

Table of Contents

Introduction	2
Installation	2
Tabular View Sorting.....	2
Risk Analysis	3
Risk Path Analysis.....	4
Input Milestones	5
Task Existence	6
Expected Cost Calculations in Full Monte 2017	8
Filters & Highlights	9
History Report	9
Enterprise Fields (Microsoft project)	10
Level of Effort.....	10

Introduction

This document describes the new features in Full Monte 2017.

Installation

If you have Full Monte 2016 then this must be uninstalled before installing Full Monte 2017. Please note that the format of the data stored by Full Monte 2017 is different to any earlier version. Full Monte 2017 will automatically convert Full Monte 2016 (and Full Monte 2014 P6 data) data into the newer format. Once converted it will no longer be recognized by Full Monte 2016/2014. Please refer to the Full Monte for Microsoft Project Installation Guide for information regarding converting from Full Monte 2.1 or earlier.

Microsoft Project Configuration

An additional Full Monte field ('Full Monte Results 2') has been added to the default system field mappings. This field will **not** be automatically mapped for projects previously used with Full Monte 2016. Currently the only data stored in Full Monte Results 2 is the diagnostic data shown in Early Start Basis, Early Finish Basis, Critical Predecessors, Critical Successors, Last Finish Basis, Last Start Basis fields. If Full Monte Results 2 is not mapped, then this information will not be available until a Risk Analysis has been performed in the current session.

It is no longer mandatory to map the field 'Full Monte Results'. This makes 'Full Monte Input Data' the only mandatory mapped field in Full Monte 2017. If the standard results and histogram fields are not mapped, then that data will not be available in a new Full Monte session until a Risk Analysis is performed.

Please see the Full Monte for Microsoft Project Installation Guide for further information.

Oracle Primavera P6 Configuration

A new Primavera user defined field called 'Full Monte Risk Path' is automatically created (if undefined) and populated with the Full Monte Risk Path data when a project is saved after performing a Risk Analysis. This field can be used to group tasks by criticality to either project completion or an interim milestone.

Please see the Full Monte User Guide for more information on Risk Path analysis.

Tabular View Sorting

The options to Sort in ascending and descending order have been removed from the right-click context menus for column headings in tabular views. Columns can be sorted simply by clicking on the column heading and by using Ctrl+Click to sort on multiple columns. There is also a new Sort dialog on the View menu.

Risk Analysis

For Full Monte 2017, new features have been added to the Risk Analysis dialog as shown in Figure 1.

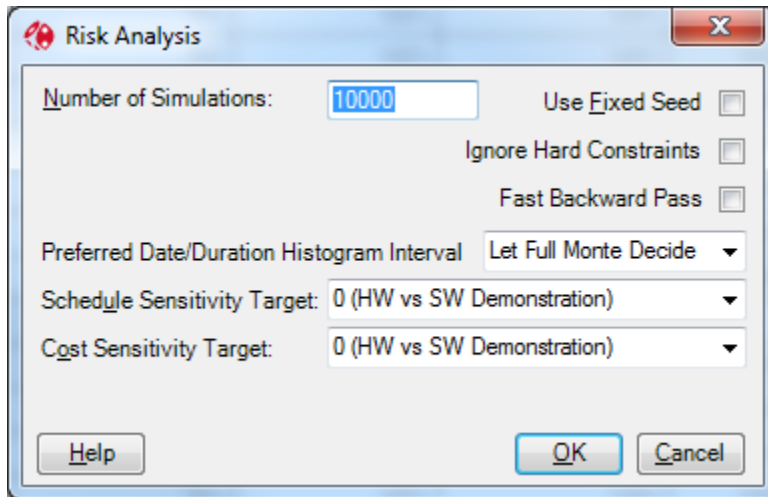


Figure 1

Ignore Hard Constraints

It has always been a best practice to remove ‘hard’ constraints from a schedule prior to performing a Monte Carlo simulation. While the term ‘hard’ constraint is not formally defined, it is often used to describe a constraint (target) date that will prevent the early dates moving into the future. Examples include Start No Later Than, Finish No Later Than, Start On, Finish On, Must Finish On etc.

Tools exist (such as Barbecana’s Schedule Inspector) that can automate the removal of such constraints but if these are not available then manually removing the constraints can be tedious. Full Monte 2017 now features a risk analysis option to ignore such constraints during the simulation. This can result in a far more realistic assessment of future schedule dates.

Fast Backward Pass

While Full Monte already utilizes a very fast simulation engine it can still take some time to run thousands of simulations on larger schedules. The Fast Backward Pass option can reduce processing times by around 50% at the expense of not calculating Late Date data and Floats. Full Monte will still calculate all Early Date data, sensitivity, percent critical (criticality), and diagnostic aids such as the Critical Predecessor and Early Start/Finish Basis fields.

Risk Path Analysis

A new Full Monte field, Risk Path, has been added and is calculated during risk analysis. Similar in concept to float tracing tools, the Full Monte Risk Path number is unique in grouping tasks by their criticality to the project (or interim milestone) outcome after considering uncertainty. An example is shown in Figure 2.

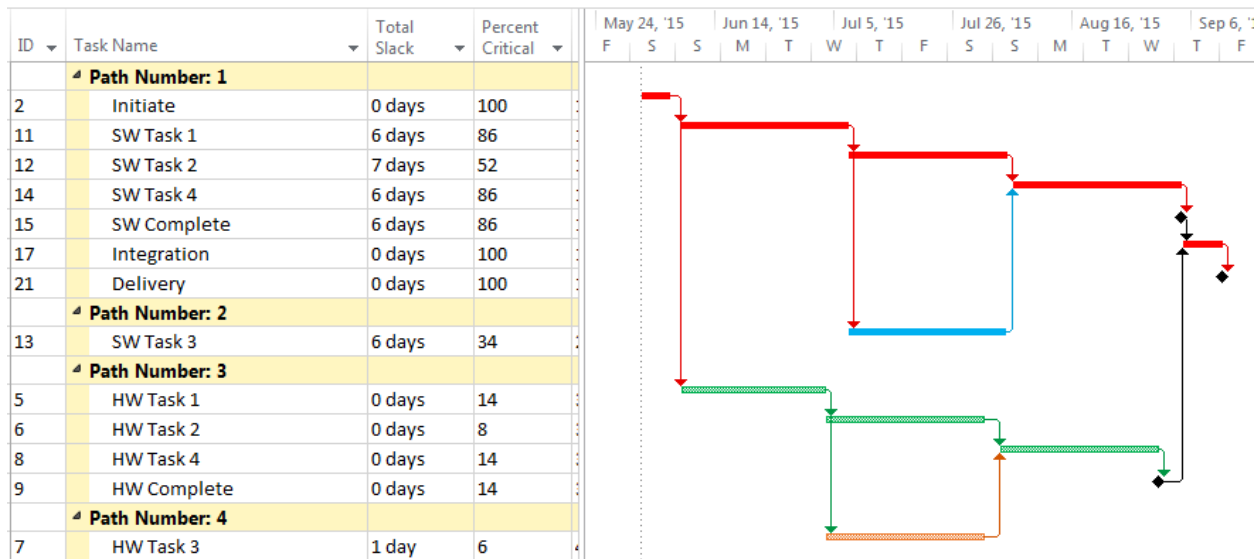


Figure 2

Note that while the tasks shown on Path Number 1 have more float than those in Path Number 3 they are more important to the project outcome after taking into account uncertainty.

The example in Figure 2 was produced in Microsoft Project by mapping the Full Monte Risk Path field to a Microsoft Project Custom Number field. For Primavera P6, a new integer user field called 'Full Monte Risk Path' is automatically created when risk analysis results are saved.

The path numbers will be calculated relative to the sensitivity target task selected in the risk analysis dialog.

Risk Path analysis can be used alongside traditional Sensitivity Tornado charts as an aid to understanding what is driving an outcome. Path analysis has the advantage that it will include tasks with no uncertainty provided they affect the outcome (are on the critical path) at least some of the time during the simulations.

Input Milestones

Many projects are dependent on external inputs from both clients and subcontractors. These are often modelled with an input milestone with a constraint/target date to represent the expected date of receipt. Until now it has not been possible to easily enter a range of dates during which the deliverable might be expected. With Full Monte 2017 the capability to enter a range of dates together with an uncertainty distribution has been added where a task is defined as a milestone, has a zero duration, and has a Start No Earlier (or similar) constraint/target date. Dates can be entered either in the spreadsheet or edit pane as shown in Figure 3.

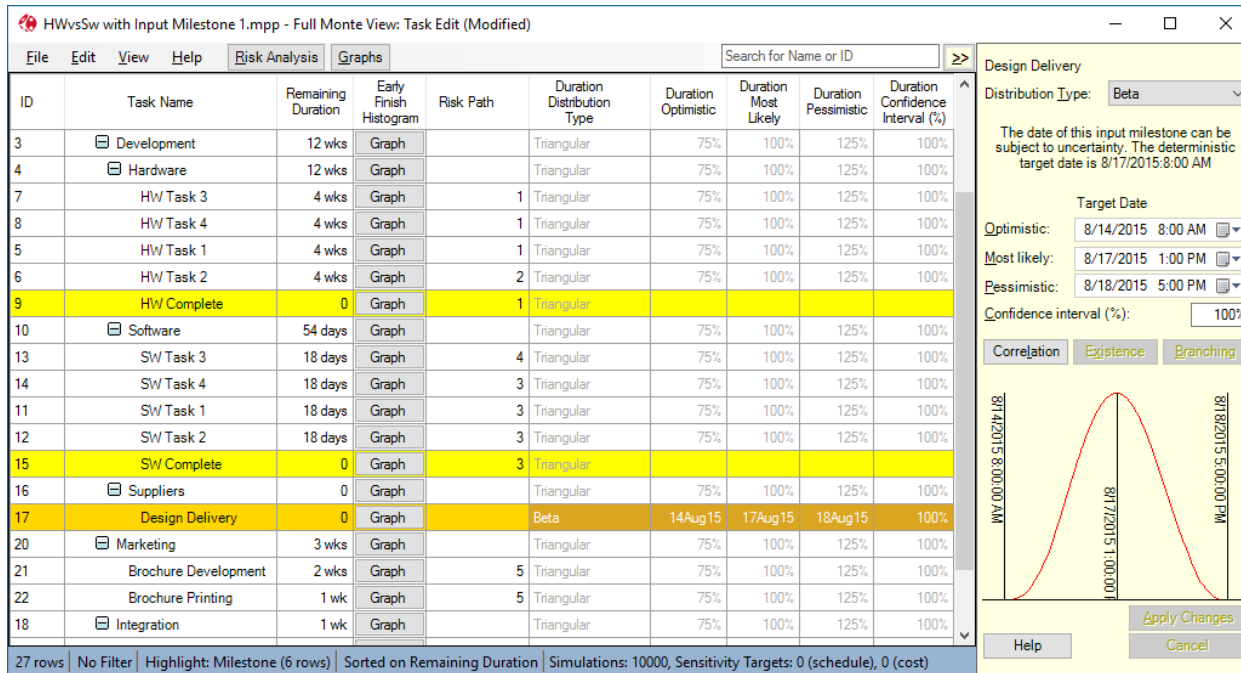


Figure 3

Task Existence

In previous versions of Full Monte, risks (threats) could be modelled by using Probabilistic Branching. While this was especially useful if a number of tasks were used to model the threat (or opportunity), the process was unnecessarily complex if the threat could be modelled with a single task.

Consider the example of making something, testing it, fixing if faulty and then delivering.

The Probabilistic Branching example is modelled with a 20% chance of executing successor Task 4 and an 80% chance of proceeding directly to Task 5 as shown in Figure 4.

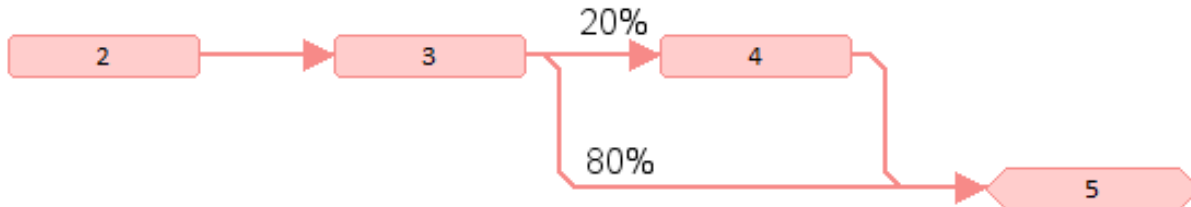


Figure 4

The Task Existence model is simpler with no additional logic as shown in Figure 5. Task 9 has a 20% chance of existing/occurring.



Figure 5

Full Monte 2017 allows both a simple probability of existence for a single task as well as a definition for a shared risk that can affect multiple tasks using a simple risk register.

When a task has a probability of existence specified (either directly or by a shared risk) then Full Monte will only consider it as affecting the outcome for the specified percentage of the simulations. For the remainder of the simulations it will be treated as a zero duration task with no cost impact.

The probability of a task existing (occurring) can be entered by clicking the 'Existence' button on the task edit pane or by adding the column 'Probability of Existence' to the spreadsheet as shown in figure 6.

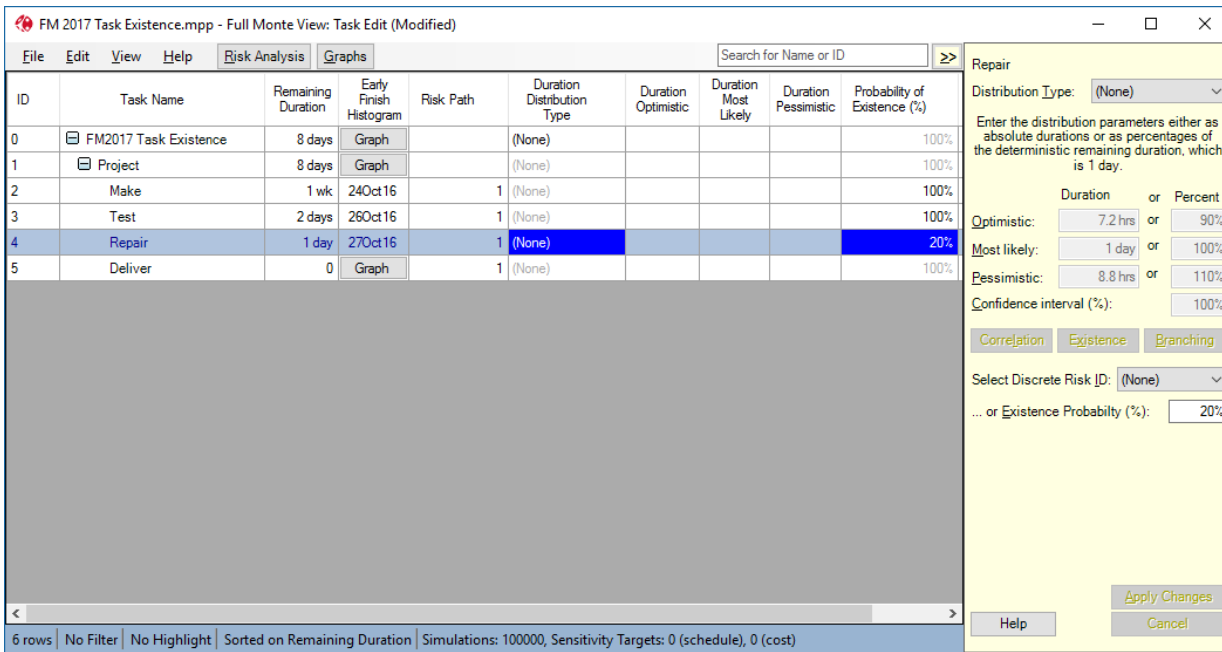


Figure 6

Note that probability of occurrence is independent of any duration uncertainty information assigned to the task. In the example above the only uncertainty is regarding whether items will fail testing. Duration uncertainty information, if specified, will only have any effect in the simulations where the task exists.

If the Discrete Risk ID is set to '(None)' then the Existence Probability is unique to the selected task however a shared risk can be defined under Edit, Manage Risks and selected from the drop down list as shown in Figure 7.

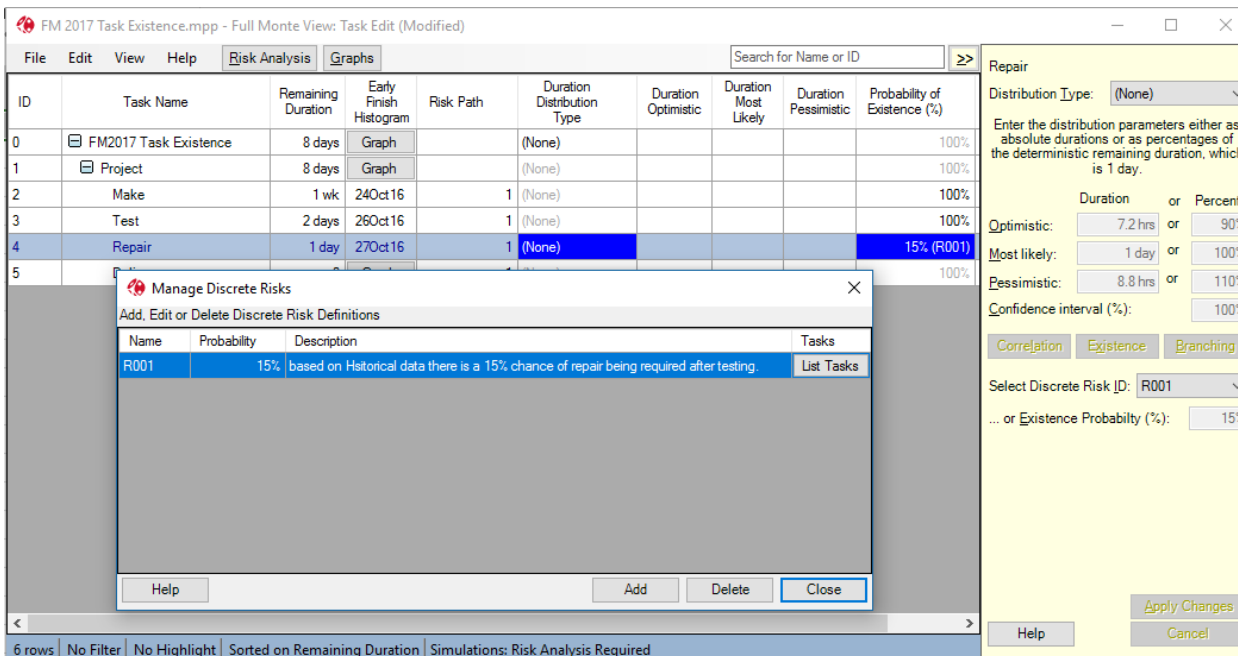


Figure 7

Note that the Probability of Existence column shows both the probability and the source risk ID.

Expected Cost Calculations in Full Monte 2017

The calculation of costs for tasks that do not always occur has been changed in Full Monte 2017. In earlier versions of Full Monte (2.x and 2016), the Cost Expected Value for tasks that did not always occur was not modified to take into account the tasks Percentage Active. So a Task with a budget cost of \$1,600 would display a Cost Expected Value of \$1,600 even if it was only active say 20% of the time. However, the cost rolled up to higher level summary tasks would be modified to reflect the percentage Active. In Full Monte 2017, the Cost Expected Value is modified by the tasks Percentage Active. Examples of previous and current results are shown in Figure 8.

Task Name	Duration	Start	Finish	Predecessors	Cost	Cost Expected Value (FM 2.1 and 2016)	Cost Expected Value (FM 2016 R1)
▸ Probabilistic Branching	8 days	Thu 4/21/16	Mon 5/2/16		\$6,400.00	\$5,120.00	\$5,120.00
Make	5 days	Thu 4/21/16	Wed		\$4,000.00	\$4,000.00	\$4,000.00
Test	1 day	Thu 4/28/16	Thu 4/28/16	2	\$800.00	\$800.00	\$800.00
Remedial Work	2 days	Fri 4/29/16	Mon 5/2/16	3	\$1,600.00	\$1,600.00	\$320.00
Deliver	0 days	Mon 5/2/16	Mon 5/2/16	3,4	\$0.00	\$0.00	\$0.00
▸ Probability of Occurrence	8 days	Thu 4/21/16	Mon 5/2/16		\$6,400.00	\$5,120.00	\$5,120.00
Make	5 days	Thu 4/21/16	Wed		\$4,000.00	\$4,000.00	\$4,000.00
Test	1 day	Thu 4/28/16	Thu 4/28/16	7	\$800.00	\$800.00	\$800.00
Remedial Work	2 days	Fri 4/29/16	Mon 5/2/16	8	\$1,600.00	\$1,600.00	\$320.00
Deliver	0 days	Mon 5/2/16	Mon 5/2/16	9	\$0.00	\$0.00	\$0.00

Figure 8

Note that the results shown in Figure 8 for Probability of Existence costs are simulated for earlier versions of Full Monte since they did not include that feature.

This change has one other effect, cost histograms for tasks that are not always active will now contain a bar for occurrences of zero cost as shown in Figure 9.

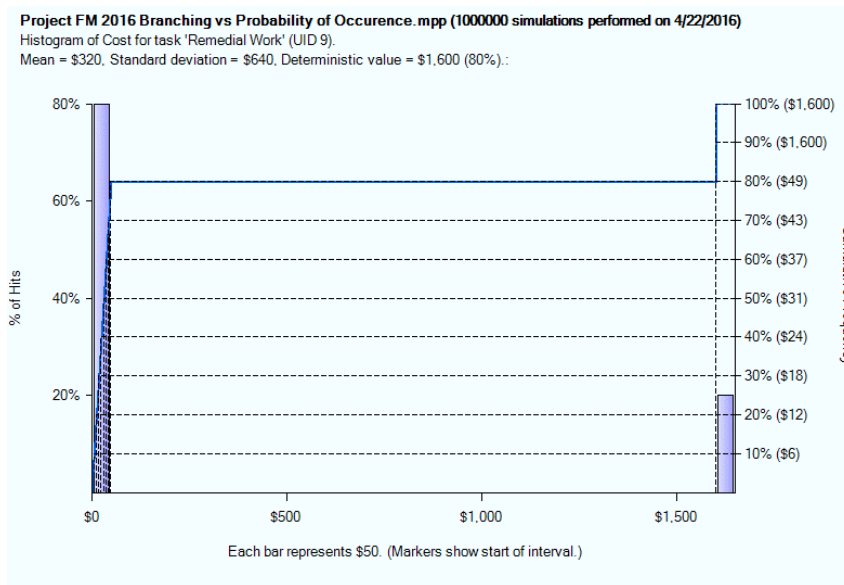


Figure 9

The graph shows that 20% of the time (left axis) the task cost (right axis) was \$1,600.

Note: The odd right Y-Axis values (\$12, \$18, \$24, \$31, \$37, \$43, \$49) are due to the fact that intermediate values are interpolated. The values are being derived as the S-Curve crosses the \$0 bar.

Filters & Highlights

Users can now select which tasks are displayed in tabular views and apply conditional highlighting. Please see the Full Monte User Guide sections 3.2 and 3.3 for details. The example shown in Figure 12 is highlighting any tasks where the Early Finish Percentile (80%) is later than a Task Deadline date.

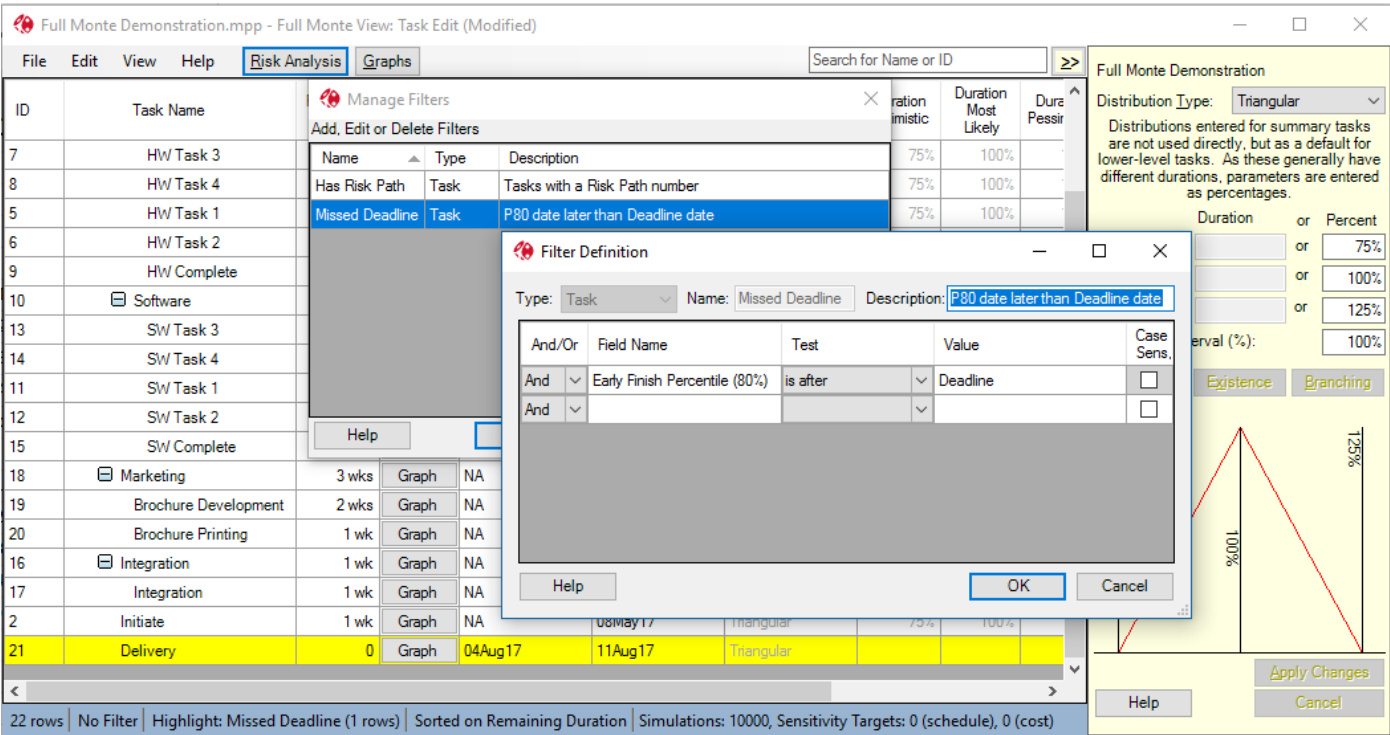


Figure 12

History Report

The history report, used to review past performance against estimated durations, now has an option to set boundaries for the data to be included. This allows unrepresentative outliers to be excluded and makes it easier to discern values that can be used for duration uncertainty on future work as shown in Figure 11.

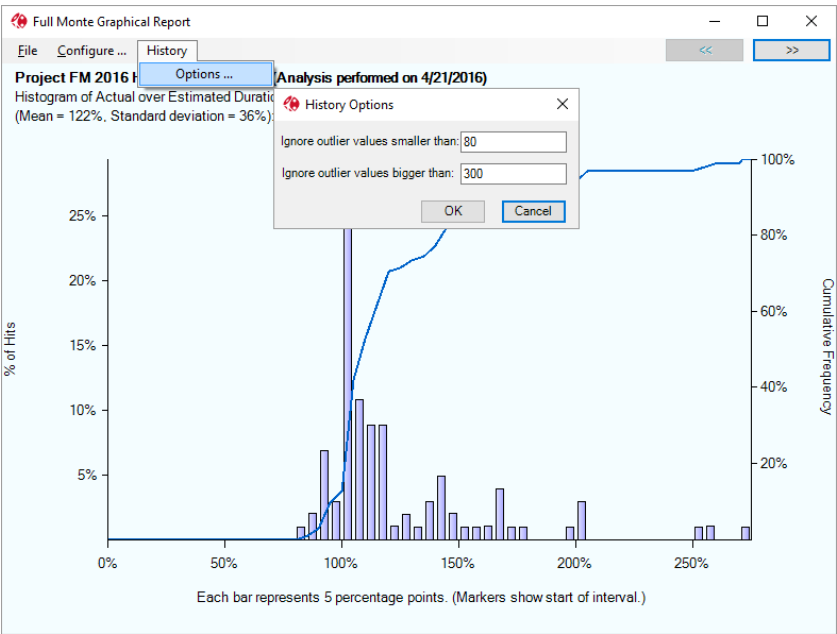


Figure 11

Enterprise Fields (Microsoft project)

When assigning Templates based on Custom Fields, Full Monte will now include any available Enterprise text fields in the menu as shown in Figure 10.

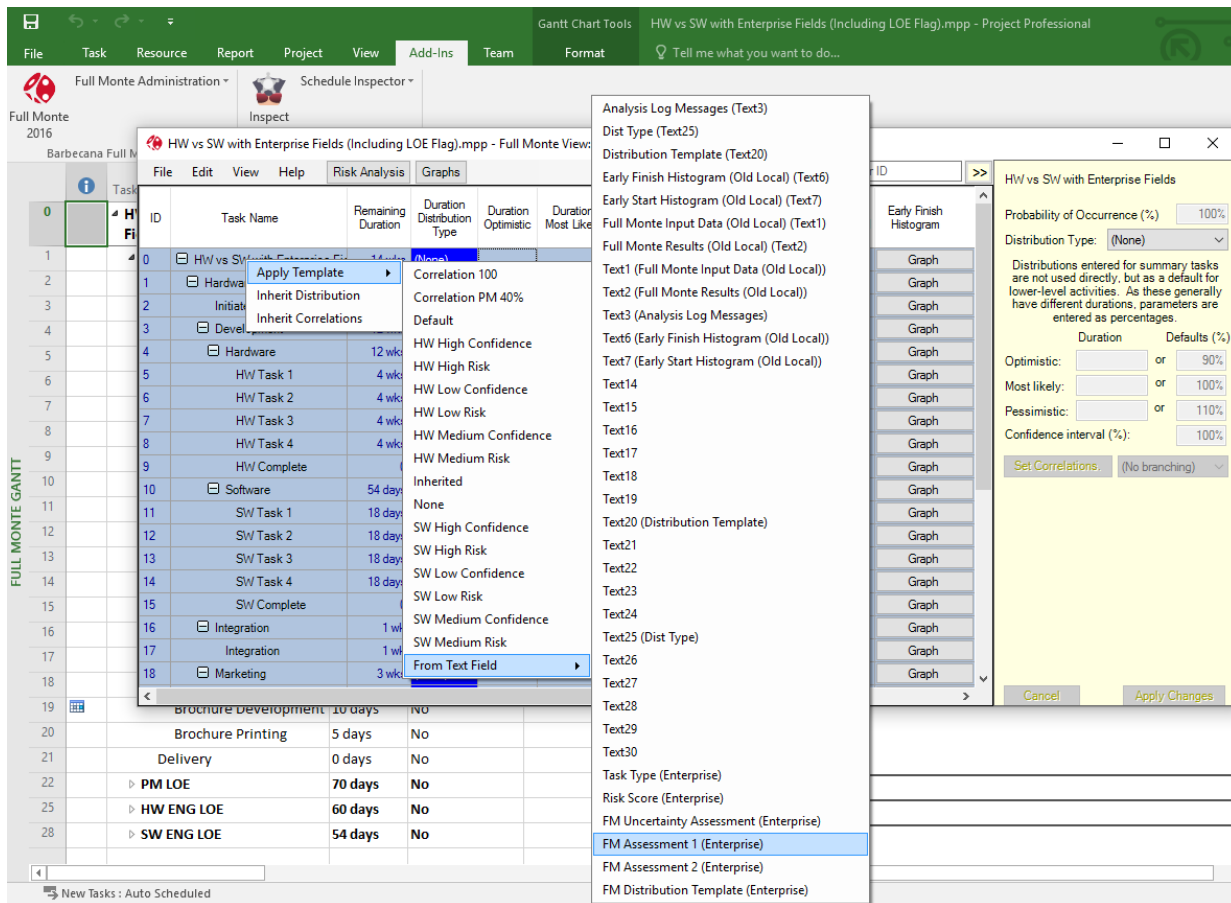


Figure 10

Level of Effort

While Primavera P6 has a special activity type (Level of Effort) to model overhead/support resources, Microsoft Project does not. This can lead to Level of Effort (LOE) support work being modelled using regular tasks. This can be hard to maintain, as the LOE duration must be manually adjusted to reflect changes to the underlying discrete work, and can result in LOE tasks being shown on the critical path. LOE tasks should not be on the critical path.

A Full Monte field called 'Level of Effort' can be mapped to a Microsoft Project Flag field to identify LOE tasks. The LOE task must be linked with Start-to-Start/Finish-to-Finish logic to the relevant start/finish of the discrete work. Full Monte will derive the duration of the LOE task from the underlying discrete work on each simulation and calculate costs accordingly. The Percent Criticality of the LOE task will be zero. For further information see Appendix F in the Full Monte User Guide.