Integrating with PlanetTogether APS

Overview

PlanetTogether was designed to work closely with ERP (Enterprise Resource Planning) or other order management, supply chain planning, and manufacturing execution systems. It is possible to import data into PlanetTogether so that data entry can be done in your ERP system and does not need to be re-entered into PlanetTogether. Also, once PlanetTogether is producing accurate schedules it is often useful to load schedule data back into the ERP system in order to update Job schedule dates and material requirement dates. PlanetTogether provides the export tools needed to make this happen. The following document will outline the requirements for data import and integration approaches. Finally it will outline how PlanetTogether exports data and options for integrating PlanetTogether's data with other systems.

Importing Data into PlanetTogether

PlanetTogether categorizes data into three buckets: Resource Objects, Inventory Objects, and Job Objects. Below are the types of data that can be imported including which are required to generate a schedule.

Some of this data is fairly static, such as Plants and Departments, while Jobs tend to be added, closed, and changed at least daily. All of the data can also be entered manually into PlanetTogether but it is generally preferred to import as much as possible so that data maintenance is in one place -- usually the ERP system.

For some data elements, especially Resources, the definitions in PlanetTogether contain fields that do not have an ERP equivalent. In these cases the values can be left at their default values, calculated in the interface, or manually entered in PlanetTogether after the object is created via the interface. If a value is omitted in the interface then manual changes to object fields will be preserved even after updating the other fields via the interface.

Resource Objects

Resource Objects deal primarily with the physical setup of the manufacturing facility and will therefore consist of how machines and capital are organized into a tiered structure. Additionally, Resource Objects are meant to reflect the manufacturer's capacity to do work and the type of work that can be done.

Required Mappings

Plants

A Plant is a group of Departments. PlanetTogether is a multi-plant capable system so there may be more than one Plant associated with the data scenario. Plants also play a role in inventory locations as Warehouses (see inventory objects) are associated with Plants.

Required Fields:

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the PLANT	String
Name	PLANT Name	String

All Plant Field Mappings

Departments

Departments are the work center groups that the resource is a part of. Think of departments as a group of resources. A resource must be associated with exactly one department. PlanetTogether uses departments for display usability as users can filter the resources they see based on department. Example: CNC1, CNC2, and CNC3 machines are all a part of the department CNC whereas labor resources ED, RYAN, and KELLY are all a part of the department LABOR.

Required Fields:

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the DEPARTMENT	String
Name	DEPARTMENT Name	String
PlantExternalId	Unique identifier of the PLANT the DEPARTMENT belongs to	String

All Department Field Mappings

Resources

Resources are the assets that perform operation/activity. They are typically machines, but can also be people or tools.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the RESOURCE	String
Name	RESOURCE Name	String

PlantExternalId	Unique identifier of the PLANT the RESOURCE belongs to	String
DepartmentExternalId	Unique identifier of the DEPARTMENT the RESOURCE belongs to	String

All Resource Field Mappings

Capabilities

A capability is the type of work a resource can do. For example, a CNC machine may be able to DRILL, CUT, and MILL. Therefore these tasks are considered capabilities. In the Job Objects section we will discuss Required Capabilities which links the capability requirement of the operation to the list of capabilities in PlanetTogether and in-turn the capable resource.

Most ERP systems do not have an exact equivalent to the Capability. A common approach therefore is to use the Item or Work Center as the Capability. Using Item as Capability would mean that each Resource is given a list of Items it can create (or Item/Operation for multi-step processes). Using Work Center as Capability would mean that each Resource in the Work Center can do equivalent work. While this is not always accurate, it may be a good starting point, with manual rescheduling to assign specific machines being used as needed. Note that in addition to using a Capability, a Default Resource can be specified for an operation to assign a particular Resource to do the work, rather than choosing from any Resource with the Capability. This is useful when certain Resources are preferred or required over others for a particular production operation.

Required Fields

Field Name	**Field Description**	**Data Type**
ExternalId	Unique identifier of the CAPABILITY	String
Name	CAPABILITY Name	String

All Capability Field Mappings

Capability Assignments

The capability assignment table links the capability with its associated resource(s). Only Resources that are linked to the needed Capability(ies) for an operation can be assigned.

Required Fields

Field Name	**Field Description**	**Data Type**
CapabilityExternalId	Unique identifier of the CAPABILITY	String
ResourceExternalId	Unique identifier of the associated RESOURCE	String
DepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
PlantExternalId	Unique identifier of the associated PLANT	String

All Capability Assignment Field Mappings

Recommended Mappings

Product Rules

Product rules are essentially overrides for standard timing data based on resource used. For example, ITEM A may run at a rate of 100 units per hour on RESOURCE A while it runs at a faster rate of 130 units per hour on RESOURCE B. This table enables PlanetTogether to schedule different durations for an Item based on the Resource it is assigned to (without needing to define a full alternate routing). Most commonly, product rules are used to override CycleHours and QtyPerCycle, but can also be used to override HeadStartSpan, MaterialPostProcessingSpan, PlanningScrapPercent, and PostProcessingHours. Product Rules can be associated at the Product/Resource level or at the Product/Operation/Resource level if more detail is needed.

Required Fields (for CycleHours override)

Field Name	Field Description	Data Type
ResourceExternalId	Unique identifier of the associated RESOURCE	String
DepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
PlantExternalId	Unique identifier of the associated PLANT	String
ProductItemExternalId	Unique identifier of the associated ITEM being produced on a job	String
OperationName	Associated job-operation name if required for multi-operation jobs.	String
CycleHrs	Cycle hours of the ITEM on the specified RESOURCE	Double
QtyPerCycle	Qty produced per cycle of the ITEM on specified RESOURCE	Double
UseCycleHrs	Boolean to control whether or not to override the operation's standard CycleHrs	Boolean
UseQtyPerCycle	Boolean to control whether or not to use override the operation's standard QtyPerCycle	Boolean

All Product Rules Field Mappings

Optional Mappings

Users

Importing users makes it easy to give your team access to PlanetTogether without manually creating users in PlanetTogether.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the USER	String
Login	Login name	String

All User Field Mappings

Resource Connectors

Resource connectors are used to model the constraint of physically linked resources. For example, if a Mixer resource was physically connected to a Packing resource then we can connect them so that if a Mixing operation schedules the Mixer any successor operation for the job will then schedule only on one of the connected Packing resources (and NOT on a Packing resource that is not connected). Resource connectors can also optionally be used to model transit hours between resources.

Required Fields

Field Name	Field Description	Data Type
ResourceExternalId	Unique identifier of the associated RESOURCE	String
ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String
DownstreamResourceExternalId	Unique identifier of the associated downstream RESOURCE	String
DownstreamResourceDepartmentExternalId	Unique identifier of the associated downstream DEPARTMENT	String
DownstreamResourcePlantExternalId	Unique identifier of the associated downstream PLANT	String

All Resource Connector Field Mappings

Allowed Helper Resources

When an operation requires the use of more than one resource at the same time we call these helper resources. The allowed helper resources function allows PlanetTogether to restrict which helper resources are allowed to help the primary resource. If a resource has Allowed Helpers defined then only those Allowed Helpers will be scheduled for simultaneous use with the main resource.

Required Fields

Field Name	Field Description	Data Type
ResourceExternalId	Unique identifier of the associated RESOURCE	String

ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String
AllowedHelperResourceExternalId	Unique identifier of the associated helper RESOURCE	String
AllowedHelperResourceDepartmentExternalId	Unique identifier of the associated helper DEPARTMENT	String
AllowedHelperResourcePlantExternalId	Unique identifier of the associated helper PLANT	String

All Allowed Helper Resources Field Mappings

Capacity Intervals

Typically shift schedules are configured and maintained directly in PlanetTogether because mose ERP systems do not define capacity with enough specificity for effective APS scheduling. However, there may be reasons for importing known shift types. For example, if the plant or certain resource will be off-line (down) for a holiday or if there is planned maintenance on specific resources, these capacity changes can be automatically adjusted via import.

Required Fields

Field Name	**Field Description**	**Data Type**
ExternalId	Unique identifier of the CAPACITY INTERVAL	String
Name	Name of the CAPACITY INTERVAL	String
StartDateTime	Start datetime of the CAPACITY INTERVAL	DateTime
EndDateTime	End datetime of the CAPACITY INTERVAL	DateTime
IntervalType	Determines how the CAPACITY INTERVAL will affect capacity.	String **Accepted Values**: NormalOnline Overtime PotentialOvertime Offline Cleanout
ResourceExternalId	Unique identifier of the associated RESOURCE	String
ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String

All Capacity Interval Field Mappings

Resource Attribute Setups

Numeric operation attributes can be used to constrain where associated operations can schedule and also define setup/changeover times and costs associated with changing from operation to operation on associated resources.

Required Fields

Field Name	Field Description	Data Type
AttributeName	Name of the associate Attribute	String
FromRangeStart	Start of the attribute's range on associated resource	Double
ToRangeEnd	End of the attribute's range on associated resource	Double
SetupMinutes	Setup time (minutes) associated with changing attribute	Double
SetupCost	Cost associated with changing attribute	Double
EligibilityConstraint	Should resource eligibility be constrained based on associated Attribute values	Boolean
ResourceExternalId	Unique identifier of the associated RESOURCE	String
ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String

All Attribute Setup Table Field Mappings

Resource Attribute Codes

Operation attribute values can be used to determine changeover times and costs based schedule resources. This is sometimes referred to as a changeover matrix.

Required Fields

Field Name	Field Description	Data Type
AttributeName	Name of the associate Attribute	String
PreviousOpAttributeCode	Code of the previous operation's attribute (FROM Code)	String
NextOpAttributeCode	Code of the next operation's attribute (TO Code)	String
SetupTime	Setup time (hours) associated with changing attribute	Double
SetupCost	Cost associated with changing attribute	Double
ResourceExternalId	Unique identifier of the associated RESOURCE	String
ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String

All Attribute Code Table Field Mappings

Resource Setup Codes

A from-to changeover matrix can still be utilized with the use of attributes. This type of matrix uses the operation setup code at the value to determine the setup/changeover cost and time.

Required Fields

Field Name	Field Description	Data Type
PreviousOpSetupCode	Setup code of the next operation(FROM Code)	String
NextOpSetupCode	Setup code of the next operation(TO Code)	String
SetupHrs	Setup time (hours) associated with changing setup code	Double
SetupCost	Cost associated with changing setup code	Double
ResourceExternalId	Unique identifier of the associated RESOURCE	String
ResourceDepartmentExternalId	Unique identifier of the associated DEPARTMENT	String
ResourcePlantExternalId	Unique identifier of the associated PLANT	String

All Resource Setup Codes Table Field Mappings

Inventory Objects

Inventory Objects pertain to the materials that both supply and are produced by the manufacturer. Item and Inventory Objects consist of raw materials, intermediate materials, and finished goods. Items are also sometimes used to model constraints such as storage space, consumed by one operation and released at a subsequent operation.

Required Mappings

Items

PlanetTogether requires an item to be included in it's item master if it's to be referenced on any other objects in the system. All that is technically required is an Item ExternalId, but the item master is also used to control batching requirements and lot usability.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated ITEM	String
Name	ITEM name	String

All Item Field Mappings

Warehouses

If an item will be either produced or consumed then it must be associated with one or more warehouses, denoting its storage location.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated WAREHOUSE	String
Name	WAREHOUSE name	String

All Warehouse Field Mappings

Plant Warehouses

Warehouses are associated with Plants to determine which warehouse inventories a particular Plant may draw materials from or supplies products to.

Required Fields

Field Name	Field Description	Data Type
WarehouseExternalId	Unique identifier of the associated WAREHOUSE	String
PlantExternalId	Unique identifier of the associated PLANT	String

All Warehouse Field Mappings

Inventory

The information surrounding the storage of an item at a warehouse is called an inventory. It's important to communicate the on-hand quantities of items at each warehouse so that PlanetTogether can constrain against and predict these levels. This is also where we can specify lead times for buy items, safety stock levels for make and buy items, and also to associate routing/bom templates with the items used during MRP.

Required Fields

Field Name	Field Description	Data Type
ItemExternalId	Unique identifier of the associated ITEM	String
WarehouseExternalId	Unique identifier of the associated WAREHOUSE	String
OnHandQty	INVENTORY record on-hand quantity at time of import.	Decimal
LeadTimeDays	Lead time (days) of a purchased item	Double
TemplateJobExternalId	Unique identifier of the associated TEMPLATE job/routing record	String

MRPProcessing	How the MRP/MPS should process this inventory if there is a shortage.	String **Accepted Values**: Ignore GenerateJobs GeneratePurchase Orders SetJobNeedDatesOnly

All Inventory Field Mappings

Recommended Mappings

Sales Orders

Sales orders are a demand source for MRP, but can also be imported into PlanetTogether for the user to see data related to the order like customer, ship date, sales rep, etc. Each sales order can have multiple Line items and ship dates.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated SALES ORDER	String
Name	Name of the SALES ORDER	String
LineNumber	SALES ORDER LINE	String
ItemExternalId	Item Associated with the SALES ORDER LINE	String
MustSupplyFromWarehouseExternalId	Unique identifier of the associated INVENTORY WAREHOUSE	String
QtyOrdered	SALES ORDER qty	Decimal
RequiredAvailableDate	Date the associated WorkOrders need to be completed by	DateTime

All Sales Order Field Mappings

Purchase Orders

Purchase orders contain a positive inventory adjustment for PlanetTogether to plan for and constrain by.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated PURCHASE ORDER	String
Name	Name of the PURCHASE ORDER	String

ItemExternalId	Item Associated with the PURCHASE ORDER	String
WarehouseExternalId	Unique identifier of the associated INVENTORY WAREHOUSE	String
QtyOrdered	PURCHASE ORDER qty	Decimal
ScheduledReceiptDate	Date the associated Purchase will be available for use	DateTime

All Purchase Order Field Mappings

Optional Mappings

On-Hand Lots

On-Hand Lots are used to track the on-hand inventory in a lot-controlled environment. When utilizing lot control in PlanetTogether the On-Hand inventory must be associated with lots otherwise the On-Hand qty must be 0.

Required Fields

Field Name	**Field Description**	**Data Type**
ExternalId	Unique identifier of the associated LOT	String
ItemExternalId	Item Associated with the LOT INVENTORY	String
WarehouseExternalId	Unique identifier of the associated INVENTORY WAREHOUSE	String
Qty	LOT Quantity	Decimal

All Lot Field Mappings

Forecasts

Forecasts are a source of demand for MRP/MPS and represent a negative inventory adjustment in the inventory plan.

Required Fields

Field Name	**Field Description**	**Data Type**
ExternalId	Unique identifier of the associated FORECAST	String
ForecastVersion	Version of the Forecast Plan	String
ItemExternalId	Item Associated with the FORECAST	String
WarehouseExternalId	Unique identifier of the associated INVENTORY WAREHOUSE	String
RequiredQty	FORECAST quantity	Decimal
RequiredDate	Date the associated WorkOrders need to be	DateTime

	completed by	

All Forecast Field Mappings

Transfer Orders

Transfer orders can move inventory from one warehouse to another at a specified date and time.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated TRANSFER ORDER	String
Name	TRANSFER ORDER name	String
FromWarehouseExternalId	Unique identifier of the associated INVENTORY FROM WAREHOUSE	String
ToWarehouseExternalId	Unique identifier of the associated INVENTORY TO WAREHOUSE	String
ItemExternalId	Item Associated with the TRANSFER	String
QtyOrdered	Quantity of order	Decimal
QtyReceived	Quantity of item received in ToWarehouse	Decimal
QtyShipped	Quantity of item shipped from FromWarehouse	Decimal
ScheduledReceiveDate	Date when quantity is to received in ToWarehouse	DateTime
ScheduledShipDate	Date when quantity is to be removed from FromWarehouse	DateTime

All Forecast Field Mappings

Job Objects

Job Objects refer to work order or production order information. Job Objects not only include the routing information for the products that need to be created, but a fair amount of business information which can include which customer ordered the product, in what quantity they ordered it, and when they need it. Where Resource Objects define what can be produced, Job Objects will ultimately inform the Resource Objects of what should be produced on a given day and inform the Inventory Objects of the demands and supply against on-hand inventories.

Required Mappings

Jobs

Jobs are synonymous with work orders, production orders, planned orders, and manufacturing orders. The jobs mapping is essentially the work order header in an ERP system. A job is the highest level of hierarchy of the job data which includes operation data, activity data, resource requirement data, capability data, routing data, and attribute data.

An important note here is that if using MRP in PlanetTogether to create Jobs, then Job Templates are used as a Standard Routing/BOM header as well. These templates are designated using a Boolean field (in table below) and are also referenced on the Inventory records.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the associated JOB	String
Name	Job name	String
NeedDate	Date the associated WorkOrders need to be completed by	DateTime
Template	Identifies if this record is a Template Routing/Job associated with an Inventory Record	Boolean

All Job Field Mappings

Manufacturing Orders

A job can contain one or more manufacturing orders. Typically the manufacturing order level is used to store additional header information. Path/routing data is also tied to the manufacturing order data level.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the MANUFACTURING ORDER	String
Name	MANUFACTURING ORDER name	String
JobExternalId	Unique identifier of the associated JOB	String
RequiredQty	Produced quantity of the MANUFACTURING ORDER	Decimal

All Manufacturing Order Field Mappings

Operations

Operations contain the production details for scheduling a particular step in the manufacturing process, such as run time and quantity per cycle.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the OPERATION STEP	String
Name	OPERATION name	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
RequiredFinishedQty	Produced quantity of the OPERATION	Decimal
CycleHrs	Cycle hours of the OPERATION	Double
QtyPerCycle	Quantity per cycle of the OPERATION	Decimal

All Operation Field Mappings

Activities

An activity tracks the production status of an operation. An operation has one Activity unless it has been split, in which case it can several. Activity data stores reported values for the operations like report good qty, reported start/end times, and production status.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the ACTIVITY	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
OpExternalId	Unique identifier of the associated OPERATION STEP	String
RequiredFinishedQty	Produced quantity of the ACTIVITY	Decimal
ReportedGoodQty	Reported good quantity of the associated ACTIVITY	Decimal

All Activity Field Mappings

Resource Requirements

An operation can have one or more resource requirements. Each resource requirement will call out a resource needed, so if the operation has two resource requirements then it will use those two resources at the same time. Default resources (to force selection of a specific resource) and usage types (to specify the portion of the operation during which the resource is used) can also be specified here..

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the RESOURCE REQUIREMENT	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
OpExternalId	Unique identifier of the associated OPERATION STEP	String

All Resource Requirement Field Mappings

Required Capabilities

Each resource requirement can specify one or more required capabilities. One resource must contain all of the required capabilities to be eligible for scheduling the operation.

Required Fields

Field Name	Field Description	Data Type
CapabilityExternalId	Unique identifier of the CAPABILITY required	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
OpExternalId	Unique identifier of the associated OPERATION STEP	String
ResourceRequirementExternalId	Unique identifier of the associated RESOURCE REQUIREMENT	String

All Required Capability Field Mappings

Material Requirements

Each operation can have one or more required materials (BOM items) associated with it. If using lot control, material requirements can be pegged to upstream production using this mapping. Materials can optionally be designated as a constraint to the operation.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the MATERIAL REQUIREMENT	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
OpExternalId	Unique identifier of the associated OPERATION STEP	String
ItemExternalId	Unique identifier of the consumed ITEM	String
TotalRequiredQty	Required quantity of the consumed ITEM	Decimal
ConstraintType	Specifies how the consumed ITEM is constrained	String **Accepted Values**: NonConstraint ConstrainedByEarlierOfLeadTimeOrAvailableDate ConstrainedByAvailableDate
WarehouseExternalID	Unique identifier of the WAREHOUSE from which the ITEM is consumed	String

All Material Requirement Field Mappings

Products

Products are used to indicate the inventory being produced by an operation. Usually the last operation of a Job produces a product. Each operation can optionally produce one or more Products.

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the PRODUCT	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
OpExternalId	Unique identifier of the associated OPERATION STEP	String
ItemExternalId	Unique identifier of the produced ITEM	String
TotalOutputQty	Produced quantity of the ITEM	Decimal

WarehouseExternalID	Unique identifier of the WAREHOUSE to which the ITEM is produced	String

All Product Field Mappings

Alternate Routing Paths

Each manufacturing order will contain at least one path to define the flow and precedence of operations. A path is the sequence of operations used to complete the order. For example, it is in the path that we specify that operations must occur in the sequence: 10>20>30. . A manufacturing order can have multiple paths which we call alternate paths. Paths can be linear, contain parallel steps, and contain branches.

Required Fields

Field Name	**Field Description**	**Data Type**
ExternalId	Unique identifier of the PATH	String
Name	PATH name	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String
PredecessorOperationExternalId	Unique identifier of the associated OPERATION STEP (FROM OPERATION)	String
SuccessorOperationExternalId	Unique identifier of the associated OPERATION STEP (TO OPERATION)	String

All Path Field Mappings

Recommended Mappings

Operation Attributes

Operation attributes are metadata associated at the operation level. They typically relate to the item being produced, such as the color or size of the item. They can be numeric or string values and can be used for data visibility purposes or for calculating dynamic setup and cost data. Each operation can have any number of Attributes.

Required Fields

Field Name	**Field Description**	**Data Type**
Name	ATTRIBUTE name	String
JobExternalId	Unique identifier of the associated JOB	String
MoExternalId	Unique identifier of the associated MANUFACTURING ORDER	String

OpExternalId	Unique identifier of the associated OPERATION STEP	String
Code	ATTRIBUTE text value	String

All Operation Attribute Mappings

Optional Mappings

Successor Manufacturing Orders

Successor Manufacturing Orders define precedence relationships between manufacturing orders .

Required Fields

Field Name	Field Description	Data Type
ExternalId	Unique identifier of the SUCCESSOR record	String
JobExternalId	Unique identifier of the associated child JOB	String
MoExternalId	Unique identifier of the associated child MANUFACTURING ORDER	String
SuccessorJobExternalId	Unique identifier of the associated parent JOB	String
SuccessorMoExternalId	Unique identifier of the associated parent MANUFACTURING ORDER	String

All Successor Manufacturing Order Mappings

Integration Approaches

SQL Server

Since ERPdata tables will rarely be in the same structure as tables needed for import into PlanetTogether a middle-ware is needed to support the transformation of data. PlanetTogether works seamlessly with Microsoft SQL Server. The following import approach/process is therefore recommended.

1. ERP will push or SQL will pull data needed for scheduling into a SQL database.
2. A SQL procedure will then run to manipulate and transform this data into the structure needed for PlanetTogether to load.
3. PlanetTogether fields will then be mapped to the new SQL table structure using the database mapping wizard included in the PlanetTogether software.

4. When the import procedure is triggered in PlanetTogether the new data will be pulled in. This can be triggered by: manual button push, scheduled times, set frequency, or web service API call.
5. Once scheduling is complete in PlanetTogether, it's data can be exported (published) back to SQL Server. This can be triggered by: manual button push, scheduled times, set frequency, or web service API call.
6. A post-publish SQL procedure or executable program can be called once data export is complete to trigger the process of updating ERP data.

Web Service APIs

External programs can trigger immediate actions in PlanetTogether using SOAP API calls Common uses include:

- Triggering import and publish of data
- Triggering optimizations
- Triggering advance of the PlanetTogether scheduling "clock"
- Creating and deleting Scenarios

See the API section below for more details.

Other Data Connections

The PlanetTogether interface service also supports other data connections such as Oracle based databases, ODBC driver, OLE DB, and even text files.

Pre-built ERP Integrations

PlanetTogether and its partners offer many pre-built integrations. These integrations serve as a starting point to move data quickly and easily between the two systems. While it may be possible to use these integrations out-of-the-box, modification is typically needed to adjust to meet specific customer requirements. Learn more about our pre-built integrations here...

Excel Import Template

PlanetTogether offers a simple way to prototype a customer's requirements by using Excel as a data source along with the assistance of SQL Server. This allows the integrator to try out different datasets and scenarios quickly to prove out requirements. The resulting Excel table structure will therefore be a great template to which data from the ERP systems can be updated to. Learn more about it here...

Exporting Data from PlanetTogether

Data from a particular Scenario can be exported from APS. These exports are primarily used for creating custom reports and updating external systems. The exports can be invoked from the Publish menu in the user interface, on a periodic basis using the Scheduling Agent, in a customization, or using the PlanetTogether API.

APS Publish Tables Overview

Below is an overview of all SQL Server Tables that can be published and updated by PlanetTogether. These tables are maintained in the PlanetTogether SQL Server Publish database, which is available in each Version package's Integration folder. Each table contains one or more IDs which can be used to join with other tables to create SQL Views or Stored Procedures. Every table also contains a "PublishDate", which can be used if more than one Published data set is maintained within the SQL database, as part of the Publish History feature.

In this section, the tables are organized into three categories: Resource, Inventory, and Job. Please note that this is done for ease of reading; tables can be joined together as long as they contain the same IDs.

Resource Tables

Table Name	Table Description	Linkedable Field IDs
Plants	Lists all Plants in the system	Plant ID
Departments	A master list of Departments	Plant ID Department ID
Resources	Lists all Resources in the system	Plant ID Department ID Resource ID
Capabilities	A master list of all Capabilities in the system, corresponds to Capability Mappings	Capability ID
Resource Capabilities	Lists Capability Assignments to Resources	Plant ID Department ID Resource ID Capability ID
Capacity Intervals	A master list of non-recurring Capacity Intervals	Capacity Interval ID
Capacity Interval Resource Assignments	Lists the assignment of non-recurring Capacity Intervals to various Resources	Capacity Interval ID Resource ID

Recurring Capacity Intervals	Lists all Recurring Capacity Intervals	Recurring Capacity Interval ID
Recurring Capacity Interval Recurrence	Lists each Recurring Capacity Interval's recurrence	Recurring Capacity Interval ID
Recurring Capacity Interval Resource Assignments	Lists the Resource Assignments of Recurring Capacity Intervals	Recurring Capacity Interval ID Resource ID
Schedules	Lists all Scenarios maintained in the system.	

Inventory Tables

Table Name	**Table Description**	**Linkedable Field IDs**
Items	A master list of all Items in the system	Item ID
Warehouses	Lists all Warehouses in the system	Warehouse ID
Plant Warehouses	Lists all Plant-Warehouse relations	Plant ID Warehouse ID
Inventories	A list of the on-hand inventory records in the system, corresponds to Inventory Mappings	Item ID Warehouse ID Inventory ID
Forecasts	A list of Forecast headers, corresponds to Forecast Mappings	Inventory ID Forecast ID
Forecast Shipments	A lists of Forecast Shipments, corresponds to Forecast Shipment Mappings	Forecast ID Forecast Shipment ID
Forecast Shipment Inventory Adjustments	Lists the Forecast adjustment in Inventory	Inventory ID, Forecast Shipment ID
Sales Orders	Lists all Sales Order Headers	Sales Order ID
Sales Order Lines	Lists Sales Order Lines	Sales Order ID Sales Order Line ID
Sales Order Line Distribution	Lists Sales Order Line Distributions	Sales Order Line ID, Sales Order Line Distribution ID
Sales Order Distribution Inventory Adjustments	Lists all Inventory Adjustments made by Sales Orders	Inventory ID Sales Order Distribution ID
Purchase To Stock	Lists all Purchase Orders in the system	Purchase To Stock ID Inventory ID
Purchase To Stock Deleted Demands	Lists all Purchase Orders whose demand has been deleted	Purchase To Stock ID
Purchase To Stock Forecast Demands	Lists all Purchase Orders whose demand is derived from Forecast Orders	Purchase To Stock ID Forecast Shipment ID
Purchase To Stock Inventory Adjustments	Lists all Inventory Adjustments made by Purchase Orders	Inventory ID Purchase To Stock ID

Purchase To Stock Safety Stock Demands	Lists all Purchase Orders whose demand is derived from Safety Stock demands	Purchase To Stock ID Inventory ID
Purchase To Stock Sales Order Demands	Lists all Purchase Orders whose demand is derived from Sales Orders	Purchase To Stock ID Sales Order Distribution ID
Purchase To Stock Transfer Order Demands	Lists all Purchase Orders whose demand is derived from Transfer Orders	Purchase To Stock ID Transfer Order Distribution ID
Transfer Orders	Lists all Transfer Order Headers	Transfer Order ID
Transfer Order Distributions	Transfer Order Distributions	Transfer Order ID Transfer Order Distribution ID Item ID From Warehouse ID To Warehouse ID
Transfer Order Distribution Inventory Adjustments	Lists all Inventory Adjustments made by Transfer Orders	Inventory ID Transfer Order Distribution ID

Jobs Tables

Table Name	**Table Description**	**Linkedable Field IDs**
Jobs	Lists all Jobs in the system	Job ID
Manufacturing Orders	Lists all Manufacturing Orders in the system	Job ID Manufacturing Order ID
Job Paths	Lists all Alternate Paths for each Job Manufacturing Order	Job ID Manufacturing Order Path ID
Job Path Nodes	Lists all Alternate Path Nodes for each Job Manufacturing Order	Job ID Manufacturing Order ID Path ID Predecessor Operation ID Successor Operation ID
Job Successor Manufacturing Orders	Lists Job Manufacturing Orders with successor Manufacturing Orders specified	Job ID Manufacturing Order ID Successor Job ID Successor Manufacturing Order ID Successor Path ID Successor Operation ID
Job Operations	List all Job Operations in the system	Job ID Manufacturing Order ID Operation ID
Job Resources	Lists Resource Requirement at the Job Operation level	Job ID Manufacturing Order ID Operation ID Resource Requirement ID
Job Resource Capabilities	Lists Capability Requirement at Job Operation's Resource Requirement level	Job ID Manufacturing Order ID Operation ID

		Resource Requirement ID Capability ID
Job Resource Blocks	Lists scheduled Job Activities and their scheduled Resources	Job ID Manufacturing Order ID Operation ID Activity ID Block ID Plant ID Department ID Resource ID Resource Requirement ID
Job Resource Block Intervals	Lists scheduled Job Activities and their scheduled Capacity Intervals	Job ID Manufacturing Order ID Operation ID Activity ID Block ID Interval Index
Job Operation Attributes	Lists each Job Operation's Attributes	Job ID Manufacturing Order ID Operation ID Name (Attribute Name)
Job Products	Lists all Products at the Job Operation level	Job ID Manufacturing Order ID Operation ID Product ID Item ID Warehouse ID
Job Product Deleted Demands	Lists Job Operation Products whose original demand has been deleted	Job Operation ID Job Product ID
Job Product Forecast Demands	Lists Job Operation Products whose original demand is derived from Forecast Order(s)	Job Operation ID Job Product ID Forecast Shipment ID
Job Product Safety Stock Demands	Lists Job Operation Products whose original demand is derived from Safety Stock demand(s).	Job Operation ID Job Product ID Inventory ID
Job Product Sales Order Demands	Lists Job Operation Products whose original demand is derived from Sales Order(s)	Job Operation ID Job Product ID Sales Order Distribution ID
Job Product Transfer Order Demands	Lists Job Operation Products whose original demand is derived from Transfer Order(s)	Job Operation ID Job Product ID Transfer Order Distribution ID
Job Materials	Lists Material Requirement(s) at the Job Operation level	Job ID Manufacturing Order ID Operation ID Material Requirement ID
Job Material Supplying Activities	Lists Activities whose materials are supplied from other Activities	Job ID Manufacturing Order ID Operation ID Material Requirement ID

		Activity ID Supplying Job ID Supplying Manufacturing Order ID Supplying Operation ID Supplying Activity ID
Job Activities	Lists all Job Activities	Job ID Manufacturing Order ID Operation ID Activity ID
Job Activity Inventory Adjustments	Lists inventory adjustments per Job Activity	Inventory ID Activity ID

Example SQL Queries

Operation Scheduling Data

The query below combines data from various publish tables to retrieve the schedule start and end by operation by job. This could be used as the basis for updating the schedules in an ERP system.

Query

```
SELECT j.Name JobName
    , o.Name OperationName
    , r.Name ResourceName
    , b.ScheduledStart
    , b.ScheduledEnd
    , a.ProductionStatus
FROM Jobs j JOIN
    ManufacturingOrders m ON j.JobId = m.JobId JOIN
    JobOperations o ON m.ManufacturingOrderId = o.ManufacturingOrderId AND m.JobId = j.JobId
JOIN
    JobActivities a ON o.OperationId = a.OperationId AND o.ManufacturingOrderId =
a.ManufacturingOrderId AND o.JobId = a.JobId JOIN
    JobResourceBlocks b ON a.ActivityId = b.ActivityId AND a.OperationId = b.OperationId AND
a.ManufacturingOrderId = b.ManufacturingOrderId AND a.JobId = b.JobId JOIN
    Resources r ON b.ResourceId = r.ResourceId
```

Result

	JobName	OperationName	ResourceName	ScheduledStart	ScheduledEnd	ProductionStatus
1	1	10	Mix	2020-05-04 11:00:00.000	2020-05-05 13:00:00.000	Ready
2	10	10	Finishing	2020-04-30 13:42:00.000	2020-05-01 10:42:00.000	Waiting
3	11	10	CNC1	2020-04-30 07:00:00.000	2020-04-30 11:36:00.000	Running
4	11	20	QA	2020-04-30 11:36:00.000	2020-04-30 13:36:00.000	Waiting

Triggering Actions Externally

There are some actions in PlanetTogether that can be triggered externally via Web Service SOAP API calls.

AdvancedClock API

The API is used to automatically Advance the clock on a specific scenario or on all scenarios. There are three variations: AdvanceClock API which takes a DateTime date parameter, AdvanceClockStringDate API, which takes a string date parameter, and AdvanceClockTicks which takes a long date parameter. Learn more about it here...

GetScenarios API

The GetScenarios API is used to retrieve a list of existing scenarios in PlanetTogether matching the specified ScenarioType—Whatif, Live, Published, RuleSeek, InsertJobs, Game, ShortTerm, Pruned—or all types by default. Learn more about it here...

DeleteScenario API

The DeleteScenario API is used to delete the specified scenario from PlanetTogether. Validation is performed on the scenario data input prior to deleting the specified scenario. If the scenario does not exist within PlanetTogether no action will be performed. Learn more about it here...

CopyScenario API

The CopyScenario API is used to automatically copy the LiveScenario, or specified scenario, and create a new What-if scenario in PlanetTogether. When a specified scenario does not exist within PlanetTogether the function will create a new scenario from the LiveScenario if the CreateScenarioIfNew value is set to true. Learn more about it here...

Publish API

The Publish API is used to automatically export data from PlanetTogether using the scenario publish settings. Learn more about it here...

Import API

The Import API is used to automatically import data into PlanetTogether into the LiveScenario, or specified scenario. When a specified scenario does not exist within PlanetTogether the function has the capability to create it if the CreateScenarioIfNew value is set to true. Learn more about it here...

Optimize API

The Optimize API is used to automatically optimize or run MRP on the LiveScenario, or specified scenario, using the system (shared) optimize settings. Learn more about it here...

CTP API

Perform external CTP calls. The Capable to Promise (CTP) functionality creates a simulated job that allows the planner to see what available capacity they may have in a given time frame.

The key data points that will be required in order to submit a CTP request are:

- Inventory (Warehouse and Item)
- How much of that Inventory is required
- When it will be required by
- What routing to use to create the Item

Once the CTP has been submitted, APS will project a Start and Finish time as well as whether or not it expects the Job to be late or early as determined by the current Optimization Rules. If the Job is projected to be late, APS will determine which constraints are bottlenecking the process. APS will also allow the CTP to reserve Capacity and Materials until a user-defined date, allowing the customer some time to determine whether or not to go through with the order. Learn more about it here...