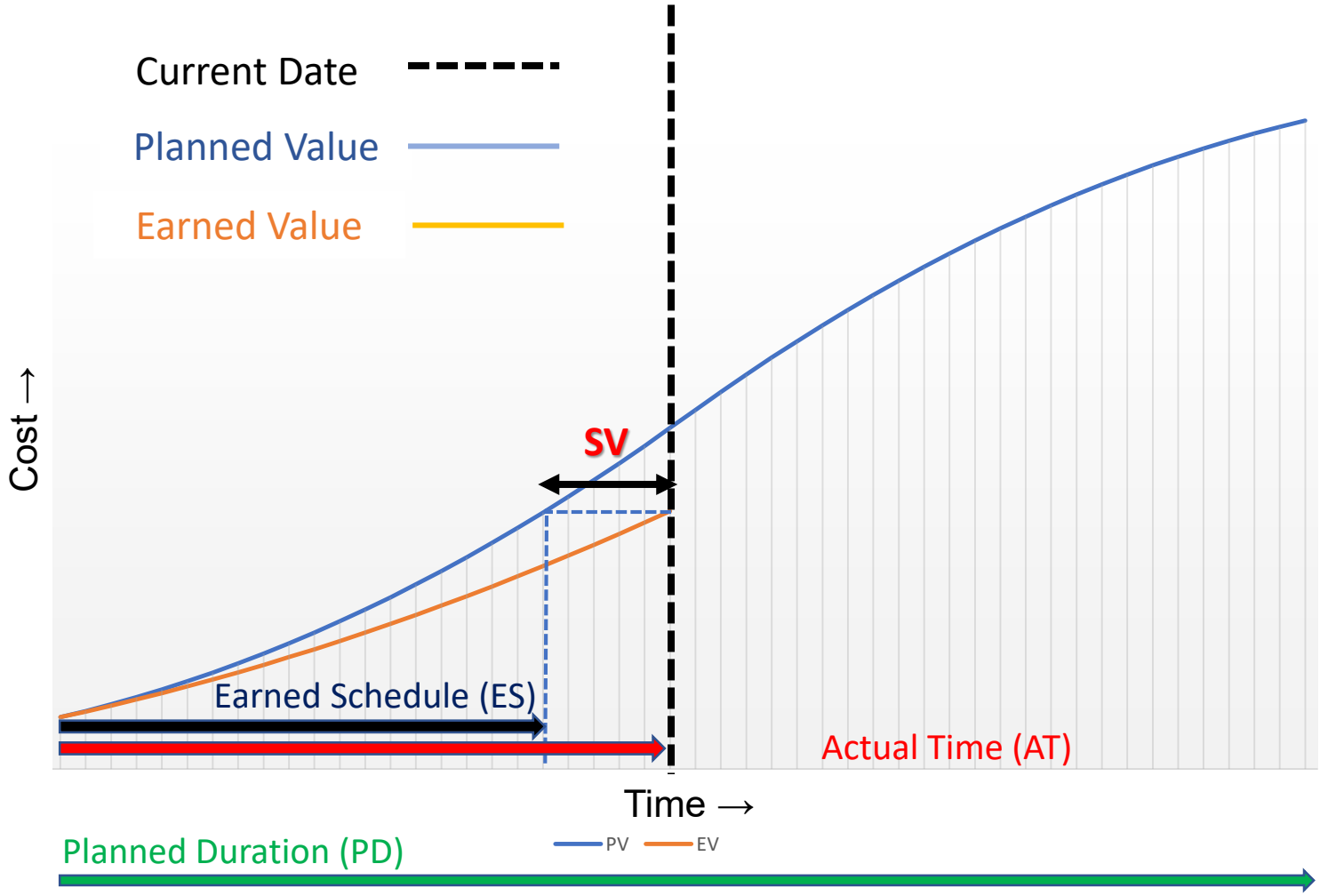

Figure 1. S-Curve Chart (Behind Schedule)

Scenario 1: Progress Check at 180 days (Cost)

- Actual Scope (earned value $30,000)
- Actual Cost (actual cost $60,000)
- BAD: Over Budget

Cost Variance (CV) BAD

- CV = Earned Value - Actual Cost
- Earned Value = $30,000 (missing engine)
- Actual Cost = $60,000
- CV = $30,000 - $60,000
- CV = -$30,000 (over budget)

Cost Performance Index (CPI) BAD

- CPI = Earned Value / Actual Cost
- Earned Value = $30,000 (missing engine)
- Actual Cost = $60,000
- CPI = $30,000 / $60,000
- CPI = .5 (cost management is poor)

CV = EV – AC
CPI = EV / AC

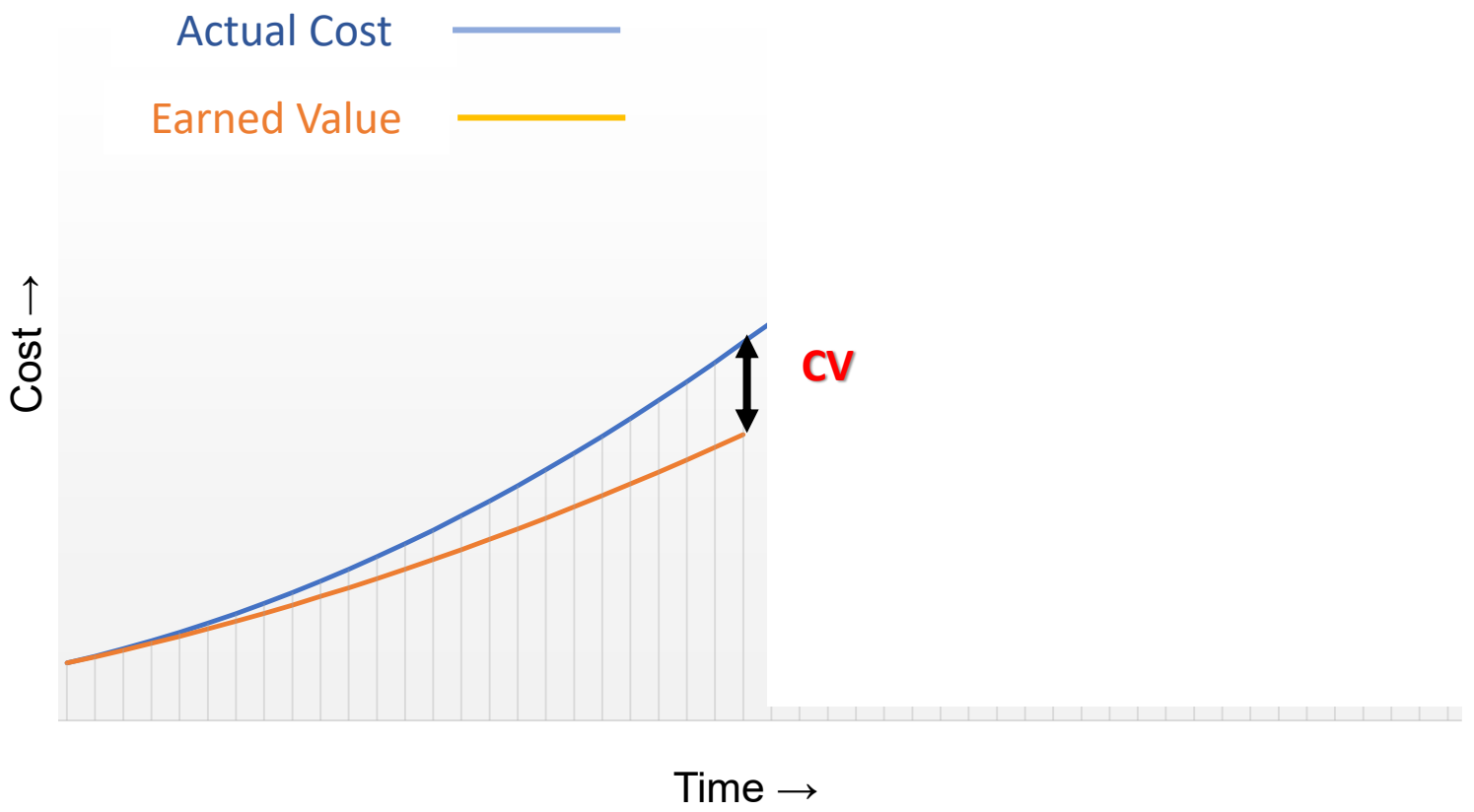

Figure 2. Cost Baseline: S-Curve (BAD)

Scenario 2: Progress Check at 180 Days

- Scope Management Plan (planned value $50,000):
  - Frame
  - Four Wheels
  - Engine
- Actual Scope (earned value $75,000):
  - Frame
  - Four Wheels
  - Engine
  - Transmission (not anticipated)
- Good: Earned value $75,000 should have been achieved in 240 days.

Schedule Variance (SV) Good

- SV = Earned Schedule - Actual Time
- Earned Schedule = 240 days
- Actual Time = 180 days
- SV = 240 - 180
- SV = 60 days

Schedule Performance Index (SPI) GOOD

- SPI = Earned Schedule / Actual Time
- Earned Schedule = 240 days
- Actual Time = 180 days
- SPI = 240 / 180
- SPI ≈ 1.33 (schedule management is good)

SV = ES – AT
SPI = ES / AT

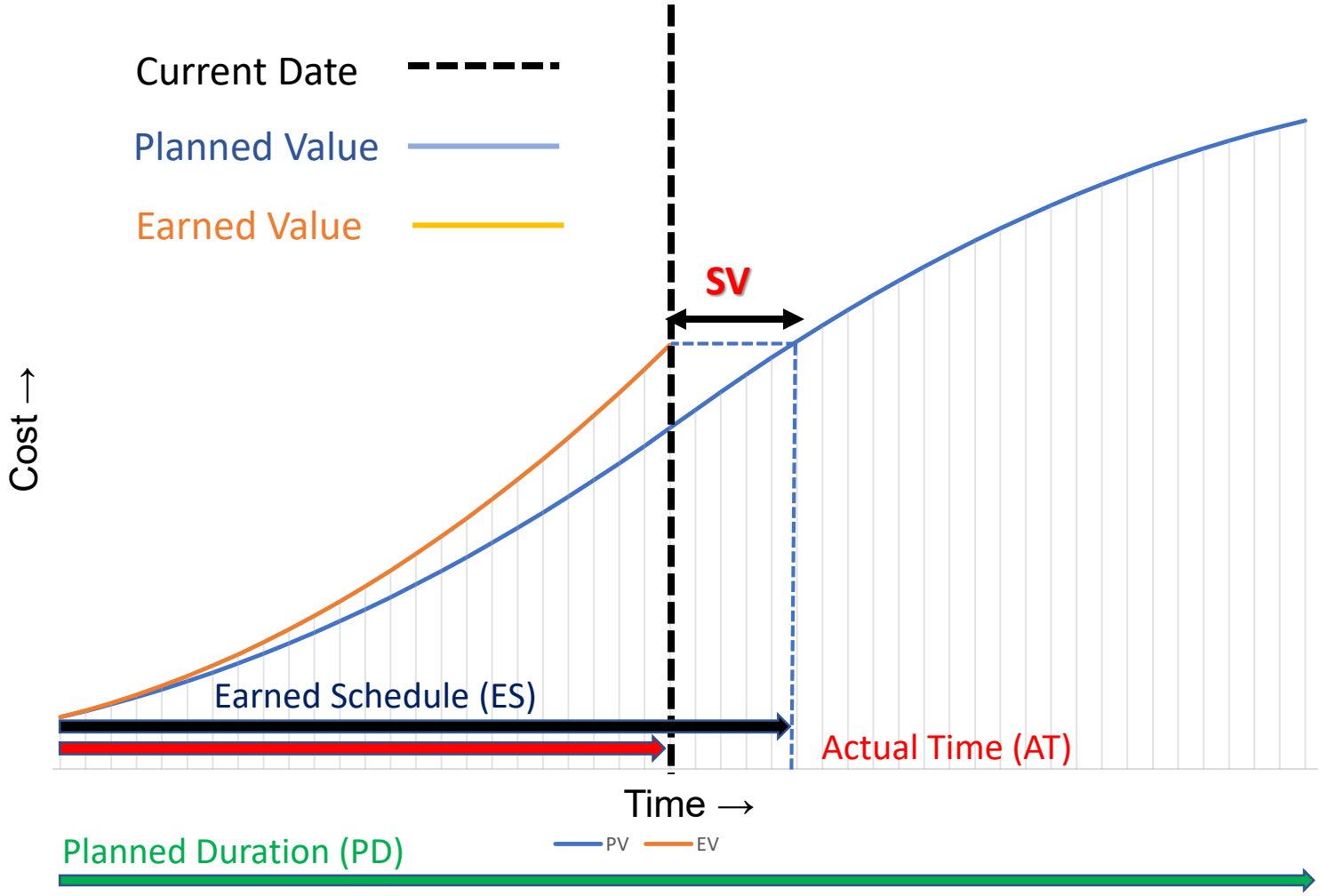

Figure 3. S-Curve Chart (Ahead of Schedule)

Progress Check at 180 Days (Cost)

- Actual Scope (earned value $75,000)
- Actual Cost (actual cost $50,000)
- GOOD: Under Budget

Cost Variance (CV) GOOD

- CV = Earned Value - Actual Cost
- Earned Value = $75,000 (added transmission)
- Actual Cost = $50,000
- CV = $75,000 - $50,000
- CV = $25,000 (under budget)
- Note: If CV = 0, the project is on budget

Cost Performance Index (CPI) GOOD

- CPI = Earned Value / Actual Cost
- Earned Value = $75,000 (added transmission)
- Actual Cost = $50,000
- CPI = $75,000 / $50,000
- CPI = 1.5 (cost management is excellent)
- Note: If CPI = 1, cost is being managed as expected

CV = EV – AC
CPI = EV / AC

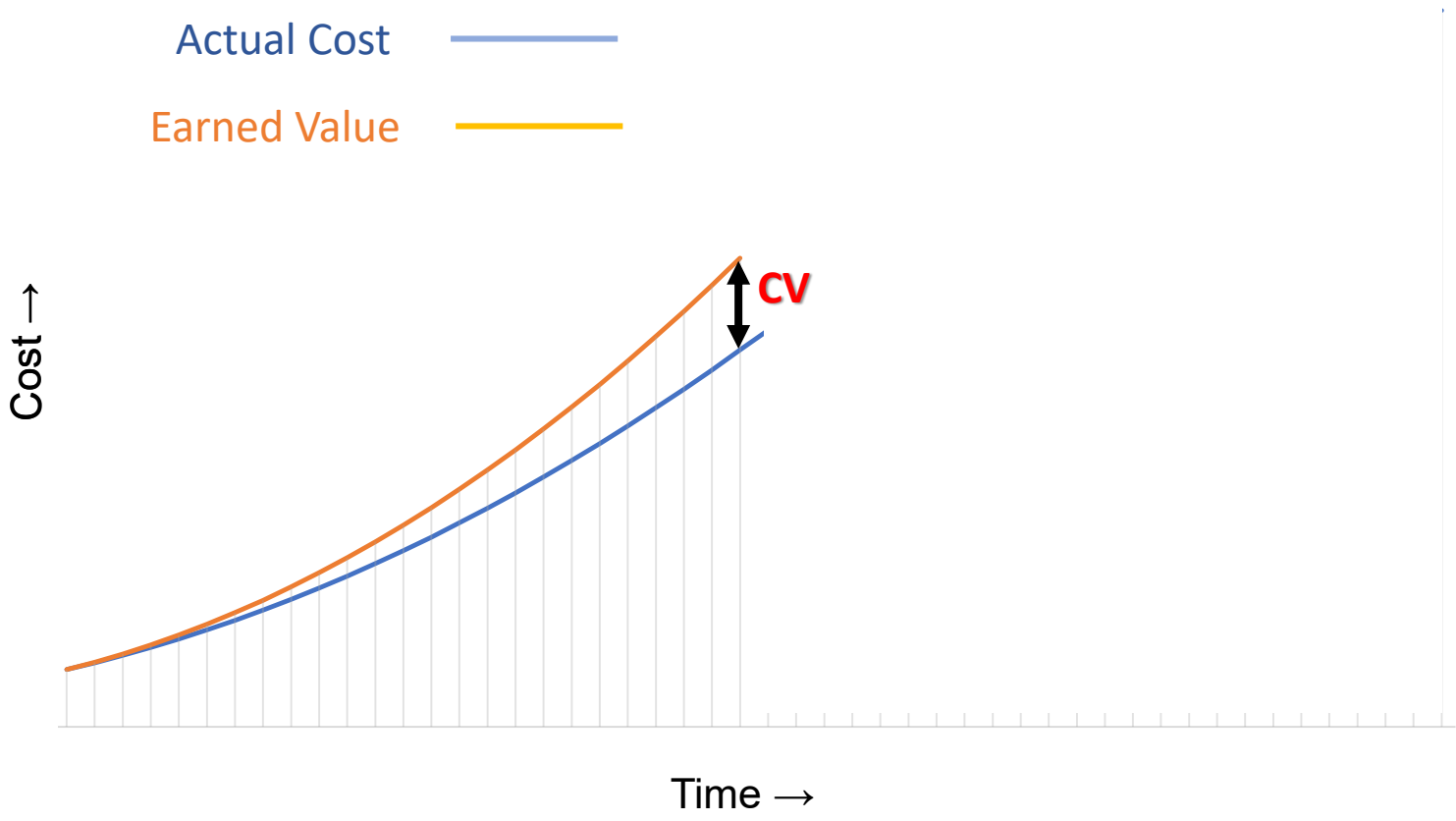

Figure 4. Cost Baseline: S-Curve (**GOOD**)

Schedule and Cost Variance: **Bottom Line**

- Less than zero (negative), bad
- Zero is good (actual equals planned)
- More than zero (positive), excellent

Schedule and Cost Performance Index: **Bottom Line**

- Less than one, bad
- One is good (actual equals planned)
- More than one, excellent

Earned Value Management Formulas

- **SV = Earned Schedule - Actual Time** (old EV - PV)
- **CV = Earned Value - Actual Cost**
- **SPI = Earned Schedule / Actual Time** (old EV / PV)
- **CPI = Earned Value / Actual Cost**