

CHAPTER 2: FORECAST AND MPS

Training Objectives

In this chapter, you learn about:

- Production Forecast within Microsoft® Business Solutions–Navision® Manufacturing II
- Netting Actual Demand and Forecast
- Planning Approach
- Forecasting Sales Items and Components
- MPS Output Provides Input to MRP

Production Forecast

Long Term Planning

When the cumulative lead-time of a product is longer than the customers' expectations of delivery time, then you have a problem: late customer deliveries, which lead to bad customer relationships. To reduce or even eliminate the problem, you can plan for future demand to shape what you need to buy or make now in order to deliver on time in the future.

What is lead time? It depends on your point of view.

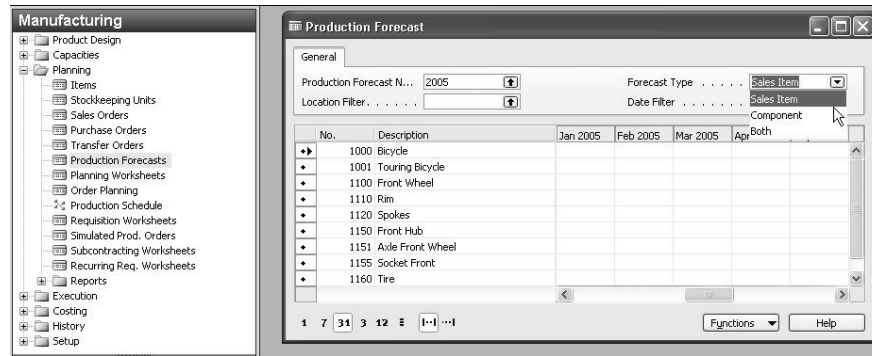
- If you are in the sales department, then lead time is the time elapsed between when the customer order is taken and when the product is delivered.
- Lead time for purchasing is the time between the recognition of the need for an order and the receipt of the items – which includes order preparation time, processing time, delivery and inspection time, to name a few.
- Everyone agrees that in manufacturing, the cumulative lead time is the longest planned length of time to accomplish an activity – this includes purchasing, production and related processing time.

When do you Need to Forecast?

For an example of customer expectations and lead time, we return to our hamburger at a restaurant. When you wait in line for a hamburger at a fast food restaurant, your expectation, as the customer, is a delivery time of a minute or two. If it goes beyond that, you tap your foot and wonder why this is called “fast food.”

What goes on behind the scenes when you place your order? Probably, someone grabs a wrapped burger, puts it in a bag and hands it to you – done! Maybe someone cooks a frozen burger patty while they assemble the bun and condiments – and you wait a few moments. In this way, your expectation of delivery time is met.

But what would happen to the restaurants' fast food if they did not use planning for its purchases? It would be a very different scenario. If the restaurant did not use planning for their purchases, then when you placed an order, someone would have to go catch a cow to begin the process of getting a patty; someone would run to the store to get mustard and ketchup; someone else would go to a market for the onions, then peel and chop them - all of this for your hamburger. We can safely say, then, that if the cumulative lead time is greater than the Customer expected lead time, you need to forecast.



Customer expectations can be stated in the form of forecasted quantities, item by item, and period by period. Normally the demand is forecasted for a given span of time (e.g. a year), and is maintained continuously.

The sales management part of the system provides options to make sales budgets displayed at an overall item group level. The sales budget can be expressed as expected amounts and/or quantities concerning all items in the group.

For planning purposes the forecast has to be stated as a quantity of each individual item covering expectations for a given period. The transformation of the sales budget into forecast per item is not covered in the current version.

Looking at Demand and Forecasts

Forecasts are not perfect. It necessary to deal with differences between actual demand and forecasted demand:

- If the forecast is greater than actual demand, you might want to move the remaining forecast to the next period. This is acceptable if the uncertainty only concerns timing. But if even the forecasted quantity is uncertain, this could cause accumulation of inventory. A standard system should not support that situation.
- A too optimistic forecast actually causes some increase in inventory if production of a period is carried out in accordance with the forecast. A surplus causes a larger opening inventory of the next period, and in that respect the remaining forecast has been moved to the next period. But calculation of net requirement uses the inventory to fulfill forecasted or actual demand of the next period. In this way the surplus is not added to the forecast of the next period.
- The opposite scenario – sale larger than forecast – is more serious. Since forecast is only made if cumulative lead-time is larger than the customer expected delivery time for sales orders, a too pessimistic forecast has the consequence that shipments to customers are going to be late. Since the system does not push customer's orders, it has to propose orders to fulfill the demand even though the orders can not be carried out in due time. If the shipment date of those customer's orders are changed to reflect reality, the orders are consuming forecast from the next period.

The production forecast can differ from the sales forecast. Seasonal variations in sale call for flexible production planning as expectations of customer demand vary. Moreover, the master planner could have other reasons for adjusting or supplementing the sales forecast. In that way usage of the production forecast can be very close to that of a master production schedule.

Forecast Types and Considerations in Microsoft Navision

The production forecast is entered manually by item. You may choose the period length to use in forecasting by choosing from the trendscape. You may choose 1 for day, 7 for week, 31 for month, 12 for year and the three bars for accounting period. The path MANUFACTURING→PLANNING→PRODUCTION FORECASTS takes you to the forecast form. Forecasts is also available from the Sales & Marketing menu, SALES & MARKETING→ANALYSIS & REPORTING→FORECASTS. A company can use the forecasting function without using manufacturing.

Forecasting can be done by sales items and by component items. It is important to understand the difference between dependent and independent demand.

- Independent Demand = Demand for an item that is unrelated to demand for other items.
- Dependent Demand = Demand that is directly related to or derived from the bill of materials structure for other items or end products.

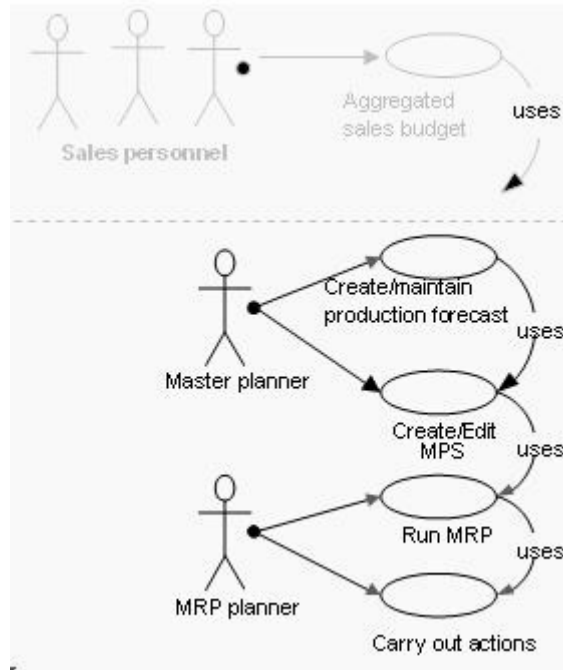
How do you forecast for an item that has both independent and dependent demand? This type of item is an item that is used to make a finished good and is sold by itself, probably as a spare part. Forecasting for this part has to be done in sales for the spare part sales, and has to be included when components are calculated.

No.	Description	Oct 2005	Nov 2005	Dec 2005	Jan 2006	Feb 2006	Mar 2006
→ A	Bicycle	800	600	3,500			
• B	Touring Bicycle						
• C	Rear Wheel						
• D	Lamp						

If you plan to net demand against forecast for each location individually, use the location filter in the header of the form before entering a quantity. Normally, forecasts are entered company-wide and not by location, but this is a company decision.

Enter Data in the Forecast Form

Forecasts mainly involve the sales, master planner and materials (or MR) planner.



The forecast is the sales department’s best guess at what is sold in the future. The forecast is specified item per item and period by period, e.g. monthly. The forecast can, for example, be transferred to a spreadsheet like this:

Forecast as per September 10th 2005								
		2005			2006			
Item	Description	October	November	December	January	February	March	April
A	Bicycle	800	600	3500	200	200	300	500
B	Touring Bicycle	900	600	3300	200	200	200	200
C	Rear wheel	5	5	5	5	5	5	5
D	Lamp	40	60	100	80	80	80	20
	and so on							

The planner then takes the sales forecast and modifies it to fit production constraints.

Traditionally the most important part of the forecast is on end items. However, if the end items are assembled to order, the forecast might be on the main-parts, which can be used as components in the final assembly. The same reasoning can be used in a make-to-order environment. For example, in a rapidly changing product area, such as home computer sales, forecasting might be done in this way. This method allows for the flexibility of both individual orders and to quickly replace an outdated part with a new, improved part.

Spare parts or options can also carry a separate forecast. In the above example, the lamp is an option and the rear wheel a spare part.

As mentioned, the gross requirement for components that are also sold as spare parts might be much larger than the sales forecast indicates, but most of the demand is dependent. In the example, both the bicycle and the touring bicycle use one rear wheel per bike. The sales forecast on the wheel shows just the expectations of direct sale for spare parts. The total amount of rear wheels for production is 1705, (800 for the bicycle + 900 for the touring bicycle + 5 sold as spare parts).

Enter three months of forecast for part A.

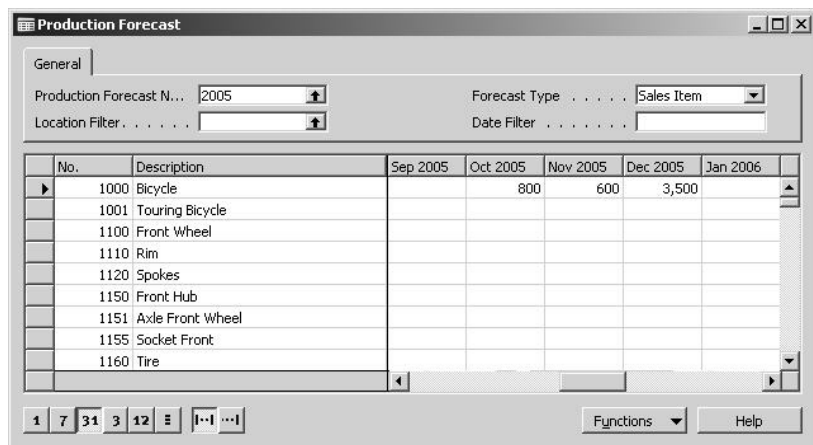
1. Before we enter the production forecast, create an item or choose an item to use in this example. This example is the basis for later examples. When choosing an item, choose one that has zero quantity on hand.
2. Go to the production forecast form,
MANUFACTURING→PLANNING→PRODUCTION FORECASTS.
3. Go to the **Production Forecast Name** field in the upper left corner of the header.
4. Use the **AssistButton** or **F6** to look up to a list of production forecast names.
5. Enter a Name and Description. For example, enter a name of “2005” and a description of “2005 Forecast.”
6. Choose the new name by clicking **OK**.
7. Still in the header, set a Forecast Type of Sales.
8. In the trendscape, choose 31 to view the production forecast in calendar months.
9. Move the date section on the right forward or back until you have October 2005 showing.
 - A short cut is to change the trendscape to Year (12) and move to the year 2005 or 2006, then change the view back to month (31).
 - Or you may enter a date range in the **Date Filter** field. (Filter expressions are covered in another manual.)

Choose an item to enter the production forecast for.

10. Enter the following information for the item for the 4th quarter 2005.

Item No	Description	Date (MM – YY)	Quantity
A	Bicycle	10– 05	800
A	Bicycle	11 – 05	600
A	Bicycle	12 – 05	3500

Based on the information, your production forecast should look like this.



When you enter a forecast in Microsoft Navision, the figure is always placed on the first date of the period. (In this manner, the production forecast form functions like the accounting budget form.) To see this,

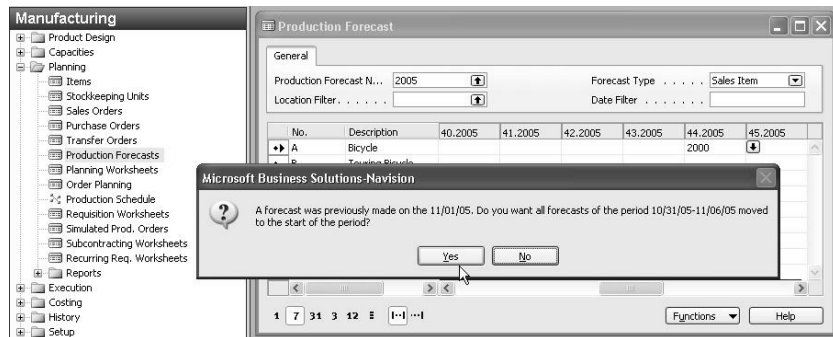
11. Put your cursor in one of the fields that holds a quantity, such as November 2005.
12. Use the **AssistButton** or **F6** to drill down to the entries.
13. See that the **Forecast Date** field has November 1, 2005.

NOTE: The definition of forecast periods says that a forecast on a given (starting date) is valid until the next forecasts start.

The time interval window gives the planner multiple choices to insert the demand at a specific date in a period. It works like this:

- If you have entered a forecast for November 2005, the demand is automatically placed on 11-01-05.

- If you change to a week scope (7), the forecast appears in week 44 of 2005, the forecast date is still 11-01-05 although this is not the first day of week 44.
- If the quantity is changed to 2000, still being in week scope, the system would normally create a positive difference entry at the first day of that period, in this case 10-31-05. However this would cause serious problems for the forecast period so instead the system now moves all forecast entries to this new starting date 10-31-05. In our example, the 600 would be moved from 11-01 to 10-31, then the difference between 600 and 2000 is also entered on 10-31.



It is therefore recommended not to change the forecast period scope unless you want to move all forecast entries to the starting date of this period.

An unlimited number of forecasts can be created and can be copied to each other. In this way the user is free to work with alternative forecasts. You can copy a forecast by clicking **FUNCTIONS**→**COPY PRODUCTION FORECAST**. Keep in mind that only one production forecast can be used in the planning process, MRP. The default production forecast is set up in manufacturing setup, and the user is allowed to choose another production forecast when running the planning worksheet. (The planning worksheet is explained in the chapter on Planning.)

14. Go to **MANUFACTURING SETUP**,
MANUFACTURING→**SETUP**→**MANUFACTURING SETUP**→**PLANNING TAB**.
15. In the field **Current Production Forecast**, choose the new forecast, 2005.

The forecast type Both is only used to give the planner an overview of both the sales item forecast and the component forecast. With this option, the forecast entries are not editable.

NOTE: When running the planning worksheets, the system bases the calculations on the sales unit of measure and the forecast entries in the valid forecast form. If there is no sales unit of measure given in the item card, the system instead uses the base unit of measure.

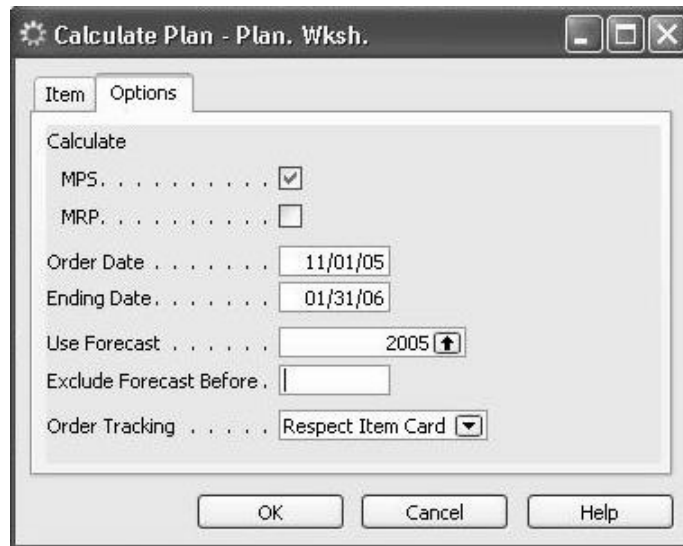
Netting Actual Demand against the Forecast

The planning process treats gross requirement from forecast as any other gross requirement. If the gross requirement causes the available projected inventory to pass below the reorder point, the system proposes a replenishment order with due regard to the planning parameters of the item.

The planning system can calculate Master Planning Schedule (MPS) or Material Requirements Planning (MRP) on request, or it can calculate both at the same time:

MPS: Calculation of a master production schedule (MPS) based on actual demand and the production forecast. The MPS calculation is carried out for items, which have a forecast or/and a sales order line. We call these items ‘MPS items’ and they are dynamically identified when the calculation starts.

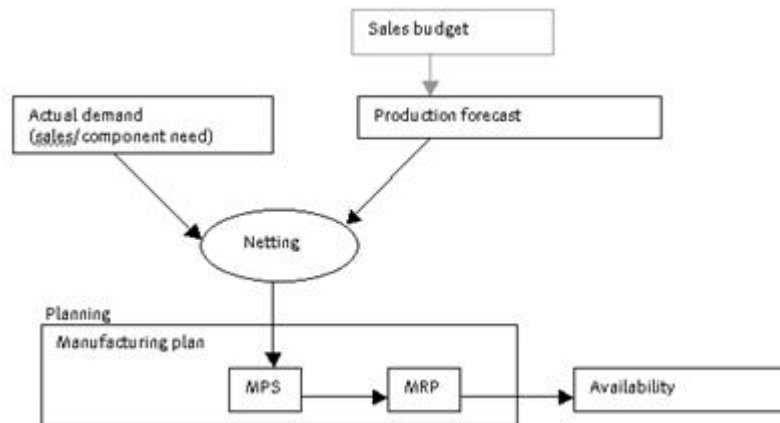
MRP: Calculation of material requirements based on actual demand for components and the production forecast on the component level. The MRP is calculated only for items that are not MPS-items as defined above. (More information on MPS and MRP is available in the Planning chapter.)



Elsewhere in the manual, we saw that we can choose to combine MPS and MRP each time we run the planning worksheet.

(MANUFACTURING→SETUP→MANUFACTURING SETUP→CHECK MARK IN COMBINED MPS/MRP) When we combine MPS and MRP, the system does not stop at the MPS level, and the production forecast should therefore reflect the same kind of production conditions, as the MPS would have considered.

The planning algorithms used are identical for both MPS and MRP. The planning algorithms concern netting, reuse of existing replenishment orders and action messages. We discuss this issue more in the chapter on Planning. Another way to show this process is in this figure.

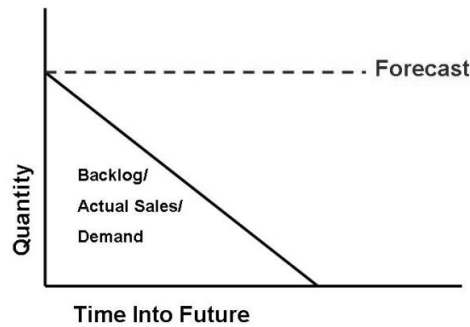


In the planning procedure the production forecast is a part of the gross requirements – but not at the same time as actual demand. When calculating the gross requirement of an item, actual demand neutralizes the forecast. We call the process ‘forecast consumption’ or ‘netting demand and forecast’.

Demand within a forecast period consumes the production forecast of that period. The forecast of a period is regarded as a gross requirement due on the forecast date. If actual requirements appear within the forecast period it reduces the forecasted quantity.

You could say that actual requirements substitute the forecast. If the actual requirements of a forecast period surpass the forecast, the forecast is removed from the gross requirements.

Forecasting



The result is a line of gross requirements starting with the remaining forecasted quantity of the period, if any, and followed by actual requirements, then the remaining forecasted quantity of the next period followed by actual requirements of that period, and so on.

Independent demand only consumes the sales item forecast, and dependent demand consumes only the component forecast.

The netting procedure does not actually delete the production forecast. The procedure only reduces the impact of the forecast. The production forecast itself is left unchanged, and has the original effect next time a plan is calculated. The netting procedure regards forecast records for previous periods expired by the starting date of the first valid forecast. If previous forecast records exist, the first valid forecast is the one having its forecast date closest before the starting date of the planning period.

After the total demand is determined by looking at all of the dependent and independent demand for an item, the demand is netted against the forecast. If demand is greater than the forecast, then planning uses the demand quantity.

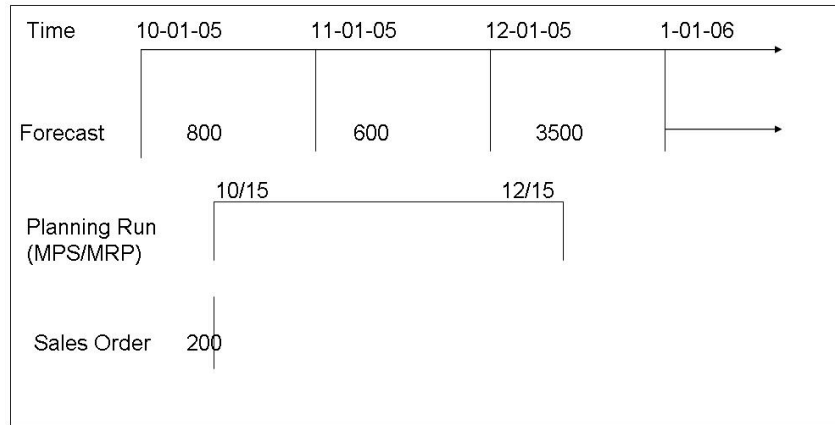
If a check mark is in the field **Use Forecast on Location**

(MANUFACTURING→SETUP→MANUFACTURING SETUP→PLANNING TAB) then demand nets against the forecast by location. If the field is not checked, demand nets against forecast company-wide. For more information on using multiple locations and the use of SKUs, refer to the course that discusses inventory and see online help. When a company forecasts to plan based on multiple locations, Use Forecast on Location provides crucial information.

NOTE: A company that forecasts by location must have a check mark in **Use Forecast on Location** in order to get correct information by location.

To understand this better, continue to look at the forecast entered for Item A. In addition to the forecast we entered, assume there is a sales order for 200 Item A for October 15 and assume the quantity on hand is zero.

Example of using planning with a forecast and actual demand



The procedure for netting the forecast using the example looks like this:

1. **FORECAST TYPE FILTER:** First, a filter is set to deal with independent demand and sales item forecast. In this example we deal with independent demand for Item A.
2. **FIND FIRST VALID FORECAST:** The first valid forecast is the one with a forecast date preceding or at the planning date. In this case the order date is 10-15-05 and the first valid forecast is the forecast for 600 with a forecast date of 10-01-05.
3. **DEFINE CURRENT FORECAST:** The first forecast is transformed to gross requirement as “current forecast”. Here it is a quantity of 600.
4. **DEFINE FORECAST PERIOD:** The next forecast is read. The result is that the next period starts 11-01-05.

The current forecast period ending date is (the next forecast date – 1), that is 10-31-05.
5. **CONSUME AND INSERT FORECAST:** All demand (unreserved or not) between forecast starting and ending date is read. The total demand in our example is 200. The total demand quantity is subtracted from the current forecast quantity (600 – 200). Reaching the end of the period the remaining current forecast is inserted as gross requirement (400).
6. **PREPARE FOR NEXT FORECAST PERIOD:** The next forecast becomes current forecast. This period starts with 11-01-05.

The procedure continues from step 4 until the last forecast has been read. In this case the planning includes forecast period 12-01-05 – 12-31-05 in its last step due to the fact that we run the planning until 12-15-05.

Due date (2005)	10-01	10-15	11-01	12-01
Forecast qty for Item A	600		800	3,500
Sales order		200		
Inventory				
Netting	400		800	3,500
Planning line 1000	400	200	800	3,500

Planning Approach

Microsoft Navision’s planning worksheet is where MPS and MRP are run. We discuss the planning worksheet both in this chapter and in the planning chapter.

The planning worksheet is found by following the path MANUFACTURING→PLANNING→PLANNING WORKSHEETS. A LOOK UNDER THE FUNCTIONS BUTTON shows a few options. In this chapter, we utilize the **Calculate Regenerative Plan** option. This and the other choices are discussed more in the chapter on planning.

The Calculate Regenerative Plan investigates demand (as we’ve examined) and supply and projects the available balance. Then the plan states the net requirement for the item. Lastly it creates a replenishment plan to fulfill net requirements.

When the calculate regenerative plan is chosen, the demand is net against the forecast. The **Component** option on the forecast determines which type of requirements to take into consideration in the netting process. If the forecast is for a sales item, and not a component forecast, only sales orders net the forecast. Otherwise the netting comprises dependent demand.

To demonstrate the Production Forecast / MPS functionality, we use item A. But first we place 300 pieces on inventory:

1. Go to PURCHASING→INVENTORY & COSTING→ITEM JOURNAL and post a positive adjustment for 300 pieces of item A to blank location on a date prior to today's date such as 01/01/04.

Now proceed to set up the item card:

2. Open the item card for item A by going to MANUFACTURING→PLANNING→ITEMS.
3. Enter the following on the replenishment tab::

Replenishment System Prod. Order
Manufacturing Policy Make-to-Stock

Enter the following on the planning tab.

Reorder Cycle 1W
Reordering Policy Lot-for-Lot
Include Inventory Yes

Close the item card.

Now create a forecast based on item A.

4. Go to MANUFACTURING→PLANNING→PRODUCTION FORECASTS.
5. In the **Production Forecast Name** field verify that you have forecast 2005 entered.
6. Verify that forecast type is set to Sales.
7. From the time interval buttons at the bottom, select Month (31).
8. On the line with item A, insert the quantities in the periods as follows:

Item No	Description	Date (MM – YY)	Quantity
A	Bicycle	10 – 05	0
A	Bicycle	11 – 05	1,200
A	Bicycle	12 – 05	1,200
A	Bicycle	01– 06	2,500

To demonstrate the concepts of master production scheduling, create sales orders to reflect actual customer demand. You are creating four sales orders based on the data in the below table.

- Create 4 different sales orders for a customer with the following shipment dates and quantities:

Item No	Description	Shipment Date (DD -MM- YY)	Quantity
A	Bicycle	11-11-05	90
A	Bicycle	11-20-05	170
A	Bicycle	12-12-05	510
A	Bicycle	12-19-05	710

Ignore any stock-out warnings.

A sales order looks like this:

The screenshot shows a software interface for a sales order. The title bar reads '109002 The Cannon Group PLC - Sales Order'. The interface has several tabs: 'General', 'Invoicing', 'Shipping', 'Foreign Trade', and 'E - Commerce'. The 'General' tab is active, showing various fields for order details. Below the fields is a table with columns: 'T... No.', 'Description', 'Location ...', 'Quantity', 'Unit of M...', 'Planned ...', 'Planned ...', and 'Shipmen...'. The table contains one row: 'I... A', 'Bicycle', 'BLUE', '90', 'PCS', '11/12/05', '11/11/05', and '11/11/05'. At the bottom of the window are buttons for 'Order', 'Line', 'Functions', 'Posting', 'Print...', and 'Help'.

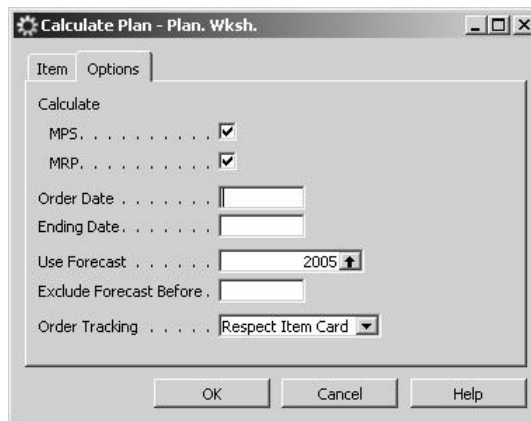
We now set up the planning system to run MPS only.

1. From the Manufacturing menu, choose SETUP→MANUFACTURING SETUP→PLANNING TAB.
2. Set Combine MPS/MRP Calculation to blank.
3. Verify that the Use Forecast on Location and the Components at Location are blank.

We have completed the preparation and we can now start generating the MPS.

1. From the Manufacturing menu, go to PLANNING→PLANNING WORKSHEET.
2. Delete the lines in the planning worksheet, if any are displayed.
3. Click FUNCTIONS→CALCULATE REGENERATIVE PLAN.
4. On the **Item** tab, set two filters:

- a location filter of BLANK (‘’) to exclude from the plan all demand existing on other locations and
 - a No. filter for the item, such as A.
5. On the **Options** tab, verify that there is a check mark in the **MPS** field and not in the **MRP** field.
 6. In the **Order Date** field, enter the starting date for the plan, for example 11/01/05.
 7. In the **Ending Date** field enter the end of the planning horizon, such as 1/31/06.
 8. In the **Use Forecast** field, verify that the new forecast, 2005, is entered. If it is not, enter it now.
 9. Leave the **Exclude Forecast before** field blank.
 10. Order Tracking should be set to Respect Item Card.



11. Click **OK**.

The MPS output looks like this:

No.	Ac...	A...	Original...	Due Date	Description	Original...	MPS Order	Quantity	Ref...	Ref. Ord...	R...
A	New	✓		11/01/05	Bicycle		✓	640	P...	101198	P..
A	New	✓		11/11/05	Bicycle		✓	90	P...	101199	P..
A	New	✓		11/20/05	Bicycle		✓	170	Pro...	101200	P..
A	New	✓		12/12/05	Bicycle		✓	1,220	Pro...	101201	P..
A	New	✓		01/01/06	Bicycle		✓	2,500	Pro...	101202	P..

Analyze this output.

1. Select the first row in the planning worksheet with a quantity of 640.
2. Click FUNCTIONS→ORDER TRACKING. You get a message saying that there are no tracking entries for this line. Forecast items are not tracked.

Now why do we not get any order tracking information here? The reason is that this line represents the gross requirement for the forecast period and therefore is not tracked to any specific demand.

1. Press ESC to return to the planning worksheet.
2. Place the cursor on the fourth line in the planning worksheet with a quantity of 1,220.
3. Click FUNCTIONS→ORDER TRACKING The Order Tracking screen shows you two lines, one for each sales order.

During December there is an independent demand with a quantity of 1,220 (510+710). This demand is higher than the forecast quantity of 1,200. Therefore the forecast for this period is totally neutralized by the actual demand.

To better explain the output in the planning worksheet, the following table can be used:

Due date (2005)	11-01	11-11	11-20	12-01	12-12	12-20	1-01
Forecast qty A	1,200			1,200			2,500
Sales order		90	170		510	710	
Inventory	300						
Netting	640			- 20			2,500
Planning line 1000	640	90	170		1,220		2,500

In the first forecast period we see that the gross requirement can be calculated to 640 (1,200 – 300 – (90+170)). This is due on the 11-01-01.

The second forecast period has no gross requirement due to the fact that all forecast is consumed during the netting (1,200 < (510+710)). The reorder cycle of one week for item A detects that both sales orders are due within one week and are therefore planned together.

The third forecast period quantity is left unchanged because there is no independent demand at all in this period.

***NOTE:** Order Tracking does not track to the production forecast because of the design of the forecast. The forecast quantity is the sum of several entries (correction history, and forecast for different locations). The system would therefore have to calculate the quantity when trying to track back to the forecast and this is not possible.*

Reports

Two reports are useful in this process and both are found by going to MANUFACTURING→PLANNING→REPORTS.

Planning Availability : This report displays an overview of all known existing requirements and receipts for the items that you select on a specific date. You can use the report to get a quick picture of the current demand-supply situation for an item. The report displays the item number and description plus the actual quantity in inventory. Changes to the projected available inventory are listed chronologically. The report has the following fields:

Field	Definition
Gross Requirement	This is the total demand, independent and dependent, for the particular item. Independent demand comes from sales orders, service orders, transfer orders and production forecasts. Dependent demand comes from production order components from planned, firm planned and released production orders. Component demand for production order proposals in planning and requisition worksheets is also included.
Planned Receipts	These are the items from replenishment order proposals. This includes planned production orders, planning worksheets and requisition worksheets.
Scheduled Receipts	These are the items from replenishment orders. This includes firm planned production orders, released production orders, purchase orders and transfer orders
Projected Balance	This shows the projected available inventory, which includes current inventory + scheduled receipts + planned receipts - requirements. Note that when calculating a replenishment plan, the program regards a projected balance, which is negative, as an additional requirement.

Field	Definition
Document Type	This shows the type of document that is the source of the availability.
Document Number	This shows the number of the relevant source document.

Production Forecast - This report shows an overview of the production forecast, plus any sales orders, for the selected items. You can use the report to check the accuracy of your production forecast, for example. You can define what is included in the report by setting filters. You can set additional fields on the tab by clicking the **Field** field, and then clicking the **AssistButton** that appears to the right.

Forecasting Sales Items and Components

When using a master production schedule, the planning responsibility for fulfilling customer demand has moved to the master planner and the MPS. When later calculating MRP, order proposals from MRP are exclusively based on dependent demand. Component needs for MPS items start the planning and the further explosion is then carried out as usual, but with no consideration to demand from sales orders.

We now illustrate how the different forecast types work. But first of all we need to delete the four sales orders and remove our bicycle inventory.

1. Go to MANUFACTURING→PLANNING→ITEMS and find the item you have been working with, A.
2. Go to the Quantity on **Sales Orders** field and use the **AssistButton** or **F6** to look up to the Sales Lines.
3. Go to the first line and choose line BUTTON→SHOW DOCUMENT. This takes you to the sales order.
4. With the cursor in the header, press **F4** to delete the sales order. Press **ESC** to go back to the Sales Lines form.
5. Repeat steps 4 and 5 until the sales orders for item A are gone.
Item A currently carries an inventory of 300, which we must remove.
6. From the Purchasing menu, choose INVENTORY & COSTING→ITEM JOURNAL. Create and post an entry to remove the 300 items from inventory for location blank on the same day you first posted them.

Sales Forecast

We now complete the steps required when entering a sales forecast.

We are going to create a new forecast – Example – using items A Bicycle and E Saddle. Use the item you have been using and a new item. The new item should be a component of the first item and have zero quantity on hand and no supply or demand. Be sure that the Reorder Cycle on the new item is 1M.

1. From the Manufacturing menu, choose PLANNING→PRODUCTION FORECAST.
2. As was shown earlier in the chapter, look up in the **Production Forecast Number** field, create a new forecast with the name Example and description Example. Choose this forecast.
3. Set the Forecast Type to Sales.
4. Choose the month (31) option on the trendscape.
5. On the lines for items A and E, tab to the periods to be forecasted, and then enter the quantities according to the below table.

We use the following table to enter the sales item forecast for items A and E. If :

Item No	Description	Date (MM – YY)	Qty.
A	Bicycle	11 – 05	200
A	Bicycle	12 – 05	150
A	Bicycle	01 – 06	300
E	Saddle	11 – 05	50
E	Saddle	12 – 05	50
E	Saddle	01 – 06	50

We have already set up the system to only run MPS, so now we are ready to start generating the MPS.

1. Go to MANUFACTURING→PLANNING→PLANNING WORKSHEET.
2. Delete the lines in the planning worksheet, if any are displayed.
3. Click FUNCTIONS BUTTON→CALCULATE REGENERATIVE PLAN.
4. Change the Number filter to include E. The filter looks like this “A|E.” Click **OK**.
5. On the **Options** tab, in the **Use Forecast** field, choose the new forecast Example.

The MPS output looks like this:

Item Number	Due Date	Quantity
A	11-01	200
A	12-01	150
A	01-01	300
E	10-13	250
E	11-19	500
E	01-01	50

The first three lines for item A are explained by the fact that we have stated a forecast with the corresponding quantities at the corresponding due dates.

But how do we explain the lines for item E? Use the order tracking tool to analyze this more.

1. Place the cursor on the first planning line for item E with a quantity of 250.
2. Press FUNCTIONS BUTTON→ORDER TRACKING. .

The tracked quantity is equal to 200. This is due to the fact that we have an independent demand of 200 for the parent item A with a due date on 10-13. How can we confirm this due date?

1. Close the Order Tracking window.
2. Place the cursor on the first planning line for item A with a quantity of 200.
3. Press ITEM→ROUTING.

The saddle is part of the final assembly, which has a starting date on 10-13.

Remember that we had an untracked quantity of 50 for the planning line of the saddle? This is the sales forecast quantity of 50 due on 11-01. The reorder cycle of one month for the saddle means that this quantity is included in the quantity due on 10-13-01.

The output can be described as follows:

Due date (2005-06)	10-13	11-01	11-19	12-01	12-07	1-01
Forecast qty A		200		150		300
Forecast qty E		50		50		50
Demand from A	200		150		300	
	↓	↙	↓	↘		
Planning line E	250		500			50
						↓

Component Forecast

The component forecast can be seen as an option forecast in relation to a parent item. This can for example be useful if the planner can estimate the demand for the component.

As the component forecast is designed to define options for a parent item, the component forecast should be equal or less than the sales item forecast quantity. If the component forecast is higher than the sales item forecast, the system treats the difference between these two types of forecast as independent demand.

We modify the Example forecast by inserting a component forecast for the saddle instead of the sales forecast previously used.

We have already entered this information in the sales item forecast for item A:

Item No	Description	Date (MM – YY)	Quantity
A	Bicycle	11-05	200
A	Bicycle	12-05	150
A	Bicycle	01-06	300

We have already entered this information in the sales item forecast for item E:

Item No	Description	Date (MM – YY)	Quantity
E	Saddle	11-05	50
E	Saddle	12-05	50
E	Saddle	01-06	50

We now enter a component forecast for item E Saddle.

1. On the Manufacturing menu, select PLANNING→PRODUCTION FORECAST.
2. Delete the sales item forecast for November, December, and January for item E.
3. Change the **Forecast Type** field to Component.
4. Enter the new component forecast quantity from the table above for 50 each in November and December 2005 and January of 2006.
5. Close the window.

Since we have not changed anything concerning the manufacturing setup, we can calculate a plan for this example.

1. Go back to MANUFACTURING→PLANNING→PLANNING WORKSHEET.
2. Delete the old lines.

- Click FUNCTIONS BUTTON → CALCULATE REGENERATIVE PLAN using the same options and click **OK**. The MPS output looks like this:

Item Number	Due Date	Quantity
A	11-01	200
A	12-01	150
A	01-01	300
E	10-13	200
E	11-19	450
E	01-01	50

The first three lines for item 1000 are explained by the fact that we have stated a forecast with the corresponding quantities at the corresponding due dates.

How do we explain the new lines for item E? Use the order tracking tool to analyze this more.

- Place the cursor on the first planning line for item E with a quantity of 200.
- Press FUNCTIONS BUTTON → ORDER TRACKING.

The tracked quantity is equal to 200. This is due to the fact that we have an independent demand of 200 for the parent item A with a due date at 10-13-01. We can confirm this by checking the routing for the parent item.

The demand for the parent item forms the demand for the component. In this case the demand is higher than the component forecast ($200 > 50$) and therefore no gross requirement exists for this period.

The output can be described as follows:

Due date	10-13	11-01	11-19	12-01	12-07-	01-01
Forecast sales qty 1000		200		150		300
Forecast comp qty 1850		50		50		50
Demand from 1000	200	/	150	/	300	
Netting	$200 > 50$		$450 > 50$			$0 < 50$
Planning lines 1850	200		450			50

As we can see on the last planning line the component forecast is higher than the demand from the parent item. Therefore the system treats the remaining quantity as independent demand.

***NOTE:** The combination of reorder cycle of one month and a monthly forecast period could lead to the calculation of two periods instead of one. Remember that we define the ending date for the forecast period as the ending date for the next period – 1 day. The traditional way of defining one month (1M) is 1M = 01-01-01 – 02-01-01. This means that the system includes two monthly entries.*

MPS Output Provides Input to MRP

We have discovered some things that cause changes in the MPS. These among others are heavy vacation/holiday schedules. In addition, we discovered that one of our primary vendors is closing down his business for a week during Christmas. Accordingly, we must change the following quantities by date and by item in the generated planning worksheet:

1. Make the following manual changes:

Item A due date 11-01-05-change quantity from 200 to 300

Item A due date 12-01-05-change quantity from 150 to 200

Item A due date 01-01-06-change quantity from 300 to 450

After you have completed the quantity changes, we change the planning system to run MRP (using the modified MPS) as input.

2. Go to MANUFACTURING→PLANNING→PLANNING WORKSHEET→FUNCTIONS BUTTON→CALCULATE REGENERATIVE PLAN.
3. On the **Item** tab, delete the No filter. On the **Options** tab, select MRP.
4. Click **OK**.

You see many entries in the planning worksheet. The first six entries are marked MPS order and are based on information we have already researched. The quantities of the lower-level (MRP) items have been derived on the basis of our modified MPS.

Test Your Skills – Forecast and MPS

2.1 Forecast and MPS

In this exercise we take a closer look at the creation of the planning lines (sequence of priorities of the tracking entries). We use different combinations of the following entries in the system:

- Sales order line of a sales item
- Sales order line of a component of that sales item
- Sales item forecast
- Component forecast
- Existing Inventory

The following BOM structure is used in order to simplify the analysis:

Item 8000
↑
Item 8001 (1)
Quantity per for item 8000 = 1

The manufacturing policy is M-T-S and the reorder cycle is 1 week for both items.

All planning parameters are 0.

1. Set the work date to 11-01-05.
2. Create items 8000 and 8001.
3. Create a new production BOM for item 8000 and insert item 8001 with a quantity of 1.
4. Insert the new BOM on the item card for item.
5. Run the calculate low level code.
6. Create a new production forecast and name it Scenario.

Use the tables below to create different scenarios and calculate regenerative plan for MPS only MPS only using the dates 11/1 – 11/30.

Complete the tables with the planning lines created in the planning worksheet with quantity and due dates.

Use the order tracking tool to analyze the results. Can you explain why the planning lines are created?

Scenario 1:

Item	Inventory	Forecast Sales	Forecast Comp.	Sales order line	Planning line qty, due date
8000	1 11-01-05	2		1 11-15-05	
8001	1 11-01-05	1			

Scenario 2:

Item	Inventory	Forecast Sales	Forecast Comp.	Sales order line	Planning line qty, due date
8000	1 11-01-05	2		1 11-15-05	
8001	1 11-01-05	1		1 11-15-05	

Scenario 3:

Item	Inventory	Forecast Sales	Forecast Comp.	Sales order line	Planning line qty, due date
8000	1 11-01-05	1		2 11-15-05	
8001	1 11-01-05		1		

Scenario 4:

Item	Inventory	Forecast Sales	Forecast Comp.	Sales order line	Planning line qty, due date
8000	1 11-01-05	1		2 11-15-05	
8001	1 11-01-05		2		

Scenario 5:

Item	Inventory	Forecast Sales	Forecast Comp.	Sales order line	Planning line qty, due date
8000		3		2 11-15-05	
8001	1 11-01-05 1 11-15-05		2	3 11-15-05	

With these five scenarios, we have explained the planning lines as well as the tracking to demand, forecast and inventory. We did not include aspects of production orders (planned scheduled receipts etc) – these merely increase inventory.

Quick Interaction: Lessons Learned

Take a moment to write down 3 Key Points you have learned from this chapter:

1.

2.

3.
