



QAD Enterprise Applications
Enterprise Edition & Standard Edition

Training Guide Forecast Simulation

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QAD Inc.

100 Innovation Place
Santa Barbara, California 93108
Phone (805) 684-6614
Fax (805) 684-1890
<http://www.qad.com>

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About This Course

Course Description

QAD designed this course to cover the basics of preparing to implement the Forecast Simulation module of QAD Enterprise Applications. The course includes:

- An introduction to the Forecast Simulation module
- An overview of key business issues
- Setting up the Forecast Simulation module
- Operating the Forecast Simulation module
- Activities and exercises throughout the course
 - Students practice key concepts and processes in the Forecast Simulation module

Course Objectives

By the end of this class, students will:

- Identify some key business considerations before setting up Forecast Simulation in QAD Enterprise Applications
- Set up Forecast Simulation in QAD Enterprise Applications
- Use Forecast Simulation in QAD Enterprise Applications

Audience

- Implementation consultants
- Members of implementation teams
- Key users

Prerequisites

- *Initial QAD Enterprise Applications Setup* training course
- *Sales Order Management* training course is very strongly recommended
- Basic knowledge of QAD Enterprise Applications as it is used in the business
- Working knowledge of the manufacturing industry in general

Course Credit and Scheduling

This course is one of several courses designed to assist students in preparing for QAD certification examinations. However, QAD does not guarantee anyone a passing grade as a result of having taken this course.

Students preparing for certification examinations should study all available materials (user guides, training guides, on-line help, for example) and acquire industry and field experience.

This course is designed to be taught in one day

QAD Resources

If you encounter questions or problems on QAD software that are not addressed in this book, several resources are available.

Product Help

All QAD products ship with integrated help systems. A properly installed QAD application will display help when you press the Help key (F1), or access it through the menu. The help covers the normal use of the product.

QAD Web Resources

The QAD website provides product and company overviews. The Print Solution option on the opening page provides a means of compiling desired content into a document specialized to your industry, business implementation, and needs.

<http://www.qad.com/>

From QAD's main site, you can access QAD's Learning or Support sites.

QAD Learning Portal for Training Opportunities

To view available training courses, locations, and materials, use the QAD Learning Portal. Choose Learning under the Global Services tab to access this resource.

QAD Support for Product Documentation and the QAD Knowledgebase

To access release notes, user guides, installation and conversion guides by product and release, visit the Support website. Support also offers an array of tools depending on your company's maintenance agreement with QAD. These include the Knowledgebase and direct links to QAD Support experts.

Choose Support under the Global Services tab.

Any QAD customer can register for a QAD web account by accessing the Support web site and clicking the Accounts link at the top of the screen. Your customer ID number is required. Access to certain areas is dependent on the type of agreement you have with QAD.

CHAPTER 1

Introduction to Forecast Simulation



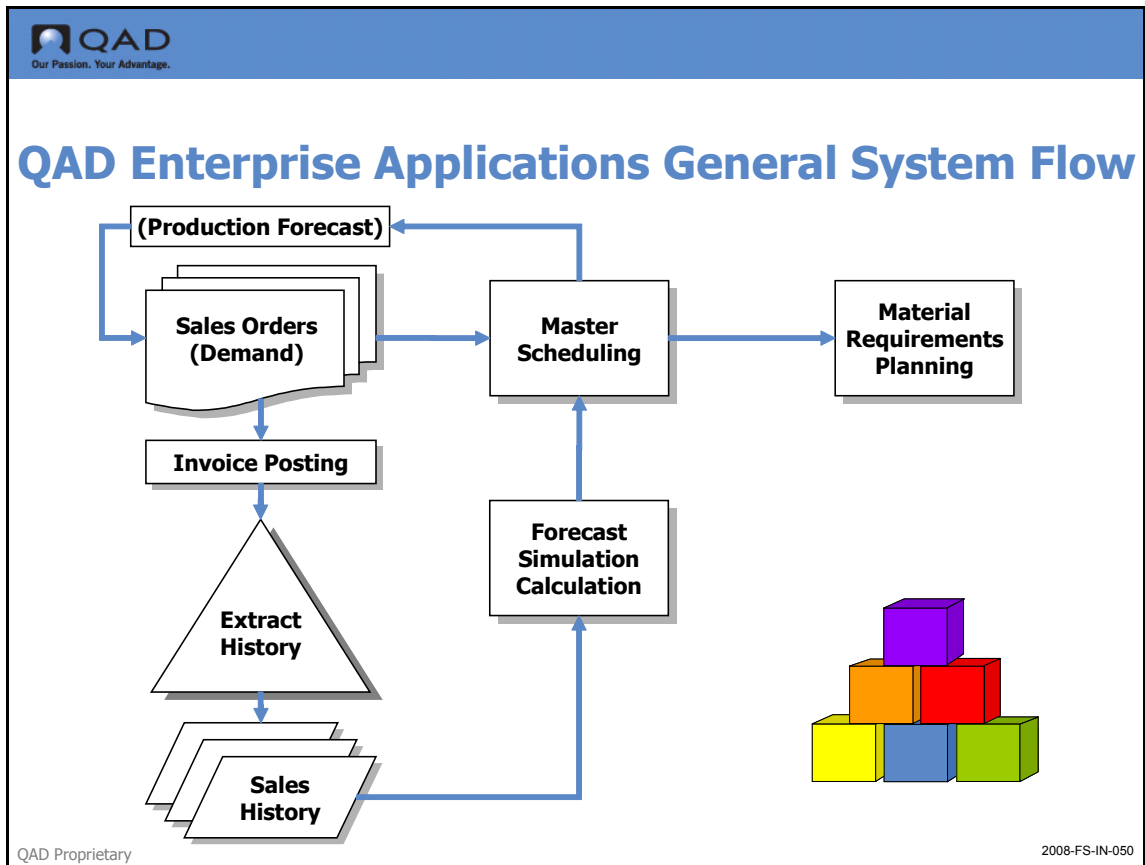
Course Overview

- ▲ Introduction to Forecast Simulation
- ▲ Business Considerations
- ▲ Set up Forecast Simulation
- ▲ Use Forecast Simulation

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Overview



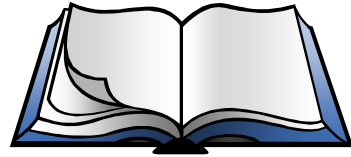
General System Flow

- Customer places sales order
 - Extract Sales History
 - History drives Forecast Simulation Calculation
- Forecast Simulation Calculation and Sales Orders feed MRP Calculation
- Manufacturing supplies needs of MRP Calculation



Terminology

- ▲ Abnormal sales
- ▲ Forecast consumption
- ▲ Trends and cycles
- ▲ Regression analysis



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Terminology

Abnormal Sales

When unusual, unanticipated sales demands are discounted from normal sales demand. Example, sales related to a natural disaster. Often called an “outlier” in statistics. See *Modifying Forecast Results* on page 88.

Forecast Consumption

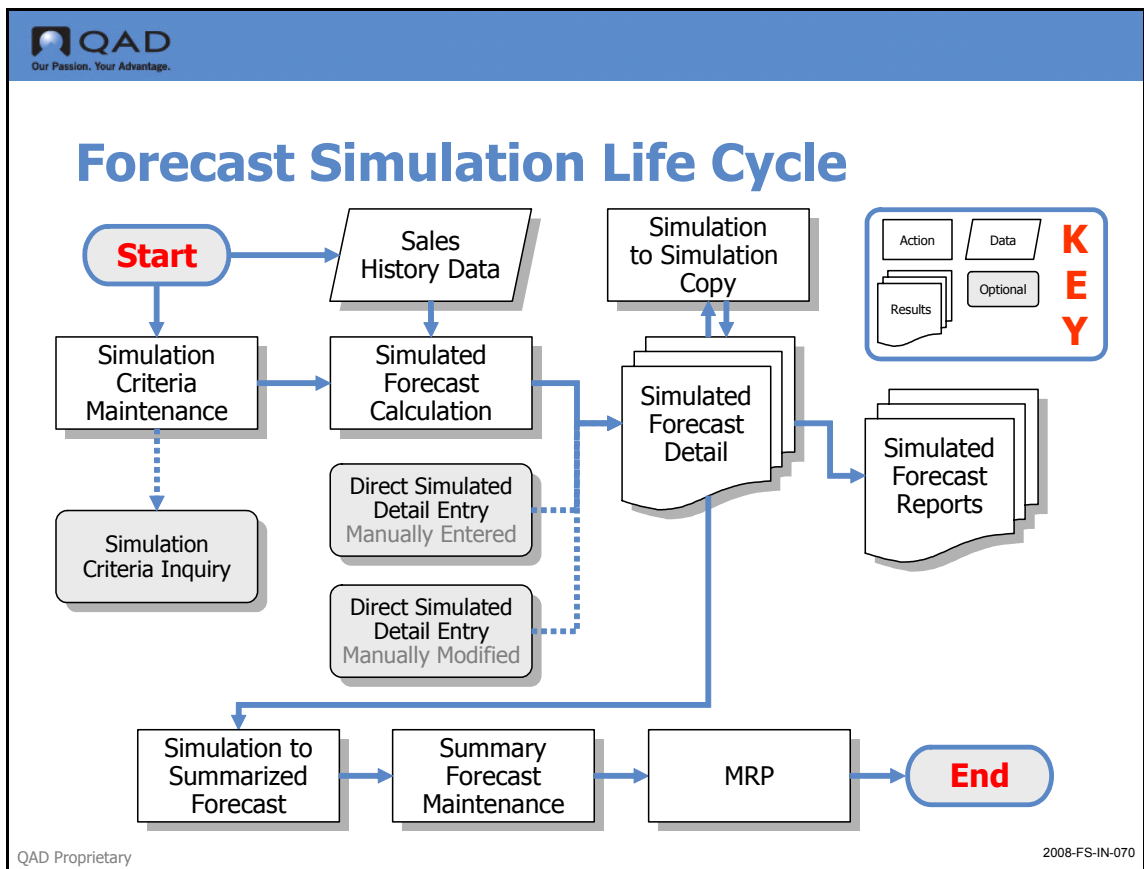
Reducing the forecast quantities by the confirmed sales order quantities. See *Forecasting Consumption* on page 49.

Trends and Cycles

Multipliers for increase or decrease in demand; and repeated patterns of varying demand. See *Sales History Patterns* on page 61.

Regression Analysis

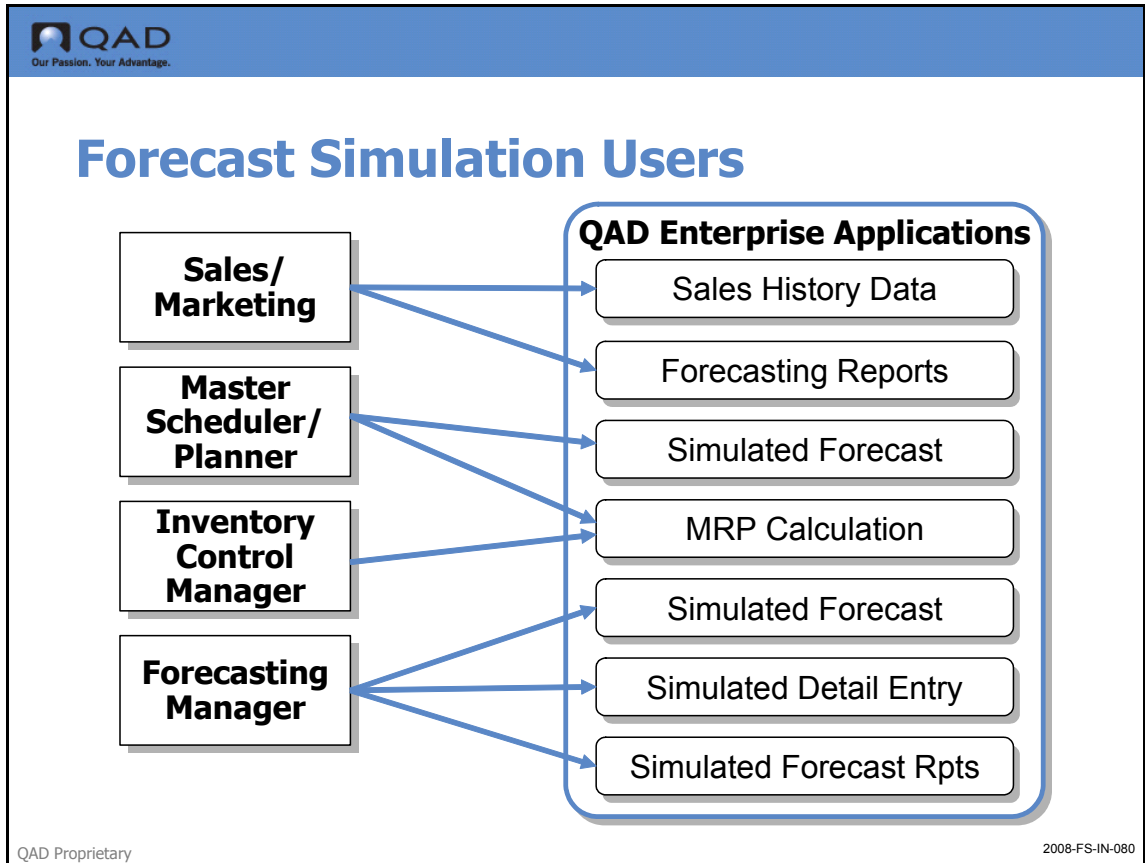
Statistical method to determine the best relationship between a response and independent variables. See *Calculation Methods* on page 60 and *Simple Regression* on page 69



Forecast Simulation Life Cycle

This life cycle is explained in detail in the Setup chapter.

See in this training guide: [Lifecycle Summary](#) on page 41



Typical Users

Various people typically control key tasks. This chart illustrates typical users and the most common tasks in Forecast Simulation with which they would be involved.



Course Objectives

In this course you learn how to:

- ▲ Identify some key business considerations before setting up Forecast Simulation in QAD Enterprise Applications
- ▲ Set up Forecast Simulation in QAD Enterprise Applications
- ▲ Use Forecast Simulation in QAD Enterprise Applications

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Course Objectives



Course Overview

- ▲ Introduction to Forecast Simulation
- ▲ Business Considerations
- ▲ Set up Forecast Simulation
- ▲ Use Forecast Simulation

CHAPTER 2

Business Considerations



Business Considerations

- ▲ **Identify some key business considerations before setting up Forecast Simulation in QAD Enterprise Applications**
- ▲ Set up Forecast Simulation in QAD Enterprise Applications
- ▲ Use Forecast Simulation in QAD Enterprise Applications

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Business Considerations



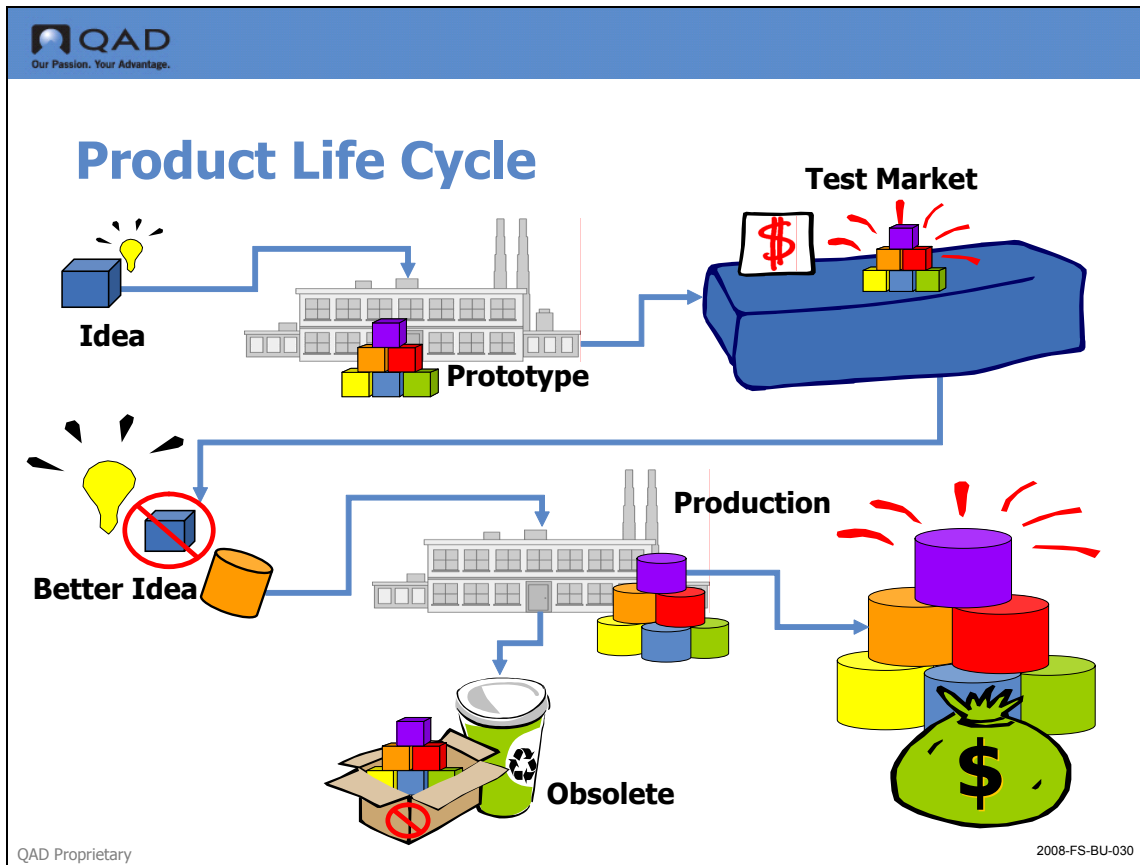
Business Issues

- ▲ Product life cycle
- ▲ Forecast consumption
- ▲ MRP horizon
- ▲ Production forecasts
- ▲ Spare (service) parts
- ▲ Multiple sites

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There are several business issues to take into consideration before setting up QAD Enterprise Applications. This section does not discuss all potential issues, but presents some issues to generate thought and discussion.



Product Life Cycle

Definition

Any product goes through some form of a life cycle at the manufacturer. The product idea is conceived, designs created, manufacturing commences, and the product moves into sales and customer availability.

For many products, design changes and modifications are applied, additional manufacturing is completed, old product is retired, and new product enters sales and customer availability.

Why Consider?

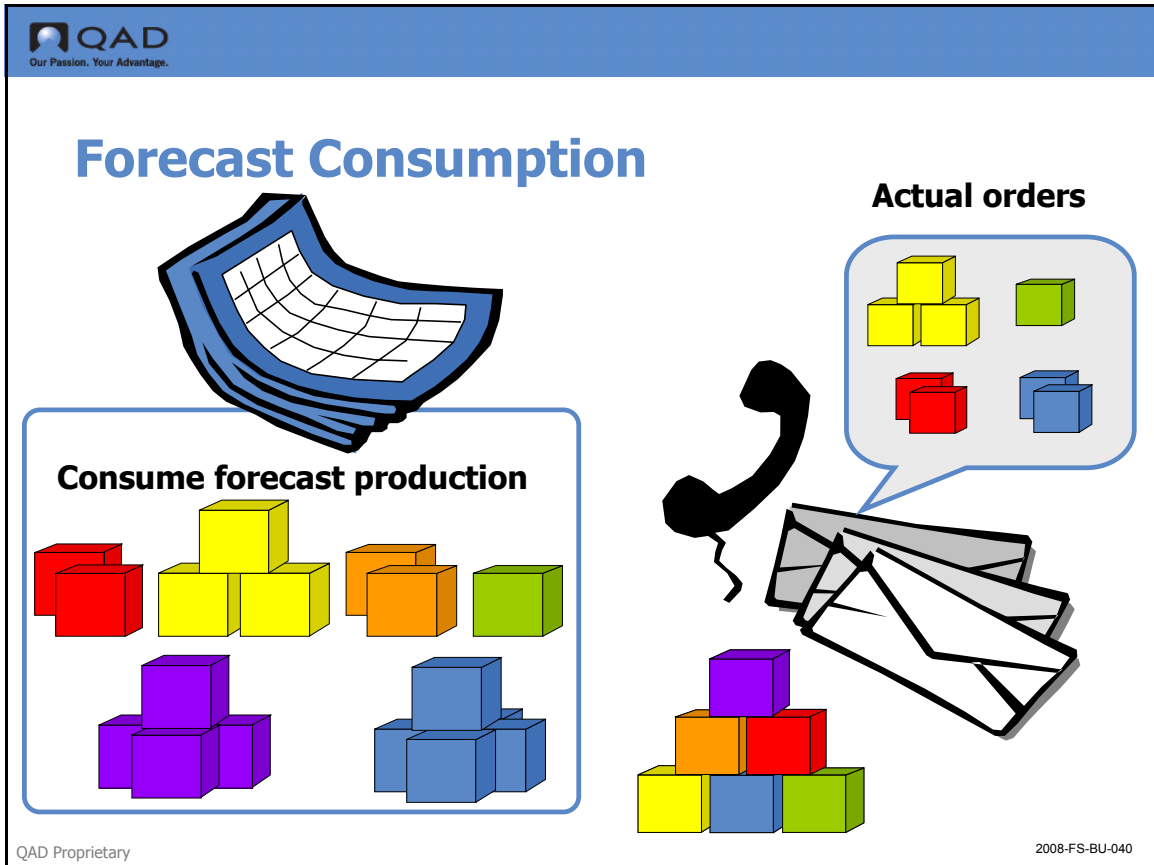
- Item status can be used to manage different stages in a product life cycle—examples include:
 - Prototype
 - Planning
 - Costing
 - Active
 - Phase out
 - Obsolete
- The bell curve effect of product demand can be forecast different for each item status

Functionality in QAD Enterprise Applications

- Restrict forecasting based on Item Status/Life Cycle
- Use Item Status Code Maintenance (1.1.5) to set up item status codes
- Assign item status codes in the Item Master screens

Setup Implications

- History across item numbers for new life cycles, new products
- Set up item status for life cycle data
- Use Family BOM and Item Status percentages for forecasting



Forecast Consumption

Definition

Consumption is controlled by Sales Order Control (7.1.24). The control program can be set to consume either forward or back, and is set based on variability of sales and forecast.

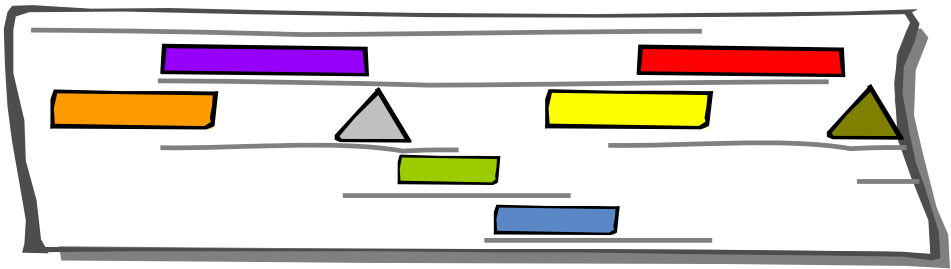
Abnormal consumption is any unplanned emergency, such as when a tornado hits and the abnormal consumption of destroyed materials causes increased demand. (An abnormal sales demand is also known as outlier.)

Why Consider?

- Consumption of forecast can make QAD Enterprise Applications “nervous” – affecting how MRP drives demand for components
- Window of forecast consumption effects product availability
- Forward/back consumption and abnormal consumption can be done at the Sales Order line from Marketing
- Forecast may be based on when you get the order (booking) whereas QAD Enterprise Applications forecasting is based on due date



MRP Horizon



One day longer than longest cumulative lead time.

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MRP Horizon

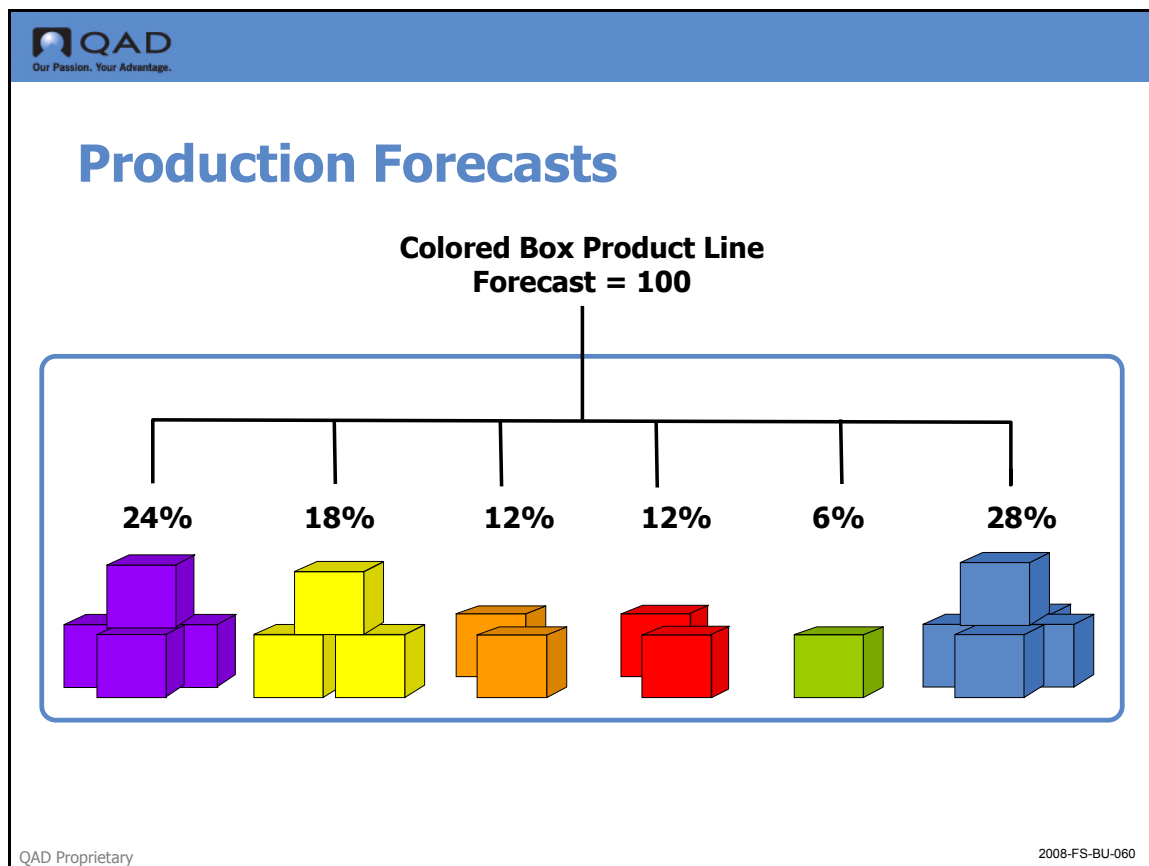
Definition

Material Requirements Planning (MRP) horizon and number of days in forecast need to be made compatible so the window and forecasting go out similar.

Ideally forecast past the MRP Horizon.

Why Consider?

- Forecasting and MRP data is significantly different when horizon and forecast are not coordinated



Production Forecasts

Definition

Production forecasts result from multilevel Master Scheduling (higher-level forecasts). The production forecasts work with forecast consumption (for O/P product types).

Why Consider?

- Planning structures

Functionality in QAD Enterprise Applications

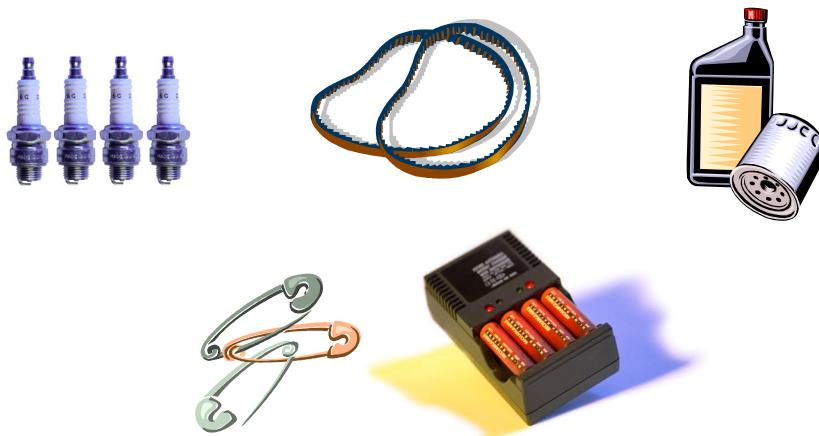
- Configured products, need a percentage on the parent item for consumption

Setup Implications

- Forecasting discreet numbers at option of configure
- Have sales consume at the option level



Spare Parts



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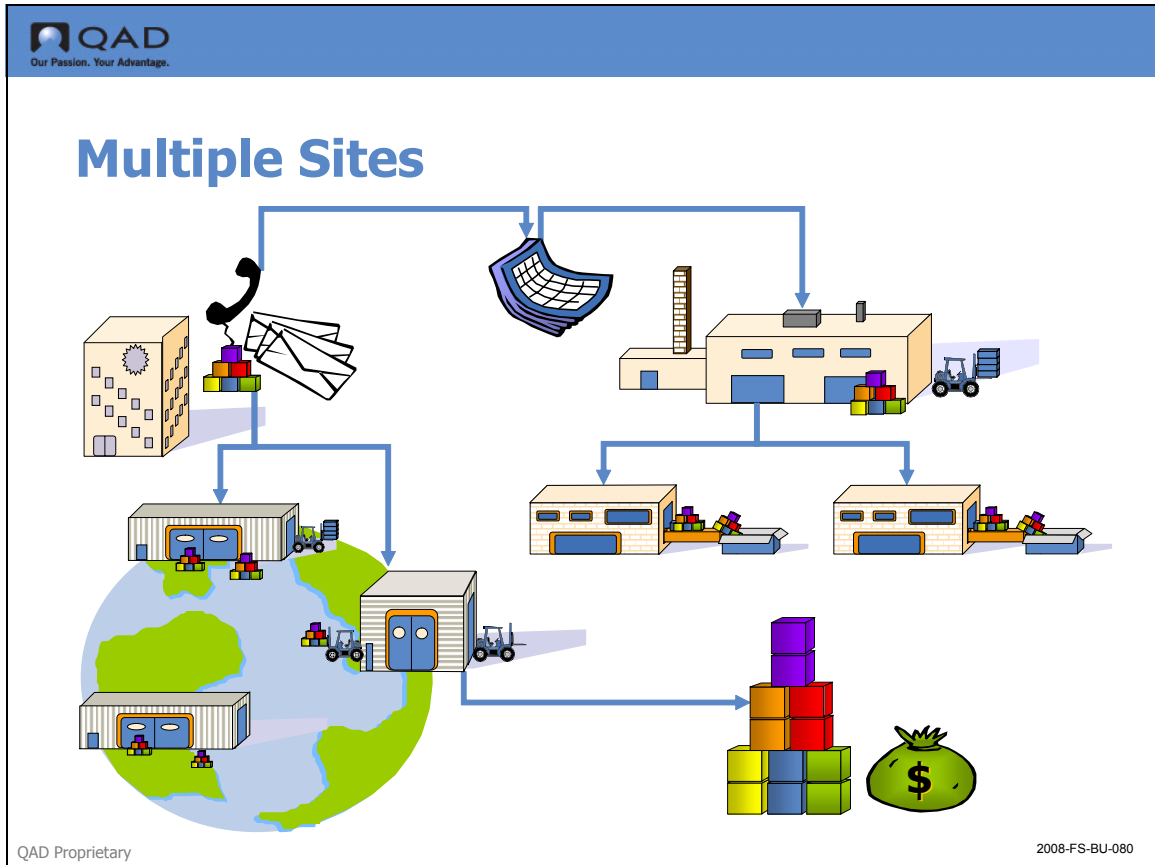
Spare Parts

Definition

Some products may be individually sold as replacement or service parts, outside the demand of the parent assembly.

Why Consider?

- Independent forecast on spare parts
- Dependent forecast on the same item based on work orders



Multiple Sites

Definition

When multiple sites carry the same service part, you can change the site listed on the Sales Order line to get available parts elsewhere. However, the sales credit and forecast consumption goes to the delivering site, not the ordering site.

Why Consider?

- Sales history goes to the ordering site
- The ordering site needs to start stocking, or increasing the stock, of the ordered part
- Do you calculate the forecast by Sales Order header site or Line item site?



Review

- ▲ Processes and Procedures
- ▲ Reporting Requirements
- ▲ Customer Expectations
- ▲ Product Configuration

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Review



Course Overview

- ▲ Introduction to Forecast Simulation
- ▲ Business Considerations
- ▲ Set up Forecast Simulation
- ▲ Use Forecast Simulation

CHAPTER 3

Set Up Forecast Simulation



Set Up Forecast Simulation

- ▲ Identify some key business considerations before setting up Forecast Simulation in QAD Enterprise Applications
- ▲ **Set up Forecast Simulation in QAD Enterprise Applications**
- ▲ Use Forecast Simulation in QAD Enterprise Applications

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Set Up Forecast Simulation

Note The forecast setup discussed here is for Forecast Simulation and all the menus contained within Forecast Simulation. This should not be confused with Forecast Maintenance (22.1), a major component of Master Scheduling.

Note Master Scheduling, a sister course in the Manufacturing Planning and Scheduling training class



Forecast Simulation Overview

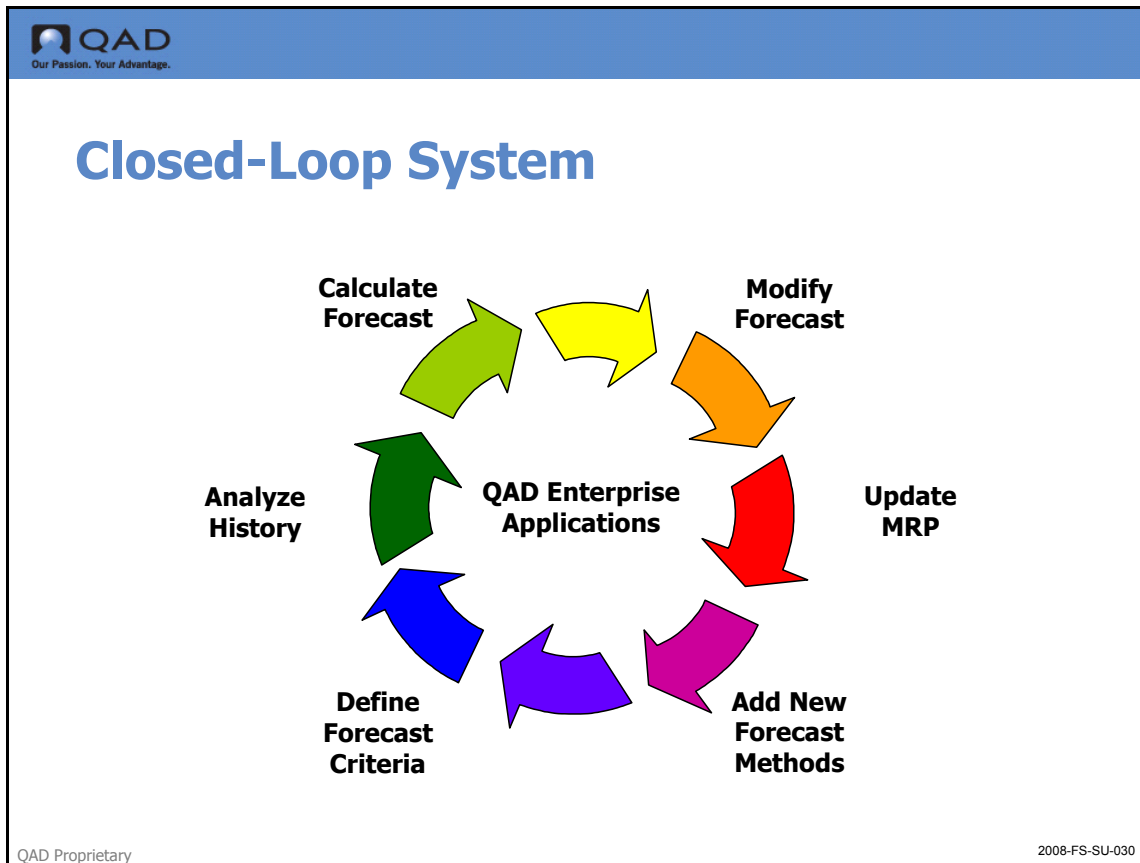
- ▲ Used to plan production and manage inventory
- ▲ Assumes that sales history repeats to varying degrees
- ▲ More sales history = More accurate forecast

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Forecast Simulation Overview

- Typically use forecast simulation to plan production and manage inventory
- Forecast simulation assumes that historical sales patterns are repeated to varying degrees in the future
- Accuracy of the forecast depends on the value of the sales information
- Five forecasting methods and a best fit model are available
- Statistically, a forecast should have at minimum 30 data points; however, Forecast Simulation will work with as few as 3 data points



Closed-Loop System

- The Forecast Simulation module makes QAD Enterprise Applications a closed-loop system
- The map above is used throughout this training course to indicate on which step you are working at any time

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Additional Functionality

chp_hist
Shipment History

Jan:

Feb:

Mar:

Apr:

Forecasts

May

Jun

Jul

- Uses shipment history file cph_hist
- Produces monthly forecast quantities

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Additional Functionality

- Forecasting simulation enables you to produce a forecast based on shipment history
- Also can produce a rolling forecast for the next 12 months or for a given calendar year



Forecast Limitations

- ▲ Cannot use data other than sales history in calculation
- ▲ Cannot forecast configured products
- ▲ Cannot forecast by sales channel
- ▲ Cannot generate forecast based on dollar value of sales history
- ▲ Inflationary base currencies not supported via current indexing of currency amounts

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Limitations

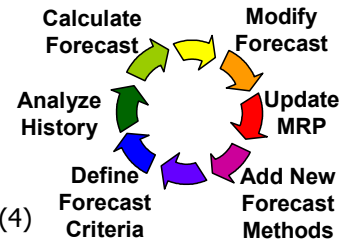
- Forecast simulation cannot use data other than the sales history information
- Configured products cannot be forecast, must individually forecast for components
- Historical sales data used is:
 - Product / type / group / line
 - Site
 - Customer / region
 - Ship-to or sold-to address
- Sales channel, dollar values, and currencies are also not part of the forecast simulation calculation





Lifecycle Summary

- ▲ Create criteria template to direct forecast calculation (1) *
- ▲ Forecast calculation (2)
- ▲ Analyze the shipment history (3)
- ▲ Produce a forecast detail record (4)
- ▲ If produced outside QAD Enterprise Applications, the detail record can be manually entered (5)
- ▲ Detail record can be altered manually (6)



* Numbers correspond with Lifecycle Flowchart

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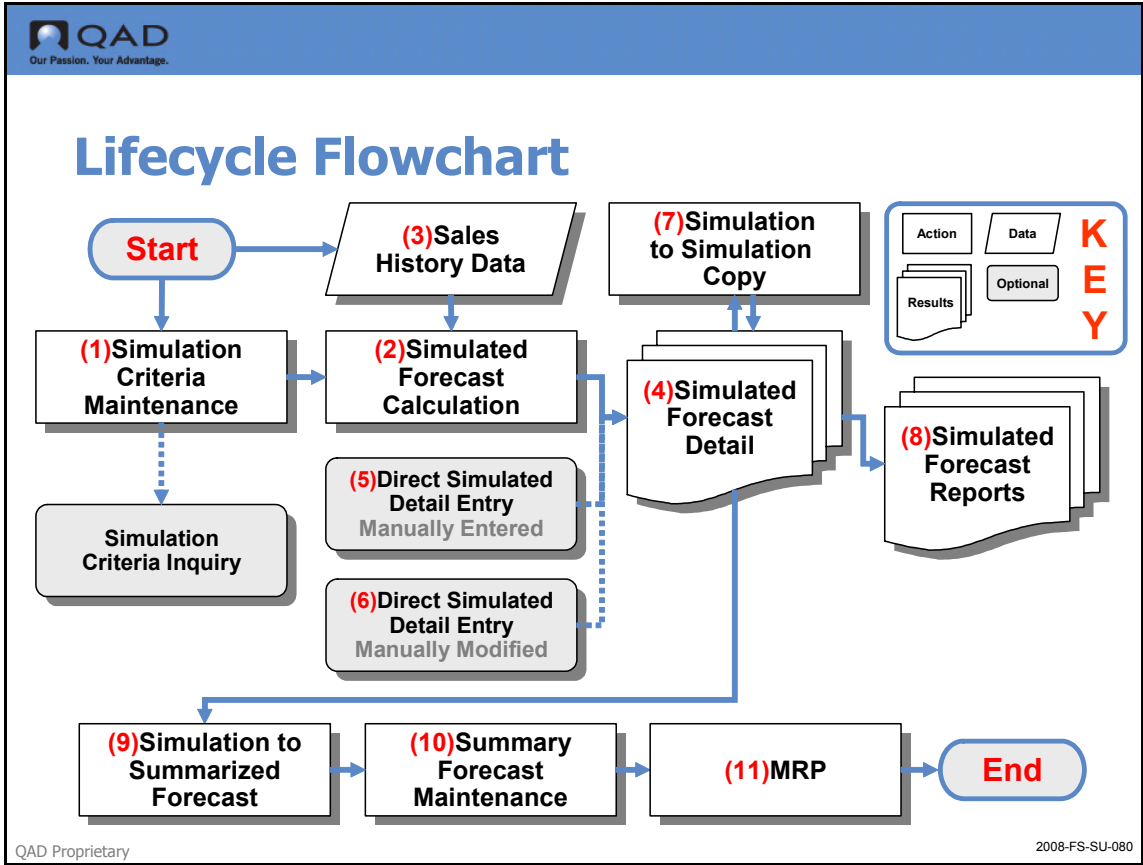
Lifecycle Summary

- The overall workflow summary illustrates all steps of the process, both setup and processing
- The summary description above matches the graphic representation in the *Lifecycle Flowchart* on page 43

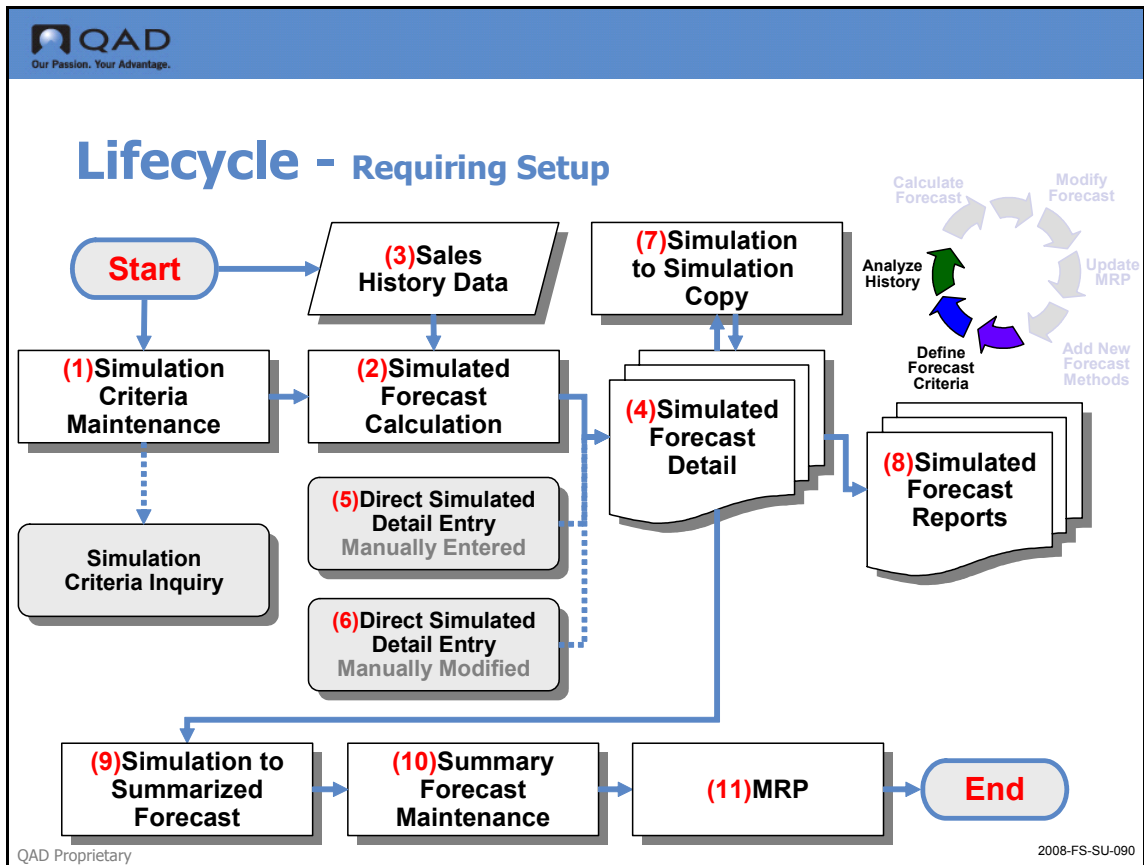


Lifecycle Summary (Continued)

- ▲ Can optionally copy and/or combine detail forecast records (7)
- ▲ Can generate a report that displays cost, price, and profit margin for the forecast quantities (8)
- ▲ Forecast quantities can be loaded in the summary forecast file to become demand to drive the MRP calculation (9)
- ▲ Can adjust the quantities in summary forecast file (10)
- ▲ Run MRP (11)



Lifecycle Flowchart



Workflow: Setup Steps

The lifecycle steps requiring setup include steps 1 and 3:

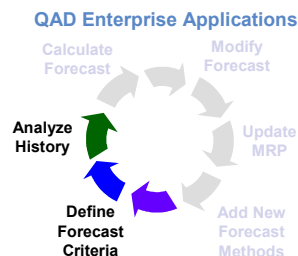
- 1 Simulation Criteria Maintenance (22.7.1)
- 3 Sales History Data



Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters



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Forecast Simulation Setup

This illustration is a suggested setup sequence of master files for the Forecast Simulation module which is based on information that flows from one master file to another and prerequisites that need to be accomplished before setting up a file. Reading the illustration:

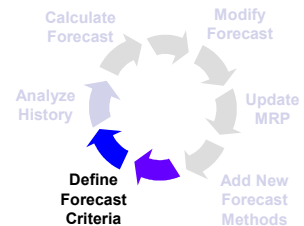


Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters

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Set up Sales Order Control


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Sales Order Control

Sales Order Control ✕

Go To ⚙ Action

Use Which Calc for Qty Available to Allocate:

Allocate Sales Order Lines Due in Days: (0 for no allocations)

Limit Allocate to Avail Only: ☒

ATP Enforcement Enabled: ☐

Family ATP Calculation:

Pick Only Allocated Lines: ☒

Are Sales Orders Printed: ☐

Keep Booking History: ☒

Print Tax ID on Invoice: ☐

Shipping Lead Time:

Company Address: 🔍

Sales Order Header Comments:

Sales Order Line Comments:

Print Only Lines to Invoice: ☐

Ln Format S/M:

Detail Allocations: ☐

ATP Horizon:

Calculate Promise Date: ☐

Sales Order Prefix:

Next Sales Order:

Invoice Prefix:

Next Invoice:

Integrate with AR: ☒

Integrate with SA: ☒

Integrate with TrM: ☐

Confirmed Orders: ☒

Fiscal Start Month:

FOB:

Integrate with Sales Analysis = Yes

Sales Order Control (7.1.24)

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Sales Order Control (7.1.24)

- Forecast Simulation analyzes the shipment history
 - The shipment history is captured when the Integrate with SA field is set to Yes
- To forecast accurately, you need sufficient sales history

Note Also discussed in Sales Order Management

Sales Order Control

Go To Action

Calculate Freight by Site: ☐ Auto Batch Confirmation: ☐

Comm on Margin not Sales: ☒

Hold Orders Over Credit Limit: ☒

SO Interest Accrued Acct: 4500

SO Interest Applied Account: 1280

Price Table Required: ☐ (Applies to Discrete Sales Orders)

Disc Table Required: ☐ (Applies to Scheduled Orders)

Vary Pricing Date by SO Line: ☒

Minimum Shipment Amount: 0

SO Edit ISB Defaults: ☐

SO Returns Update ISB: ☐

Confirmation Batch ID:

Confirmation Printer:

Pending Inv Update ISB: ☐

Auto Batch Shipment: ☐

Shipment Batch ID:

Shipment Batch Printer:

Use SO Freight List Trailer Code: ☐

Nontaxable Trailer Code 1: 10

Nontaxable Trailer Code 2: 11

Nontaxable Trailer Code 3: 20

Forecast Consumption

Consume Forward: 1

Consume Back: 2

Check Customer Item Nbr First: ☐

Taxable Trailer Code 1: 10

Taxable Trailer Code 2: 11

Taxable Trailer Code 3: 21

Consume Forecast Settings

Sales Order Control (7.1.24)

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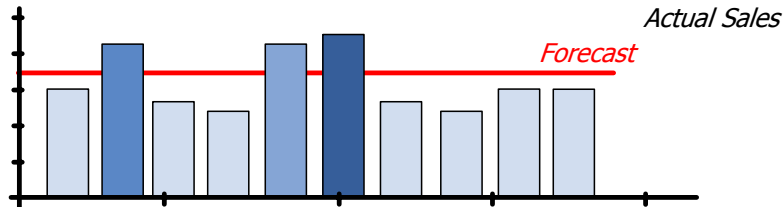
- Long-term forecasts are generally more accurate than short-term ones
- Forecasts are calculated for one month periods—actual sales seldom correspond to the forecast for a monthly period

Important Forecasting quantities in Forecast Simulation are in monthly buckets. Forecasting quantities in Master Scheduling are in weekly buckets. (Master Scheduling forecast quantities are accessed in Forecast Maintenance, not Forecast Simulation.) Note this difference between Master Scheduling and Forecast Simulation.

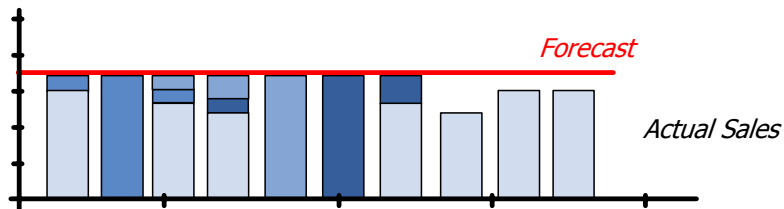
- To compensate for this inaccuracy, you can expand the forecast window by using forward and backward consumption
 - Forecast consumption periods, in the Sales Order Control (7.1.24), are in weekly buckets



Forecasting Consumption



- ▲ If backward or forward consumption = 0, you get requirements that tell you to produce quantities exceeding forecast to meet sales
- ▲ With backward or forward consumption:
 - Forecast for current week consumed first
 - Then unconsumed forecast from following and prior periods are consumed to m



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Forecasting Consumption

- The system consumes the forecast for the specified number of periods, first by going back, then forward, one period from the original forecast period
- It then continues to search backward and forward until the specified number of previous and future periods have been examined, or the entire sales order quantity has been applied
- Only confirmed sales orders consume the forecast

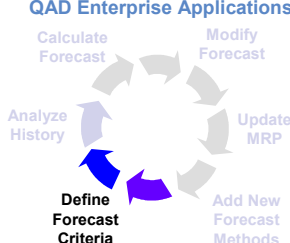


Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ **Simulation Criteria Maintenance**
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters

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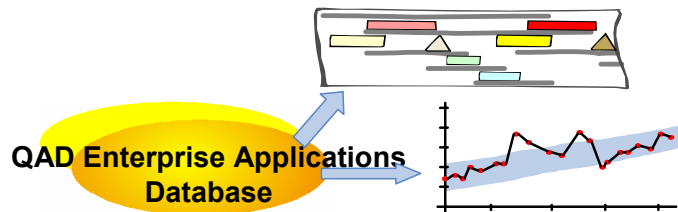
Set Up Criteria Template

- To let QAD Enterprise Applications run the forecast simulation calculation, you must first develop a criteria template
 - Specifies what sales history to use
 - Defines how to perform the forecast simulation calculation



What is a Criteria Template?

- ▲ Tells QAD Enterprise Applications how to do the calculation
 - Statistical data, Product information, Customer qualities
 - Template is identified and stored on the system by Forecast ID
 - Once the template has been used in a calculation, it cannot be further modified



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What is a Criteria Template?

- The criteria template specifies statistical data, product information, and customer qualities to use in the forecast simulation calculation
- Each criteria template is identified by a unique forecast ID
 - Results with the same forecast ID overwrite existing results with the same ID
- A template can only be modified until it has been used for a calculation
 - Once a template has been used for a calculation, it cannot be modified
- The forecast simulation is produced in monthly buckets for either the year specified (yearly) or for the next 12 months, beginning with the current month (rolling)
 - To setup a yearly forecast, you must enter an ending year earlier than the forecast year
 - A rolling forecast must have an ending year that is the same as the forecast year



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Simulation Criteria Maintenance

Simulation Criteria Maintenance

Go To Action

Forecast ID: CLASSDescription: CLASSROOM SIMULATION

Forecast Year: 2008Years of History: 5Ending: 2007Forecast Method: 01Alpha factor: .40Trend: .10User factor[1]: 0.00[2]: 0.00

Item Number: 20-005To: 20-005Prod Line:To:Group:To:Item Type:To:Order Line Site:To:

Use Ship To/Sold To: Sold ToList Type:Customer:To:Region:To:

Statistical Data

Production Data

Sales History Data

Simulation Criteria Maintenance (22.7.1)

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Simulation Criteria Maintenance (22.7.1)

Category	Defines
Statistical Data	Method, trend, alpha factor. Also includes user factors to a specified user-defined forecast method
Production Information	Item, product line, group, item type, and order line site being forecast
Sales History Data	How to use sales history data (customer, region, and list type) in the calculation

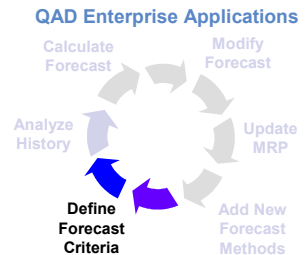
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Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ **Identify Template**
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters



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Identify Template

- The Forecast ID identifies a template of criteria for analyzing historical sales data in the calculation
- The criteria template may be modified each time a calculation is performed
 - Forecast results are stored by forecast ID, year, and item
 - Prior forecast results from the calculation of annual forecasts, identified by Forecast ID, are overwritten
 - Rolling forecast results, identified by Forecast ID and Forecast Year, are overwritten starting with the current month forward
 - You must specify a Forecast ID and Forecast Year


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Simulation Criteria Maintenance

Identify Template

Simulation Criteria Maintenan... X

Go To ▾
Action ▾

Forecast ID: CLASS

Forecast Year: 2008

Description: CLASSROOM SIMULATION

Years of History: Ending:

Alpha factor: Trend:

User factor[1]: [2]:

Item Number: To:

Prod Line: To:

Group: To:

Item Type: To:

Order Line Site: To:

Use Ship To/Sold To: List Type:

Customer:

Region:

Rolling: Forecast Year = Ending Year

Yearly: Forecast Year is after Ending Year

Simulation Criteria Maintenance (22.7.1)

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Simulation Criteria Maintenance (22.7.1): Identify Template

- Forecast ID is an eight-character alphanumeric, user-assigned
- Description is optional



Identify Template

Yearly Forecast

Current Date: Jan. '09

Forecast Year: 2009

Ending Year: 2008

Quantity:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	120	125	127	126	140	195	200	210	190	130	120	120

Rolling Forecast

Current Date: Apr. '09

Forecast Year: 2009

Ending Year: 2009

Quantity:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009				126	135	175	195	210	190	140	130	120
2010	120	125	127									

uses history up through Mar. 2009

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Yearly or Rolling Forecast

- In the first example above, the forecast has been set up as a yearly forecast:
 - Uses sales history ending in 2008
 - Projects forecast quantities for all the months of 2009
- In the second example above, the forecast has been set up as a rolling forecast:
 - Uses sales history ending in March 2009
 - Projects forecast quantities for April 2009 through March 2010
- Each forecast example above would have a unique Forecast ID
- When identifying your new Criteria Template, choose the forecast year and ending year based on whether you want a yearly forecast or a rolling forecast

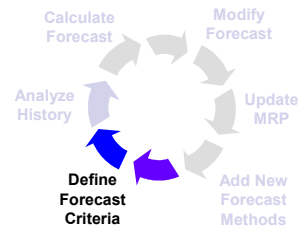


Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ **Specify Sales History Time Frame**
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters

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Specify Sales History Time Frame

- After identifying the template ID and years, select the sales history time frame for the calculation

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Simulation Criteria Maintenance

Specify Time Frame

Simulation Criteria Maintenance

Forecast ID: CLASS

Description: CLASSROOM SIMULATION

Forecast Year: 2008

Forecast Method: 01

Years of History: 5

Alpha factor: .40

User factor[1]: 0.00

Ending: 2007

Trend: .10

[2]: 0.00

Item Number: 20-005

Prod Line:

Group:

Item Type:

Order Line Site:

Use Ship To/Sold To: Sold To

Customer:

Region:

List Type:

5 Years Maximum

Enter Ending Year

Ending Year
= Same as forecast year
= Rolling forecast

Ending Year
= Earlier than forecast year
= Yearly forecast

Simulation Criteria Maintenance (22.7.1)

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Simulation Criteria Maintenance: Specify Time Frame

- Can analyze up to five years
- The system reduces the number of years if there are no sales for a year
- Ending year must be the same or earlier than the forecast year
 - Same = Rolling Forecast
 - Earlier = Yearly Forecast



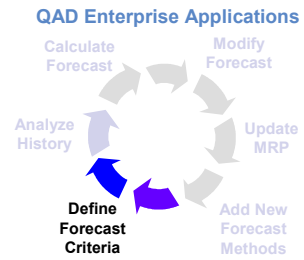
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Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ **Determine Calculation Method**
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters

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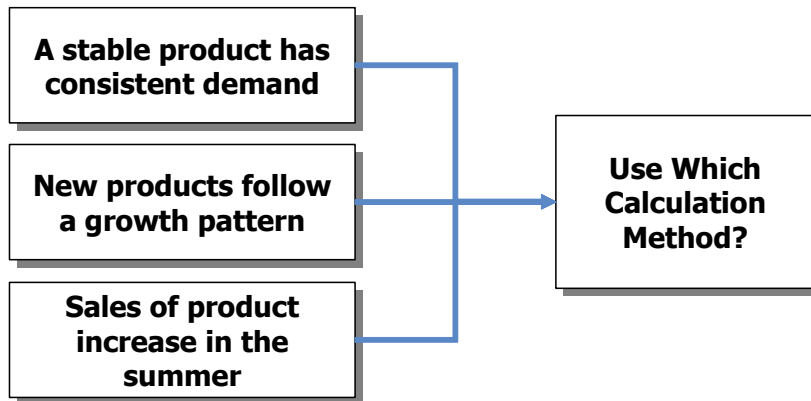
Determine Calculation Method

- After identifying the template by a unique ID, and selecting the type and years for the forecast and the history, you must determine what type of calculation to use
- Standard calculation methods are available
- Custom calculation methods (written in PROGRESS) can be designed by the user



Calculation Method

- ▲ Two digit forecast method indicates which PROGRESS procedure to run
- ▲ Alpha, trend, and user factors are used by some of the methods



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- You must decide which calculation method best suits the needs of your products



Calculation Methods

- ▲ Sales history can contain four underlying patterns of demand:
 - Trend (new products)
 - Seasonal (yearly cycle)
 - Horizontal (stable products)
 - Cyclical (business cycle level)

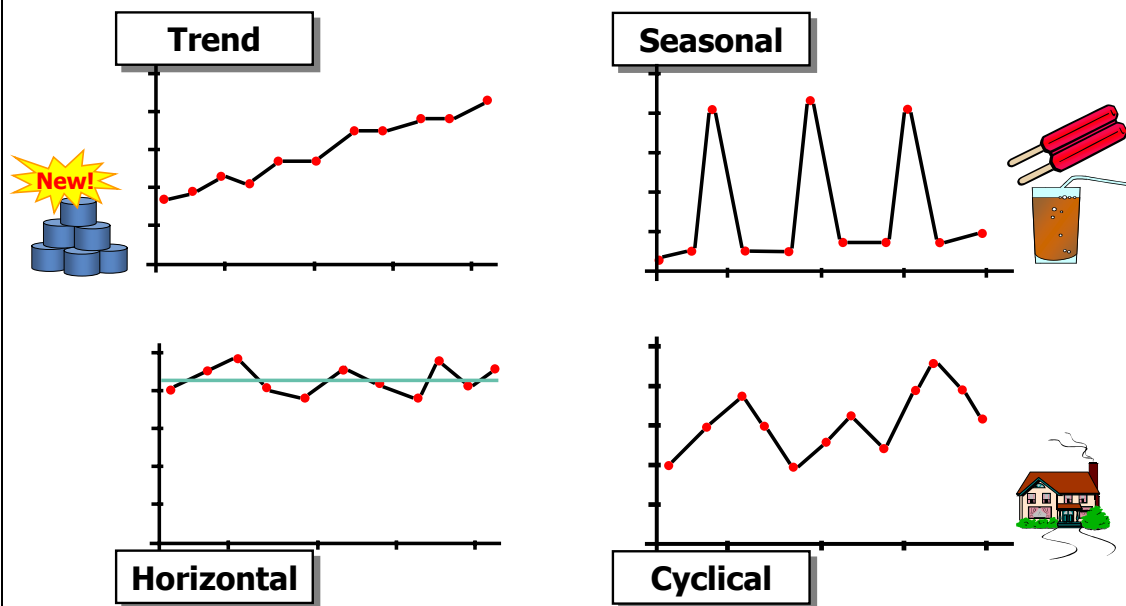
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Calculation Methods

- Some typical considerations for selecting a calculation method include determining the sales history patterns of demand
- Four typical patterns are:
 - Trend – a steady growth of demand
 - Seasonal – cyclical patterns of greater and lesser demand, that usually repeat each year
 - Horizontal – a steady demand for product that has little deviation
 - Cyclical – greater and lesser demand that usually cycles over several years, and may not be easily predicted

Sales History Patterns



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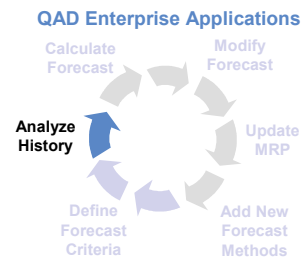
Sales History Patterns

Pattern	Description	Example
Trend	Sales quantities generally increase over time.	The growth pattern of a new product
Seasonal	Sales quantities fluctuate according to some seasonal factor such as weather or the way in which a firm has chosen to handle its operations.	Sales of soft drinks, which increase in the summer months
Horizontal	Sales quantities do not increase or decrease substantially.	A stable product with consistent demand
Cyclical	This pattern is similar to seasonal, but the length is greater than one year. The pattern does not repeat at constant intervals and is the hardest to predict.	The sale of houses



Forecasting Methods

- ▲ Analyze sales history to forecast future demand
- ▲ Use basic “time series analysis” techniques
 - Mathematical manipulation of the sales history
- ▲ Six forecasting methods coded
 - Methods may/may not account for underlying patterns



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Forecasting Methods

- Calculation methods examine sales history to make mathematical predictions for future product demand



Method Codes

- ▲ Methods 01-06 are predefined
- ▲ Methods 07-50 are reserved for QAD
- ▲ Methods 51-99 are for other forecasting methods
- ▲ Method 00 indicates that the forecast detail record was not generated by the system
 - Manually created
 - Loaded through CIM interface
 - Created using the copy functions

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Method Codes

- QAD Enterprise Applications offer you six predefined forecast methods
- A choice of best fit is based on the least mean absolute deviation of the other five
- You can add additional methods to the system with User Forecast Method Maintenance (22.7.17)



Method Codes

- ▲ 02: Double Moving Average
- ▲ 03: Double Exponential Smoothing
- ▲ 04: Linear Exponential
- ▲ 05: Classic Decomposition
- ▲ 06: Simple Regression

- ▲ **01: Best Fit**
 - Uses Methods 02-06

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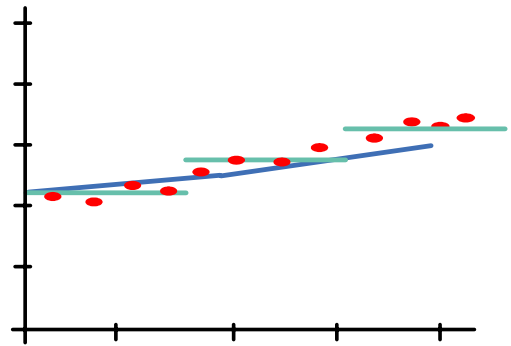
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- The existing calculation methods provided in QAD Enterprise Applications are methods 02-06
- Method 01 examines the results of 02-06 to select a best fit solution
 - Each of these codes is discussed further in the following pages



Double Moving Average (Method 02)

- ▲ Simplest of forecasting techniques
- ▲ Computes moving average on four-month periods
- ▲ Calculates another moving average based on the first set
- ▲ Lags behind trend effects



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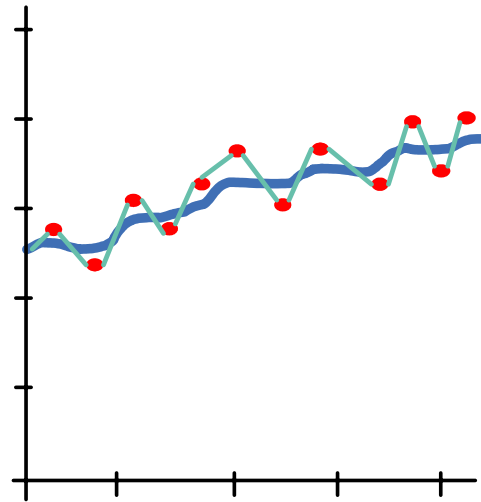
Double Moving Average

- The simplest of the forecasting techniques
- Used a set of simple moving averages based on historical data, then computes another set of moving averages based on the first set
- Produces forecast that lags behind trend effects



Double Exponential Smoothing (Method 03)

- ▲ Most popular forecasting technique
- ▲ Similar to Double Moving Average but includes a weighting factor
- ▲ Lags behind trend effects
- ▲ Uses alpha factor



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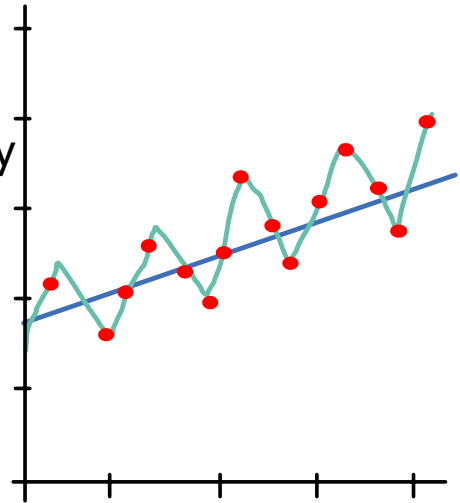
Double Exponential Smoothing

- The most popular of the forecasting techniques
- Uses the alpha factor to weight the most recent sales data more heavily than the older sales data



Linear Exponential (Method 04)

- ▲ Similar to Exponential Smoothing
- ▲ Incorporates a trend/seasonal factor
- ▲ Uses alpha factor
- ▲ Uses trend factor
- ▲ Requires two years of history



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Linear Exponential

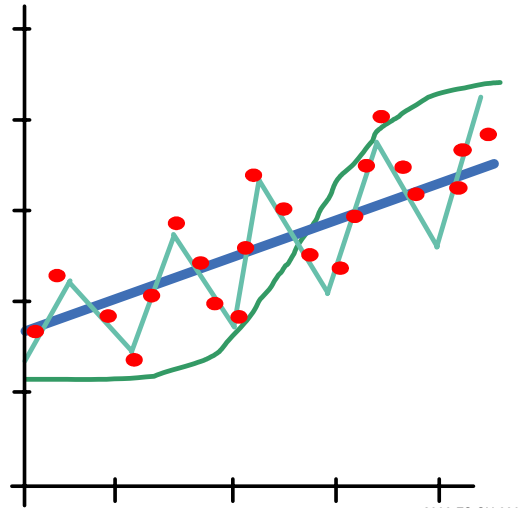
- Produces results similar to Double Exponential Smoothing
- Extra advantage of incorporating a seasonal/trend adjustment factor
- Uses both trend and alpha factors
 - Large trend (close to one) weighs heavily any sharp changes in sales
 - Small trend (close to zero) begins to ignore sharp increase/decreases

Note Requires minimum of two years of sales history



Classic Decomposition (Method 05)

- ▶ Recognizes three underlying patterns
- ▶ Trend factor assumed to be straight line
- ▶ Seasonal factor accounts for annual fluctuations
- ▶ Cyclic factor follows business cycle
- ▶ Requires two years of history (three is better)



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Classic Decomposition

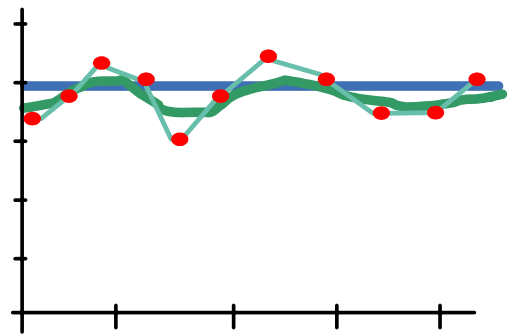
- Usually the preferred method for seasonal, high-cost items
- Eliminates all random fluctuations

Note Requires a minimum of two years sales history. Better forecast with three years history.



Simple Regression (Method 06)

- ▲ Also called Least Squared Method
- ▲ Ensures that forecast quantity is equally likely to be higher or lower than quantity sold
- ▲ Good for horizontal time series data



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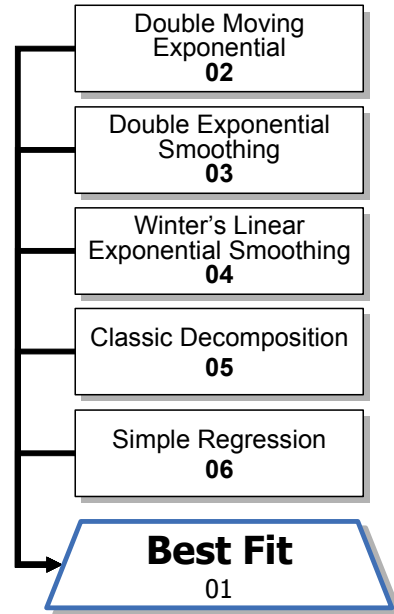
Simple Regression

- Analyzes the relationship between objects (sales) and time space (month)
- Good for products with a stable history



Best Fit (Method 01)

- ▲ Uses all predefined methods
- ▲ Selects results with least Mean Absolute Deviation
- ▲ Does not need prior knowledge of underlying patterns present in sales history
- ▲ Recommend using this at least once



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Best Fit

- Best Fit does take the longest to run, of codes 01-06
- Examines the results of each 02 through 06, before making a recommendation based on the least mean absolute deviation
- Recommended to be used at least once



Underlying Patterns

Double Moving
Exponential
02

Double
Exponential
Smoothing
03

Winter's Linear
Exponential
Smoothing
04

Classic
Decomposition
05

Simple
Regression
06

Method	02	03	04	05	06
Cyclical				yes	
Trend	lags	lags	yes	yes	
Seasonal			yes	yes	
Horizontal					yes
Years of History	1	1	2	2-3	1
Trend Factor			yes		
Alpha Factor		yes	yes		

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Underlying Patterns

- Summarizing the methods, patterns predicted, years of history required, alpha, and trend factors for the predefined methods

Simulation Criteria Maintenance

The screenshot shows the 'Simulation Criteria Maintenance' window for Forecast ID: CLASS and Description: CLASSROOM SIMULATION. The window contains various input fields for simulation parameters. Red boxes and arrows highlight specific fields with explanatory text:

- Alpha factor:** .40 (highlighted with a red box). An annotation states: "Alpha near 0 = weights history equally, Alpha near 1 = weights recent history".
- Trend:** .10 (highlighted with a red box). An annotation states: "Trend near 0 = ignore sharp changes, Trend near 1 = weights changes heavily".
- User factor[1]:** 0.00 (highlighted with a red box). An annotation states: "Two User Factors are reserved for Custom Calculations".

Other visible fields include: Forecast Year: 2008, Forecast Method: 01, Years of History: 5, Ending: 2007, Item Number: 20-005, Prod Line, Group, Item Type, Order Line Site, Use Ship To/Sold To: Sold To, List Type, Customer, and Region.

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Simulation Criteria Maintenance (22.7.1): Alpha and Trend Factors

- Alpha and trend must be between zero and one

Factor	Zero	One
Alpha	Equal weight on all history	Weights recent history
Trend	Ignores sharp changes in history	Weights heavily sharp changes in history

Simulation Criteria Maintenance: User Factors

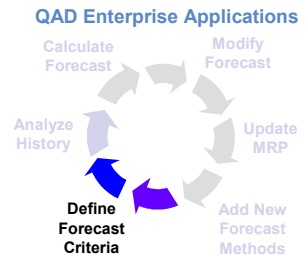
- User factors (1) and (2), in the Simulation Criteria Maintenance (22.7.1), are reserved for custom calculation method factors



Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ **Indicate Items for Forecast**
- ▲ Specify Customer Parameters



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Indication Items for Forecast

- After selecting a calculation method, you indicate for which items the forecast performs the calculation

Note Select items with sales history information. For forecasts without history, use one of the copy functions.

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Simulation Criteria Maintenance

Indicate Items

Simulation Criteria Maintenance...

Go To Action

Forecast ID: CLASS Description: CLASSROOM SIMULATION

Forecast Year: 2008 Years of History: 5 Ending: 2007
Forecast Method: 01 Alpha factor: .40 Trend: .10
User factor[1]: 0.00 [2]: 0.00

Item Number: 20-005 To: 20-005
Prod Line: To:
Group: To:
Item Type: To:
Order Line Site: train To:

Use Ship To/Sold To: Sold To List Type:
Customer: To:
Region: To:

Order Site Corresponds to Sales Order

Product Line, Group, Item Type

Simulation Criteria Maintenance (22.7.1)

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Simulation Criteria Maintenance (22.7.1): Indicate Items

- Enter item or range of items by item number, product line, group, and/or item type
- Further define by order line site on the sales orders

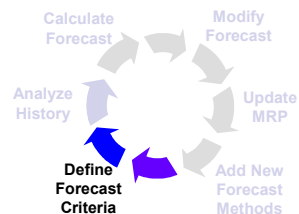


Forecast Simulation Setup



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ **Specify Customer Parameters**

QAD Enterprise Applications



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Specify Customer Parameters

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Simulation Criteria Maintenance

Specify Customer Parameters

Simulation Criteria Maintenance...

Go To Action

Forecast ID: CLASS Description: CLASSROOM SIMULATION

Forecast Year: 2008 Years of History: 5 Ending: 2007
Forecast Method: 01 Alpha factor: .40 Trend: .10
User factor[1]: 0.00 [2]: 0.00

Item Number: 20-005 To: 20-005
Prod Line: To:
Group: To:
Item Type: To:
Order Line Site: train To:

Use Ship To/Sold To: Sold To List Type:
Customer: To:
Region: To:

Product Line, Group, Item Type

Simulation Criteria Maintenance (22.7.1)

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Simulation Criteria Maintenance (22.7.1): Specify Customer Parameters

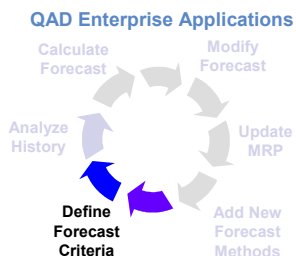
- Setting the use Ship-to/Sold-to flag selects sales history for analysis based on customer addresses
- List type, customer, and region fields identify a subset of customer
- If you select ship-to and regions, only permanent ship-to addresses within the region are selected



Forecast Simulation Setup: Summary



- ▲ Sales Order Control
- ▲ Simulation Criteria Maintenance
- ▲ Identify Template
- ▲ Specify Sales History Time Frame
- ▲ Determine Calculation Method
- ▲ Indicate Items for Forecast
- ▲ Specify Customer Parameters



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Forecast Simulation Setup: Summary



Course Overview

- ▲ Introduction to Forecast Simulation
- ▲ Business Considerations
- ▲ Set up Forecast Simulation
- ▲ Use Forecast Simulation

CHAPTER 4

Use Forecast Simulation



Use Forecast Simulation

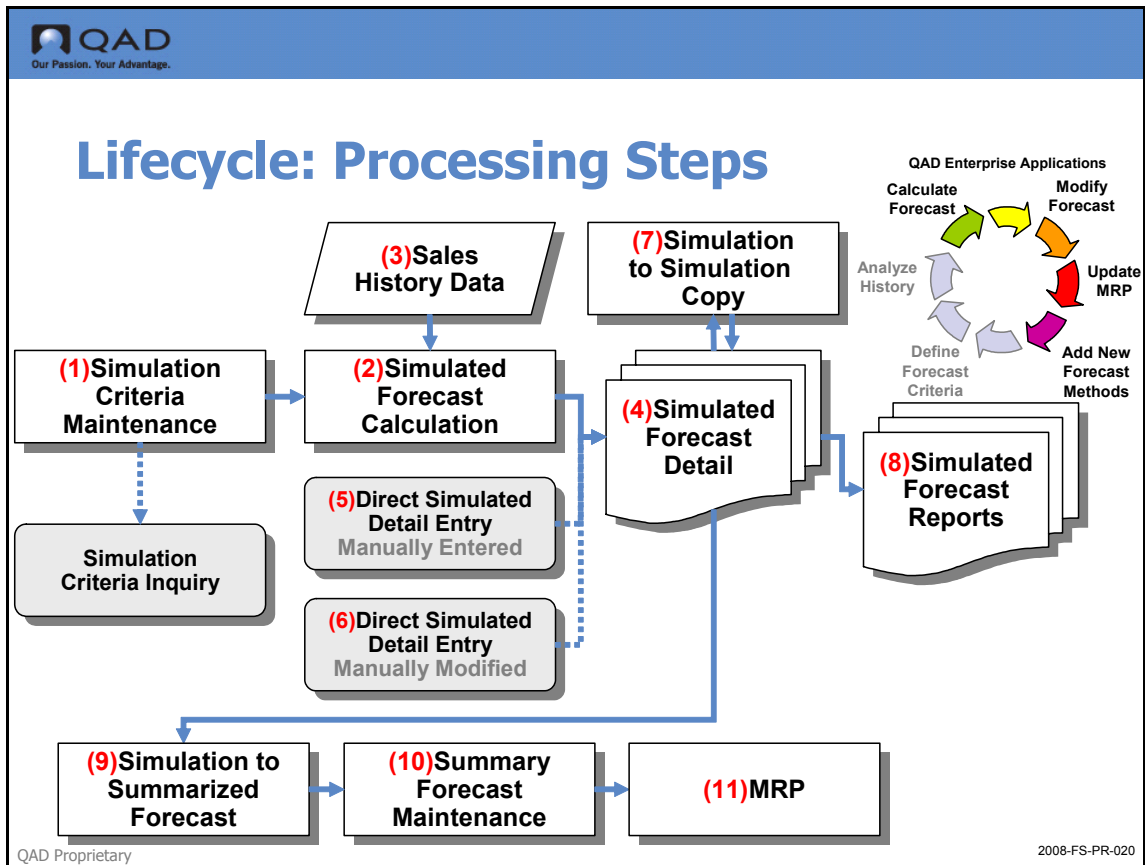
In this section you learn how to:

- ▲ Identify some key business considerations before setting up Forecast Simulation in QAD Enterprise Applications
- ▲ Set up Forecast Simulation in QAD Enterprise Applications
- ▲ **Use Forecast Simulation in QAD Enterprise Applications**

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Forecast Processing



Workflow: Processing Steps

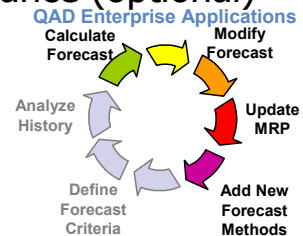
- The highlighted items in the lifecycle above are the steps performed while processing the forecasting simulation module
 - Steps 4 and 8 above are results, not actions



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - Simulation to Simulation Copy (optional)
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Use Forecast Simulation

This illustration is a suggested processing sequence for Forecast Simulation which is based on information that flows from one file to another and prerequisites that need to be accomplished.

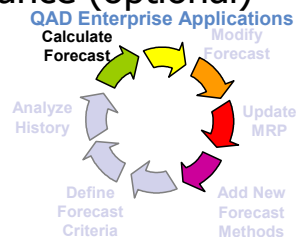


Using Forecast Simulation



▲ Simulated Forecast Calculation

- CIM Data Load
- Detail Forecast Maintenance (optional)
- Simulation to Simulation Copy (optional)
- Single Item Simulation Copy (optional)
- Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Run Forecast Simulation Calculation

- Simulated Forecast Calculation analyzes an item's sales history and predicts what quantity will be sold in the future
- Forecast quantities are maintained in forecast detail records
- There are four ways to create a forecast detail record:
 - Run the forecast calculation using sales history and a specified forecast method
 - Use the CIM interface and load a forecast generated elsewhere
 - Create a forecast detail record by entering forecast quantities
 - Copy existing forecast detail records to a new forecast ID



Calculating Quantities

- ▲ Simulated Forecast Calculation
 - Enter criteria template ID previously defined
 - Or, define template at time of calculation
- ▲ Forecast generated for every item within the item range
- ▲ A report follows the calculation showing the number of sufficient and insufficient items
- ▲ Template and detail records are updated at the time of calculation
 - Previous template and records are deleted
 - Template is frozen & cannot be further modified in Simulation Criteria Maintenance

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Calculating Quantities

- At least one sales record is required to produce nonzero forecast quantity
- When insufficient history exists to create a valid forecast, the detailed forecast record is created with quantities of zero and the item is printed out as insufficient

Note Negative results are shown as zeros.



Calculating Quantities (Continued)

- ▲ Calculation analyzes history to predict sales
 - For a given year
 - For the next twelve months
- ▲ Results are only as good as sales data referenced
 - The system requires at least one sales record
 - “Insufficient” items have quantities of zero
- ▲ Calculate forecast frequently for high-cost items
- ▲ Re-calculate when sales data has changed
- ▲ Rolling forecast uses all history up through the previous month
 - Benefit from doing forecast on a monthly basis

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To generate a forecast:

- 1 Identify the criteria template.
 - a If no criteria template is previously defined for a given ID, you can define the criteria template at the time of the calculation.
- 2 Specify an output device for the generated report of calculations.
- 3 After the calculation is run, the template and detail records are updated. Previous templates and records are deleted. The template is frozen and cannot be further modified.



Simulated Forecast Calculation

Simulation Criteria Maintenance X

Go To Actions Copy Print Preview

Forecast ID: 2009 Description: 2009 Forecast

Forecast Year: 2009 Years of History: 0 Ending:

Forecast Method: 00 Alpha factor: .00 Trend: .00

User factor[1]: .00 [2]: .00

Item Number: 1100-00 To: 1100-00

Prod Line: To:

Group: To:

Item Type: To:

Order Line Site: To:

Use Ship To/Sold To: Sold To List Type:

Customer: To:

Region: To:

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Simulation Forecast Calculation

- Sales history data is analyzed to predict sales quantities for the year specified
- This calculation may take some time to process—you may wish to submit it in batch
- The calculation requires a criteria template
 - You can use the criteria template defined in Simulation Criteria Maintenance (22.7.1) and stored in the system by forecast ID
 - Or you can define the template here
- Items must exist in the item master file
- When Ship-To and regions are defined to select the sales history data, only permanent Ship-To addresses in the address master file are in the selected region range
- At least one sales record is required to produce a non-zero forecast quantity



- When insufficient history exists to create a valid forecast, a forecasting master record is not created and the item is printed out as “insufficient item”
- Negative results are shown as zeroes
- Memo items and drop shipments are excluded from any forecast calculations
- To recover a deleted forecast record, you must run the calculation again
- This function should be password controlled



Modify Results Before Running MRP

- ▲ Forecast quantities may require manipulation to be more reflective of future market demand
- ▲ Especially true when forecast results are based on historical data that included unprecedented sales (abnormal sales demand or outlier)
 - Examples: Sales promotions or natural disasters
- ▲ Typical modifications also include business-appropriate rounding for decimals or for order quantities

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Modifying Forecast Results

- Make adjustments to the forecast results whenever there is a reason to expect future demand to differ from sales history
 - Abnormal sales demand (outlier)
 - Unwanted decimal sales quantities from calculations
- Make all adjustments prior to copying forecast quantities to MRP



Modification Methods

- ▲ Detail Forecast Maintenance
 - Manually alter the detail records
- ▲ Single Item Simulation Copy
 - Copy forecast quantities of one item to another item
 - Optionally apply a multiplicative factor
- ▲ Simulation to Simulation Copy
 - Replace or combine forecast quantities in one detail record with another
 - Optionally apply a multiplicative factor

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Modification Methods

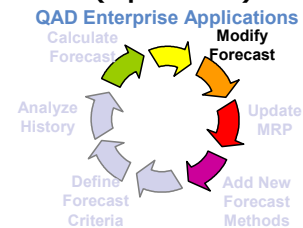
- Three most common ways to adjust forecast quantities manually are:
 - Detail Forecast Maintenance (22.7.7)
 - Simulation to Simulation Copy (22.7.11)
 - Single Item Simulation Copy (22.7.12)
- You can also load forecast records from outside QAD Enterprise Applications with a CIM load



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - Simulation to Simulation Copy (optional)
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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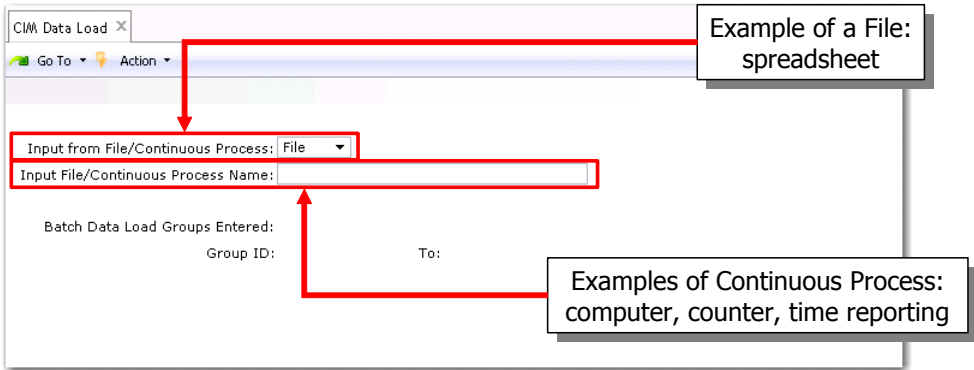
2008-FS-PR-100

Load Forecast

The loading of forecast quantities created outside the system



CIM Data Load



Example of a File: spreadsheet

Input from File/Continuous Process: File

Input File/Continuous Process Name:

Batch Data Load Groups Entered:

Group ID:

To:

Examples of Continuous Process: computer, counter, time reporting

CIM Data Load (36.15.1)

It is also possible to use CIM Data Load Processor

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CIM Data Load (36.15.1)

Use CIM Data Load (36.15.1) to load data from an external data source into the QAD Enterprise Applications database for processing. Import data can be in ASCII file format or acquired in real-time.

The CIM process has several steps:

- 1 Run CIM Data Load (36.15.1)—loads the external data you specify into batch load data files
- 2 Specify which data to load by file name, if applicable, and data type—either a prepared file or real-time process
- 3 Run CIM Data Load Processor (36.15.2)—takes the imported data and updates the appropriate QAD Enterprise Applications master files

- 4 Use CIM Data Load Process Monitor (36.15.4) to monitor the load process, as needed
- 5 Use Batch Request Detail Report (36.14.5) to review processing errors and delete processed data, as needed

In import files, data-load groups are segregated by special characters

- @@batchload indicates the start of a new data-load group
- @@end indicates the end

CIM Data Load (36.15.1) does not automatically format data—input files must be pre-formatted

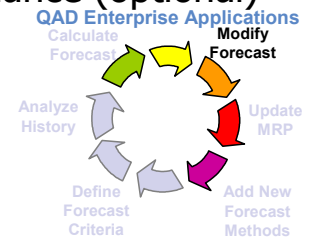
Each import record's data must be in the sequence it would be if you were entering it manually using an QAD Enterprise Applications maintenance function.



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - Simulation to Simulation Copy (optional)
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Create Forecast Manually

- Manual adjustments to forecast quantities are often made to reflect the experience of management in predicting future demand
- Enables you to adjust and aggregate forecast



Create Forecast Manually

- ▲ Cannot produce a rolling forecast manually
- ▲ Create or modify forecast quantities in the forecast detail record
- ▲ Provide Forecast ID, year, and item number
- ▲ Enter quantities for each month
- ▲ System creates corresponding criteria template
 - Manually created forecasts always use a forecast method of 00

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Guidelines for Creating Records Manually

- Records are created for January through December, therefore limiting the forecast to a yearly forecast
- You can create new records, or modify records from a CIM Load or the Run Forecast Simulation Calculation
- Still must provide the forecast template criteria—ID, year, and item(s)
- Calculation is always method = 00, since there is no forecast calculation performed against these records
 - You are creating the records by your own calculations, not the system's calculation

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Detail Forecast Maintenance

Forecast ID: 2009
Forecast Year: 2009
Item Number: 1100-00
UM: EA

Year	Month	Original Forecast	Adjusted Forecast
2009	January	0	100
2009	February	0	100
2009	March	0	100
2009	April	0	150
2009	May	0	150
2009	June	0	150
2009	July	0	200
2009	August	0	200
2009	September	0	200
2009	October	0	250
2009	November	0	250
2009	December	0	250
	Total	0	2,100

Original Forecast = 0
Indicates Created
Forecast Manually

Enter Quantities,
or Adjust Calculated
Quantities

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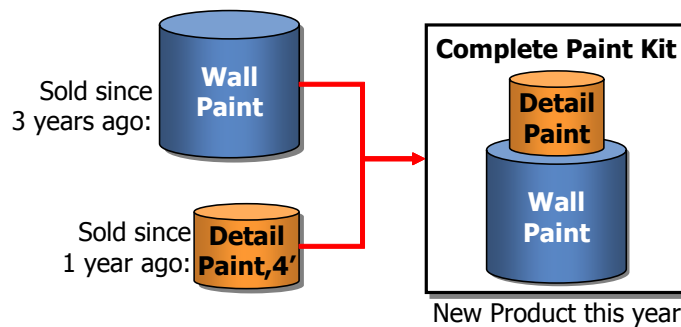
Detail Forecast Maintenance (22.7.7)

- Cannot manually create a rolling forecast, only yearly
- Original Forecast quantities generated by Simulated Forecast Calculation or through CIM Data Load (36.15.1)
 - Run the calculation again to reproduce original forecast
- The Adjusted Forecast quantity column is where you manually change the original results
 - Before modifying forecast detail records, you should archive the original forecast or copy to another forecast ID
 - Typically used to adjust decimal results from the calculation



Copying Forecast Results

- ▲ Copying/combining forecast results when you:
 - Have to predict demand for a new product
 - Or want to aggregate all the forecast for an item
- ▲ Optional multiplicative factors
- ▲ Replace or combine monthly forecast quantities



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Copying Forecast Results

- Copying/combining typically used to:
 - Aggregate forecast for an item
 - Predict demand for new product
 - Apply multiplicative factors
 - Replace monthly forecast quantities, such as decimal production quantities



Multiplicative Factors

Base	Units	10%	-10%
Jan	100	110	90
Feb	150	165	135
Mar	120	132	108z

Scale	Units	10%	-10%
Jan	100	10	n/a
Feb	150	15	n/a
Mar	120	12	n/a

Trend	Units	10%	-10%	
Jan	100	10	-10	= 100 +/- (100 x 10%)
Feb	150	15	-15	= 150 +/- (150 x 10%)
Mar	120	12	-12	= 120 +/- (120 x 10%)

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Multiplicative Factors

- * Single Item Simulation Copy (22.7.12) allows you to scale forecast results for the new item as some percentage of the old item
- * Simulation to Simulation Copy (22.7.11) enables you to apply multipliers to the entire item range

Note Scale cannot be negative.

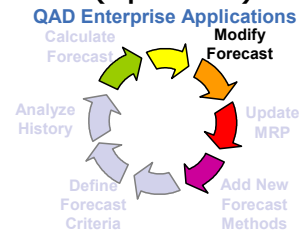
- Trend multipliers increase each month
- You can use more than one multiplier at a time with a cumulative effect
 - Base increase/decrease is applied first, Scale second, Trend third
- Factors are applied to source quantities and the results added to the target, not applied to combined source and target quantities



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - **Simulation to Simulation Copy (optional)**
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Copy Forecast

- There are two ways to copy a forecast
 - Simulation to Simulation Copy (22.7.11) and
 - Single Item Simulation Copy (22.7.12)



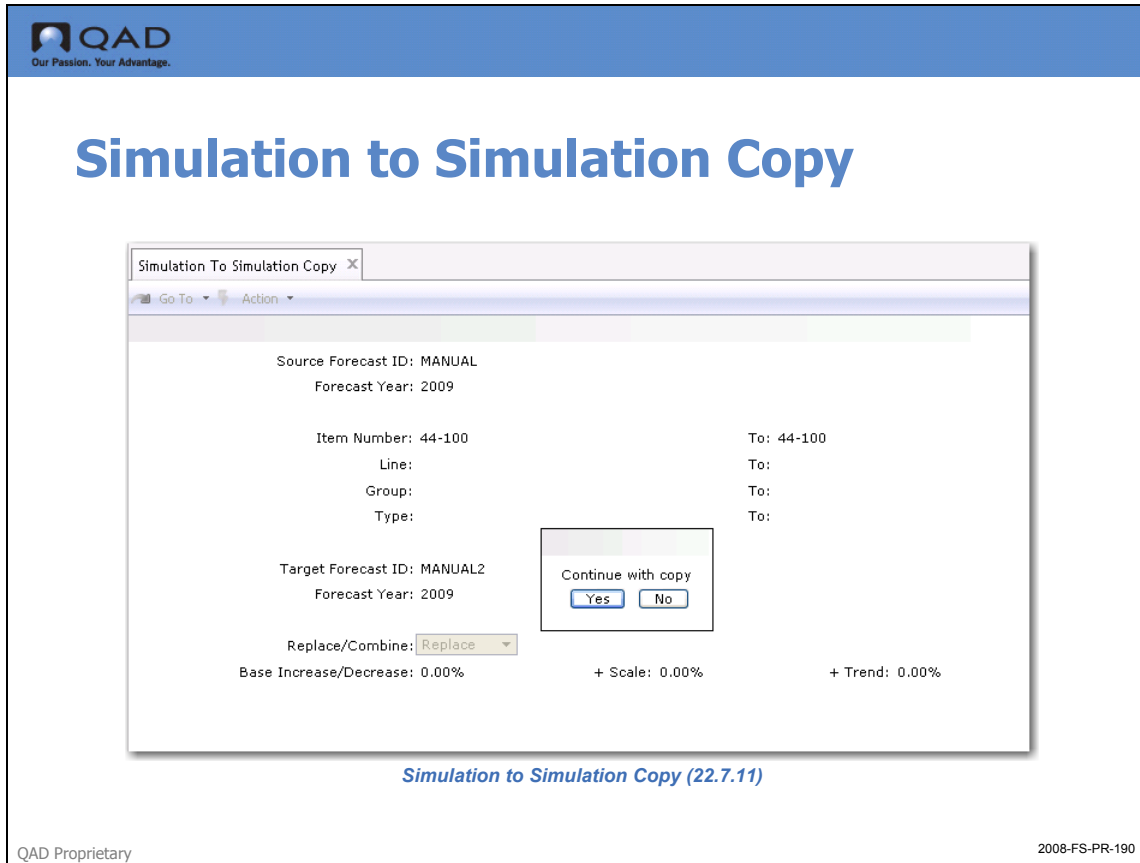
Simulation to Simulation Copy

- ▲ Enter a source and target forecast ID
- ▲ If the target record exists, you may
 - Combine the source and target quantities
 - Overwrite the target with the source
- ▲ Specify the item range
 - Copy only a subset of items in the source

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- Enables you to copy (replace) or combine criteria templates and/or detail records
 - Valuable when you need to aggregate forecasts
 - Targets are changed/overwritten, source remains unchanged
 - If item ranges of target and source are different, the target range is expanded



Simulation to Simulation Copy

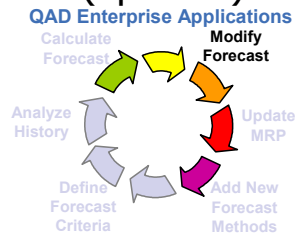
- Choose between replacing or combining forecast quantities
- If target forecast record exists, must use forecast method 00 for target
 - If target does not exist, record is created with method 00
- View the results in Detail Forecast Inquiry (22.7.8) or Detail Forecast Report (22.7.9)



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - Simulation to Simulation Copy (optional)
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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- The second method for copying forecasts copies sales history from one item to another
- Helpful for new items that should have similar sales patterns as existing items



Single Item Simulation Copy

- ▲ Copy per item number
- ▲ Source and target items can be different
- ▲ Items must have identical units of measure
 - Or a unit of measure conversion must exist

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- Enables you to create forecast for a single new item based on the historical sales data of another item
- Useful for products with a shortage of sales history
- Copies forecast records to different items
- Can multiply by a Base Increase/Decrease, Scale, or Trend factor
- If target forecast record exists, must use forecast method 00 for target
 - If target does not exist, record is created with method 00

Warning During combine or replace, original target records and criteria template are overwritten. The source record is not altered.

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Single Item Simulation Copy

Single Item Simulation Copy x

Go To Action

Source Forecast ID: MANUAL
Forecast Year: 2009
Item Number: 44-100 CONTROL UNIT, HOME USE

Target Forecast ID: MANUAL1
Forecast Year: 2010
Item Number: 44-100

Replace/Combine: Replace
Base Increase/Decrease: 10.00 + Scale: 0.00 + Trend: 0.00

Single Item Simulation Copy (22.7.12)

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Single Item Simulation Copy (22.7.12)

- # Use this function to create forecast for a new item based on historical sales of another item
- # Similar to Simulation to Simulation Copy (22.7.11) but here forecast records are copied for a single item
 - The source record for an item is copied to another forecast ID with a different item
 - The new item must exist in the item master
- Forecast records are copied only in terms of units
 - Source and target items need identical units of measure or a unit measure conversion
- The Forecast Method for the target must be 00 if the target forecast record exists
 - If the target does not exist, a record is created with method 00

- During a Combine or Replace, the original target forecast record and criteria template is overwritten
 - The source record is not altered

Important This function should be password controlled.

Important Be cautious when copying/combining forecast results. From a statistical point of view, the result is not a valid forecast. You should aggregate/combine historical sales data before doing the forecast calculation.

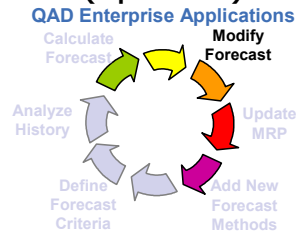
Important Multipliers applied to the source quantity before replacing or adding to the target quantity.



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance (optional)
 - Simulation to Simulation Copy (optional)
 - Single Item Simulation Copy (optional)
 - Detail Forecast Report (optional)
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Maintain Forecast Records



Forecast Reports

- ▲ Detail Forecast Report allows you to display:
 - Forecast quantity – units
 - Cost – general ledger (GL) cost-per-unit
 - Price – sales price-per-unit
 - Extended Cost – units times GL cost
 - Extended Price – units times sales price
 - Margin – Extended Price minus Extent Cost
- ▲ To display profit margin, both the cost and price must be in the same currency

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Forecast Reports

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Detail Forecast Report

Detail Forecast Report X

Go To Action

Forecast ID: YEARLY

To: YEARLY

Forecast Year: 2008

To: 2008

Item Number: 44-100

To: 44-100

Prod Line:

To:

Cost Set: Standard

Site: train

Price List:

Currency: USD

Summary/Detail: Detail

Output:

Batch ID:

Detail Forecast Report (22.7.9)

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Detail Forecast Report (22.7.9)

- Sample report data on the next page



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Detail Forecast Report

Detail Forecast Report - 12/11/... X



Detail Forecast Report

Puerto Rico

Forecast Year	Item Number	UM	Month	Units	Unit Cost	Cur	Price	Cur	Extended Cost	Extended Price	Margin
2009	2009 1100-00	EA	January	100	97.023	USD	25.00	USD	9702.25	2500.00	-7202.25
			February	100	97.023	USD	25.00	USD	9702.25	2500.00	-7202.25
			March	100	97.023	USD	25.00	USD	9702.25	2500.00	-7202.25
			April	150	97.023	USD	25.00	USD	14553.38	3750.00	-10803.38
			May	150	97.023	USD	25.00	USD	14553.38	3750.00	-10803.38
			June	150	97.023	USD	25.00	USD	14553.38	3750.00	-10803.38
			July	200	97.023	USD	25.00	USD	19404.50	5000.00	-14404.50
			August	200	97.023	USD	25.00	USD	19404.50	5000.00	-14404.50
			September	200	97.023	USD	25.00	USD	19404.50	5000.00	-14404.50
			October	250	97.023	USD	25.00	USD	24255.63	6250.00	-18005.63
			November	250	97.023	USD	25.00	USD	24255.63	6250.00	-18005.63
			December	250	97.023	USD	25.00	USD	24255.63	6250.00	-18005.63
			Total	2100					203747.25	52500.00	-151247.25
	Total Line1000								203747.25	52500.00	-151247.25
	Total ID2009								203747.25	52500.00	-151247.25

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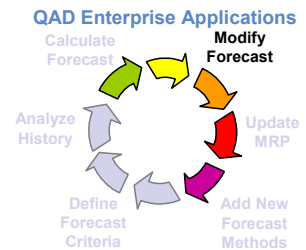
- Sample report data



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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2008-FS-PR-280

Forecast Summary

- The forecasted demand is used to drive MRP
- Simulation to Summarized Forecast (22.7.13) loads forecast quantities to the summary forecast file used by MRP



Forecast Summary Driving MRP

- ▲ Detail records used to create the summary forecast file used by MRP
- ▲ Identify detail record by forecast ID, year, and item
 - Monthly buckets
- ▲ Identify summary forecast file by item, site, year
 - Enter a summarized site
 - Weekly buckets
- ▲ Various loading methods to go from monthly to weekly quantities

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Driving MRP

- All calculations have been run and modified, as necessary
- The detail records are summarized into one file for the MRP calculation



Loading Methods for Detail Records

- ▲ Detail records are loaded to summary forecast files in terms of units
- ▲ Three loading methods to break the monthly forecast quantities into weekly quantities used by MRP:

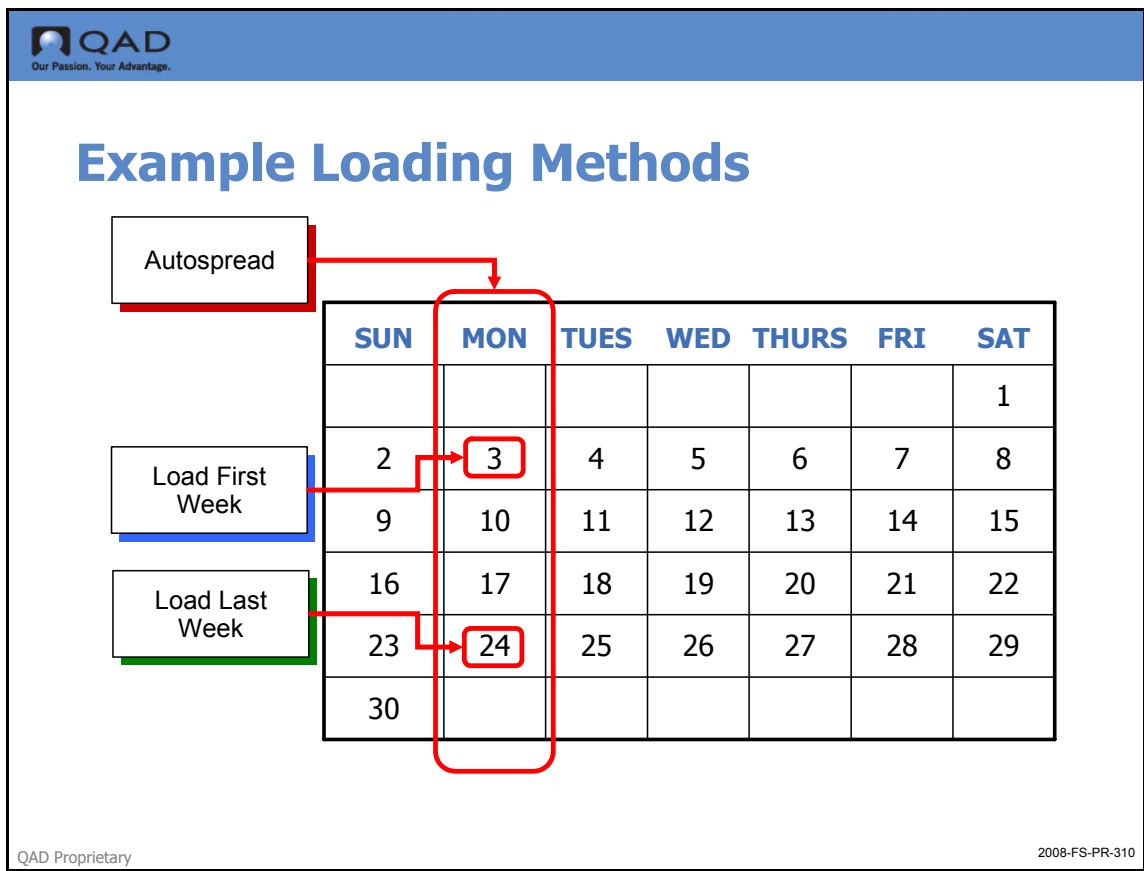
- | | |
|---------------------------|---|
| 1. Autospread | (default) Monthly forecast broken into daily averages and rolled into weekly buckets starting on Monday |
| 2. Load Last Week | Monthly forecast loaded into the last week of the month appearing on Monday |
| 3. Load First Week | Monthly forecast loaded into the first week of the month appearing on Monday |

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Loading Methods

- Monthly buckets are loaded as weekly buckets for the MRP calculation



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- Autospread loads the monthly quantities equally across the weeks
- Load first week enters all quantities into the first week appearing on a Monday
- Load last week enters all quantities into the last week appearing on a Monday

Simulation to Summarized Forecast

The screenshot shows the 'Simulation To Summarized Fcst' window in QAD. The window has a title bar with 'Simulation To Summarized Fcst' and a close button. Below the title bar is a navigation bar with 'Go To' and 'Action' buttons. The main content area displays the following information:

- Forecast ID: YEARLY
- Forecast Year: 2008
- Item Number: 44-100
- To: 44-100
- Line:
- To:
- Group:
- To:
- Type:
- To:

Below this information, there are several fields and buttons:

- Summarized Site: train
- Loading Method: 1
- Autospread
- Start: 11/3/2008
- Replace/Combine: Replace
- Update: ☐
- Output: page
- Batch ID:

Red arrows and boxes highlight specific areas and actions:

- A red box around 'Summarized Site: train' is connected by a red arrow to a box labeled 'Select Site for Updating'.
- A red box around 'Loading Method: 1' is connected by a red arrow to a box labeled 'Select Loading Method'.
- A red box around 'Autospread' is connected by a red arrow to a box labeled 'Report = See results only' and another red arrow to a box labeled 'Update = Send data to MRP'.
- A red box around the 'Update: ☐' field is connected by a red arrow to the 'Update = Send data to MRP' box.

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Simulation to Summarized Forecast (22.7.13)

- Forecast detail records are used to create, replace, or combine summary forecast files
- Select a summarized site for updating

Note You can combine detail records into one summary forecast file, but this is not recommended. From a statistical viewpoint, the combined result is not a valid forecast.

Updates to the summary forecast file are permanent and cannot be undone manually except by changing the file in Forecast Maintenance (22.1) (a Master Scheduling task)


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Forecast Maintenance



Simulation To Summarized Fcst
Training

11/03/08 21:43:38
Page: 1

Item Number: 44-100 Site: train Year: 2008
CONTROL UNIT, HOME USE

Week	Forecast	Week	Forecast	Week	Forecast	Week	Forecast
12/31/07	0	03/31/08	0	06/30/08	0	09/29/08	0
01/07/08	0	04/07/08	0	07/07/08	0	10/06/08	0
01/14/08	0	04/14/08	0	07/14/08	0	10/13/08	0
01/21/08	0	04/21/08	0	07/21/08	0	10/20/08	0
01/28/08	0	04/28/08	0	07/28/08	0	10/27/08	0
02/04/08	0	05/05/08	0	08/04/08	0	11/03/08	26
02/11/08	0	05/12/08	0	08/11/08	0	11/10/08	26
02/18/08	0	05/19/08	0	08/18/08	0	11/17/08	25
02/25/08	0	05/26/08	0	08/25/08	0	11/24/08	25
03/03/08	0	06/02/08	0	09/01/08	0	12/01/08	23
03/10/08	0	06/09/08	0	09/08/08	0	12/08/08	23
03/17/08	0	06/16/08	0	09/15/08	0	12/15/08	22
03/24/08	0	06/23/08	0	09/22/08	0	12/22/08	23
Total	0	Total	0	Total	0	Total	193

End of Report

Monthly data from Forecast Summary is loaded into weekly buckets for MRP after Forecast Summary

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Results

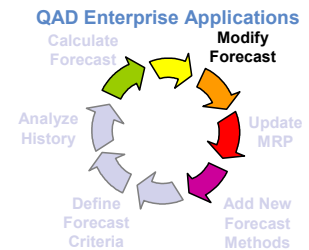
- After running Simulation to Summarized Forecast (22.7.13) with Update/Report set to Update, the data is loaded into Forecast Maintenance (22.1)
- At this point, the simulation now affects MRP
 - Before data was loaded, the Forecast Simulation had no effect on MRP



Using Forecast Simulation



- ▲ Simulated Forecast Calculation
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)



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Run MRP

Three MRP calculations are available in QAD Enterprise Applications:

- 1 Net Change Materials Plan (23.1)
Only calculates changes since the last MRP calculation
- 2 Regenerate Materials Plan (23.2)
Complete recalculation of all demand and supply
Must be run the first time MRP is used
- 3 Selective Materials Plan (23.3)
Calculates only manually selective factors

Materials Requirements Plan(MRP) Menu

Choose Net Change, Regenerate, or Selective Materials Plan (various MRP modes)

Update MRP

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Add New Forecast Methods

Net Change Materials Plan (23.1)

- Only calculates changes since the last MRP calculation

Regenerate materials Plan (23.2)

- Complete recalculation of all demand and supply
- Must be run the first time MRP is used

Selective Materials Plan (23.3)

- Calculates only manually selective factors

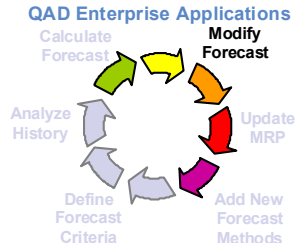


Using Forecast Simulation



- ▲ Simulated Forecast Calculation
 - CIM Data Load
 - Detail Forecast Maintenance *
 - Simulation to Simulation Copy *
 - Single Item Simulation Copy *
 - Detail Forecast Report *
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance *

(* Optional)



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User Forecast Method Maintenance

- Allows you to incorporate your own expertise into the system
- User Forecast method maintenance
 - You supply PROGRESS program
 - Provide a method number
- User factors (1) and (2) are reserved for your forecast methods

Note You must supply the PROGRESS program Save


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Add New Forecast Methods

Simulation Criteria Maintenance
X

Go To
Action

Forecast ID: CLASS
Description: CLASSROOM SIMULATION

Forecast Year:
Forecast Method:

Years of History:
Alpha factor:

Ending:
Trend:

User factor[1]:

User factor[2]:

Item Number:
To:

- ▲ Allows you to incorporate your own expertise into the system
- ▲ User Forecast Method Maintenance
 - You supply PROGRESS program
 - Provide a method number
- ▲ User factors (1) and (2) are reserved for your forecast methods

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2008-FS-PR-370

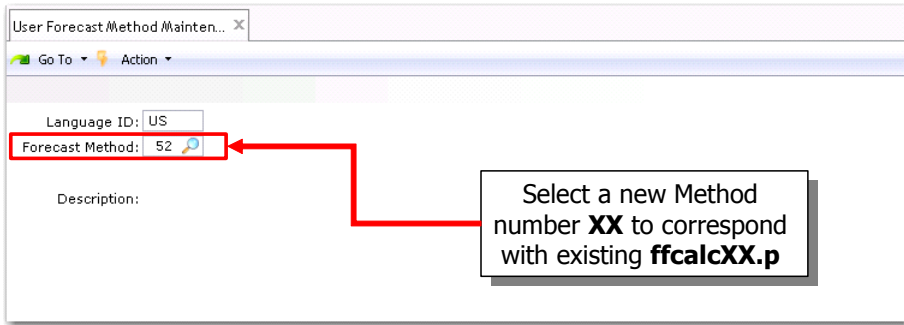
User Forecast Method Maintenance

- Required if you want to use other statistical methods in a forecast calculation
- Your user-supplied PROGRESS program must be named `ffcalcXX.p`
 - XX is the forecast method and must be between 51–99



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User Forecast Method Maintenance



User Forecast Method Maintenance (22.7.17)

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Rules for Adding Methods

- Required if you want to use other statistical methods in a forecast calculation
- Your user-supplied PROGRESS program must be named ffcalcXX.p
 - XX is the forecast method and must be between 51-99



Rules for Adding Methods

- ▲ Name of the program must be `ffcalcXX.p`
 - XX is the forecast method
 - Forecast method must be between 51-99
- ▲ Procedure must be written and accessible to QAD Enterprise Applications before the method number is defined in User Forecast Method Maintenance
- ▲ Procedure must use an array named `calc[1-60]` as the historical data input and an array `fcast[1-12]` for the calculated output
- ▲ Procedure must include the following files at the beginning of the procedure
 - `fcalvar.i` and `ffvar.i`

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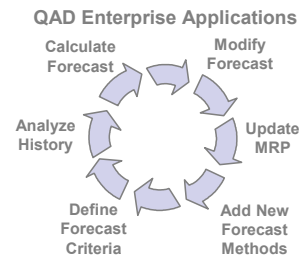
Miscellaneous Functions

- Used to delete or archive forecast records or criteria templates into a file
- Run Detail Forecast Delete/Archive (22.7.23) twice
 - First with Delete set to No to review the record
 - Then run again with Delete Yes
- If Delete and Archive are Yes, deleted data is copied to an ASCII file
- The file can be reloaded using Archive Reload File



Miscellaneous Functions

▲ Detail Forecast Delete/Archive



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Detail Forecast Delete/Archive (22.7.23)

- With Delete = Yes, forecast records satisfying the selection criteria are deleted from the database
- With Archive also Yes, deleted data is stored in a file name `ffYYMMDD.hst`
 - `ff` indicates this is a simulated forecast record and `YYMMDD` is the date you ran Delete/Archive
 - If the file exists, the archived record is appended to the existing file
- You cannot recover a deleted forecast record. Archived files can be retrieved using Archive Reload File
- Keep record of the contents of the archive file—there is no record within the file
- This function should be password controlled



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Detail Forecast Delete/Archive

Detail Forecast Delete / Archi... X

Go To Action

Forecast ID: YEARLY1

Forecast Year: 2008

Item Number: 44-100

To: YEARLY1

To: 2008

To: 44-100

Delete: ☒

Archive: ☒

Archive File: ff081103.hst

Output: page

Detail Forecast Delete/Archive (22.7.23)

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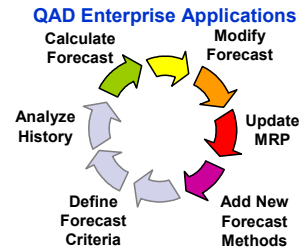
2008-FS-PR-410



Forecast Simulation Processing: Summary



- ▲ Simulated Forecast Calculation
- ▲ Simulation to Summarized Forecast
- ▲ Run MRP
- ▲ User Forecast Method Maintenance (optional)

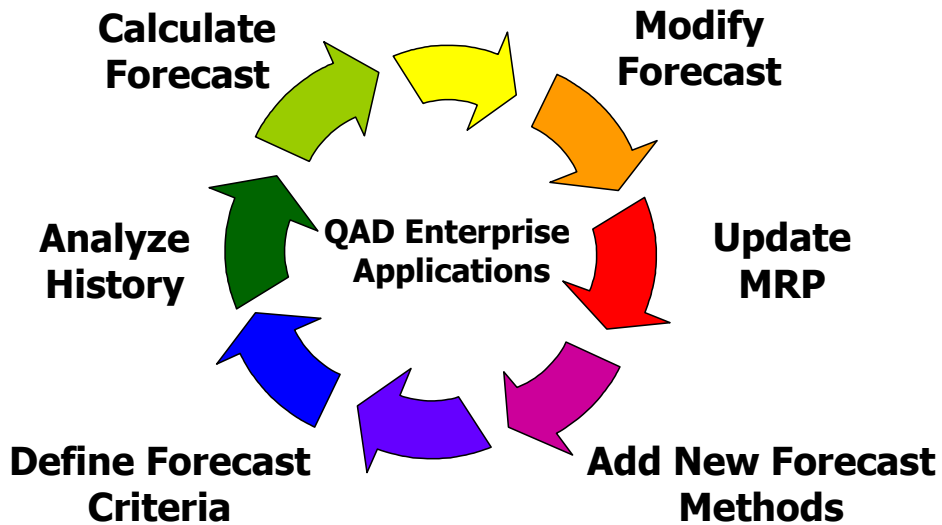


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2008-FS-PR-420

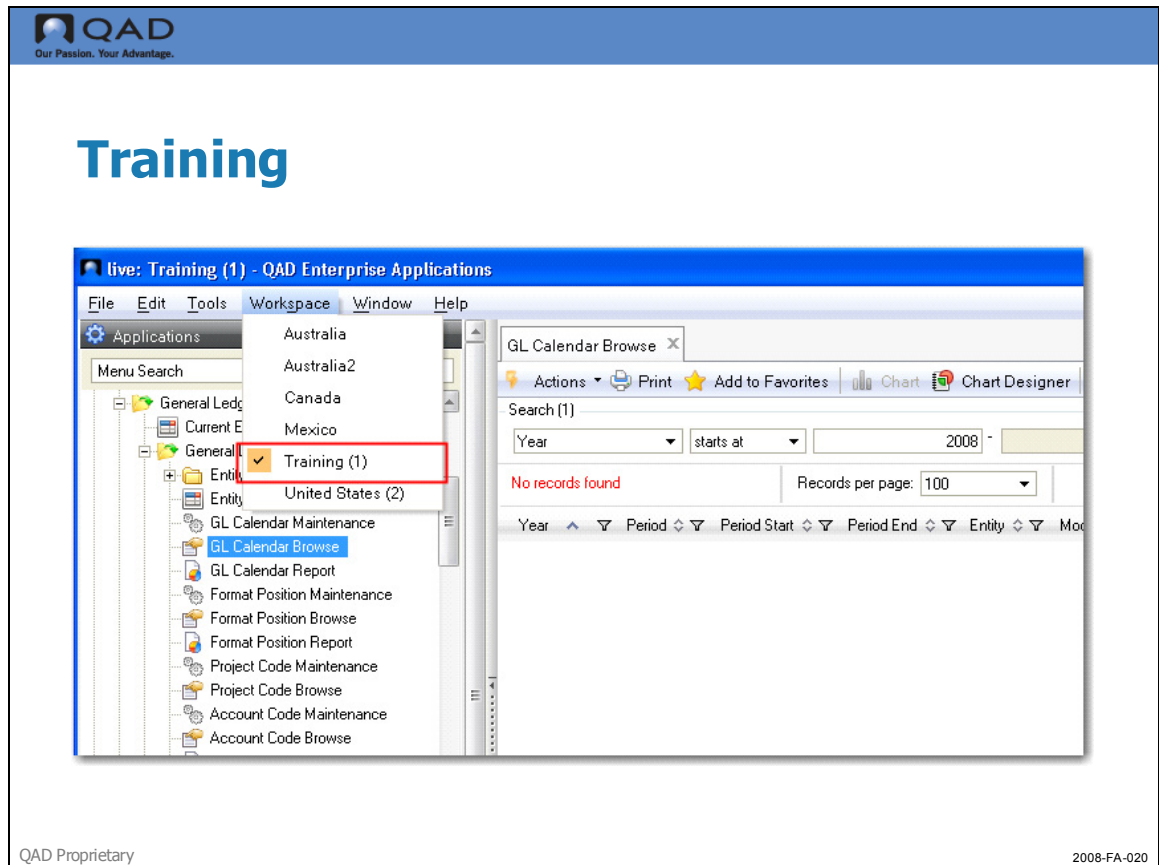


Forecast Simulation Loop System: Summary



QAD Proprietary

2008-FS-PR-430

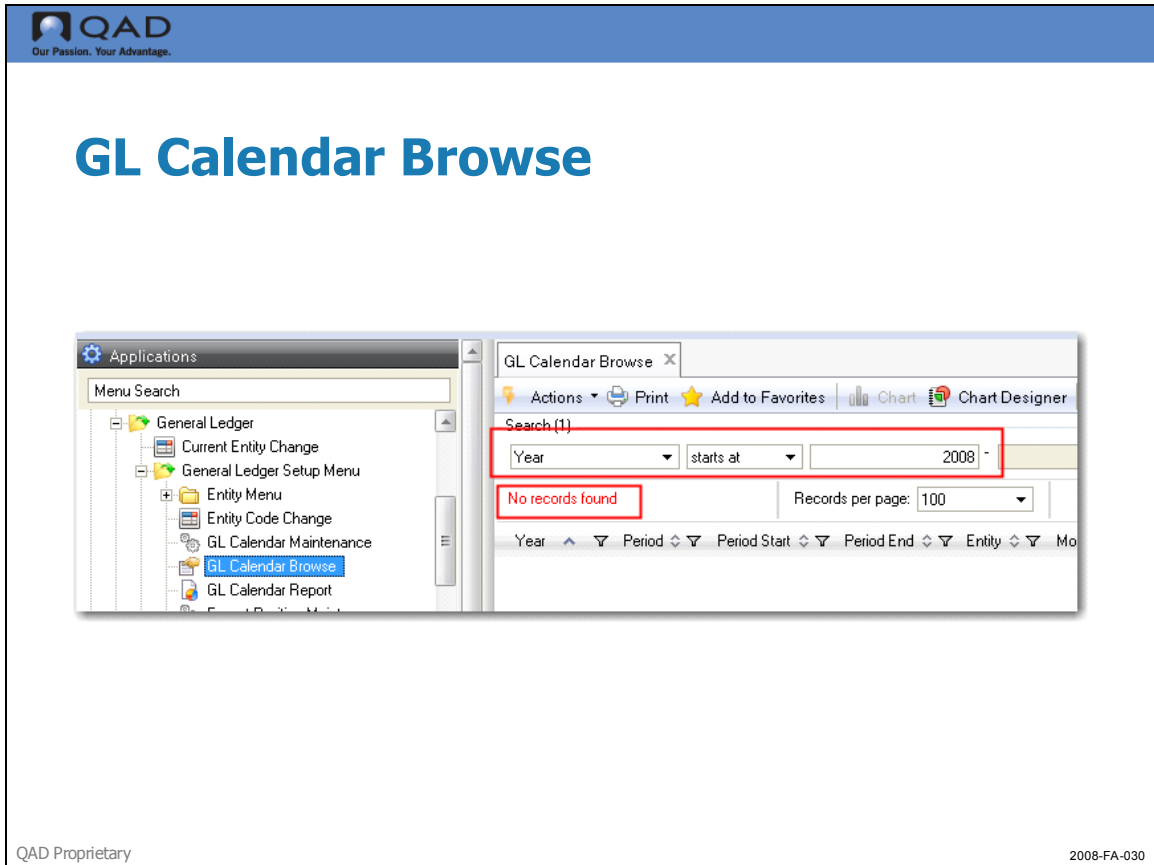


Processing Exercises

Important The data used in these exercises may not be the same as the data shown in the screen captures in this lesson.

First Activity for all 2008 SE courseware

- 1 Verify Domain: From the workspace menu select Training.
Note the domain name appears in the top window frame



2 Verify GL Calendar Period

Use GL Calendar Browse (25.3.5)

Start search at current year

You should see a list of months for the current year

If you find “No Records” continue to step three

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GL Calendar Maintenance

GL Calendar Maintenance X

Go To Actions Copy Print

QUALITY PRODUCTS COMPANY

Year: 2008

Period: 1

Period Start: 10/1/2008

Period End: 12/31/2008

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Use GL Calendar Maintenance (25.3.4)

Enter the current year, then as a short cut enter one period whose dates will cover the term of your training event.

Exercise: Create Manual Forecast

In this activity you will create a monthly forecast for item 1100-00 and autospread that to the weekly summarized Forecast.

- 1 Using Simulation Criteria Maintenance 22.7.1 setup a simulation template. Use Forecast ID of the current year, or next year, or the item code 1100-00. Enter a description that is meaningful to you. For the field Forecast Year enter the current year or next year. Use 2 years of History, set Ending Year to the same year as you used for Forecast Year. For Forecast Method use 00, for the item code use 1100-00 for both from and to fields.
- 2 Use Detail Forecast Maintenance 22.7.7 to create a manual forecast. Enter your forecast ID, as the screen displays it will show all zeros in the Original Forecast column. Use the Next button to cycle through the screen. As you re-enter the screen the cursor will be in the Adjusted Forecast column. For Jan-Mar enter 100 per month, for Apr-Jun enter 150 per month, for Jul-Sep enter 200 per month, for Oct-Dec enter 250 per month.
- 3 Use Simulation to Summarized Fcst. 22.7.13 to autospread the monthly simulated forecast to the weekly summarized forecast. Use your Forecast ID and set update to yes.
- 4 Use 22.1 Forecast Maintenance or 22.3 Forecast Inquiry to verify your forecast has been updated. This data will be used to input MRP.

APPENDIX A

Study Questions

- 9 Describe the four common sales history patterns, and give an example of a typical product that has that type of sales history.
- a Trend
 - b Seasonal
 - c Horizontal
 - d Cyclical

Processing

Study Questions for Forecast Processing

- 1 What menu name and menu number would you use to run the system calculation for forecast simulation?
Menu Name:
- 2 Describe how the system shows forecast quantities for items that have no sales history.
- 3 Memo items and drop shipments are included in forecast calculations.
True False
- 4 You cannot produce a rolling forecast manually. Only yearly forecasts can be done manually.
True False
- 5 If you had a new item likely to have a similar sales history to an existing item, what function would you use to create forecast results for the new item? There are two possible answers.
a Menu Name:
b Menu Name:
- 6 Why should you archive the original forecast or copy to another forecast ID before modifying forecast detail records?
- 7 When performing a Simulation to Simulation copy, if the item ranges of target and source are different, what happens to the target? What happens to the source?
- 8 Forecast simulation records are in monthly buckets. MRP calculations use weekly buckets. What three ways can Simulation to Summarized Forecast load the detail records into the MRP summarized records?
a
b
c

Answers to Study Questions

Setup Forecast Simulation

- 1 False. In QAD Enterprise Applications, Forecast Simulation can only use data from sales history information
- 2 To post sales history to the `cph_hist` field, you must set:

Menu Name:	Sales Order Control
Field and Setting;	Integrate with SA = Yes
- 3 Forecasts are calculated for monthly buckets or periods. However, Master Scheduling quantities are in weekly buckets. This difference between Master Scheduling and Forecast Simulation should be noted.
- 4 Forecast consume forward and consume backward help smooth production. When sales order demand exceeds forecast demand for a week, you produce enough to meet the greater sales demand. When forecast demand exceeds sales orders, you overproduce to meet the forecasted demand, but product remains in excess after the sales orders are shipped. Consume forward and backward takes the excess sales order demand of one week and applies it to the unused portion of the forecasted demand of either the period(s) before or after. It continues to search backward and forward until the specified number of previous and future periods have been examined, or the entire sales order quantity has been applied.

Menu Name:	Sales Order Control
Field and Setting;	Consume Fwd = number of periods to search for future demand Consume Back = number of periods to search for previous demand
- 5 False. Only confirmed sales orders consume the forecast.
- 6 True. The template can only be modified until it has been used for a calculation.
- 7 Ending Year is the same as the Forecast Year = Rolling Forecast
Ending Year is before the Forecast Year = Yearly Forecast
- 8 The system can use up to five years of sales history.
- 9 Trend: A steady growth of demand. Typically a new product.
Seasonal: A cycle of greater and lesser demand, usually within a single year. Typically products like soft drinks and frozen desserts, which have increased demand during hotter months.

Horizontal: A steady demand for a product, with very little variation. Typically a stable, well-established product.

Cyclical: Similar to seasonal demand, with greater and lesser demand, but follows a business cycle over several years. Difficult to predict. Typically real estate.

Process Forecast Simulation

- 1 Simulated Forecast Calculation.
- 2 At least one sales record is required to produce nonzero forecast quantity. When insufficient history exists to create a valid forecast, the detailed forecast record is created with quantities of zero and the item is printed out as insufficient.
- 3 False. Memo items and drop shipments are excluded from any forecast calculations.
- 4 True. You cannot produce a rolling forecast manually, only yearly forecasts. The rolling forecast requires forecasting for the next twelve monthly periods. Manual forecasts can only be created for January through December.
- 5 Run a forecast calculation for the first item, then use one of the two copy features to copy the results to the second forecast template.
 - a Menu Name: Single Item Simulation Copy
 - b Menu Name: Simulation to Simulation Copy
- 6 To obtain the original forecast quantities, you need to run the original calculation again. After the calculation is run, the template and detail records are updated. Previous templates and records are deleted. This makes it important to archive the original forecast or copy to another forecast ID before modifying forecast detail records.
- 7 When performing a Simulation to Simulation copy, if the item ranges of target and source are different, the target range is expanded. Targets are changed/overwritten, source remains unchanged.
- 8 Forecast simulation records are in monthly buckets. MRP calculations use weekly buckets. Simulation to Summarized Forecast can load the detail records into the MRP summarized records by:
 - a Autospread (default)—calculating daily averages, rolling these into weekly buckets, distributing weekly averaged totals throughout the month
 - b Load first week
 - c Load last week

