Integrating HP Project and Portfolio Management with Microsoft® Project

Version: 1.3
March 2009

Introduction:
HP Project and Portfolio Management (PPM) provides enterprise level project management capability, including visibility into multiple projects, staff profiles, resource-project breakdowns, time management, and a strict process oriented approach to managing projects. The integration with Microsoft Project provides users with the ability to leverage their experience and capabilities to get projects up and running swiftly, while using PPM's collective capabilities, such as time and resource management, to ensure process control and visibility across projects and across the enterprise.

Users may prefer to use Microsoft Project Management to create or update workplans off-line, for resource leveling, or for comfort if the users are more familiar with Microsoft Project. Using the integration between Microsoft Project and PPM allows the benefits of both applications to work in concert.

This paper describes the built-in capabilities of PPM 7.x to integrate with Microsoft Project 2002 Standard or Professional, Microsoft Project 2003 Standard or Professional, or Microsoft Project 2007 Standard or Professional. Expanding on the standard product documentation, this paper helps Project Managers gain a more detailed understanding of the integration process. Major topics include an overview of how the integration works, how to select an appropriate synchronization mode, and answers to frequently asked questions (FAQ) about integrating PPM with Microsoft Project.

This paper assumes that readers have a good understanding of both PPM and Microsoft Project. Before reading this paper, please familiarize yourself with the standard product documentation on the integration process, found in the "Integrating HP Project Management with Microsoft Project" chapter of the *HP Project Management User's Guide*. Topics such as system requirements and setup steps are covered in the chapter. If you are a newcomer to Microsoft Project, you will also want to review introductory documentation on Microsoft Project.

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1 How the Integration Works

To provide an understanding of the basics of the integration process between Project Management and Microsoft Project, the following sections describe:

- How projects in one application are associated with projects in the other application
- Mapping of fields between the two applications
- Different synchronization modes used during integration

1.1 Project-to-project Association

Each PPM project is associated with a particular Microsoft Project file throughout the project life cycle. This association starts when one project is used to create the other project. This can happen in either direction - the Microsoft Project file can be opened as a new PPM project, or a PPM project can be synchronized into a new Microsoft Project file. The Project Manager periodically brings the association up to date by synchronizing the two projects with each other.

At this high level, the integration is similar to using the Windows briefcase to synchronize local files on a laptop computer with the reference copies on a network drive, or to synchronizing a PDA device (such as a Palm Pilot) with its desktop application. There is a persistent relationship between information on each side of the integration, but the information on both sides is only brought up to date when the synchronization is run.

Note that this is a one-to-one association. Since PPM is a distributed application (as opposed to a desktop application like Microsoft Project) there are some subtleties to this relationship. Each PPM project is associated with a particular Microsoft Project file at a particular directory location. This can either be a location on the local hard drive or a location on a shared network drive, but there is always a specific location and Microsoft Project filename associated with each PPM project.

1.2 High Level Data Map

Table 1 provides a high-level summary of the way in which the integration maps information between projects in the two applications. The PPM field names are shown with their corresponding field names in Microsoft Project. Any additional information that would be useful to a Project Manager, especially in the treatment of project actuals by Microsoft Project, is in the Notes column of the table. See "Tracking Project Actuals through the Integration" later in this document for more information.

Table 1 Mapping Fields between PPM and Microsoft Project

PPM field	Microsoft Project field	Notes
Planning Information		
Task name	Task name	
Resources	Resources	Microsoft Project resource names are matched with PPM user accounts.
Predecessors	Predecessors	For all predecessor relationships.
Constraint type/date	Constraint type/date	For the constraint types supported by both applications.
Scheduled start date	Start	
Scheduled finish date	Finish	
Scheduled duration	Duration	Microsoft Project recalculates to make sure the start/finish/duration are in sync, but duration is not always changed. For example, if the task is 'fix duration', only the start/finish dates are changed.
Scheduled effort	Work	Days of scheduled effort are converted to hours of work using the Microsoft Project setting for "Hours per day" in Tools-Options-Calendar.
Scheduled effort/Resource Assignment	Work/Resource Assignment	For tasks with more than one assigned resource, the portion of the effort (work) assigned to each resource is synchronized.
Milestones	Milestones	Milestones received from Microsoft Project must be manually set to 100% Complete. Milestones sent from PPM behave normally in Microsoft Project.
Actuals Information		
Percent complete	Percent complete	Microsoft Project is configured by default to equate Percent Complete and Percent Work Complete.
Actual start date	Actual start	Microsoft Project defaults Start to Actual Start when this date is known.
Actual finish date	Actual finish	Microsoft Project defaults Finish to Actual Finish when this date is known.
Actual duration	Actual duration	Microsoft Project recalculates

		Actual Duration from the Actual Start and Actual Finish dates.
Actual effort	Actual work	When any effort metric is tracked in PPM, the default link in Microsoft Project between Percent Complete and Percent Work Complete is disabled.
Estimated finish date	Finish	Microsoft Project does not track an Estimated Finish as a distinct field from the scheduled Finish. The Baseline feature can be used to capture the original Finish date for variance reporting purposes.
Estimated remaining effort	Remaining work	
User defined field	Custom field	Both Microsoft Project and PPM (from version 7.5) have special fields for user specified information. PPM can define a map between a subset of these user defined fields to use in synchronization.
Activity field	Custom field	Microsoft Project does not have an Activity field like PPM. As of PPM 7.1 SP9, this field in PPM can be mapped and synched to a custom field in Microsoft Project
Notes	Notes (for tasks)	The ability to map and synchronize the Notes field has been added in PPM 7.1 SP9.

1.3 Synchronization Modes Explained

When the Project Manager performs a synchronization, information in the PPM project is used to bring the Microsoft Project up to date, and vice versa. But what information is used, and how? The answer depends on the synchronization mode selected for that PPM project.

To understand what a synchronization mode means, we need to understand the way that the integration categorizes project information. This is because the synchronization mode determines what will happen to each category of information during the synchronization. The integration classifies project information into the four categories described below. A summary of categories by synchronization mode is provided in Table 2.

1.3.1 Information Specific to either PPM or Microsoft Project

The first two categories are information that is distinct to either PPM or to Microsoft Project. For instance, a task in PPM can contain references to other PPM information, such as Requests and Packages. There is no equivalent type of information in Microsoft Project. Conversely, the resource cost rates in a Microsoft Project file have a different definition and concept from those in PPM, so those are not part of synchronization.

All synchronization modes treat these two categories of information in the same way: the information is not altered. If the information existed prior to the synchronization, then the synchronization will not change or delete the information. The exception to this rule is when a task is deleted during the synchronization. In that case, all information associated specifically with that task will be deleted.

1.3.2 Information Shared in Common by PPM or Microsoft Project

The remaining categories consist of information that is tracked by both applications. These are project planning information and project actuals information. This shared information is handled differently depending on the synchronization mode selected.

The project planning information is the information determined before work begins on a task. This category includes the names, sequence, and level of indenture of tasks (the work breakdown structure.) Planning information also includes the assigned resources, scheduled start and finish dates, scheduling constraints, and the scheduled duration and scheduled effort.

Project actuals information is the collection of metrics detailing how much time and effort are actually required to complete tasks. This category includes actual start and finish dates, actual durations of tasks, and actual effort. Actuals information also includes each of the related estimated totals and estimated remaining values: percent complete, estimated finish date, estimated effort remaining, etc.

1.3.3 Categories of Information by Synchronization Mode

Table 2 summarizes how each category of information is treated during the synchronization. The *HP Project Management User's Guide* chapter entitled "Integrating HP Project Management with Microsoft Project" explains in detail how the PPM interface changes, depending on the synchronization mode, to support the flow of information between the two projects.

Table 2 Categories of Information by Synchronization Mode

	PPM controls all shared workplan information	Control is shared	Microsoft Project controls all shared workplan information
Information in PPM only	Not altered	PPM dependencies on external tasks will not be preserved with synchronization	PPM dependencies on external tasks will not be preserved with synchronization
Information in Microsoft Project only	Not altered	Not altered	Not altered
Planning information	PPM information used to update Microsoft Project	Microsoft Project information used to update PPM	Microsoft Project information used to update PPM
Actuals information	PPM information used to update Microsoft Project	PPM information used to update Microsoft Project	Microsoft Project information used to update PPM

2 Choosing the Right Synchronization Mode

Not all Project Managers will want to use PPM and Microsoft Project together in the same way. The integration process offers a choice of three synchronization modes.

Each PPM project can have a different synchronization mode. This allows each Project Manager to use the interface differently, or even for a single Project Manager to manage two projects differently.

On the other hand, there are benefits to an organization from standardizing on the use of synchronization modes. For instance, if all projects are synchronized with Microsoft Project in the same manner, external stakeholders can have the same expectations about the timeliness of the project information presented in the PPM Dashboard.

In general, if the user prefers to use Microsoft Project for project planning, either the "Microsoft Project controls all shared workplan information" or "Control is shared" setting should be used. If the user prefers Microsoft Project, but Time Management needs to be used, then the "Control is shared" mode is recommended. Otherwise, the "PPM controls all shared workplan information" is the recommended choice of mode.

The following examples illustrate different methods of integrating the two applications with different synchronization modes, depending on the strategy adopted by the Project Manager.

2.1 Plan a new PPM project based on a previous Microsoft Project plan

A Project Manager who is planning a new project may want to create the plan using PPM, but use a previous project as a starting point. The Project Manager can use the

integration to open this old Microsoft Project file. When opening the project, the Project Manager should select the 'PPM controls all shared workplan information' synchronization mode since all subsequent project planning will be performed inside PPM. The new PPM project will be placed in the 'In Planning' project state, and the Project Manager can rework the project as desired.

Planning the project in PPM gives the Project Manager an opportunity to become familiar with the PPM features that will be new to him or her, such as task states and references from tasks to Demand Management Requests. If the Project Manager wants to see or present the project in the familiar Microsoft Project views, the modified plan can be put back to Microsoft Project by synchronizing in 'PPM controls all shared workplan information' synchronization mode.

2.2 Gradual conversion - display active projects in the PPM Dashboard

For active projects, a Project Manager may want to make a gradual transition to PPM. If the stakeholders and participants are not yet familiar with PPM, this is usually the best choice. When opening the project, the Project Manager will select the 'Microsoft Project controls all shared workplan information' synchronization mode. This means that the project plan will be presented to stakeholders and participants in the PPM Dashboard, but PPM will not allow the project plan or actuals to be directly modified through PPM.

During the initial synchronization, the Project Manager will be notified of any synchronization errors through a pop-up screen. Any warning or informational level messages can be recorded to a log file by selecting the "Enable all information-level tracing" from the PPM menu in Microsoft Project.

The integration attempts to match Microsoft Project resource names to PPM users in three different ways. The order of precedence of resource mapping is username, then full name in "First Last" order, and finally full name in "Last First" order. (Note that Microsoft Project does not allow resource names containing the comma character.)

This order of precedence means, for instance, that when a resource name matches a PPM user by username, the interface does not attempt to match by full name.

Upon the first synchronization, or when a new resource is added to Microsoft Project, a resource mapping dialogue will be presented to the Project Manager. This dialogue will show all the automatic resource mappings between PPM and Microsoft Project based on the criteria described above, and will provide an opportunity to confirm these mappings. The dialogue also allows the creation of resource mappings for resources that PPM was not able to assign automatically, and also the ability to modify any automatic resource mappings if that is desired. This dialogue will not be available for 'PPM controls all shared workplan information' projects.

This is also a good opportunity to familiarize participants and stakeholders with the presentation of the project in the PPM Dashboard, and to make any desired adjustments to the configuration of the PPM project. The Project Manager can synchronize the project as often as required to bring PPM up to date with changes made in Microsoft Project. The Project Manager can also change the synchronization mode to one of the other available modes, however, this ability is provided as option for one-time correction

of the Project mode, and data loss can result if the synchronization mode is modified. The other synchronization modes are discussed in the following sections.

2.3 Convert active projects from Microsoft Project to PPM

If stakeholders and participants are familiar with PPM, the Project Manager can transition all project planning and tracking to PPM. The Project Manager can also decide to transition only the tracking of actuals to PPM.

To transition the tracking of actuals to PPM, the Project Manager will select the 'Control is shared' synchronization mode. This means that project participants, in addition to seeing their task assignments, can enter actuals for these tasks using PPM. PPM will not allow the project plan (structure, schedule dates, etc.) to be modified through the PPM interface.

A project manager who is managing a project using the 'Control is shared' synchronization mode for the first time will want to collect only a few actuals. Collecting only a few fields mitigates the risk of mistakes while the Project Manager and resources are becoming familiar with both the integration and a new way of tracking project work in real time. More actuals fields can be enabled in PPM later.

The Project Manager may instead choose to transition all activities into PPM immediately. In this case, the Project Manager will open the project using the 'PPM controls all shared workplan information' synchronization mode. The integration recalculates the durations of each task, keeping the start and finish dates the same, to reconcile with PPM base calendar and resource calendars. This recalculation prepares the project to be rescheduled using the PPM duration-based scheduling algorithm. The project will initially be placed in the 'Plan' project state. Once the Project Manager has visually compared the converted project to be sure the dates are correct, the project should be moved to the 'Active' state.

2.4 Augment Microsoft Project with the PPM Dashboard

Some Project Managers who are accustomed to planning and tracking projects using Microsoft Project will want to continue to do so. This strategy is similar to that of gradually converting from Microsoft Project to PPM, but in this case we consider those Project Managers who do not wish to eventually make a full conversion. These Project Managers can leverage the PPM Dashboard as a way to publish project information to stakeholders and resources. By synchronizing their Microsoft Project file into PPM, the Project Manager automatically presents project overviews and task assignments to interested parties.

When using the integration in this way, the Project Manager may need to set stakeholders' expectations about project information in the PPM Dashboard. Unlike projects controlled by PPM, the project status information presented in the PPM Dashboard will not always be current. For example, the Project Manager could collect and enter project actuals into Microsoft Project on a weekly basis, and then synchronize the projects. This means that the project information presented in the PPM Dashboard may be up to a week out of date. Project Managers may want to make sure that stakeholders have appropriate expectations to avoid miscommunications.

Using this strategy, Project Managers do not want to allow project resources to enter actuals directly. The Project Managers prefer to collect actuals information from their resources (verbally or by email) and then enter that information into Microsoft Project personally. Likewise, the Project Manager will not want to allow changes to the project planning information in PPM.

To enforce these constraints, the Project Manager selects the 'Microsoft Project controls all shared workplan information' synchronization mode when synchronizing the Microsoft Project file into PPM. The previous discussion of resource naming and matching (in the conversion strategies) applies to this strategy also.

2.5 Augment Microsoft Project by Collecting Simple Actuals with PPM

A Project Manager may want to use advanced Microsoft Project planning functionality (resource leveling with a shared resource pool, for instance) while providing real time visibility to stakeholders and collecting actuals directly from resources. The 'Control is shared' synchronization mode supports this style of integration.

When starting to use the 'Control is shared' synchronization mode, a Project Manager should try to "keep it simple" by enabling only a few straightforward actuals fields to be collected through PPM. Resources should be asked to focus on updating the state of their PPM tasks from "Ready" to "In Progress" and then to "Complete" in a timely manner. If early or late starts and finishes are common, the Project Manager may choose to enable these actual fields, to allow resources to directly communicate when work actually occurred. If these are uncommon events, the Project Manager may prefer to track these exceptions personally by changing the start and finish dates in Microsoft Project, avoiding the possibility of resources entering incorrect dates as they learn to use a new way of project tracking.

The 'Tracking Project Actuals through the Integration' section of this paper discusses in detail why keeping it simple is a good way to start, but we offer a few of the highlights here. First, few resources will be accustomed to reporting their progress in a timely fashion. Further, although a Project Manager is used to thinking about tasks in terms of the time or duration worked, percent complete, remaining work, and so forth, most resources will not be as familiar with these concepts. These metrics have nuances with which the Project Manager is familiar (for instance, is percent complete a duration or effort metric? Does actual duration include non-working days?) The Project Manager will want to be judicious in planning how many of these concepts to introduce, and how quickly.

2.6 Augment Microsoft Project by Collecting Complex Actuals with PPM

Once the Project Manager has become familiar with how the integration operates in the 'Control is shared' synchronization mode, and has educated the Project Team on how to understand and report task actuals, the Project Manager may want to collect a richer set of actuals. Many actuals, such as actual work performed, are a key to understanding performance and making progressive improvement.

In addition to the observations in the previous section about how to begin working in the 'Control is shared' synchronization mode, the Project Manager will want to review the later section of this paper on tracking actuals through the integration. A guiding observation to keep in mind is this: through the integration, resources entering actuals into PPM will behave in a very similar fashion to the Project Manager typing the same information directly into the associated field of Microsoft Project.

Microsoft Project offers a wide range of actuals fields, which are tightly interrelated by automatic data integrity rules. Most Project Managers do not take the time to completely learn all of these automatic data integrity rules. Instead, they learn how to track the information that matters to them by making entries into only a few fields. When using the integration to track actuals through PPM, these are probably the fields that the Project Manager will want to enable in the PPM Dashboard.

3 Answers to Frequently Asked Questions

This section of the document answers many of the questions and problems that may occur when integrating PPM with Microsoft Project. You will probably encounter only a few of these questions in any particular implementation. Some questions address cases where the operation of the integration depends on detailed functionality in one of the two applications that users infrequently encounter.

3.1 General

General questions, including those that relate to several synchronization modes or business scenarios, are part of this category.

3.1.1 How does PPM communicate with Microsoft Project?

PPM communicates with Microsoft Project through a plug-in for Microsoft Project. This plug-in allows communication to occur between Microsoft Project and the PPM Server. The plug-in communicates using XML over HTTP or HTTPS using the same port as the web interface. There is no special installation required to enable connectivity, other than installing Microsoft Project and the PPM plug-in on the computer where the integration activities will be performed. PPM uses the Microsoft COM interface to launch Microsoft Project from a link in the PPM interface. To enable this capability, ActiveX must be properly configured in the web browser being used to access PPM. In previous versions of PPM, the plug-in has been a combination of a Visual Basic DLL and a macro. Due to issues with the macro, as of PPM 7.1 SP9, the plug-in will consist only of the DLL without a macro.

3.1.2 What are the browser security requirements to enable integration?

PPM uses an ActiveX control to provide some of the functionality for the integration with Microsoft Project. This requires following web browser settings to be enabled on the client:

- *Initialize and Script ActiveX controls not marked as safe*

This setting is required to initialize the **MSProject.Application** ActiveX control. This ActiveX control is supplied by Microsoft with the Microsoft Project client installation and

is used to open Microsoft Project on the client machine from the browser. All other functions regarding the Microsoft Project Integration are performed by the PPM Microsoft Project Plug-in which runs within Microsoft Project. The Plug-In is used to synchronize projects with Microsoft Project. The user's web browser can also call the plug-in functions through the ActiveX control to import a project into Microsoft Project.

In secure environments the required web browser settings may not be allowed on client machines. In such environments the risk can be mitigated with one of the following options:

1. Customers may enable this setting only for the 'Trusted sites' zone and not in the 'Internet' zone. The server hosting the PPM application needs to be added to the 'Trusted sites' zone.
2. Users may manually open the Microsoft Project project file. All the Microsoft Project Integration features will still be available from the Microsoft Project menus. However, the user cannot use the link in a PPM work plan to open the associated Microsoft Project project file on the client machine.

3.1.3 Does the interface update PPM or Microsoft Project custom fields?

Both PPM and Microsoft Project have custom field functionality. As of PPM 7.5 a user can map a custom field in Microsoft Project with a user data field in PPM in order to exchange the data in these fields during synchronization.

3.1.4 Does the interface update PPM or Microsoft Project task notes?

Both PPM and Microsoft Project have task notes functionality, and the functionality to sync them is now available in PPM 7.1 SP9. Synchronization of task notes can happen in either direction, but can only happen in one direction at any given time based on the project settings.

3.1.5 Can I change my synchronization mode once I've assigned it to a project?

While PPM does allow you to change the synchronization mode of a project at any point, it is strongly recommended that this not be done. This ability is provided as option for one-time correction of the Project mode, and data loss can result if the synchronization mode is modified. Careful consideration of the synchronization mode that will best suit a project before it is created will ensure the smooth operation of the synchronization functions and prevent possible data loss.

Data loss when changing synchronization mode falls into two categories: Active loss and Passive loss. Active loss occurs when data that was synchronized in the previous mode is not synchronized in the new mode, and that data could be lost or overwritten. Actuals data is the most vulnerable to this type of loss. Passive loss occurs when synchronization does not happen immediately before a synchronization mode change occurs. In this case, data that was entered since the last synchronization may be overwritten or discarded during synchronization in the new mode.

3.2 How PPM information is synchronized into Microsoft Project

Questions in this category are related to how the information in a PPM project is represented after being synchronized into a Microsoft Project file. The information can be sent out during a synchronization of changes to the PPM project. Most answers in this section apply to the 'PPM controls all shared workplan information' synchronization mode.

See "Tracking Project Actuals through the Integration" for more information about how actuals are handled in the 'Control is shared' synchronization mode.

3.2.1 How are PPM predecessor relationships synchronized?

All PPM predecessor relationships are synchronized. The master project in PPM is sequence one, while the root task grouping in Microsoft Project is sequence zero. Because the two applications number the tasks differently, the exact predecessor numbers will all decrease by one in Microsoft Project. However, the relationships are identical.

3.2.2 How are PPM scheduling constraints synchronized?

Both PPM and Microsoft Project represent a scheduling constraint using two kinds of information: a constraint type and a constraint date. Some constraint types (for example, 'as soon as possible') do not require a constraint date. All PPM scheduling constraints are synchronized to Microsoft Project.

3.2.3 Are all types of PPM references allowed?

All types of references are allowed in any synchronization mode. However, Microsoft Project does not include the concept of references, so they will not be synchronized to Microsoft Project.

3.2.4 How are cancelled or bypassed PPM tasks synchronized?

Microsoft Project has a simpler task state model than PPM. For instance, in Microsoft Project all unstarted tasks share a common state. Microsoft Project does not clearly distinguish between tasks that are pending predecessors, tasks that are ready, and tasks in progress where no percent complete has yet been reported. This is a consequence of the assumption that task actuals are not entered into Microsoft Project in real time.

Microsoft Project also does not have distinct states to recognize tasks that have been cancelled or bypassed. When a cancelled or bypassed PPM task is synchronized, the keyword 'Cancelled' or "Bypassed" is pre-pended to the task name in Microsoft Project to clearly indicate the task state.

Bypassed tasks are synchronized as 100% complete. If any actuals were reported, this information is also synchronized. The bypassed state indicates that some effort may have been spent, but that work was discontinued.

Cancelled tasks are synchronized as 100% complete and with zero duration. Microsoft Project automatically omits these tasks from the Gantt Chart view.

3.2.5 How can an unscheduled PPM project be synchronized to Microsoft Project?

Microsoft Project is usually used in the 'automatic' calculation mode. In this mode, when a predecessor or constraint is defined, tasks are immediately shifted to comply with the constraint. PPM instead evaluates scheduling constraints selectively, when the Project Manager chooses to schedule all or part of the project. This means that the Project Manager may choose to leave the project dates out of compliance with a defined scheduling constraint, instead of requiring the Project Manager to adjust the project plan definition to satisfy the tool.

In order to accommodate the PPM project information, the integration automatically places Microsoft Project into the 'manual' calculation mode. This change only occurs when synchronizing a project in the 'PPM controls all shared workplan information' mode. In this calculation mode, Microsoft Project will not force the project dates to meet its scheduling rules for task relationships.

To later change the calculation mode of Microsoft Project, use the menu selection '**Tools** | **Options**' and select the **Calculation** tab.

3.2.6 Why are the scheduled dates in Microsoft Project sometimes different than in PPM?

In PPM, a task can have actual start and finish dates that are earlier or later than the planned dates. In Microsoft Project, on the other hand, these actual dates will override the respective scheduled dates. For example, if a task was scheduled to start on May 1st but is reported to have actually started on May 2nd, Microsoft Project automatically changes the task start date to May 2nd.

When PPM tasks with actual dates are synchronized, Microsoft Project applies these rules to the task data. For this reason the scheduled dates in Microsoft Project may not be identical to the dates in PPM.

3.2.7 Are PPM resource calendars synchronized?

Although resource assignments to tasks are synchronized, the calendars of these resources are not synchronized from PPM.

You do *not* need to maintain resource calendars in both applications. Differences in resource calendars can result in discrepant task durations. (See the following question and answer for details.) The start and finish dates, however, will be accurate in the synchronized Microsoft Project file.

3.2.8 Why are task durations in Microsoft Project sometimes different than in PPM?

When PPM task data is synchronized, the highest priority is given to keeping the start and finish dates identical. In most cases, the duration will also be identical. However, Microsoft Project will always recalculate the duration of each task based on the start and finish dates and the Microsoft Project resource calendars. As a result, there may be some discrepancies.

Usually these discrepancies arise from differences in the resources calendars in the two applications. Note that PPM resource calendars are not synchronized with Microsoft Project resource calendars. For example, the Microsoft Project duration would be longer if some of the intervening days were recognized as non-working time only in PPM.

3.2.9 How are Microsoft Project resource units for task assignments determined during synchronization?

In PPM, each resource on a task may be assigned different hours of effort for that task. The total effort for the task is the sum of the scheduled effort values for each resource. For example, if Fred is assigned to work 12 hours on a task, and Barbara is assigned to work 8 hours on the same task, then the total task effort would be (12 + 8 =) 20 hours.

This representation of effort breakdown is slightly different than Microsoft Project's concept of "resource units". Following the same example, if both Fred and Barbara are full-time resources in Microsoft Project, then they might have 60 and 40 resource units assigned on the task, respectively (depending on the task's duration). But if Barbara is only a half-time resource in Microsoft Project, her resource units on the task would double (to 80), representing the same amount of work, which now takes a larger percentage of her capacity.

When synchronizing a project, the hours of effort for each assigned resource on a PPM task is provided, and Microsoft Project automatically translates the value into the appropriate resource units for the assignment. If the resources involved are full-time resources in Microsoft Project, then their respective resource units for each task will be proportional to their respective assigned effort values on the corresponding PPM task.

3.3 How Microsoft Project information is synchronized into PPM

Questions in this category are related to how the information in a Microsoft Project file is represented after it is brought into PPM. The information can be brought in either when opening a project during project creation, or during a later synchronization of changes to the Microsoft Project file. Most answers in this section apply to the 'Microsoft Project controls all shared workplan information' and 'Control is shared' synchronization modes.

3.3.1 Are Microsoft Project resource calendars and cost rates synchronized?

Although resource assignments to tasks are synchronized, the calendars and cost rates of these resources are not synchronized into PPM.

You do not need to maintain resource calendars in both applications. The task durations resulting from the Microsoft Project resource calendars are maintained. These task durations are only recalculated to match the PPM resource calendars when placing a project in the 'PPM controls all shared workplan information' synchronization mode.

3.3.2 Are Microsoft Project resource units synchronized?

When synchronizing a project, Microsoft Project automatically translates the resource units for each task assignment into real hours of effort. These effort values are then specified directly on task assignments in PPM. (See section 3.2.9 for an examination of the difference between Microsoft Project's resource units and PPM's hours of effort.)

3.3.3 Are Microsoft Project baseline dates synchronized?

Baseline information is not synchronized by the integration. The project baseline can be captured and maintained in either product, as the project manager prefers.

3.3.4 How are Microsoft Project predecessor relationships synchronized?

The most commonly used type of predecessor is a finish-to-start predecessor. This type of predecessor means that the preceding task must be finished before the successor task should start. Many Microsoft Project users never use any other type of predecessor.

Predecessors of this type are synchronized into PPM. The root task grouping in Microsoft Project is sequence zero; while the master project in PPM is sequence one. Because the two projects number tasks differently, the exact predecessor numbers will all increase by one in PPM. However, the relationships are identical.

Microsoft Project supports other types of predecessors that are infrequently used: start-finish, finish-finish, and start-start. These types of predecessors are supported by PPM, and will be synchronized. PPM also supports External Dependencies as predecessors; however, Microsoft Project does not. These External Dependencies will not be synchronized to Microsoft Project. If you switch synchronization mode from "PPM controls all shared workplan information" to any other mode, the External Dependency predecessors will be lost.

3.3.5 How are Microsoft Project scheduling constraints synchronized?

Both PPM and Microsoft Project represent a scheduling constraint using two kinds of information: a constraint type and a constraint date. Some constraint types (for example 'as soon as possible') do not require a constraint date. Both the constraint type and date are synchronized into PPM.

Microsoft Project supports some scheduling constraints that are infrequently used: as late as possible, must finish on, and finish no earlier than. These scheduling constraints are one way to plan a project backward from an end date.

3.3.6 How are split tasks synchronized?

Microsoft Project can schedule work on a task to start and stop several times. This is referred to as a split task. Task splits are usually automatically (and sometimes accidentally) created by the Microsoft Project resource leveling feature with settings that instruct Microsoft Project to split task work, instead of adjusting units.

PPM tracks a task with a single start and finish date. When a split task is synchronized, the start date will be the start date of the earliest split, and the finish date will be the finish date of the last split. If the project is in either the 'Microsoft Project controls all shared workplan information' or 'Control is shared' synchronization mode, the synchronized duration will be identical to the Microsoft Project duration. In the 'PPM controls all shared workplan information' synchronization mode, the duration will be recalculated to span from the earlier split start to the latest split finish date. In either case, the task split information in Microsoft Project will not be altered by the integration.

3.3.7 How does the integration work with Microsoft Project resource leveling?

Microsoft Project offers an automatic resource-leveling feature, which attempts to automatically resolve resource overallocations. Resource leveling calculates a 'leveling delay' for each task and adjusts the schedule dates accordingly.

A project can be scheduled in Microsoft Project using resource leveling and then synchronized with PPM. Only the leveled start and finish dates are synchronized into PPM. Although the 'leveling delay' is not imported, PPM will faithfully maintain the resulting schedule dates. Rescheduling the project in PPM could change these dates.

3.3.8 How are lag or lead offsets on Microsoft Project predecessor relationships synchronized?

When a Microsoft Project predecessor relationship is defined to have a lag or lead (a positive or negative offset to the normal predecessor relationship) Microsoft Project will adjust the start and finish dates of the successor task accordingly. The lag and lead offsets are supported by PPM, and are synchronized.

3.3.9 Are Microsoft Project work contours or delayed assignments synchronized?

Microsoft Project allows task assignments to be further specified with a work contour or delayed start to work. Contoured or delayed assignments are synchronized into PPM as simple assignments.

As an alternative, a Project Manager can create similar project plans by dividing the task into several sub-tasks that have distinct non-contoured assignments. This approach is often preferable since it gives clearer visibility from project views and is easier to explain to resources.

3.3.10 Will the synchronization affect my macros and VB scripts?

Macros, VB scripts, or other extensions should not be affected by the integration. It may be necessary to disable some extensions of this type during synchronization, because the changes made using the Microsoft Project COM interface can trigger these extensions.

3.3.11 Will the synchronization affect my use of a shared resource pool?

A project can be scheduled using a shared resource pool and synchronized into PPM in the normal fashion. If the shared resource pool is not already open, the synchronization may pause when Microsoft Project presents a dialog asking whether you would like to open the shared resource pool. When this happens, shift to the Microsoft Project application and respond to the dialog. The synchronization will then be able to proceed.

3.3.12   What happens when a user deletes a task in Microsoft Project which has actuals in PPM?

In PPM you cannot delete a task which has actuals, but in Microsoft Project you can. You will get a warning message in Microsoft Project, but Microsoft Project will still allow you to delete the task. If this happens, in 'PPM controls all shared workplan information' mode, when you try to synchronize with PPM, you will get a synchronization error that a dependent task has been deleted. You will need to perform a "Refresh Association…" from the PPM menu in order to restore the task and dependency before you will be able to successfully synchronize.

3.4 Troubleshooting

Because PPM and Microsoft Project make conflicting assumptions about how to interpret data, integrating the two applications can result in the same data being presented differently from one application to the other.

This section addresses some of these points in the integration. It also describes how to troubleshoot any synchronization problems, should that be necessary.

3.4.1 How will synchronizing a Microsoft Project file change the project?

Synchronizing a project file into PPM will make several minor changes to the Microsoft Project file. If the project is being fully converted to PPM, then these changes do not need to be saved. However, if the Microsoft Project file will later be synchronized with PPM, the changes must be saved so the integration can recognize the file correctly later.

During the synchronization, all blank lines are deleted from the project. No notifications or warnings will be issued upon the removal of blank lines.

Unlike PPM, Microsoft Project allows a task to have dates and even actuals yet have no name. Tasks that do not have names will be given simple default names, such as "MS Blank Task #1" by the integration. The Project Manager will want to verify these names and possibly give them more appropriate names than the defaults. After synchronization, tasks that had no names assigned in Microsoft Project will show up in the Warnings tab of the "Show Info" dialogue.

3.4.2 How does cutting and pasting affect the synchronization process?

In Microsoft Project, if you cut and paste a task, you have effectively deleted it and created a new task with the same attributes. This is important, because the new task is not considered for purposes of synchronization to be the same task – the synchronization can't figure that out. If, instead, you select the task and then drag it to the desired position, it is still the same task.

If you're in doubt about the effects of edits in Microsoft Project (creating a new task, moving the existing task) you can show a column called "Unique ID". As long as the Unique ID value doesn't change, you are fine.

3.4.3 How is an unsatisfied finish-to-finish request predecessor synchronized?

When a PPM task is a finish-to-finish predecessor of an open Demand Management Request, the task can be 100% complete but not fully finished. Tasks that are successors of this task will stay in a 'Pending Request' state until the Request is completed.

When synchronizing tasks in this condition, the integration will report the task percent complete as 100%.

3.4.4 How are Blocking and finish-to-finish request predecessors handled during synchronization?

When a task has either a Blocking or a finish-to-finish request predecessor that is incomplete, some types of task updates are not blocked. For instance, a task that is pending a request cannot be marked as complete. PPM enforces these constraints automatically.

Unfortunately, Microsoft Project does not have the capability of adding dependencies on requests. The predecessors on requests in PPM are synchronized, but they are ignored by Microsoft Project.

3.4.5 Why isn't Microsoft Project calculating roll-up values?

Microsoft Project allows you to choose between "automatic" and "manual" scheduling modes. Since automatic is the default, many users never discover that there is another choice. When Microsoft Project is in 'manual' scheduling mode, you must press the **F9** key to recalculate task grouping roll-up values. You will only want to do so, however, when you are not using the 'PPM controls all shared workplan information' synchronization mode. Instructing Microsoft Project to schedule a project synchronized in this mode can make many changes to project dates.

In most circumstances, the integration will leave the "calculation mode" set to 'manual' or 'automatic' as specified in the project. The exception to this occurs when synchronizing a workplan to Microsoft Project in "PPM controls all shared workplan information" mode, or when synchronizing actuals to Microsoft Project in "Control is shared" mode. In these cases, during the synchronization, the calculation mode will be set to 'manual' at the beginning of the synchronization, then reverted back to the original value ('manual' or 'automatic') at the end of the synchronization task.

3.4.6 How did Microsoft Project get into manual scheduling mode?

There are two likely possibilities.

- If you created this Microsoft Project file by synchronizing a PPM project, then the integration turned off automatic scheduling functionality for the duration of the synchronization. This allows the integration to set the dates on Microsoft Project tasks to match the PPM dates (instead of allowing Microsoft Project automatic scheduling to immediately revise the dates. At the end of the synchronization, the integration attempts to change the calculation mode back to the original value. If the original value was 'automatic', and the integration was unable to complete this change for some reason, the mode may stay as 'manual'.

- If you opened a Microsoft Project file that was in manual mode and then created a new Microsoft Project file, Microsoft Project may have carried over this scheduling setting as a default.

3.4.7 Why did synchronizing actuals change the scheduled dates in Microsoft Project?

Microsoft Project automatically reschedules the project in response to the actual dates from PPM. The following notes summarize the interaction. See "Tracking Project Actuals through the Integration" for more information.

When you synchronize projects in the 'Control is shared' synchronization mode, information is transferred in both directions. First, the PPM actuals are applied to Microsoft Project. Second, the Microsoft Project schedule dates are applied to PPM.

When a task is updated with actuals, Microsoft Project checks whether the scheduled dates and durations are consistent with the actuals. If Microsoft Project finds any discrepancies, it automatically reschedules the task to correct the problem. You will observe the same behavior if you type in the actuals manually.

When the synchronization applies PPM actuals to the tasks in Microsoft Project, it is likely that Microsoft Project will implicitly adjust some of the schedule dates. There is no way to turn off that feature of Microsoft Project. For that reason, you should always take a careful look at the active portions of your project in Microsoft Project after the synchronization is complete.

3.4.8 How can I synchronize a Microsoft project in a SQL Server database?

In order to synchronize a project with PPM, the project needs to be in a file format (preferably the binary MPP file format.) To synchronize with a project stored in an ODBC source like a SQL Server database, you should first open a project from the remote source and use the Microsoft Project "Save As ..." feature to save the project to your local computer. After you have synchronized with PPM, you can save the local file back to the ODBC source if you wish.

3.4.9 Why are the actual durations of some task groups not synchronized into PPM?

PPM and Microsoft Project do not have the same functionality for the actual durations of task groups or summary tasks that are still in progress. Microsoft Project presents the actual duration to date as a tentative figure. PPM waits until the entire summary task is complete to present a rolled-up total. When the task grouping is complete, PPM will display the same actual duration value.

The explanation above applies to the 'Microsoft Project controls all shared workplan information' and 'Control is shared' synchronization modes. In the 'PPM controls all shared workplan information' synchronization mode, there is a simpler explanation. When a project is initially opened in this mode, it is placed in the "Plan" project state. Roll-up values, like exceptions and other indicators, are calculated when the PPM project is changed to the 'Active' project state and saved.

3.4.10 Why is the Microsoft Project start date of a task group sometimes later than some tasks?

When using the 'PPM controls all shared workplan information' synchronization mode, the start date of a task group may not be the earliest start date of all tasks within that group. This is a side effect of the integration placing Microsoft Project in 'manual' calculation mode, which stops Microsoft Project for recalculating the PPM schedule dates. In 'manual' calculation mode, Microsoft Project does not automatically roll up dates to task groups. When the PPM scheduled start date for the summary task is later than the actual start dates of some tasks (because a task was started early, for instance), Microsoft Project will correct the scheduled start dates of the tasks but not of the task group.

3.4.11 Why did synchronizing an estimated finish date from PPM create a constraint?

Unlike most PPM actuals, there is no corresponding Microsoft Project field for the estimated finish date. The closest match available is the scheduled finish date, since in Microsoft Project the start and finish dates are automatically updated to reflect actual dates and estimates as these become available.

When a specific value is entered as the finish date in Microsoft Project, the application assumes that the task should also be constrained to finish exactly on that date. When the integration updates the finish date of a Microsoft Project task to match a Project Management estimated finish date, Microsoft Project implicitly creates a finish-no-earlier-than constraint with this same date.

In 'Microsoft Project controls all shared workplan information' and 'Control is shared' synchronization modes, Microsoft Project will be the authority for scheduling information. In these modes, the estimated finish date in PPM will always be overwritten by Microsoft Project's finish date.

3.4.12 Can I automatically create PPM user accounts for unmatched resources?

The integration does not currently have this capability. The Project Manager should save or print out the list of unmatched resources generated by the integration, and work with the PPM Administrator to create these user accounts.

3.4.13 What do I do if the synchronization hangs?

The synchronization can sometimes appear to be stuck because Microsoft Project has raised a warning dialog. These are usually warnings about scheduling conflicts.

When this happens, the Microsoft Project button in the Windows task bar at the bottom of the screen should flash, as a signal that the application needs attention. To get the synchronization moving again, go to the Microsoft Project file and dismiss the warning dialog.

In some cases, the synchronization will continue. For instance, when a warning message about use of a shared resource pool is presented, simply select the option **Do not open other files** and click **OK** to close the dialog. The synchronization will proceed.

However, sometimes the synchronization will fail with an error message after a Microsoft Project warning dialog is presented. In some cases, it can be unclear what scheduling constraint is objectionable. The constraint can even be in another open Microsoft Project file. If this happens, you should close all open Microsoft Project file files and close the Microsoft Project application before restarting the integration. Allowing the integration to start Microsoft Project with only the single project open gives the integration a clean starting point and resolves the vast majority of problems.

When you first start using Microsoft Project, Windows offers "helpful" hints when it sees you doing the same operation repeatedly (for instance, typing the same duration value manually on several tasks in a row) to explain how to use a power-user editing feature. Unfortunately, the synchronization cannot differentiate these dialogs from error messages, and this behavior will therefore halt the synchronization.

Most users will not encounter this problem, because the dialogs have a "don't tell me about this again" checkbox. Once checked, the dialog will not pop up again, and thus the synchronization can succeed. Users are most likely to encounter this problem when they get a new copy of MS Project (on a new computer, for instance) and are again presented with these help dialogs.

3.4.14 How is task duration recalculated when a Microsoft Project plan is synchronized?

The Duration displayed in a synchronized PPM project depends on the synchronization mode chosen.

In the two synchronization modes where Microsoft Project controls the schedule ('Microsoft Project controls all shared workplan information' and 'Control is shared') the task duration shown in PPM is identical to the duration in Microsoft Project.

In the 'PPM controls all shared workplan information' mode, the interface needs to recalculate the durations during synchronization to reconcile the dates to the PPM resource calendars. This prepares the project to be scheduled using the PPM duration-based scheduling algorithm.

You will see two types of changes to the durations. First, if the non-working days indicated in the Microsoft Project calendars and PPM calendars are different, the duration can change either up or down. The start and finish dates will not change.

The second type of change is a side effect of the PPM 10 hour/day work schedule. Since most Microsoft Project plans are built using an 8 hour/day work schedule, this means that in general PPM will consider a task to have ended two hours before the end of the work day. (Although the Microsoft Project interface does not display the start and finish times, this information is tracked in order to allow tasks with durations less than one whole day.) The effect of this difference is that tasks that in Microsoft Project have an even number of days of duration will be shown in PPM as .2 days shorter.

When later rescheduling the project in PPM, this difference can have an impact. The PPM scheduling algorithm will attempt to compact your plan to use up all available time, including these apparently unused 2 hours at the end of tasks. To prevent this, the

Project Manager will want to make the durations whole numbers only, for the portions on the project plan that will be rescheduled using PPM.

3.4.15 Which web browser should I use with the PPM and Microsoft Project integration?

While the integration itself does not explicitly require a web browser, the ability to launch Microsoft Project from the PPM web interface is only available when used with a supported version of Internet Explorer. Check with the System Requirements and Compatibility Matrix document for your version of PPM to see the complete list of supported web browsers.

3.4.16 Why aren't my dependencies between projects preserved when synchronizing with Microsoft Project?

PPM has the capability to create dependencies between multiple projects; however, Microsoft Project does not have this ability. If dependencies between projects are created in PPM, they cannot be synchronized to Microsoft Project. If dependencies are created in PPM outside of the synchronization process, and Microsoft Project information is synchronized to PPM using "Control is shared" or "Microsoft Project controls all shared workplan information", the dependencies will be lost.

3.4.17 Why aren't my Major Milestones showing up in Microsoft Project after synchronization?

PPM will synchronize all milestones with Microsoft Project; however, Microsoft Project does not have the concept of "Major Milestones". In the case where a Major Milestone has been defined in PPM, it will synchronize with Microsoft Project as a standard milestone.

4 Tracking Project Actuals through the Integration

This section discusses details involved in collecting task actuals in PPM for projects planned in Microsoft Project and vice-versa.

4.1 Transferring actuals from Microsoft Project to PPM

The actuals information in PPM will match the Microsoft Project information, with a few exceptions:

Estimated Finish will default to either the Scheduled Finish or Actual Finish.

If the plan is in Control is Shared mode, or is being newly imported as PPM Controls all shared workplan information mode, then PPM re-calculates the rollup information, which may change:
- summary level calculations for percent complete, since the applications use slightly different calculations
- task-level calculations for percent complete. If the task in Microsoft Project includes contoured effort for resources, then the "Percent Complete" value in Microsoft Project might not match the "Percent Work Complete" value. The Percent Work Complete value is used at the resource level and the Percent

Complete value at the task level. When PPM rolls up the task-level information, it is based on the percent work complete assignment values.

4.2 Transferring actuals from PPM to MSP

Microsoft Project enforces relationships among actuals data such as actual start/finish date, percent complete, effort, or ETC (estimated remain effort), and it will recalculate some of the values. Therefore do not expect that all of the data above will match PPM values. Dates will cause a recalculation of effort, as will percent complete if the effort is contoured or uneven in Microsoft Project. To manage this, the transfer of actuals information is controlled by a setting in the Microsoft Project Integration policy for the project. A user can select one of three options, listed below.

4.2.1 Percent Complete option

With the Percent Complete option, the Percent Complete is the only actuals information passed to Microsoft Project, at the task level. The schedule information in Microsoft Project will remain unchanged. Other actuals metrics (dates, effort) are automatically calculated by Microsoft Project and are unlikely to match PPM.

This option reflects how many project managers are used to managing their plans in Microsoft Project. Some of the predictive value of the data captured in PPM is lost. For example, the project manager cannot see in Microsoft Project that task X started 4 days late. Proactive management of projects by exception in PPM can help in this case.

This model is useful especially when the overall progress of the plan is most important.

4.2.2 Percent Complete + Actuals Dates option

For this option, the Percent Complete, Actual Start, Actual Finish and Estimated Finish (if tracked) are passed to Microsoft Project, at the task level. The schedule dates will shift to the actual start date when the task starts, which can cause a cascade effect in the plan. The scheduled finish date will match the actual finish when the task completes, which will recalculate the duration, and potentially effort, in Microsoft Project and can also have a cascading date impact. If Estimated Finish is tracked, it resets the scheduled finish date in Microsoft Project, causing an adjustment of duration and potentially effort.

Resource-assignments data, including effort and dates, may not match PPM.

This is useful when the actuals dates are accurate and the project manager wants to push things out based on dates.

4.2.3 Actual Efforts option

In this option, the Actual Effort and Estimated Remaining Effort are passed to Microsoft Project at the resource-assignment level. Microsoft Project calculates the percent complete for the task. The total expected effort (actual + estimate) updates the scheduled effort, so if the task will complete with more or less effort than originally scheduled, the schedule adjusts, likely adjusting the scheduled duration and finish dates, causing a cascade effect in the plan.

Note that PPM passes estimated remaining effort regardless of whether it is tracked. This is possible because PPM calculates it in the background. This is necessary because otherwise it is impossible to indicate that a task will take more or less effort than expected.

Microsoft Project calculates the percent complete in this case. If the effort among resources is uneven, or if the effort is contoured, the task-level percent complete in MSP may not match the value in PPM, since they are based on slightly different calculations.

This model is useful for project managers that focus strongly on effort metrics to manage their plans.

4.2.3.1 Actual Efforts and Time Management integration

PPM allows time entry against a task by resources that are not assigned to the task. PPM also allows time to be logged against summary tasks rather than individual leaf-level tasks.

Effort logged against a task (summary or leaf) in PPM by a resource that is not assigned is not transferred to Microsoft Project. The effort rollups are re-calculated by Microsoft Project and will not match PPM.

When effort is collected in PPM at the summary task level, the actual effort at the leaf task level remains 0 while the percent complete varies. The estimated remaining effort at the leaf task level remains at its full value until the task completes. If this data is transferred to Microsoft Project, the percent complete will show as 0 until the task completes.