

RED-AMBER-GREEN STOPLIGHTS IN MICROSOFT PROJECT

PREPARED BY



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Managing Projects with Microsoft Office Project 2007



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Contents

1	Stoplight Indicators (Red Amber Green – RAG).....	3
1.1	Stoplight Business Rules.....	3
1.1.1	Business Rules Based on Percentage.....	3
1.1.2	Business Rules Based on Duration.....	4
1.2	Inserting Indicator Icons on the Schedule.....	4
1.2.1	Indicator Icons for %Complete and %Work Complete.....	4
1.2.2	Indicator Icons for Physical % Complete.....	6
1.2.3	Indicator Icons for Absolute Duration Variance.....	6

Equations

Equation 1	Calculating Schedule Variance Index.....	3
Equation 2	Schedule Performance Index (SPI) Formula.....	6

Figures

Figure 1	Setup Parameters for Schedule Variance Calculation.....	5
Figure 2	Establish Icon Settings.....	6
Figure 3	Indicator Icons for Absolute Schedule Variance Durations.....	7

Tables

Table 1	Schedule Variance Thresholds.....	3
Table 2	Interpreting Schedule Variance.....	3
Table 3	Schedule Variance Indicator Icons.....	4
Table 4	Second Type of Schedule Variance Indicators.....	4

1 STOPLIGHT INDICATORS (RED AMBER GREEN – RAG)

Once an expected and calculated percent complete are known, the next step in the analysis is to determine if the variance between the expected and calculated percent complete is cause for concern.

1.1 Stoplight Business Rules

The management team must decide how large a variance from expectations is cause for monitoring (yellow), and how much additional variance is cause for more concern (red). If tasks are reasonably on schedule and cost (green) there is no need for action or reporting. Additionally, sometimes tasks are far ahead of schedule or far below cost which is occasionally given a status of “blue.” Generally, the discussion on cost is beyond the scope of this paper, but will be included as appropriate.

1.1.1 Business Rules Based on Percentage

It is generally accepted that there is no cause for concern if a project is progressing with no more than a 10% schedule variance and a cost threshold of a specific dollar amount; the figures for percentage and dollar threshold vary widely even within the same industry. For purposes of illustration assume:

Table 1 Schedule Variance Thresholds

Schedule Variance	Condition
0-10%	Green
10%-20%	Yellow
More than 20%	Red

Calculate the schedule variance by either subtracting the expected and calculated values, or dividing them. It is also possible to use Start/Finish or Duration variances. For reasons that will become apparent later, the preference is to divide the calculated and expected values in accordance with Equation 1.

Equation 1 Calculating Schedule Variance Index

$$ScheduleVarianceIndex = \frac{CalculatedPercentComplete}{ExpectedPercentComplete}$$




Given the ratio of Equation 1, the following becomes apparent in Table 2:

Table 2 Interpreting Schedule Variance

Schedule Variance Index	Condition	Percent Ahead/Behind
<1.0	Behind Schedule	100(1-Schedule Variance Index)
1.0	On Schedule	0%
>1.0	Ahead of Schedule	100(Schedule Variance Index – 1)

Combining the information in Table 1 and Table 2, each color coded icon indicates the schedule variance conditions in Table 3:




Table 3 Schedule Variance Indicator Icons

Schedule Variance Index	Indicator Icon
>=0.90	
0.8 to 0.90	
<0.8	

1.1.2 Business Rules Based on Duration

Percentage ahead/behind schedule is the most typical measure; it is also possible to use absolute values. Use of absolute values is discouraged since the direction of the variance is also important. In some instances a favorable schedule variance is just as consequential as an unfavorable variance. However, it is generally accepted that variances indicating a behind schedule condition should be reported while a favorable variance is not usually a problem to be reported. A sample of duration based schedule variances is illustrated in Table 4.

Table 4 Second Type of Schedule Variance Indicators

Schedule Variance	Indicator Icon
1 day or less	
2 to 5 days	
More than 5 days	

The duration based schedule variance can be in reference to either the start or finish date. Microsoft Project has Start Variance, Finish Variance, and Duration Variance variables. The units for Start/Finish/Duration Variance are duration (the default is days). The variance calculations are with respect to the baseline used for Earned Value Calculations, see section **Error! Reference source not found.**

1.2 Inserting Indicator Icons on the Schedule

1.2.1 Indicator Icons for %Complete and %Work Complete

Assuming the calculated percent complete is in %Complete or %Work Complete, and the expected percent complete is in Number1, then an indicator column may be calculated and the icon set. Assuming the schedule variance index will be in Number2, apply the formulas as needed for Number2 and the formula settings per Figure 1:

$$\frac{\%Complete}{[Number1]}$$

$$\frac{\%Work Complete}{[Number1]}$$

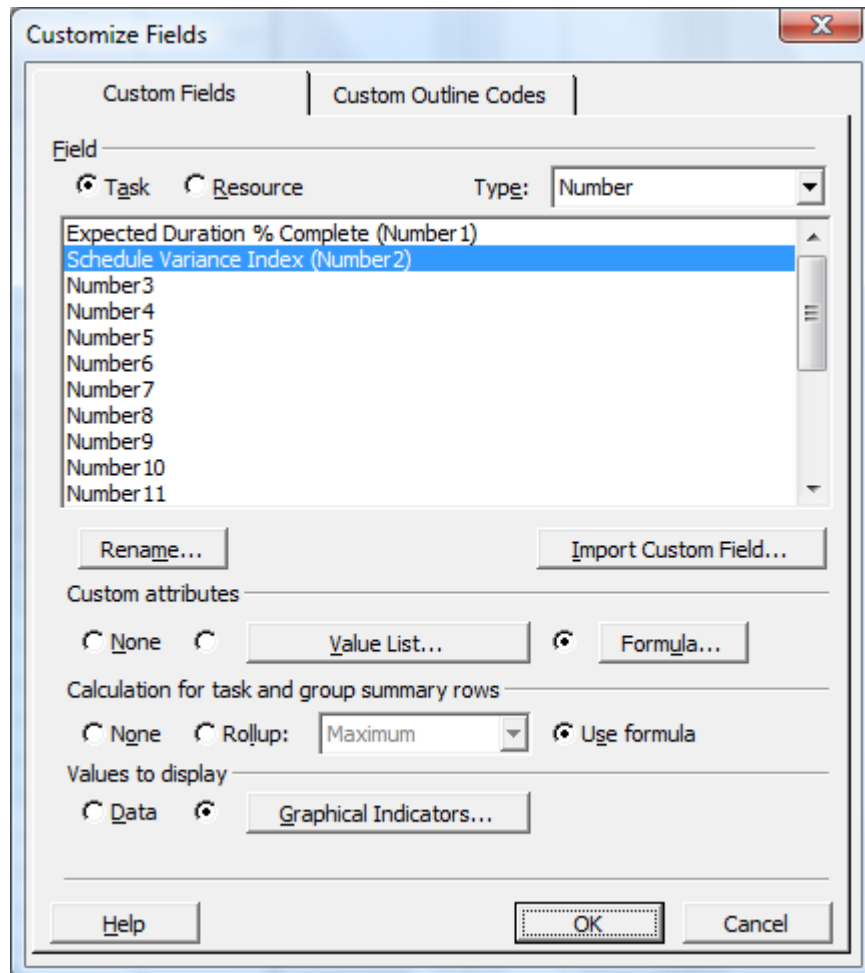


Figure 1 Setup Parameters for Schedule Variance Calculation

The icon colors are set with guidelines in Figure 2. Note the order of the tests is significant.

It is important to use a custom number field for this calculation, the text fields produce errors on the border points (example: exactly 0.8 or 0.9).

Clear the check boxes for the summary rows and project summary row by selecting each radio button and then clearing the check box.

If a test is necessary to establish a "blue" condition, such as at least 15% ahead of schedule, this would be the first test and would be greater than or equal to 1.15.

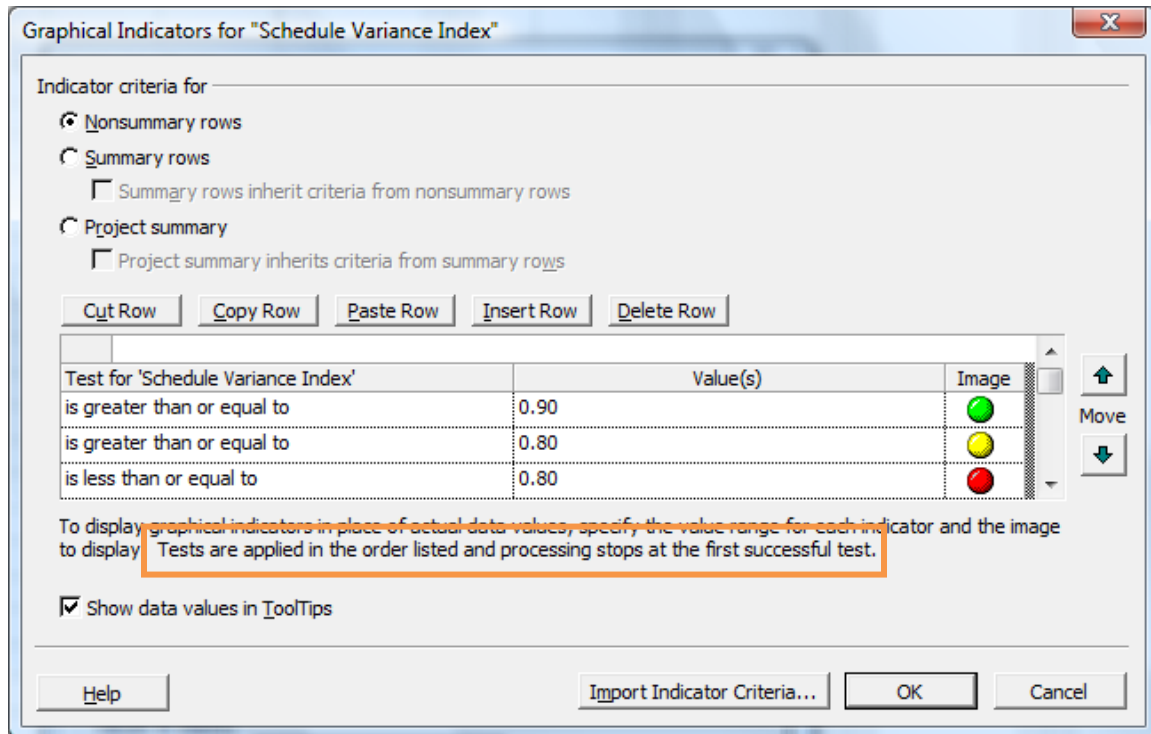


Figure 2 Establish Icon Settings

1.2.2 Indicator Icons for Physical % Complete

As it turns out, Microsoft Project has a readily available calculation when using Physical % Complete or properly applying Earned Value in Project 2003 or Project 2007; the field is the Schedule Performance Index [SPI]. The field is very similar to the Schedule Variance Index that was created earlier. Note that the SPI is a real and defined term in Earned Value calculation and is given by

$$[SPI] = \frac{EarnedValue}{PlannedValue} = \frac{BudgetedCostOfWorkPerformed(BCWP)}{BudgetedCostOfWorkScheduled(BCWS)}$$

Equation 2 Schedule Performance Index (SPI) Formula

The term "schedule variance index" is only used within the context of this paper for clarity. The similarity between the schedule variance index and the Schedule Performance Index (SPI) is quite obvious which is why the approach was taken to produce an index rather than subtracting two values.

To color code the [SPI] apply the same criteria shown in Figure 2. Note the [SPI] will calculate properly based on the specific baseline used for calculations as set in **Error! eference source not found..**

1.2.3 Indicator Icons for Absolute Duration Variance

Assuming the duration variance (in days) is calculated and contained in the Number1 field, the indicator Icons would be per Figure 3. The duration variance might be

calculated against start, finish, or duration variances compared to any given reference baseline as determined by **Error! Reference source not found..**

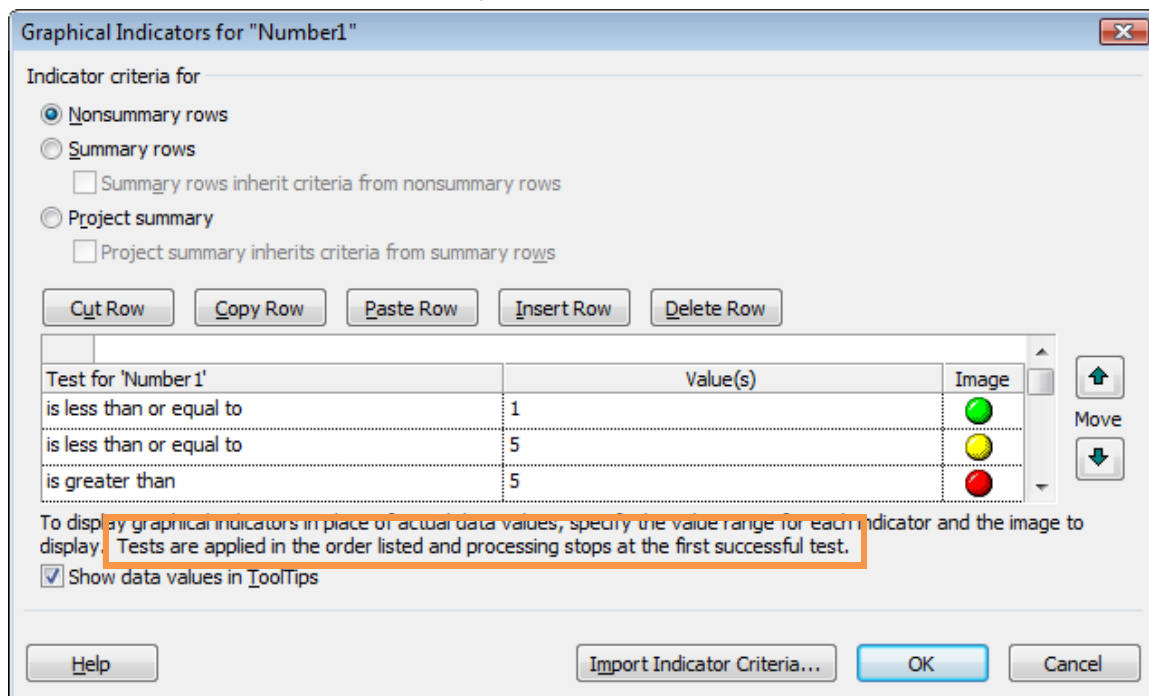


Figure 3 Indicator Icons for Absolute Schedule Variance Durations

In the event negative and positive variances should be considered differently, the number of tests included in Figure 3 would have to deal with all variance conditions.

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