

EARNED VALUE PROCESS

- Develop detailed project schedule.
- Each phase or milestone should have the rolled up budget.
 - This budget can be further broken down into milestones with associated values.
- As each milestone is completed, that portion of the project is realized as earned value.
- There are different earned value methods. Your organizations PPM tool may automatically generate earned value based on your project schedule.
- Two main earned value tracking methods are SPI (Schedule Performance Index) and CPI(Cost Performance Index). Both are indicators of the project's health/execution.
- The following are some earned value methods we'll discuss here:
 - 0/100
 - XY (Fixed Formula-20/80, 25/75, 30/70, 50/50, 75/25)
 - Weighted Percent Complete

WATERFALL MILESTONES

Milestone	Due Date	Cost
Kick Off Phase		\$72,000
Requirements Workshop Completed	May 29, 2020	\$12,000
Deal established with laptop vendor		\$10,000
High-Level Requirements document signed-off		\$50,000
Requirements Phase		Sep 25, 2020
Licensing and Software Purchased	June	\$150,000
Laptops Purchased	June	\$50,000
Requirements Workshops Completed	June	\$51,600
Detailed Requirements Document Approved	July	\$100,000
Functional Design & Requirements Approved	August	\$51,600
High-Level Test Cases Reviewed	September	\$51,600
Development / Unit Testing	Jan 29, 2021	\$112,000
User Testing Support / Defect Fixing	Mar 26, 2021	\$227,400
Production Rollout / User Training	Jun 30, 2021	\$80,600

- Milestones should be defined at least monthly so that EV can be realized every month.
 - Even better if monthly milestones can be further broken down.
- As each milestone is completed, the associated value will be realized as EV.
 - Executive management will see that this project is providing value to the organization.

AGILE MILESTONES

Sprint	Story	In Progress	Completed	Value
Sprint 0				\$25,000
Sprint 1	Story 1			\$5,000
	Story 2			\$5,000
	Story 3			\$5,000
	Story 4			\$5,000
	Story 5			\$5,000
Sprint 2				\$25,000
Sprint 3				\$25,000
Sprint 4				\$25,000
Sprint 5				\$25,000
Sprint 6				\$25,000
Sprint 7				\$25,000
Sprint 8				\$25,000
Sprint 9				\$25,000
Sprint 10				\$25,000

- Within each sprint, different stories are defined that have value associated with them.
- As each story is completed, the associated value will be realized as EV.

EARNED VALUE METHODS

- 0-100 Method
 - 0% credit is earned when the activity is started. 100% credit is earned only upon completion of the task.
- XY Technique
 - When a task will span across multiple months, you will leverage breakouts such as (20/80, 25/75, 30/70, 50/50, 75/25). This represents the percentage completion of the task and what's left to complete.
 - Take the value of the milestone and multiply it by the percentage complete.
- Weighted percent complete
 - Irrespective of a calendar, a percentage weight is given for when each sub-task is completed. For example, there is a milestone valued at \$100,000

Task	Weight	Value
Design	40%	\$40,000
Development	40%	\$40,000
Test & Release	20%	\$20,000

SCHEDULE TRACKING - SPI

- The Schedule Performance Index (SPI) shows how you are progressing compared to the planned project schedule. It is found by dividing Earned Value by Planned Value.
 - If the SPI is greater than one; the project is ahead of schedule.
 - If SPI is less than one. The project is behind schedule.
 - If the SPI is equal to one; the project is on schedule.
- Example of Schedule Performance Index (SPI):
 - You have a project to be completed in 12 months, and the budget is \$100,000. Six months have passed, and \$60,000 has been spent, but upon closer review, you find that only 40% of the work has been completed so far.
 - Actual Cost (AC) = \$60,000
 - Planned Value (PV) = 50% of \$100,000 = \$50,000
 - A word of caution - In this situation, you can assume the budget was distributed evenly for each month. Therefore, in 6 months, 50% of the budget will have been spent.
 - Earned Value (EV) = 40% of \$100,000 = \$40,000
 - Schedule Performance Index (SPI) = $EV / PV = \$40,000 / \$50,000 = 0.8$
 - Hence, the Schedule Performance Index is 0.8
- You are behind schedule since the Schedule Performance Index is less than one.

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Requirements Phase	Sep 25, 2020	\$454,800
Licensing and Software Purchased	June	\$150,000
Laptops Purchased	June	\$50,000
Requirements Workshops Completed	June	\$51,600
Detailed Requirements Document Approved	July	\$100,000
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- At the end of 5 months, we'd be at the end of the requirements phase budgeted at \$526,800. This is our planned value (PV) since the budget is not evenly spread.
- Actual Cost (AC) so far is \$526,800.
- The overall budget is \$946,800.
- So far, 35% of the work has been completed overall (5 months complete out of 14)
- Earned Value (EV) = 35% of \$946,800 = \$331,380
- Schedule Performance Index (SPI) = $EV / PV = \$331,380 / \$526,800 = 0.63$
 - We are behind schedule if we assume money is evenly distributed.
- True EV is \$526,000 since we realized all expenditures after 5 months.
- $SPI = \$526,000 / \$526,000 = 1$
 - We are on schedule if we take true EV as each milestone is completed.

SCHEDULE TRACKING - CPI

- The Cost Performance Index specifies how much you are earning for each dollar spent on the project. It shows how well the project is sticking to the budget.
- Cost Performance Index = (Earned Value) / (Actual Cost)
 - If the CPI is greater than one the project is under budget.
 - If the CPI is less than one the project is over budget.
 - If the CPI is equal to one the project is proceeding as per the planned spending.
- **Example of Cost Performance Index (CPI)**
 - You have a project to be completed in 12 months, and the budget of the project is \$100,000. Six months have passed, and \$60,000 has been spent, but upon closer review, you find that only 40% of the work has been completed.
 - Actual Cost (AC) = \$60,000
 - Planned Value (PV) = 50% of \$100,000 = \$50,000
 - Earned Value (EV) = 40% of \$100,000 = \$40,000
 - Cost Performance Index (CPI) = $EV / AC = \$40,000 / \$60,000 = 0.67$
 - This means you are earning 0.67 cents for every \$1 spent since the Cost Performance Index is less than one. This means you are over budget.

CPI EXAMPLE – OUR PROJECT

Milestone	Due Date	Cost
Kick Off Phase		\$72,000
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- At the end of 5 months, we'd be at the end of the requirements phase budgeted at \$526,800. This is our planned value (PV) since the budget is not evenly spread.
- Actual Cost (AC) so far is \$526,800.
- The overall budget is \$946,800.
- So far, 35% of the work has been completed overall (5 months complete out of 14)
- Earned Value (EV) = 35% of \$946,800 = \$331,380
- Cost Performance Index (CPI) = $EV / AC = \$331,380 / \$526,800 = 0.63$
- This means you are earning 0.63 cents for every \$1 spent since the Cost Performance Index is less than one. This means you are over budget.
 - Again, EV is actually \$526,000 at the 5 month mark. Therefore CPI should be 1 indicating that we're on schedule.