



QAD Enterprise Applications
Standard & Enterprise Edition

Training Guide **Forecast Simulation**

70-3044D
QAD 2011 Standard & Enterprise Edition
Lab: Enterprise Edition 2011 - Addons r02 - Training
Workspace: 10USA > 10USACO
April 2011

This document contains proprietary information that is protected by copyright and other intellectual property laws. No part of this document may be reproduced, translated, or modified without the prior written consent of QAD Inc. The information contained in this document is subject to change without notice.

QAD Inc. provides this material as is and makes no warranty of any kind, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. QAD Inc. shall not be liable for errors contained herein or for incidental or consequential damages (including lost profits) in connection with the furnishing, performance, or use of this material whether based on warranty, contract, or other legal theory.

QAD and MFG/PRO are registered trademarks of QAD Inc. The QAD logo is a trademark of QAD Inc.

Designations used by other companies to distinguish their products are often claimed as trademarks. In this document, the product names appear in initial capital or all capital letters. Contact the appropriate companies for more information regarding trademarks and registration.

Copyright ©2011 by QAD Inc.

ForecastSimulation_TG_v2011SE_EE.pdf/njm/mjm

QAD Inc.

100 Innovation Place
Santa Barbara, California 93108
Phone (805) 566-6000
<http://www.qad.com>

Contents

| | |
|--|-----------|
| About This Course | 1 |
| Course Description | 2 |
| QAD Web Resources | 3 |
| Chapter 1 Introduction to Forecast Simulation | 5 |
| Course Overview | 6 |
| General System Flow | 7 |
| Terminology | 8 |
| Forecast Simulation Life Cycle | 9 |
| Typical Users | 10 |
| Chapter 2 Business Considerations | 13 |
| Overview | 15 |
| Product Life Cycle | 16 |
| Forecast Consumption | 18 |
| MRP Horizon | 19 |
| Production Forecasts | 20 |
| Spare Parts | 21 |
| Multiple Sites | 22 |
| Summary | 23 |
| Chapter 3 Forecast Simulation Setup | 25 |
| Overview | 27 |
| Closed-Loop System | 28 |
| Additional Functionality | 29 |
| Limitations | 30 |
| Lifecycle Summary | 31 |
| Lifecycle Flowchart | 33 |
| Forecast Simulation Setup | 34 |
| Sales Order Control | 35 |
| Forecasting Consumption | 38 |
| Set Up Criteria Template | 39 |
| What is a Criteria Template? | 40 |
| Simulation Criteria Maintenance | 41 |

| | |
|--|----|
| Identify Template | 42 |
| Identify Template | 43 |
| Yearly or Rolling Forecast | 44 |
| Specify Sales History Time Frame | 45 |
| Specify Time Frame | 46 |
| Determine Calculation Method | 47 |
| Calculation Method | 48 |
| Sales History Patterns | 50 |
| Forecasting Methods | 51 |
| Method Codes | 52 |
| Double Moving Average | 54 |
| Double Exponential Smoothing | 55 |
| Linear Exponential | 56 |
| Classic Decomposition | 57 |
| Simple Regression | 58 |
| Best Fit | 59 |
| Underlying Patterns | 60 |
| Alpha and Trend Factors in Simulation Criteria Maintenance | 61 |
| Indication Items for Forecast | 62 |
| Simulation Criteria Maintenance | 63 |
| Specify Customer Parameters | 64 |
| Simulation Criteria Maintenance | 65 |
| Summary | 66 |

Chapter 4 Forecast Simulation Processing67

| | |
|--|----|
| Workflow: Processing Steps | 69 |
| Use Forecast Simulation | 70 |
| Run Forecast Simulation Calculation | 71 |
| Calculating Quantities | 72 |
| Simulation Forecast Calculation | 74 |
| Modifying Forecast Results | 75 |
| Modification Methods | 76 |
| Load Forecast | 77 |
| CIM Data Load | 78 |
| Create Forecast Manually | 80 |
| Guidelines for Creating Records Manually | 81 |
| Detail Forecast Maintenance | 82 |
| Copying Forecast Results | 83 |
| Multiplicative Factors | 84 |
| Copy Forecast | 85 |
| Simulation to Simulation Copy | 87 |
| Single Item Simulation Copy | 88 |
| Single Item Simulation Copy | 90 |

| | |
|---|-----|
| Detail Forecast Report | 91 |
| Maintain Forecast Records | 92 |
| Detail Forecast Report | 93 |
| Forecast Summary | 95 |
| Driving MRP | 96 |
| Loading Methods | 97 |
| Simulation to Summarized Forecast | 99 |
| Results | 100 |
| Run MRP | 101 |
| Add New Forecast Methods | 102 |
| User Forecast Method Maintenance | 103 |
| User Forecast Method Maintenance | 104 |
| Rules for Adding Methods | 105 |
| Miscellaneous Functions | 106 |
| Detail Forecast Delete/Archive | 108 |
| Create Sales History | 111 |
| Setup/Implementation | 114 |
| Study Questions for Forecast Simulation Setup | 114 |
| Processing | 115 |
| Study Questions for Forecast Processing | 115 |
| Answers to Study Questions | 116 |
| Setup Forecast Simulation | 116 |
| Process Forecast Simulation | 117 |

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

Environment and Workspace

The hands on exercises should be used with the Enterprise Edition 2011 - Addons r02 - Training environment, in the 10USA > 10USACO workspace.

Course Credit and Scheduling

This course is designed to be taught in one day and is worth 6 credit hours.

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.

QAD Web Resources

QAD's Learning and Support pages can be found at

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

4 Training Guide — Forecast Simulation

Chapter 1

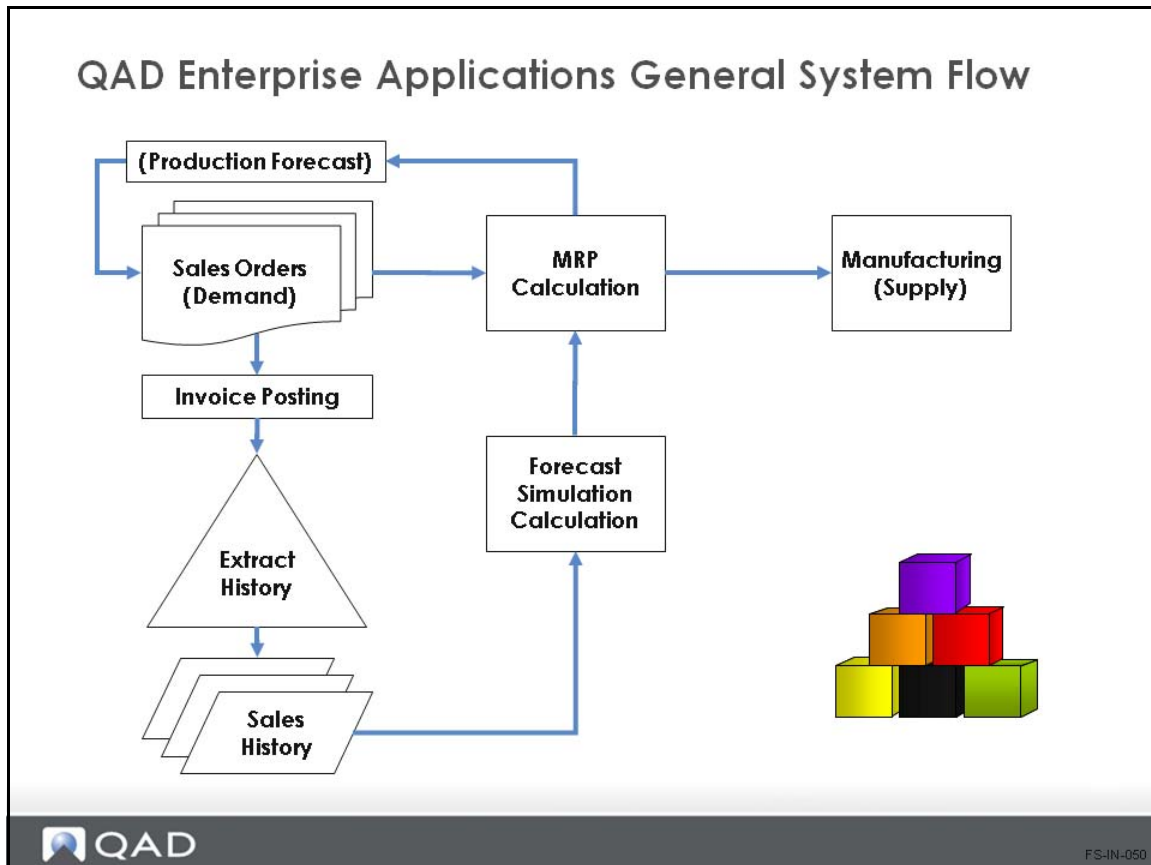
Introduction to Forecast Simulation

Course Overview

Course Overview

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

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

Terminology

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



FS-IN-060

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 in this training guide: [Modifying Forecast Results](#).

Forecast Consumption

Reducing the forecast quantities by the confirmed sales order quantities. See [Forecasting Consumption](#).

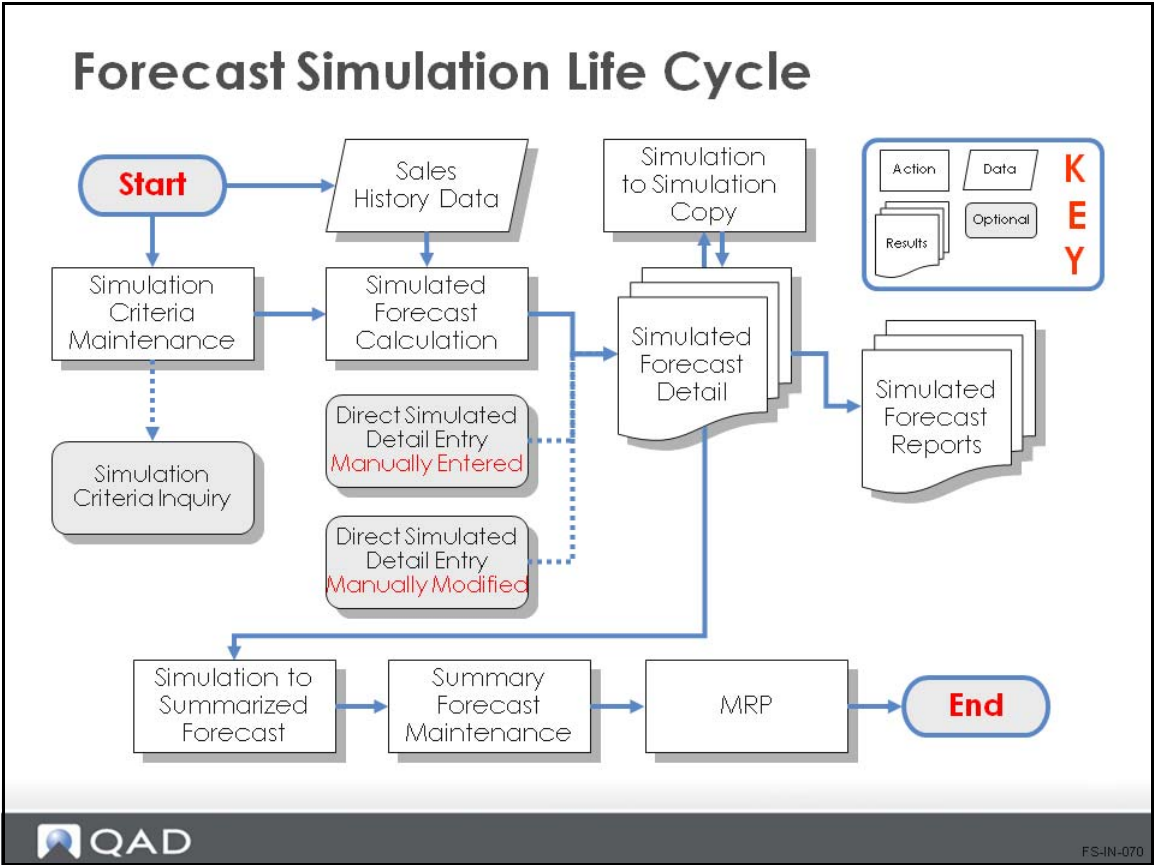
Trends and Cycles

Multipliers for increase or decrease in demand; and repeated patterns of varying demand. See in this training guide: [Sales History Patterns](#).

Regression Analysis

Statistical method to determine the best relationship between a response and independent variables. See in this training guide: [Calculation Methods and Simple Regression](#).

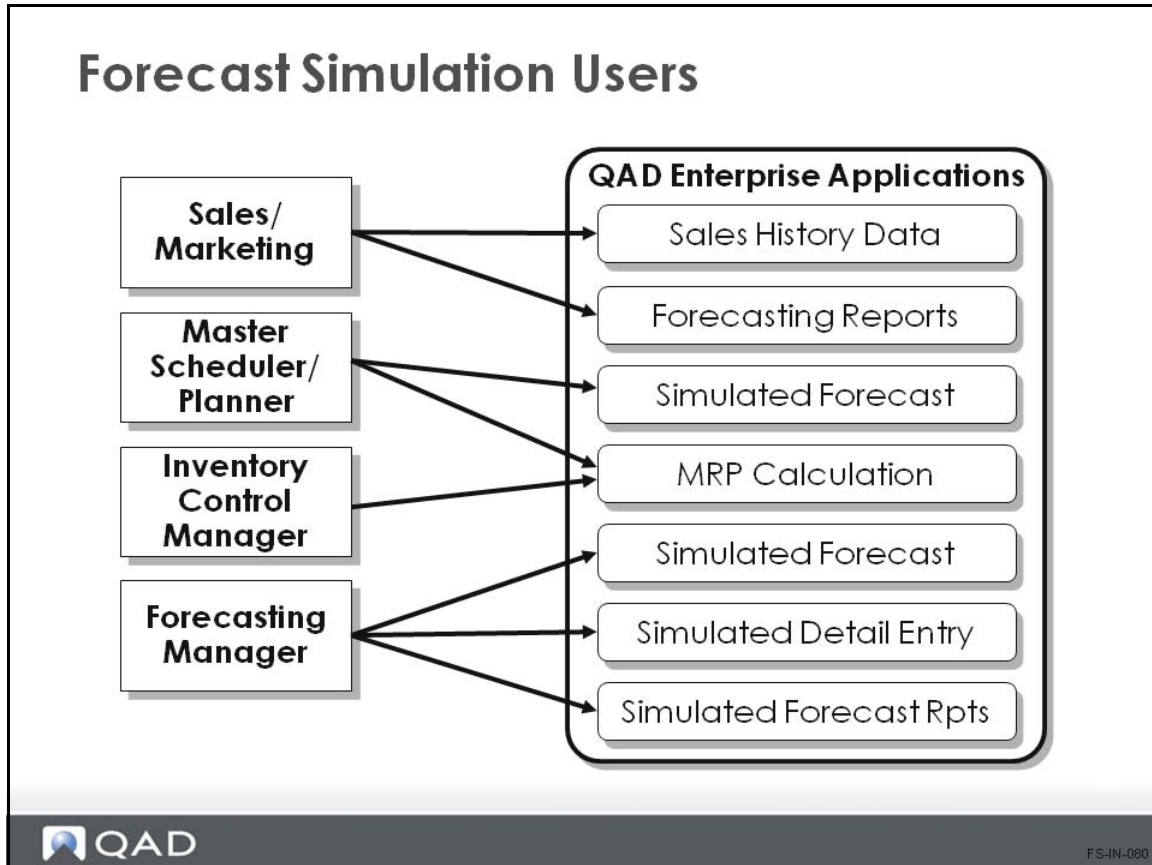
Forecast Simulation Life Cycle



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

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

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

Chapter 2

Business Considerations

Business Considerations

- **Identify 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

Overview

Business Issues

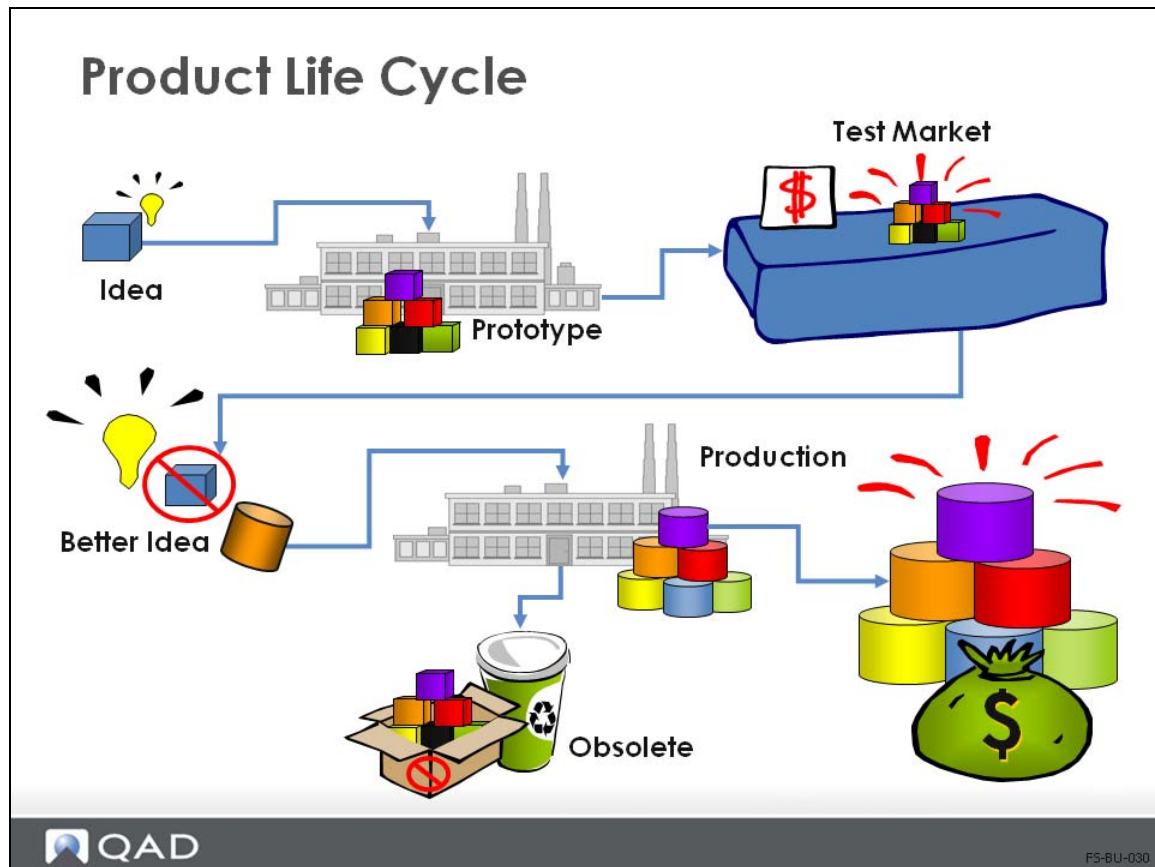
- Product life cycle
- Forecast consumption
- MRP horizon
- Production forecasts
- Spare (service) parts
- Multiple sites



F5-BU-020

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

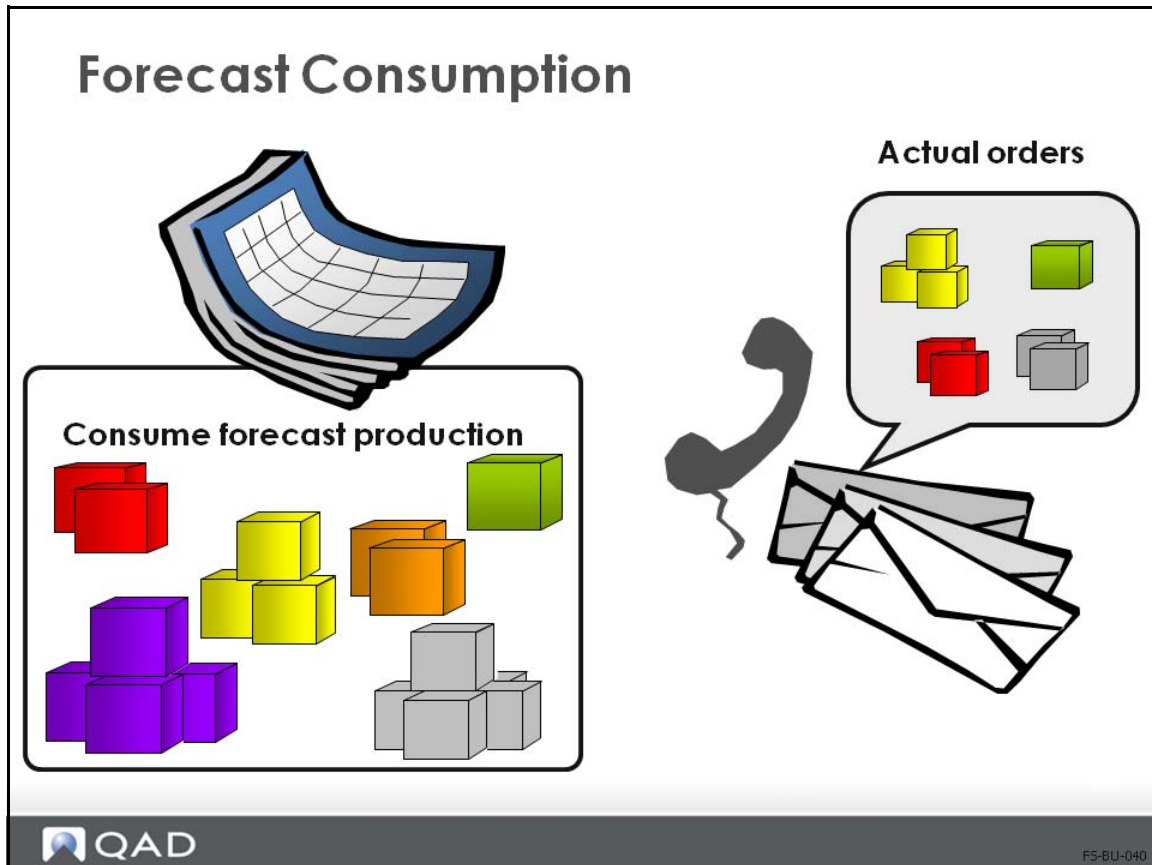
Functionality in QAD Enterprise Applications

- 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

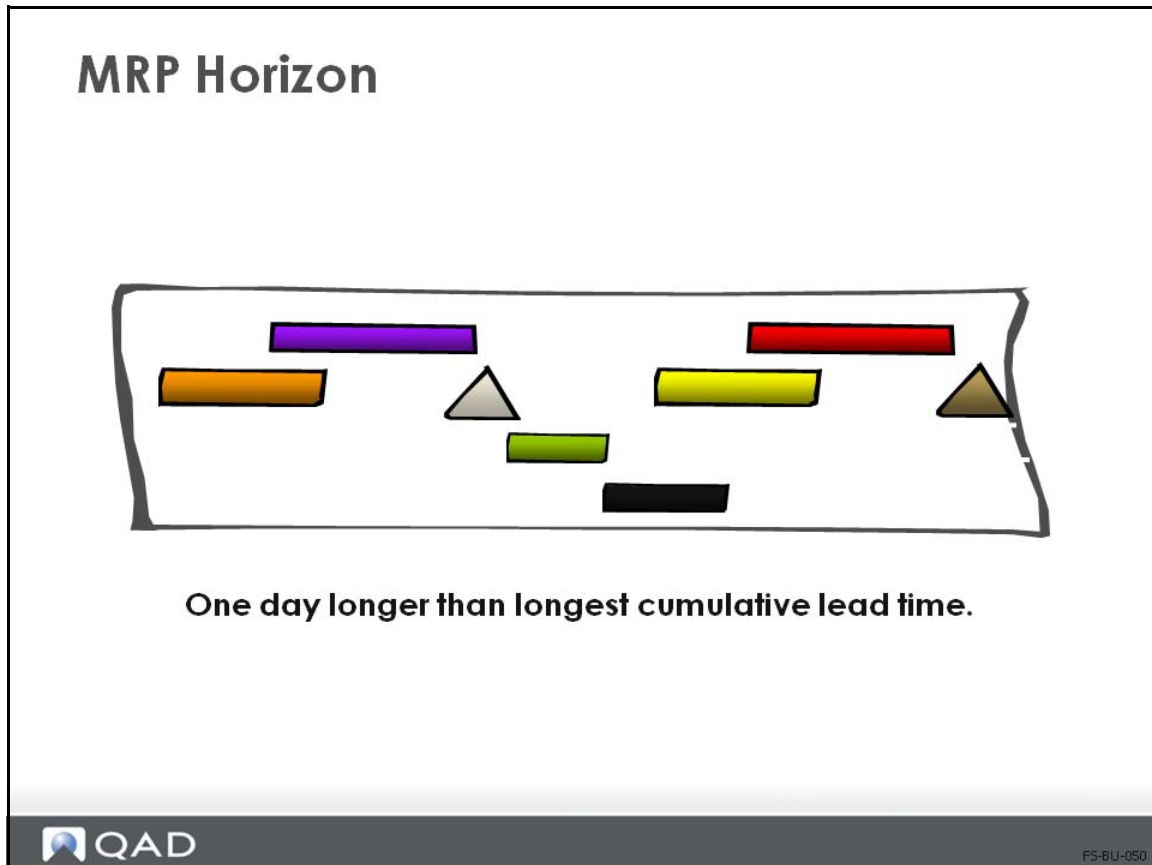
Consumption is controlled by Sales Order Control (7.1.24). The control program can be set to consume either forward or back, and is set based on variability of sales and forecast.

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



Definition

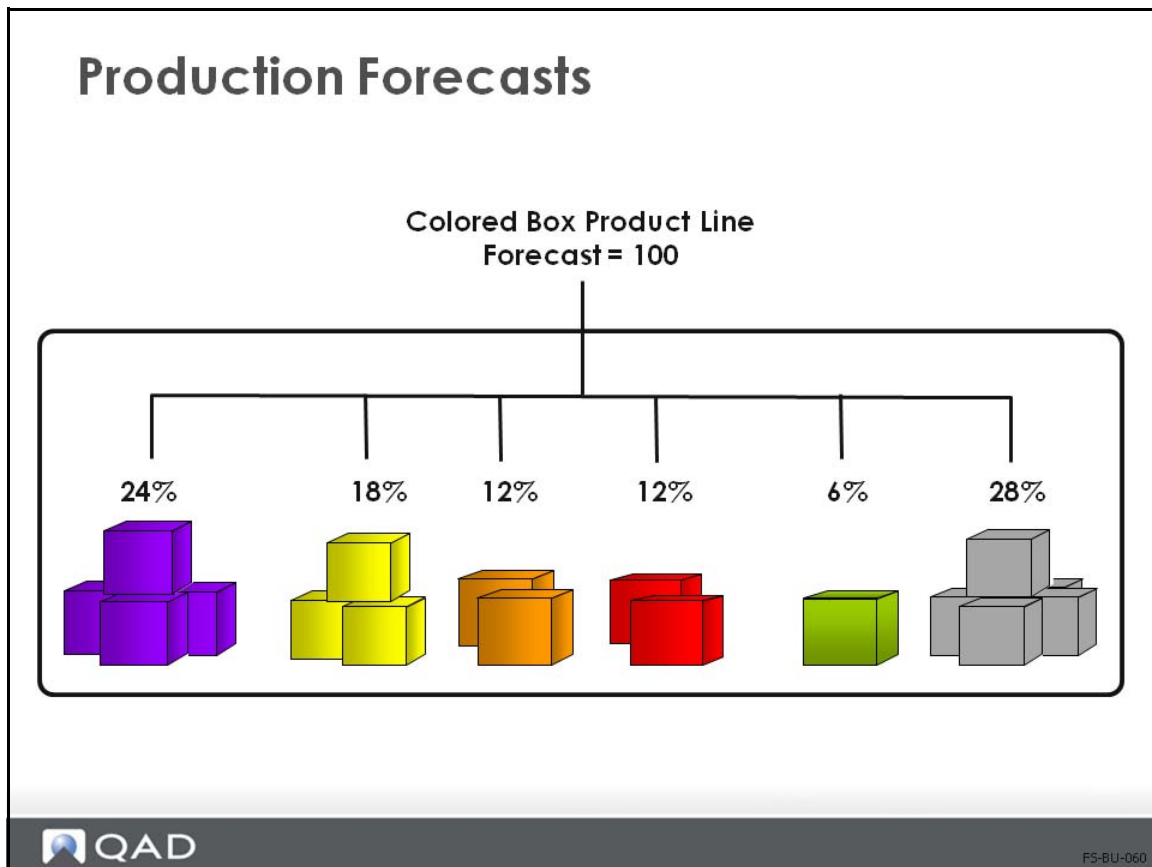
Material Requirements Planning (MRP) horizon and number of days in forecast need to be made compatible so the window and forecasting go out similar.

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

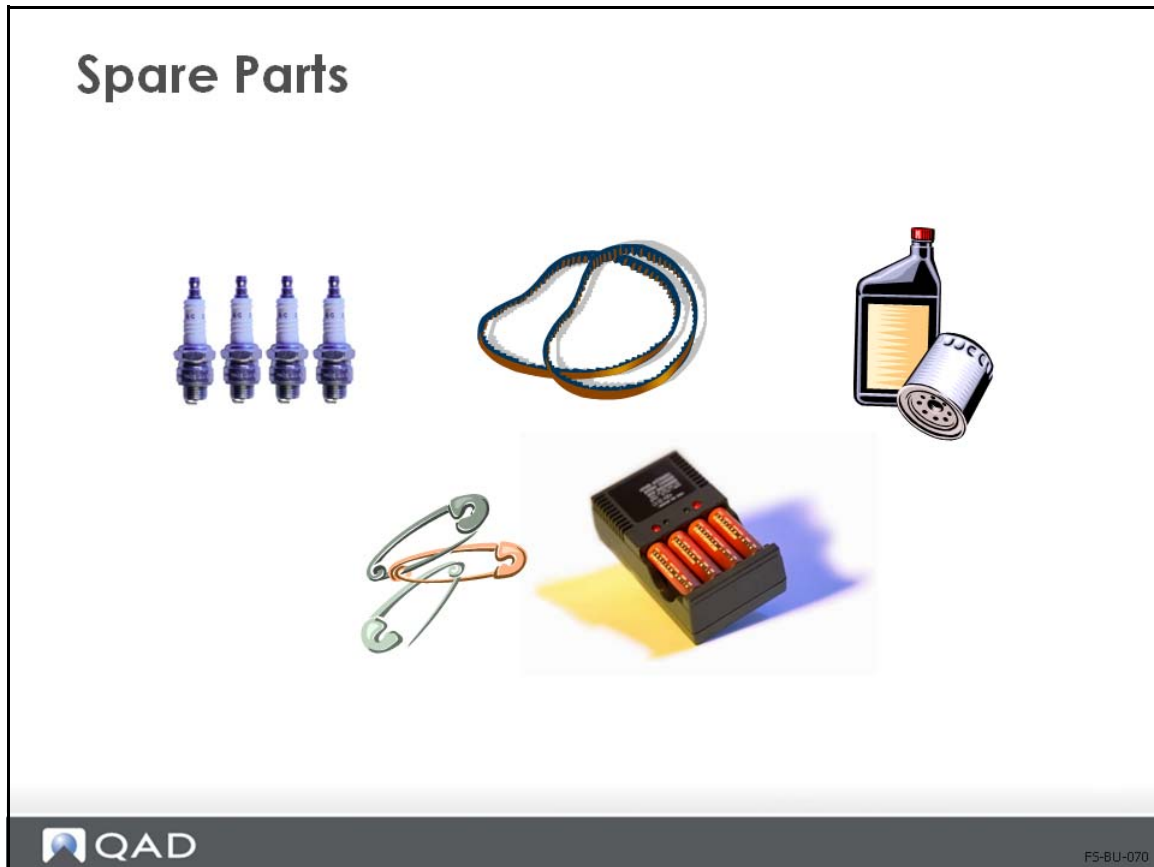
Functionality in QAD Enterprise Applications

- 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



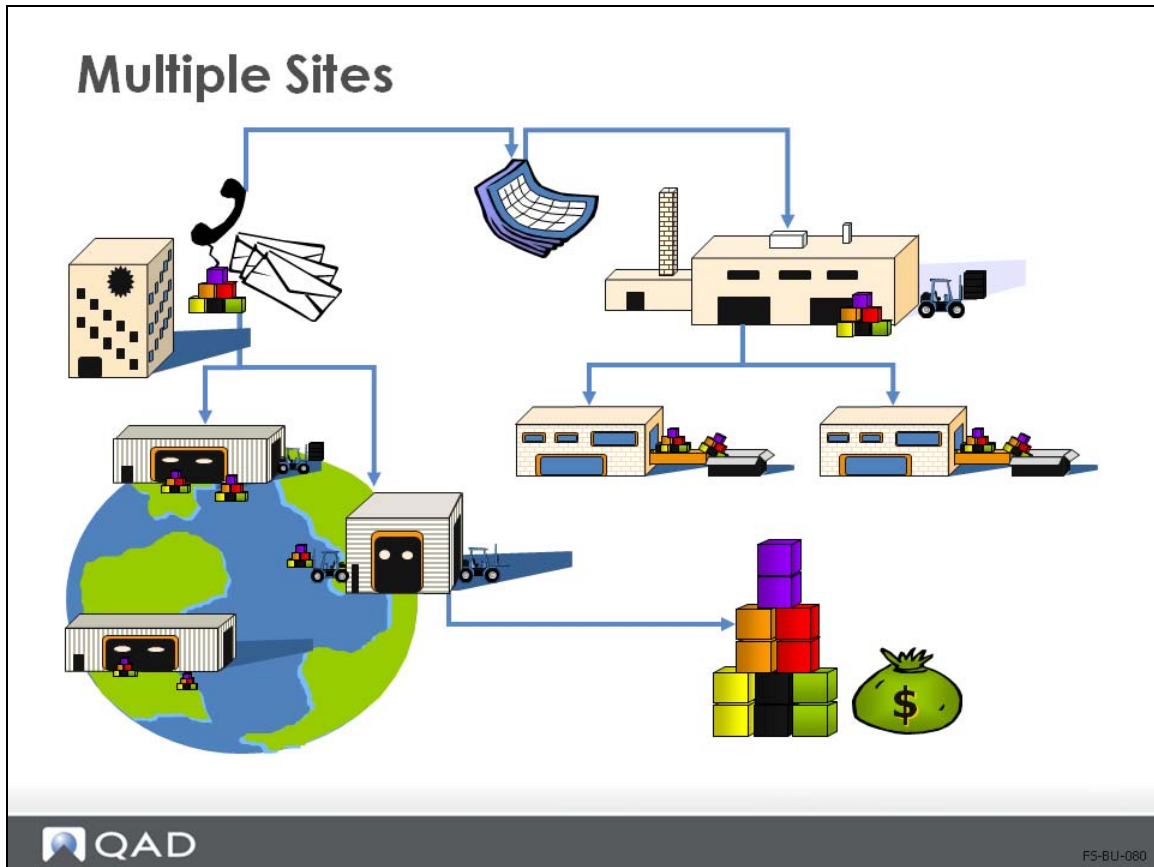
Definition

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

Is the forecast calculated by Sales Order header site or Line item site?

Summary

Review

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

Chapter 3

Forecast Simulation Setup

Set Up Forecast Simulation

- Identify 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



F5-SU-010

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

Overview

Forecast Simulation Overview

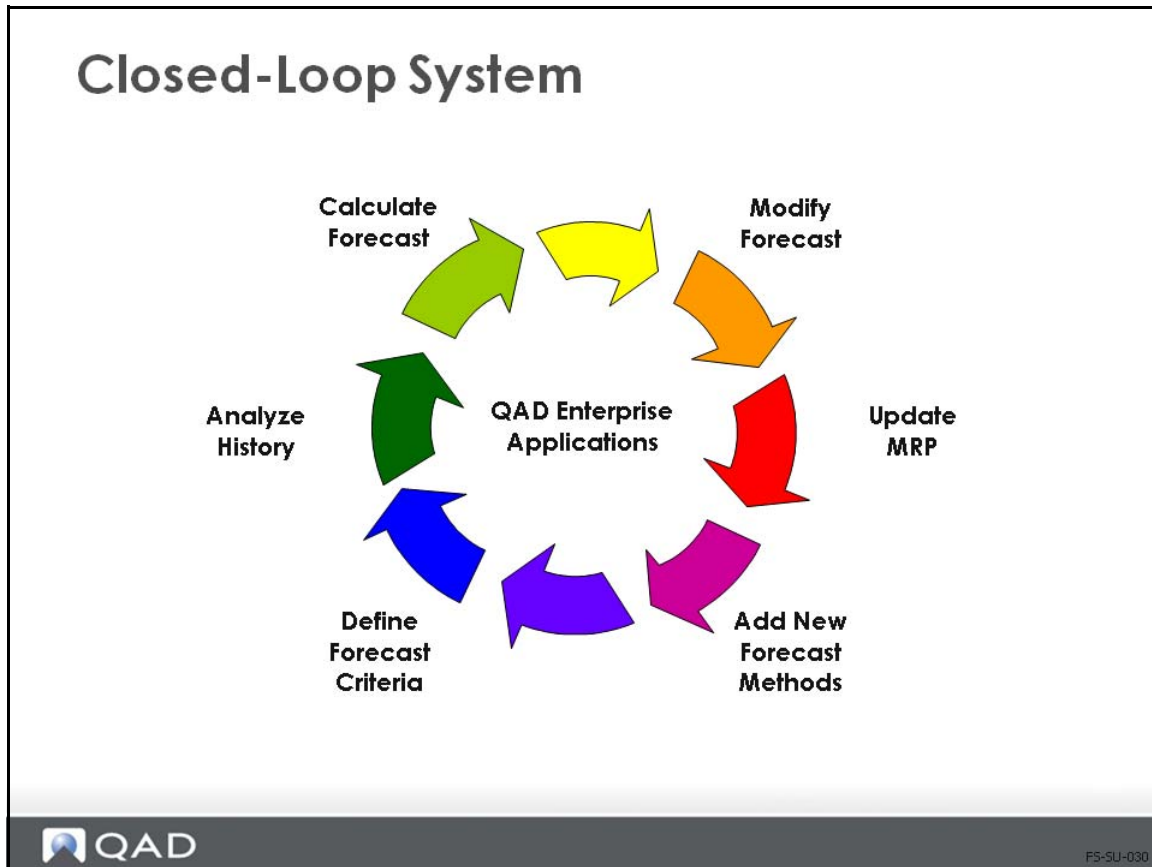
- Used to plan production and manage inventory
- Assumes that sales history repeats to varying degrees
- More sales history = More accurate forecast



F5-SU-020

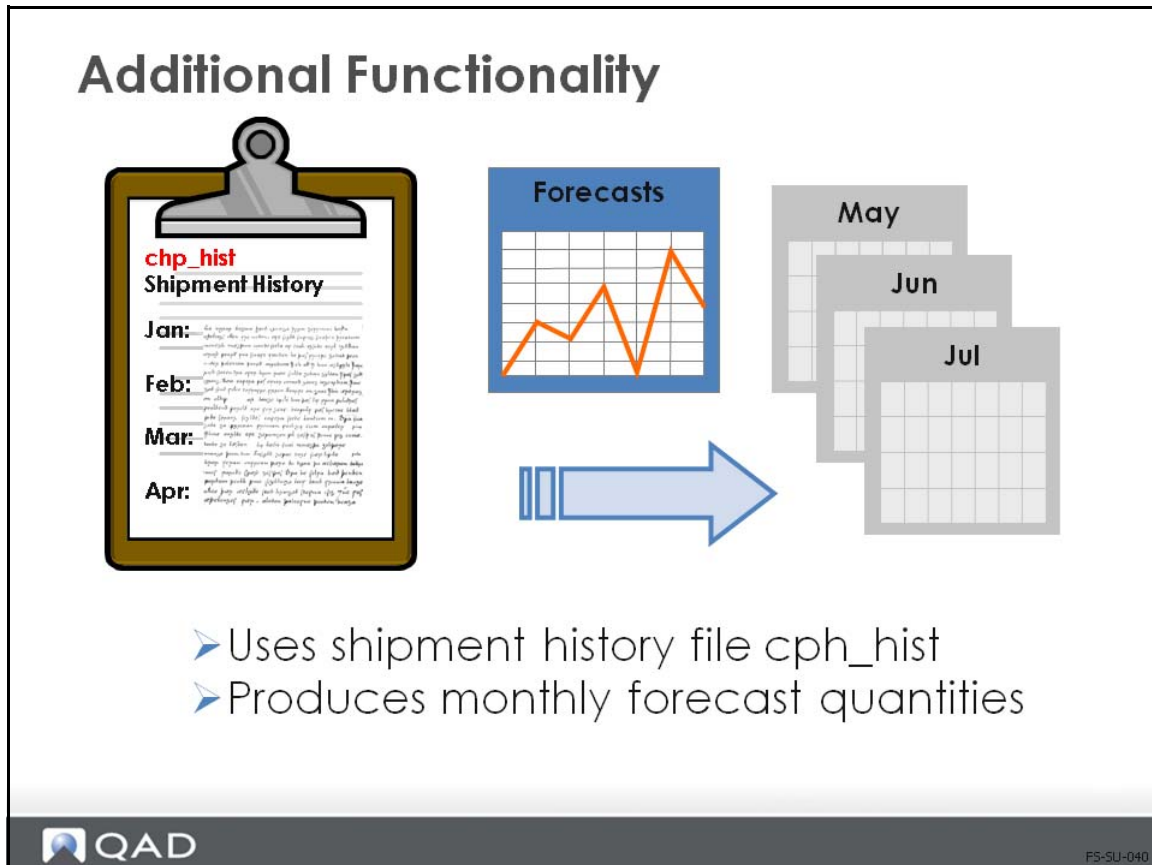
- Typically use forecast simulation to plan production and manage inventory
- Forecast simulation assumes that historical sales patterns are repeated to varying degrees in the future
- Accuracy of the forecast depends on the value of the sales information
- Five forecasting methods and a best fit model 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

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

Limitations

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



FS-SU-050

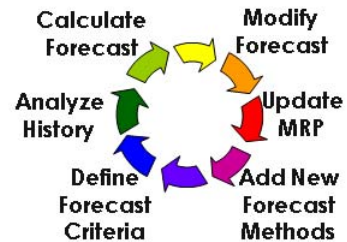
- Forecast simulation cannot use data other than the sales history information
- Configured products cannot be forecast, must individually forecast for components
- Historical sales data used is:
 - Product / type / group / line
 - Site
 - Customer / region
 - Ship-to or sold-to address
- Sales channel,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

Lifecycle Summary

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



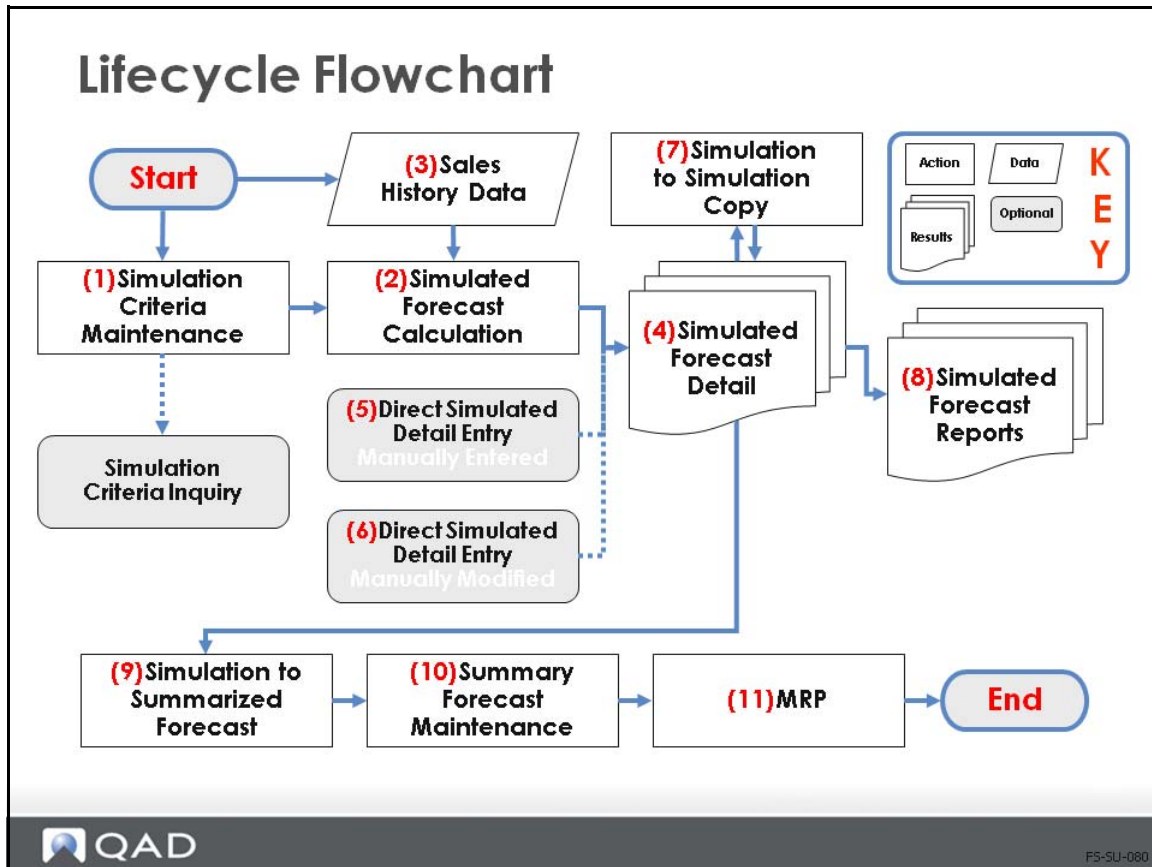
FS-SU-060

- 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.

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:

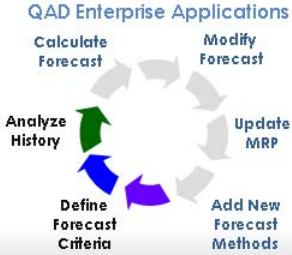
- Simulation Criteria Maintenance (22.7.1)
- Sales History Data

Forecast Simulation Setup

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

Calculate Forecast Modify Forecast

Analyze History Update MRP

Define Forecast Criteria Add New Forecast Methods

F5-SU-100

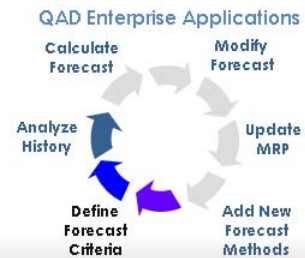
This illustration is a suggested setup sequence of master files for the Forecast Simulation module which is based on information that flows from one master file to another and prerequisites that need to be accomplished before setting up a file. Reading the illustration:

Sales Order Control

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



Sales Order Control

Sales Order Control

Go To Action

Use Which Calc for Qty Available to Allocate: 1

Allocate Sales Order Lines Due in Days: 10 (0 for no allocations)

Limit Allocate to Avail Only:

ATP Enforcement Enabled:

Family ATP Calculation: 1

Pick Only Allocated Lines:

Are Sales Orders Printed:

Keep Booking History:

Print Tax ID on Invoice:

Shipping Lead Time: 1

Company Address: 10000000

Sales Order Header Comments:

Sales Order Line Comments:

Print Only Lines to Invoice:

Ln Format S/M: Multi

Detail Allocations:

ATP Horizon: 0

Calculate Promise Date:

Sales Order Prefix: S0

Next Sales Order: 20001

Invoice Prefix: IV

Next Invoice: 10000

Integrate with AR:

Integrate with SA:

Integrate with TrM:

Confirmed Orders:

Fiscal Start Month: 1

FOB: Shipping Point

Integrate with Sales Analysis = Yes

- 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

Sales Order Control X
Go To Action

| | |
|---|--|
| Calculate Freight by Site: <input type="checkbox"/> | Auto Batch Confirmation: <input type="checkbox"/> |
| Comm on Margin not Sales: <input checked="" type="checkbox"/> | |
| Hold Orders Over Credit Limit: <input checked="" type="checkbox"/> | |
| SO Interest Accrued Acct: <input type="text" value="4500"/> | <input type="text"/> |
| SO Interest Applied Account: <input type="text" value="1280"/> | <input type="text"/> |
| Price Table Required: <input type="checkbox"/> (Applies to Discrete Sales Orders) | |
| Disc Table Required: <input type="checkbox"/> (Applies to Scheduled Orders) | |
| Vary Pricing Date by SO Line: <input checked="" type="checkbox"/> | Confirmation Batch ID: <input type="text"/> |
| Minimum Shipment Amount: <input type="text" value="0"/> | Confirmation Printer: <input type="text"/> |
| SO Edit ISB Defaults: <input type="checkbox"/> | Pending Inv Update ISB: <input type="checkbox"/> |
| SO Returns Update ISB: <input type="checkbox"/> | |
| Forecast Consumption | Auto Batch Shipment: <input type="checkbox"/> |
| Consume Forward: <input type="text" value="1"/> | Shipment Batch ID: <input type="text"/> |
| Consume Back: <input type="text" value="2"/> | Shipment Batch Printer: <input type="text"/> |
| Check Customer Item Nbr First: <input type="checkbox"/> | Use SO Freight List Trailer Code: <input type="checkbox"/> |
| Taxable Trailer Code 1: <input type="text" value="10"/> | Nontaxable Trailer Code 1: <input type="text" value="10"/> |
| Taxable Trailer Code 2: <input type="text" value="11"/> | Nontaxable Trailer Code 2: <input type="text" value="11"/> |
| Taxable Trailer Code 3: <input type="text" value="21"/> | Nontaxable Trailer Code 3: <input type="text" value="20"/> |

Consume Forecast Settings

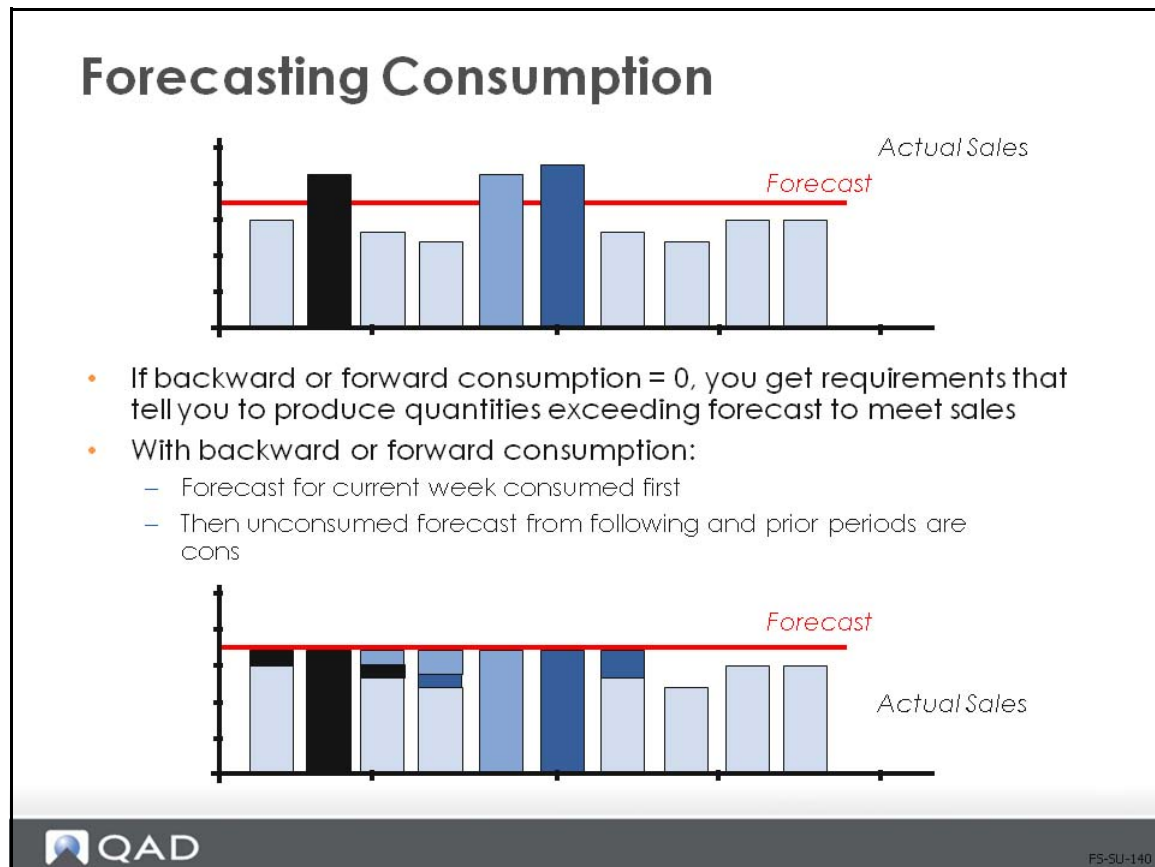
FS-SU-130

- 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



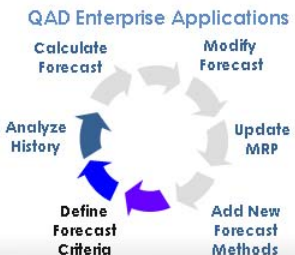
- The system consumes the forecast for the specified number of periods, first by going back, then forward, one period from the original forecast period
- It then continues to search backward and forward until the specified number of previous and future periods have been examined, or the entire sales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

Set Up Criteria Template


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

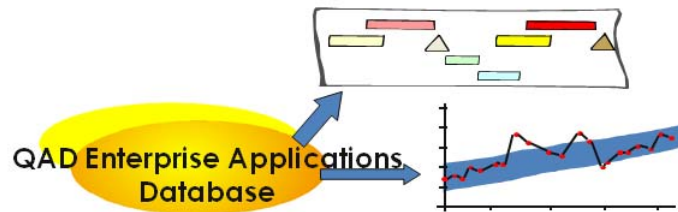

FS-SU-150

- 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?

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



FS-SU-160

- 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

Simulation Criteria Maintenance

Simulation Criteria Maintenance

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


Statistical Data
 Production Data
 Sales History Data

QAD FS-SU-170

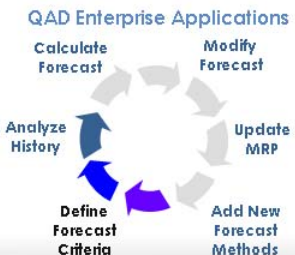
| Category | Defines |
|------------------------|---|
| Statistical Data | Method, trend, alpha factor. Also includes user factors to a specified user-defined forecast method |
| Production Information | Item, product line, group, item type, and order line site being forecast |
| Sales History Data |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

Identify Template


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


F5-SU-180

- 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

Identify Template

Simulation Criteria Maintenance

Identify Template

The screenshot shows the 'Simulation Criteria Maintenance' window with the following fields and values:

- Forecast ID: CLASS
- Description: CLASSROOM SIMULATION
- Forecast Year: 2008
- Forecast Method: 01
- Years of History: 5
- Ending: 2007
- Alpha factor: .40
- Trend: .10
- User factor[1]: 0.00
- User factor[2]: 0.00
- Item Number: 20-005
- To: 20-005
- Prod Line: [empty]
- To: [empty]
- Group: [empty]
- To: [empty]
- Item Type: [empty]
- To: [empty]
- Order Line Site: [empty]
- To: [empty]
- Use Ship To/Sold To: Sold To
- List Type: [empty]
- Customer: [empty]
- To: [empty]
- Region: [empty]

Callouts in the image:

- 'Enter Forecast ID' points to the Forecast ID field.
- 'Enter Forecast Year' points to the Forecast Year field.
- A box explains: 'Rolling: Forecast Year = Ending Year' and 'Yearly: Forecast Year is after Ending Year'.

QAD FS-SU-190

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

Yearly or Rolling Forecast

Identify Template

Yearly Forecast

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 |

Current Date: Jan. '09
Forecast Year: 2009
Ending Year: 2008


Rolling Forecast

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


Current Date: Apr. '09
Forecast Year: 2009
Ending Year: 2009


FS-SU-200

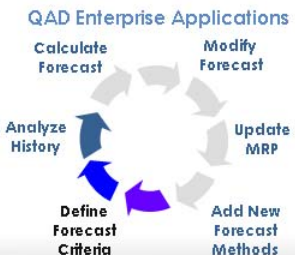
- In the first example above, the forecast has been set up as a yearly forecast:
 - Uses sales history ending in 2008
 - Projects forecast quantities for all the months of 2009
- In the second example above, the forecast has been set up as a rolling forecast:
 - Uses sales history ending in March 2009
 - 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

Specify Sales History Time Frame


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


FS-SU-210

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

Specify Time Frame

Simulation Criteria Maintenance

Specify Time Frame

Forecast ID: CLASS

Forecast Year: 2008

Forecast Method: 01

Description: CLASSROOM SIMULATION

Years of History: 5

Alpha factor: .40

User factor[1]: 0.00

Ending: 2007

Trend: .10

User factor[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

FS-SU-220

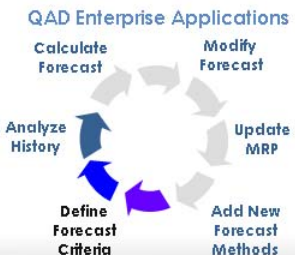
- Can analyze up to five years
- The system reduces the number of years if there are no sales for a year
- Ending year must be the same or earlier than the forecast year
 - Same = Rolling Forecast
 - Earlier = Yearly Forecast

Determine Calculation Method


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

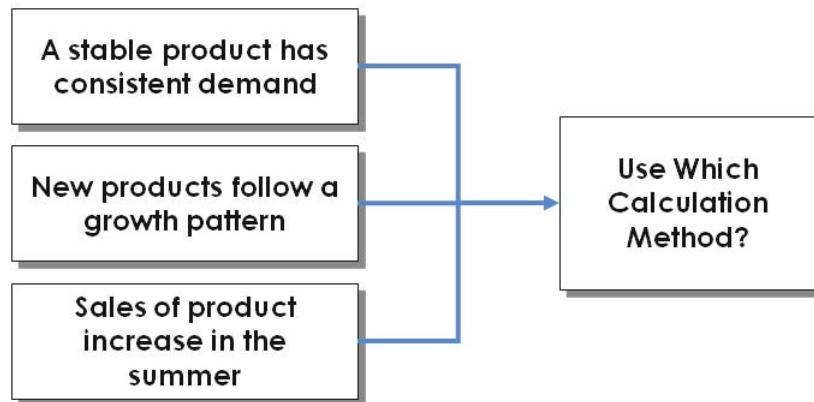

F5-SU-230

- 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

Calculation Method

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



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

Calculation Methods

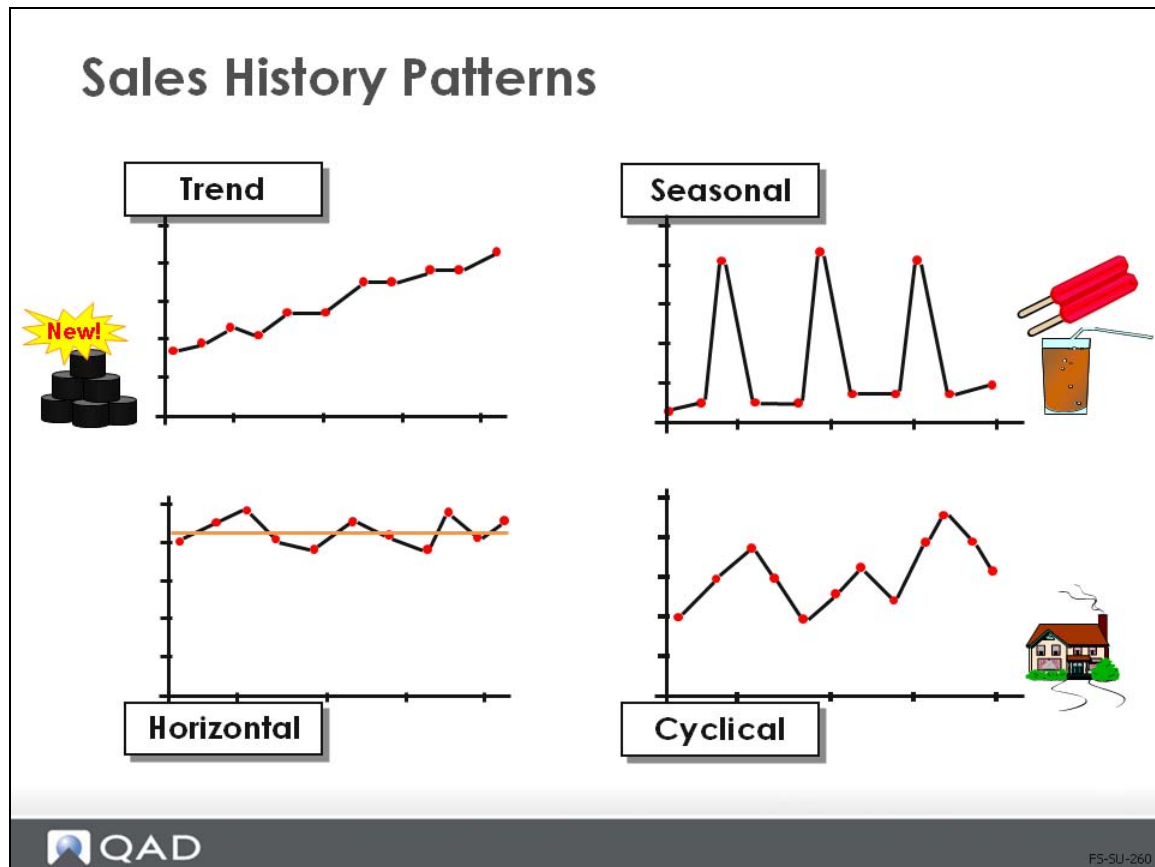
- Sales history can contain four underlying patterns of demand:
 - Trend (new products)
 - Seasonal (yearly cycle)
 - Horizontal (stable products)
 - Cyclical (business cycle level)



F5-SU-250

- 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

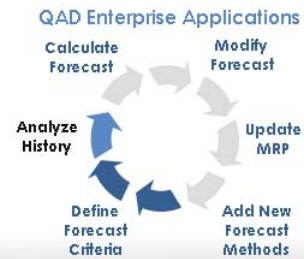


| Pattern | Description | Example |
|------------|--|---|
| Trend | Sales quantities generally increase over time. | The growth pattern of a new product |
| Seasonal | Sales quantities fluctuate according to some seasonal factor such as weather or the way in which a firm has chosen to handle its operations. | 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

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



FS-SU-270

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

Method Codes

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



FS-SU-280

- 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



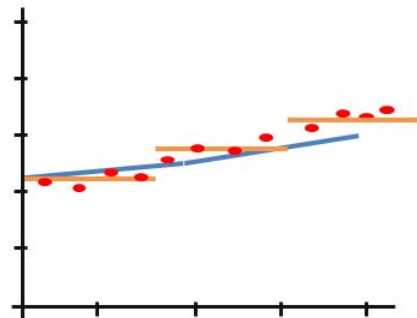
F5-SU-290

- 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

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

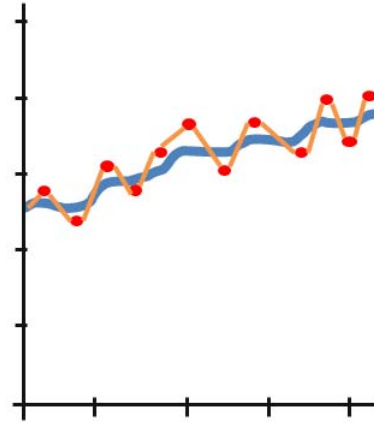


- The simplest of the forecasting techniques
- Used a set of simple moving averages based on historical data, then computes another set of moving averages based on the first set
- Produces forecast that lags behind trend effects

Double Exponential Smoothing

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

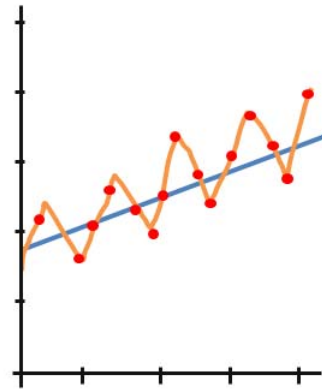


- The most popular of the forecasting techniques
- Uses the alpha factor to weight the most recent sales data more heavily than the older sales data

Linear Exponential

Linear Exponential (Method 04)

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



FS-SU-320

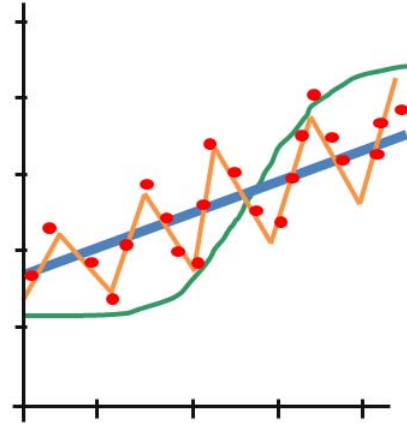
- Produces results similar to Double Exponential Smoothing
- Extra advantage of incorporating a seasonal/trend adjustment factor
- Uses both trend and alpha factors
 - Large trend (close to one) weighs heavily any sharp changes in sales
 - Small trend (close to zero) begins to ignore sharp increase/decreases

Note Requires minimum of two years of sales history

Classic Decomposition

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)



FS-SU-330

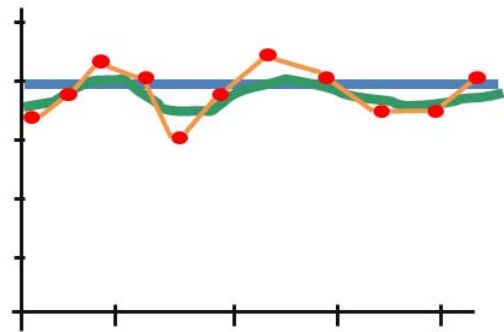
- Usually the preferred method for seasonal, high-cost items
- Eliminates all random fluctuations

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

Simple Regression

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

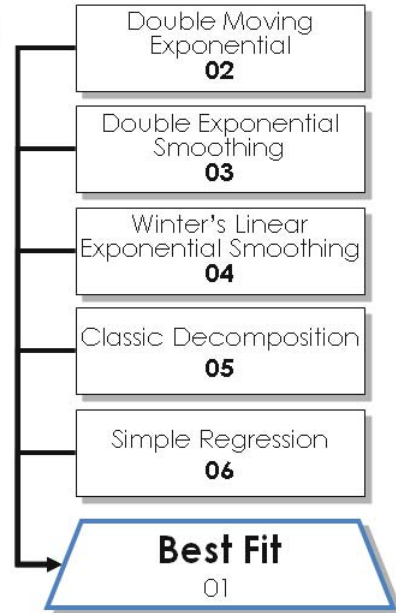


- Analyzes the relationship between objects (sales) and time space (month)
- Good for products with a stable history

Best Fit

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



- 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

| 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 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 | | |

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

Alpha and Trend Factors in Simulation Criteria Maintenance

Simulation Criteria Maintenance

Trend near 0 = ignore sharp changes
Trend near 1 = weights changes heavily

Alpha near 0 = weights history equally
Alpha near 1 = weights recent history

Two User Factors are reserved for Custom Calculations

- Alpha and trend must be between zero and one


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

User Factors

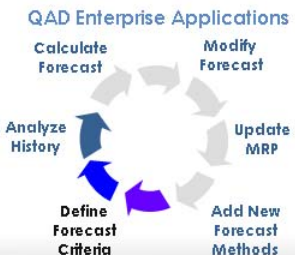
- User factors (1) and (2), in the Simulation Criteria Maintenance (22.7.1), are reserved for custom calculation method factors

Indication Items for 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



QAD Enterprise Applications


F5-SU-380

- 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.

Simulation Criteria Maintenance

Simulation Criteria Maintenance

Indicate Items

Simulation Criteria Maintenan... x

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

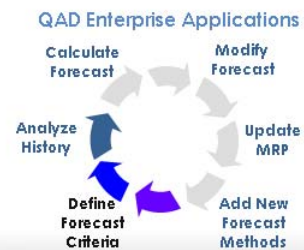
- Enter item or range of items by item number, product line, group, and/or item type
- Further define by order line site on the sales orders

Specify Customer Parameters

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**



Simulation Criteria Maintenance

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:

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

Customer: To:

Region: To:

Product Line,
Group, Item Type


FS-SU-410

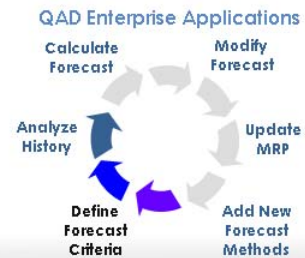
- Setting the use Ship-to/Sold-to flag selects sales history for analysis based on customer addresses.
- List type, customer, and region fields identify a subset of customer
- If you select ship-to and regions, only permanent ship-to addresses within the region are selected.

Summary

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



Chapter 4

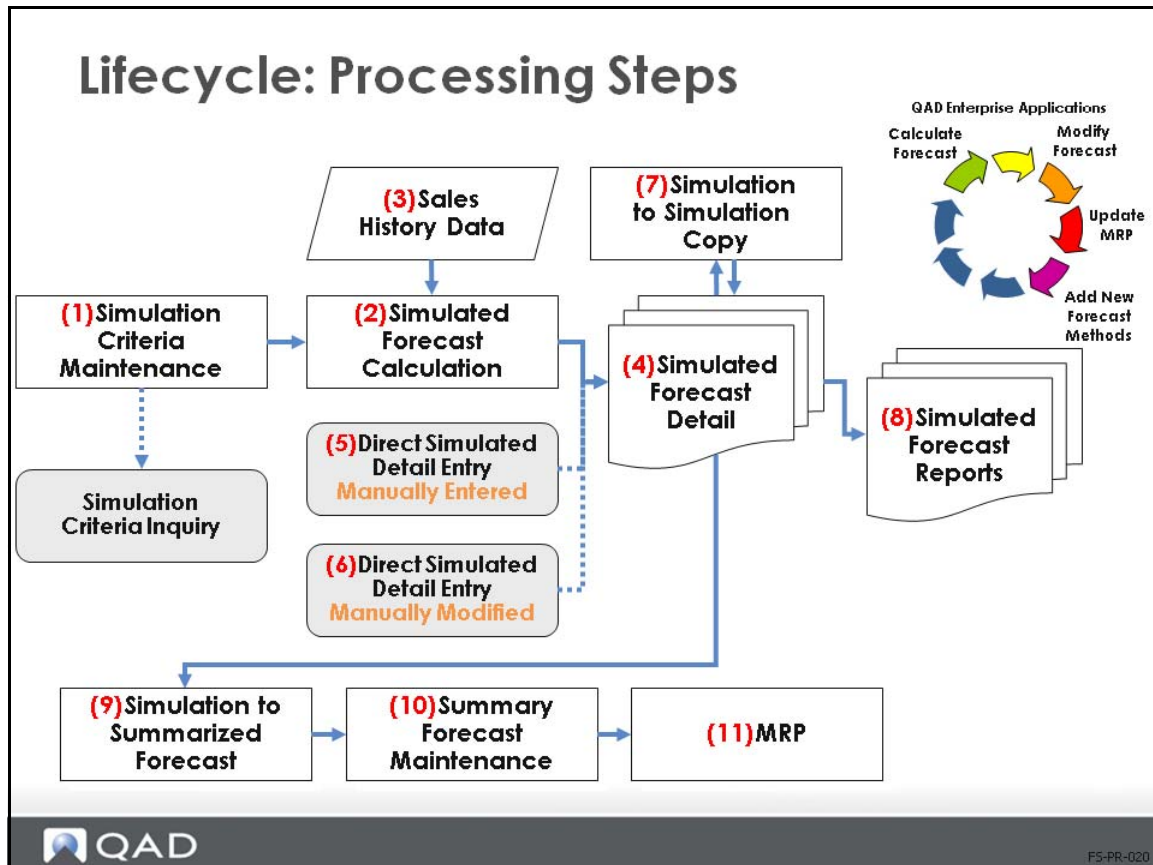
Forecast Simulation Processing

Use Forecast Simulation

In this section you learn how to:

- Identify 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**


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

Use Forecast Simulation

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)



QAD Enterprise Applications

Calculate Forecast

Modify Forecast

Update MRP

Add New Forecast Methods


QAD

F5-PR-030

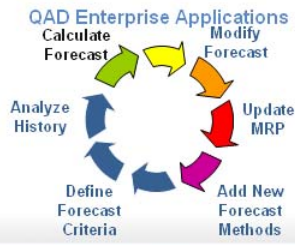
This illustration is a suggested processing sequence for Forecast Simulation which is based on information that flows from one file to another and prerequisites that need to be accomplished.


.Run Forecast Simulation Calculation

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)




F5-PR-040

- 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

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



F5-PR-050

- 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



F5-PR-060

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.

Modifying Forecast Results

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



F5-PR-080

- 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

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




F5-PR-090

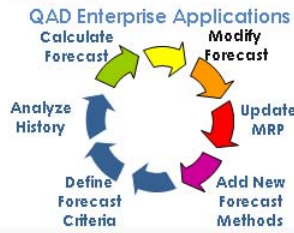
- Three most common ways to adjust forecast quantities manually are:
 - Detail Forecast Maintenance (22.7.7)
 - Simulation to Simulation Copy (22.7.11)
 - Single Item Simulation Copy (22.7.12)
- You can also load forecast records from outside QAD Enterprise Applications with a CIM load

Load Forecast


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)

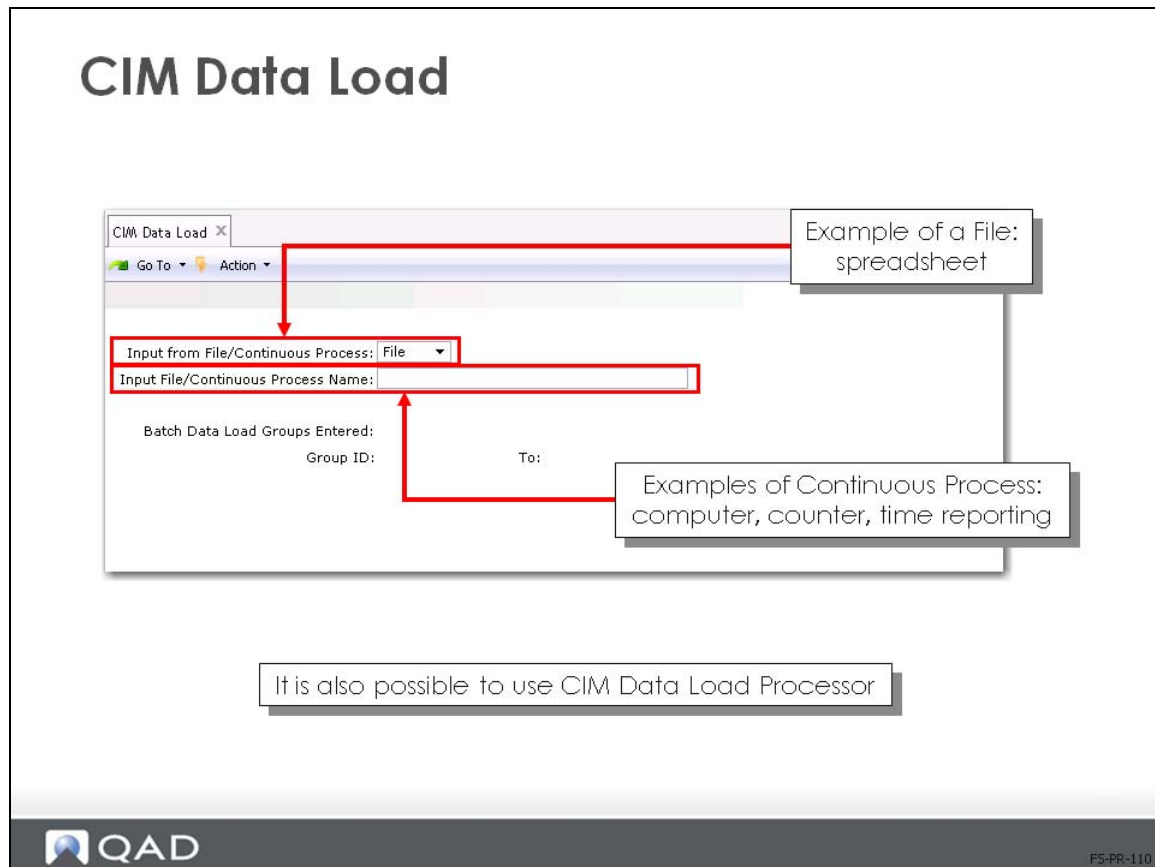


QAD Enterprise Applications


F5-PR-100

The loading of forecast quantities created outside the system

CIM Data Load



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

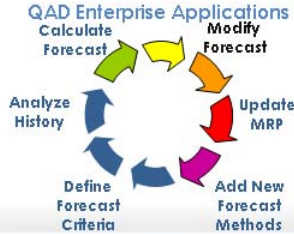
Each import record's data must be in the sequence it would be if you were entering it manually using an QAD Enterprise Applications maintenance function.

Create Forecast Manually


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)



QAD Enterprise Applications
F5-PR-120



- 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

Guidelines for Creating Records Manually

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



F5-PR-130

- 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

Detail Forecast Maintenance

Detail Forecast Maintenance

Forecast ID: MANUAL Method: 00
 Forecast Year: 2009 Item Number: 44-100 UM: EA

| Year | Month | Original Forecast | Adjusted Forecast |
|-------|----------|-------------------|-------------------|
| 2009 | January | 0 | 100 |
| 2009 | February | 0 | 110 |
| 2009 | March | 0 | 120 |
| | | 0 | 130 |
| | | 0 | 140 |
| | | 0 | 150 |
| | | 0 | 160 |
| | | 0 | 150 |
| | | 0 | 140 |
| 2009 | October | 0 | 130 |
| 2009 | November | 0 | 120 |
| 2009 | December | 0 | 110 |
| Total | | 0 | 1,560 |

Original Forecast = 0
Indicates Created Forecast Manually

Enter Quantities, or Adjust Calculated Quantities

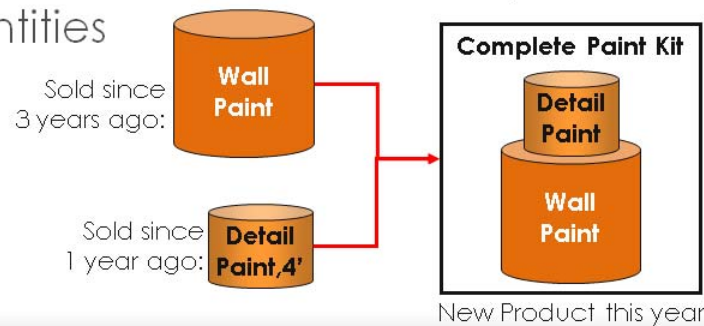
QAD F5-PR-140

- 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 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



- 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

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%) |



F5-PR-160


- * 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.

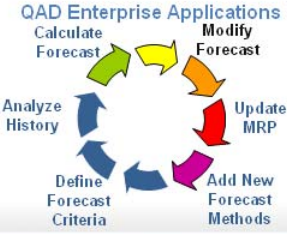
- Trend multipliers increase each month
- You can use more than one multiplier at a time with a cumulative effect
 - Base increase/decrease is applied first, Scale second, Trend third
- Factors are applied to source quantities and the results added to the target, not applied to combined source and target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

Copy Forecast


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)



QAD Enterprise Applications
F5-PR-170


F5-PR-170

- 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



F5-PR-180

- 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

Simulation to Simulation Copy

Simulation To Simulation Copy x

Go To Action

Source Forecast ID: MANUAL
Forecast Year: 2009

Item Number: 44-100
Line:
Group:
Type:

Target Forecast ID: MANUAL2
Forecast Year: 2009


Replace/Combine: Replace

Base Increase/Decrease: 0.00%

To: 44-100
To:
To:
To:

Continue with copy


+ Scale: 0.00% + Trend: 0.00%


FS-PR-190

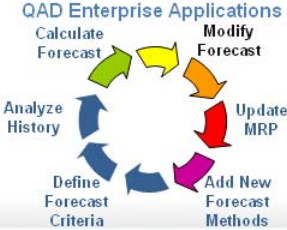
- Choose between replacing or combining forecast quantities
- If target forecast record exists, must use forecast method 00 for target
 - If target does not exist, record is created with method 00
- View the results in Detail Forecast Inquiry (22.7.8) or Detail Forecast Report (22.7.9)

Single Item Simulation Copy


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)



QAD Enterprise Applications


F5-PR-200

- 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



F5-PR-210

- 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.

Single Item Simulation Copy

Single Item Simulation Copy


Single Item Simulation Copy
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


F5-PR-220

- # 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.

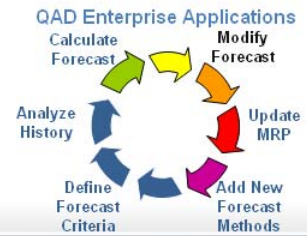
Important Multipliers applied to the source quantity before replacing or adding to the target quantity.

Detail Forecast Report

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)



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

Detail Forecast Report

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

| QAD | | Detail Forecast Report | | | | | | 11/03/08 21:01:20 | | | |
|---------------|-----------------|------------------------|-----------|-------|-----------|-----|----------|-------------------|---------------|----------------|------------|
| | | Training | | | | | | Page: 1 | | | |
| Forecast Year | Item Number | UM | Month | Units | Unit Cost | Cur | Price | Cur | Extended Cost | Extended Price | Margin |
| YEARLY | 2008 44-100 | EA | January | 100 | 0.000 | USD | 1,000.00 | USD | 0.00 | 100000.00 | 100000.00 |
| | | | February | 120 | 0.000 | USD | 1,000.00 | USD | 0.00 | 120000.00 | 120000.00 |
| | | | March | 130 | 0.000 | USD | 1,000.00 | USD | 0.00 | 130000.00 | 130000.00 |
| | | | April | 140 | 0.000 | USD | 1,000.00 | USD | 0.00 | 140000.00 | 140000.00 |
| | | | May | 150 | 0.000 | USD | 1,000.00 | USD | 0.00 | 150000.00 | 150000.00 |
| | | | June | 160 | 0.000 | USD | 1,000.00 | USD | 0.00 | 160000.00 | 160000.00 |
| | | | July | 150 | 0.000 | USD | 1,000.00 | USD | 0.00 | 150000.00 | 150000.00 |
| | | | August | 140 | 0.000 | USD | 1,000.00 | USD | 0.00 | 140000.00 | 140000.00 |
| | | | September | 130 | 0.000 | USD | 1,000.00 | USD | 0.00 | 130000.00 | 130000.00 |
| | | | October | 120 | 0.000 | USD | 1,000.00 | USD | 0.00 | 120000.00 | 120000.00 |
| | | | November | 110 | 0.000 | USD | 1,000.00 | USD | 0.00 | 110000.00 | 110000.00 |
| | | | December | 100 | 0.000 | USD | 1,000.00 | USD | 0.00 | 100000.00 | 100000.00 |
| | | | Total | 1550 | | | | | 0.00 | 1550000.00 | 1550000.00 |
| | Total Line 2000 | | | | | | | | 0.00 | 1550000.00 | 1550000.00 |
| | Total ID YEARLY | | | | | | | | 0.00 | 1550000.00 | 1550000.00 |


End of Report



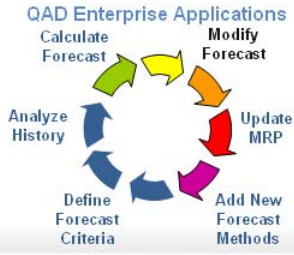
- Sample report data

Forecast Summary


Using Forecast Simulation



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



QAD Enterprise Applications


F5-PR-280

- 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

Driving 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



F5-PR-290

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

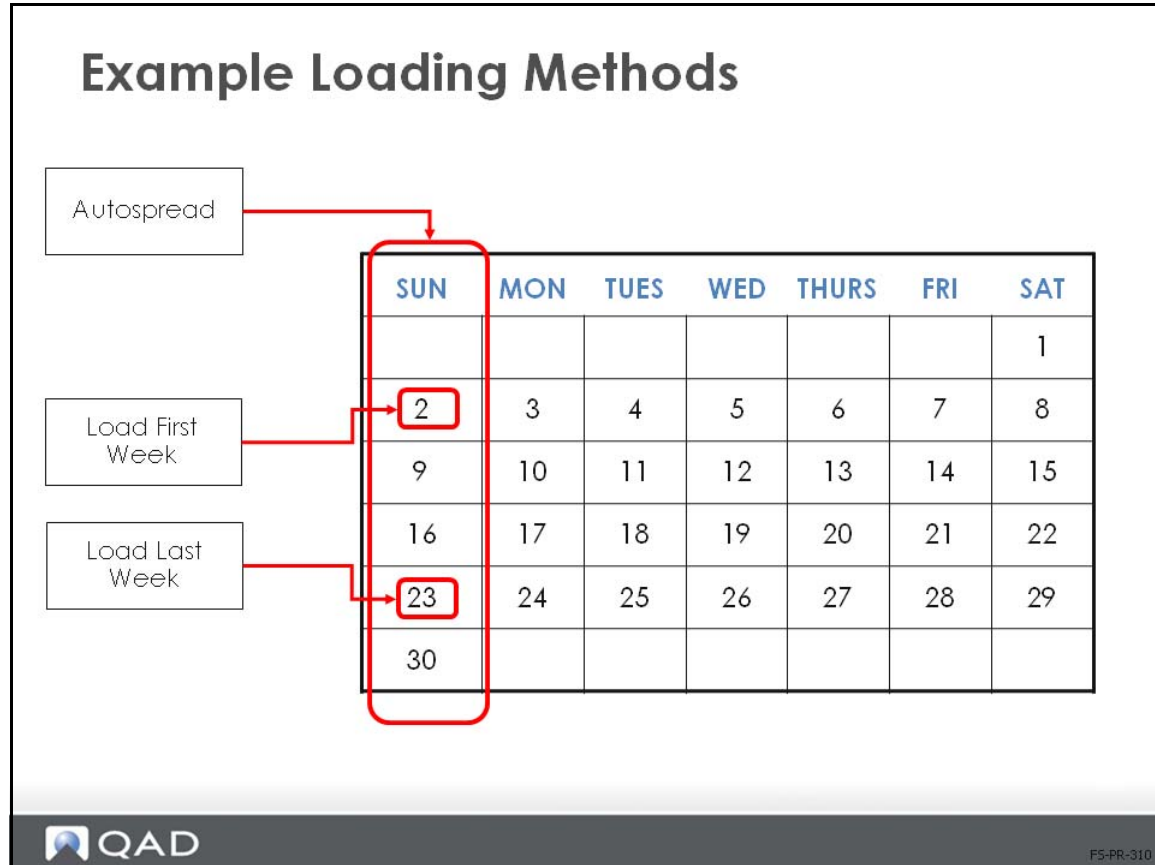
Loading Methods

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 |

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



- 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 a software window titled "Simulation To Summarized Fcst". The window contains the following fields and options:

- Forecast ID: YEARLY
- Forecast Year: 2008
- Item Number: 44-100
- To: 44-100
- Line: To:
- Group: To:
- Type: To:
- Summarized Site: train
- Loading Method: 1
- Autospread
- Start: 11/3/2008
- Replace/Combine: Replace
- Update:
- Output: page
- Batch ID:

Annotations in the image include:

- A red box around "Summarized Site: train" with an arrow pointing to a callout box: "Select Site for Updating".
- A red box around "Loading Method: 1" and "Autospread" with an arrow pointing to a callout box: "Select Loading Method".
- A red box around the "Update: Update = Send data to MRP".

At the bottom of the window, the QAD logo is on the left and "F5-PR-320" is on the right.


- 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)

Results

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 | 26 |
| 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


F5-PR-330

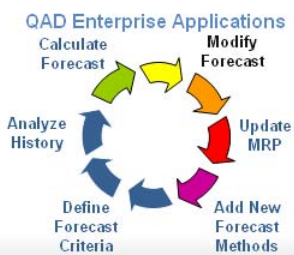
- After running Simulation to Summarized Forecast (22.7.13) with Update/Report set to Update, the data is loaded into Forecast Maintenance (22.1)
- At this point, the simulation now affects MRP
 - Before data was loaded, the Forecast Simulation had no effect on MRP


Run MRP

Using Forecast Simulation



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




F5-PR-340

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

Add New Forecast Methods

Materials Requirements Plan(MRP) Menu

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

**Update
MRP**

QAD FS-PR-350

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


User Forecast Method Maintenance

Using Forecast Simulation



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




F5-PR-360

- 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

User Forecast Method Maintenance

Add New Forecast Methods

- 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

Simulation Criteria Maintenance

Forecast ID: CLASS Description: CLASSROOM SIMULATION

Forecast Year: 2008 Years of History: 5 Ending: 2007

Forecast Method: 1 Alpha factor: .40 Trend: .10

User factor[1]: 0.00 [2]: 0.00

Item Number: 20-005 To: 20-005

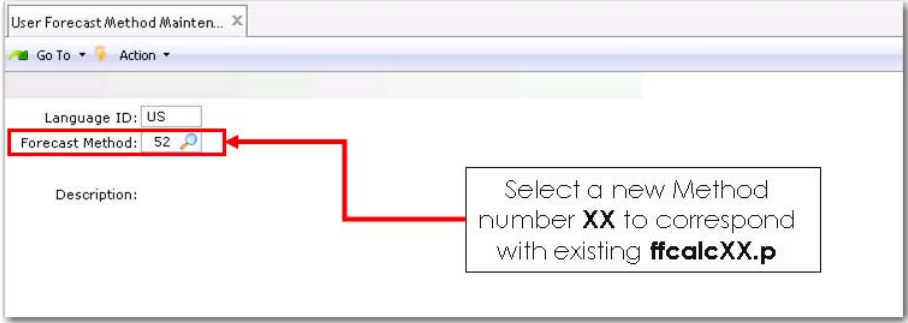


F5-PR-370

- 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

User Forecast Method Maintenance



Language ID: US

Forecast Method: 52

Description:

Select a new Method number **XX** to correspond with existing **ffcalcXX.p**

QAD F5-PR-380

- 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

Miscellaneous Functions

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 fvar.i



F5-PR-390

- 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

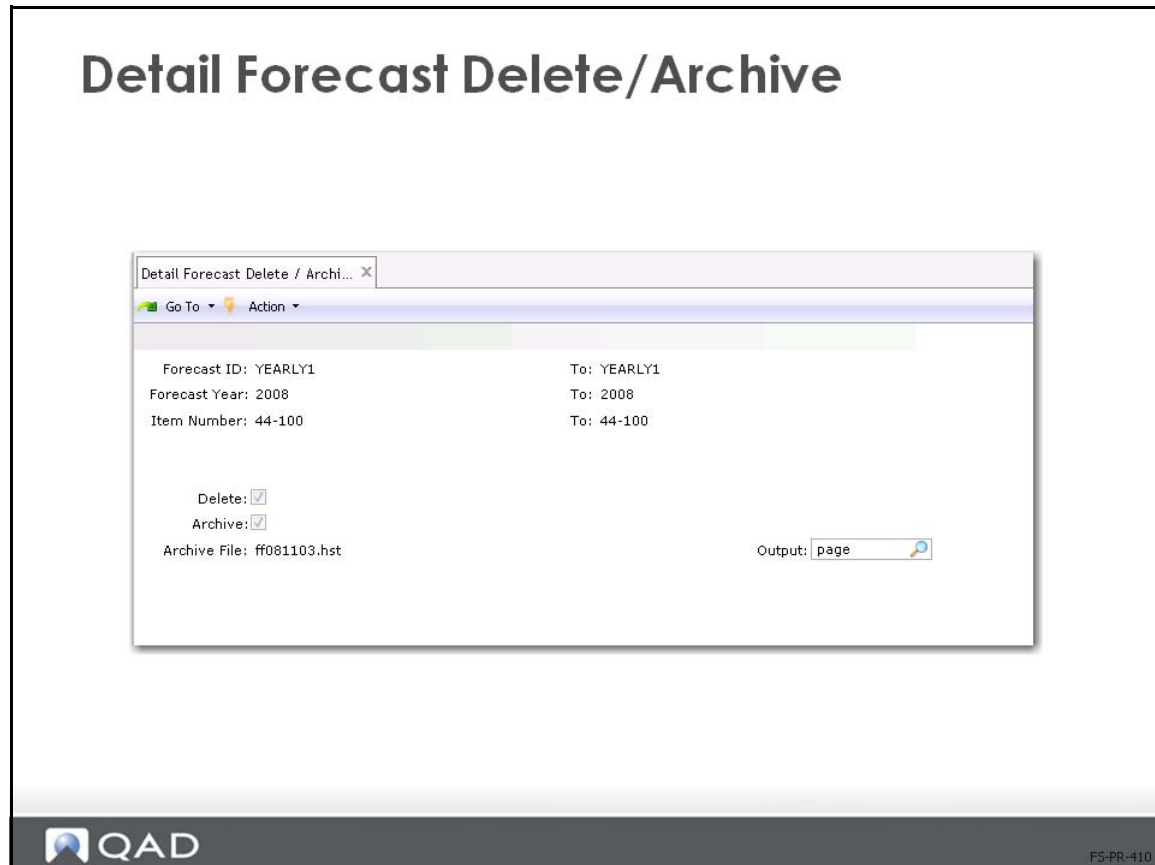
- Detail Forecast Delete/Archive



Refresh

Refresh

Detail Forecast Delete/Archive



- 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

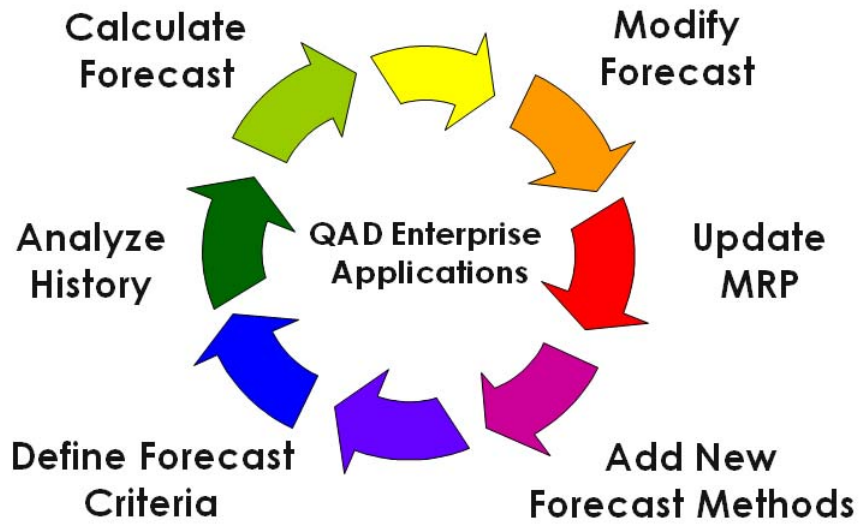
Forecast Simulation Processing: Summary



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



Forecast Simulation Loop System: Summary



Create Sales History

Instruction: In this activity you will create a sales forecast manually and upload it to the Master Production Schedule Forecast for processing by MRP. Sales forecasts are often done by month, MPS is usually done by week.

- 1 Using Detail Forecast Maintenance (22.7.7), enter the current year as Forecast ID and forecast year, and enter Item Number 01010. Click Next in the column Original Forecast there is no data, as there is no sales history to work from. Click Next until cursor is in the January field of Adjusted Forecast.
- 2 Enter a forecast of 100 for January - March, 150 for April - June, 200 for July - September, and 250 for October - December.
- 3 Using Simulation to Summarized Fcst (22.7.13), autospread the monthly sales forecast to the weekly Master Schedule. Set Forecast ID to the current year, this finds the current Adjusted Forecast. Leave the Loading Method set at the default of 1, which is autospread. Click Next and direct output to page to view the result. The System has spread the monthly forecast into weekly buckets. If you are happy with the result run Simulation to Summarized Fcst again with the Update box checked to upload the Simulated Forecast to Forecast Maintenance.
- 4 Using Forecast Maintenance (22.1) for Item 01010 verify that the forecast has been uploaded for the current year. Here the weekly plan may be further modified or used directly to run MRP.

Appendix A

Study Questions

Setup/Implementation

Study Questions for Forecast Simulation Setup

- 1 In QAD Enterprise Applications, the Forecast Simulation calculation can use data other than sales history information.
TrueFalse
- 2 What do you need to set for the shipment history to post to `chp_hist`? Where do you set this field?
Menu Name:
Field and Setting:
- 3 For what size buckets/periods are simulated forecasts calculated?
- 4 Describe forecast consumption and how it affects production, when you use consume forward or consume backward. What menu name/menu number would you use to set this?
Menu Name:
Field and Setting:
Effects of consume forward and consume backward on production:
- 5 Unconfirmed sales orders can consume forecast demand.
TrueFalse
- 6 Once a forecasting criteria template has been used for a calculation, it can no longer be modified.
TrueFalse
- 7 Which ending year is used for a Yearly Forecast and which ending year is used for a Rolling Forecast?
Ending Year is the same as the Forecast Year = _____ Forecast
Ending Year is before the Forecast Year = _____ Forecast
- 8 How many years, maximum, of sales history can the forecast calculation examine?
- 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.
TrueFalse
- 4 You cannot produce a rolling forecast manually. Only yearly forecasts can be done manually.
TrueFalse
- 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

