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Manage > Lead > Govern
10 Fernwood Drive
San Francisco, CA 94127, USA
http://www.digitalcelerity.com

Microsoft Project™ with Clarity PPM™ Best Practices Paper

INTRODUCTION

Opening a Microsoft Project (MSP) project schedule that has been stored in Clarity is a simple task, but after inspecting the opened project the first impression may be surprise. What kind of surprises?" Well, when a project manager initially opens a project from Clarity into MSP, they may see that:

- The project finish date has slipped, or
- The total hours of work for the project, a phase, activity, or task have increased or decreased, or
- The task start date or finish date for one or more key tasks are earlier or later, or
- Tasks now are project milestones

These are a few of the many changes that may appear when a project manager opens their project schedule from Clarity.

MSP WORK AND DURATIONS

The main work equation in the Microsoft Project Scheduling Algorithm is:

Work = Duration x Units

Any updated value in this equation automatically changes another while the third value is fixed based on the preference of the user.

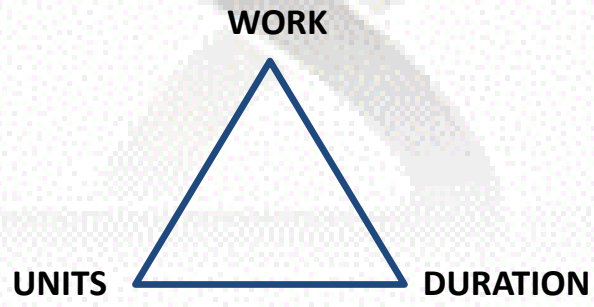

Figure 1: MSP Work, time, and assignment units' relationship

When Microsoft Project resolves the above equation, you may see unexpected results. For example, you have a 5-day fixed-duration task and you assign a resource for a workload of 80 hours, the Units value increases to 200% (80 = 40 x 2). Therefore, you should verify the calculations resulting from your data.

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Task Name	Work	Duration
⊟ Develop Business Case	40 hrs	5 days
PM	*40 hrs*	

Figure 2: Typical MSP task assignment with Units at 100% and Duration at 5 days = 40 hrs work

There are often misunderstandings about the meanings of the terms “duration” and “work”. A task has duration amount and work amount, which may not always be equivalent values.

- Duration is the total of active working time required to complete a task.
- Work is the total amount of work to be performed on a task, in the specified duration, by all assigned resources

For instance, a task may take 8 hours to perform but it can happen anytime in a 40-hour week. 8 hours is the Work amount while 40 hours is the duration.

Microsoft Project Term	**Definition**
Duration	The total number of business days required to complete a task. This is the number of business days from the start date to the finish date of a task.
Work	Work is the total amount of effort, measured in hours, scheduled to be expended in completing a task.
Units	Units represent the percentage of a resource assigned to a task.
Elapsed Duration	The amount of calendar time a task will take to finish
Remaining Work	Estimate to Complete. The additional hours required to complete the task.
Task Type	Work remains constant for **Fixed Work** tasks, regardless of changes in duration or the number of resources (assignment units) assigned to the task. Assignment units for **Fixed Units** tasks remain constant, regardless of the amount of work or duration on the task. Task duration remains constant for **Fixed Duration** tasks regardless of the number of resources (assignment units) assigned or the amount of work.
Split Tasks	When work on a task is interrupted, split tasks can be created to reflect the periods when work is and isn’t being performed.

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TASK TYPE = FIXED UNITS

There are three task types in Microsoft Project: **Fixed Units**, **Fixed Duration** and **Fixed Work**. These are key to the behavior of MSP when interfaced with Clarity.

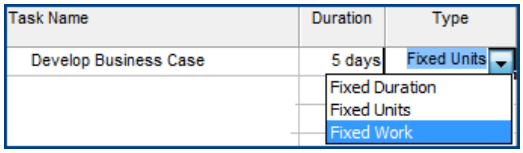

Figure 3: Selecting MSP Task Type

Fixed Units are the most commonly used task type. Use of the Fixed Units task type allows Microsoft Project to calculate ASAP Finish Date based on resource availability.

When a Project Manager assigns a resource to a task, the PM specifies the assignment units in the Units field of the Assign Resources dialog box. You can display the units by inserting the Assignment Units column to the Task View.

The Fixed Units task type dictates that the percentage of assignment units on a task remain constant regardless of changes to duration or work. This, for many Microsoft Project users, is the default task type because it's the task type that fits most project tasks. If you increase task duration, Microsoft Project will not require that you to find another resource or force a 50% resource to work 100% in an assignment.
Changes to a Fixed Unit task create these results:

- If you revise the duration, work also changes, and units are fixed.
- If you revise work, duration also changes, and units are fixed.
- If you revise units, duration also changes, and work is fixed.

TASK TYPE = FIXED WORK

The Fixed Work task type dictates that the amount of work on an assignment should remain constant regardless of changes to duration or units. When the Fixed Work task type is used, minimizing a task's duration is frequently the second priority, thus Assignment Units are adjusted to complete the task in the expected timeframe.

When a resource is assigned to a task, the task's duration is translated into work measured in hours. The Task Usage or Resource Usage views are the recommended views in which to display Fixed Work hours.

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Changes to a Fixed Work task create these results:

- If you revise the duration, units also change, and work is fixed.
- If you revise units, duration also changes, and work is fixed.
- If you revise work, duration also changes, and units are fixed.

TASK TYPE = FIXED WORK

The Fixed Duration task type is used when the priority is to maintain a constant duration while varying work and assignment units. To complete work, assign resource as needed to satisfy Finish Date.

Changes to a Fixed Duration task create these results:

- If you revise units, work also changes, and duration is fixed.
- If you revise work, units also change, and duration is fixed.
- If you revise the duration, work also changes, and units are fixed.

TASK WORK CONTOUR

When you assign a resource to a task, Microsoft Project applies, by default, a flat contour. A flat contour implies that the work is uniformly distributed across the task. This flat contour can be seen at all levels of detail and can be managed (added or subtracted).

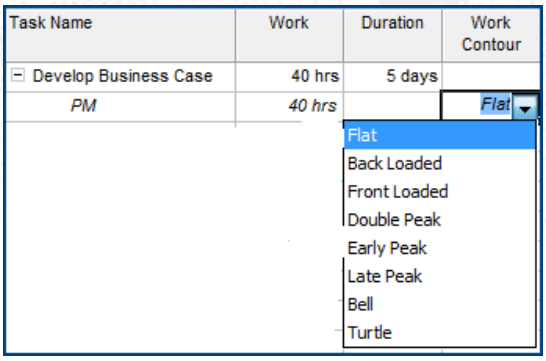

Figure 4: Selecting MSP Work Contour

It is important to remember, however, that Microsoft Project does not update the work contour so, for example, if 4 hours are removed from Tuesday, it does not mean 4 hours are automatically added somewhere else in the project.

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The Clarity Microsoft Project Interface maintains an assignment work contour. For example, “flat” assignments remain flat after having been saved to (and re-opened from) Clarity. The possible work contour values in Microsoft Project are mapped to the loading patterns in Clarity. (See the mapping below.) Those contours not supported in Clarity (such as “double peak” and “turtle”) are all mapped to the “Contoured” loading pattern. But even though they cannot be viewed in Clarity, they are maintained in the Microsoft Project file.

Note: If there is a contoured assignment with a gap (in working time) between the end of the actual work and the start of the remaining work, and either “Updating task status updates resource status” is not checked, or „Split in-progress tasks“ is checked, the work contour will be set to „Flat“.

Tip: Use Flat work contour as much as possible to reduce the time you spend updating the plan. Use other contour types to manage your resources more precisely.

Note: There is a notable performance advantage when assignments have a work contour that is not “contoured”. In the “contoured“ case, the distribution of remaining work must be set in Microsoft Project on a day-by-day basis. Note that actual work is always set in this way so projects with a high proportion of actual work will open more slowly than those projects with mostly remaining work.

TASK WORK CONTOUR MAPPING BETWEEN MSP AND CLARITY

When opening from Clarity:

- **Fixed** (Clarity) becomes **Contoured** (msp) Note: “Contoured” is not a preset work contour in MSP, but the resulting type when the assignment hours are edited in the calendar.
- **Uniform** (Clarity) becomes **Flat** (msp)
- **Front** (Clarity) becomes **Front** (msp)
- **Back** (Clarity) becomes **Back** (msp)
- **Contour** (Clarity) will map to whatever the Work Contour was in Microsoft Project when the project was saved (i.e. **Turtle**, **Bell**, etc.). Note that if the task is opened for the first time in MSP, it will be opened as **Flat**.

When saving to Clarity:

- **Back** (msp) becomes **Back** (Clarity)
- **Front** (msp) becomes **Front** (Clarity)
- **Flat** (msp) becomes **Uniform** (Clarity)
- **Contoured** (msp) becomes **Fixed** (Clarity)
- Any other Work Contour (e.g. Double Peak, Turtle, Early Peak, etc) becomes **Contour** (Clarity)

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SUMMARY TASKS AND DETAILED TASKS

Summary tasks facilitate a hierarchy and summarize related tasks in a task list (i.e. into a work breakdown structure). This is a convenient way to organize your project down to small pieces, making them easier to manage and view a collection of all sublevels at a glance.

Summary tasks represent a total of the project's phases and have no impact on the schedule.

However, in Microsoft Project these tasks can have a more active role than they do in Clarity; they can have dependencies and even assignments. Assignments made in this way never affect the task's duration, start or finish dates.

Tip: DO NOT assign dependencies to summary tasks or resources to summary tasks.

TASKS	SUMMARY TASKS	COMMENTS
Tasks have a variable duration and work, entered by the user or calculated from its assignments. Users can control these values.	Duration and work are "rolled-up" or aggregated from the task-level.	Do not link start and finish dates to phase, activity or the project.
Tasks have dependencies. If the duration changes, this may have an impact on successors' start dates.	Summary tasks DO NOT have dependencies.	Create your dependencies between tasks. Note: if you do create Summary Task dependencies in MSP, the CA Clarity PPM Interface will still save the project back to Clarity, but the Dependency will be removed .in Clarity.
Tasks have assignments. The user can enter tracking information against tasks. If actuals are entered before the task's start date or after the finish date, the duration is adjusted accordingly.	Summary tasks do not have assignments.	Note: If you add an assignment to the Summary Task in MSP and Save to Clarity, a CA Clarity PPM Interface error message prevents the changes from being saved to Clarity

MILESTONES

All milestones have NO duration.

Tip: Create a milestone by setting the duration to zero and not by checking the "Mark Task As Milestone" checkbox only.

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When you set the duration of the milestone task to zero, Microsoft Project will automatically check the box “Mark task as milestone”. If you check the box to set the milestone and allow a duration on the milestone, then you will see difference in the way Microsoft Project and Clarity handles it.

For example, a user creates a milestone task with a 3-day duration, and checks the “Mark task as milestone” checkbox. In this example, the milestone task starts on 3/1 and ends on 3/3

Microsoft Project will stick “the diamond” on 3/1 and will consider the milestone date to be 3/1. Clarity will mark the task as a milestone and consider the milestone date to be 3/3.

TASK CONSTRAINTS

There are two types of constraints: soft and hard.

- “Soft” constraints: Start No Earlier Than, Finish No Later Than, Start No Later Than, etc.
- “Hard” constraints: Must Start On, Must Finish On.

Task Name	Duration	Type	Constraint Type
Develop Business Case	5 days	Fixed Units	As Soon As Possible
Review Business Case	3 days	Fixed Units	
Approve Business Case	1 day	Fixed Units	
PROJECT APPROVED	0 days	Fixed Units	

As Late As Possible
As Soon As Possible
Finish No Earlier Than
Finish No Later Than
Must Finish On
Must Start On
Start No Earlier Than
Start No Later Than

Figure 5: Selecting MSP Constraint Type

Applying a constraint to a Finish date is equivalent to setting a deadline that the task cannot exceed. However, applying a constraint does not help keep your project dates on track. When the project is late, Microsoft Project shifts the tasks to the right. All the tasks move except the last milestone, which remains as originally scheduled as a result of the constraint. Therefore, when you first apply this type of constraint to a task, Microsoft Project displays the Planning Wizard to warn you of the possibility that this situation could occur.

NOTE: When you allow a milestone to shift, you can view the delays, and can then apply the proper solution to get the project back on schedule.

- Try not to use any constraints (other than the default As Soon As Possible).
- Try to use only soft constraints to the Start dates, such as Start No Earlier Than.
- Try to avoid hard constraints when possible. The tasks that must start or finish at a specified date are rare; most of the time, you can use the Start No Earlier Than constraint instead.
- Plan what you want to occur, rather than what you think will actually happen.

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Real Constraints in Microsoft Project override implicit constraints in Clarity. For example, a task has a “Start No Earlier Than” constraint for Monday and you change its start date in Clarity to Tuesday will result in Microsoft Project displaying the Monday constraint and schedule.

Tasks are rescheduled due to changing Project Start; a task is not constrained by the Project Start.

NOTE: The Project Start is changed in Clarity. When opened in Microsoft Project, the task will have no constraints and appear at the Project Start.

TASK DEPENDENCY AND LAG

'Elapsed' lags are interpreted as calendar-day lags. Example: A lag of "3ed" (3 elapsed days) from the finish of a task whose current scheduled finish is today (Friday) will push the successor to next Monday. But if you import and then export the Microsoft Project schedule from Clarity this dependency will be converted to "3d". This will cause the successor to be rescheduled to next Wednesday. For this reason, **do not use elapsed lags**.

Dependencies do not cause a recalculation in Clarity, but they do once they are exported to Microsoft Project. Example: The finish date of the predecessor task is changed in Clarity. If you look in Clarity at the successor task's start date, you will see it has not changed (and may be before the predecessor's date). But if you open the project into Microsoft Project, you will see the updated date because the recalculation in Microsoft Project is triggered in Microsoft Project upon exporting.

Clarity supports and synchronizes to minute-precise scheduling, but you cannot see the precision in Clarity. Edits in Clarity will cause them to “snap" to full day. Time units displayed are reset upon export from Clarity, to y/m/w/d/h/m with no space.

Authored by: Noland Eidsmoe, Project Management Practice Principal, Digital Celerity LLC

Digital Celerity LLC | www.digitalcelerity.com

10 Fernwood Drive, San Francisco, CA 94127

Phone: (408) 812-9999 | Fax (408) 516-8069 | Contact Us: Sales@DigitalCelerity.com

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