PlanetTogether APS for Dynamics NAV Getting Started Guide

Advanced Planning & Scheduling

Introduction

PlanetTogether provides manufacturers with powerful and easy to use planning and scheduling tools. With these APS tools you can:

- Quickly and easily create accurate production schedules that help you to improve on-time delivery and manufacturing efficiencies.
- Perform "what-if" analysis to see the impact of proposed schedule changes such as overtime, order expediting, and preventive maintenance.
- Visually plan your capacity load.
- Drive material purchasing off of production schedules to lower inventory levels.
- See and fix problems in advance while low cost solutions exist.

Key Features

These are some of the important features that APS provides to help you improve your scheduling process.

- Finite scheduling of machines, labor, and tooling for realistic schedules.
- Material-constrained schedules for accurate planning.
- Multi-user collaborative planning allowing planners to work together and non-planners to view the schedules.
- Multi-Dimensional Optimization to generate effective schedules automatically.
- Finite Drag-and-drop schedule adjustment with automatic rescheduling of dependencies and conflicting operations.
- Automatic selection of "best resources" based on resource capabilities.
- Overlapping operation scheduling to reduce manufacturing lead-times.
- What-if Scenarios and full Undo/Redo capability to safely experiment with changes.

Software Implementation Overview

A typical implementation of the APS module takes from two to six weeks (depending upon the amount of customization required) from the installation of the software to the go-live date. This usually involves thirty to sixty hours of consulting time including installation, configuration, customization and training.

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*It is important to note that **APS should be implemented in parallel with other manufacturing modules** such as MRP, Routings and Bills of Material. Failure to do so can result in a significant amount of added time and effort to re-engineer this manufacturing data that drives the APS module. An APS certified consultant should work with you in your design of your manufacturing data to ensure the data support effective scheduling.*

Implementation Steps

1. Remote Desktop Connection setup and software installation

   To enable ongoing support and training a Remote Desktop connection to the server is essential.

2. Manufacturing Process Walkthrough

   This can be a physical and/or verbal walkthrough of the production process to identify key production scheduling issues and goals.

3. Sample Routing/BOM/Work Order definition and scheduling

   This is where sample data is first created to attempt to model the production process for scheduling.

4. Iterative Routing/BOM refinement/Scripting

   The model is refined until schedules can be generated accurately. This may require custom script creation to accurately model important constraints. This step is where most of the time is spent.

5. Custom Report creation
   Most companies have a specific schedule report format that production personnel are comfortable with. This can usually be duplicated in a custom Report. Custom reports can be created and added to the PlanetTogether menu for easy access.

6. Planner Training / Process Review
   During the implementation process the planner will become familiar with use of the system so little training is usually needed at this stage. However this is a good time to clearly define and document how the system will be used on a daily basis and to handle exceptions.

7. Go Live.
   Once the generated schedules are reasonably accurate then the system can begin to be used on a daily basis. This also requires that production entry is done to update work that is completed on the shop floor. This will cause the schedule to be updated accordingly.

Installing the Software

PlanetTogether is a separate module that is installed on the server and on the clients of any computers that need to view the schedule. Client installations are self-updating so that once installed they do not need to be updated when new versions of the software are released – once the server is updated the clients update themselves automatically.

Hardware and Software Prerequisites

These are the minimum recommendations for hardware and software for running APS.

Server

- Microsoft Windows XP Professional, 2000, or 2000, 2003, 2005 server
- Microsoft .Net Framework Version 2.0
- 2 GHz processor
- 2 GB of physical RAM *
- 10 GB of hard disk space

Master Scheduler Client

- Microsoft Windows XP (Pro or Home), 2000
- Microsoft .Net Framework Version 2.0
- 2 GHz processor
- 2 GB of physical RAM *
- 5 GB of hard disk space
- 21” UXGA (1600 x 1200) monitor

View-Only, What-If Client

- Microsoft Windows XP (Pro or Home), 2000
- Microsoft .Net Framework Version 2.0
- 1 GHz processor
- 512 MB of physical RAM *
- 5 GB of hard disk space
- 17” VGA monitor

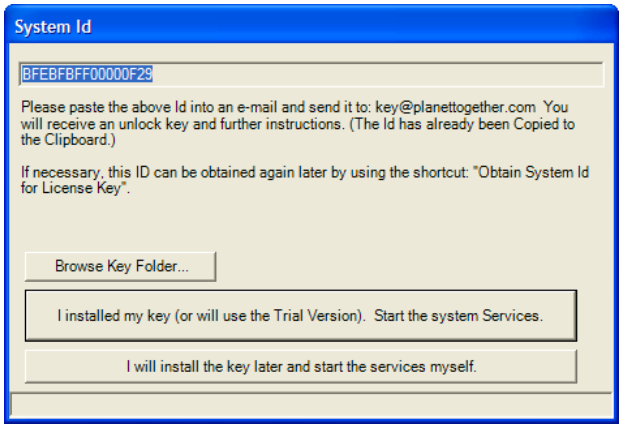
Server Installation

The APS server components can be installed on the same PC as the NAV server or it can installed on its own PC (as long as it has access to the NAV SQL Server). In most circumstances APS is installed on the same server provides good performance. However for very large scheduling problems (for example more than 10,000 production orders) maximum performance can be achieved by installing APS on a dedicated PC.

- ✓ The NAV server must be installed prior to installing PlanetTogether since PlanetTogether uses the same SQL Server database.

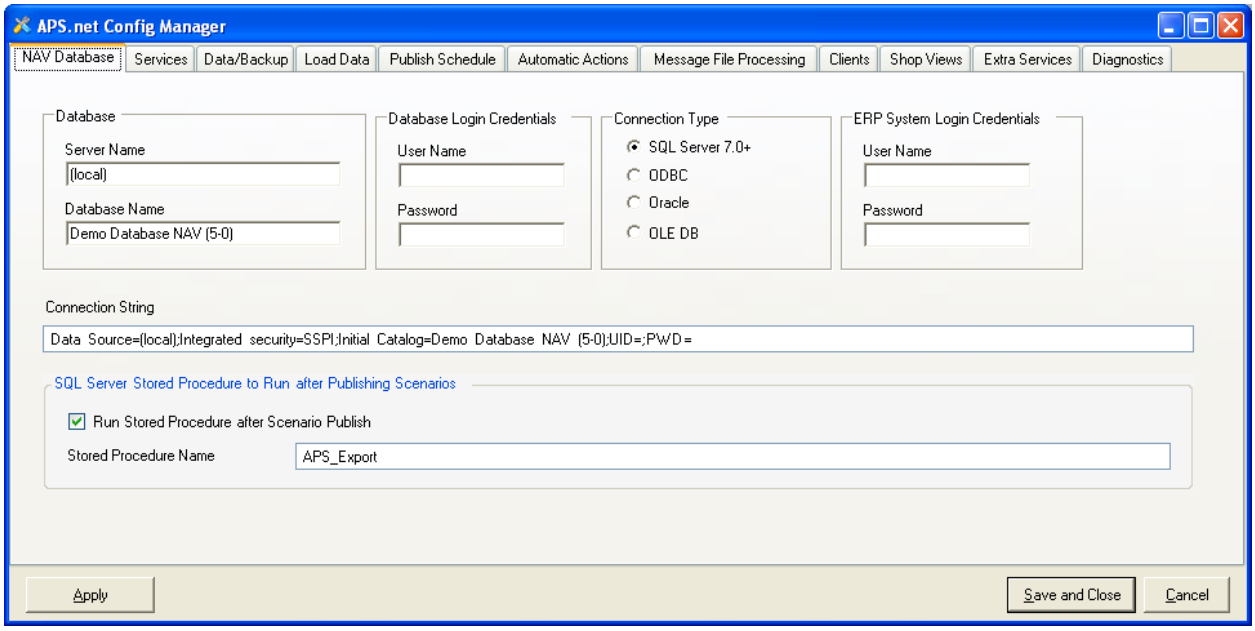
To install the PlanetTogether Server:

1. Run PlanetTogether Server Setup.msi
2. Obtain and install your license key: PlanetTogether requires a license key to run. During the installation you will be prompted to e-mail your SystemId (displayed below) in order to obtain your key. It's best to obtain and install your key before proceeding with the installation so that the system services do not have to be re-started manually later after installing your key (a trial-version key is installed by default. This key limits the system to 20 Job in each Plant.).



3. Specify Database Connection settings in the Config Manager (shown below): The Config Manager is shown at the end of the installation to enable setting of various database connection options that PlanetTogether will use to export data to the SQL Server database. Note that the Config Manager can also be accessed later from the PlanetTogether program folder to edit these

settings.



4. Add the APS Views to the SQL Database. During the installation the Views file, **APS_Views.**sql, will be displayed. This file contains the SQL Server Views that PlanetTogether will use to pull data from the database. To install the views, run the query in the file against the database that you will be pulling data from. This can be done using SQL Server Management Studio for SQL Server 2005, or using Query Analyzer with earlier versions of SQL Server. Note that due to dependencies between Views you will receive errors when running the view. This is not a problem – just run it four times and each time fewer errors should appear as new Views are created.

   If there are multiple databases that you would like to pull data from (for example a test and live database) then the views should be installed on each database. These views can be customized later for any special integration requirements that you have.

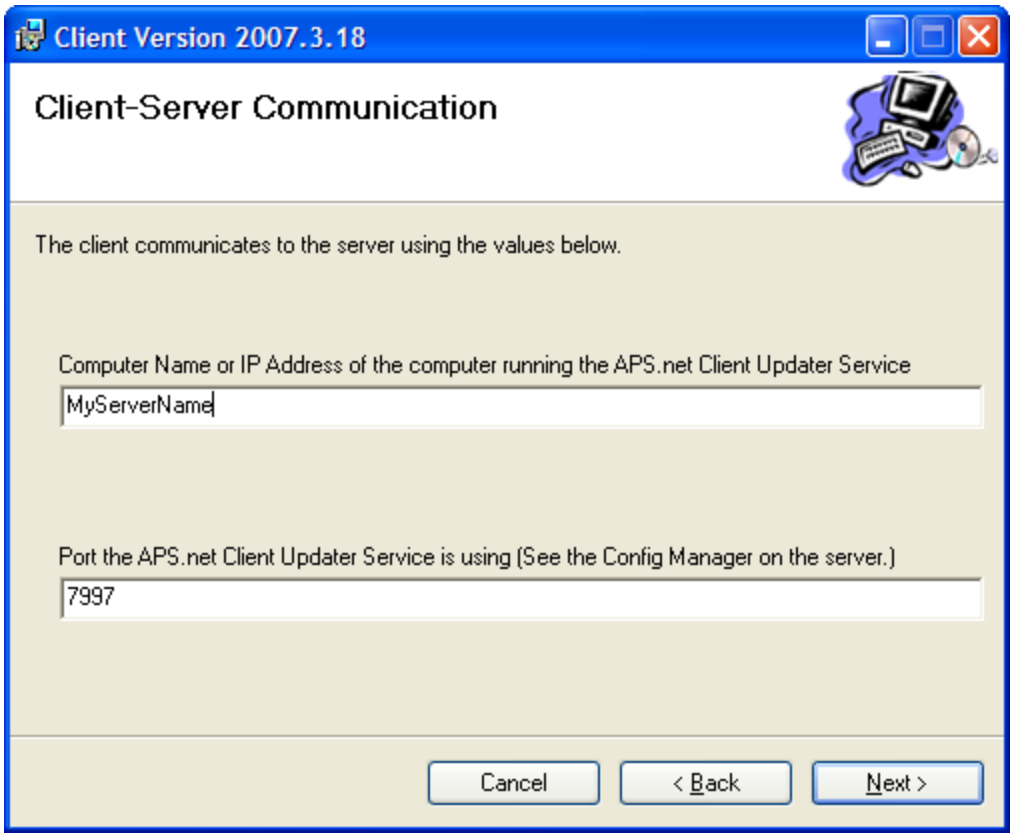
5. Test the installation by double-clicking the PlanetTogether icon on the desktop. You should be able to login successfully with **User=admin**, **Password=<blank>**.

Client Installation

The PlanetTogether client is usually installed on the PC of one or more planner users and the PCs of any operations, sales, customer service, or management personnel who might require viewing the production schedule. Note that once the clients are installed they will be automatically updated when new PlanetTogether versions are installed on the server so manual subsequent client installs will not be necessary.

To install the APS Client:

1. From the client PC, run **Client Setup.msi**. This file is typically found at: **C:\ProgramFiles\PlanetTogether\ProgramFiles\SetupFiles\ClientSetup\Client Setup.msi**
2. Enter the Computer Name or IP address and port: This is the location of the Client Updater Service that is installed on the APS Server. You can enter the Computer Name or IP address of the APS Server. The default value for the Port should be used unless it was necessary to run the Client Updater Service on an alternate port due to a conflict with another service.



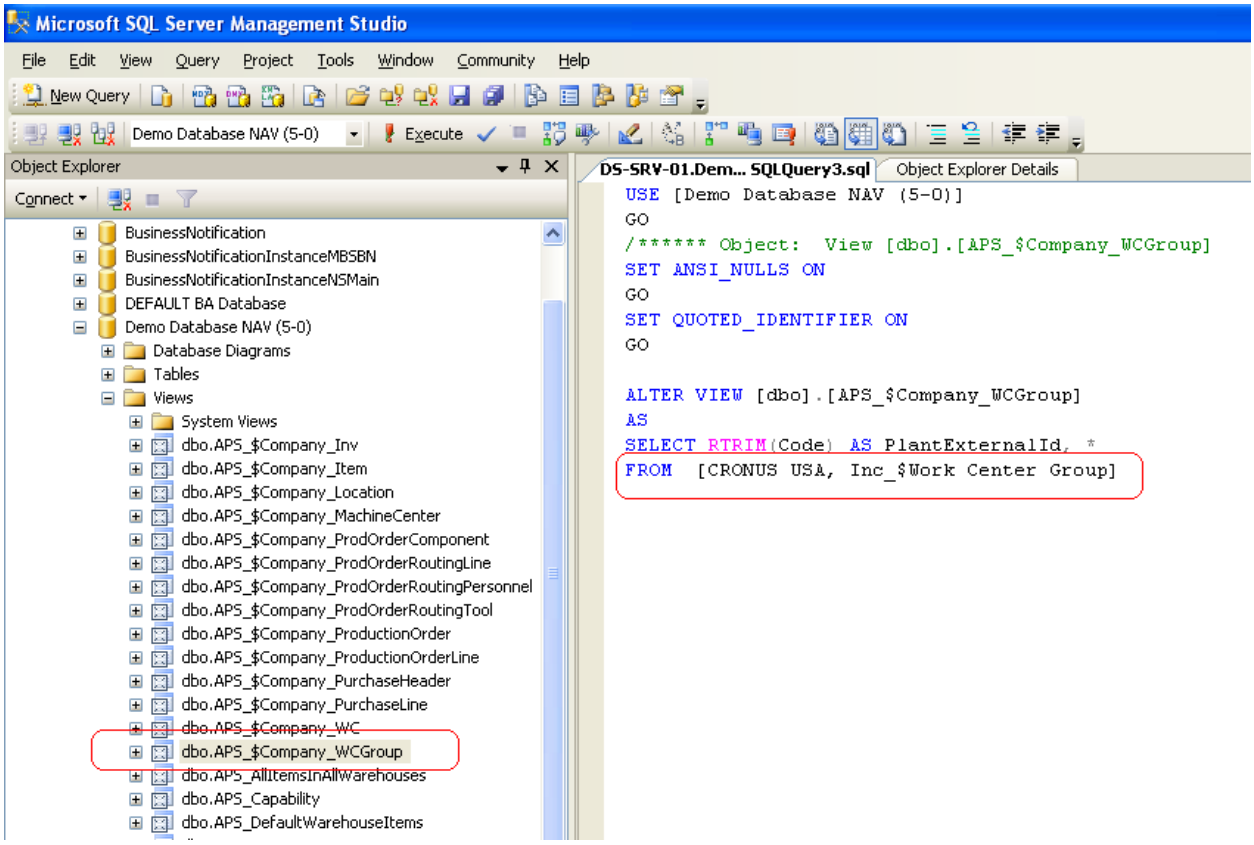
3. Test the installation by double-clicking the PlanetTogether icon on the desktop. You should be able to login successfully with **User=admin**, **Password=<blank>**.

Setting up Master Data for Scheduling

Most of the data that PlanetTogether needs is already present in your NAV database. Those data objects are listed in the table below.

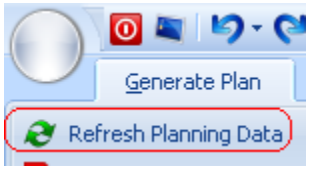
Selecting the NAV Company

To specify which Company PlanetTogether should import from, modify the SQL Views that start with "dbo.APS_$Company" as shown below.

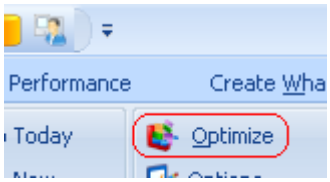


Importing to PlanetTogether

Once the data is setup in NAV it can be imported to PlanetTogether by clicking "Refresh Planning Data" in the menu of PlanetTogether:



After refreshing, you can schedule Production Orders by clicking "Optimize":



Overview of Object Mappings between NAV and PlanetTogether

The table below lists the various NAV data objects that PlanetTogether uses. In some cases the terminology used by PlanetTogether is different so the PlanetTogether terminology is also given.

Note that the "mappings" between NAV and PlanetTogether are fully customizable. They can be modified as necessary from the "Edit Mappings" tool in PlanetTogether and from the SQL Server Views in the NAV database. Please see the "Customizing the NAV PlanetTogether Mappings" section below for more information.

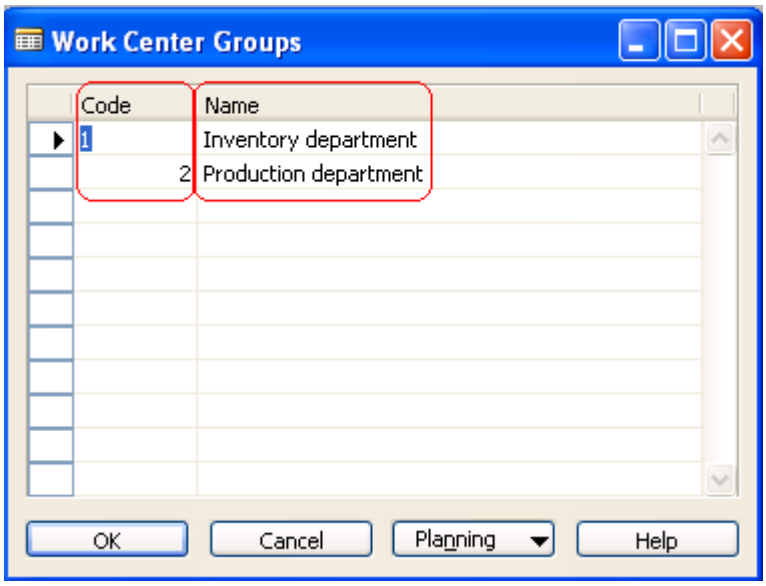
NAV Object	PlanetTogether Object
Work Center Group	Plant
Work Center	Department, Capability
Machine	Resource
Location	Warehouse
Item, Inventory	""
Production Orders	Jobs
Purchase Orders	""

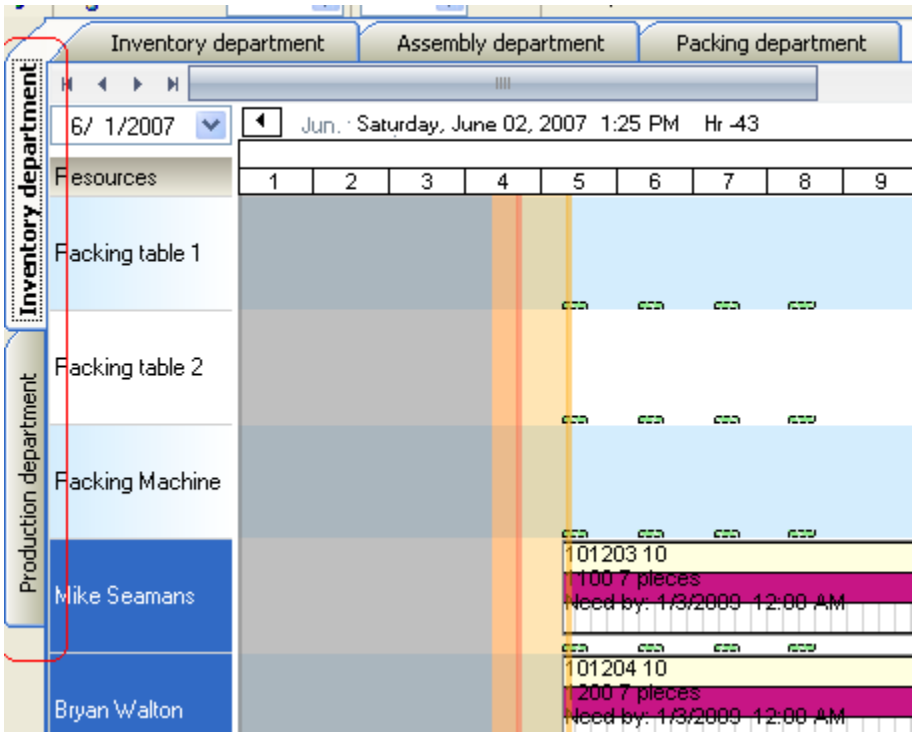
NAV Screens that impact PlanetTogether

The screen shots below show the various places in NAV where you can access data that has an impact on PlanetTogether. The fields used by PlanetTogether are circled in red boxes. Where appropriate, the corresponding data is shown in PlanetTogether screenshots as well to illustrate where that information is used in PlanetTogether.

Work Center Groups

Each Work Center Group creates a Plant in PlanetTogether. Each Plant is shown in a tab along the left edge of the Gantt in PlanetTogether.

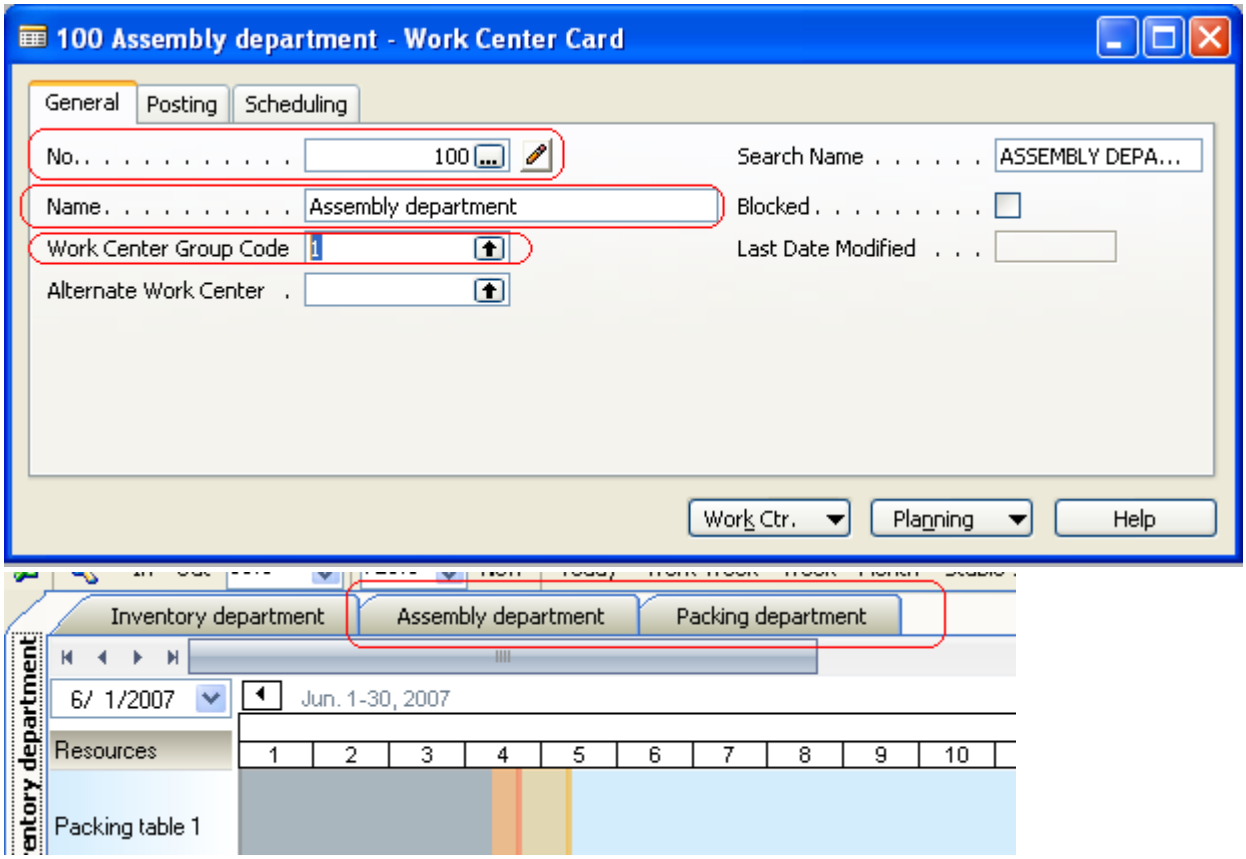


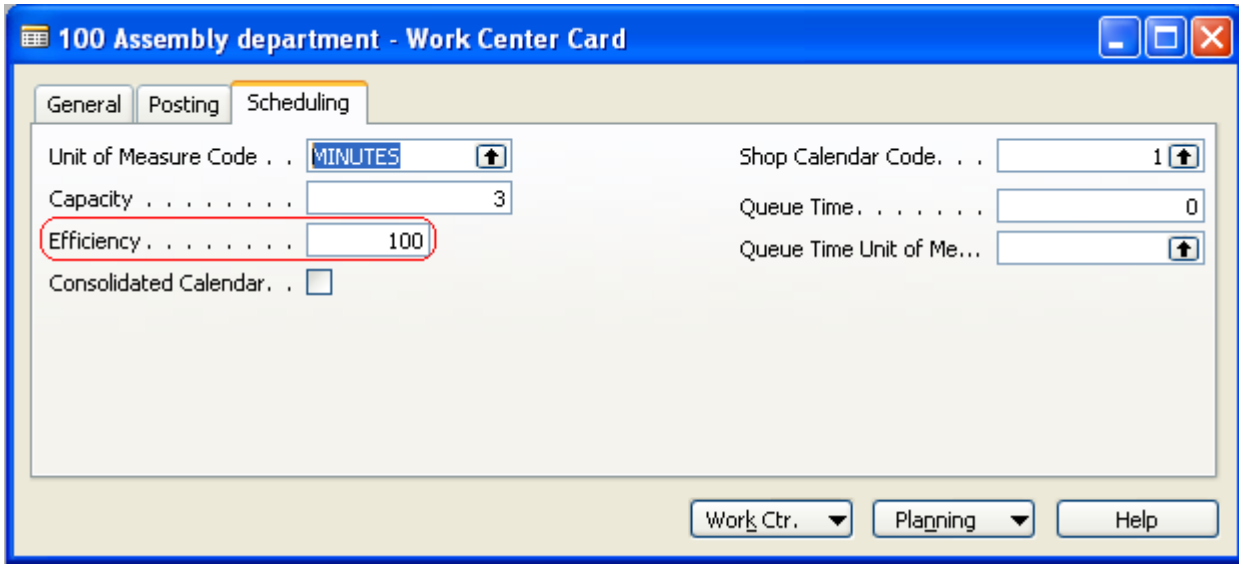


Work Center

Each Work Center in NAV creates a Department in PlanetTogether. Each Department belongs to one Plant. Each Department is shown along the top of the Gantt in PlanetTogether.

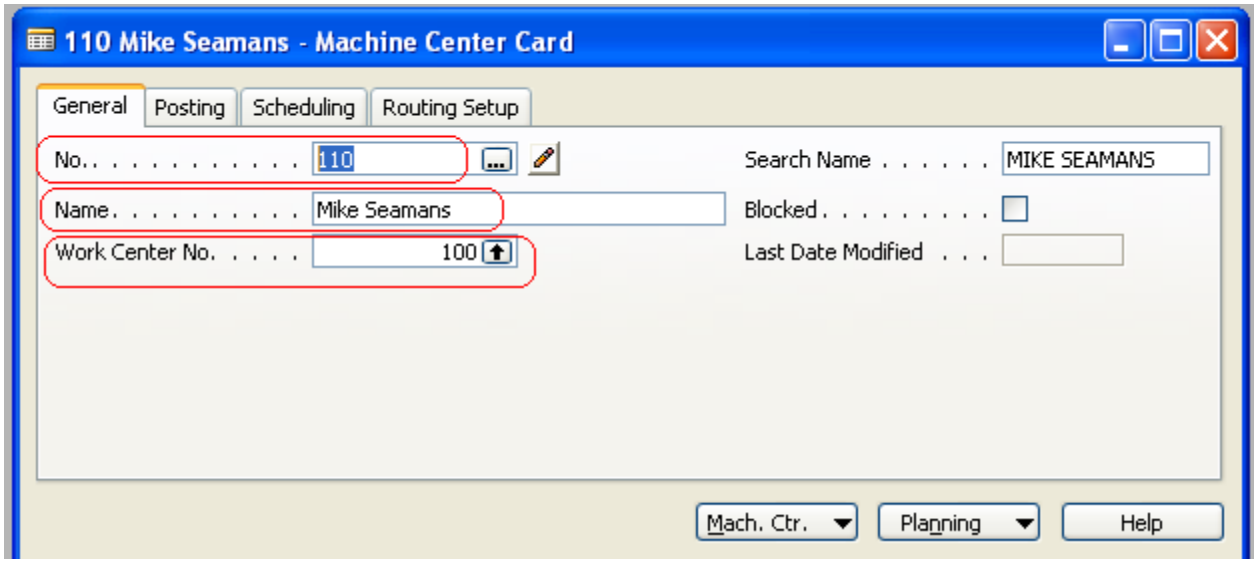
Each Work Center in NAV also creates a Capability in PlanetTogether. This is what PlanetTogether uses to determine which Operations to schedule on which Resources. Each Production Operation also refers to the Work Center / Capability and the Capability is linked automatically to the Resources in the Work Center. If more flexibility is needed beyond scheduling by Work Center (for example, if machines in the Work Center are not totally identical) then this can be accomplished by modifying the Capability/Resource links in PlanetTogether or by creating a Customization DLL to limit which Resources are selected based on Item Attributes (for example, "Machine 1 can only run Items up to 48" in length").

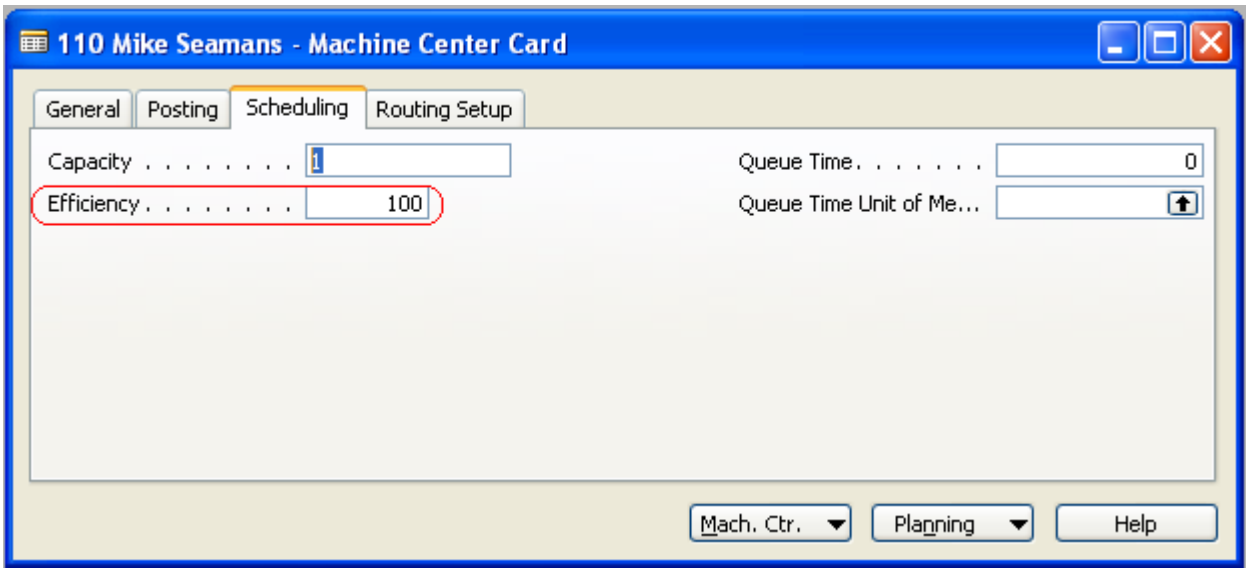



100 Assembly department - Work Center Card
General
Posting
Scheduling
Unit of Measure Code . .
MINUTES
Capacity . . . . . .
3
Efficiency . . . . . .
100
Consolidated Calendar. .
Shop Calendar Code. . .
1
Queue Time. . . . . .
0
Queue Time Unit of Me...
Work Ctr.
Planning
Help

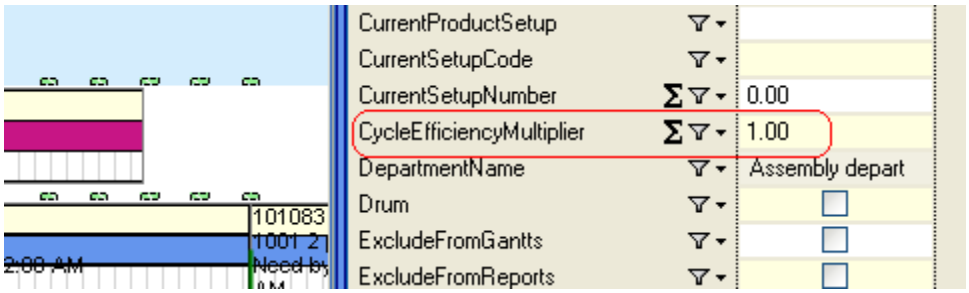
Machine

Each Machine in NAV creates a Resource in PlanetTogether, using the Name and Work Center. Each Resource belongs to one Department. The Resources are listed down the left of the Gantt and can be further defined in PlanetTogether to take advantage of additional functionality that does not exist in NAV (such as sequence-dependent setup times).

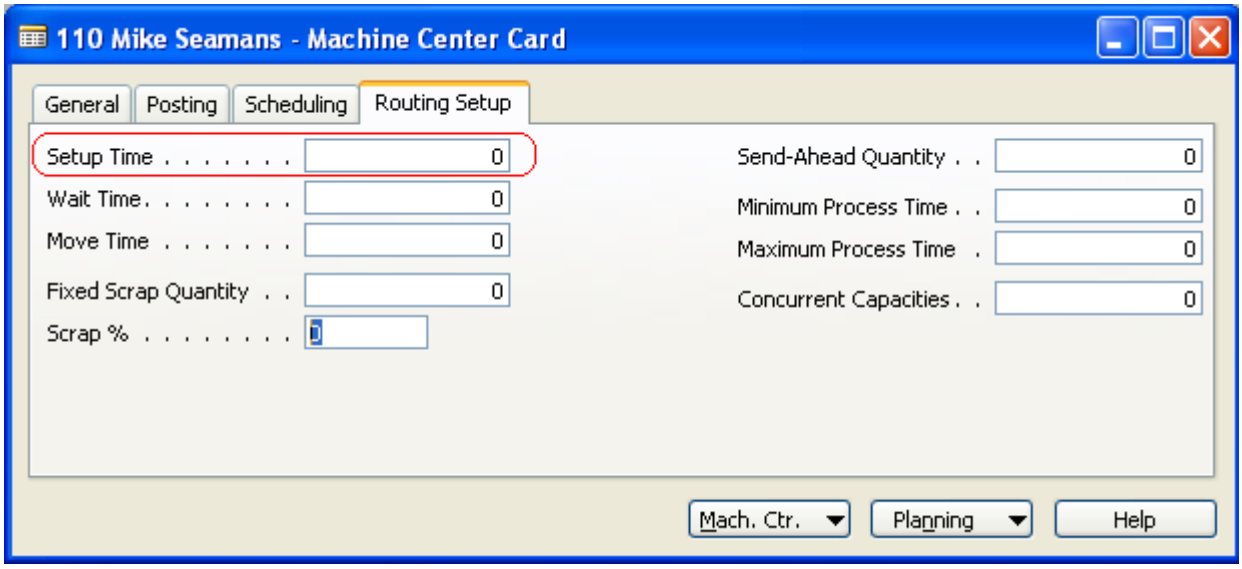




The Efficiency sets the "Cycle Efficiency Multiplier" in PlanetTogether for the Machine as shown below. If this null then the Work Center Efficiency is used instead.



Note that the Queue Time estimate is not used by PlanetTogether. Instead, PlanetTogether will dynamically calculate queue time based on the actual load on the Resource. (This is much more accurate.) Note also that the Capacity is not used by PlanetTogether. Instead, you can set the capacity in PlanetTogether using Capacity Intervals. Capacity Intervals are very flexible and can vary over time.

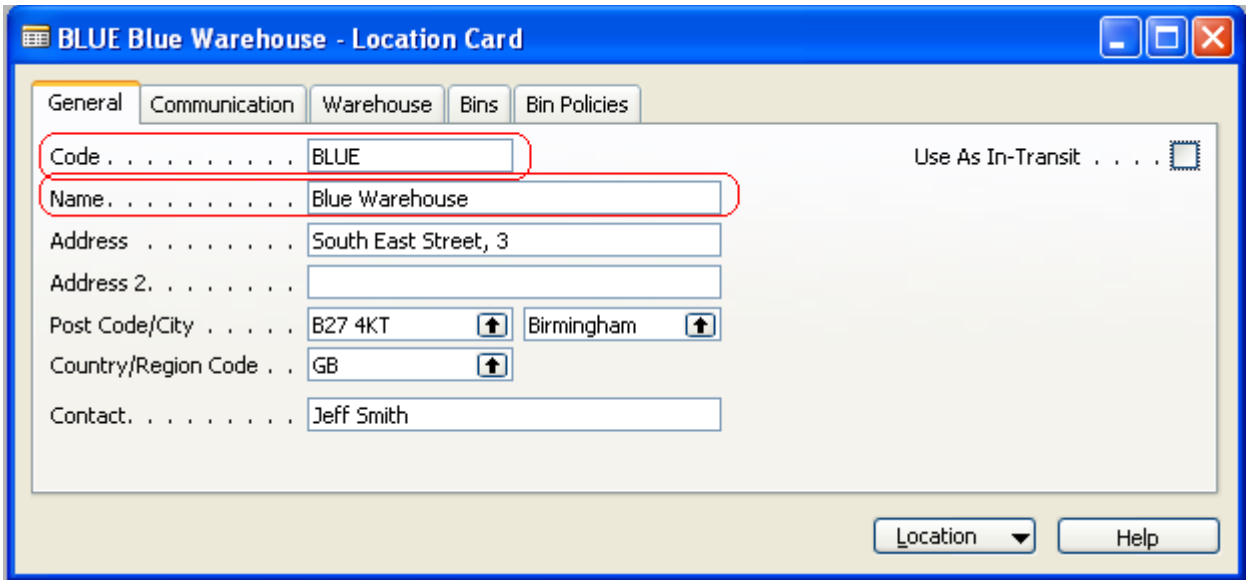


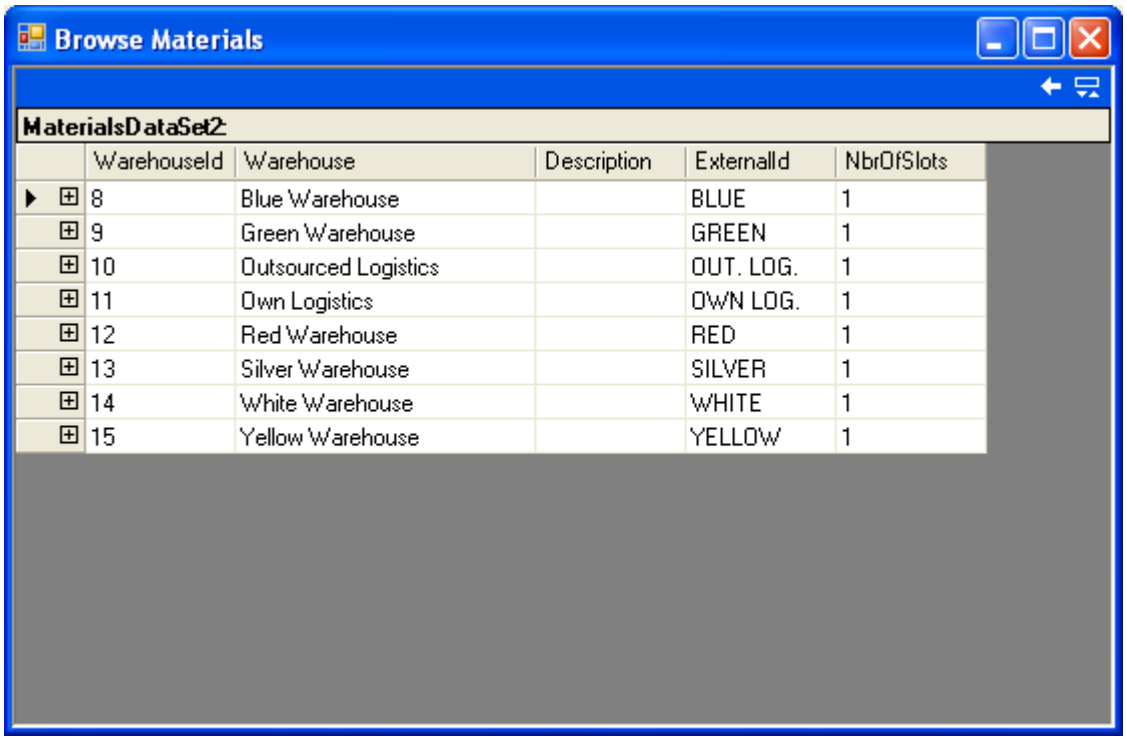
Setup Time is used to set the Setup Span of the Resource. There are various controls in PlanetTogether concerning setup time so this value may or may not be used during scheduling based on those settings.

Note that various other fields such as Wait Time, Move Time and Scrap % are used by PlanetTogether indirectly as it pulls these values from the Production Order operation.

Locations

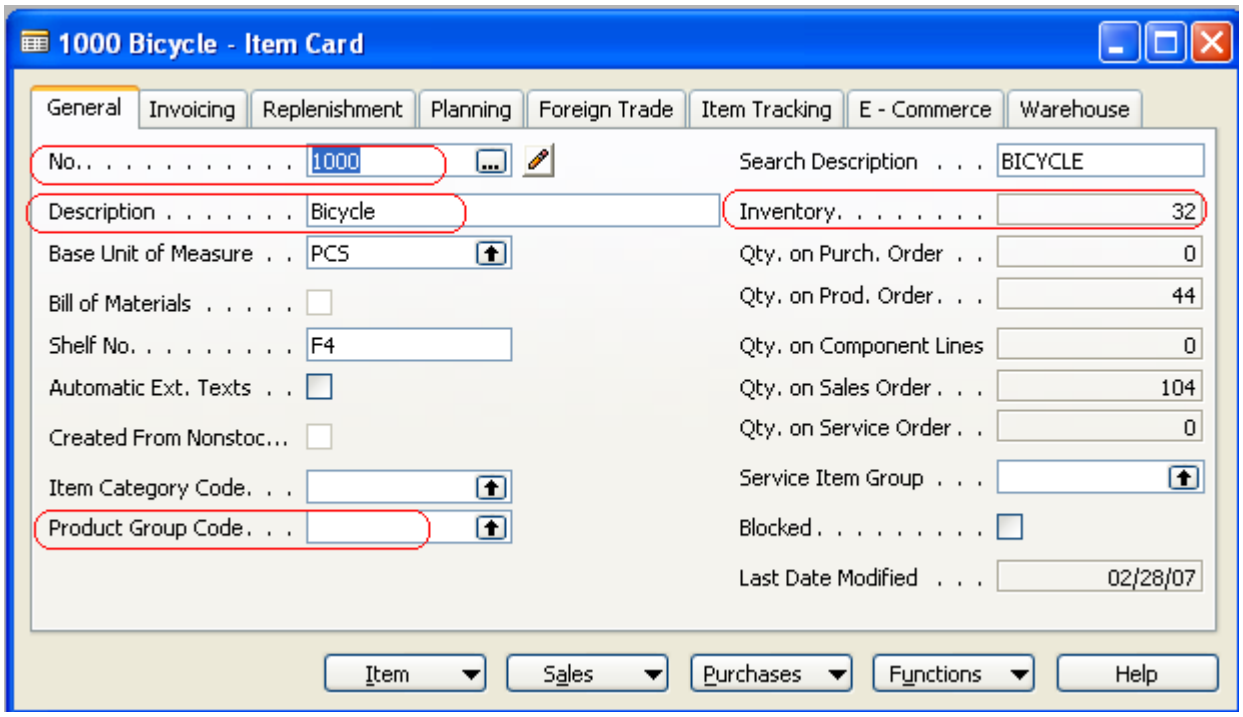
Each NAV Location corresponds to a Warehouse in PlanetTogether. A Warehouse is where inventory is stored. By default each Warehouse is allowed to supply operations in all Plants. (This can be modified in the APS_PlantWarehouse SQL Server View if necessary.)





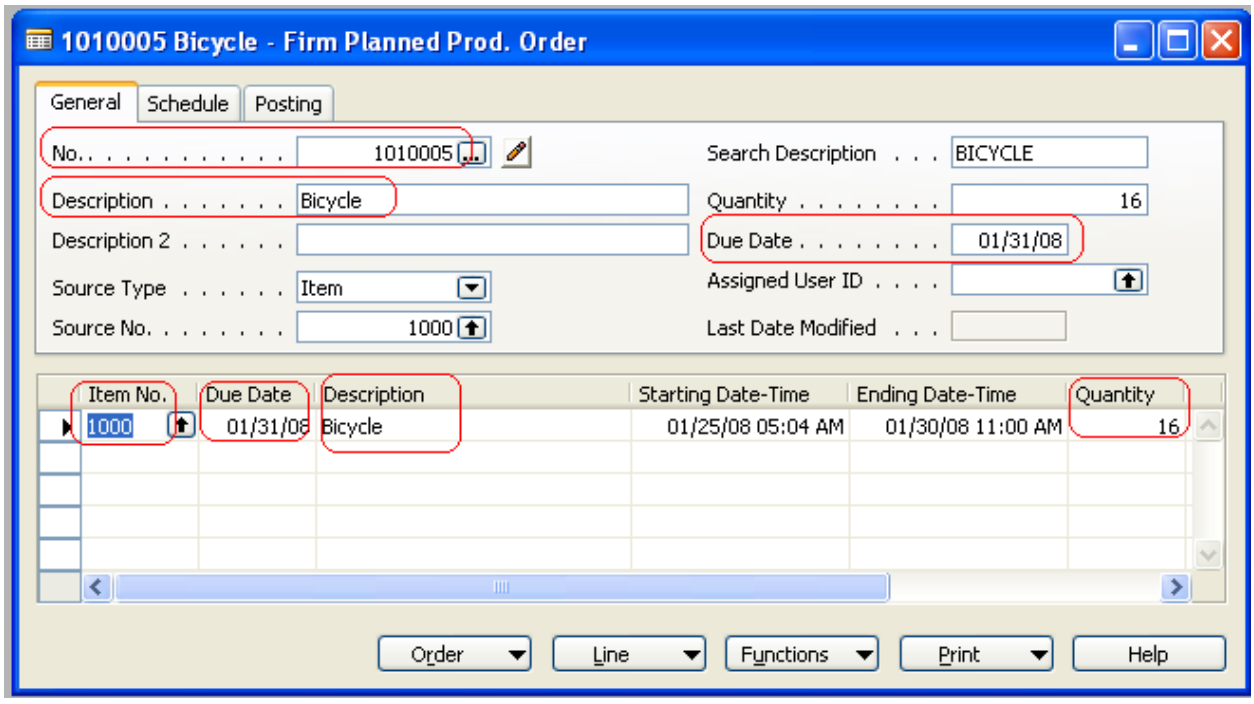
Items

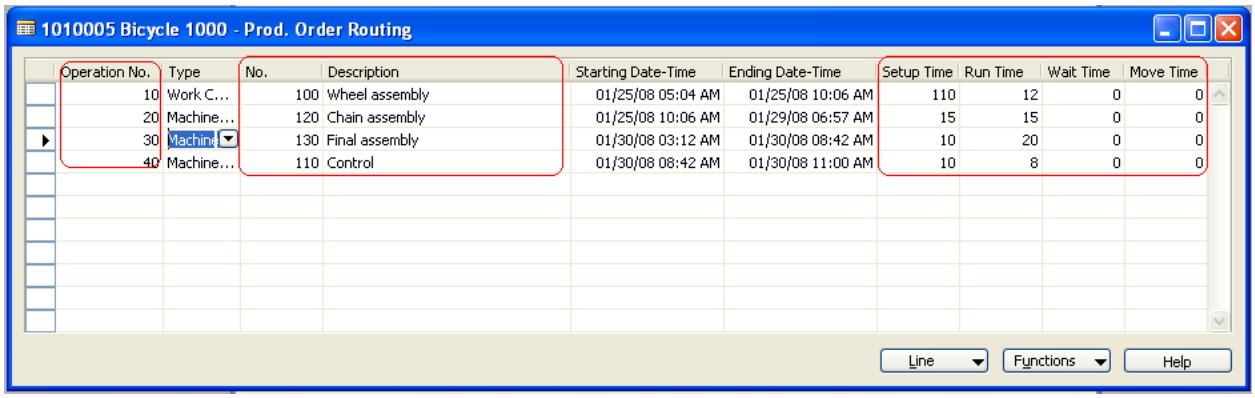
Each Item in NAV corresponds to an Item in PlanetTogether. The inventory is also used for material constraints. Product Group Code can be used for sorting and filtering in the Inventory Plan view.

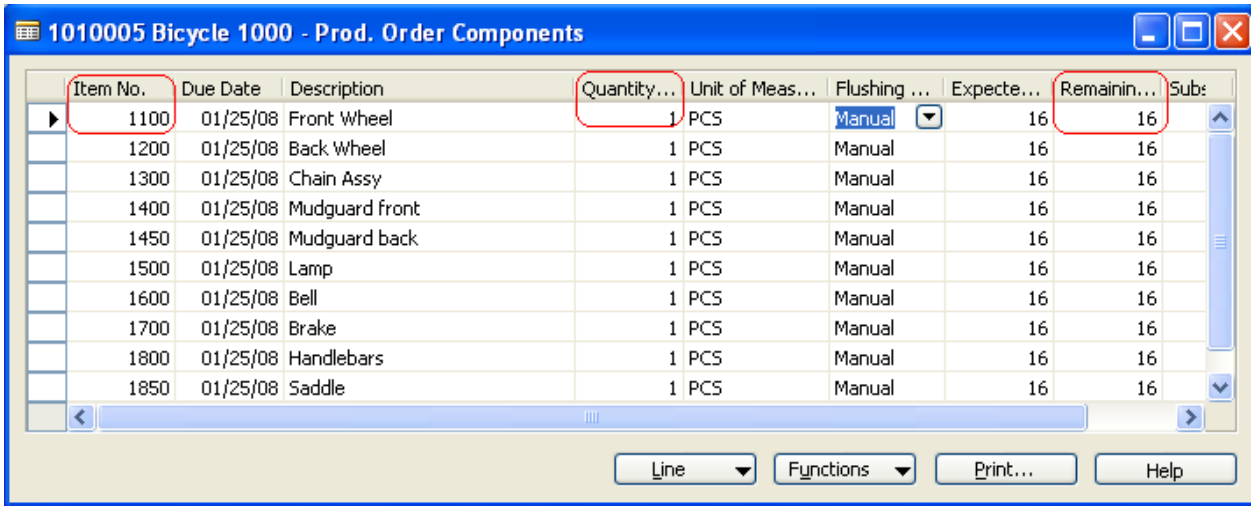


Production Order

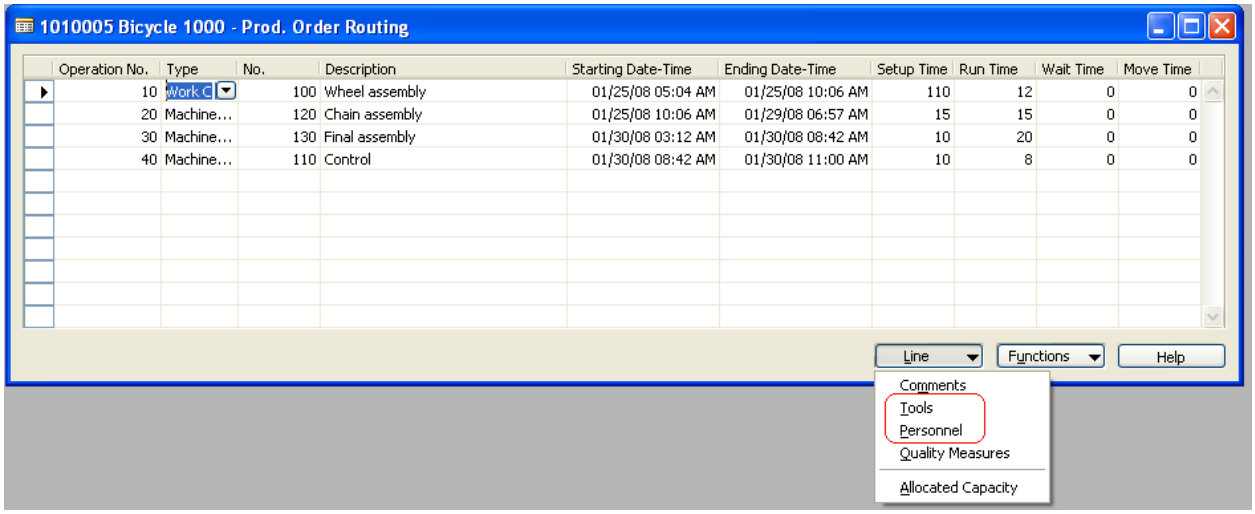
Both Firm Planned and Planned Production Orders are imported to PlanetTogether as Jobs. The Jobs have a Commitment of Firm or Planned accordingly.

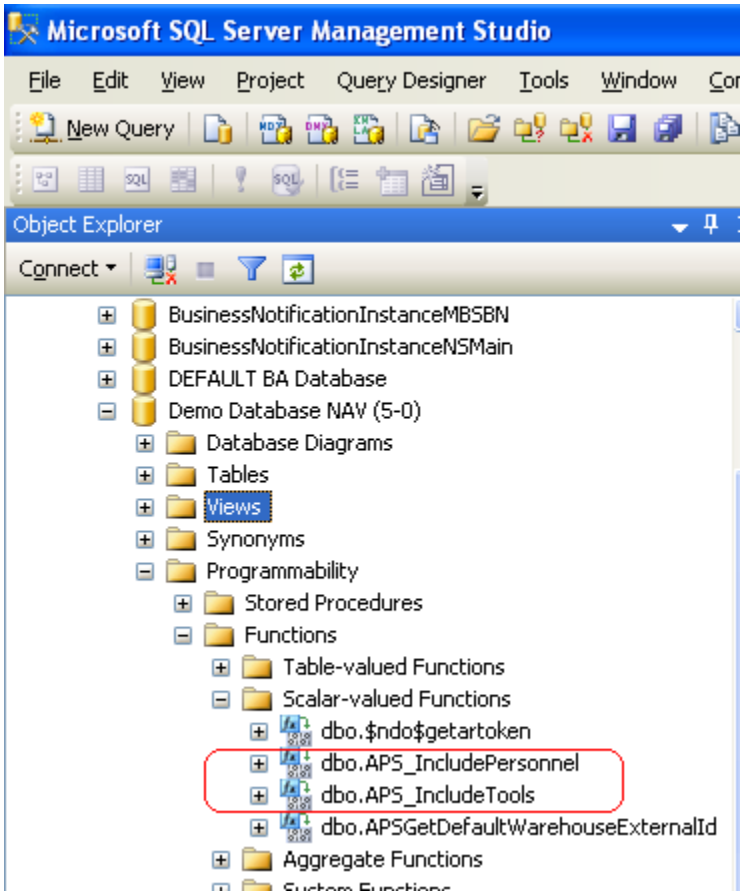


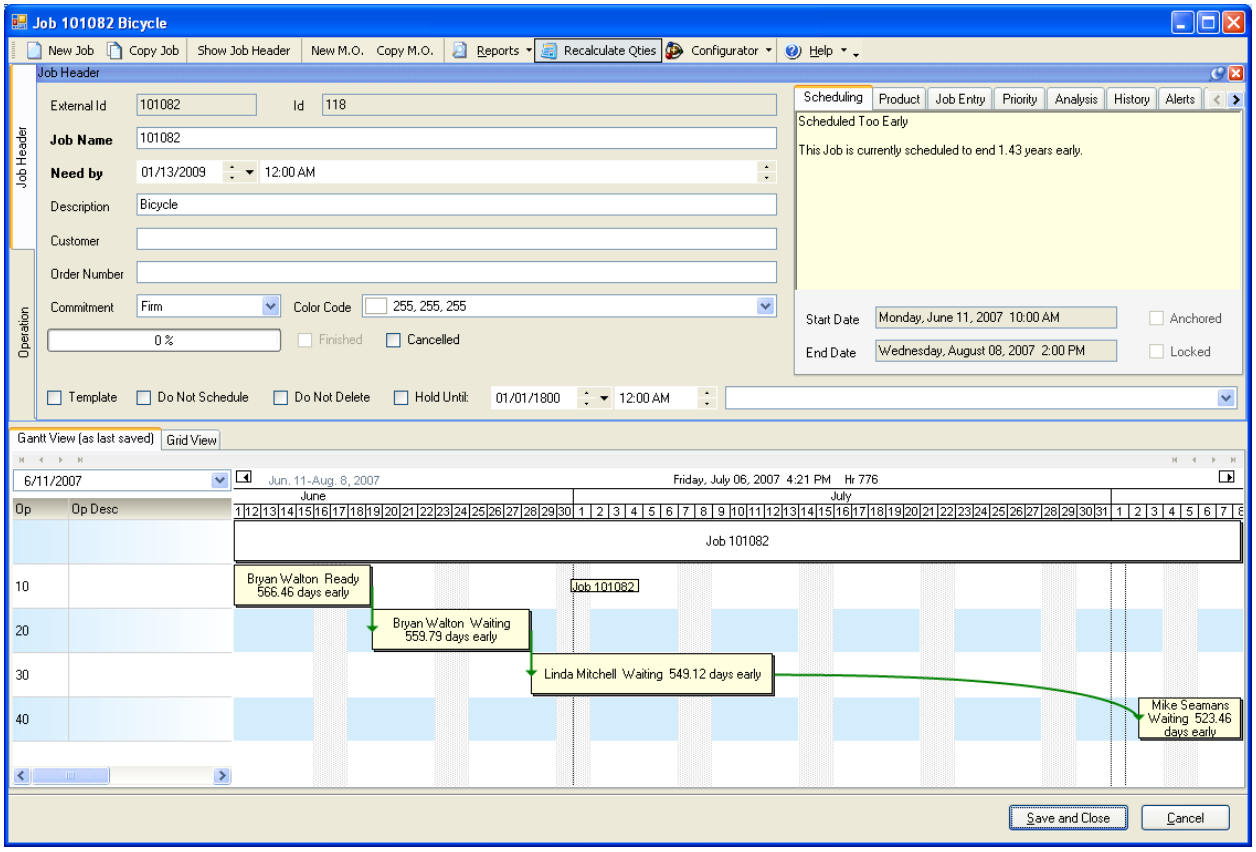




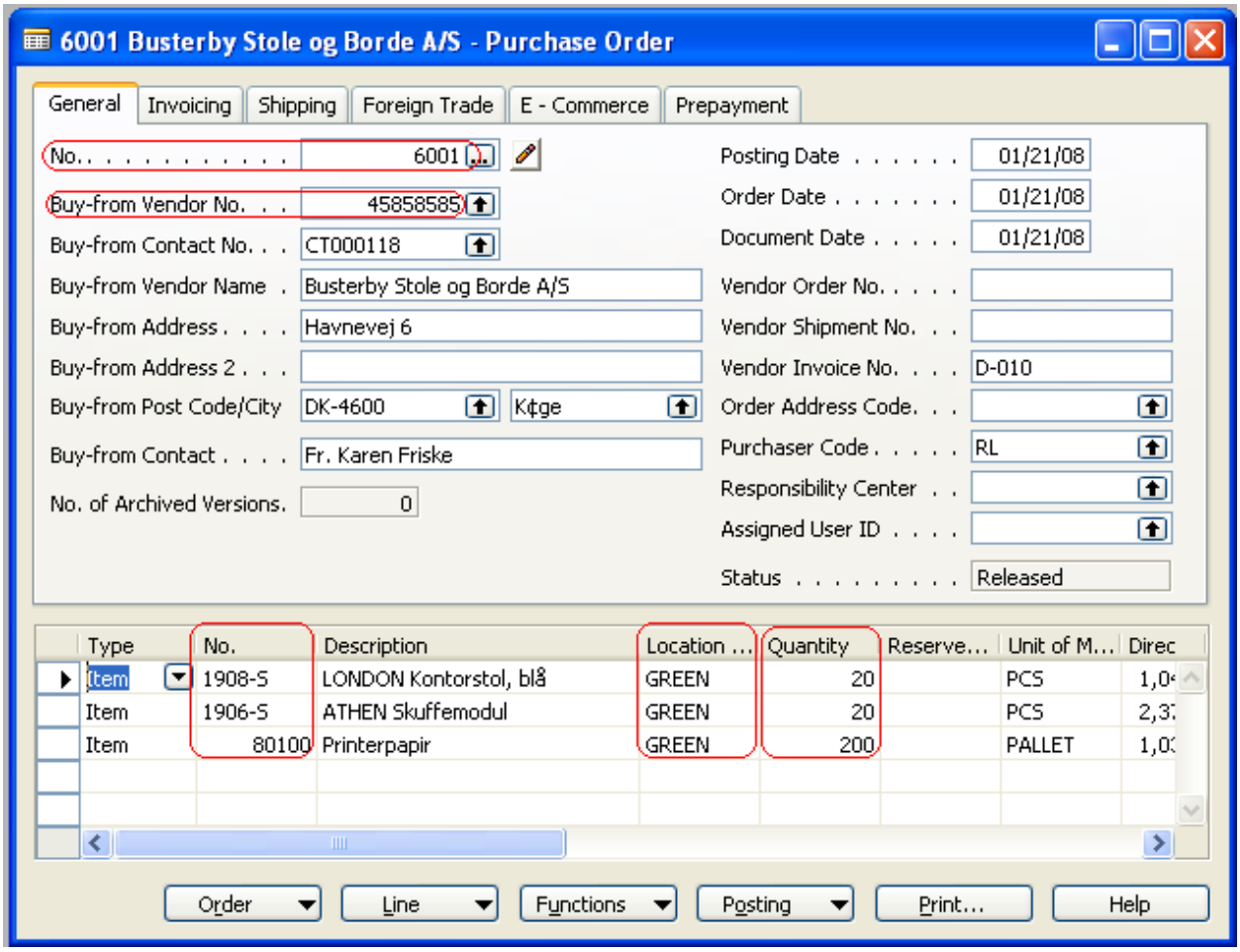
Tool and personnel requirements can be imported optionally. To include them edit the Scaler-value Functions in SQL Server as shown below.

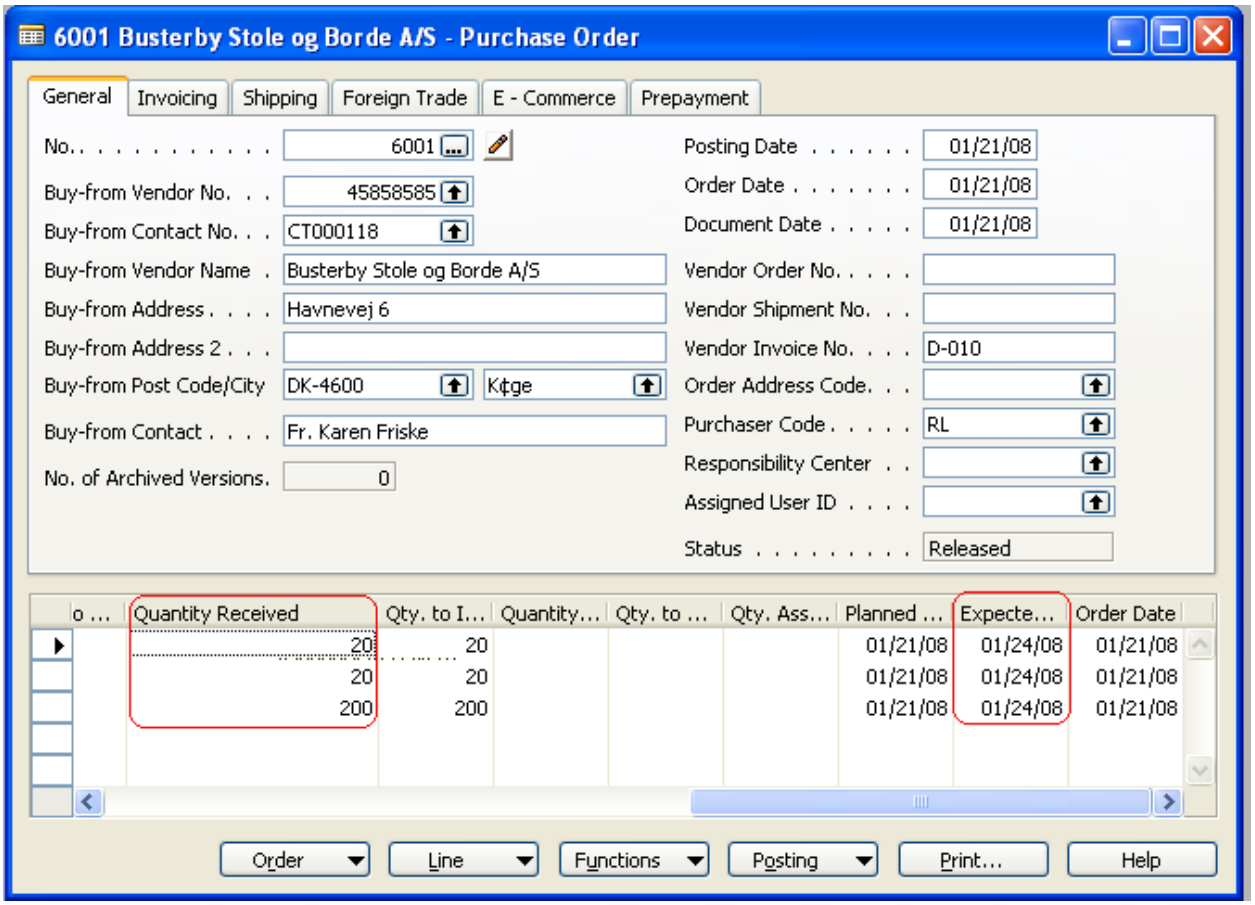



Microsoft SQL Server Management Studio
File Edit View Project Query Designer Tools Window
New Query
Object Explorer
Connect
BusinessNotificationInstanceMBSBN
BusinessNotificationInstanceNSMain
DEFAULT BA Database
Demo Database NAV (5-0)
Database Diagrams
Tables
Views
Synonyms
Programmability
Stored Procedures
Functions
Table-valued Functions
Scalar-valued Functions
dbo.ndogetartoken
dbo.APS_IncludePersonnel
dbo.APS_IncludeTools
dbo.APSGetDefaultWarehouseExternalId
Aggregate Functions


Job 101082 Bicycle
New Job
Copy Job
Show Job Header
New M.O.
Copy M.O.
Reports
Recalculate Qties
Configurator
Help
Job Header
External Id
101082
Id
118
Job Name
101082
Need by
01/13/2009
12:00 AM
Description
Bicycle
Customer
Order Number
Commitment
Firm
Color Code
255, 255, 255
0 %
Finished
Cancelled
Template
Do Not Schedule
Do Not Delete
Hold Until:
01/01/1800
12:00 AM
Scheduling
Product
Job Entry
Priority
Analysis
History
Alerts
Scheduled Too Early
This Job is currently scheduled to end 1.43 years early.
Start Date
Monday, June 11, 2007 10:00 AM
End Date
Wednesday, August 08, 2007 2:00 PM
Anchored
Locked
Gantt View (as last saved)
Grid View
6/11/2007
Jun. 11-Aug. 8, 2007
Friday, July 06, 2007 4:21 PM Hr 776
Op
Op Desc
June
July
Job 101082
10
20
30
40
Bryan Walton Ready
566.46 days early
Job 101082
Bryan Walton Waiting
559.79 days early
Linda Mitchell Waiting 549.12 days early
Mike Seamans
Waiting 523.46
days early
Save and Close
Cancel

Purchase Order




6001 Busterby Stole og Borde A/S - Purchase Order
General
Invoicing
Shipping
Foreign Trade
E - Commerce
Prepayment
No. 6001
Buy-from Vendor No. 45858585
Buy-from Contact No. CT000118
Buy-from Vendor Name Busterby Stole og Borde A/S
Buy-from Address Havnevej 6
Buy-from Address 2
Buy-from Post Code/City DK-4600 Køge
Buy-from Contact Fr. Karen Friske
No. of Archived Versions. 0
Posting Date 01/21/08
Order Date 01/21/08
Document Date 01/21/08
Vendor Order No.
Vendor Shipment No.
Vendor Invoice No. D-010
Order Address Code.
Purchaser Code RL
Responsibility Center
Assigned User ID
Status Released
o ...
Quantity Received
Qty. to I...
Quantity...
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Qty. Ass...
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Print...
Help

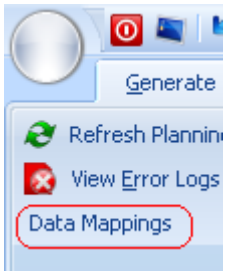
Customizing the NAV PlanetTogether Mappings

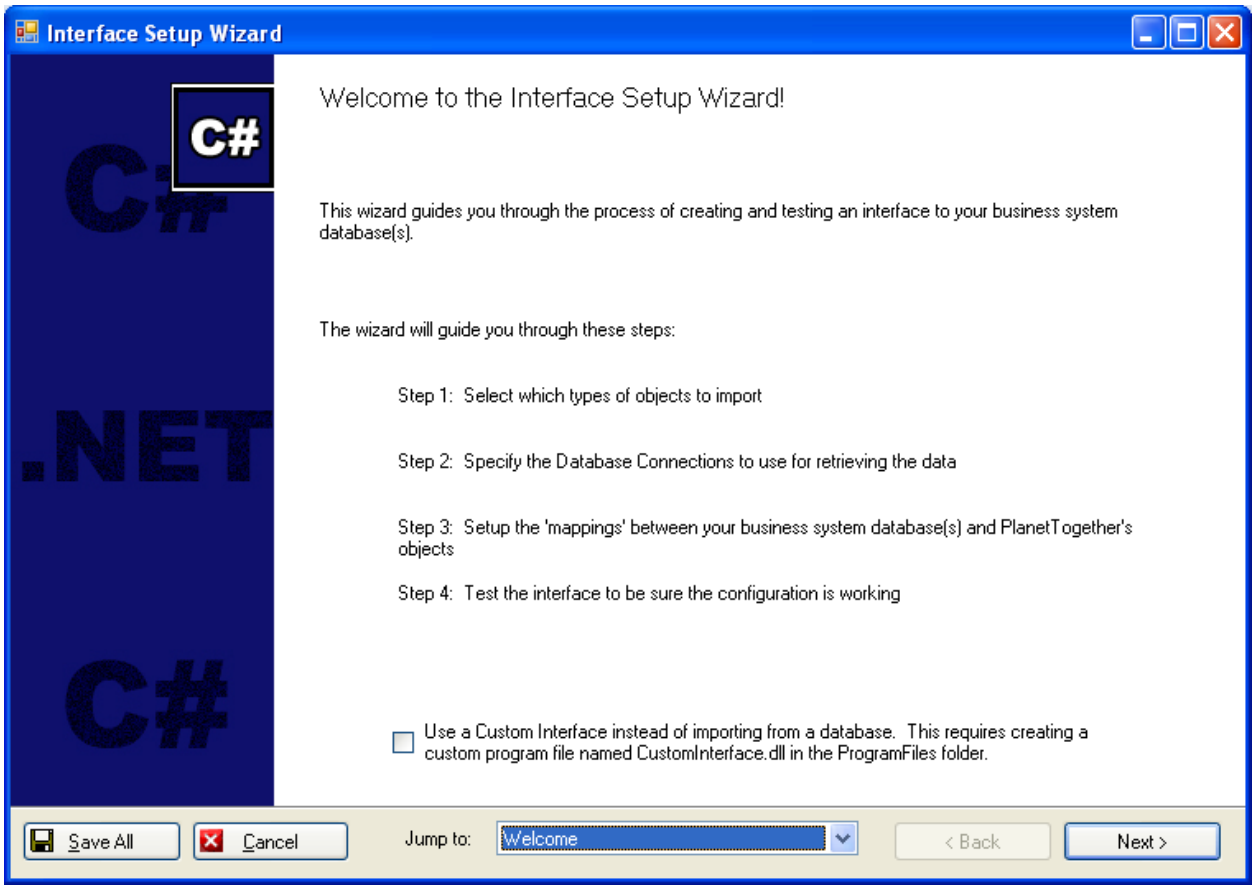
If necessary, you can customize the way in which NAV and PlanetTogether communicate.

Importing from NAV to PlanetTogether

The mappings between the NAV data and PlanetTogether data is specified in two places: (1) in the Interface Setup Wizard, and (2) in the SQL Server Views. Both are pictured below.

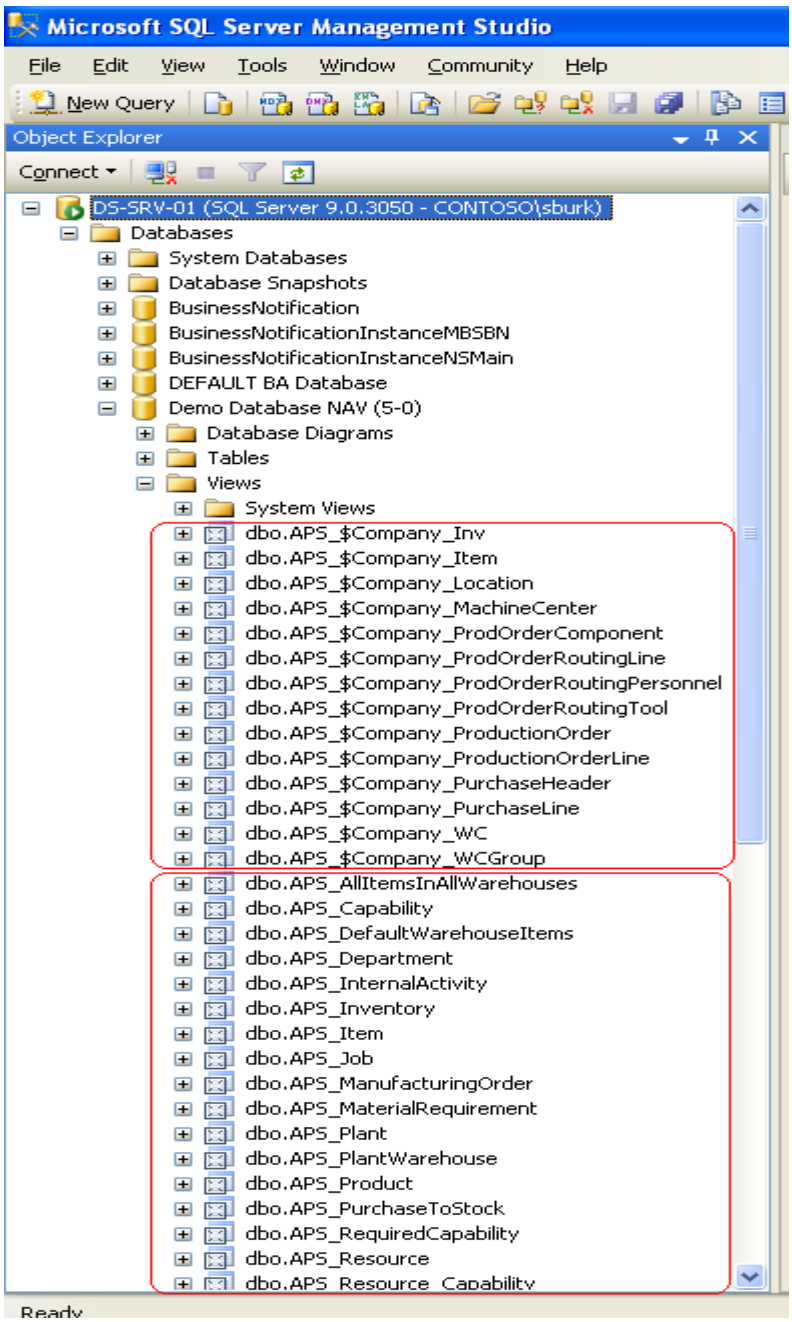
Click “Data Mappings” in PlanetTogether to display the Interface Setups Wizard.





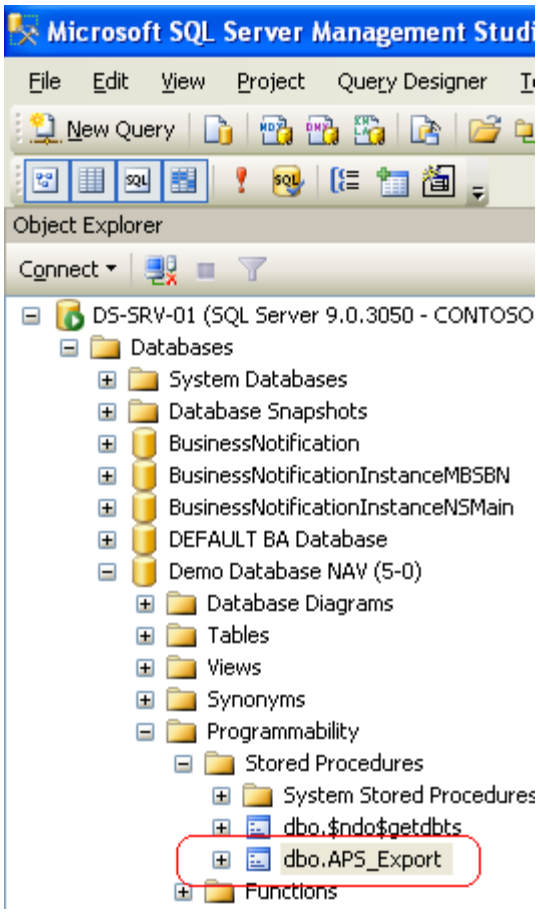
This wizard specifies the exact Views and fields from which data is extracted from NAV to populate PlanetTogether.

The SQL Views shown below can also be customized to retrieve data from other tables or even databases as necessary.



Exporting from PlanetTogether to NAV

After a schedule is created in PlanetTogether it can be used to update the Production Orders in NAV. This can be done by editing the Stored Procedure shown below. Then simply click the "Export to SQL" button in the PlanetTogether menu to export the data to the PlanetTogether SQL Database and run the Stored Procedure.


Microsoft SQL Server Management Studi
File
Edit
View
Project
Query Designer
New Query
Object Explorer
Connect
DS-SRV-01 (SQL Server 9.0.3050 - CONTOSO
Databases
System Databases
Database Snapshots
BusinessNotification
BusinessNotificationInstanceMBSBN
BusinessNotificationInstanceNSMain
DEFAULT BA Database
Demo Database NAV (5-0)
Database Diagrams
Tables
Views
Synonyms
Programmability
Stored Procedures
System Stored Procedures
dbo.ndogetdbts
dbo.APS_Export
Functions