

# BUILDING INFORMATION MODELING BIM

مدرس: کامبیز کردانی PMP,MSc

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## Synchro Risk

# Risk Management Methodology

## RISK MANAGEMENT METHODOLOGY :

**1: RISK MANAGEMENT = INTEGRAL PART OF THE PROJECT**

2: EARLY IDENTIFICATION OF RISKS

3: COMMUNICATION WITHIN THE TEAM

4: IDENTIFICATION OF OPPORTUNITIES!

5: CLARIFICATION OF RISK OWNERSHIP

6: RISK PRIORITISING & ANALYSES

7: PLANNING AND IMPLEMENTATION OF MITIGATION MEASURES

8: RISK REGISTER

9: TRACKING RISKS AND ASSOCIATED TASKS

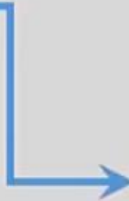
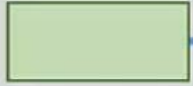
# Key Elements of work

WBS = scope of work  
task = portion of work

original duration

# Key Elements of work

predecessor(s)



S

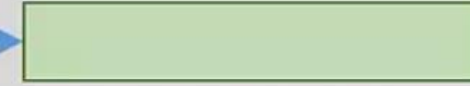
WBS = scope of work  
task = portion of work



F

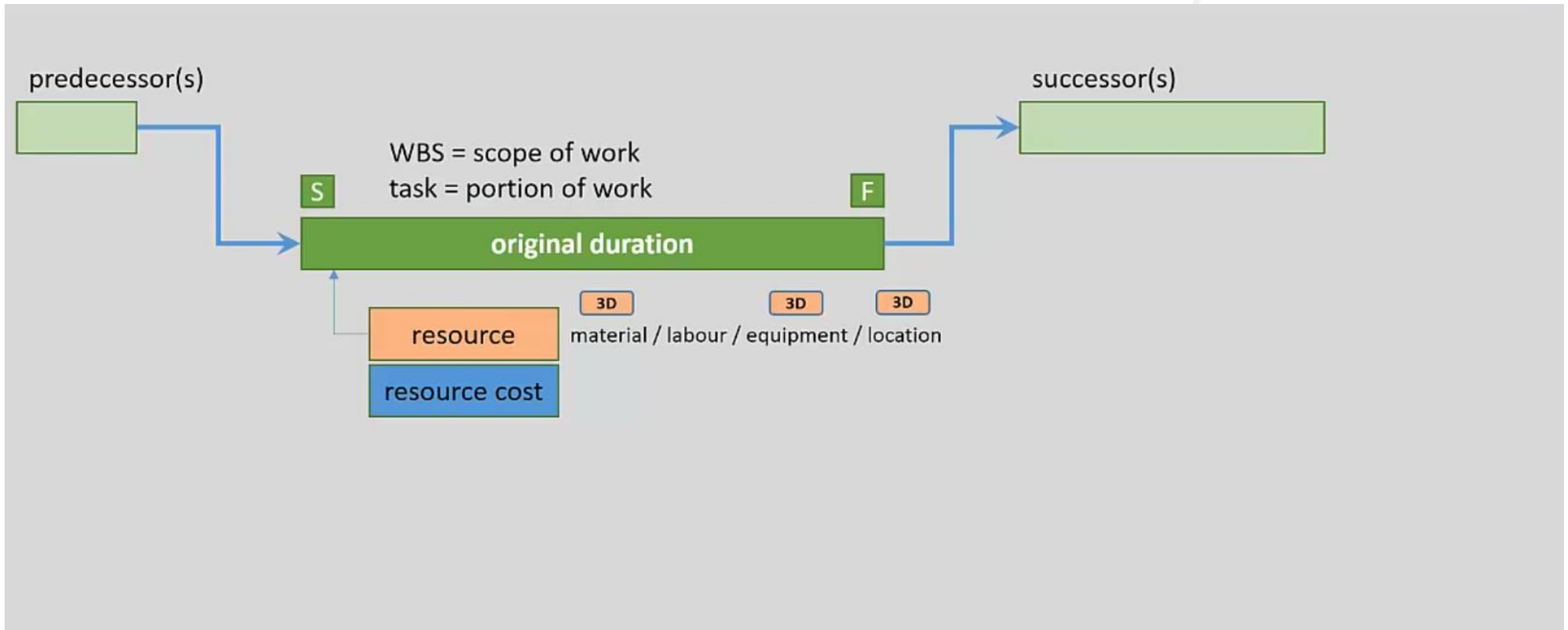


successor(s)

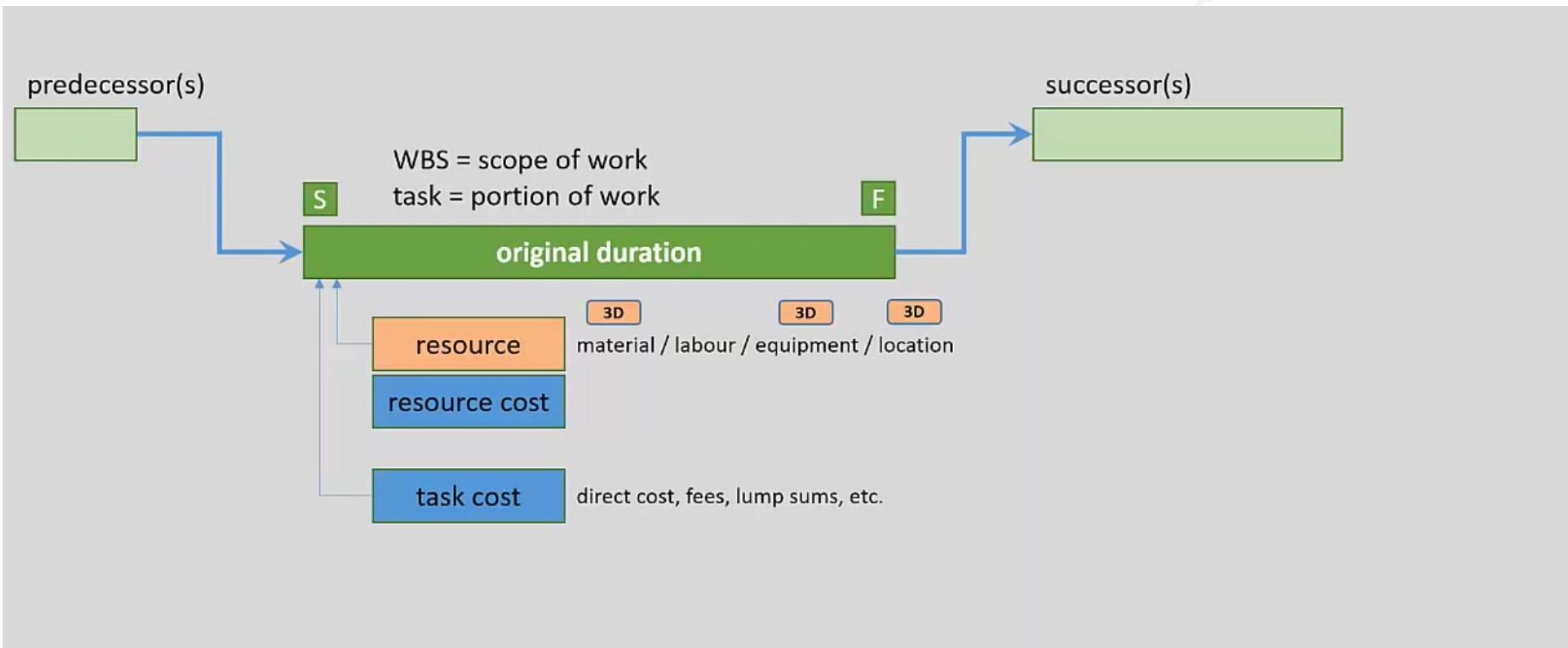


Prepared by

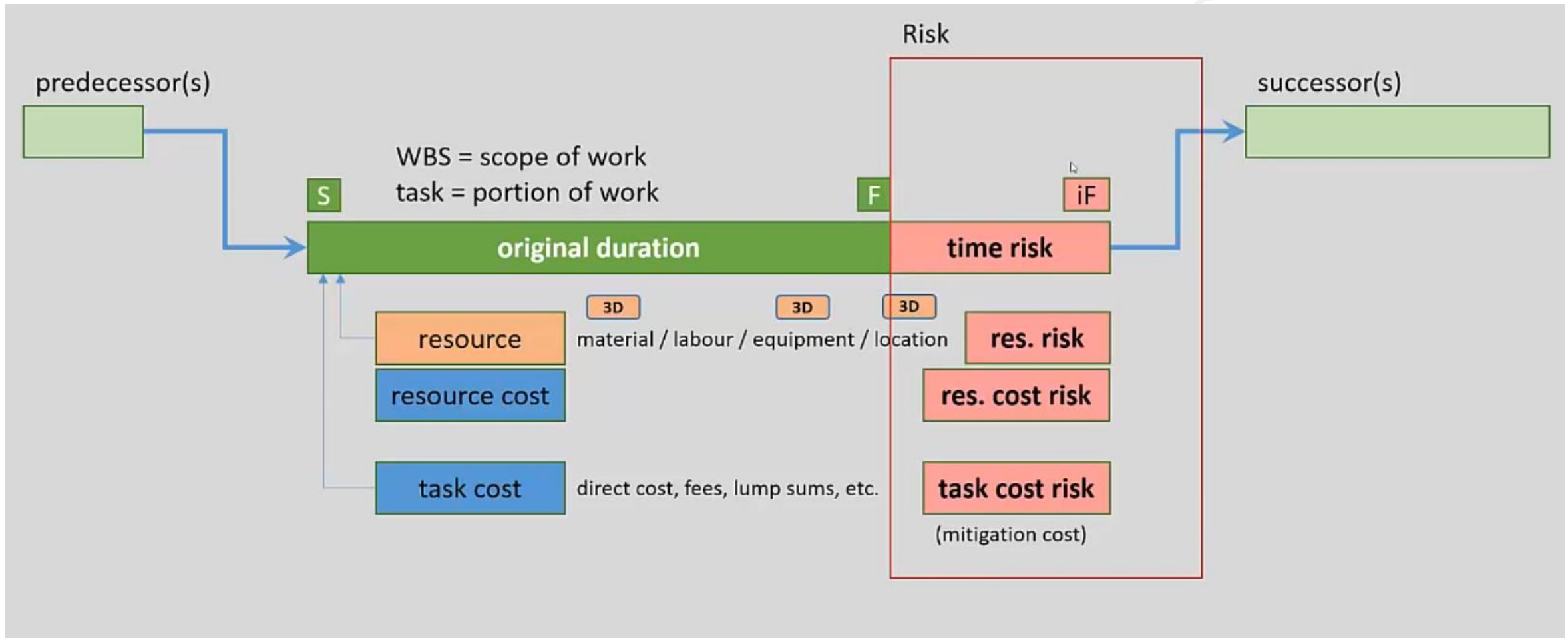
# Key Elements of work



# Key Elements of work



# Key Elements of work



# Probability and Impact of risk

| Probability (Likelihood) | 5<br>almost certain |                    |            |               |            |                   |
|--------------------------|---------------------|--------------------|------------|---------------|------------|-------------------|
|                          | 4<br>likely         |                    |            |               |            |                   |
|                          | 3<br>moderate       |                    |            |               |            |                   |
|                          | 2<br>unlikely       |                    |            |               |            |                   |
|                          | 1<br>rare           |                    |            |               |            |                   |
|                          |                     | 1<br>insignificant | 2<br>minor | 3<br>moderate | 4<br>major | 5<br>catastrophic |
|                          |                     | Impact             |            |               |            |                   |

# Earned Value Analysis

| <b>Baseline</b>                         | <a href="#">The task cost when the Baseline currently selected in Navigator&gt;Baselines and Scenarios was saved</a>                                                                                               |                                                                            |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Planned Value [BCWS]</b>             | <b>Planned Value (PV)</b> , also known as <b>BCWS</b> (Budgeted Cost of Work Scheduled), is the portion of the budgeted total cost ( <b>BAC</b> ) of a task that is scheduled to be completed as of the data date. | $BAC * (Data\ Date - Planned\ Start) / (Planned\ Finish - Planned\ Start)$ |
| <b>Earned Value [BCWP]</b>              | <b>Earned Value (EV)</b> , also known as <b>BCWP</b> (Budgeted Cost of Work Performed), is the portion of the budgeted total cost ( <b>BAC</b> ) of a task that is actually completed as of the data date.         | $BAC * \% \text{ Complete}$                                                |
| <b>Actual Cost [ACWP]</b>               | <b>Actual Cost (AC)</b> , also known as <b>ACWP</b> (Actual Cost of Work Performed), is the actual total cost incurred on a task/project as of the data date.                                                      | Actual task expenses + Total Actual costs of assigned resources            |
| <b>Schedule Variance [SV]</b>           | Positive value if the task is ahead of schedule, negative value if behind schedule                                                                                                                                 | $BCWP - BCWS$                                                              |
| <b>Schedule Variance %</b>              | Greater than 100% if the task is ahead of schedule, less than 100% if behind schedule                                                                                                                              | $BCWP / BCWS$                                                              |
| <b>Schedule Performance Index [SPI]</b> |                                                                                                                                                                                                                    | $SV / BCWS * 100\%$                                                        |
| <b>Cost Variance [CV]</b>               |                                                                                                                                                                                                                    | $BCWP - ACWP$                                                              |
| <b>Cost Variance %</b>                  |                                                                                                                                                                                                                    | $CV / BCWP * 100\%$                                                        |

# Earned Value Analysis

|                                                                                                            |                                                                                                                                                                                                                                                                                                   |                                                                               |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Cost Performance Index [CPI]                                                                               |                                                                                                                                                                                                                                                                                                   | BCWP / ACWP                                                                   |
| Cost Schedule Index [CSI]                                                                                  |                                                                                                                                                                                                                                                                                                   | CPI * SPI                                                                     |
| Variance [AV]                                                                                              | Positive value if the task is underbudget, negative value if overbudget                                                                                                                                                                                                                           | BCWS – ACWP                                                                   |
| Cost % of Planned [CPP]                                                                                    | Greater than 100% if the task is overbudget, less than 100% underbudget                                                                                                                                                                                                                           | ACWP / BCWS * 100%                                                            |
| Budget at Completion [BAC]                                                                                 | The budgeted or planned total cost through task completion.                                                                                                                                                                                                                                       | Budgeted task direct costs +<br>Total Budgeted costs of<br>assigned resources |
| Estimate at Completion [EAC]                                                                               | An estimate of the overall cost through task completion following the current trend                                                                                                                                                                                                               |                                                                               |
| Variance at Completion [VAC]                                                                               |                                                                                                                                                                                                                                                                                                   | BAC - EAC                                                                     |
| To Complete Performance Index [TCPI]                                                                       |                                                                                                                                                                                                                                                                                                   | $(BAC - BCWP) / (EAC - ACWP)$                                                 |
| <u>TPI</u>                                                                                                 |                                                                                                                                                                                                                                                                                                   |                                                                               |
| <a href="#">NOTE: A Baseline must be selected in Baselines and Scenarios to display TPI related fields</a> |                                                                                                                                                                                                                                                                                                   |                                                                               |
| Include in TPI                                                                                             | When <b>True</b> , the task's progress counts toward WBS, Activity Code, and Project <b>TPI</b> . When <b>False</b> , the task's progress is not included in the WBS, Activity Code, and Project <b>TPI</b> - the task's <b>TPI</b> is still calculated and displayed regardless of this setting. |                                                                               |

# Earned Value Analysis

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>BL Time Units</b>         | The Time Units allotted to complete the task.                                                                                                                                                                                                                                                                                                                                                                    | BL Planned Duration                                                                                    |
| <b>Earned Time Units</b>     | The Time Units earned by the task up to the Data Date. If the current <b>Duration at Completion</b> of the task is the same as the <b>BL Planned Duration</b> , then <b>Earned Time Units</b> equals <b>Actual Duration</b> . Otherwise if the <b>Duration</b> of the task has changed since the BL was saved, the <b>Earned Time Units</b> are a scaled proportion of the <b>BL Time Units</b> .                | $\text{Actual Duration} / (\text{Actual Duration} + \text{Remaining Duration}) * \text{BL Time Units}$ |
| <b>BL Earned Time Units</b>  | The Actual Duration that is planned to have been completed in the Baseline up to the Data Date                                                                                                                                                                                                                                                                                                                   | BL Duration expected to be completed up to Data Date                                                   |
| <b>Remaining Time Units</b>  | The Time Units left to complete. The difference between <b>BL Planned Duration</b> and <b>Earned Time Units</b> . Only equal to <b>Remaining Duration</b> if <b>Duration at Completion</b> equals <b>BL Duration</b> .                                                                                                                                                                                           | BL Time Units - Earned Time Units                                                                      |
| <b>Earned % Complete</b>     | The proportion of the <b>BL Time Units</b> that have been "earned" to date.                                                                                                                                                                                                                                                                                                                                      | $\text{Earned Time Units} / \text{BL Time Units}$                                                      |
| <b>BL Planned % Complete</b> | The <b>Duration % Complete</b> the task should have reached to be on schedule with the Baseline                                                                                                                                                                                                                                                                                                                  | $\text{BL Earned Time Units} / \text{BL Time Units}$                                                   |
| <b>TPI</b>                   | Time Performance Index is a progress indicator as a function solely of time. A <b>TPI</b> value of 1 indicates the task is on schedule compared to the baseline; greater than 1 means it is ahead of schedule and less than 1 means it is behind schedule. The value will always equal 1 when the task is complete.                                                                                              | $\text{Earned \% Complete} / \text{BL Planned \% Complete}$                                            |
|                              |                                                                                                                                                                                                                                                                                                                                                                                                                  | $\text{Earned Time Units} / \text{BL Earned Time Units}$                                               |
| <b>Time Variance</b>         | The difference between <b>Earned Time Units</b> and <b>BL Earned Time Units</b> . A positive value indicates the task is ahead of schedule, a negative value indicates the task is behind schedule. A task may have a <b>TPI</b> value of 0 and have a non-zero <b>Time Variance</b> value (i.e. The task's Actual Start is before the BL Start, or the task is still in Planned Status after the BL Start date) | Earned Time Units - BL Earned Time Units                                                               |