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COMPARING PRESENT VALUES OF %COMPLETE TO "WHERE I SHOULD BE" USING MICROSOFT PROJECT

PREPARED BY

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Managing Projects with Microsoft Office Project 2007

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1   INTRODUCTION

This paper discusses the concept of expected %Complete for project tasks compared to an actually claimed percent complete. This paper provides additional information on how to answer the question: "If I am on schedule, what %Complete should I be at this point in time?"

The key to understanding percent complete is to recognize the value is a fraction. To obtain a fraction, divide two numbers. This implies the user knows which two numbers to divide: Bricks laid divided by total bricks required, wages paid divided by total budget, work hours spent divided by total work hours estimated. Without knowing which two numbers to divide, a percent complete is just a number for misinterpretation by others. The real questions here are: "If I am on schedule, how many bricks should I have laid? How many dollars in wages should I have paid? How many work hours should have been expended? How much cost should I have incurred?

2   BACKGROUND

Microsoft Project contains three measures of "%Complete." Many users of the software want to know: If they are on schedule, what should be the values calculated by each of the measures of percent complete. The three measures are: Percent Complete (%Complete), Percent Work Complete (%Work Complete), and Physical % Complete. Additional measures are available if created by the user.

3   PERCENT COMPLETE CALCUATION TYPES

3.1   Percent Complete

The default method of measuring "%Complete" by Microsoft Project is based on activity duration, a 10 day activity is 40% Complete at the close of business on the 4th work day from the start date of the activity. Microsoft Project will indicate this task is "late" if the value for %Complete is less than the expected value as of the status date. This information is viewable in either the status indicator or status columns.

The formula to roll up %Complete for summary level tasks, and eventually the entire project is given by:

$$\frac{\sum_{i=1}^{i=tasks} \%Complete_i * Duration_i}{\sum_{i=1}^{i=task} Duration_i}$$

Equation 1 Duration Based Percent Complete

 Using Figure 1 below, Microsoft Project will calculate the percent complete as follows:

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Task Name	% Complete	Duration	Week 1	Week 2
□ Summary Tasks	44%	7 days		
SubTask1	50%	5 days		
SubTask2	30%	7 days		
SubTask3	65%	3 days		
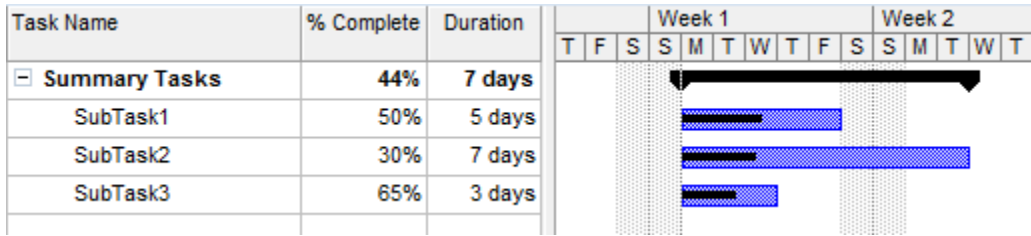
Figure 1 Percent Complete Screen Shot

%Complete = [(50%*(5 days) + 30%*(7 days) + 65%*(3 days)]/(5 days + 7 days + 3 days)

%Complete = 43.6667%

Microsoft Project will round to the nearest whole integer, 44%.

3.2 Percent Work Complete

Percent complete based on the number of work hours completed is another measure calculated by Microsoft Project. For this purpose, two resources will be loaded to the tasks with work as shown.

Resource Name	Std. Rate	Type
Worker 1	$86.00/hr	Work
Worker 2	$19.00/hr	Work

Figure 2 Resource Sheet

Task Name	Work	% Work Complete	Duration	Resource Names	Week 1	Week 2	Week
□ Summary Task	66 hrs	0%	7 days				
SubTask 1	40 hrs	0%	5 days	Worker 1		Worker 1	
SubTask 2	14 hrs	0%	7 days	Worker 1[25%]		Worker 1[25%]	
SubTask 3	12 hrs	0%	3 days	Worker 2[50%]		Worker 2[50%]	
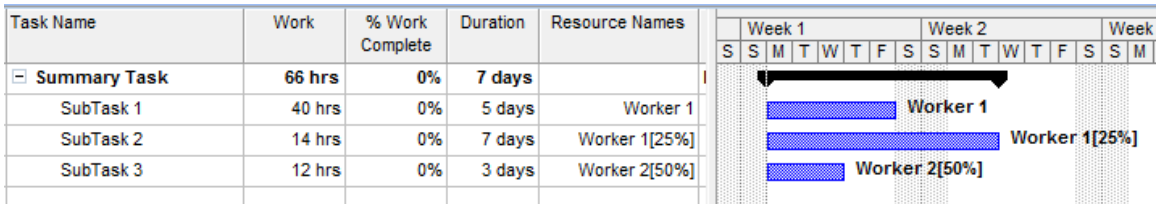
Figure 3 Resource Loaded Schedule Showing Total Work

The man-hour profile for work-hours is loaded with the majority of the work in the first three days:

Task Name	Work	Details	Week 1						Week 2			
			S	M	T	W	T	F	S	S	M	T	W
□ Summary Task	66 hrs	Work		14h	14h	14h	10h	10h			2h	2h	
⊞ SubTask 1	40 hrs	Work		8h	8h	8h	8h	8h					
⊞ SubTask 2	14 hrs	Work		2h	2h	2h	2h	2h			2h	2h	
⊞ SubTask 3	12 hrs	Work		4h	4h	4h							

Figure 4 Work Profile (Task Usage View)

Percent work complete is calculated in accordance with an effort based weighting:

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$$\%WorkComplete = \frac{\sum\limits_{i=1}^{i=tasks} \%WorkComplete_i * Work_i}{\sum\limits_{i=1}^{i=tasks} Work_i}$$

Equation 2 Percent Work Complete

Using the same percentages as the original example, the calculation becomes:

%Work Complete= [50%*(40) + 30%*(14) + 65%*(12)]/[40+14+12]

%Work Complete=48.48%

Microsoft Project confirms the calculation:

Figure 5 Percent Work Complete Screen Shot

3.3 Physical Percent Complete

When the desired unit of measure is Physical Percent Complete, a baseline is required and the calculation is based on the dollar costs involved. In this case, the cost of the project is spread as shown below:

Figure 6 Costed Resource Loading

For the moment, the Project Status Date will be set far into the future, past the last day of the project. In this case, although any measure of the three measures of percent complete should indicate a behind schedule condition, the Physical % Complete appears in the figure below:

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Task Name	Work	Physical % Complete	Duration	Resource Names	Week 1	Week 2	Week 3
− Summary Task	66 hrs	46%	7 days				
SubTask 1	40 hrs	50%	5 days	Worker 1	Worker 1		
SubTask 2	14 hrs	30%	7 days	Worker 1[25%]		Worker 1[25%]	
SubTask 3	12 hrs	65%	3 days	Worker 2[50%]	Worker 2[50%]		
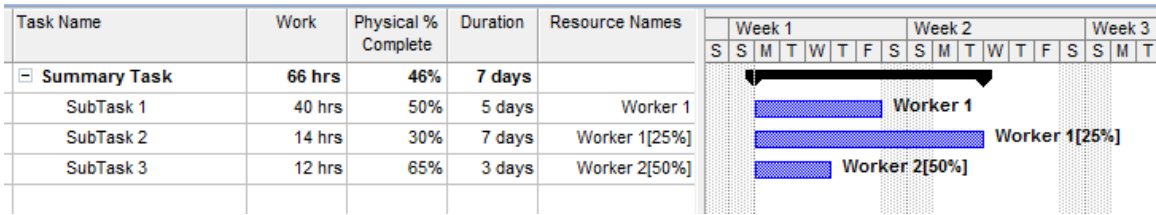
Figure 7 Physical Percent Complete Screen Shot

The equation used by Microsoft Project depends on the dollar value of the work budgeted and is shown below:

$$Physical\%Complete = \frac{\sum_{i=1}^{i=tasks} Physical\%Complete_i * BAC_i}{\sum_{i=1}^{i=tasks} BAC_i}$$

Equation 3 Physical Percent Complete

Note: BAC is Budget At Complete, Total Cost, or Baseline Cost.
The details of the calculation are:

Physical Percent Complete = [50%($3,440)+30%($1204)+65%(228)]/[$4872]

Physical Percent Complete = 46%

Further analysis regarding calculation of Physical % Complete is in a later section of this paper. Specifically, what happens when the status date is before or during the period of performance of tasks?

4   ANALYSIS
The previous section describes three methods of determining percent complete. In each case, the value claimed for percent complete was numerically identical for the three discrete tasks (50%, 30% and 65%, respectively). The weighted value of the calculation produced a different result in each case at the summary level. In the example, the values are close. However, consider what might happen if there was a large discrepancy in the amount of work assigned to the tasks, or, if the costs of the resources were vastly different from each other.

Further, the measures of percent complete (Duration, Work, and Physical) all represent different things. Although the possibility does exist that the measures could theoretically be equal under certain circumstances, the general case is the measures will not be numerically equal.

4.1   Expected Percent Complete
The idea behind expected percent complete is that workers will produce value of 1 hour of work at the same rate assumed when the project was first bid. That is, a brick layer can lay 80 bricks an hour, or, a software coder can write 80 lines of

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perfect code per day, a technical writer will complete 10% of the document each day for 10 days, etc. Assuming the work equals the bid rate as fact, then the percent complete profile for each method described above can be calculated by dividing the amount of production (in dollars, hours, or duration) by the appropriate unit for total. Total work is 66 hours, total duration is 7 days, and total cost is $4,872. These measures will produce the percent completes in the table below:

Table 1 Expected Values of Percent Complete

Method vs. Day	%Complete	%Work Complete	Physical % Complete
1	20	21	19
2	40	42	39
3	60	64	58
4	73	79	75
5	87	94	93
6	93	97	96
7	100	100	100

Graphically the results are different for each method of percent complete as a function of time:
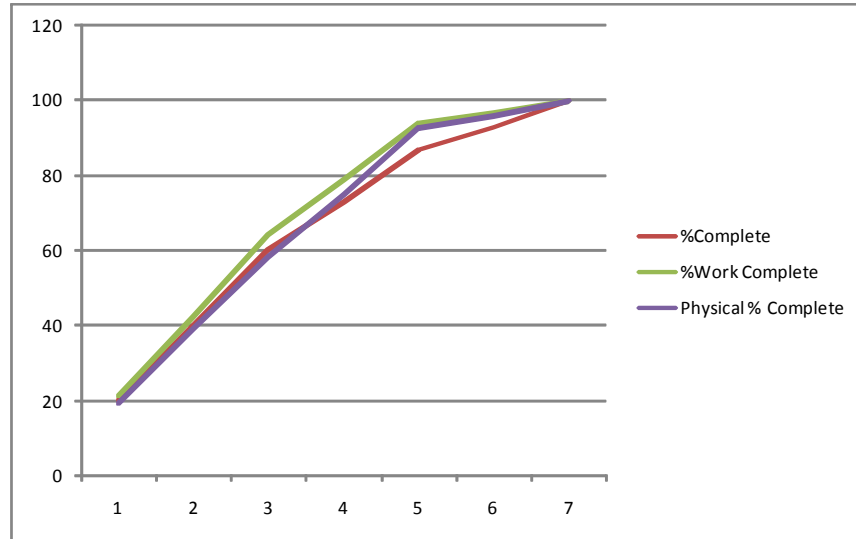
Figure 8 Graphical Illustrations of Three Methods of Percent Complete

4.2 Duration Analysis (Detail Tasks)

By definition, the duration percent complete of a task grows only with the passage of time and is always on schedule. Since it is duration based measurement, unless the task has not started and needs to be delayed, the user should always claim the tasks to be "as scheduled" when updating the duration based percent complete. Where the calculation will vary is when the user makes updates to the remaining work and remaining duration fields. This author has no understanding of the concept a user can claim any duration based %complete and then provide remaining duration estimates that are inconsistent with the percent complete provided. In the case of duration based percent complete, it is best to adjust remaining duration (or remaining work) and let the software calculate the percent complete. If the user provides remaining work or duration greater than calculated by the program, the %Complete value will regress. If the user revises the remaining duration/work to be less than calculated by the program, the %Complete increases. Depending on the reporting rules in place on the program, it may be a violation of reporting rules to allow the percent complete to decrease from a prior reporting period.

If an estimator believes it will take three days to paint 24 feet of fence, the planned profile will be 33% per day. If at the end of the first day the painter claims four additional days are needed, then the job is 1/5 = 20% duration complete (1 day of actual duration, 4 days of remaining duration).

What the user really wants to know is how the 20% complete calculation compares to the 33% complete that is expected (the baseline). Indeed, what duration percent complete is expected for the purpose of this comparison as of the status date (end of day 1)? The answer is 33% and the painter met 20/33=61% of expectation (39% behind schedule).

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What can be done in a case such as this? If the task is originally assigned as fixed units with one resource, then management needs to decide how to recover from the given situation. There appears to be several choices:

- Clearly the painter has re-estimated the job, perhaps because of increased intelligence gained during the performance of Day1. The painter provides a revised estimate to complete so the cost of the job increases (from 24 hours to 40 hours). Management must decide if the additional cost will be absorbed or passed on to the customer, and, if the additional duration is acceptable to all the stakeholders.

- Substitute a resource and assign the task to someone who can complete the job within the remaining baseline duration (2 remaining days). This may change costs.

- Change technology, perhaps the painter can use spray equipment as opposed to a brush and complete on the baseline finish day (Day 3). This may also impact cost.

- Man-load the task with additional workers (perhaps at increased cost) to save the baseline duration, or at least compress duration. It is a matter for management to reconcile estimating practices that 24 man-hours were estimated for the job when the performing organization provided a higher estimate once the task was underway and more information was known. Of course this scenario that sooner or later the maximum amount of productive resources will have already been added to the job and adding more resources will decrease productivity.

It is necessary to understand what the expected percent complete represents and how that should be compared to the percent complete column. The variables for consideration are:

Table 2 Variables in Play

Forecast Data	Baseline Data
Start	Baseline Start
Duration	Baseline Finish
Finish	Baseline Duration

4.2.1 Business Rules for Consideration

To calculate an <u>expected</u> percent complete, rules must be in place to determine when the duration will start and finish as an expectation; generally these are baseline data. This will establish the "expected total duration" which becomes the denominator in Equation 4. Additionally, the expected start date becomes the

defining item to anchor the expected total duration. Objectively, these dates are the baseline start and baseline duration; this is not always the case.

$$Expected\%Comeple = 100 * \frac{DesiredDurationToDate}{ExpectedTotalDuration}$$

Equation 4 Notional Equation for Expected Duration Percent Complete

It is reasonable to assume the task will start no later than [Baseline Start] as long as the schedule logic yields [Start]≤ [Baseline Start]. If the task starts on the baseline start date, the expected and desired duration to date will match. As a practical matter, a task performer is accountable to start and finish on the baseline or forecast dates. It is somewhat unreasonable to hold the task performer accountable for a forecast start and a baseline finish; indeed the forecast start may already be later than the baseline finish date due to other circumstances.

The business rules to determine expected percent complete must fairly address the situation where schedule logic precludes starting a task on the baseline start date. If expected percent complete accrues prior to any possible start date, the task manager is being unfairly penalized.

In a similar matter, a forecast start may be well in advance of the baseline start; holding the task performer to the baseline finish date will unnecessarily consume available slack where the performer should be performing to the baseline duration with a corresponding early finish compared to baseline finish.

To properly establish expectations, business rules must state if task performers are accountable to baseline or current forecast dates. It is unreasonable to calculate an expected % complete greater than 0% when incomplete predecessors preclude starting the task when expected by the baseline. To do so will cause expected percentage calculations to accrue for future tasks compounding the effect. This paper will assume task performance is accountable to baseline dates or forecast dates, not a mixture of the two types.

The table below establishes criteria for Desired Duration and Expected Total Duration that can be substituted into Equation 1 to establish an expected duration complete for detail level tasks. The table assumes measurement is in reference to the [Status Date]. If reference is needed to the current date, replace [Status Date] with Now().

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Table 3 Formulas for Expected Duration Complete for Detail Tasks

	Desired Duration to Status Date for Detail Tasks	Expected Total Duration
Baseline Dates	IIf([Baseline Start]<=[Status Date],IIf([Status Date]>=[Baseline Finish],[Baseline Duration], ProjDateDiff([Baseline Start],[Status Date])),0)/[Minutes Per Day]	[Baseline Duration]
Forecast Dates	IIf([Start]<=[Status Date],IIf([Status Date]>= [Finish], [Duration],ProjDateDiff([Start],[Status Date])),0)/ [Minutes Per Day]	[Duration]

The formulas for desired duration must address:

4.2.1.1 Expected Start Date After Status Date

If the task expected start, either baseline start or forecast start, is to the right of the status date, the desired duration complete is 0.

4.2.1.2 Expected Start Date Prior to Status Date

If the expected start date is no later than the status date, some measure of desired duration exists. The formula must address that the desired duration can not be greater than the total expected duration, otherwise the calculation in Equation 4 will produce a value greater than 100%.

4.2.1.3 Calculation of Expected Duration Percent Complete – Detail Tasks

4.2.1.3.1 Expected Duration Calculation

Insert a column (custom number, or duration, text will not work) into the MS Project file and rename the field "Desired Duration." The formula is entered from the Tools/Customize/Fields dialog box, see Figure 9.
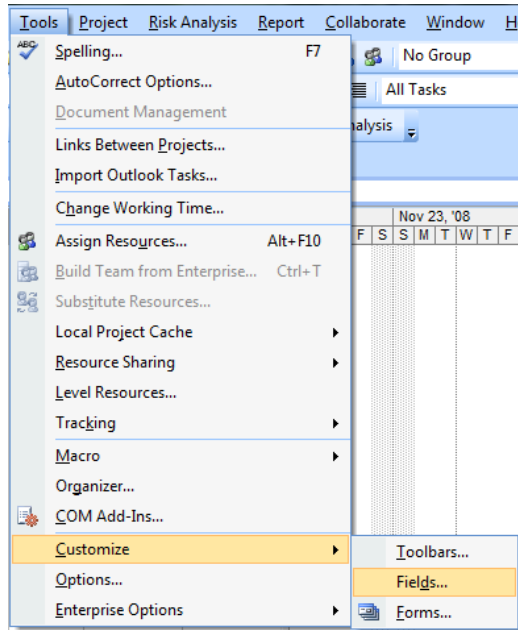
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Figure 9 Customizing Fields

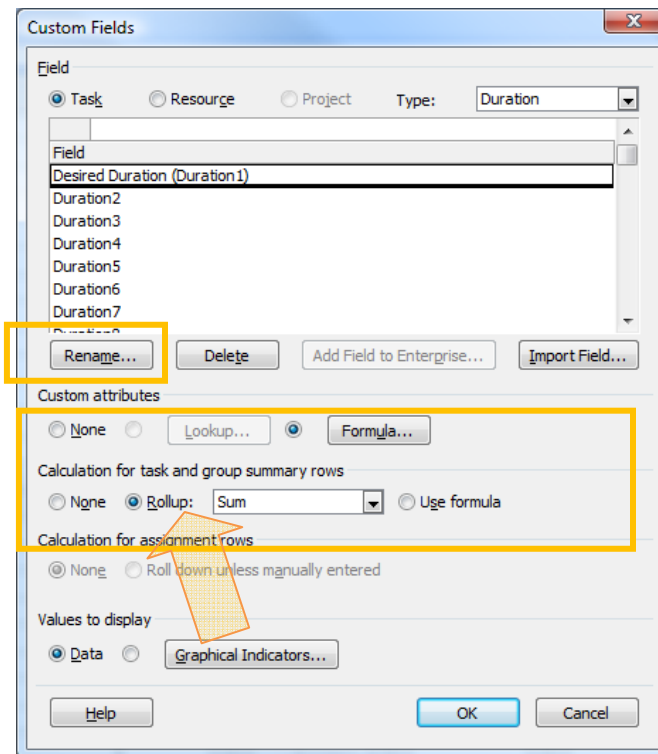Select the desired field and then Formula, see Figure 10:

Figure 10 Customize Fields Dialog Box

The formula for this column is from the left side of Table 3 consistent with the desired baseline or forecast values. It is extremely important the summary task rows

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are calculated using the "sum" as shown in Figure 10. The formula is entered by clicking the Formula command button in Figure 10, see Figure 11 below:
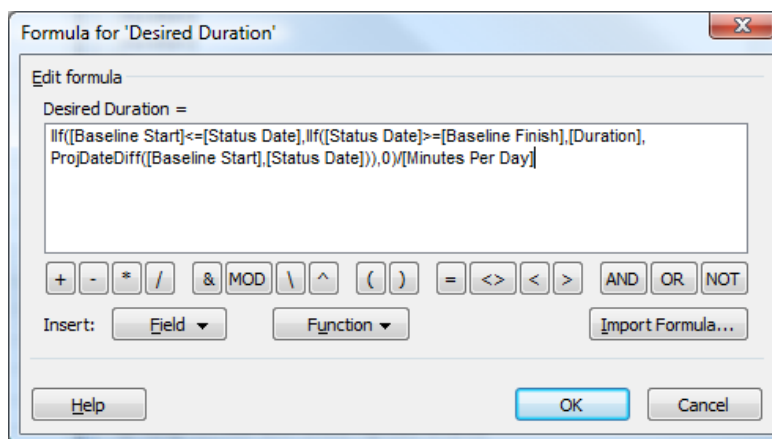

Figure 11 Formula Definition for Custom Desired Duration Column

4.2.1.3.2 Expected Total Duration Calculation

Repeat the same steps for Desired Duration (immediately above), with the exception being the formula. The formula will come from the right side of Table 3 and will be either [Baseline Duration] or [Duration] to be consistent with the Desired Duration column.

4.2.1.3.3 Calculation of Expected Duration Percent Complete

Add a third custom, this time use a custom number column, Number1 through Number10. This column will provide the desired calculation and will address issues created by summary tasks. Since the summary tasks for the components of this calculation have already been addressed with the "sum" function, it will be possible to use the formula for summary tasks as well.

It will be necessary to consider 0 duration tasks, tasks after the status date and formatting of the calculation to contain no decimal places. This can be accomplished with:

Format(100*(IIf([Start]>[Status Date],0,IIf([Duration2]=0,1,[Duration1]/[Duration2]))),0)
Note: substitute [Baseline Start] if measuring against baseline dates

The formula dialog for the custom column is shown in Figure 12 and Figure 13.

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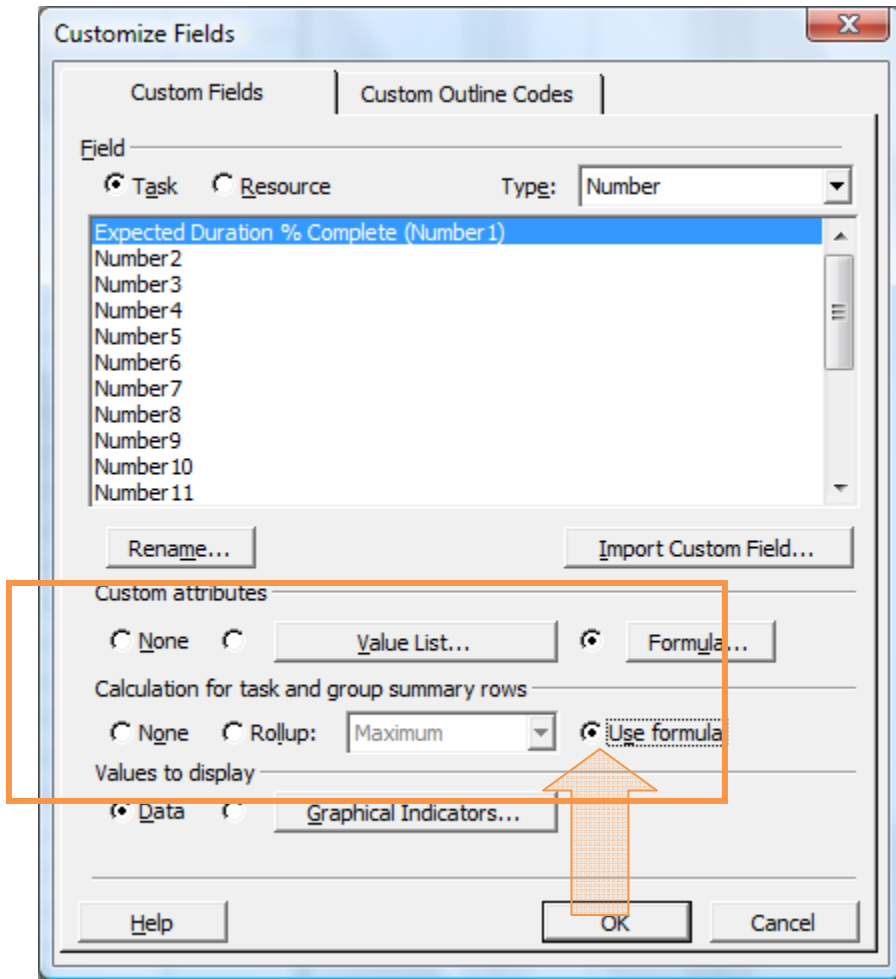

Figure 12 Custom Field Dialog Box for Expected Duration % Complete Calculation

Formula for 'Expected Duration % Complete'

Edit formula

Expected Duration % Complete =

```
format(100*(IIf([Start]>[Status Date],0,IIf([Duration2]=0,1,[Duration1]/[Duration2]))),0)
```
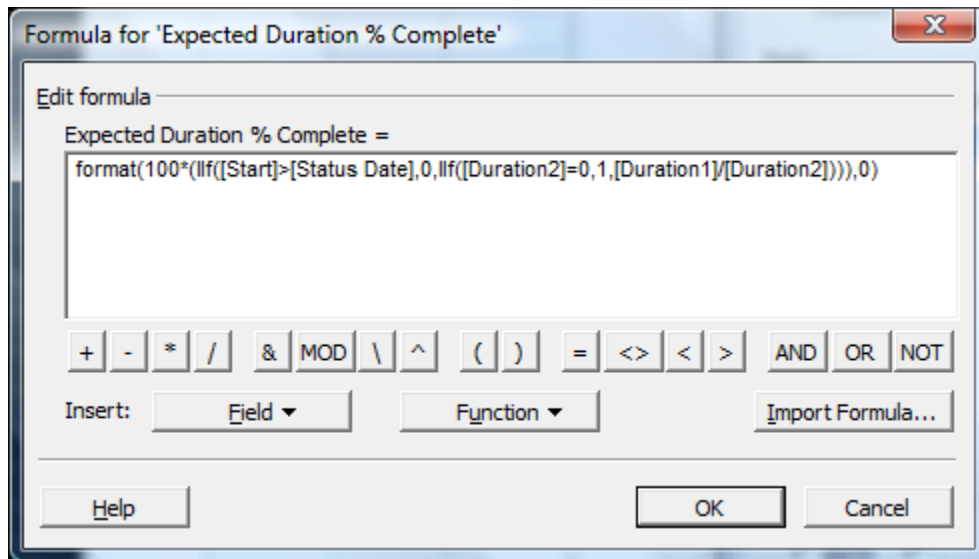
Figure 13 Formula Dialog Box for Expected Duration % Complete

4.2.2 Calculation of Duration Expected Percent Complete – Summary Tasks

The summary task calculations must be duration weighted in accordance with Equation 1. The formula requires summation of individual data elements for both the numerator and denominator in the equation. This is easily accomplished using custom text fields (or number fields) and formulas described above.

4.2.3 Expected Duration Complete Calculation – Alternate Method

If the schedule is properly resource loaded, and the resources contain reasonable cost figures, use the Physical % Complete method of section 4.4 and its subparagraphs.

If there are no resources or costs in the schedule, an alternative to calculate expected duration complete is available by creating a resource ("Worker1") with a work rate of $1/hr and assign that resource to every detail task on the project. Then set a baseline. At this point, use the Physical % Complete method of 4.4 since the one resource assigned to each task will be level loaded across the task duration.

4.2.4 Duration Based Percent Complete Conclusion

Again, I am not certain any of these calculations truly make sense. The duration % complete progresses with time and can never be insufficient or overstated. The value can logically only be the measure of duration into the total task duration to the status date divided by the task total duration (either baseline or forecast). When Microsoft Office Project calculates %Complete, it uses the forecast dates for the measurement. The %Complete value should not be entered by the user, it should be calculated by the program after the user enters remaining duration or remaining work (if the task is not fixed duration). If a user believes they are any (duration) % complete other than as calculated by the program, they are not providing a duration based % complete; more than likely, the user is providing an estimate of % Work complete.

4.3 Work Analysis (Detail Tasks)

*** This section is in work ***

The percent work complete is a measure of how many hours are spent on a task in comparison to what was bid to complete the task. However this is not necessarily the case because it assumes 1 hour of effort will produce the same work product that the person estimating the task believes the effort should take. If an estimator believes it should take 24 hours to paint 24 feet of fence, then at the end of one day there should be eight feet of fence painted. A problem occurs if the painter reports at the end of the day that only six feet of fence were painted and it will take at least 32 more hours (4 days) to complete the job. At this point, the job is now 8/40= 20% Work Complete based on the latest revised estimate.

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However, this is a measure of work hours to complete the job. There may be additional detail available. For example, the painter may have painted 16 feet of fence the first day and only have 8 feet of fence remaining. If the remaining 8 feet requires substantial preparation work, or, might be located in rough terrain, then the job may be physically 66% complete but still require more man-hours that what might be originally estimated.

To establish an expected Work%Complete, the notional formula of Equation 5 applies:

$$ExpectedWork\%Complete = 100 * \frac{ExpectedWorkToDate}{ExpectedTotalWork}$$

Equation 5 Notional Equation for Expected Work Percent Complete

As before, business rules will dictate of the task manager is accountable for baseline work to the status date, or, forecast work to the status date. In either case, the resultant test addresses comparison of the date fields against a status date.

4.4   Cost Based Percent Complete (Physical % Complete) (Detail Tasks)

Once a resource loaded schedule (with resource costs) is established with a baseline, the expected Physical %Complete at any status date is given by:

$$ExpectedPhysical\%Complete = 100 * \frac{BudgetedCostOfWorkScheduled}{BaselineCost}$$

Equation 6 Expected Physical % Complete

In the event a user desires to use forecast dates and costs as opposed to baseline dates, the formula can be adjusted by saving data to one of the spare baseline fields (Basline1 through Baseline10) and using that field as the basis for Earned Value calculations.

4.4.1 Using Physical Percent Complete for Calculations

Progress calculations and variances are calculated by Microsoft Project using one of two methods for Earned Value. Microsoft Project allows Earned Value calculations based on Percent Complete or Physical Percent Complete. The default method for Earned Value calculations is Percent Complete.

4.4.2 Changing Earned Value Methods

Although the exact details of properly displaying Physical%Complete are beyond the scope of this paper, the essential parameters are addressed.

4.4.2.1 Change Earned Value Method for Tasks

Display all tasks in the schedule, for a single file this is normally accomplished from the Formatting Toolbar, see Figure 14.
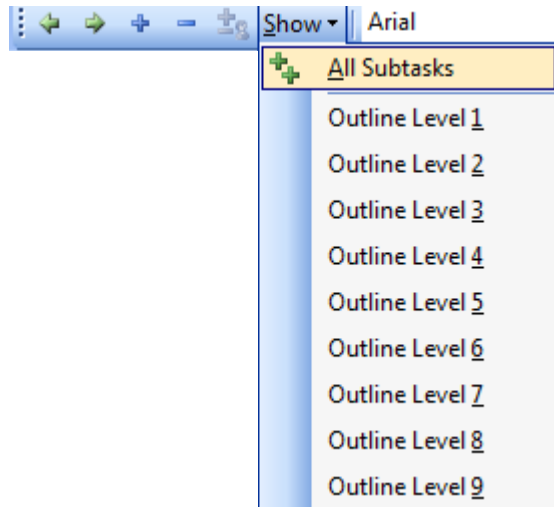
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Figure 14 Showing All Tasks In The Schedule

Select the multiple task information icon ▤ from the Standard Toolbar, the Multiple Task Information dialog box appears, see Figure 15. Once the dialog box is open, select the advanced tab, and change the Earned Value Method to Physical Percent Complete:
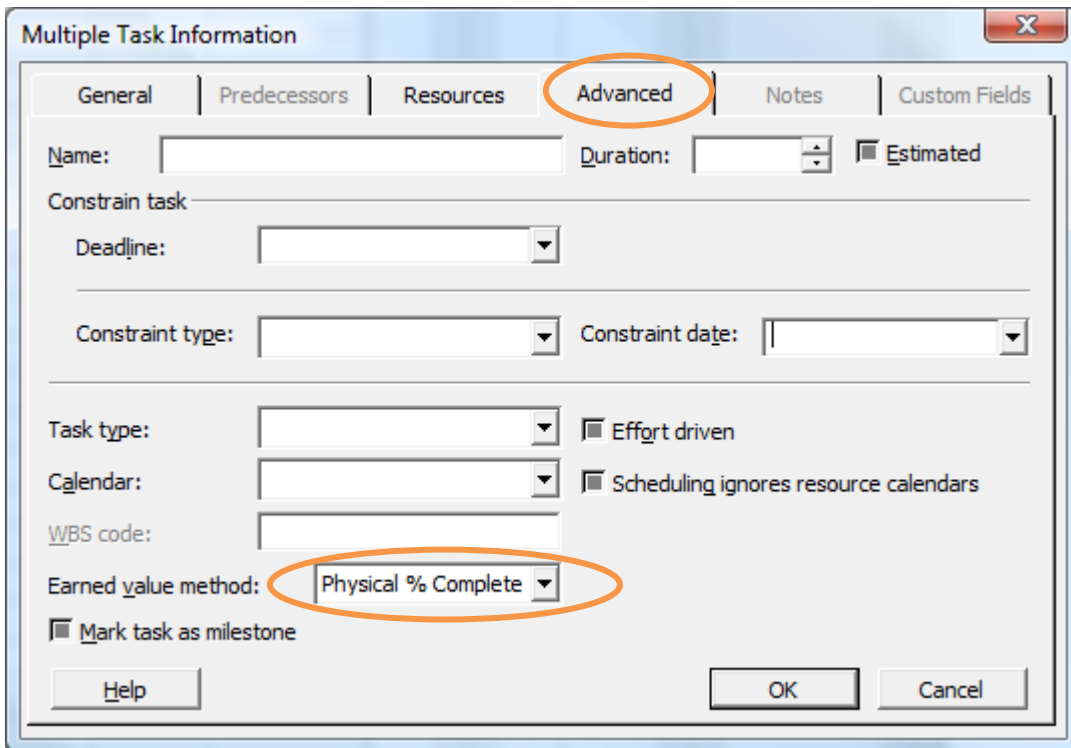

Figure 15 Multiple Task Information Dialog Box

Select OK to complete the change.

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4.4.3 Saving A Baseline

From the main menu, select Tools/Tracking/Save Baseline (this is "Set Baseline" in Project 2007), see Figure 16.
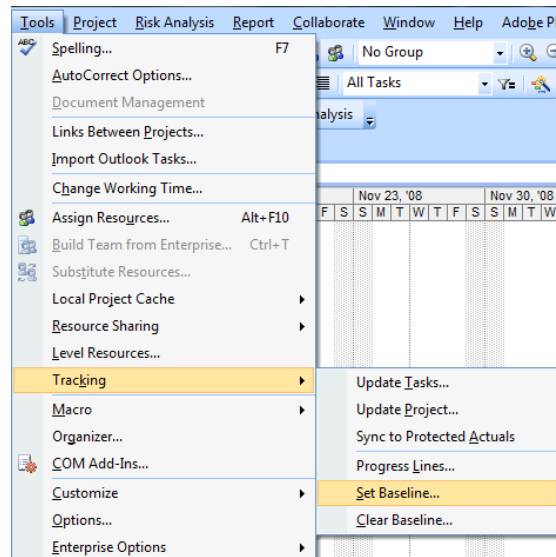

Figure 16 Saving a Baseline

4.4.4 Switching Baselines Used for Earned Value Calculations
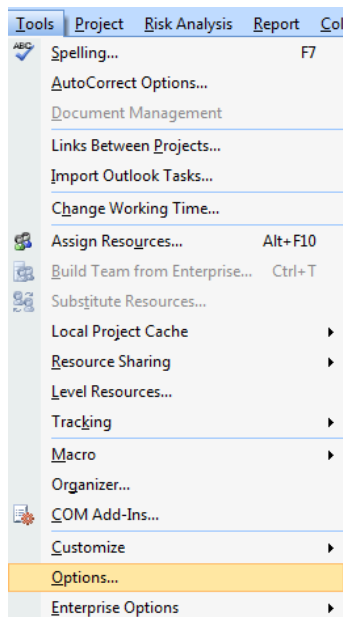
From the main menu, select Tools/Options, see Figure 18.

Figure 17 Accessing Microsoft Project Options

Select the Calculations Tab, and then select Earned Value (see Figure 18):
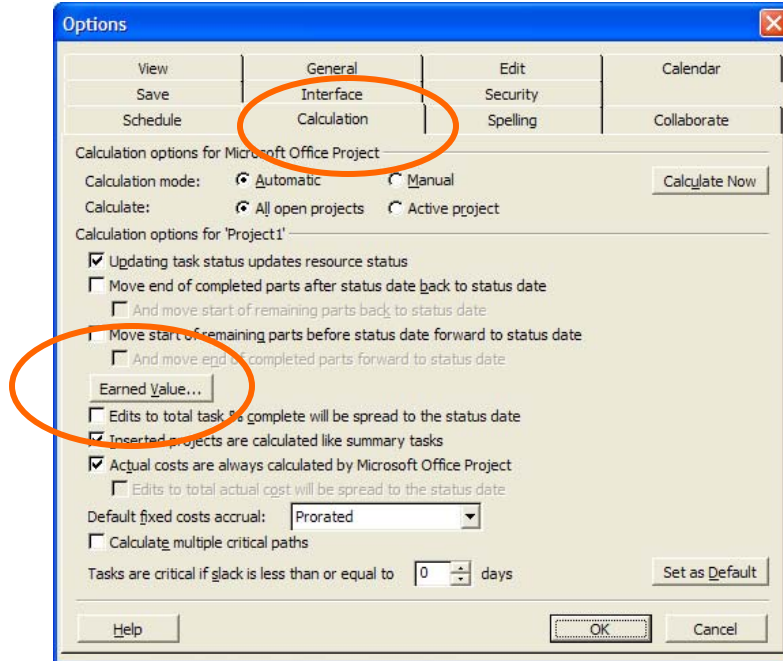
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Figure 18 Microsoft Project Options Dialog Box

When the Earned Value Dialog Box appears, select the appropriate baseline for calculation of current forecast Earned Value parameters; in this example, Baseline1 is selected. Also verify Physical % Complete is selected as the default Earned Value method. See Figure 19.
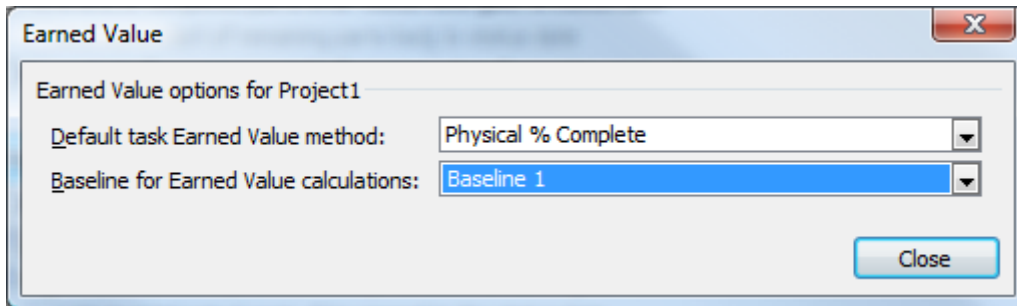

Figure 19 Earned Value Parameters Selection Dialog Box

4.4.5 Calculating Expected Physical % Complete

The expected Physical % Complete for any Baseline$_i$ is given by Equation 7; the formula will also calculate correctly at summary task levels.

$$ExpectedPhysical\%Complete_i = 100 * \frac{BCWS_i}{BaselineCost_i}$$

Format([BCWS]/[Baseline$_i$ Cost],0)

Equation 7 Expected Physical % Complete Calculation for Baseline "*i*"

Place the formula in a spare number column, an example is shown in Figure 20 assuming use of Baseline1.
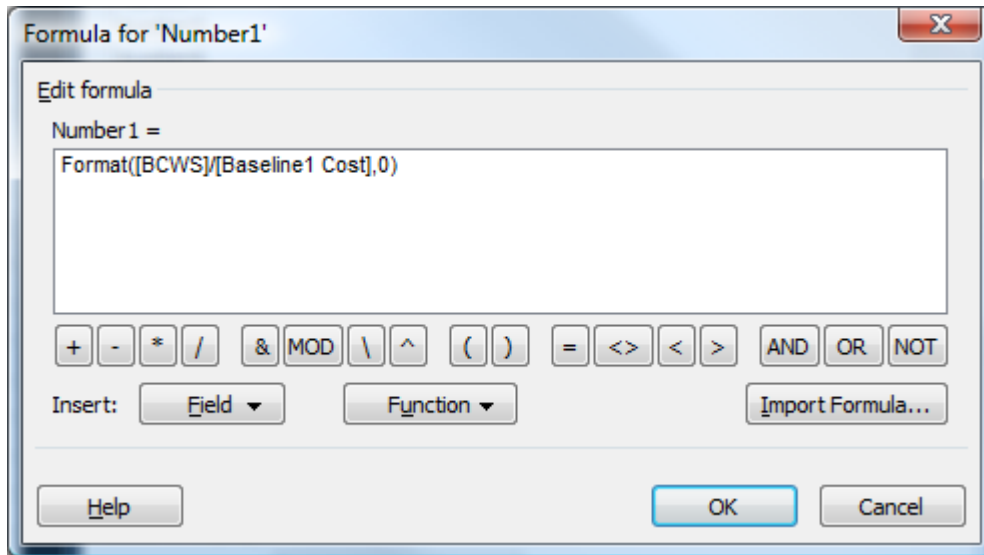
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Figure 20 Formula for Expected Physical Percent Complete

5   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.

5.1   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.

5.1.1   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 figure varies widely even within the same industry. For purposes of illustration assume:

Table 4 Schedule Variance Thresholds

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

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Calculate the schedule variance by either subtracting the expected and calculated values, or dividing them. For reasons that will become apparent later, the preference is to divide the calculated and expected values in accordance with Equation 8.

Equation 8 Calculating Schedule Variance Index

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

Given the ratio of Equation 8, the following becomes apparent in Table 5:

Table 5 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 4 and Table 5, each color coded icon indicates the schedule variance conditions in Table 6:

Table 6 Schedule Variance Indicator Icons

Schedule Variance Index	Indicator Icon
>=0.90	🟢
0.8 to 0.90	🟡
<0.8	🔴

5.1.2 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 no discouraged. A sample of duration based schedule variances is illustrated in Table 7

Table 7 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 and can be calculated with the date difference formula, such as Figure 21:

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ProjDateDiff([Baseline Start],[Start])/[Minutes Per Day]
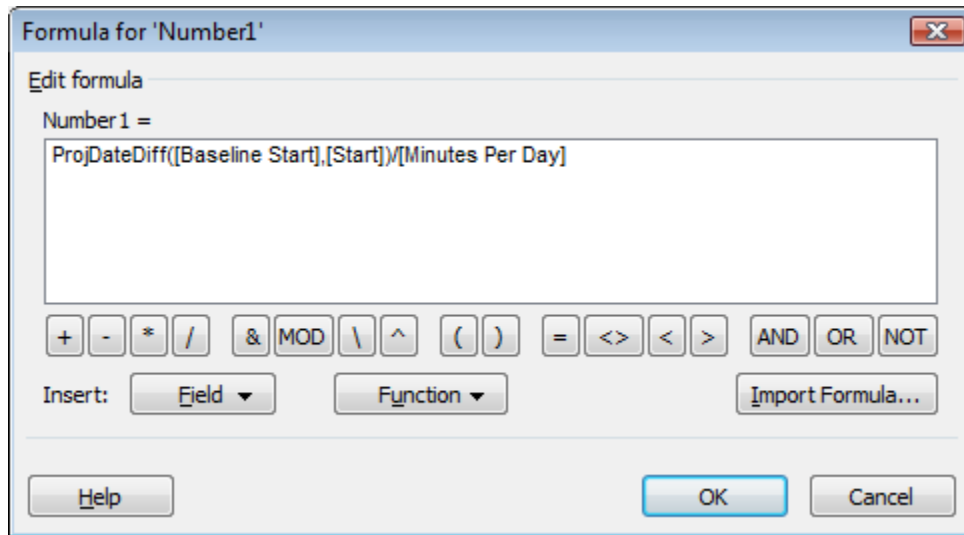
Figure 21 Duration Based Schedule Variance Calculation

The summary task formulas should be the same as for the individual tasks.

5.2   Inserting Indicator Icons on the Schedule

5.2.1   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 must 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 22:

%Complete/[Number1]
%Work Complete/[Number1]

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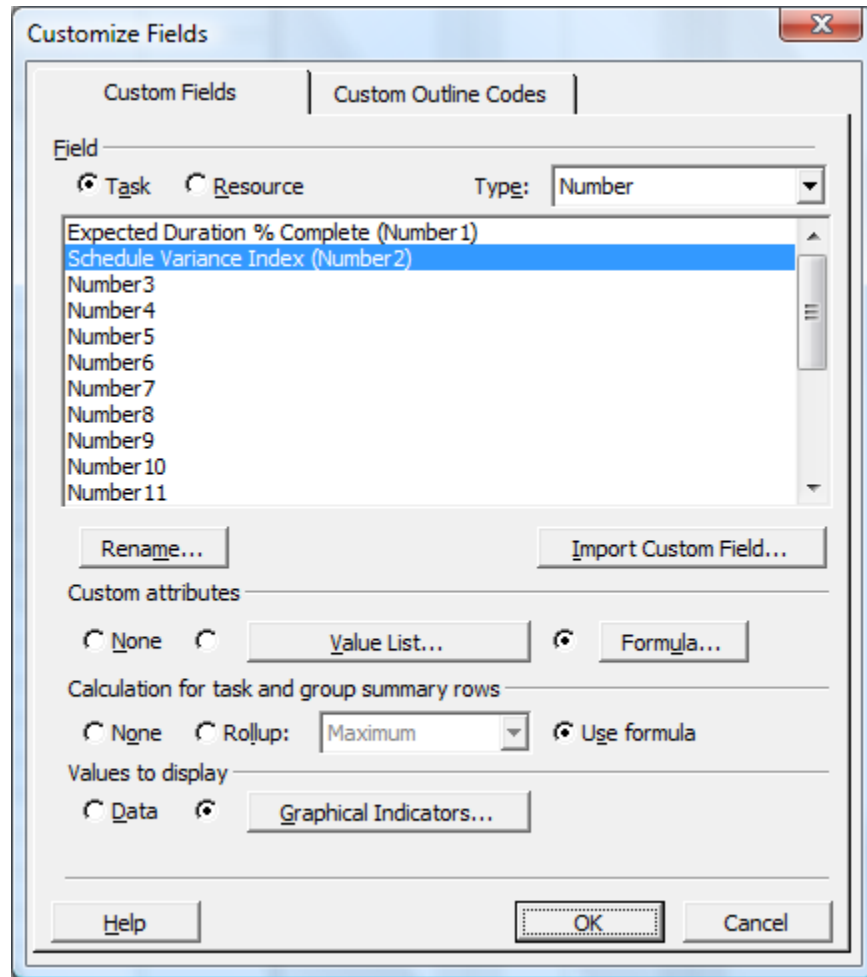
Figure 22 Setup Parameters for Schedule Variance Calculation

The icon colors are set with guidelines in Figure 23. 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.

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Figure 23 Establish Icon Settings

5.2.2 Indicator Icons for Physical % Complete

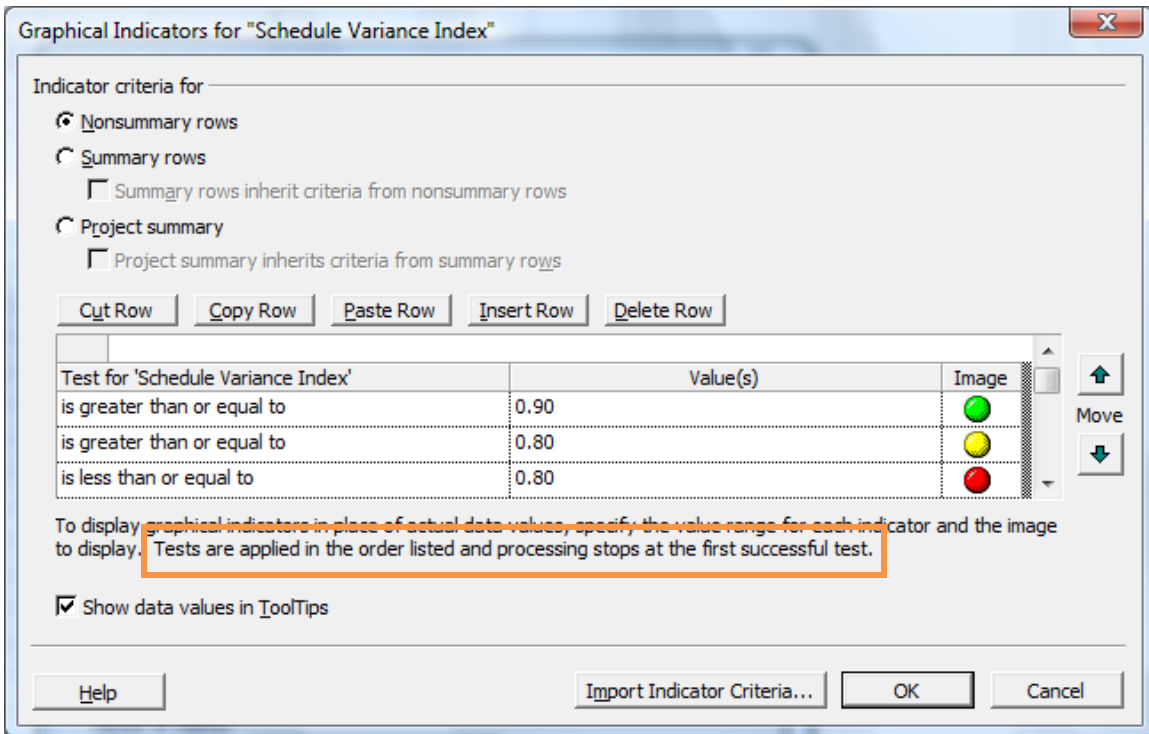As it turns out, Microsoft Project has a readily available calculation when using Physical % Complete or properly applying Earned Value in Project 2003 or Project 2007; the field is the Schedule Performance Index [SPI]. The field is very similar to the Schedule Variance Index that was created earlier. 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 9 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 23. Note the [SPI] will calculate properly based on the specific baseline used for calculations as set in Figure 19.

5.2.3 Indicator Icons for Absolute Duration Variance

Assuming the duration variance (in days) from Figure 21 is calculated and contained in the Number1 field, the indicator Icons would be per Figure 24:

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Graphical Indicators for "Number1"

Indicator criteria for

- ● Nonsummary rows
- ○ Summary rows
  - ☐ Summary rows inherit criteria from nonsummary rows
- ○ Project summary
  - ☐ Project summary inherits criteria from summary rows

[Cut Row] [Copy Row] [Paste Row] [Insert Row] [Delete Row]

Test for 'Number 1'	Value(s)	Image
is less than or equal to	1	🟢
is less than or equal to	5	🟡
is greater than	5	🔴

Move ⬆ ⬇

To display graphical indicators in place of actual data values, specify the value range for each indicator and the image to display. Tests are applied in the order listed and processing stops at the first successful test.

☑ Show data values in ToolTips

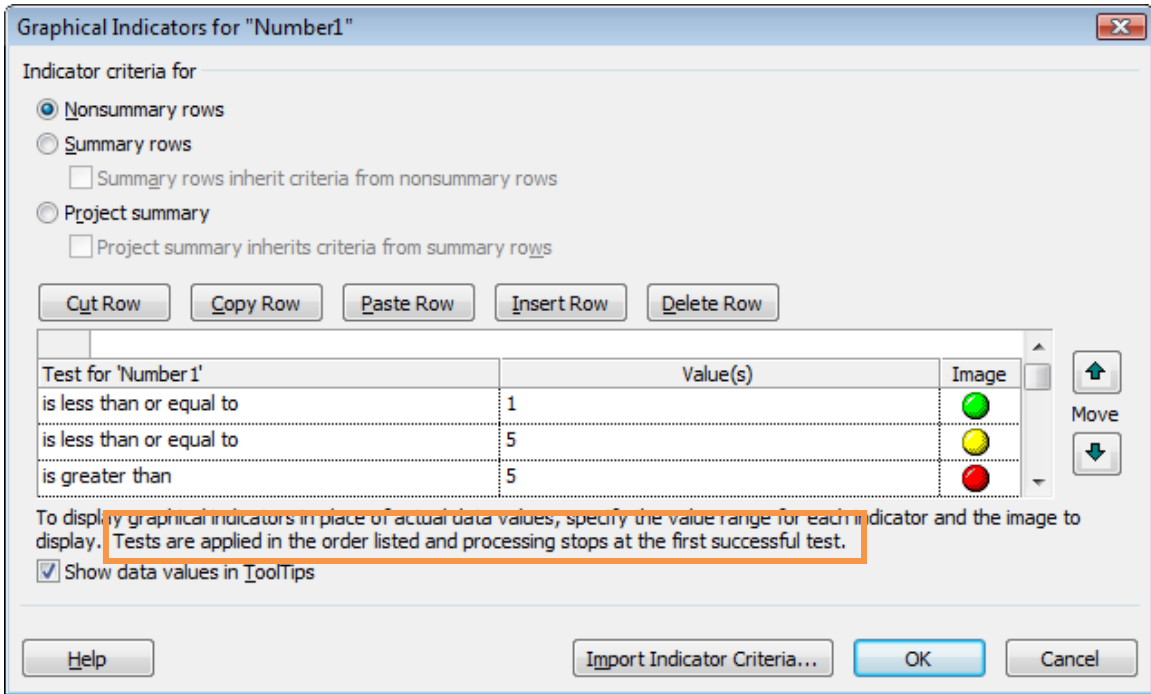[Help]   [Import Indicator Criteria...]   [OK]   [Cancel]

Figure 24 Indicator Icons for Absolute Schedule Variance Durations