

# Earned Value Management (EVM)

Calculating Project Status

# What is EVM?

- A project management technique for calculating project status
- Compares planned work to completed work to cost of that completed work
  - Planned Value (PV), aka, Budgeted Cost of Work Scheduled (BCWS)
  - Earned Value (EV), aka, Budgeted Cost of Work Performed (BCWP)
  - Actual Cost, aka, Actual Cost or Work Performed (ACWP)

# Who Cares?

- Project status should be driven by data
- Project monitoring from data identifies where attention should be paid due to control variance
  - Schedule Variance (SV), relationship between PV and AV
  - Cost Variance (CV), relationship between AV and AC
- Some churn is natural; pronounced negative trends indicate areas of concern
- Will appear on the PMP exam and will be an interview question of Senior Project Managers

# EVM Considerations

- Not without controversy among project managers
  - Easy to misinterpret
  - May misstate status
  - Difficult for stakeholders to understand
  - Difficult and time consuming to calculate, if not using a scheduling tool (MS Project for instance)
- One of our tools; as with any tool, there are times and places where they may be best and worst used
  - Carpenter with a hammer

# Example

	1	2	3	4	5	6	7	
	Planned Value (Budgeted Cost of Work Scheduled)							
AA	\$2,800	\$2,800	\$3,000	\$1,200	\$800			\$10,600
AB	\$3,300	\$3,500	\$500	\$5,000	\$3,500	\$300	\$300	\$16,400
AC	\$3,200	\$3,200	\$4,200	\$4,200	\$500			\$15,300
AD				\$500	\$2,200	\$2,200	\$1,200	\$6,100
AE					\$800	\$2,400	\$2,400	\$5,600

	1	2	3	4	5	6	7	
	Earned Value (Budgeted Cost of Work Performed)							
AA	\$2,300	\$2,450	\$2,800	\$1,400	\$1,400			\$10,350
AB	\$1,850	\$2,100	\$1,800	\$1,800	\$4,100			\$11,650
AC	\$3,200	\$3,200	\$3,200	\$3,200	\$2,500			\$15,300
AD				\$800	\$2,500	\$2,500	\$300	\$6,100
AE					\$1,000	\$1,500	\$1,200	\$3,700

	1	2	3	4	5	6	7	
	Actual Cost (Actual Cost of Work Performed)							
AA	\$2,300	\$2,450	\$2,800	\$1,400	\$3,300			\$12,250
AB	\$1,800	\$2,100	\$1,600	\$1,800	\$3,800			\$11,100
AC	\$3,200	\$3,200	\$3,200	\$3,200	\$5,000			\$17,800
AD				\$800	\$2,700	\$1,800	\$300	\$5,600
AE					\$1,000	\$1,500	\$1,200	\$3,700

## Period 1:

AA and AB are both behind  
AB is under spending

## Period 2:

AA and AB are falling further behind, AB very much so  
Spending seems to be fine

## Period 3:

AA and AB are falling further behind, AB catching up  
Spending is a little under

## Period 4:

AA a little ahead of plan  
AB and AC behind  
Spending is fine

## Period 5:

AA and AB accomplishing more on plan  
AC ahead on plan and over-spending

# Example - Variances

	Period 1				
	PV	EV	AC	SV	CV
AA	\$2,800	\$2,300	\$2,300	-\$500.00	\$0.00
AB	\$3,300	\$1,850	\$1,800	-\$1,450.00	-\$50.00
AC	\$3,200	\$3,200	\$3,200	\$0.00	\$0.00
AD					
AE					
	Period Variance			-\$1,950.00	-\$50.00
	Cumulative Variance			-\$1,950.00	-\$50.00
	Period 2				
	PV	EV	AC	SV	CV
AA	\$2,800	\$2,450	\$2,450	-\$350	0
AB	\$3,500	\$2,100	\$2,100	-\$1,400	0
AC	\$3,200	\$3,200	\$3,200	\$0	0
AD					
AE					
	Period Variance			-\$1,750.00	\$0.00
	Cumulative Variance			-\$3,700.00	-\$50.00

## Period 1:

AA Schedule Variance = -500

AA Cost Variance = 0

AB SV = -1,450

AB CV = -50

AC is right on

## Period 2:

AA Schedule Variance = -350

AA Cost Variance = 0

AB SV = -1,400

AB CV = -50

AC is again right on

# Example - Variances

	Period 3				
	PV	EV	AC	SV	CV
AA	\$3,000	\$2,800	\$2,450	-\$200	-\$350
AB	\$500	\$1,800	\$2,100	\$1,300	\$300
AC	\$4,200	\$3,200	\$3,200	-\$1,000	\$0
AD					
AE					
	Period Variance			\$100.00	-\$50.00
	Cumulative Variance			-\$3,600.00	-\$100.00
	Period 4				
	PV	EV	AC	SV	CV
AA	\$1,200	\$1,400	\$1,400	\$200	\$0
AB	\$5,000	\$1,800	\$1,800	-\$3,200	\$0
AC	\$4,200	\$3,200	\$3,200	-\$1,000	\$0
AD	\$500	\$800	\$800	\$300	\$0
AE					
	Period Variance			-\$3,700.00	\$0.00
	Cumulative Variance			-\$7,300.00	-\$100.00
	Period 5				
	PV	EV	AC	SV	CV
AA	\$800	\$1,400	\$3,300	\$600	\$1,900
AB	\$3,500	\$4,100	\$3,800	\$600	-\$300
AC	\$500	\$2,500	\$5,000	\$5,000	\$2,500
AD	\$2,200	\$2,500	\$2,700	\$300	\$200
AE	\$800	\$1,000	\$1,000	\$200	\$0
	Period Variance			\$6,500.00	\$4,300.00
	Cumulative Variance			-\$800.00	\$4,200.00

## Period 3:

AA Schedule Variance = -200

AA Cost Variance = -350

AB SV = -1,300 (we're catching up!)

AB CV = 300 (and over spending)

AC SV = -1,000 (Something happened)

AC CV = 0

## Period 4:

AA Schedule Variance = 200

AA Cost Variance = 0

AB SV = -3,200 (Oops...something happened)

AB CV = 0

AC SV = -1,000 (trend is not good)

AC CV = 0

## Period 5:

AA Schedule Variance = 600

AA Cost Variance = 1,900 (Over spending)

AB SV = 600

AB CV = -300 (under spending)

AC SV = 5,000! (Getting down!)

AC CV = 2,500 over spending

# Cumulative Variance

	Period 3				
	PV	EV	AC	SV	CV
AA	\$3,000	\$2,800	\$2,450	-\$200	-\$350
AB	\$500	\$1,800	\$2,100	\$1,300	\$300
AC	\$4,200	\$3,200	\$3,200	-\$1,000	\$0
AD					
AE					
	Period Variance			\$100.00	-\$50.00
	Cumulative Variance			-\$3,600.00	-\$100.00
	Period 4				
	PV	EV	AC	SV	CV
AA	\$1,200	\$1,400	\$1,400	\$200	\$0
AB	\$5,000	\$1,800	\$1,800	-\$3,200	\$0
AC	\$4,200	\$3,200	\$3,200	-\$1,000	\$0
AD	\$500	\$800	\$800	\$300	\$0
AE					
	Period Variance			-\$3,700.00	\$0.00
	Cumulative Variance			-\$7,300.00	-\$100.00
	Period 5				
	PV	EV	AC	SV	CV
AA	\$800	\$1,400	\$3,300	\$600	\$1,900
AB	\$3,500	\$4,100	\$3,800	\$600	-\$300
AC	\$500	\$2,500	\$5,000	\$5,000	\$2,500
AD	\$2,200	\$2,500	\$2,700	\$300	\$200
AE	\$800	\$1,000	\$1,000	\$200	\$0
	Period Variance			\$6,500.00	\$4,300.00
	Cumulative Variance			-\$800.00	\$4,200.00

Period to period, we may be on time or behind, over budget or under: cumulative variance sums across the project.

By period 5, the cumulative variance suggests we are back on schedule, though having \$4,200 more than plan

However, AB is still in trouble: \$4,750 remains to complete and \$600 remains in plan (PV periods 6 and 7)

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	Planned Value (Budgeted Cost of Work Scheduled)							
AA	\$2,800	\$2,800	\$3,000	\$1,200	\$800			\$10,600
AB	\$3,300	\$3,500	\$500	\$5,000	\$3,500	\$300	\$300	\$16,400
AC	\$3,200	\$3,200	\$4,200	\$4,200	\$500			\$15,300
AD				\$500	\$2,200	\$2,200	\$1,200	\$6,100
AE					\$800	\$2,400	\$2,400	\$5,600

	1	2	3	4	5	6	7	
	Earned Value (Budgeted Cost of Work Performed)							
AA	\$2,300	\$2,450	\$2,800	\$1,400	\$1,400			\$10,350
AB	\$1,850	\$2,100	\$1,800	\$1,800	\$4,100			\$11,650
AC	\$3,200	\$3,200	\$3,200	\$3,200	\$2,500			\$15,300
AD				\$800	\$2,500	\$2,500	\$300	\$6,100
AE					\$1,000	\$1,500	\$1,200	\$3,700



# Summary

- EVM is a tool to monitor project progress
- Variances indicate where further detail is required
- Cumulative variances smooth out the period-to-period trends
- Easy to be misled by the data ( “Lies, damn lies and statistics” - Mark Twain)
- Useful to suggest where we need to dive into the details, especially for projects with 100s of activities