MS Project Macro to calculate a Planned %Work

Solving an old PMs dilemma

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INTRODUCTION

As a Project Manager, over the years, I have found very complex to have MS Project (MSP) calculate a Planned %Work for a given Status Date. This limitation has been discussed with many of my fellow PMs, and we were never able to find an easy way to solve it. I have witnessed PMs manually updating custom fields, or even parallel projects, to try to calculate a Planned %Work. And when you have thousands of tasks in your project, this activity can be daunting and time consuming.

One method could be trying to use the %Schedule Variance (%SV) field to evaluate how your scheduled has deviated from your baseline plan, however this requires you to include every planned resource cost, actual costs, etc. in your project. And, in my experience, most of the times you don't have them entered or complete.

So, if you go and search the internet, you will find different recommendations to estimate this %Work at certain Status Date, being the most common formula the following:

$$Estimated\ \%Work\ Complete = \frac{Status\ Date - Baseline\ Start\ Date}{Baseline\ Finish\ Date - Baseline\ Start\ Date}\ x\ 100$$

This formula is very simple and assumes that your work load is constant over the task duration. Then, it calculates the elapsed time from the planned start date of the task (Baseline) as a percentage of the total duration of the task. This assumption would be incorrect if your resource work load varies over the task duration, yet, it usually doesn't.

The restriction for this formula is that it is only correct for individual tasks, however it cannot be applied to group / summary tasks. To be right, the summary task's %Work should be calculated using an earned-value criterion (effort driven). For custom fields, MSP would only allow you to calculate summary tasks as an average, maximum, minimum, sum, etc. of their subtasks, which is not suitable for our purpose.
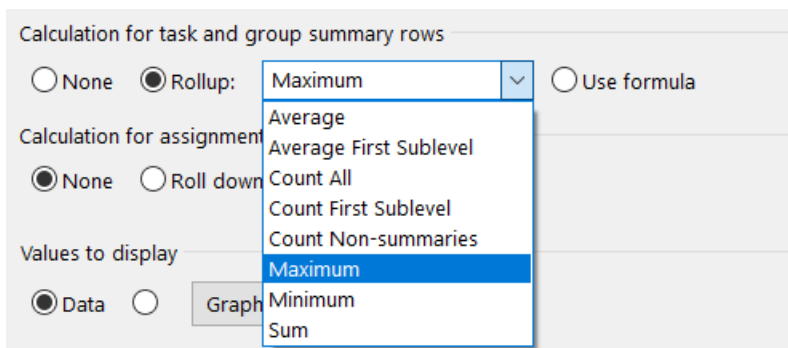

The only fields in MSP that allow earned-value calculations for summary tasks are: %Complete or Physical %Complete.
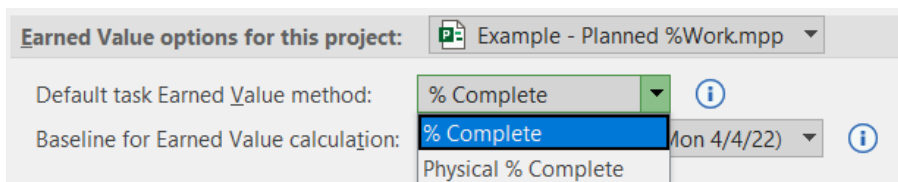

So, to solve this old PMs issue, I decided to write a simple VB Macro that momentarily uses the earned-value logic of the %Work field to calculate a Planned %Work for Summary Tasks at a defined Status Date.

VB MACRO LOGIC

First of all, you need to create 5 Custom Fields in your MSP project. For this, right-click on your task bar header, and select *Insert Column*. Then select the custom fields listed below:
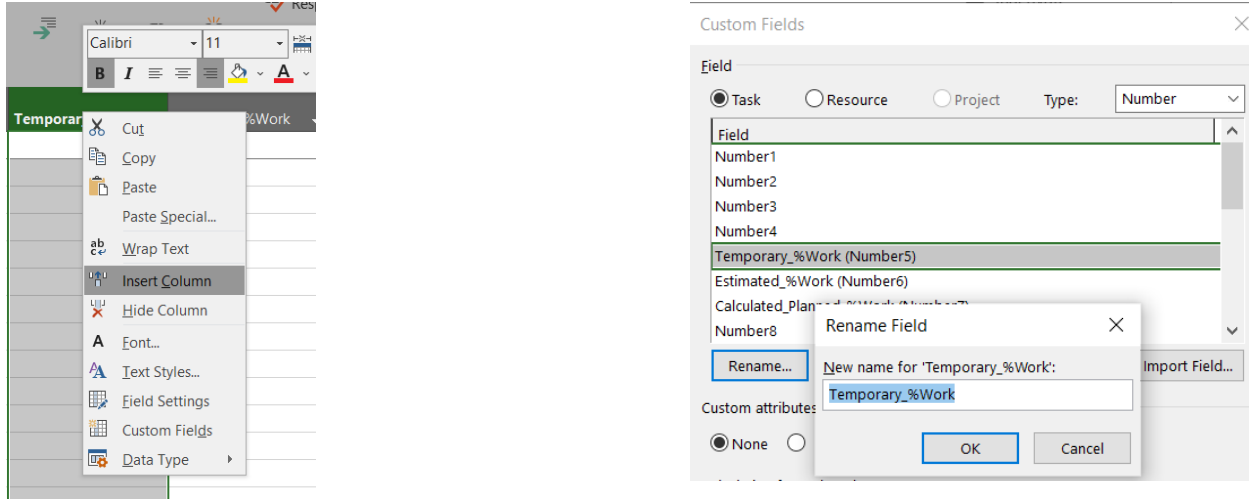
1) **Number5 (I have renamed it to Temporary_%Work):** This field will temporarily hold the current %Work of your project, to restore it at a later time. Just select the field and rename it (right-click, select *Custom Fields / Rename*). Nothing else needs to be done with this field.

2) **Number6 (I have renamed it to Estimated_%Work):** In this field you will use the common formula explained in the Introduction, to calculate the estimated work completed at the Status Date. It only needs to be calculated for the individual tasks, not for the summary tasks. Rename it, then set the "Custom Attributes" field to the *Formula* option to include the calculation. Copy and paste the formula below.
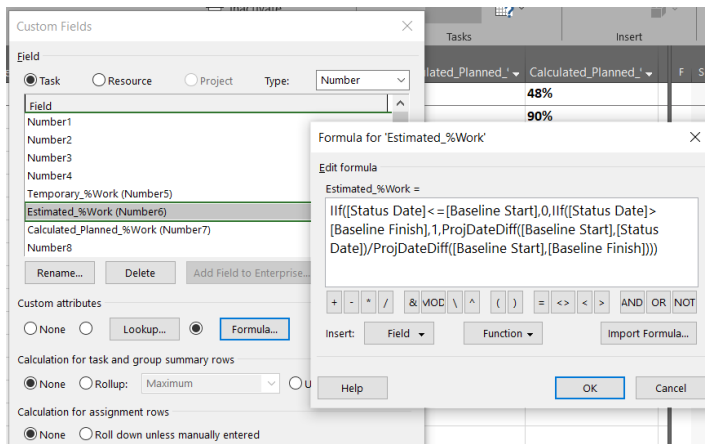

Formula*: *IIf([Status Date]<=[Baseline Start],0,IIf([Status Date]>[Baseline Finish],1,ProjDateDiff([Baseline Start],[Status Date])/ProjDateDiff([Baseline Start],[Baseline Finish])))*

"Calculation for task and group summary rows", needs to be left at **None**

* I won't discuss here how this formula works. I leave that for you to figure out.

3) **Text7(I have renamed it to Estimated_%Work_Percent):** It transforms the decimal value calculated in 2) to a percentage value. We need to use a text field in MSP to do that. Rename it, then set the "Custom Attributes" to the *Formula* option to include the calculation. Copy and paste the formula below.
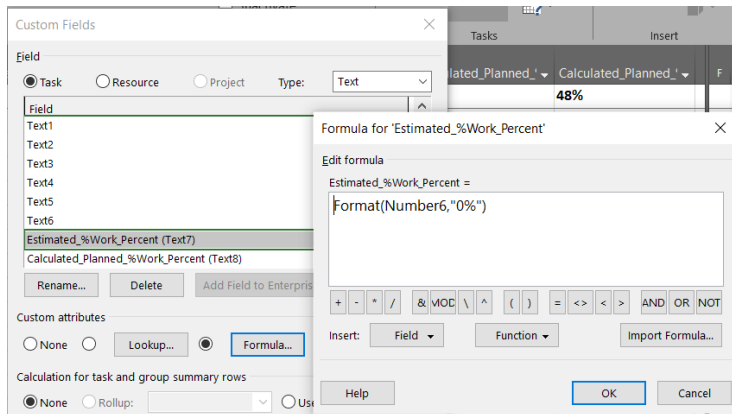
Formula: *Format(Number6,"0%")*

"Calculation for task and group summary rows", needs to be left at **None**

4) **Number7(I have renamed it to Calculated_Planned_%Work):** Once the Macro has completed the job of using the field %Work to calculate the earned-value percentages for the Summary Tasks, it will store these values in this field. Just rename it (right-click, select *Custom Fields / Rename*). Nothing else needs to be done with this field.

5) **Text8(I have renamed it to Calculated_Planned_%Work_Percent):** It only presents the calculated value in 4) in a percentage format. Again, we need to use a text field to do so. Rename it, then set the "Custom Attributes" to the *Formula* option to include the calculation. Copy and paste the formula below.
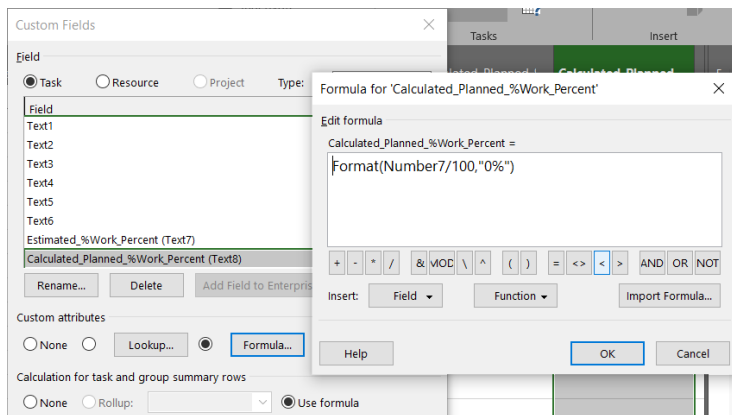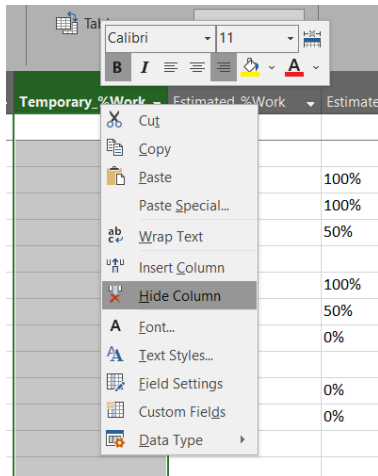

Formula*: *Format(Number7/100,"0%")*

"Calculation for task and group summary rows", needs to be set to **Use formula**

*It corrects the calculated value dividing it by 100 to present it as a percentage (%).

At this point, you could hide all the created columns from 1) to 4) and only make the final result (5) visible. To do so, right-click and select *Hide Column*.

6) Now that your project has all the required fields, you can start including the developed VB Macro. Go to *View / Macros / Visual Basic*
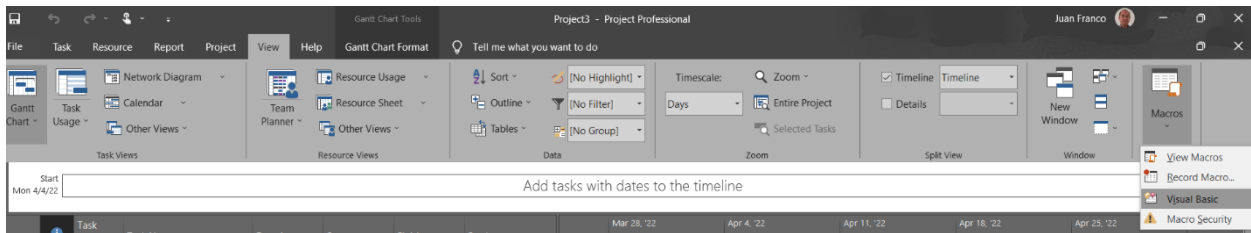
In the VB Editor window select *View / Code*

Copy & paste the following Code:

```
'Macro that calculates a Planned %WorkComplete
'Created by Juan Pablo Franco @ anterossolutions.com
'Provided As Is. Run it under your own risk.
'

    Sub Calculate_Work_Planned()

    Dim ProjTasks As Tasks
    Dim ProjTask As Task

    Set ProjTasks = ActiveProject.Tasks
    'Saves your work before modifying your %Work, just in case
```

```
FileSave
SelectTaskField Row:=1, Column:="Name", RowRelative:=False

    For Each ProjTask In ProjTasks
        If Not ProjTask Is Nothing Then
            If Not ProjTask.Summary = True Then
            ' Copy your current %Work in a temporary column Number5, not for summary tasks
            ProjTask.Number5 = ProjTask.PercentWorkComplete
            End If
        End If
    Next ProjTask

    For Each ProjTask In ProjTasks
        If Not ProjTask Is Nothing Then
            If Not ProjTask.Summary = True Then
            ' Copy your Estimated_%Work in your %Work to let Project calculate the % for summary tasks
            ProjTask.PercentWorkComplete = ProjTask.Text7
            End If
        End If
    Next ProjTask
    CalculateProject

    For Each ProjTask In ProjTasks
        If Not ProjTask Is Nothing Then
            ' Copy the resulting values in the Planned %Work column (Number7)
            ProjTask.Number7 = ProjTask.PercentWorkComplete
        End If
    Next ProjTask

    For Each ProjTask In ProjTasks
        If Not ProjTask Is Nothing Then
            If Not ProjTask.Summary = True Then
            ' Restore the original %Work values, and leave everything as it was. Calculate Project
            ProjTask.PercentWorkComplete = ProjTask.Number5
            End If
        End If
    Next ProjTask
    CalculateProject



End Sub
```
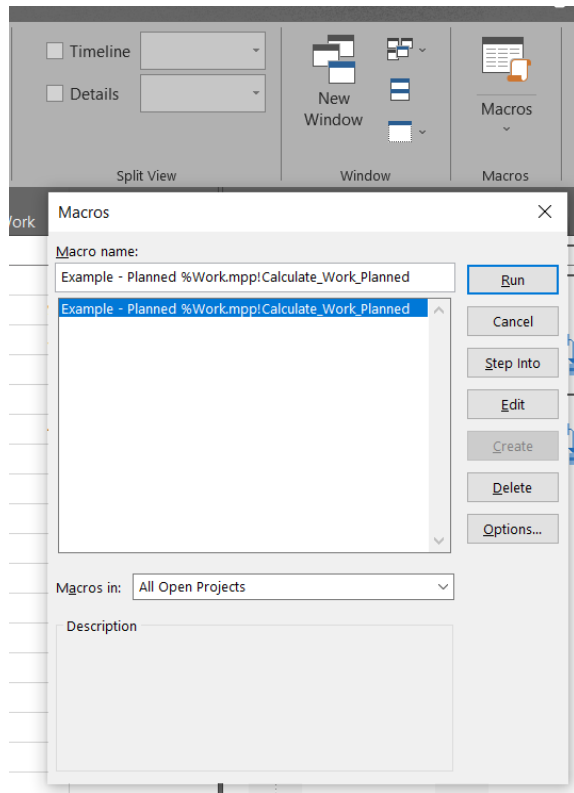
Save it, and if everything went right, you will now have a Macro called "Calculate_Work_Planned" in your Macro List (*View / Macros / View Macros*)


It will work with your created custom fields. If you get any errors, please verify that you have used exactly the same specified fields.

FINAL RECOMMENDATIONS

a. **WARNING:** This VB Macro is manipulating your project data (%Work field) so, if it fails and stops, it could modify and damage your entered information. That is why **the Macro saves your work file as the first step in the process**. If you do not want to save your work DO NOT RUN THE MACRO. Additionally, if the Macro failed and modified your information, you just need to close your work file without saving it and nothing had happened. However, if you save your work after the running the Macro, you will overwrite your information. Be careful, only save your work if you are sure your information is OK. I would advise to save your work file with a different name after the first time you run the Macro, just to allow you to review that everything went fine.

b. **WARNING:** You should disable the automatic project calculation in MSP before running the Macro. For smaller projects it wouldn't be a problem, but for a large project it will cause your MSP to freeze. I have run this Macro, having disabled the automatic calculation, for an 8,500+ tasks project and it only took one or two minutes to complete. So, go to *File / Option / Schedule / Calculation* and disable the automatic project calculation.
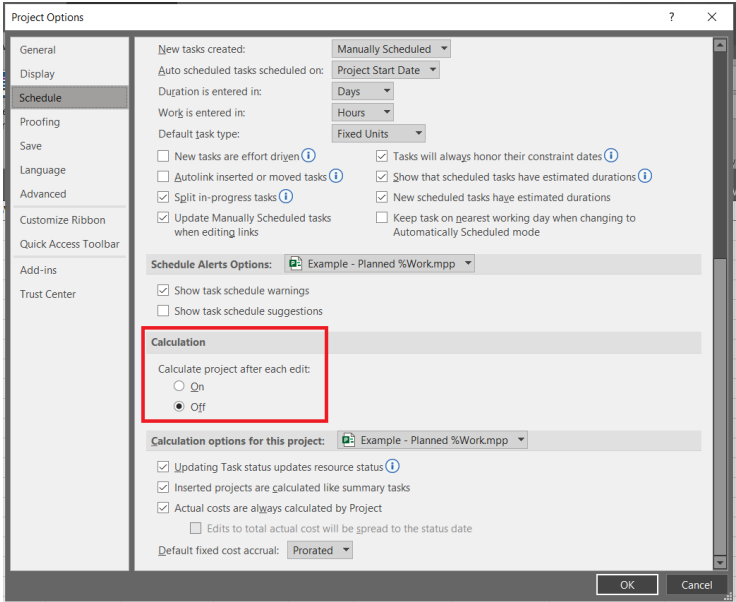
c. Do not forget to save the Baseline in your project. Without it you won't be able to calculate any Estimated %Work. To do so, go to *Project / Set Baseline / Set Baseline*. If you require to work with a different Baseline than the standard one (Ex. Baseline 1, 2, 3…) you need to modify accordingly the formula in 2).
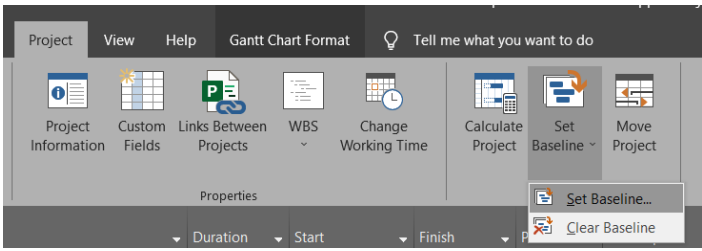

d. Whenever you open your project file with the included Macro, do not forget to select the "Enable Macros" option if you are going to run it. Sometimes MSP in configured to avoid running any macros. So, if you have problems running the Macro, check that security option.
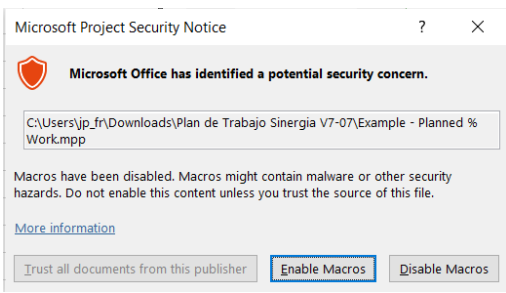
e. I have included a small MSP file (Example - Planned %Work.mpp) with this article. Please, feel free to play with it. This is an example project running from January, 3rd 2022 to February, 1st 2022. Modify the Status Date between these two dates to see how the Estimated %Work calculation varies. Enter different %Work values for the different subtasks, then verify that the Macro is not modifying your entered information. Try entering in the %Work field the exact values from your Estimated %Work, validate how this field calculates the summary tasks using an

earned-value logic, and how it will present to you exactly the same values that the Macro has calculated. After entering values in the %Work field, always run the calculate project option (*Project / Calculate Project*).
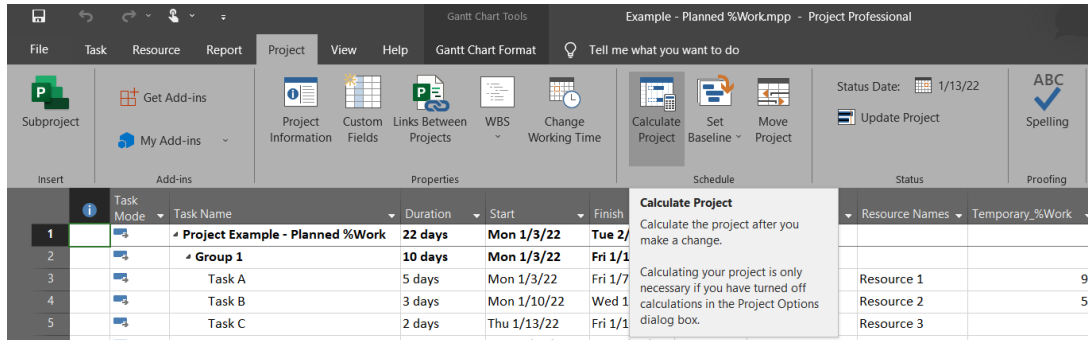
f. I have used this Macro in many projects, it has always worked well, never gave me any problems. Please, use it under your own risk. I hope it is helpful to you. If it is, please be nice and share it with your peers.

Download the Excel file here:

https://www.dropbox.com/s/rtlxtqqsvrg4bih/Example%20-%20Planned%20%25Work.mpp?dl=0