Celeris *Systems*

Task Types
Duration, Work and Units
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1 Introduction

Microsoft Project allows tasks with fixed work, fixed duration, or fixed units. Many people ask questions about changes in these values when they change one of the other two parameters. This paper offers some insight into the behavior of Microsoft Project with respect to tasks.

It is assumed you have a working knowledge of Microsoft Project with an understanding of the terms units, duration, work, remaining work, remaining duration and status dates.

2 Summary

For those who just need the bottom line, the chart below will get you moving:

Celeris Systems

What Project Recalculates

Task Type Fixed:

You Change	Units	Units ED	Duration	Duration ED	Work
Units	Duration	Duration	Work	Work	Duration
Work	Duration	Duration	Units	Units	Duration
Duration	Work	Work	Work	Work	Units

ED: Effort Driven

3 About Tasks

3.1 General Information about Tasks

3.1.1   Task Types

Microsoft Project utilizes three different task types: Fixed Units, Fixed Duration, and Fixed Work. In addition to the three task types, fixed duration and fixed units may be effort driven, or not effort driven.

3.1.2   Effort Driven

Tasks that are of type fixed duration or fixed units may also be effort driven or non-effort driven:

An Effort Driven Task:
- Total task work remains at its current value, regardless of how many resources are assigned to the task.
- When new resources are assigned, remaining work is distributed amongst all assigned resources, proportionately.

3.1.3   Formula

Generally, the same formula is always used, you can solve the formula for any quantity desired. Work varies with assignment span (duration),

the number of resources assigned, and the assignment units for the assigned resources:

$$Work = Duration \times Resources \times Units\%$$

3.2 Fixed Units

3.2.1 Fixed Units non-Effort Driven

A resource unit is allocated as a percentage, 100% is one resource unit, 250% is 2.5 units. If the resource is a human, then 100% is one full time head as based on their resource calendar.

3.2.1.1 Changing Units (Fixed Units non-Effort Driven)

Adding resource units to this type of task will increase the amount of remaining work while holding duration constant. Remaining work is spread after the status date. Any new resources assigned will be spread from the status date forward without a change to task duration.

Removing resources from the task will remove remaining work from the task. If only one resource remains, and the units are decreased, task duration will start to increase while holding the work constant. For example, if a single resource is assigned at 100% for 5 days, work will be 40 hours. If the units are decreased below 100%, duration will rise.

3.2.1.2 Changing Work (Fixed Units non-Effort Driven)

Changing work (remaining work) for the task will hold resource units constant while duration will change as necessary to accommodate the

work. Newly added work that is entered in the left pane of the Gantt chart will be spread proportionately between the resources in accordance with the percentage units assigned. The capacity for each resource (such as hours per day) is respected.

3.2.1.3   Changing Duration (Fixed Units non-Effort Driven)

Changing the duration of a fixed units task causes recalculation of the remaining work of the task. Remaining work is calculated base on the duration and unit percentages assigned.

Work=Assignment Units*(Minutes/Day)*(Duration in minutes)
Note: The smallest unit of measure for work and duration is the minute. Microsoft Project maintains 2 digits of displayed accuracy so the smallest value that may be visible is 0.01 minutes (about 6 seconds).

3.2.2   Fixed Units – Effort Driven

3.2.2.1   Changing Units (Fixed Units – Effort Driven)

Altering the units will hold remaining work constant at a prior value while recalculating duration based on the new units assigned.

3.2.2.2   Changing Work (Fixed Units – Effort Driven)

Altering Work causes recalculation of duration while respecting the number or hours a resource has available for a given day. The work is distributed proportionately in accordance with the units percentages assigned to the task.

3.2.2.3   Changing Duration (Fixed Units – Effort Driven)

Changing the duration of a fixed units task causes recalculation of the remaining work of the task. Remaining work is calculated base on the duration and unit percentages assigned.

3.3 Fixed Work

3.3.1.1   Changing Units (Fixed Work – non-Effort Driven)

This combination is not possible, all fixed work tasks are effort driven.

3.3.1.2   Changing Duration (Fixed Work – non-Effort Driven)

This combination is not possible, all fixed work tasks are effort driven.

3.3.1.3   Changing Work (Fixed Work – non-Effort Driven)

This combination is not possible, all fixed work tasks are effort driven.

3.3.1.4   Changing Units (Fixed Work – Effort Driven)

Changing the work allocation units percentage will alter remaining duration while holding work constant. If units% is reduced below 100%, duration will increase. If units% is changed to above 100%, remaining duration may or may not change. The work assigned to a specific resource will remain constant. If other resources will hold the duration at the existing length then there will be no change. If there is only one resource and units are increased above 100%, the task duration will decrease.

3.3.1.5   Changing Duration (Fixed Work – Effort Driven)

Changing duration holds work constant while changing units allocation percentage for all assigned resources. The units allocation percentage will change only for the remaining duration.

3.4 Fixed Duration

3.4.1.1   Changing Units (Fixed Duration – non-Effort Driven)

Changing units percentage allocation changes remaining work for the altered resources while holding task duration.

3.4.1.2   Changing Duration (Fixed Duration – non-Effort Driven)

Changes to duration will alter remaining work for the assigned resources.

3.4.1.3   Changing Work (Fixed Duration – non-Effort Driven)

Changes to work (remaining work) will change the resource units' % allocation.

3.4.1.4   Changing Units (Fixed Duration – Effort Driven)

Changing Units' % will adjust remaining work for the changed resource. Adding new resources (an increase in unit %) will keep total work

constant while changing the remaining work and units' % for all resources.

3.4.1.5   Changing Duration (Fixed Duration – Effort Driven)

Changing duration will hold resource units' % constant will altering the remaining work for each resource.