QAD Enterprise Applications
Standard and Enterprise Edition

Training Guide

Forecast Simulation

70-3212-2013.1SE_EE
QAD 2013.1 Standard and Enterprise Edition
Workspace: 10USA > 10USACO
September 2013

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

Contents

Change Summary

The following table summarizes significant differences between this document and the last published version.

Date/Version	Description	Reference
September 2013/v2013.1 SE_EE	Rebranded for QAD 2013.1 SE_EE	--
May 2013/v2013 SE_EE	Edited for style and clarity	--
March 2013/v2013 SE_EE	Rebranded for QAD 2013 SE_EE	--
September 2012/v2012.1 SE_EE	Rebranded for QAD 2012.1 SE_EE; Consistency edit	--
March 2012/v2012 SE_EE	Rebranded for QAD 2012 SE_EE	--
September 2011/v2011.1SE_EE	Rebranded for QAD 2011.1 SE_EE	--

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 enable students to 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* training course is 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 typically taught in one day and is worth six credit hours.

Virtual Environment Information

This guide applies to both the Standard Edition and the Enterprise Edition of QAD Enterprise Applications. Use the hands-on exercises in this book with the latest Enterprise Edition learning environment in the 10USA > 10USACO workspace. When prompted to log in, specify *demo* for user ID and *qad* for password.

Note If you use Standard Edition. complete the exercises in the EE environment; the concepts are the same in both environments and can be applied to Standard Edition. Features that only apply to Enterprise Edition are noted in the text.

Additional Resources

If you encounter questions on QAD software that are not addressed in this book, several resources are available. The QAD corporate Web site provides product and company overviews. From the main site, you can access the QAD Learning or Support site and the QAD Document Library. Access to some portions of these sites depends on having a registered account.

http://www.qad.com/

QAD Learning Center

To view available training courses, locations, and materials, use the QAD Learning Center. Choose Education under the Services tab to access this resource. In the Learning Center, you can reserve a learning environment if you want to perform self-study and follow a training guide on your own.

QAD Document Library

To access release notes, user guides, training guides, and installation and conversion guides by product and release, visit the QAD Document Library. Choose Document Library under the Support tab. In the QAD Document Library, you can view HTML pages online, print specific pages, or download a PDF of an entire book.

To find a resource, you can use the navigation tree on the left. You can also use cross-document search, which finds all the documents matching your search terms and lets you refine the search by book type, product suite or module, and date published.

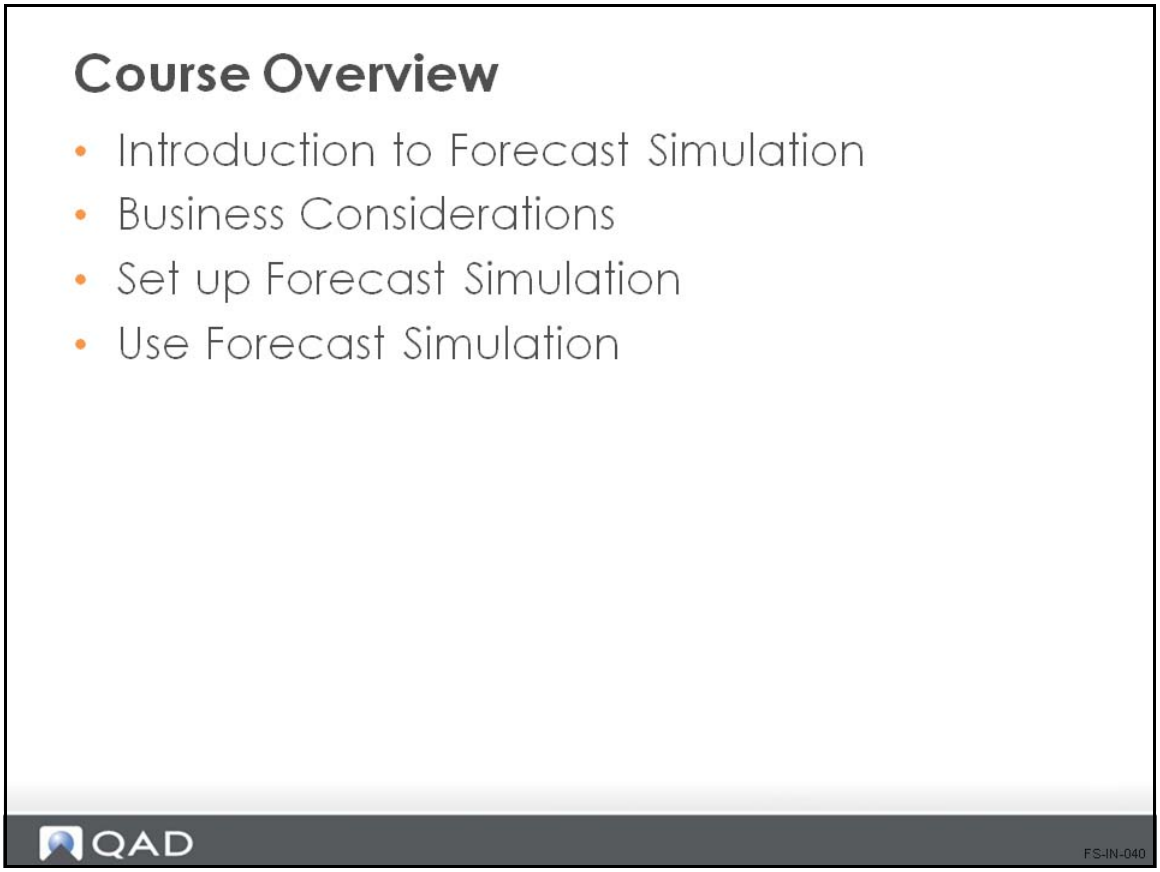
QAD Support

Support also offers an array of tools depending on your company’s maintenance agreement with QAD. These support resources include the Knowledgebase and QAD Forums, where you can post questions and search for topics of interest. To access the Knowledgebase or QAD Forums, choose Visit Online Support Center under the Support tab.

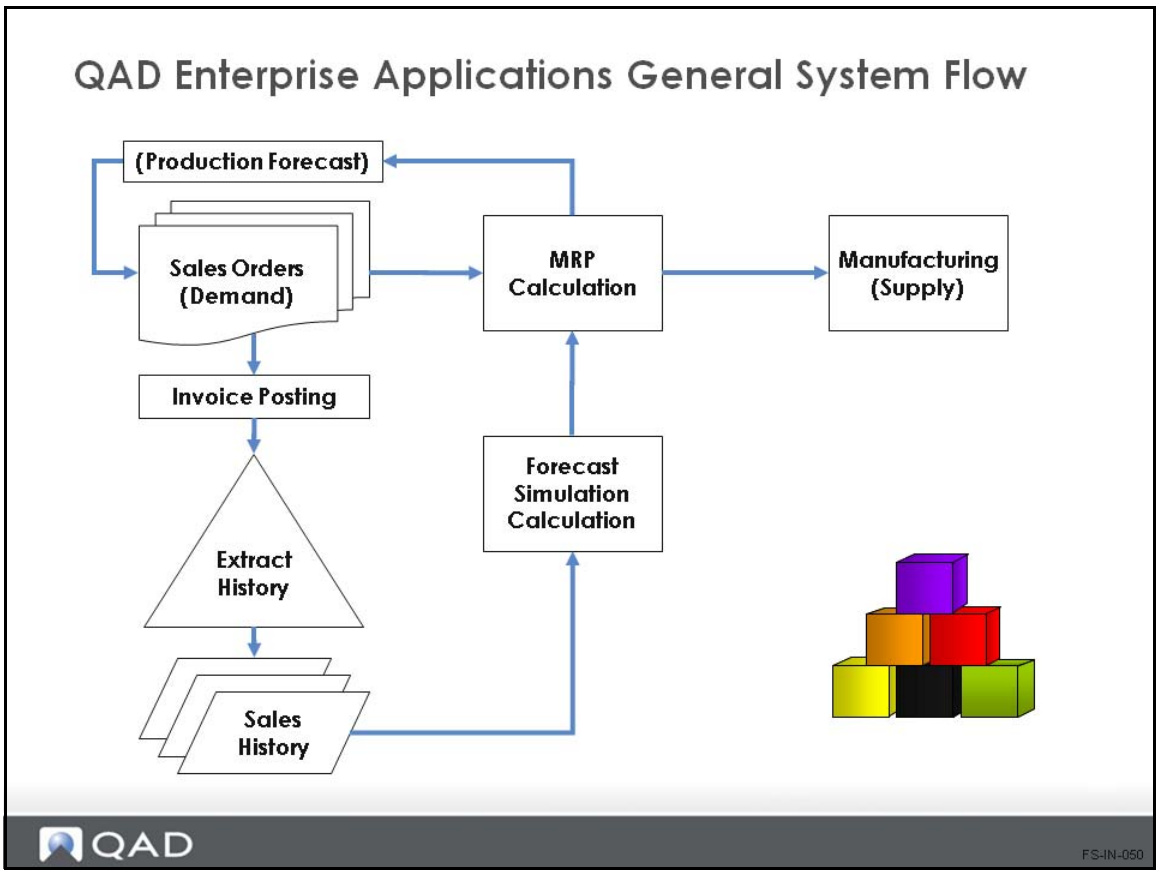
Chapter 1

Introduction to Forecast Simulation

Course Overview

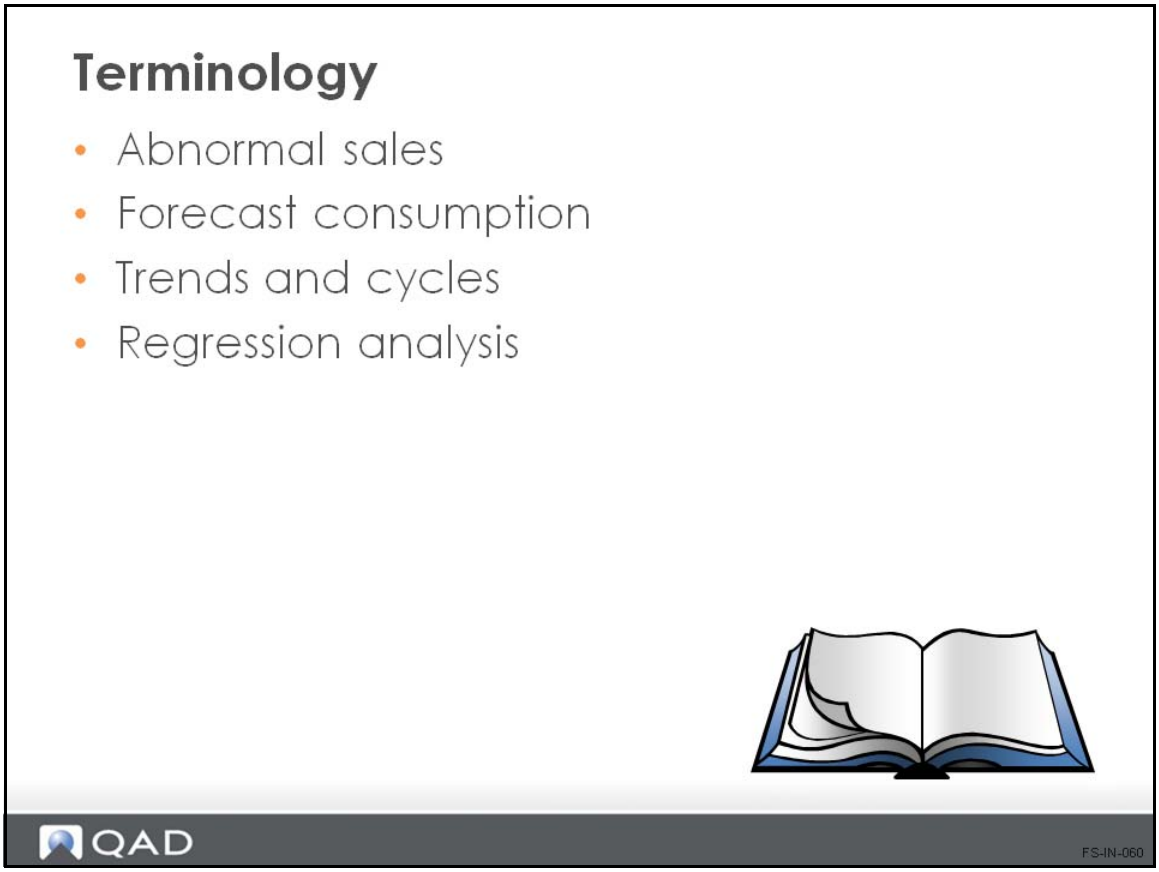


General Forecasting System Flow



- 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



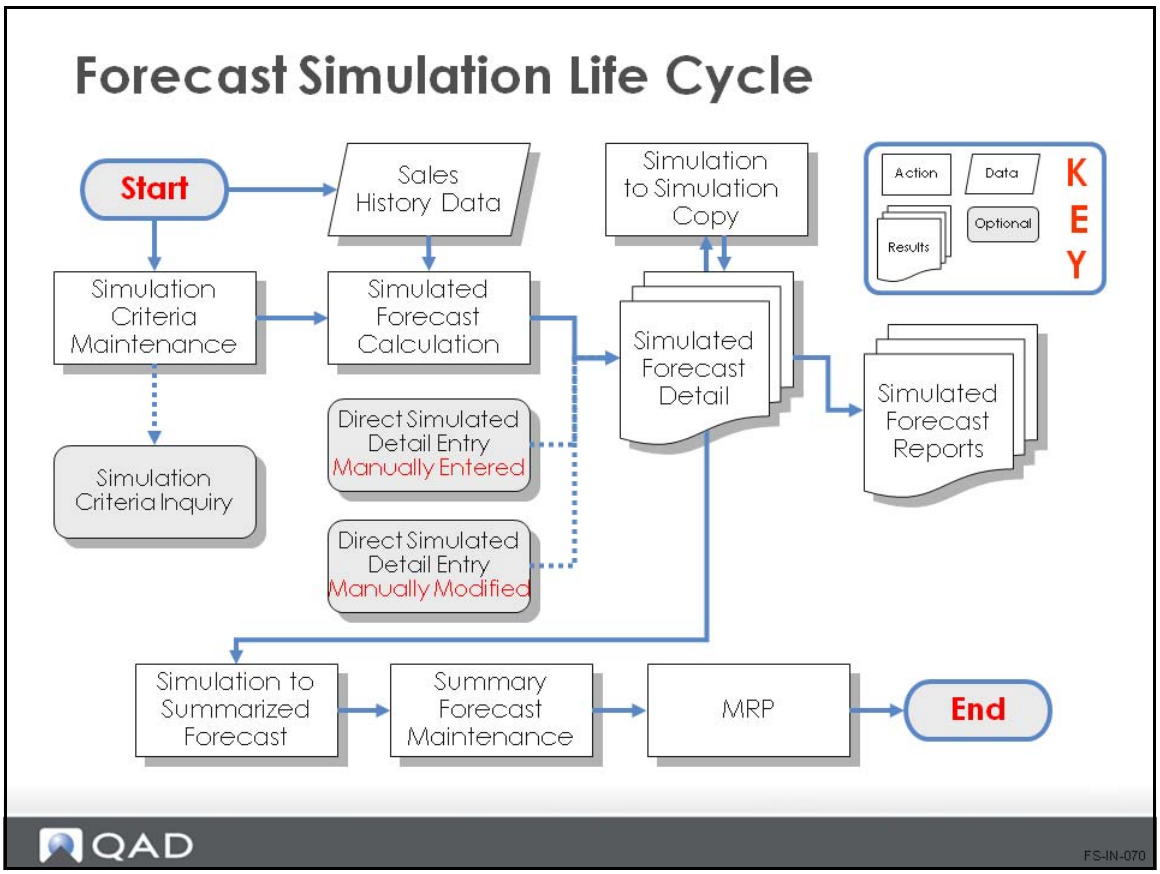
Abnormal Sales. When unusual, unanticipated sales demands are discounted from normal sales demand. Example, sales related to a natural disaster. Often called an "outlier" in statistics. See "Modifying Forecast Results" on page 75.

Forecast Consumption. Reducing the forecast quantities by the confirmed sales order quantities. See "Forecasting Consumption" on page 38.

Trends and Cycles. Multipliers for increase or decrease in demand; and repeated patterns of varying demand. See "Sales History Patterns" on page 50.

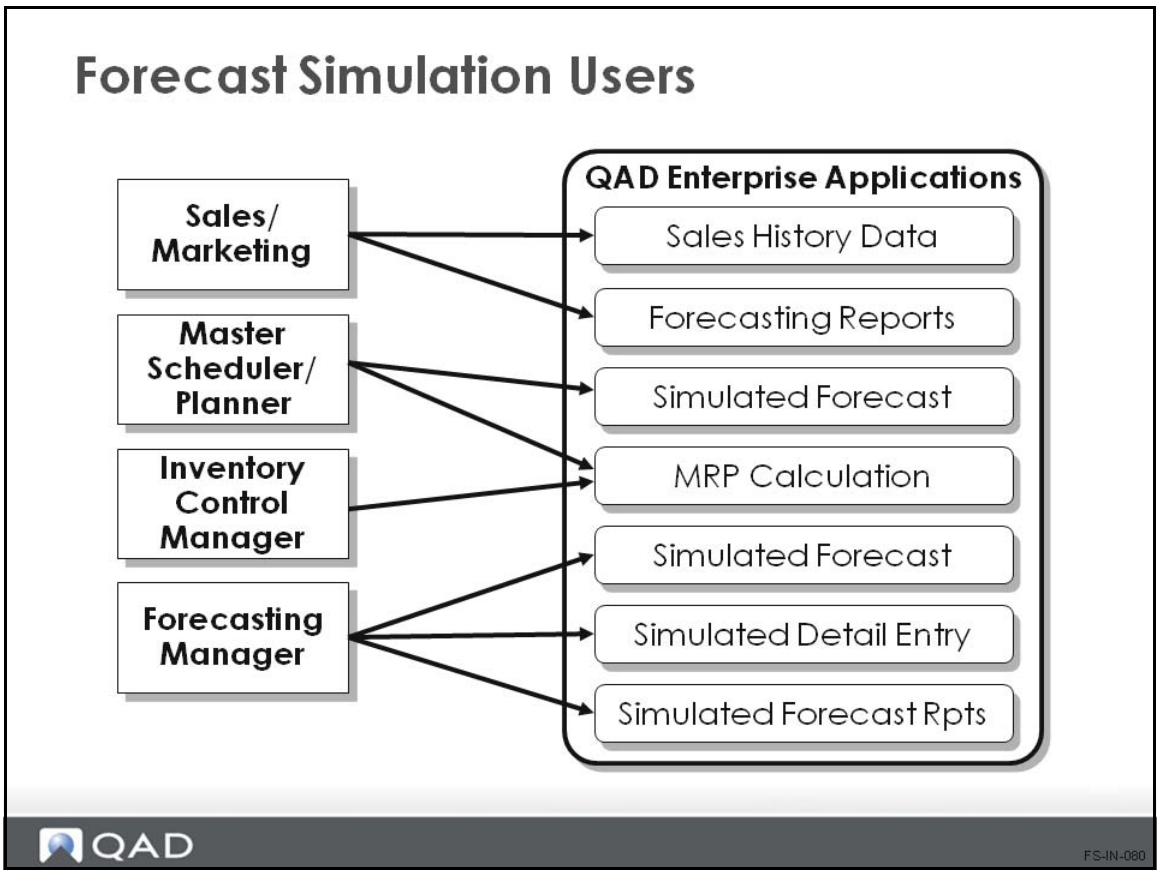
Regression Analysis. Statistical method to determine the best relationship between a response and independent variables. See "Simple Regression" on page 58.

Forecast Simulation Life Cycle

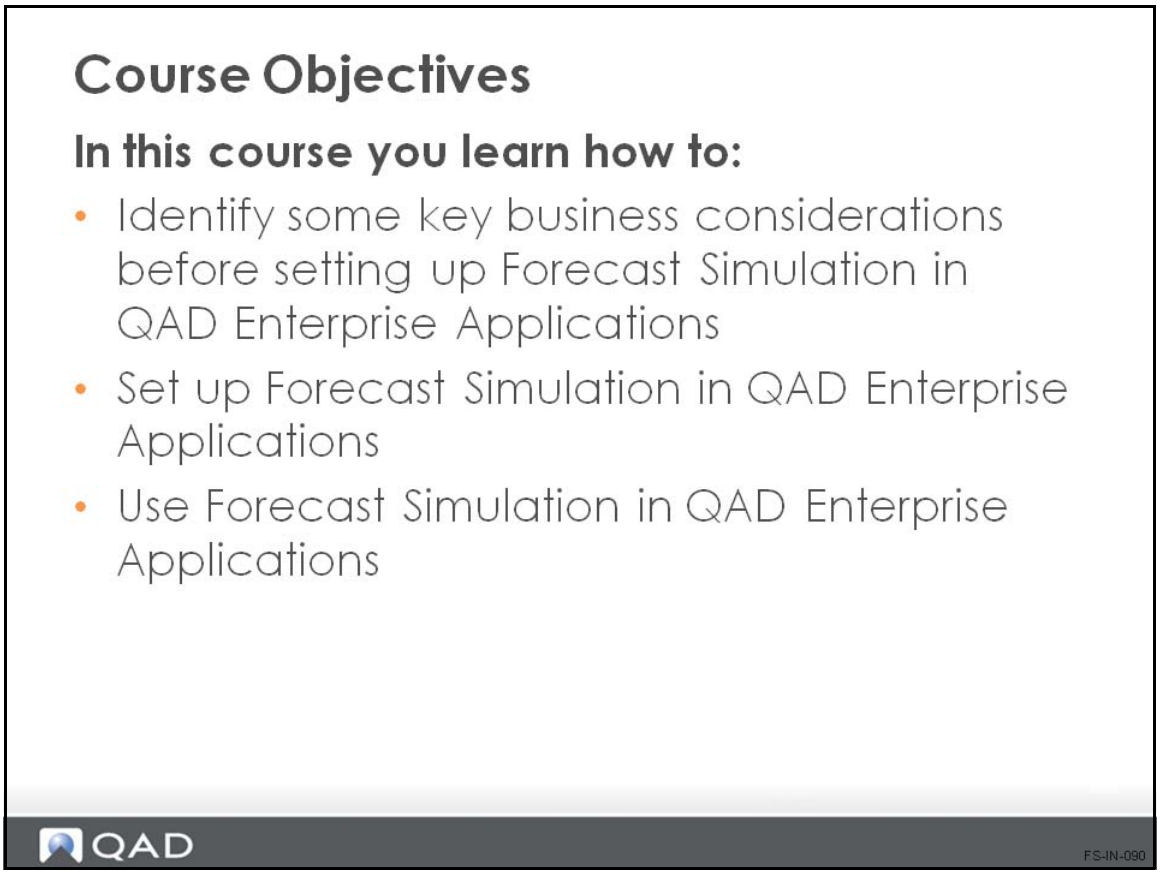


This life cycle is explained in detail in the Setup chapter. See “Lifecycle Summary” on page 31.

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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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
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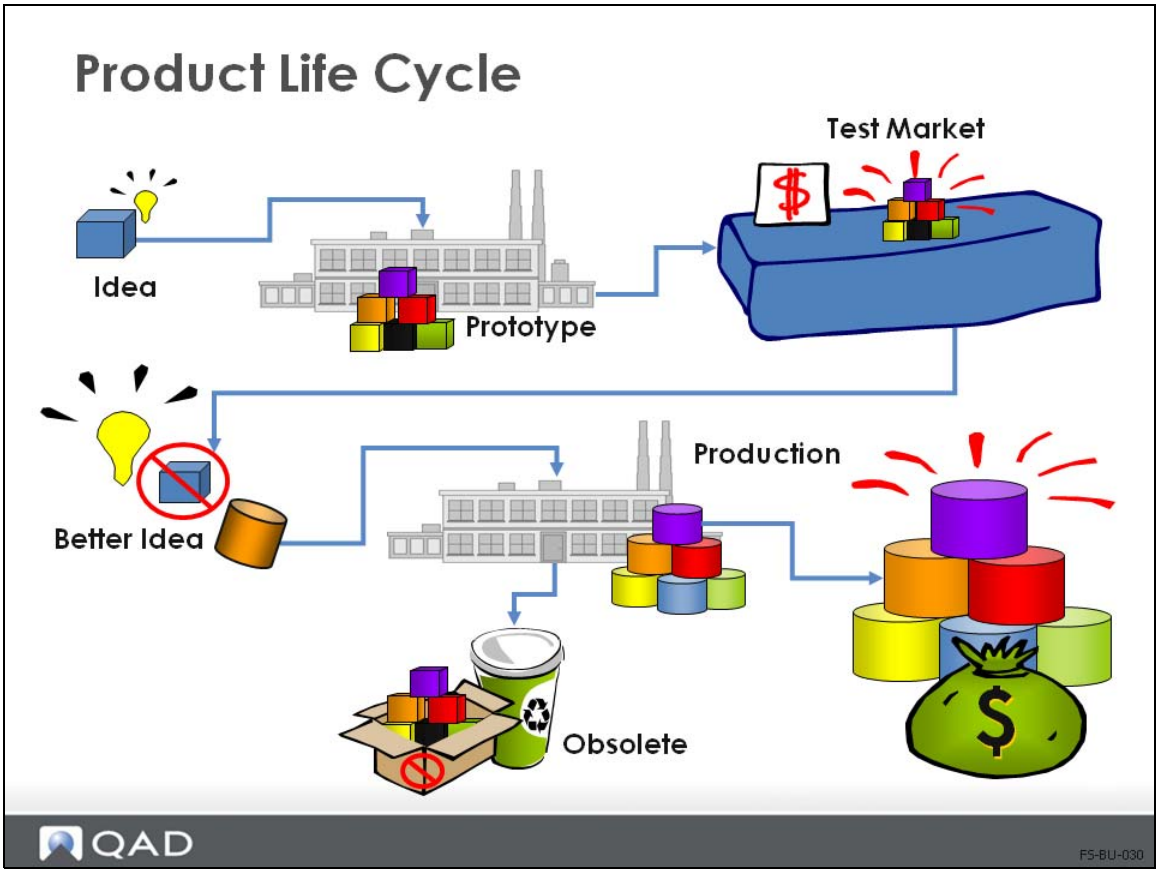
Overview

There are several business issues to consider 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

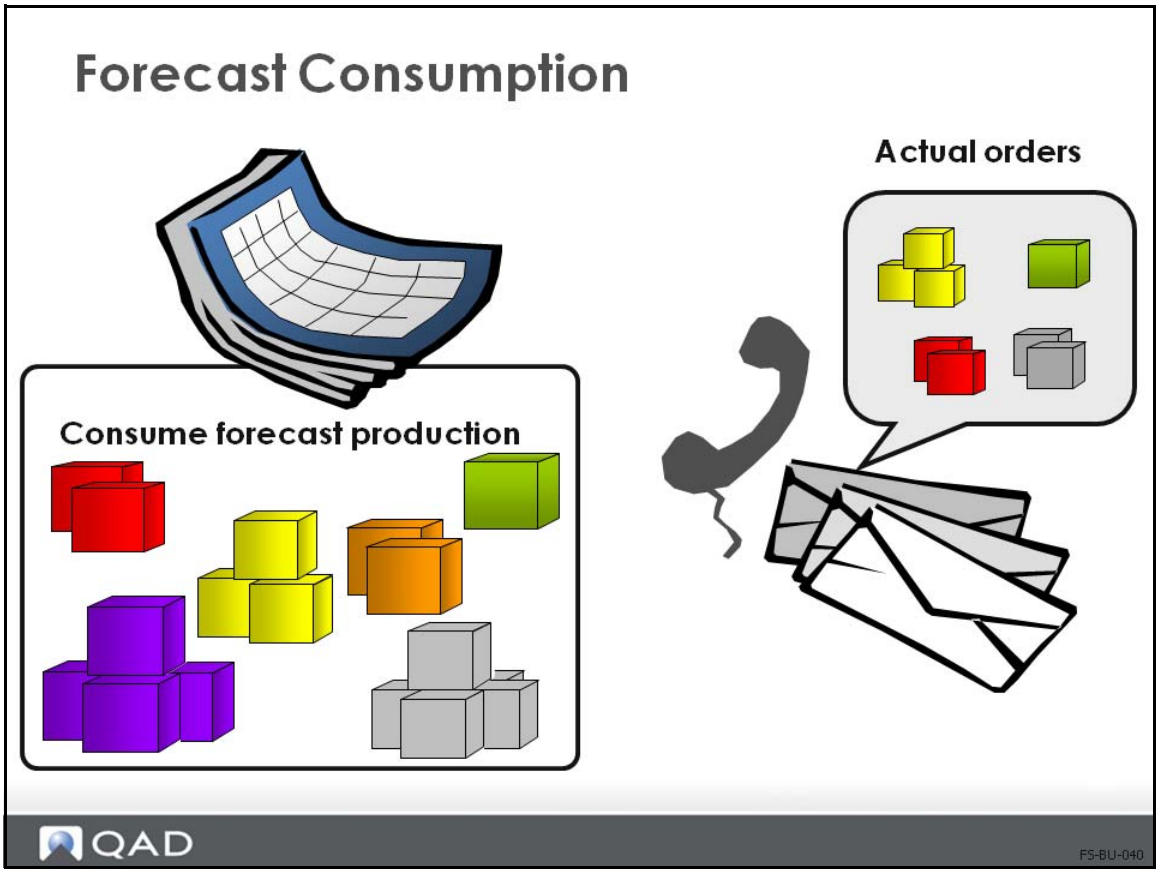
Functionality in QAD Enterprise Applications

- 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

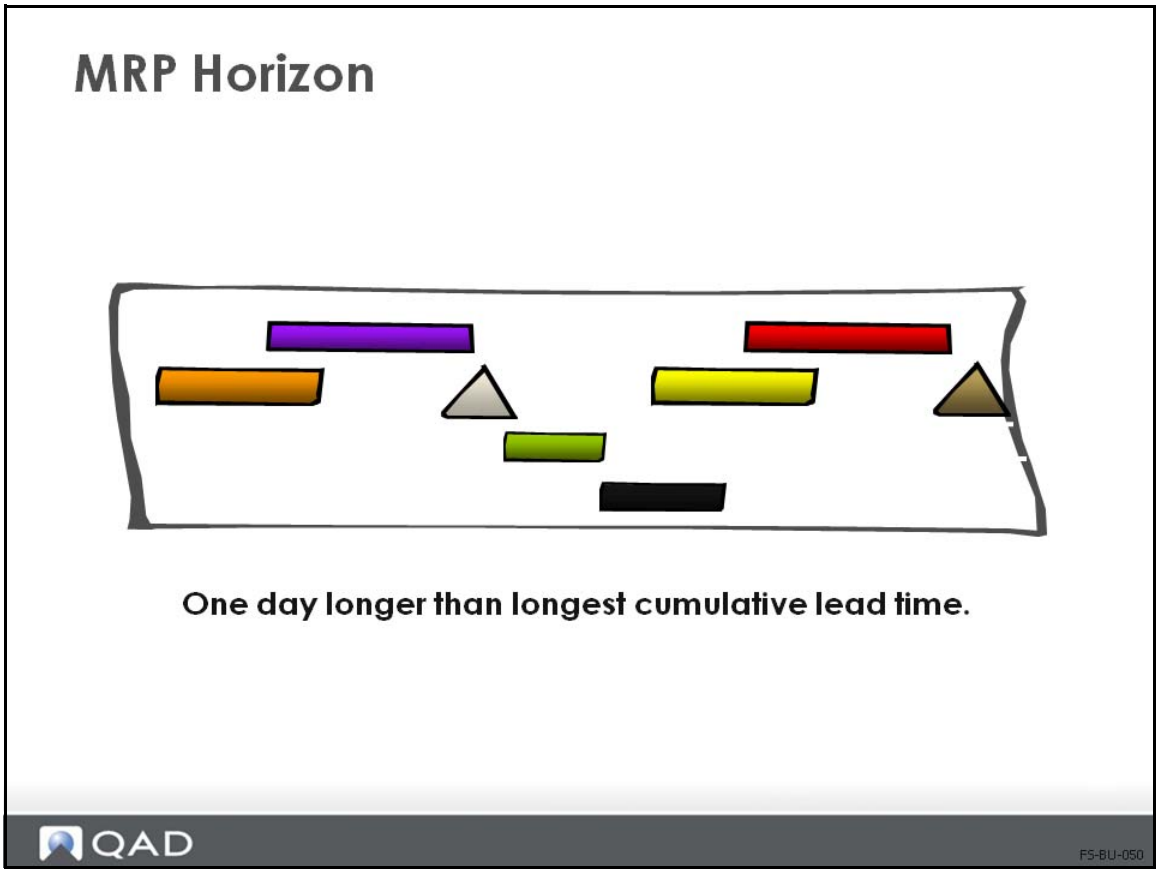
Sales Order Control (7.1.24) controls consumption. The control program can be set to consume either forward or back, and is set based on variability of sales and forecast.

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 can be based on when you get the order (booking) whereas QAD Enterprise Applications forecasting is based on due date

MRP Horizon



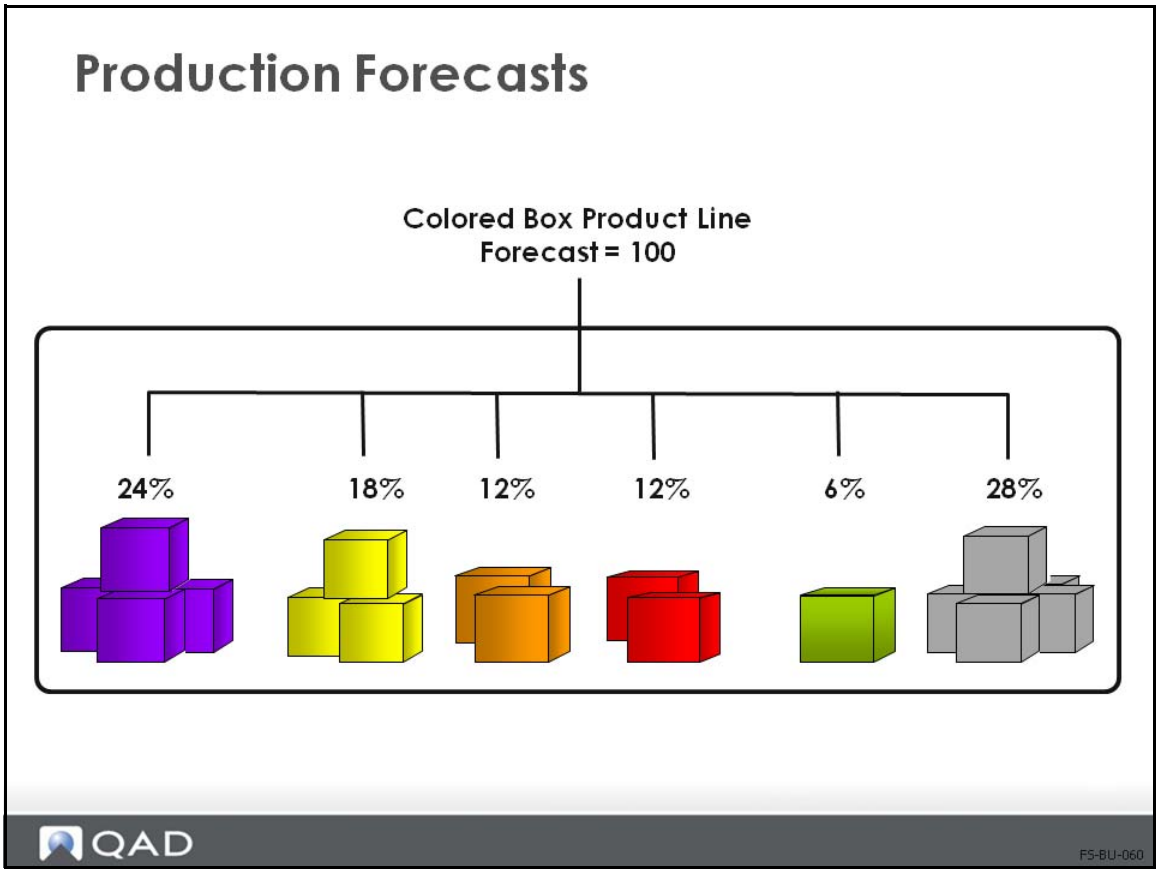
Definition

Make the Material Requirements Planning (MRP) horizon and number of days in the forecast compatible so that the values generated are meaningful. Forecast past the MRP horizon. One day longer than the longest cumulative lead time is often ideal.

Why Consider?

Forecasting and MRP data can differ significantly 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

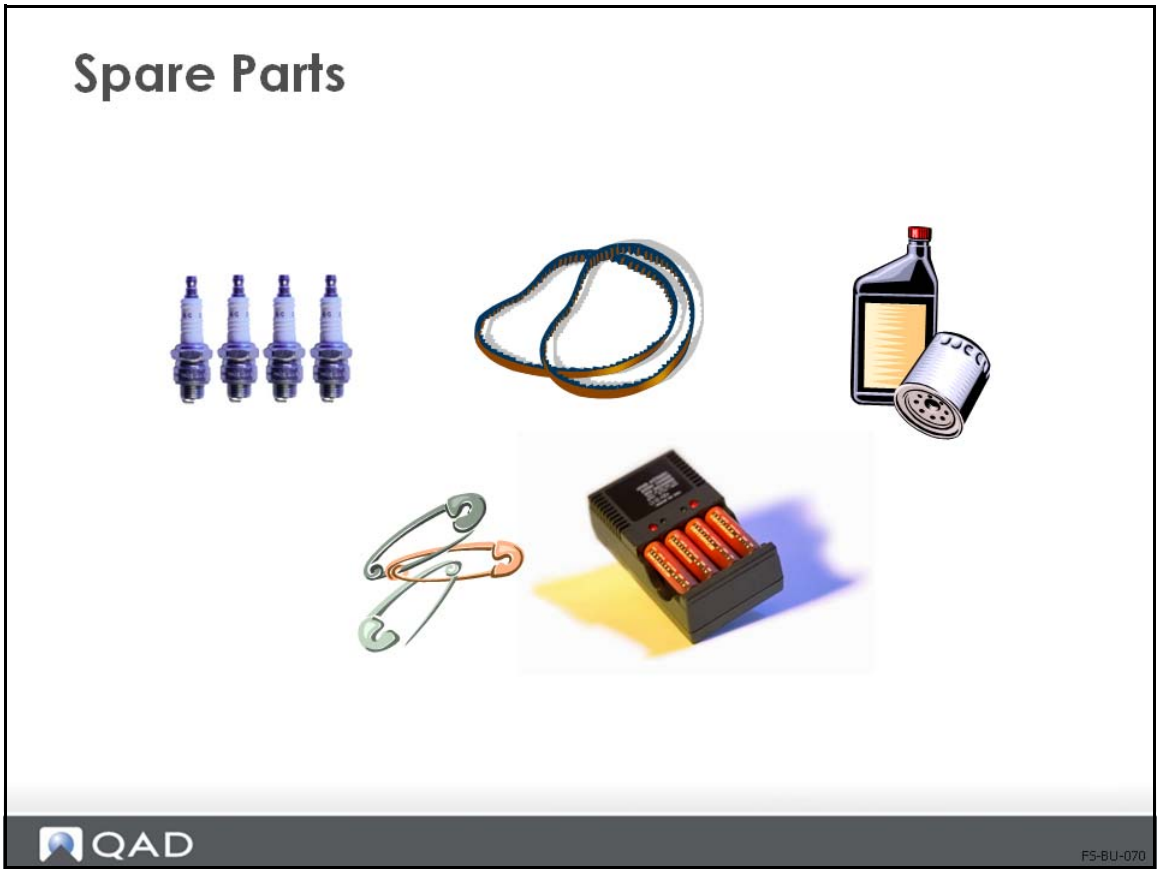
Functionality in QAD Enterprise Applications

- 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



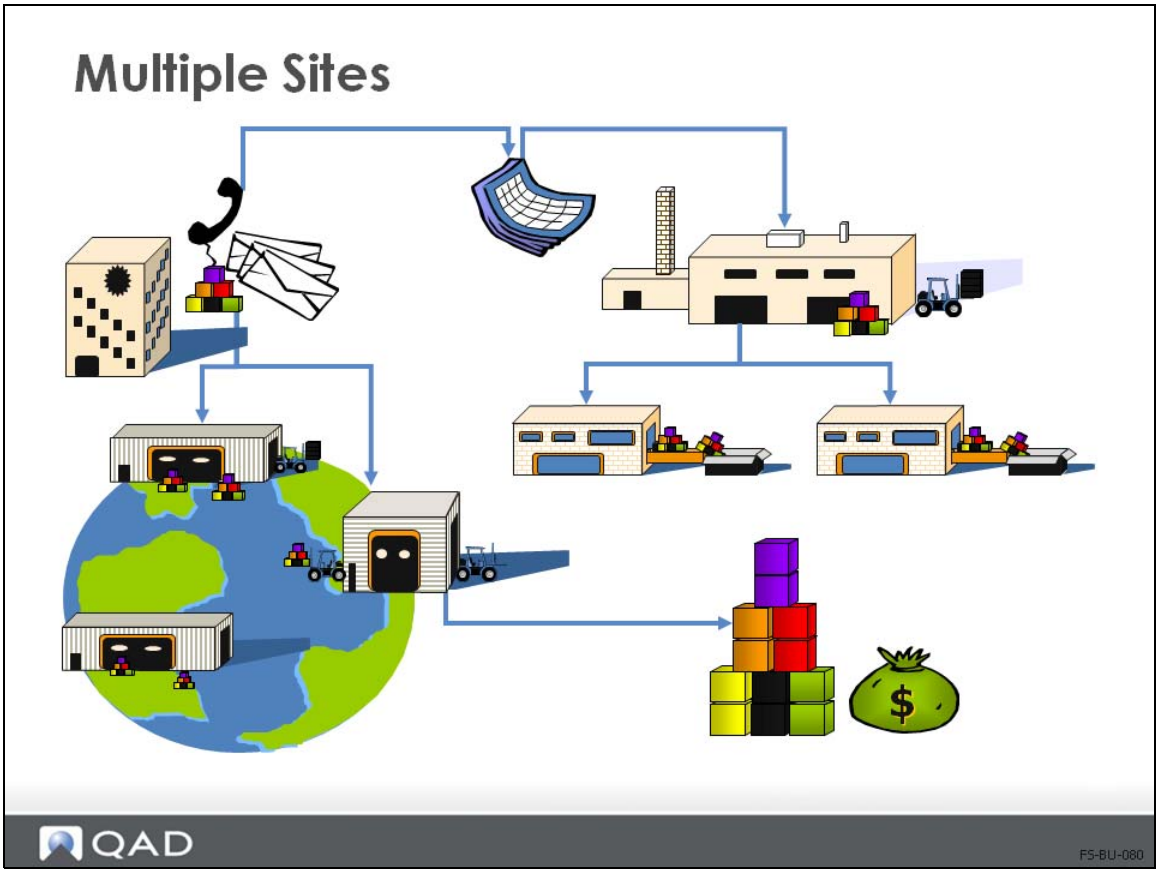
Definition

Some products can 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 starts stocking, or increases the stock of, the ordered part

Does the sales order header site or the line item site figure in the calculation of the forecast?

Summary


Review
Processes and Procedures
Reporting Requirements
Customer Expectations
Product Configuration
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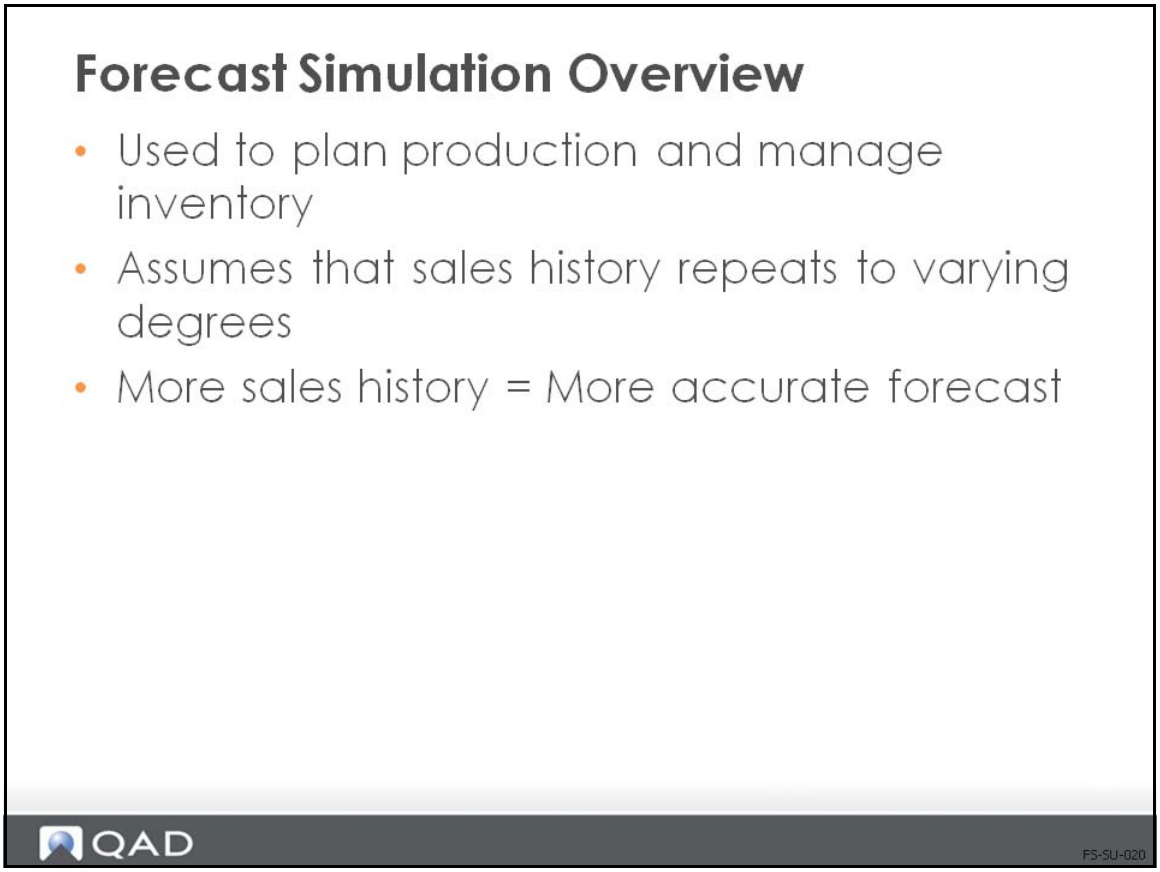
Chapter 3

Forecast Simulation Setup

The forecast setup discussed here is for Forecast Simulation and all the menus contained within Forecast Simulation. Do not confuse this program with Forecast Maintenance (22.1), a major component of Master Scheduling.

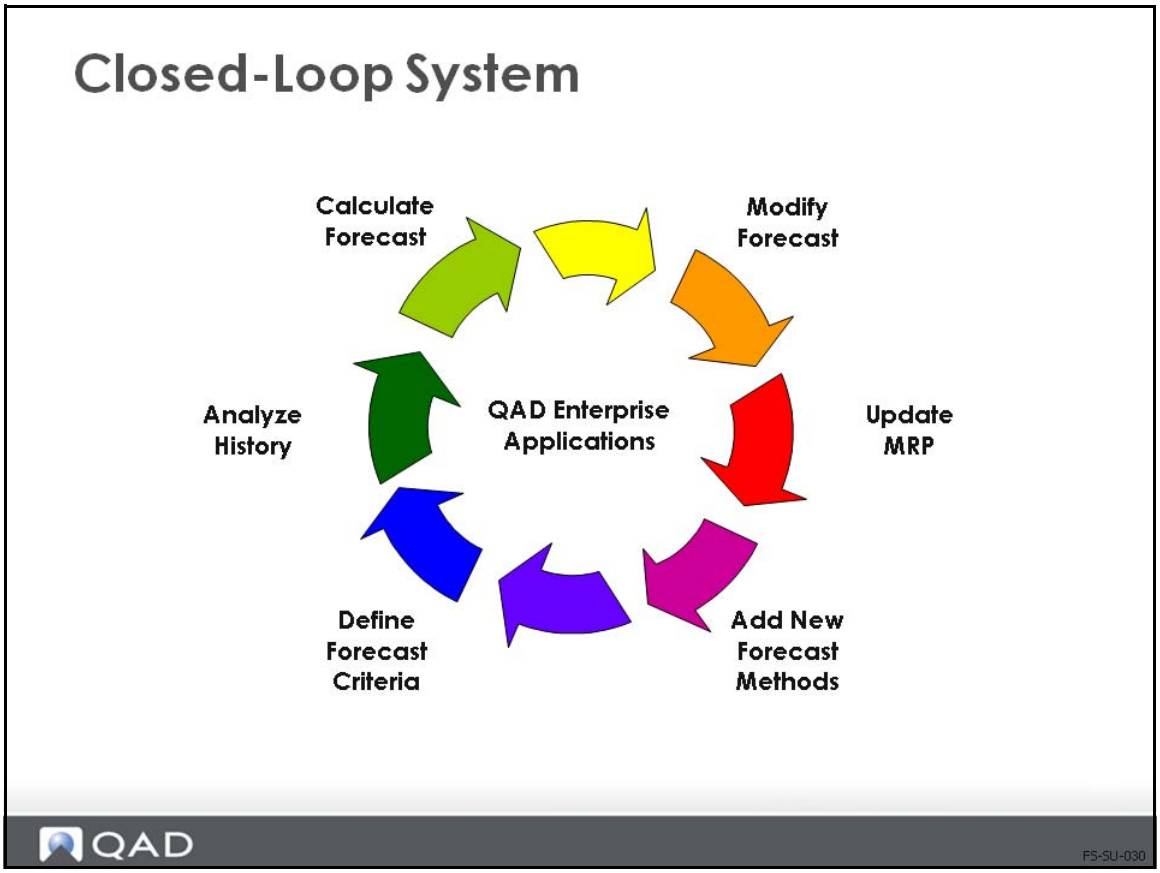
Note Master Scheduling is a a related course in the Manufacturing Planning and Scheduling training class.

Overview



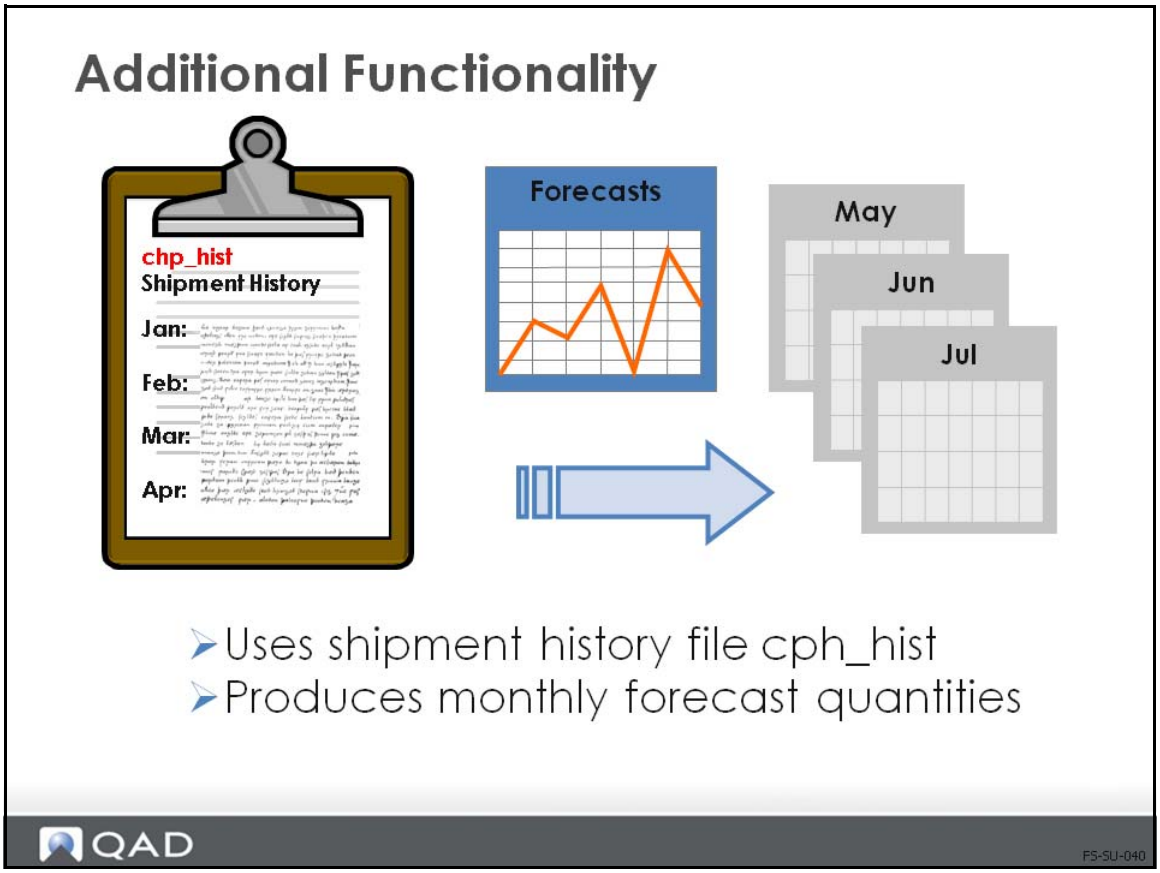
- Typically use forecast simulation to plan production and manage inventory
- Forecast simulation assumes that historical sales patterns are repeated to varying degrees in the future
- Accuracy of the forecast depends on the value of the sales information
- Five forecasting methods and a best fit model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

Closed-Loop System



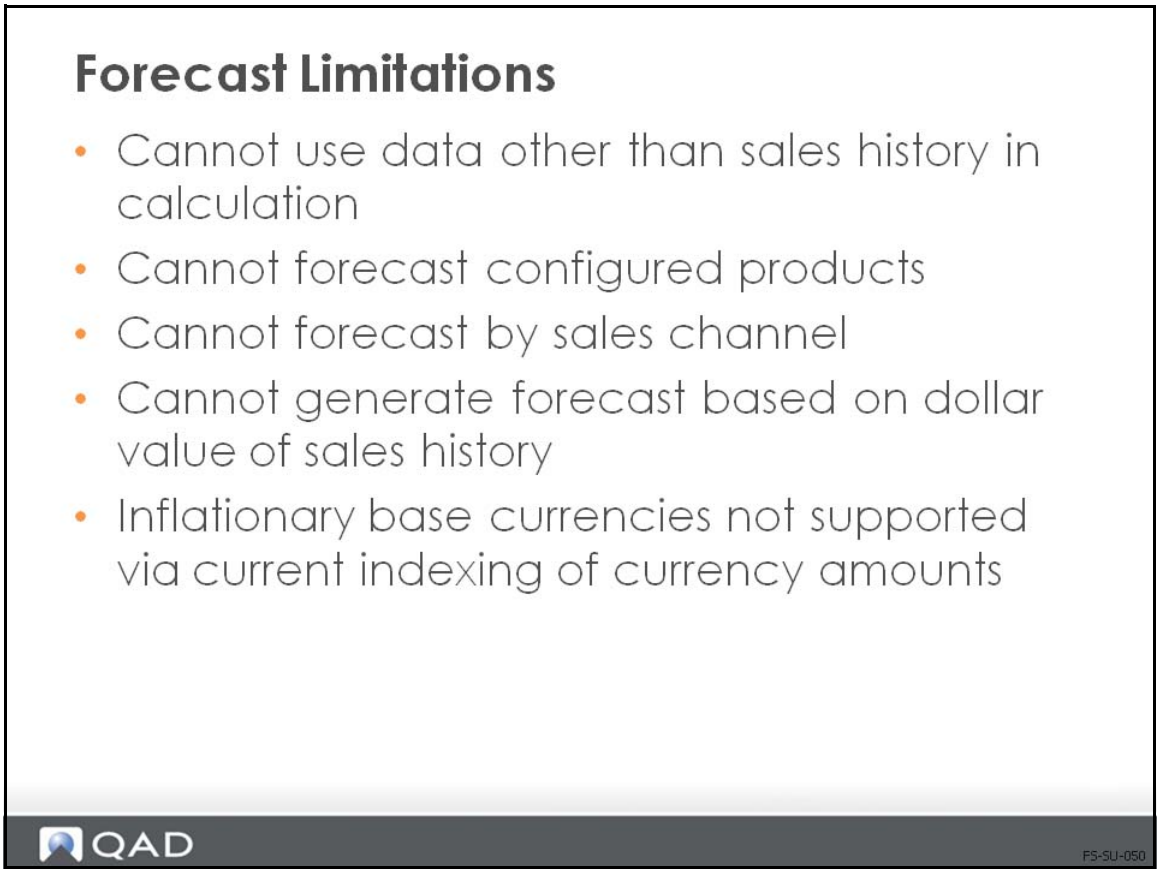
- The Forecast Simulation module makes QAD Enterprise Applications a closed-loop system
- This map is used throughout this training course to indicate the step you on which are working at any time

Additional Functionality



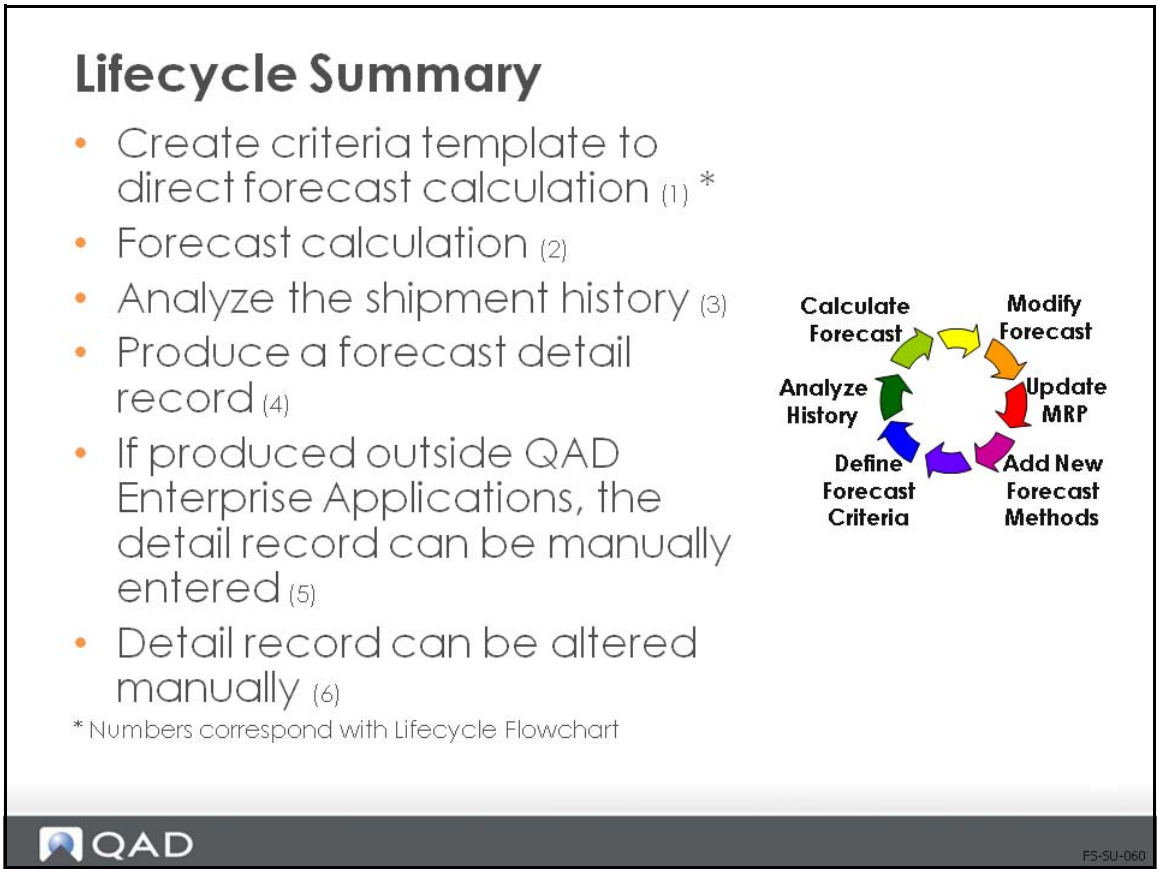
- Forecasting simulation enables you to produce a forecast based on shipment history
- Also can produce a rolling forecast for the next 12 months or for a given calendar year

Limitations

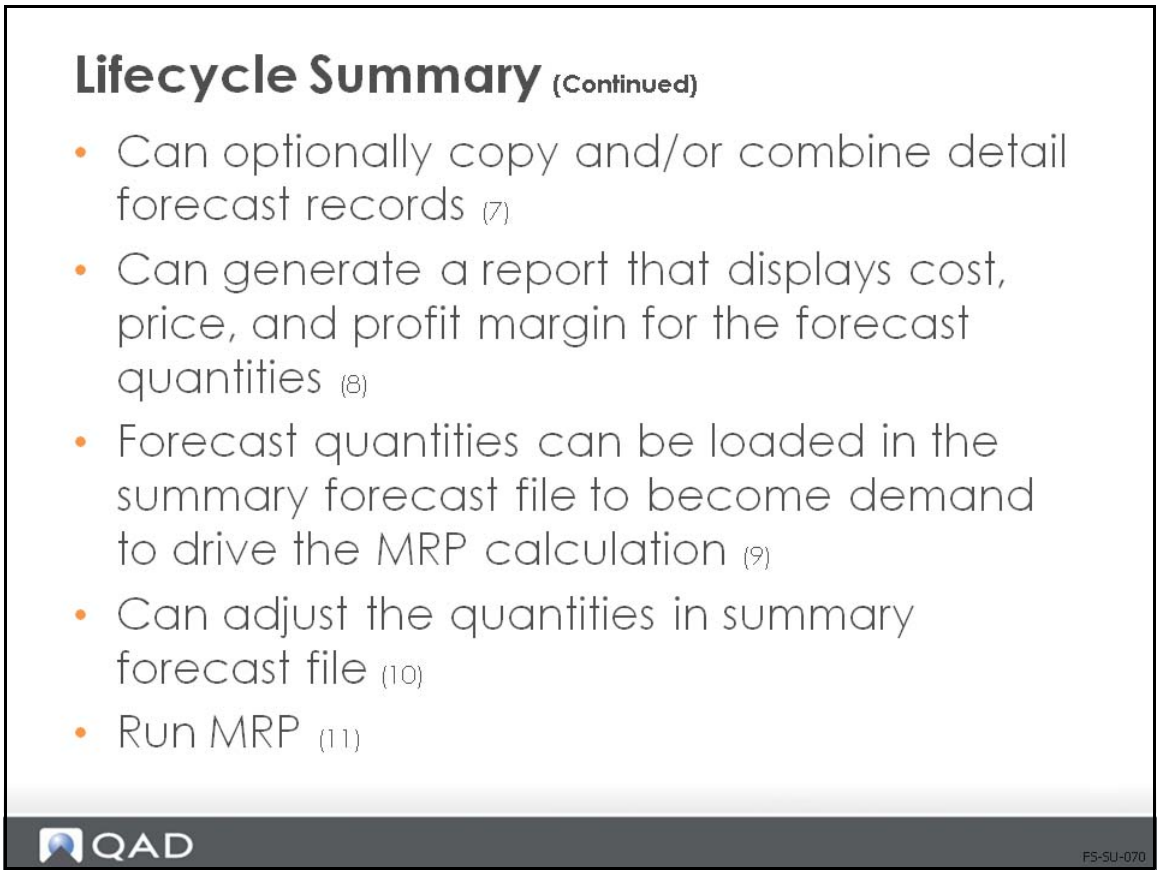


- Forecast simulation cannot use data other than the sales history information
- Configured products cannot be forecast, must individually forecast for components
- Historical sales data used is:
  - Product / type / group / line
  - Site
  - Customer / region
  - Ship-to or sold-to address
- Sales channel,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

Lifecycle Summary



- The overall workflow summary illustrates all steps of the process, both setup and processing
- This summary description 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)
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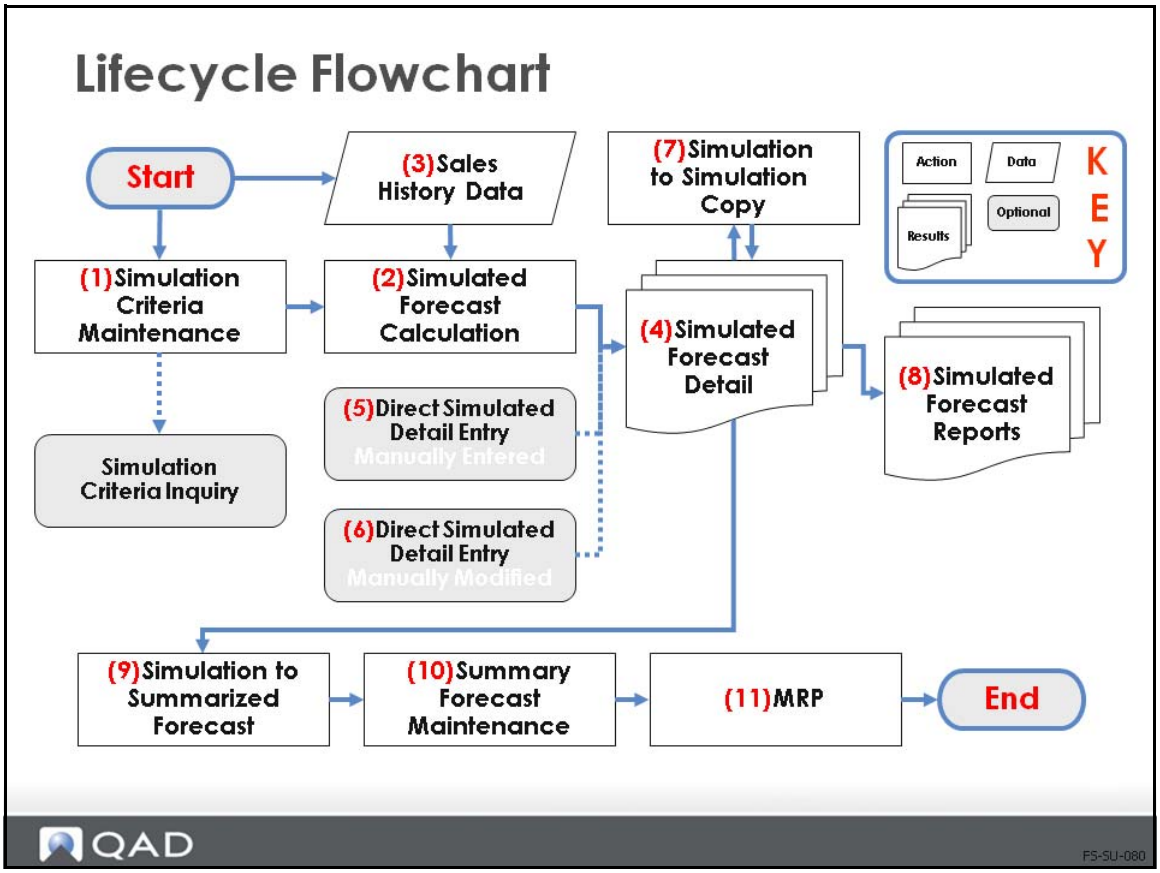
Lifecycle Flowchart

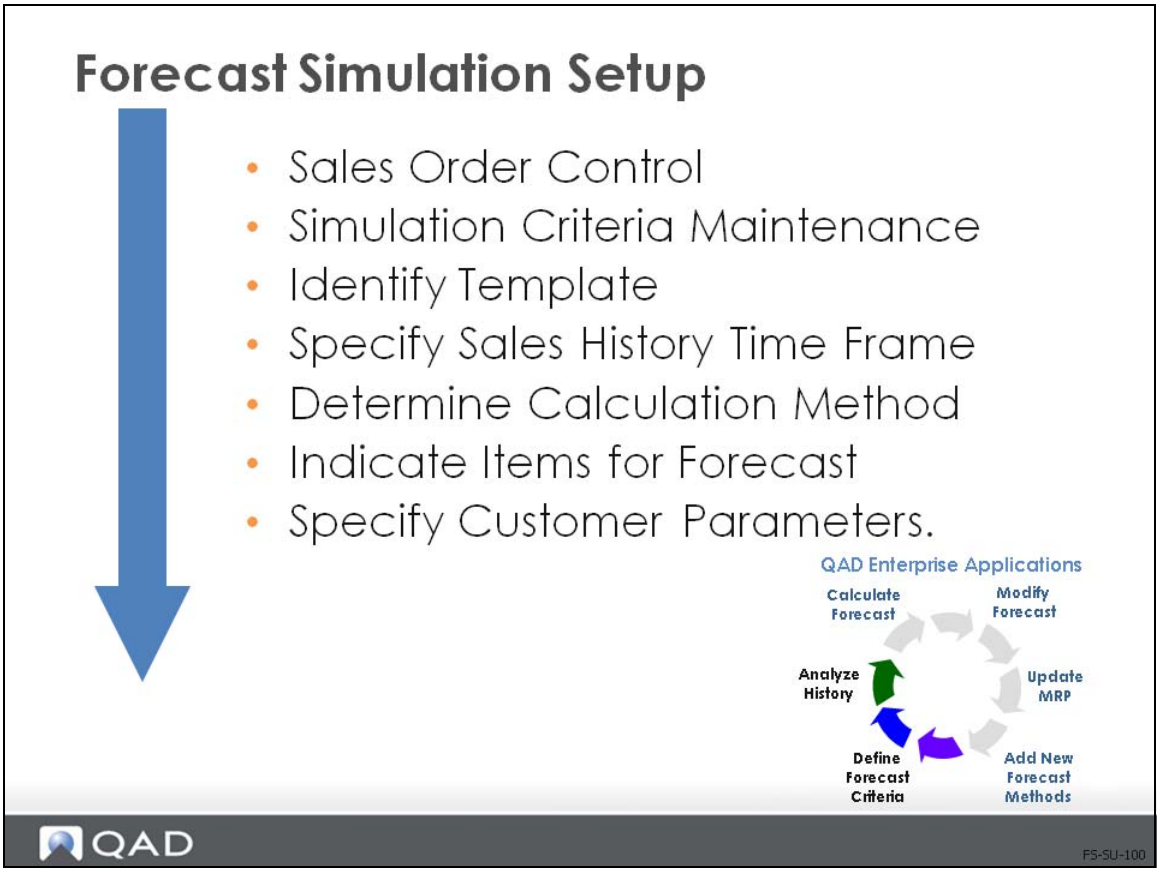


Workflow: Setup Steps

The lifecycle steps requiring setup include steps 1 and 3:

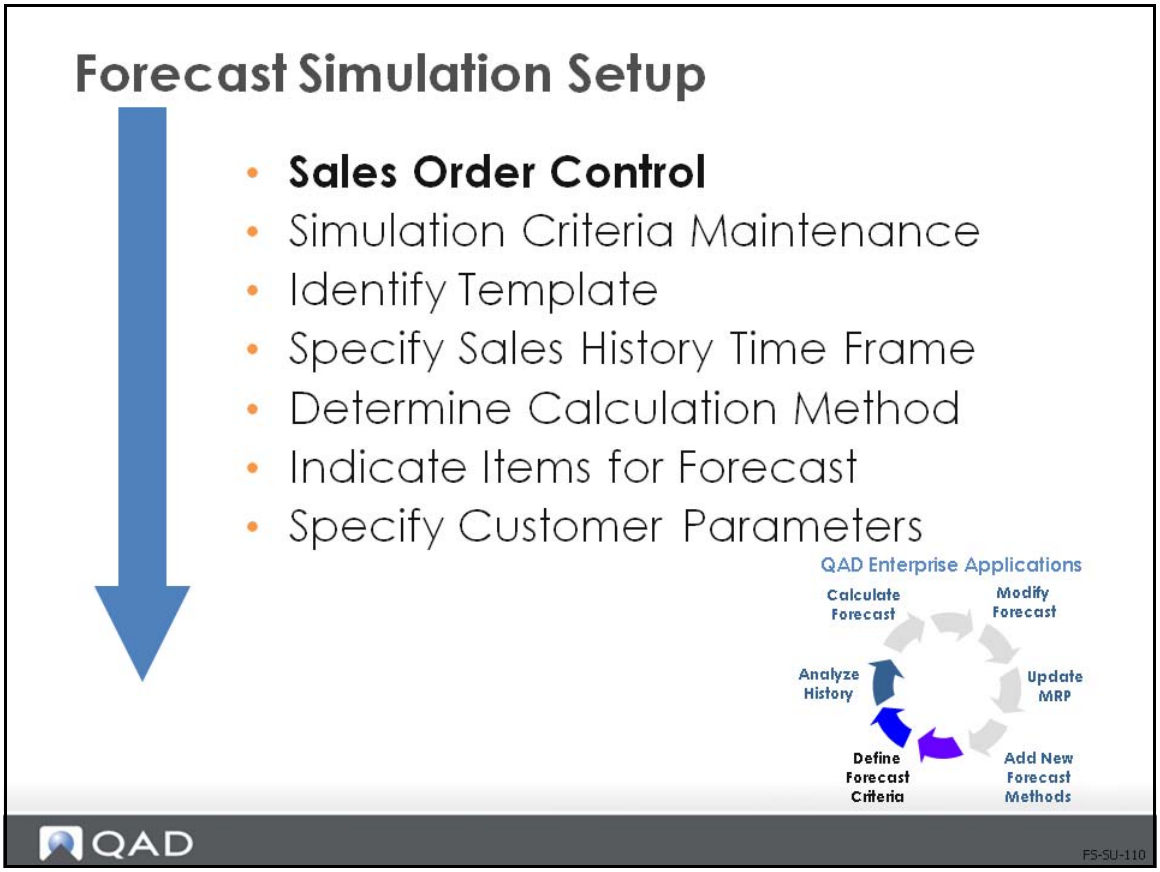
- Simulation Criteria Maintenance (22.7.1)
- Sales History Data

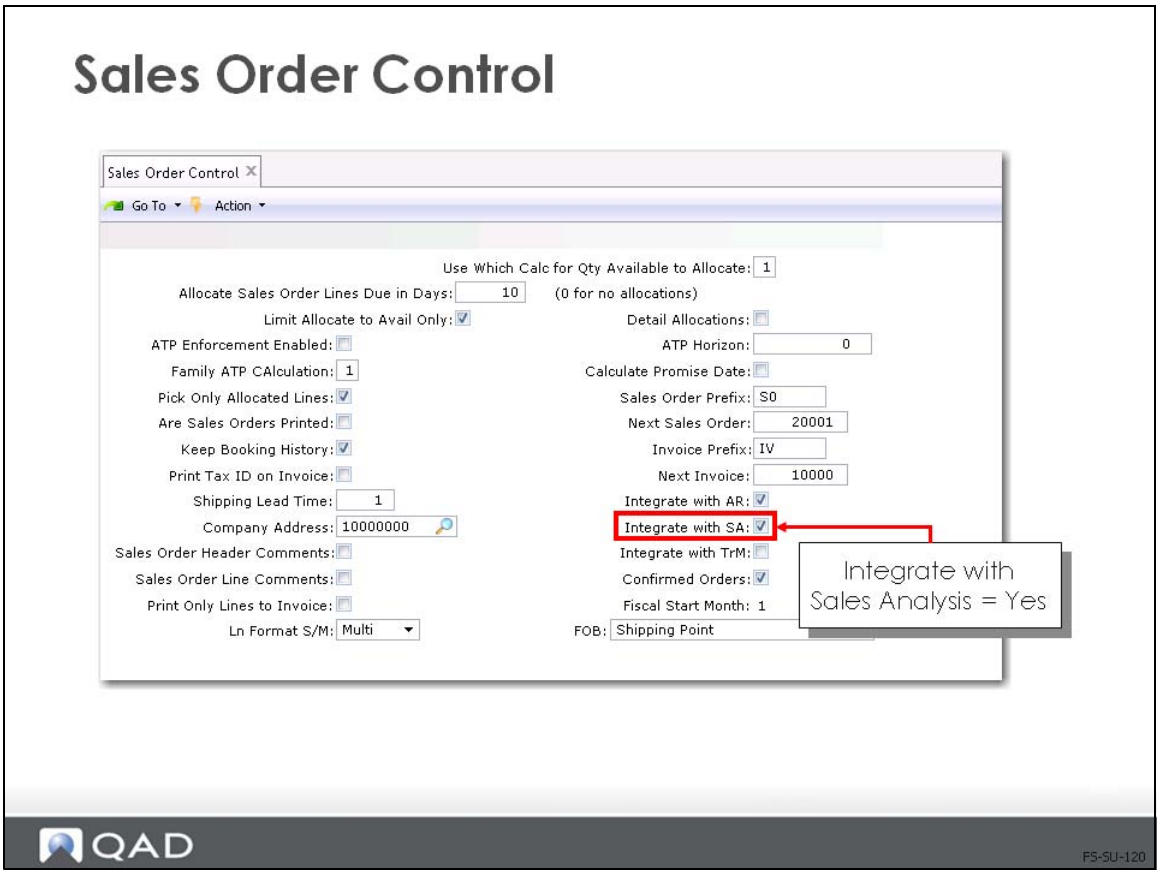
Forecast Simulation Setup



This illustration is a suggested setup sequence of master records for the Forecast Simulation module. It is based on information that flows from one type of data to another and prerequisites before setting up a particular type of data.

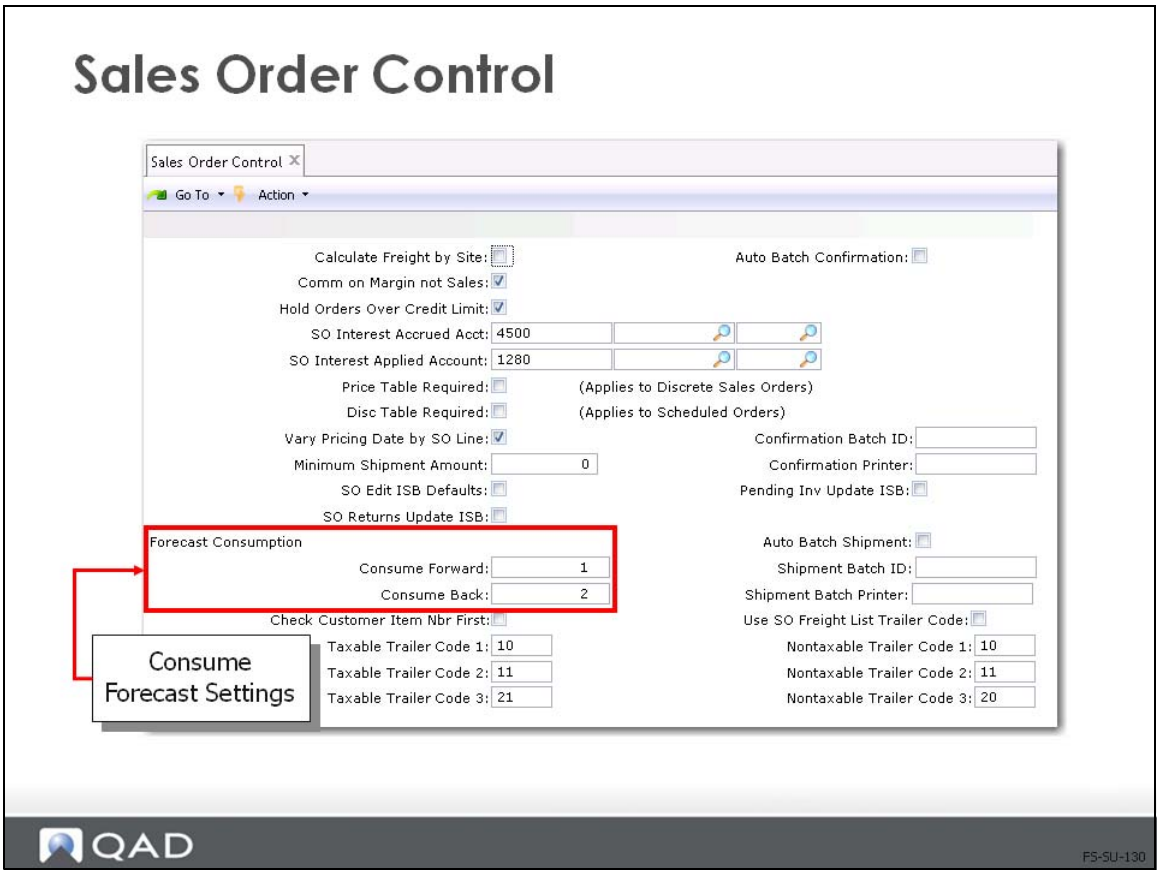
Sales Order Control





- 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 *Training Guide: Sales Order Management*

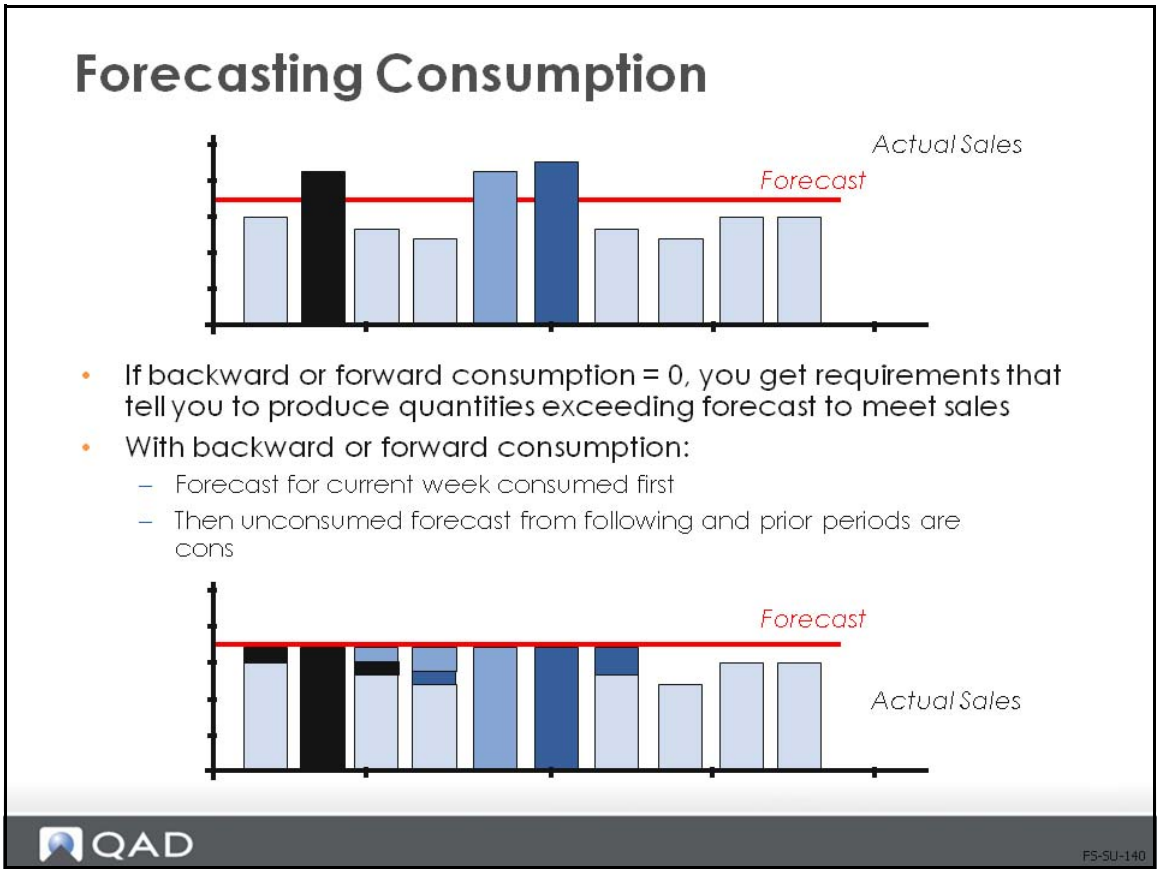


- Long-term forecasts are more accurate than short-term ones
- Forecasts are calculated for one-month periods; actual sales seldom correspond to the forecast for a monthly period

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.

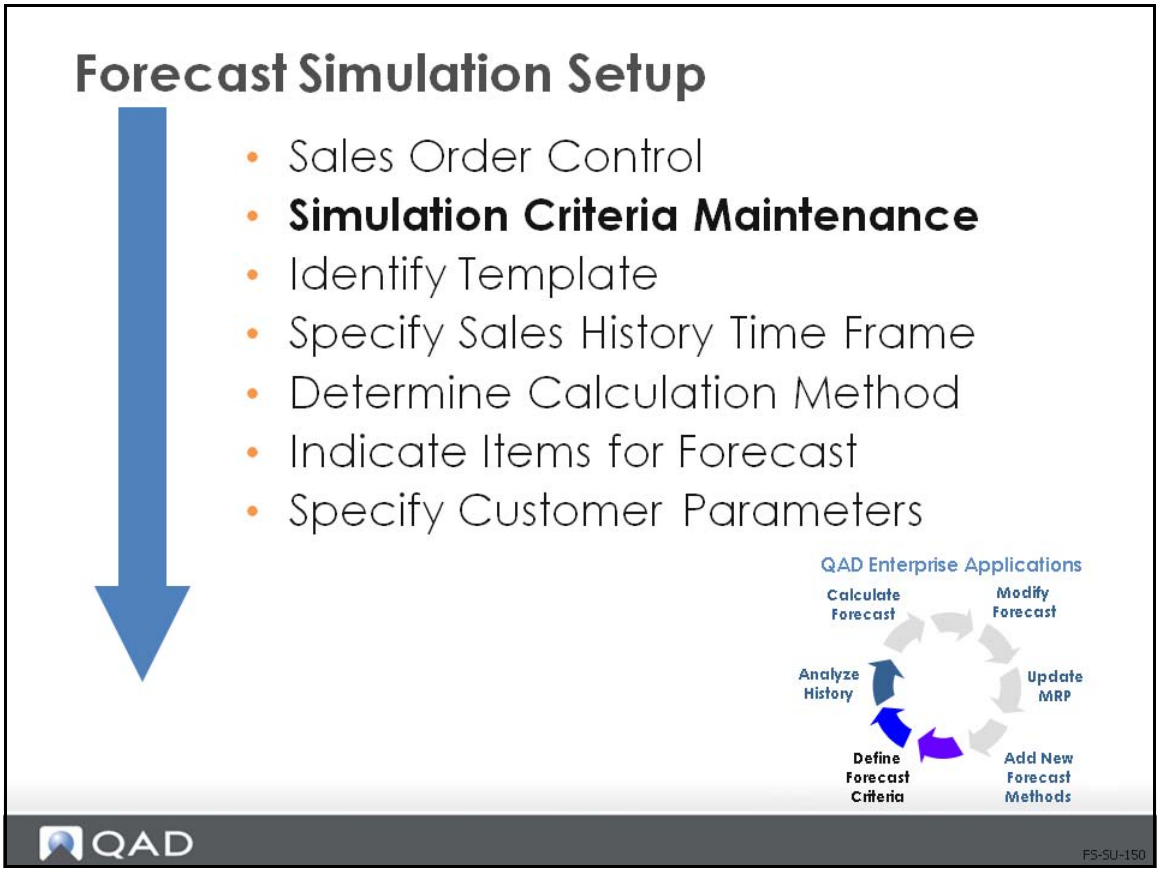
- To compensate for this inaccuracy, you can expand the forecast window by using forward and backward consumption
- Forecast consumption periods, in the Sales Order Control (7.1.24), are in weekly buckets

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

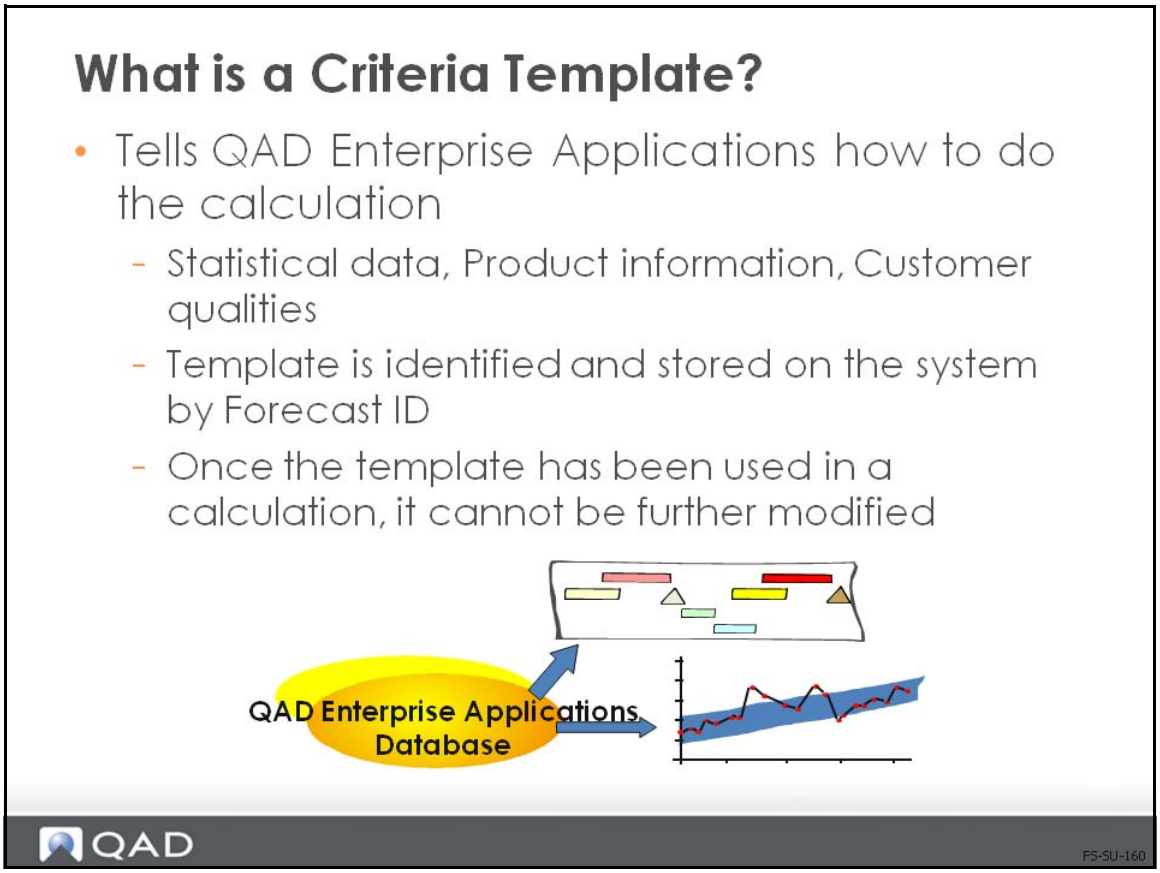
Set Up Criteria Template



To let QAD Enterprise Applications run the forecast simulation calculation, first develop a criteria template

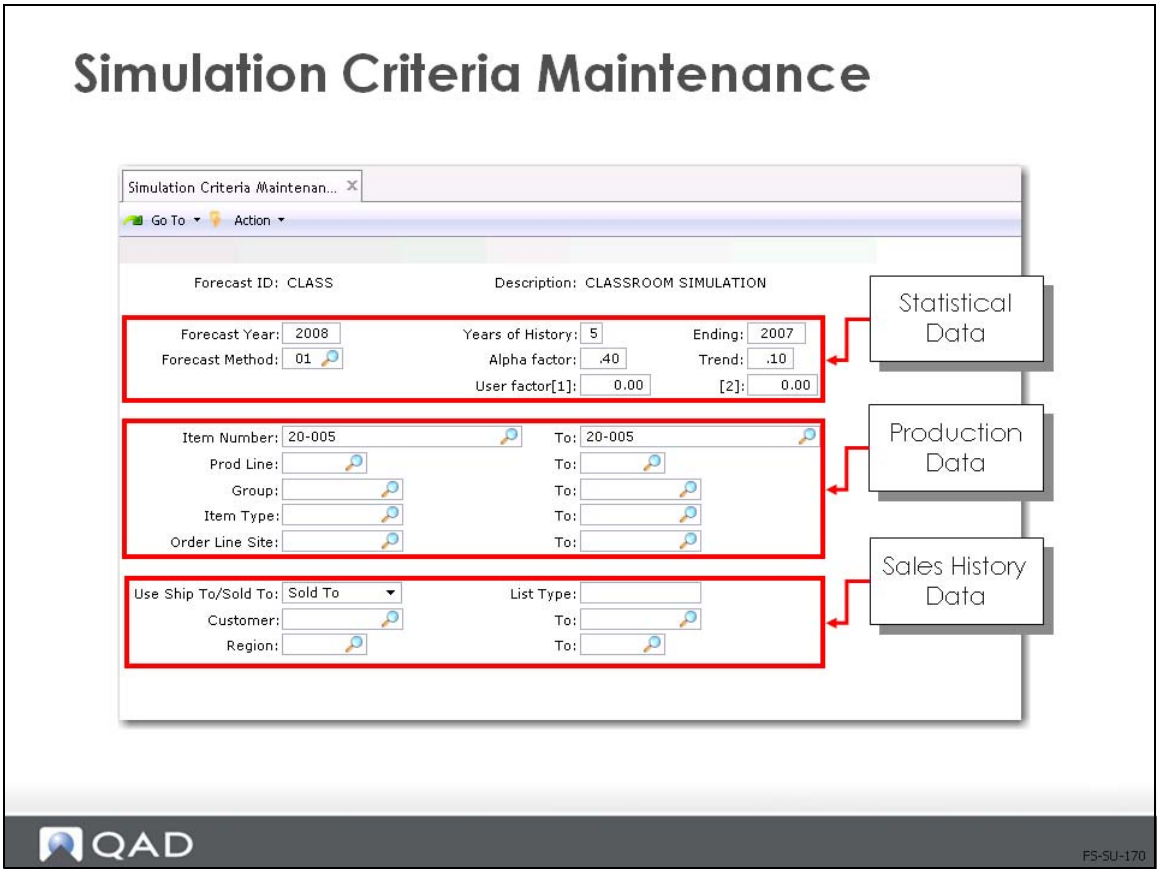
- Specifies what sales history to use
- Defines how to perform the forecast simulation calculation

What is a Criteria Template?



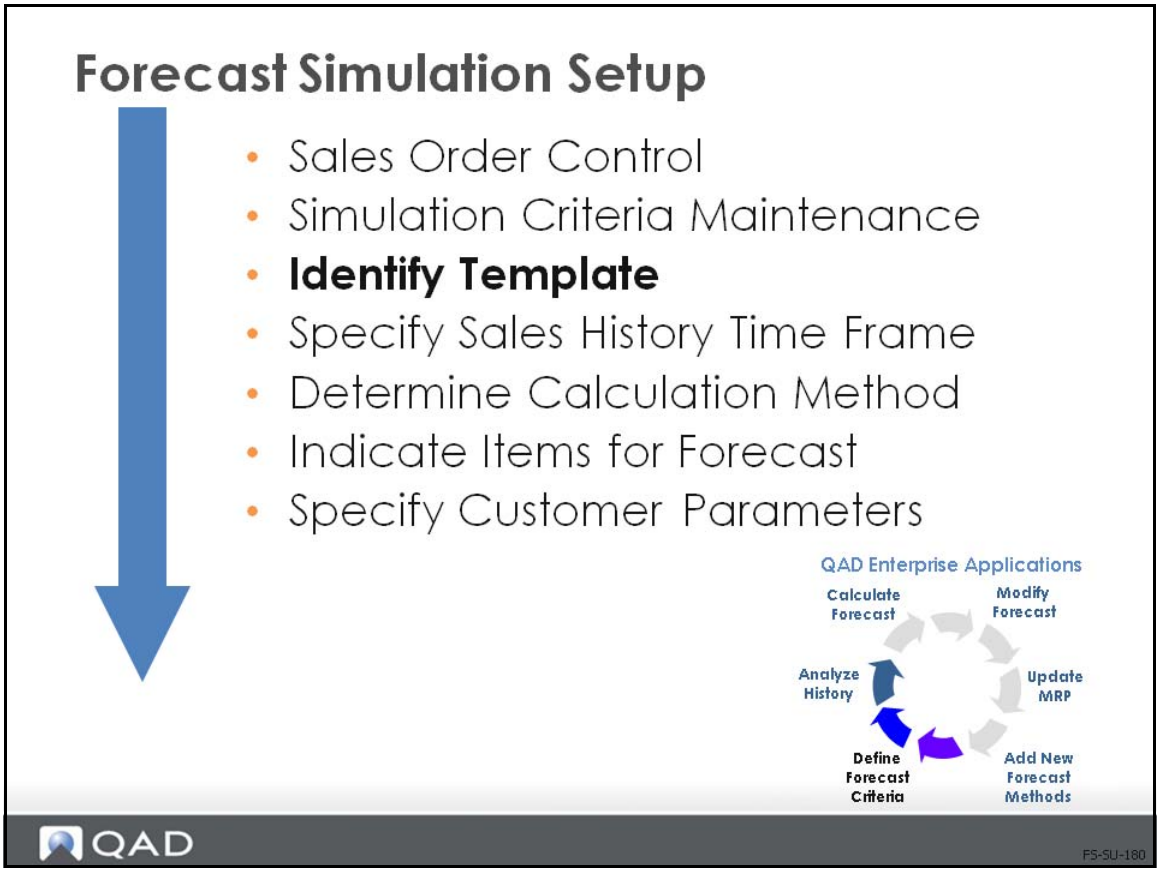
- The criteria template specifies statistical data, product information, and customer qualities to use in the forecast simulation calculation
- A unique forecast ID identifies each criteria template. Results with the same forecast ID overwrite existing results with the same ID
- A template can only be 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 set up a yearly forecast, 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



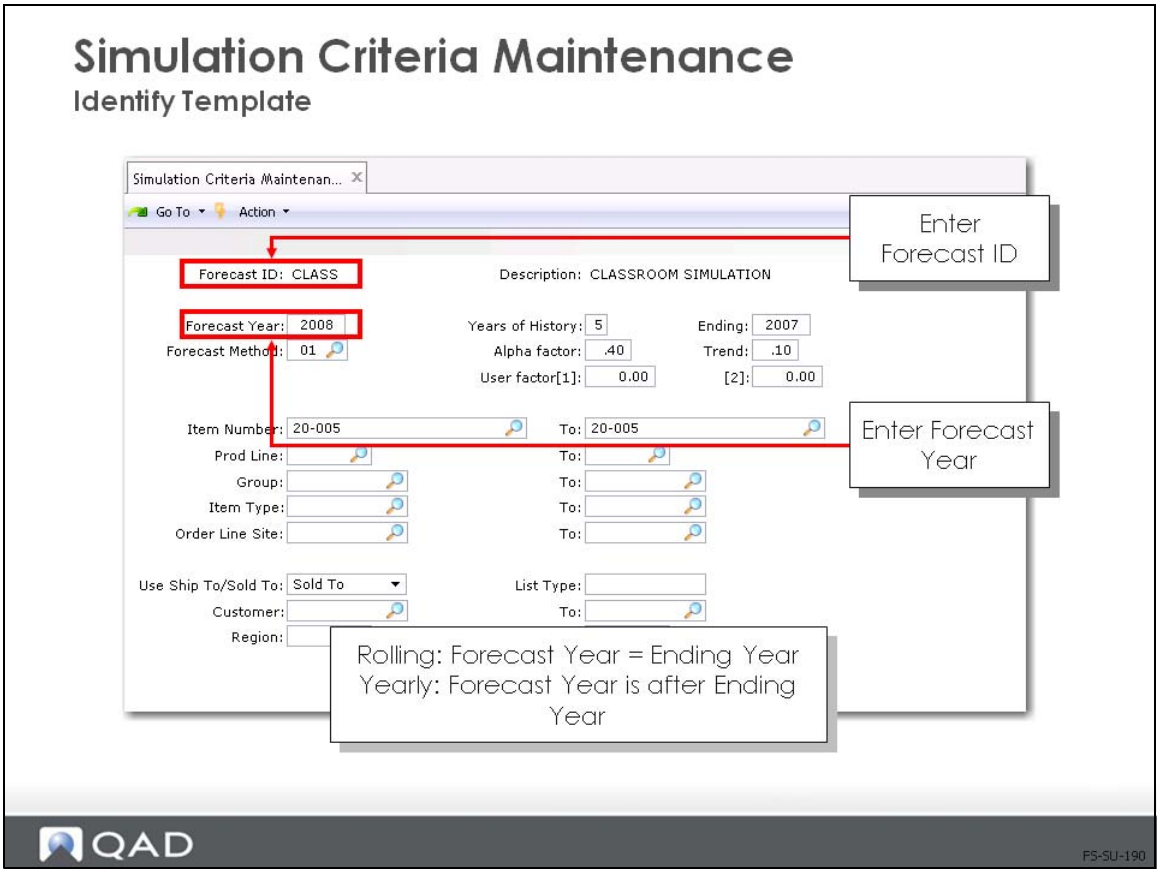
Category	Defines
Statistical Data	Method, trend, alpha factor. Also includes user factors to a specified user-defined forecast method
Production Information	Item, product line, group, item type, and order line site being forecast
Sales History Data	How to use sales history data (customer, region, and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

Identify Template



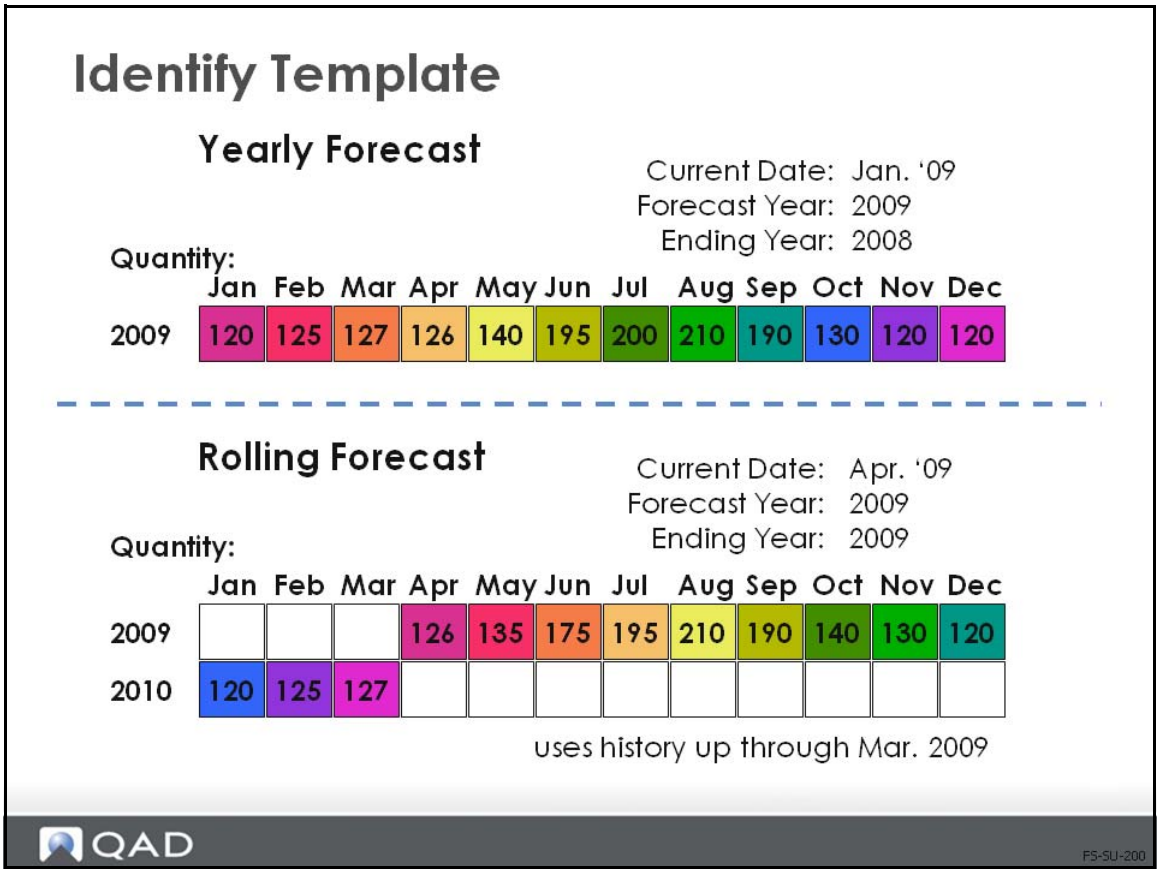
- The Forecast ID identifies a template of criteria for analyzing historical sales data in the calculation
- The criteria template can be modified each time a calculation is performed
  - Forecast results are stored by forecast ID, year, and item
  - Prior forecast results from the calculation of annual 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
  - Specify a Forecast ID and Forecast Year

Identify Template



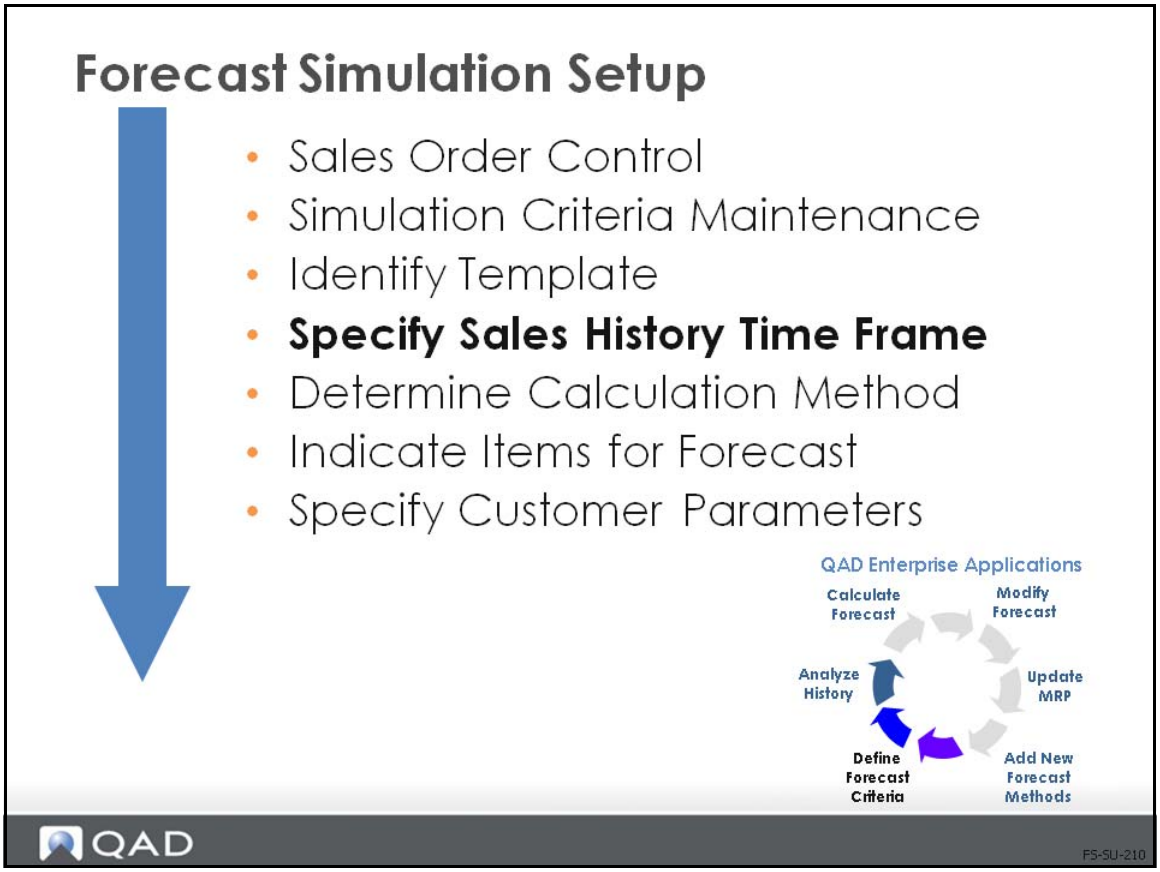
- Forecast ID is an eight-character alphanumeric, user-assigned code
- Description is optional

Yearly or Rolling Forecast



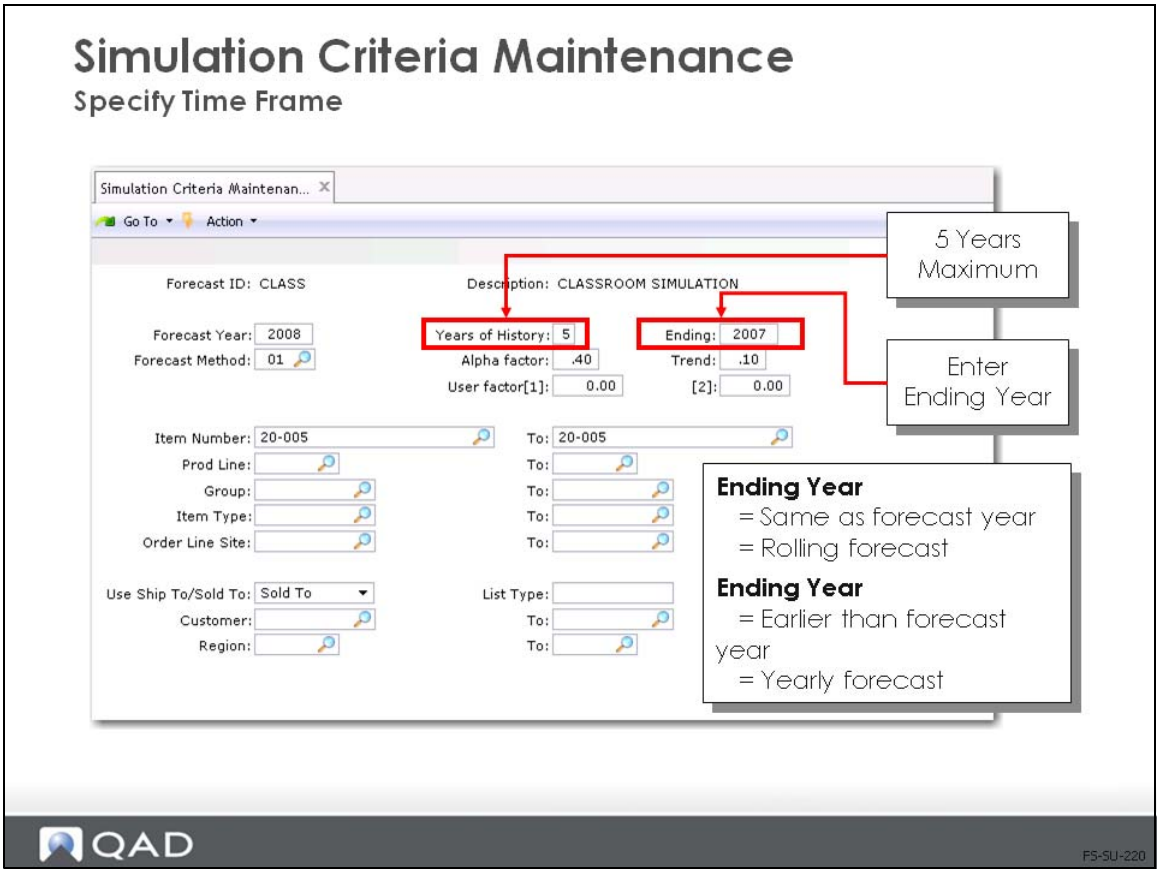
- In the first example above, the forecast has been set up as a yearly forecast:
  - Uses sales history ending in 2008
  - Projects forecast quantities for all the months of 2009
- In the second example above, the forecast has been set up as a rolling forecast:
  - Uses sales history ending in March 2009
  - Projects forecast quantities for April 2009through March 2010
- Each forecast example shown here has 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



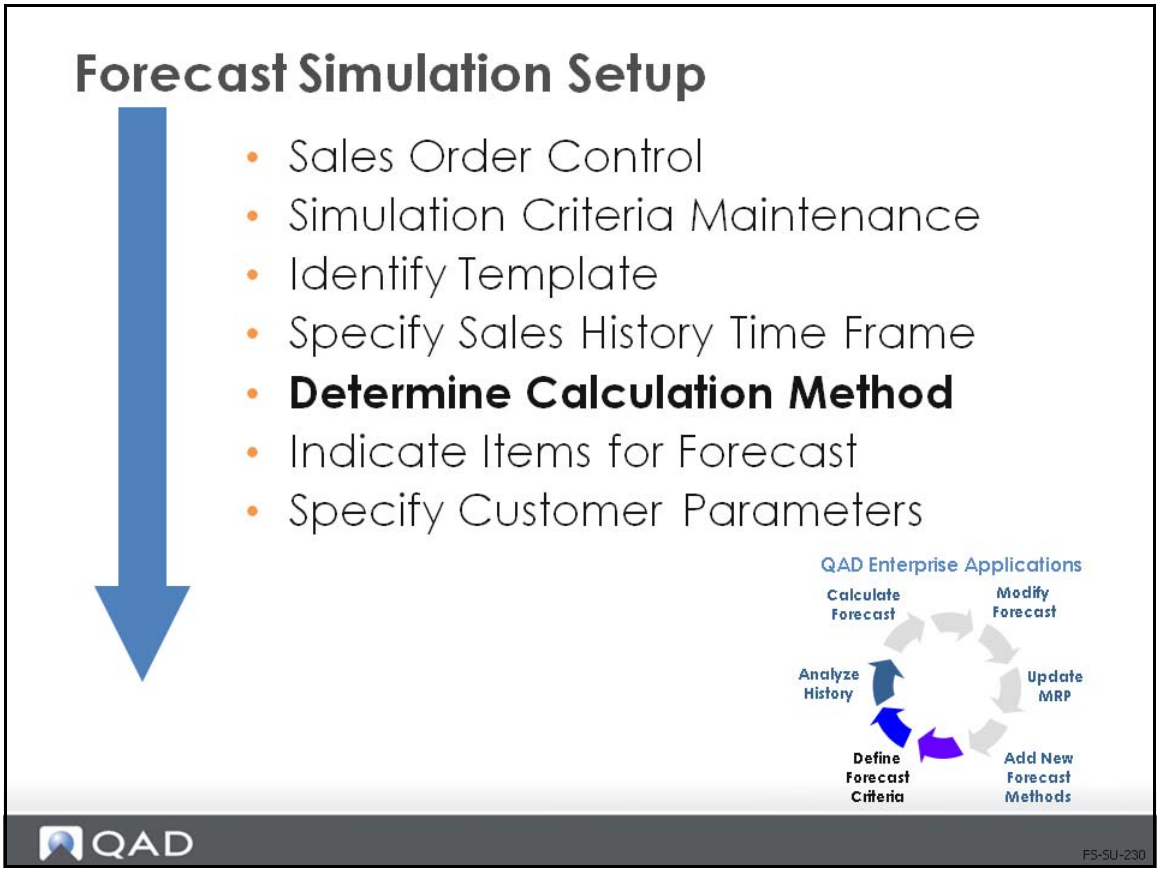
- After identifying the template ID and years, select the sales history time frame for the calculation

Specify Time Frame



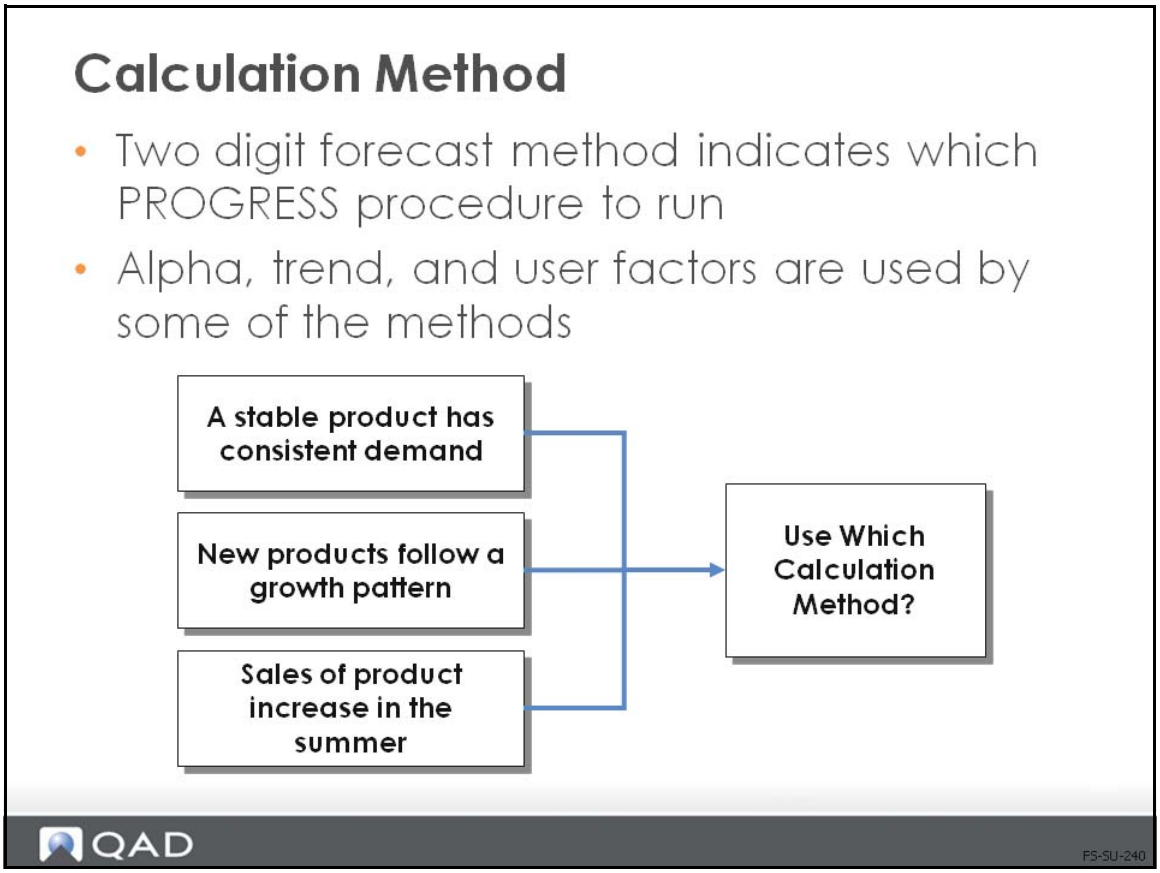
- Can analyze up to five years
- The system reduces the number of years when there are no sales for a year
- Ending year must be the same or earlier than the forecast year
  - Same = Rolling Forecast
  - Earlier = Yearly Forecast

Determine Calculation Method

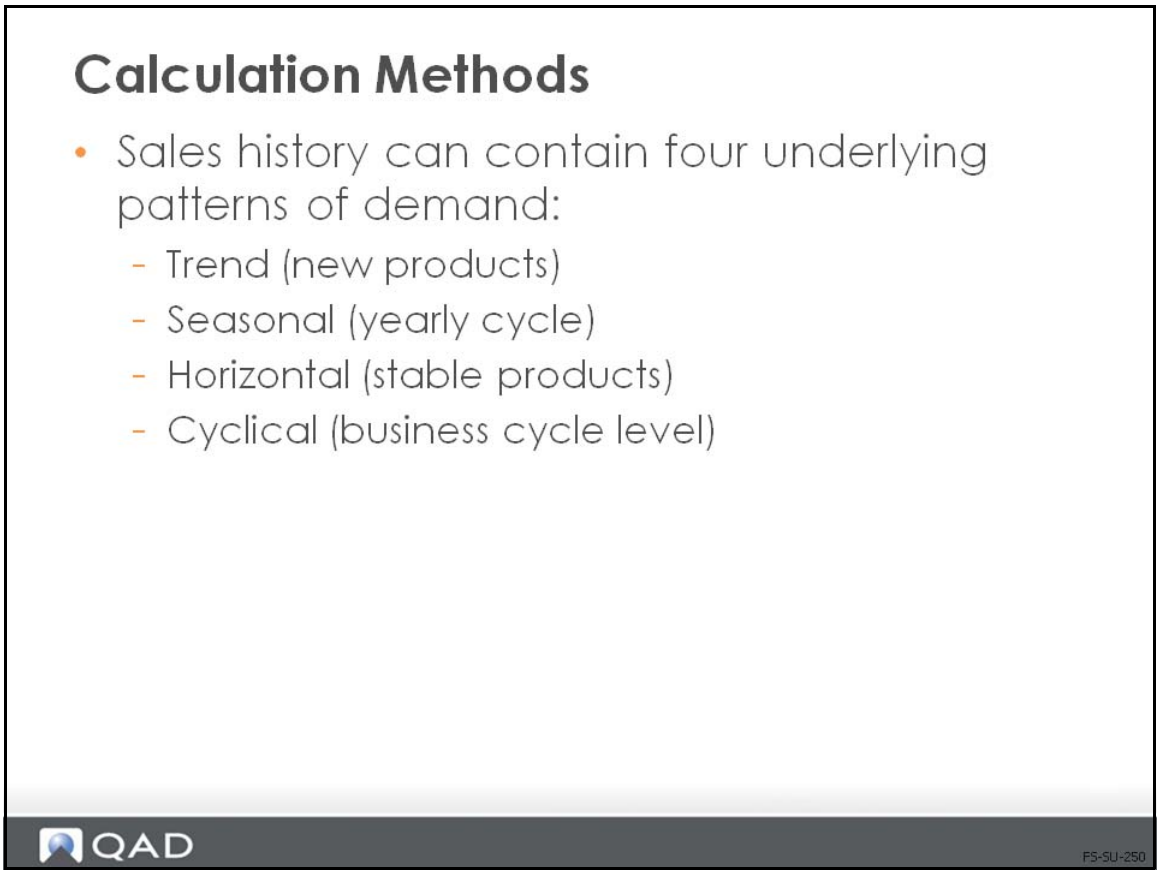


- After identifying the template by a unique ID, and selecting the type and years for the forecast and the history, determine what type of calculation to use
- Standard calculation methods are available
- The user can design custom calculation methods (written in Progress 4GL).

Calculation Method

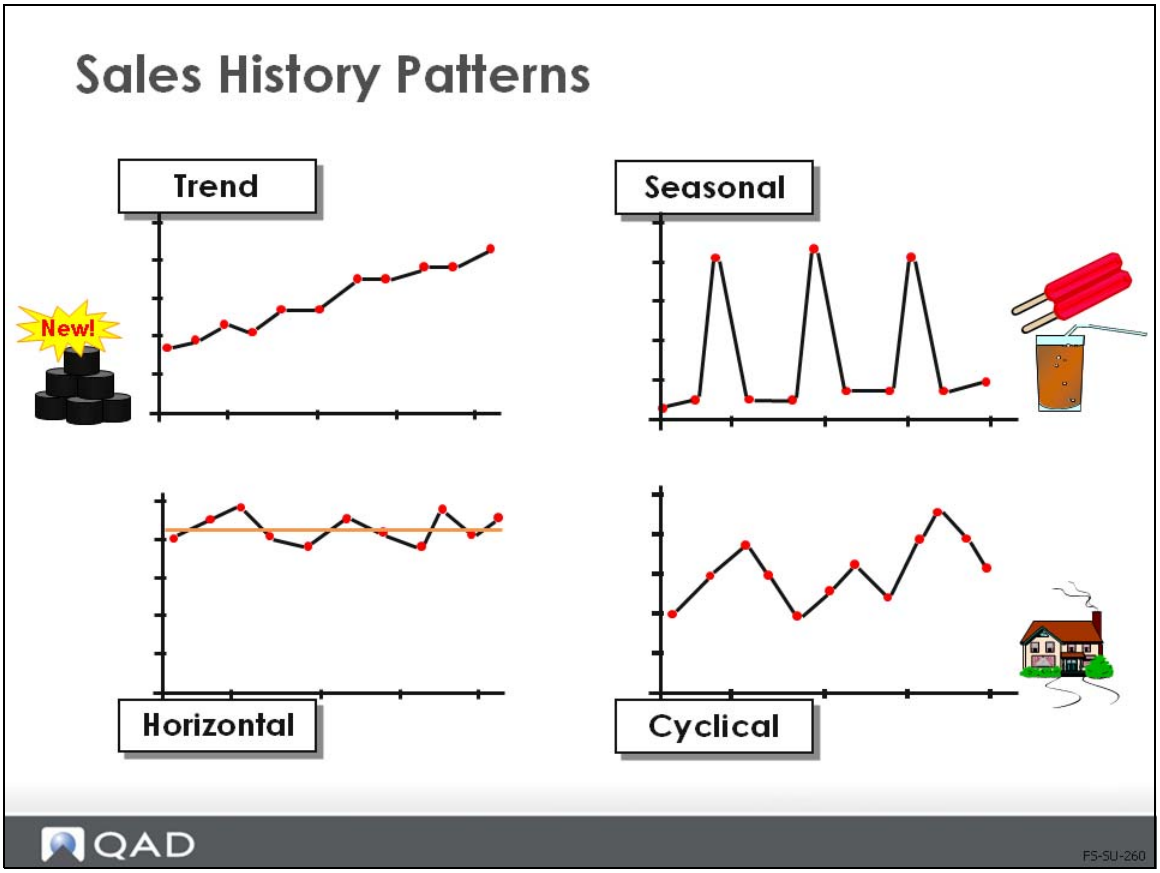


Decide which calculation method best suits the needs of your products



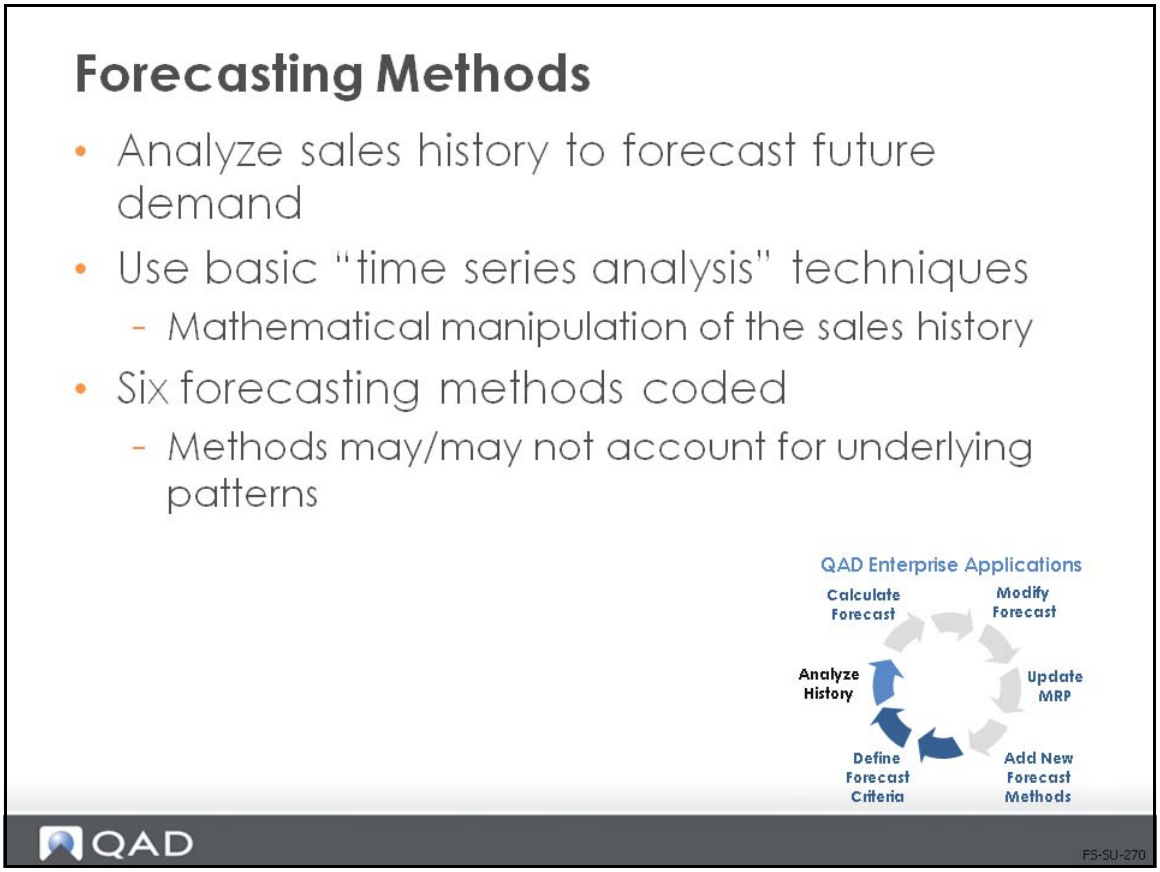
- Some typical considerations for selecting a calculation method include determining the sales history patterns of demand
- Four typical patterns are:
  - Trend – a steady growth of demand
  - Seasonal – cyclical patterns of greater and lesser demand that usually repeat each year
  - Horizontal – a steady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

Sales History Patterns



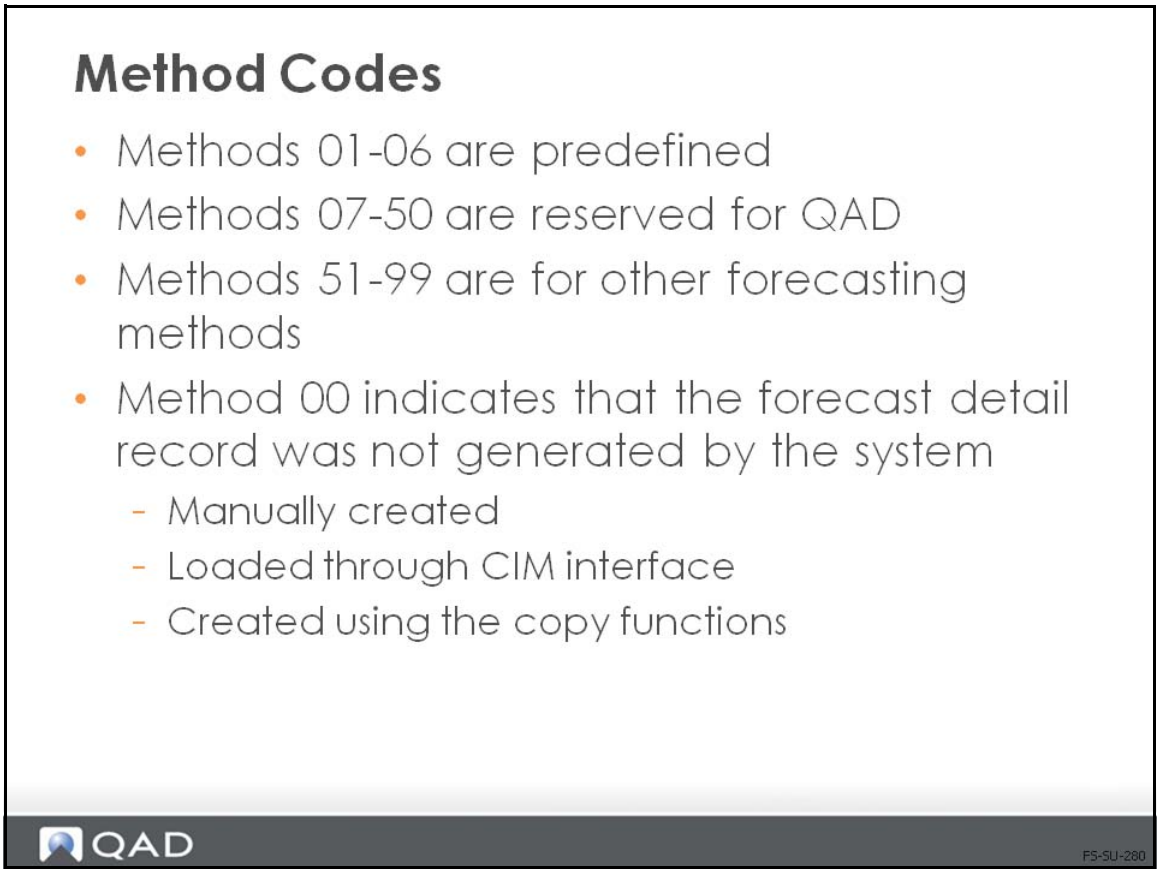
Pattern	Description	Example
Trend	Sales quantities generally increase over time.	The growth pattern of a new product
Seasonal	Sales quantities fluctuate according to some seasonal factor such as weather or the way in which a firm has chosen to handle its operations.	Sales of soft drinks, which increase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

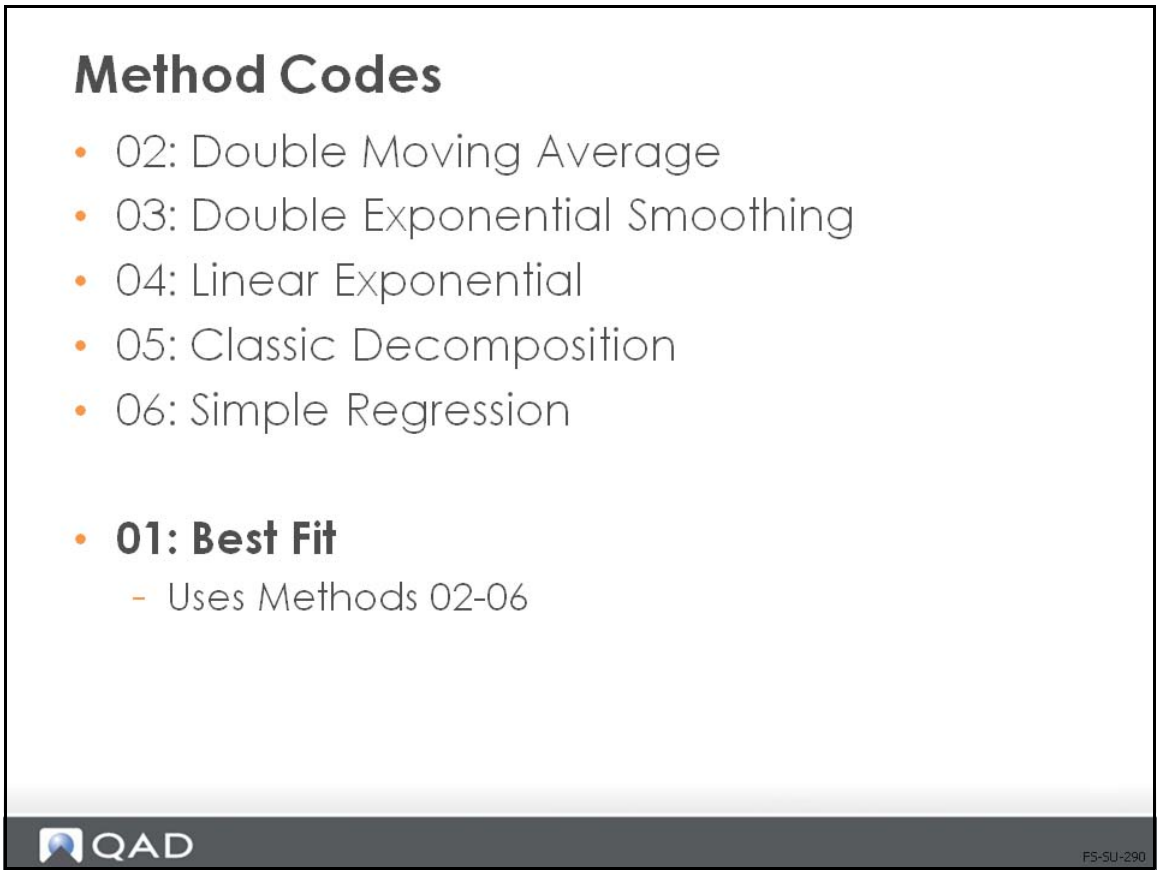


- Calculation methods examine sales history to make mathematical predictions for future product demand

Method Codes

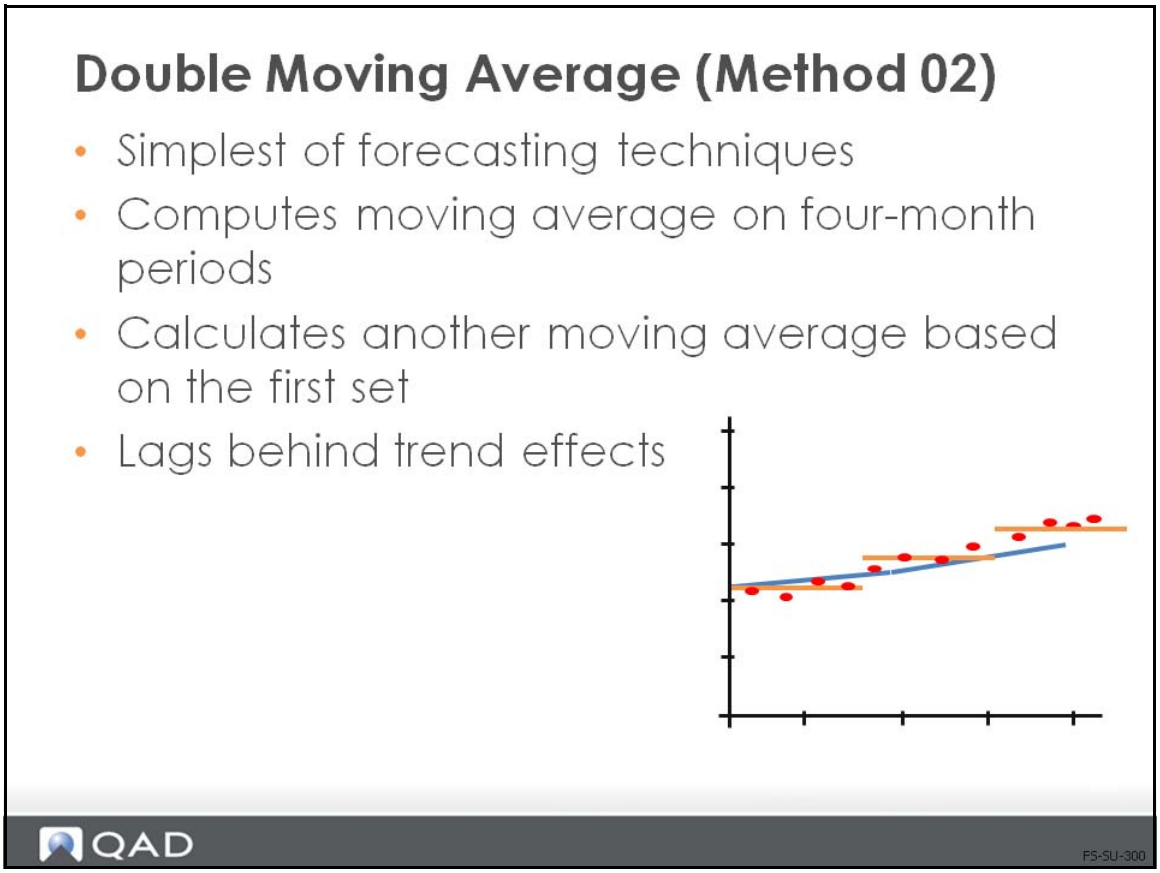


- QAD Enterprise Applications offer you six predefined forecast methods
- A choice of best fit is based on the least mean absolute deviation of the other five
- You can add additional methods to the system with User Forecast Method Maintenance (22.7.17)



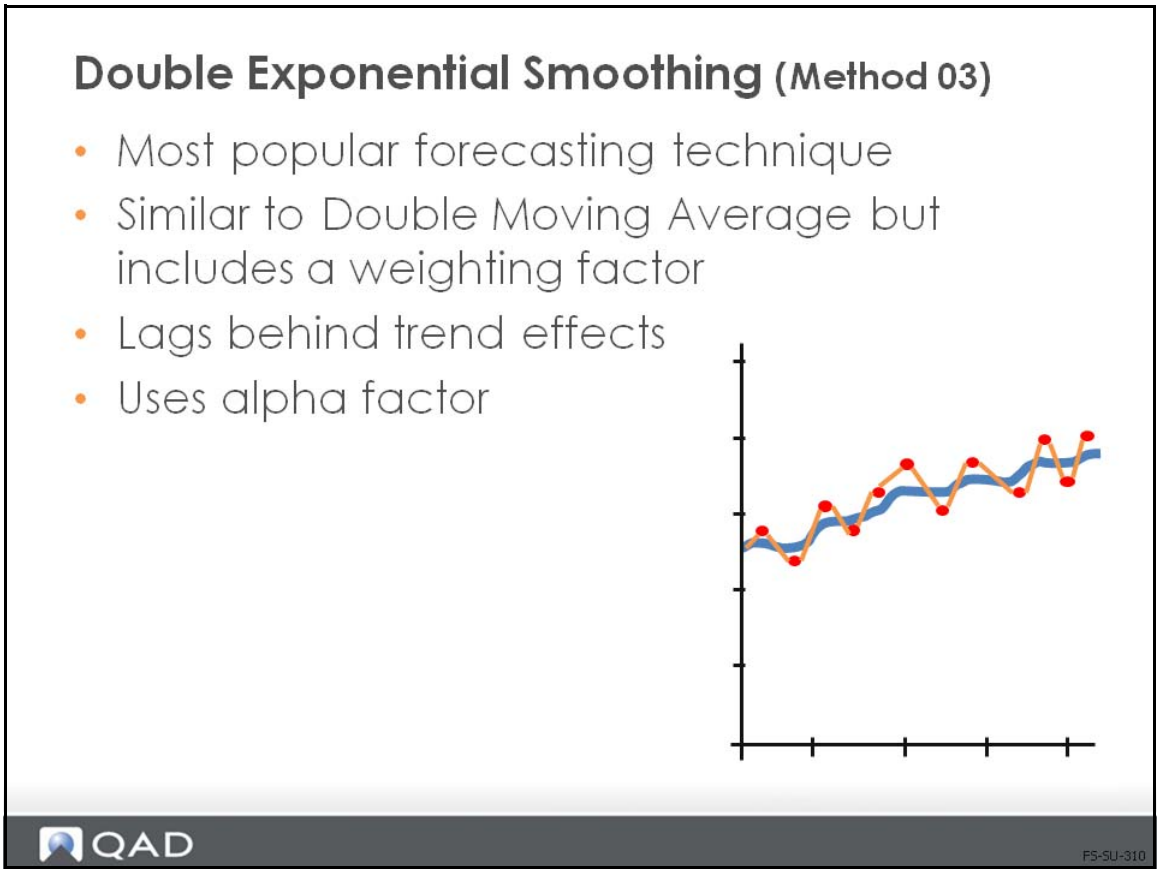
- The existing calculation methods provided in QAD Enterprise Applications are methods 02-06
- Method 01 examines the results of 02-06 to select a best fit solution
  - Each of these codes is discussed further in the following pages

Double Moving Average



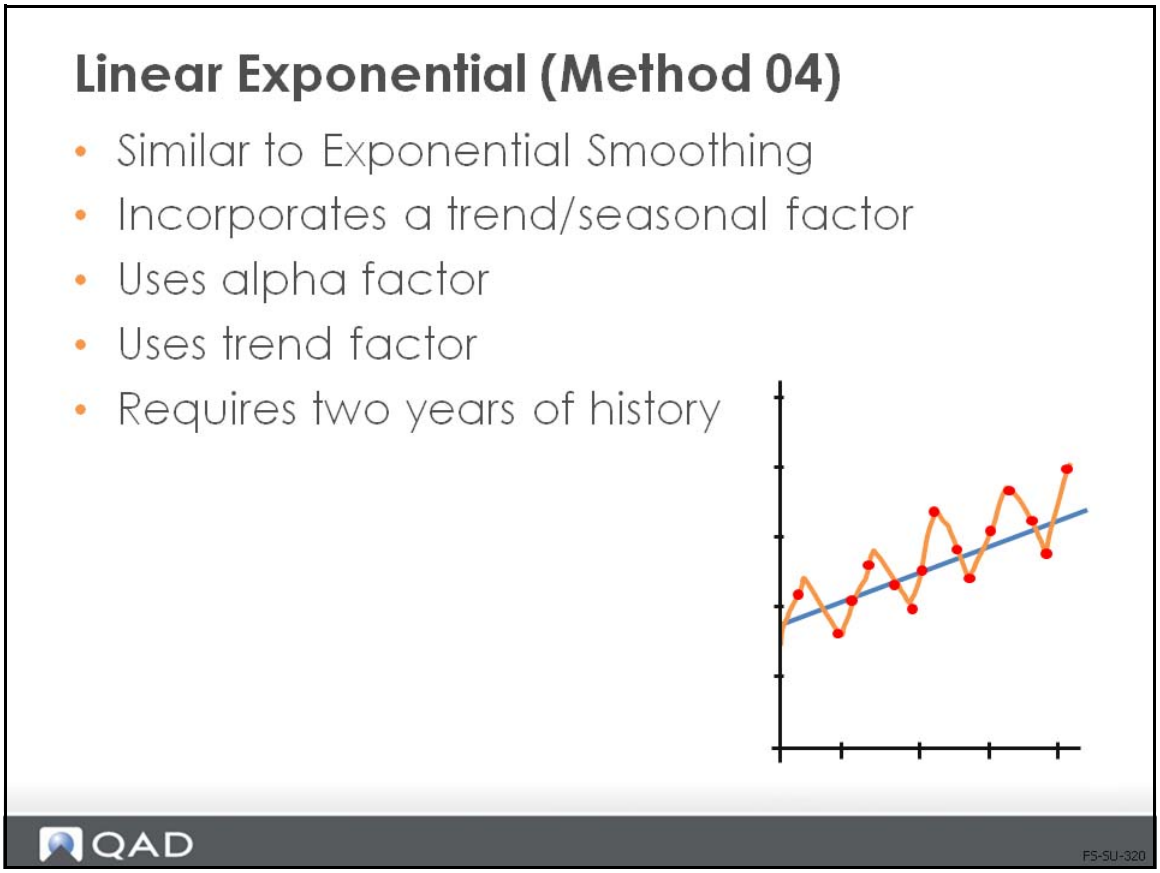
- The simplest of the forecasting techniques
- Used a set of simple moving averages based on historical data, then computes another set of moving averages based on the first set
- Produces forecast that lags behind trend effects

Double Exponential Smoothing



- 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

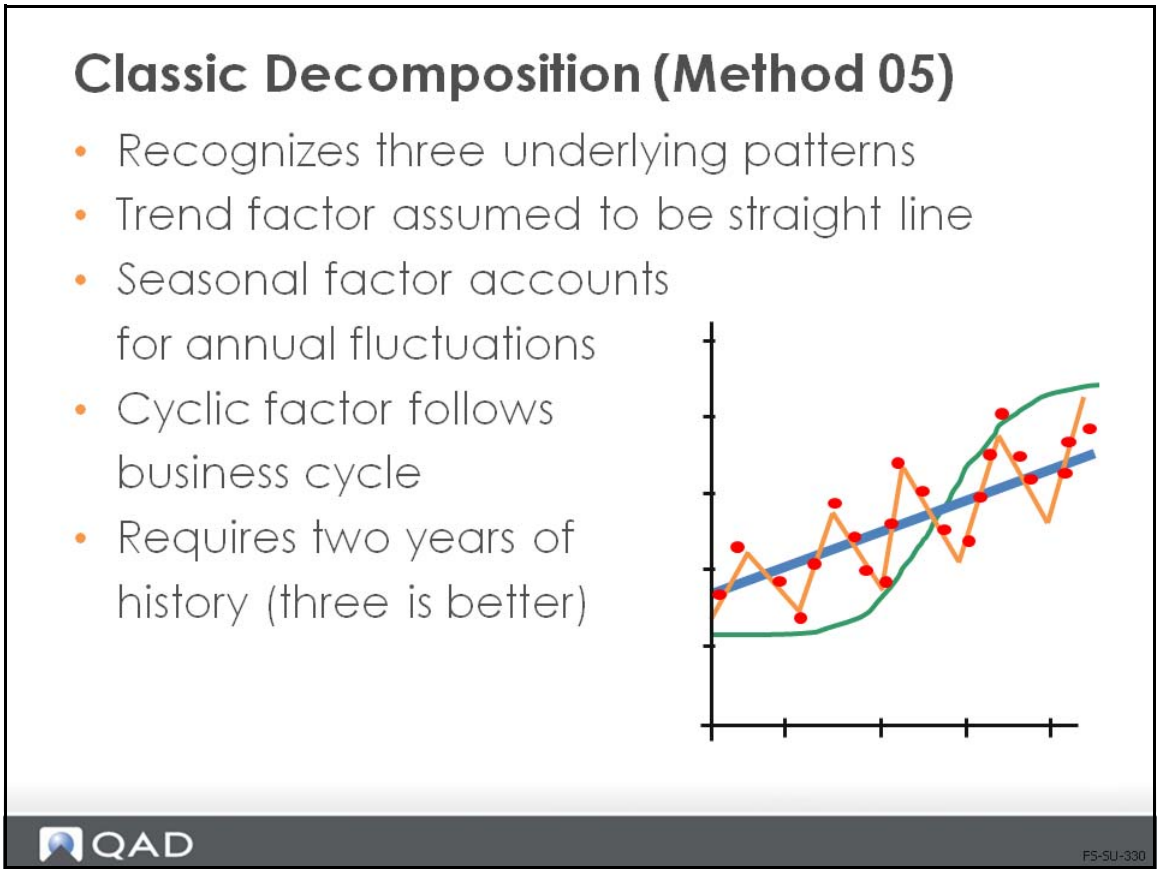
Linear Exponential



- 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

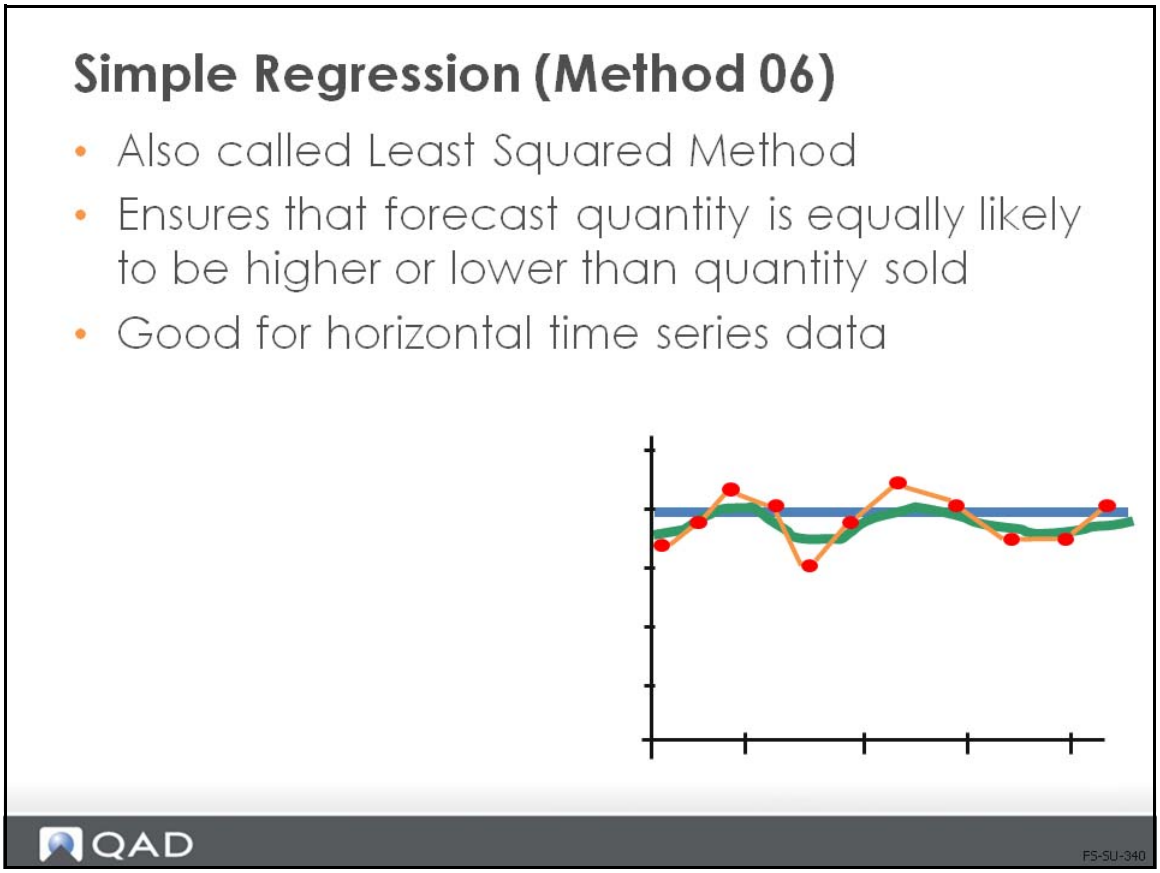
Classic Decomposition



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

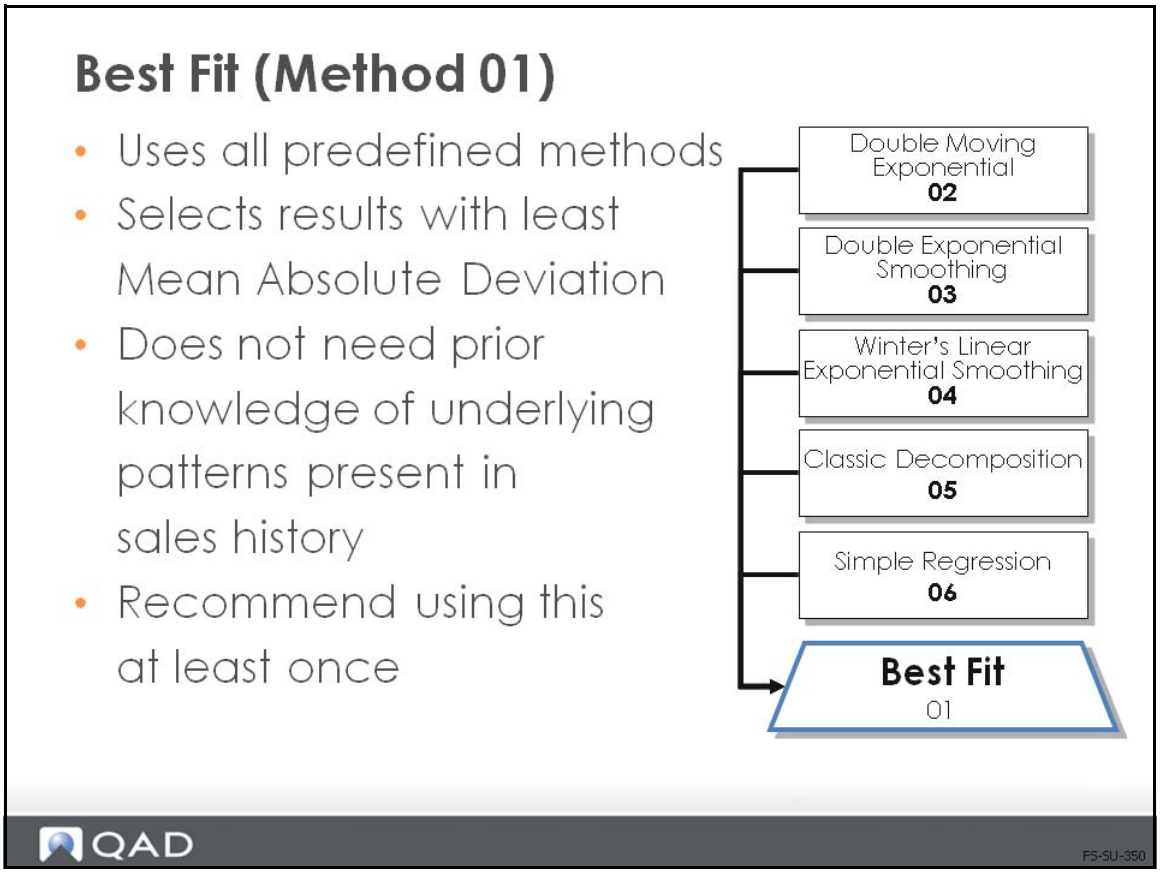
Note Requires a minimum of two years sales history. Better forecast with three years history.

Simple Regression



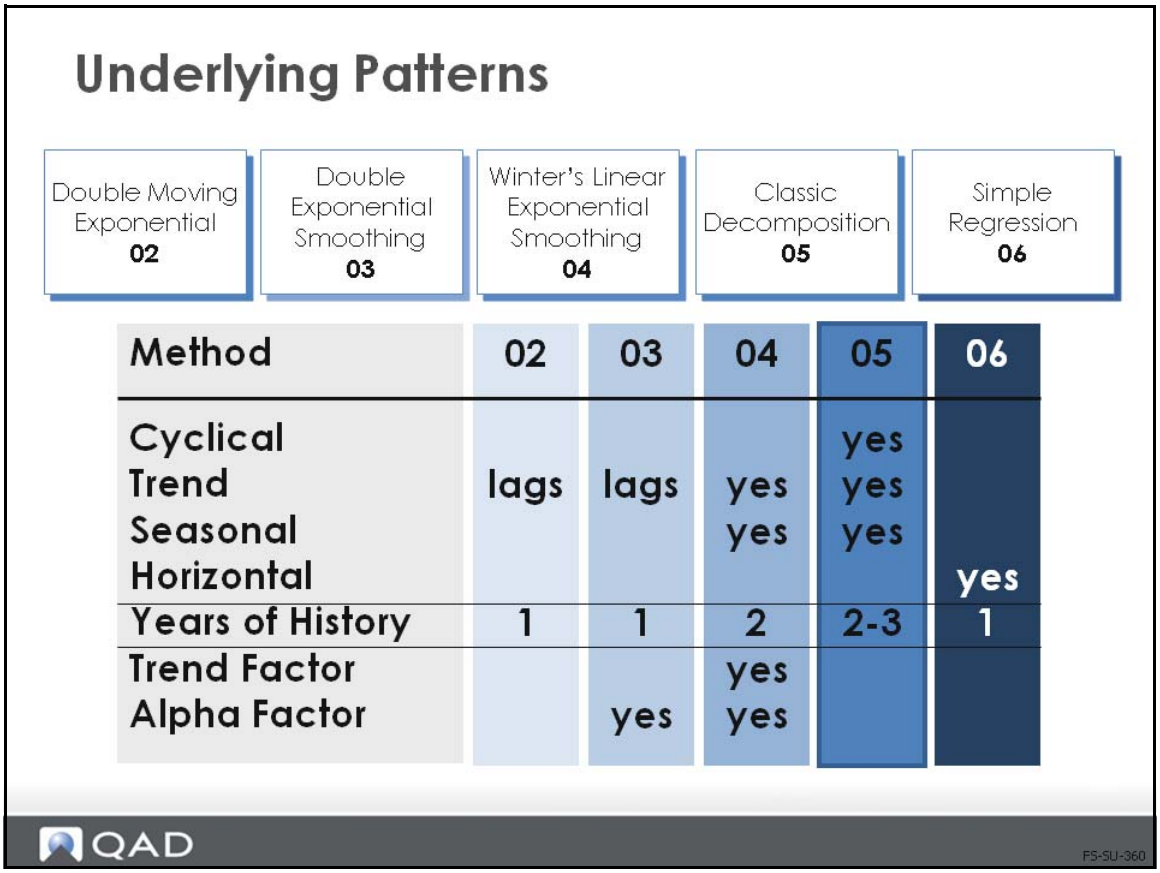
- Analyzes the relationship between objects (sales) and time space (month)
- Good for products with a stable history

Best Fit



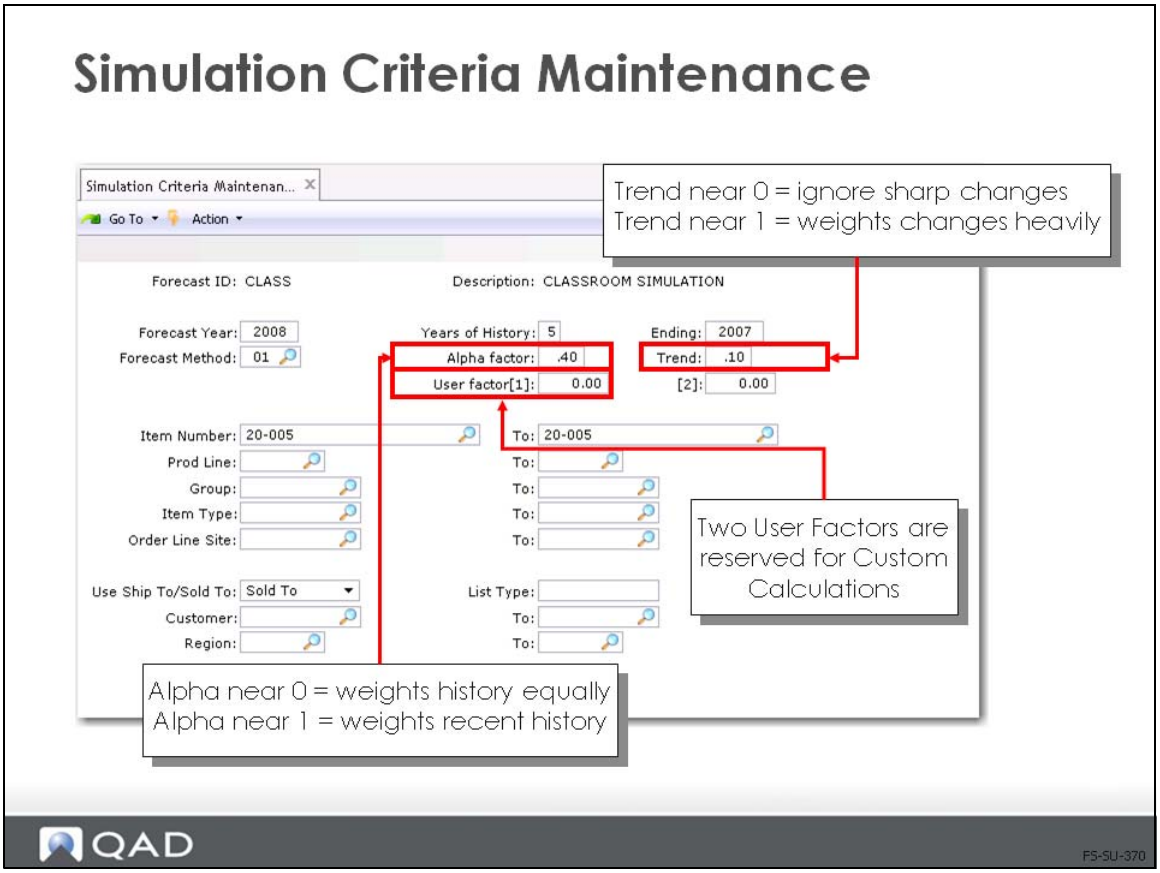
- Best Fit does take the longest to run, of codes 01-06
- Examines the results of each 02 through 06, before making a recommendation based on the least mean absolute deviation
- Recommended to be used at least once

Underlying Patterns



- 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



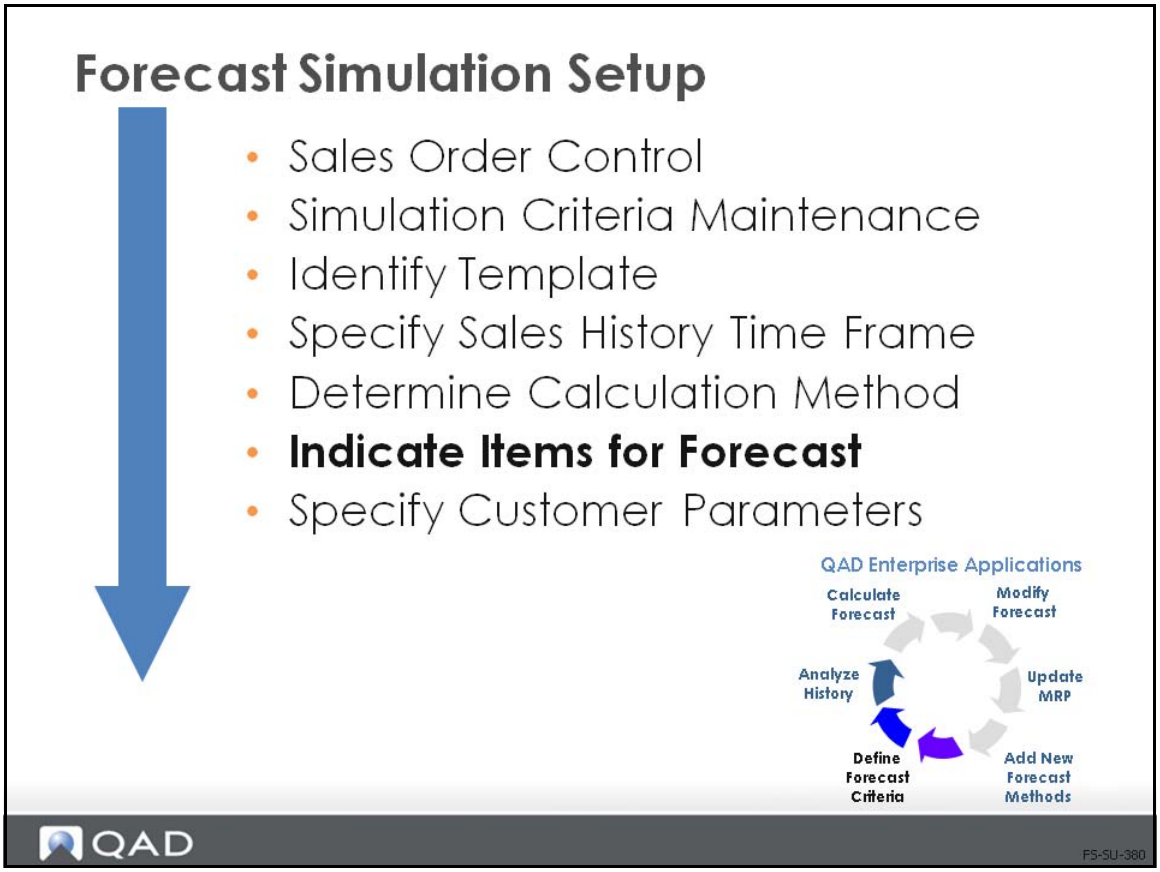
- Alpha and trend must be between zero and one

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 Simulation Criteria Maintenance (22.7.1), are reserved for custom calculation method factors

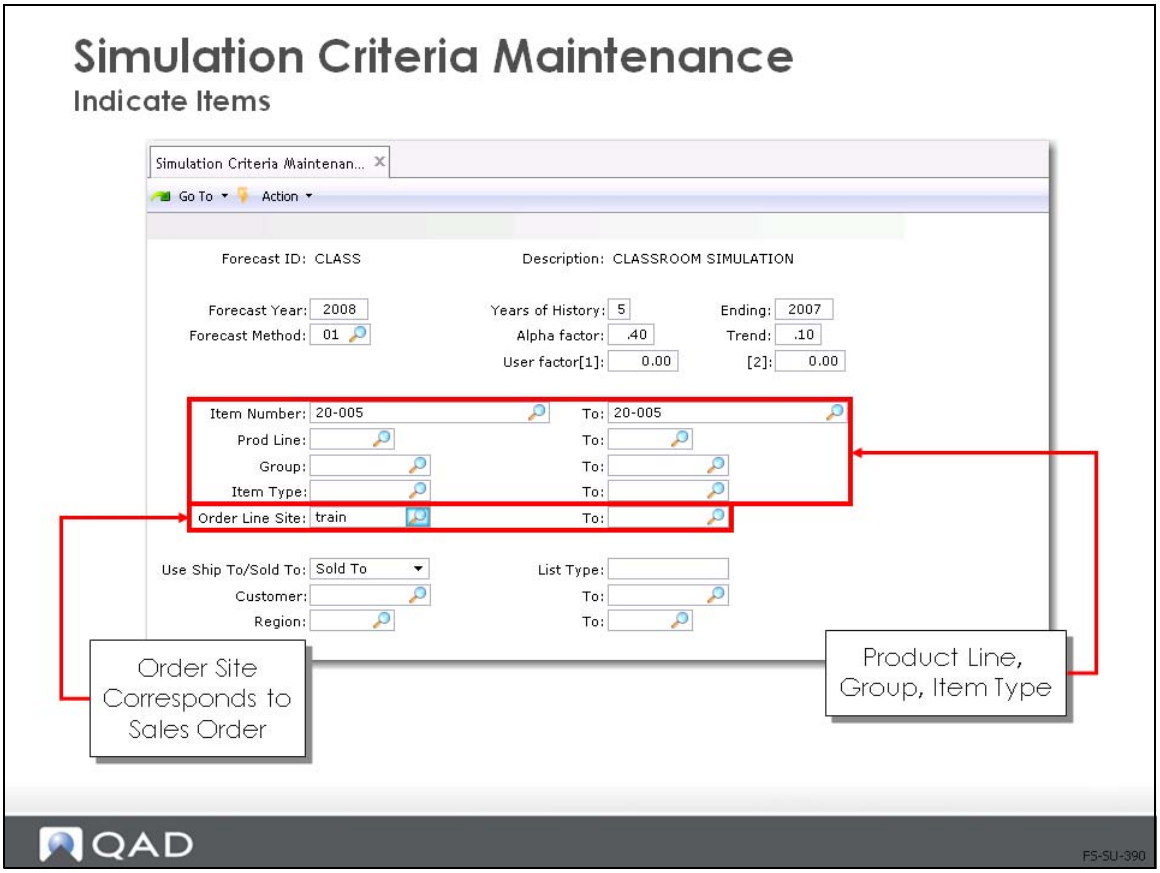
Indicate Items for Forecast



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

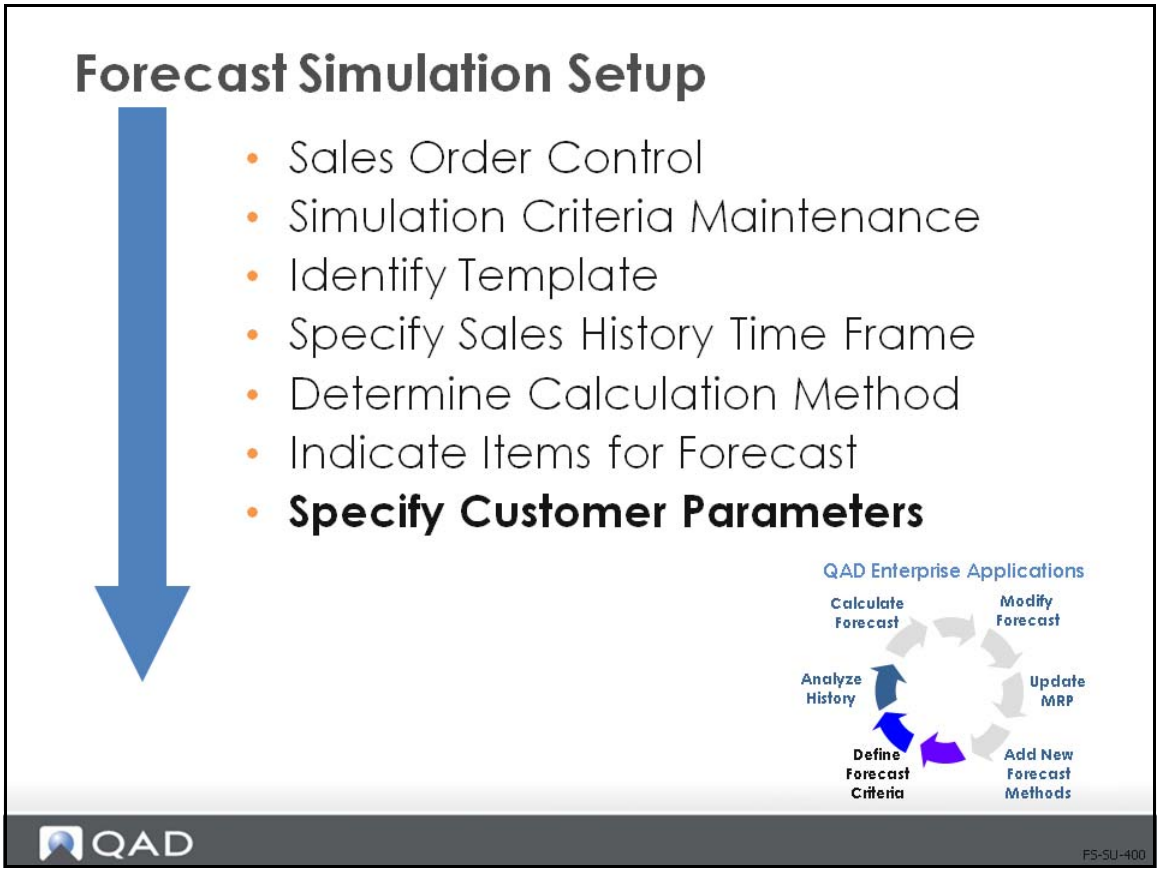
Note Select items with sales history information. For forecasts without history, use one of the copy functions.

Simulation Criteria Maintenance

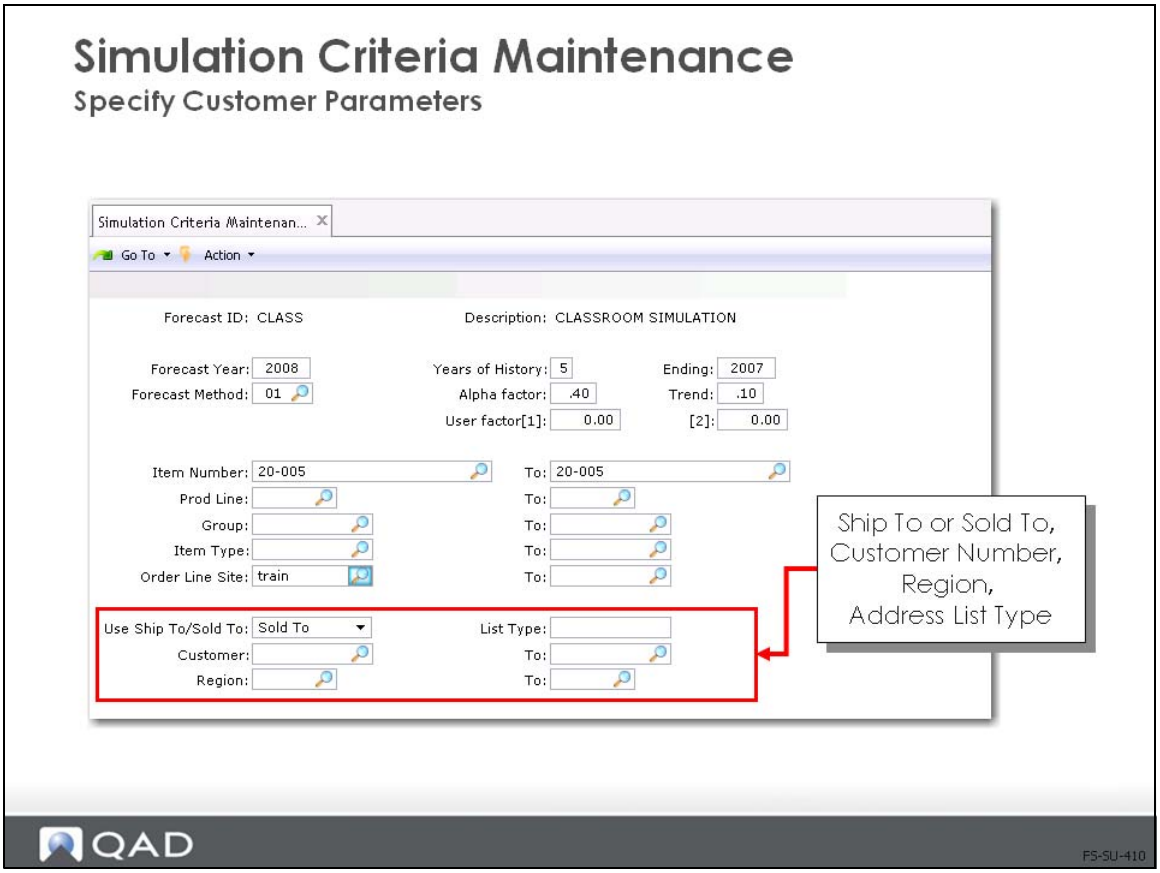


- Enter item or range of items by item number, product line, group, and/or item type
- Further define by order line site on the sales orders

Specify Customer Parameters

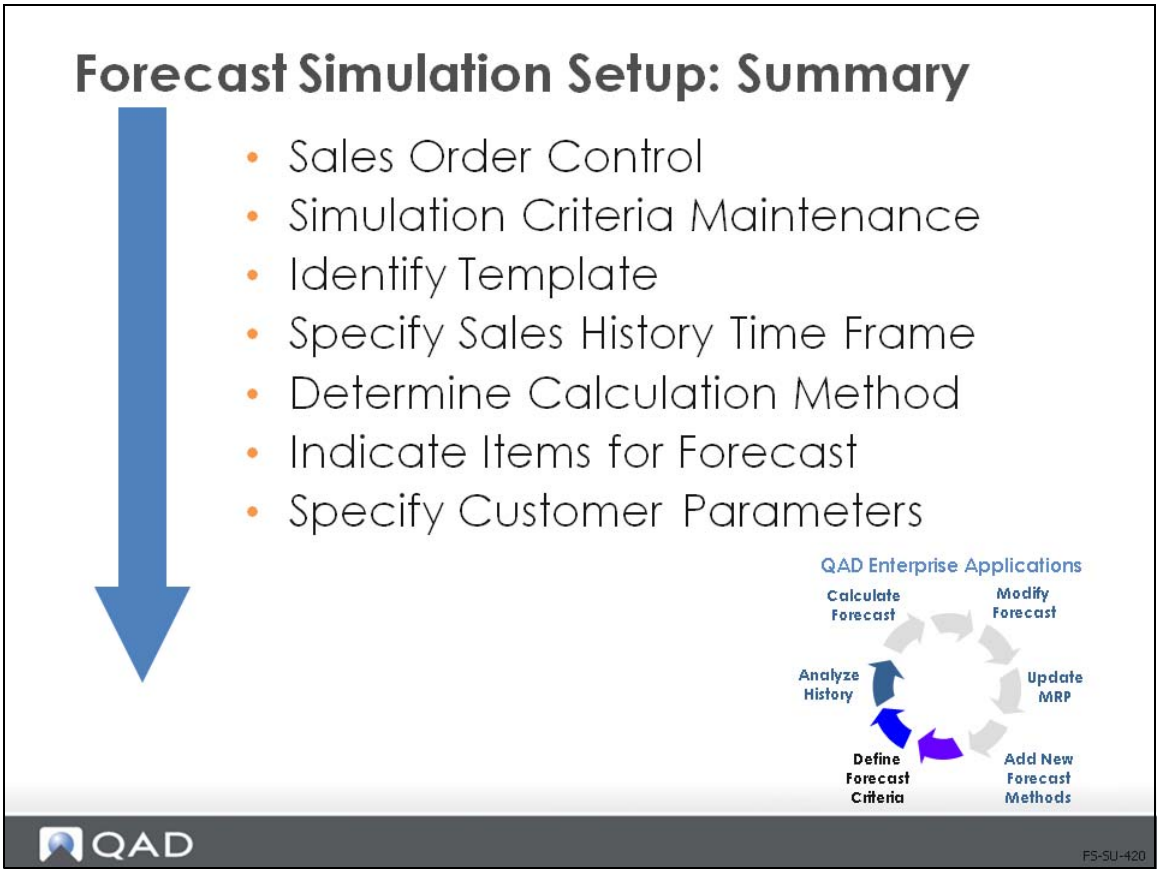


Simulation Criteria Maintenance



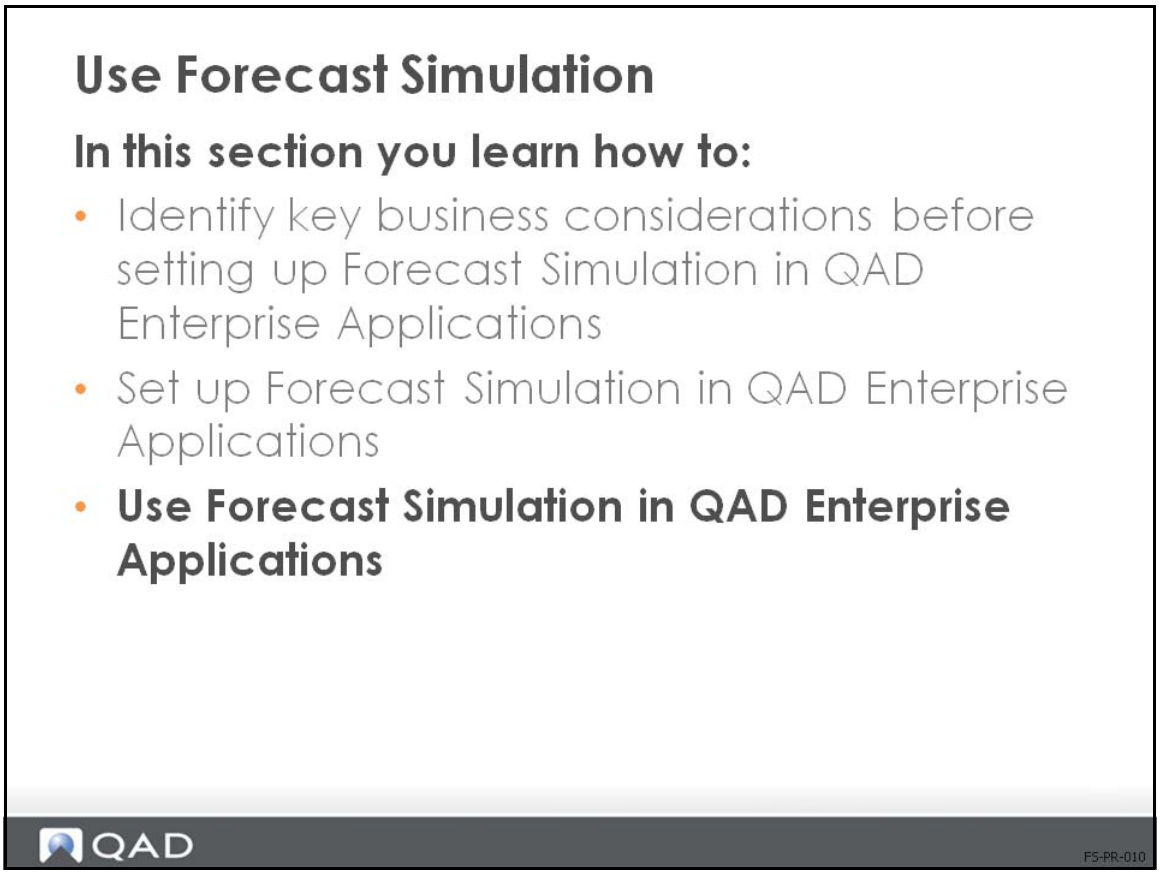
- Setting the use Ship-to/Sold-to flag selects sales history for analysis based on customer addresses.
- List type, customer, and region fields identify a subset of customer
- If you select ship-to and regions, only permanent ship-to addresses within the region are selected.

Summary

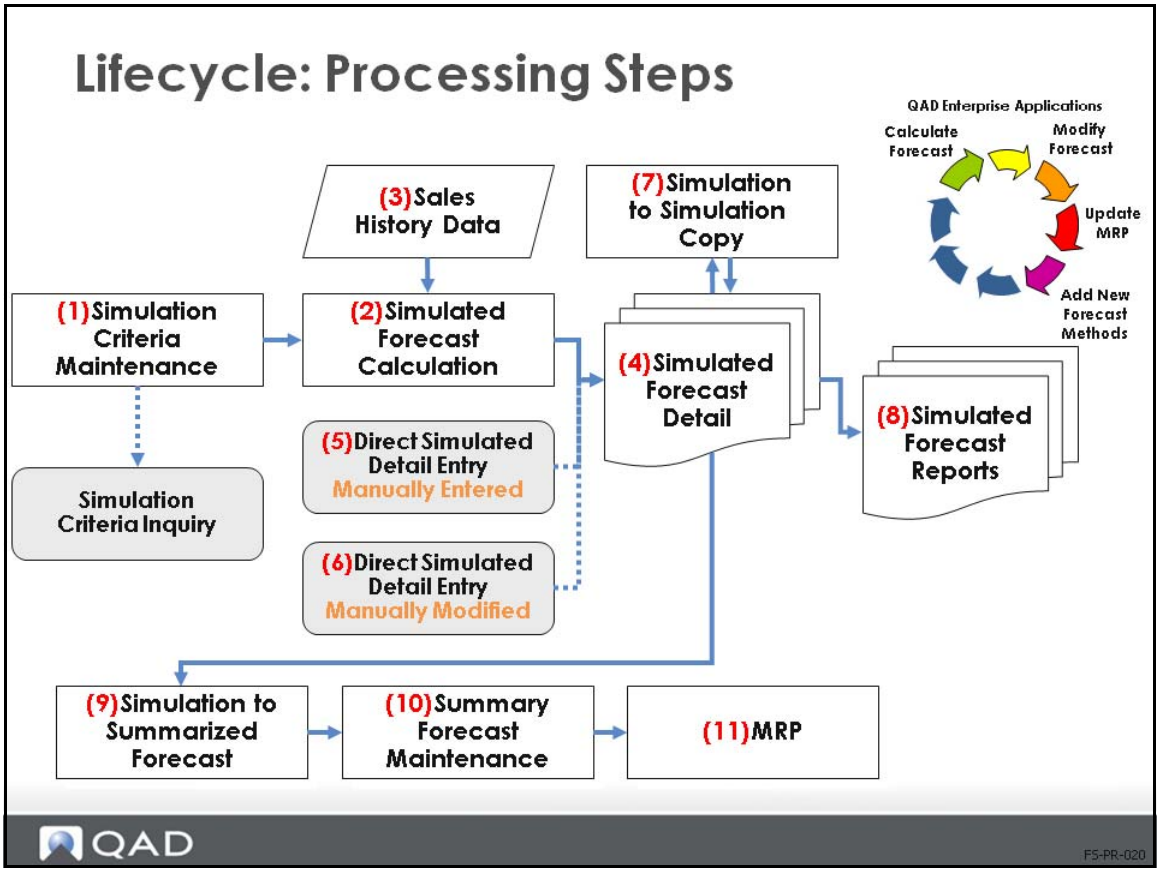

Forecast Simulation Setup: Summary
Sales Order Control
Simulation Criteria Maintenance
Identify Template
Specify Sales History Time Frame
Determine Calculation Method
Indicate Items for Forecast
Specify Customer Parameters
QAD Enterprise Applications
Calculate Forecast
Modify Forecast
Analyze History
Update MRP
Define Forecast Criteria
Add New Forecast Methods
QAD
FS-SU-420

Chapter 4

Forecast Simulation Processing

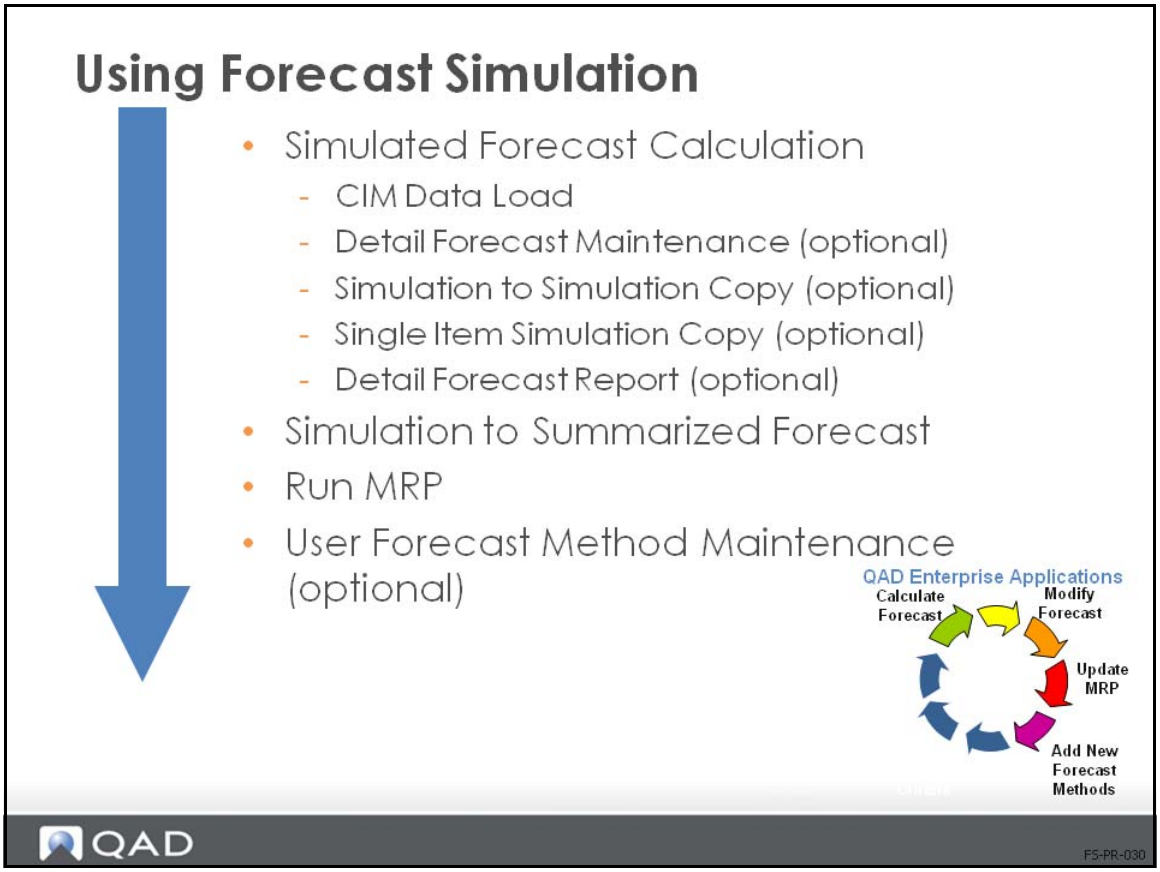

Use Forecast Simulation
In this section you learn how to:
Identify key business considerations before setting up Forecast Simulation in QAD Enterprise Applications
Set up Forecast Simulation in QAD Enterprise Applications
Use Forecast Simulation in QAD Enterprise Applications
QAD
FS-PR-010

Workflow: Processing Steps



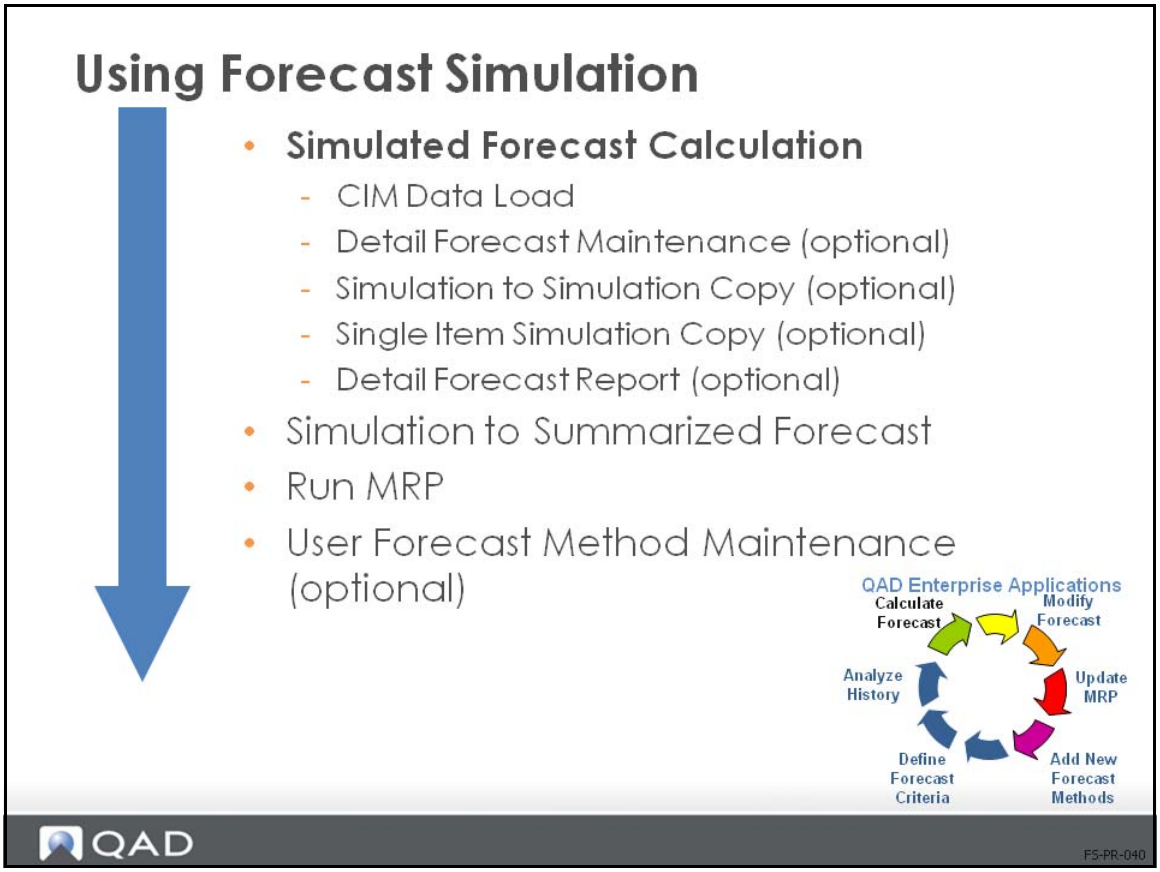
- The highlighted items in the lifecycle shown here are the steps performed while processing the forecasting simulation module
- Steps 4 and 8 shown here are results, not actions

Use Forecast Simulation



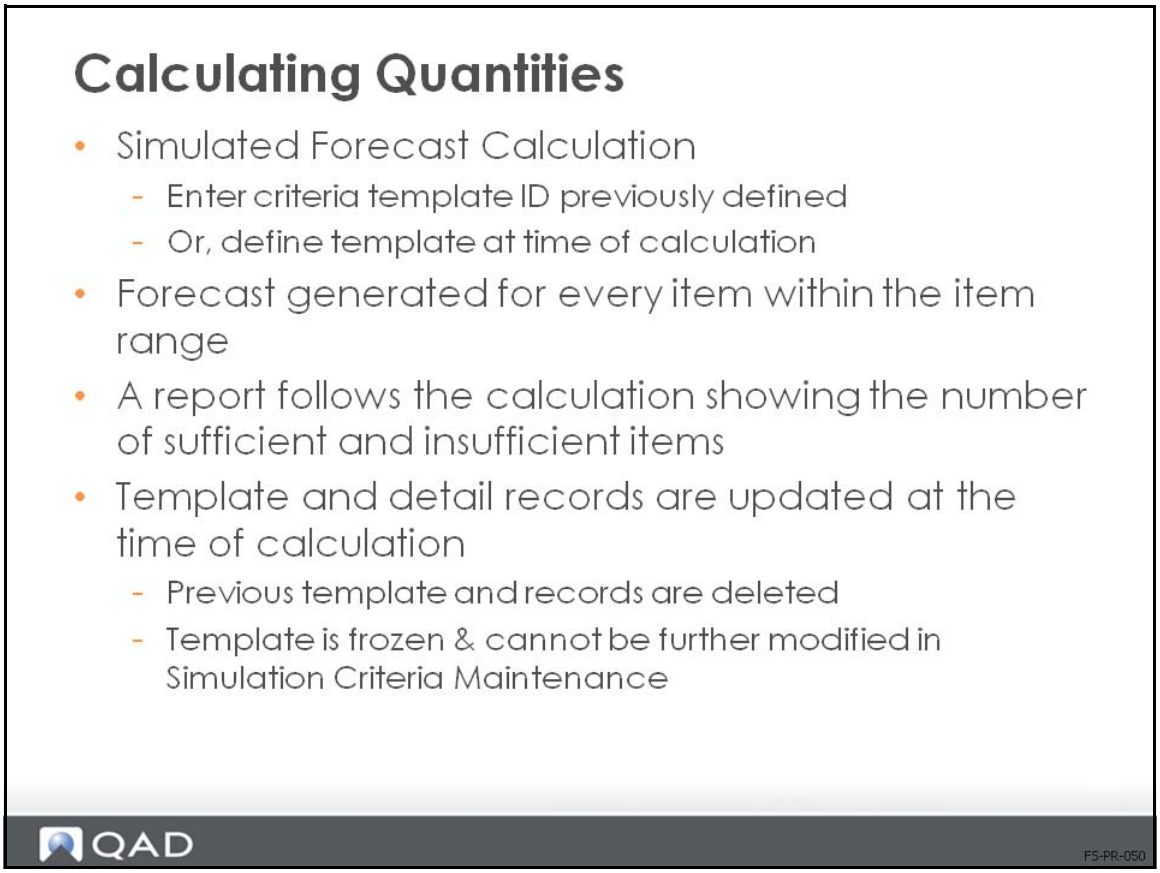
This illustration is a suggested processing sequence for Forecast Simulation based on information that flows from one type of data to another and prerequisites.

.Run Forecast Simulation Calculation



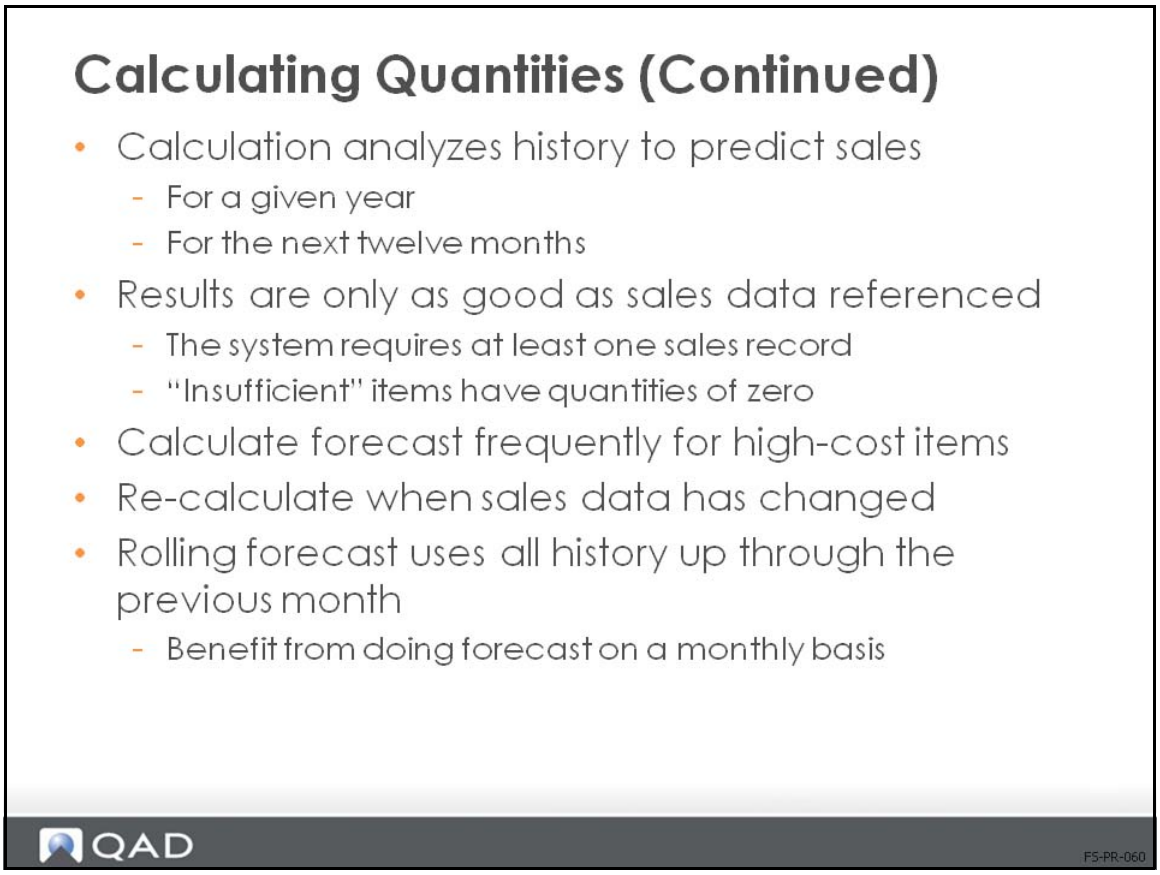
- Simulated Forecast Calculation analyzes an item's sales history and predicts what quantity will be sold in the future
- Forecast quantities are maintained in forecast detail records
- There are four ways to create a forecast detail record:
  - Run the forecast calculation using sales history and a 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



- 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.



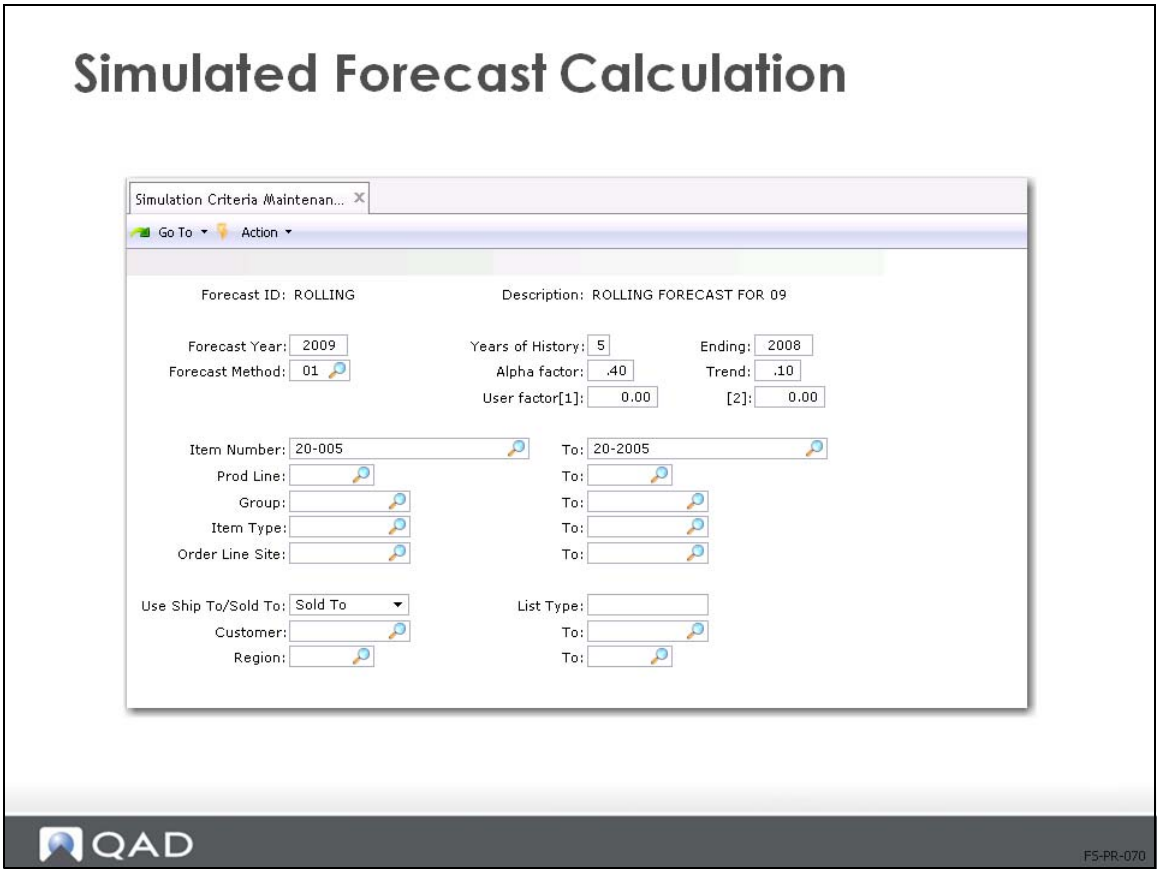
To generate a forecast:

1 Identify the criteria template. If a criteria template has not been 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.

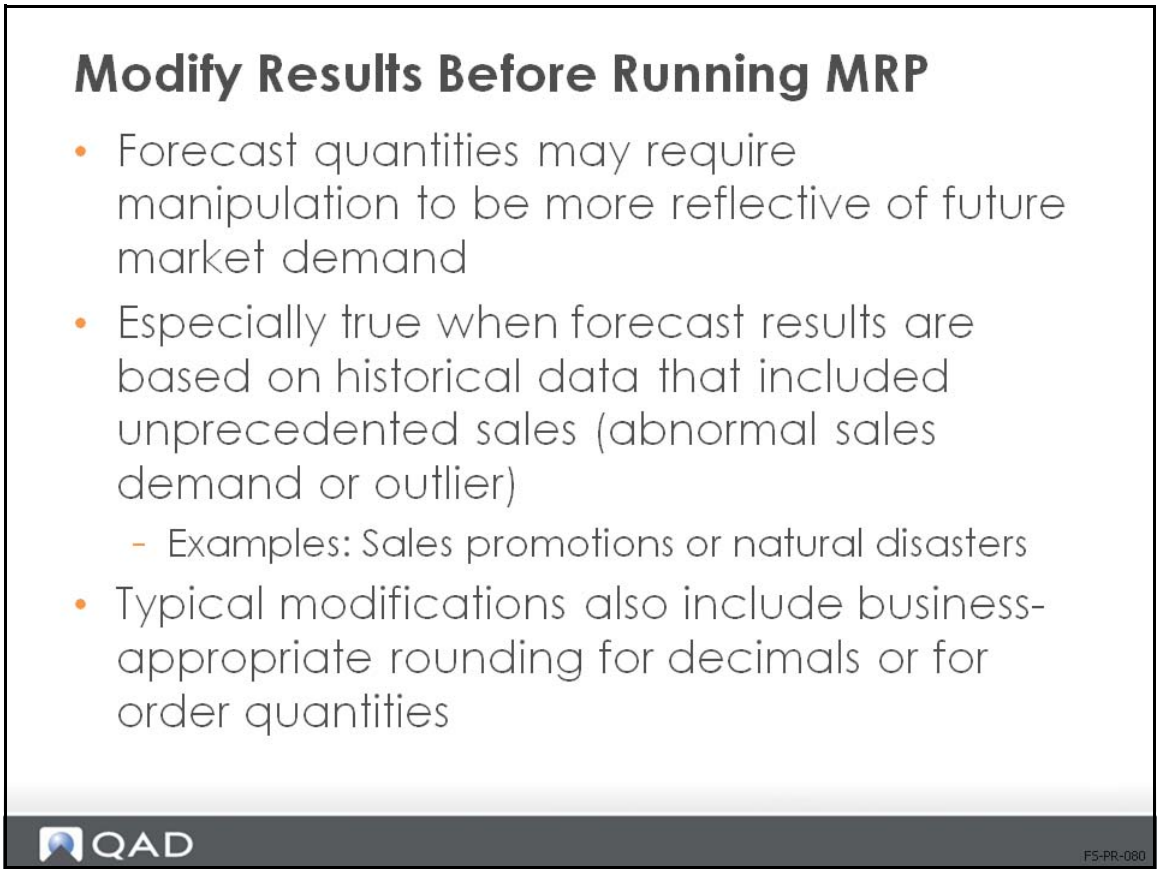
3 After the calculation is run, the template and detail records are updated. Previous templates and records are deleted. The template is frozen and cannot be further modified.

Simulation Forecast Calculation



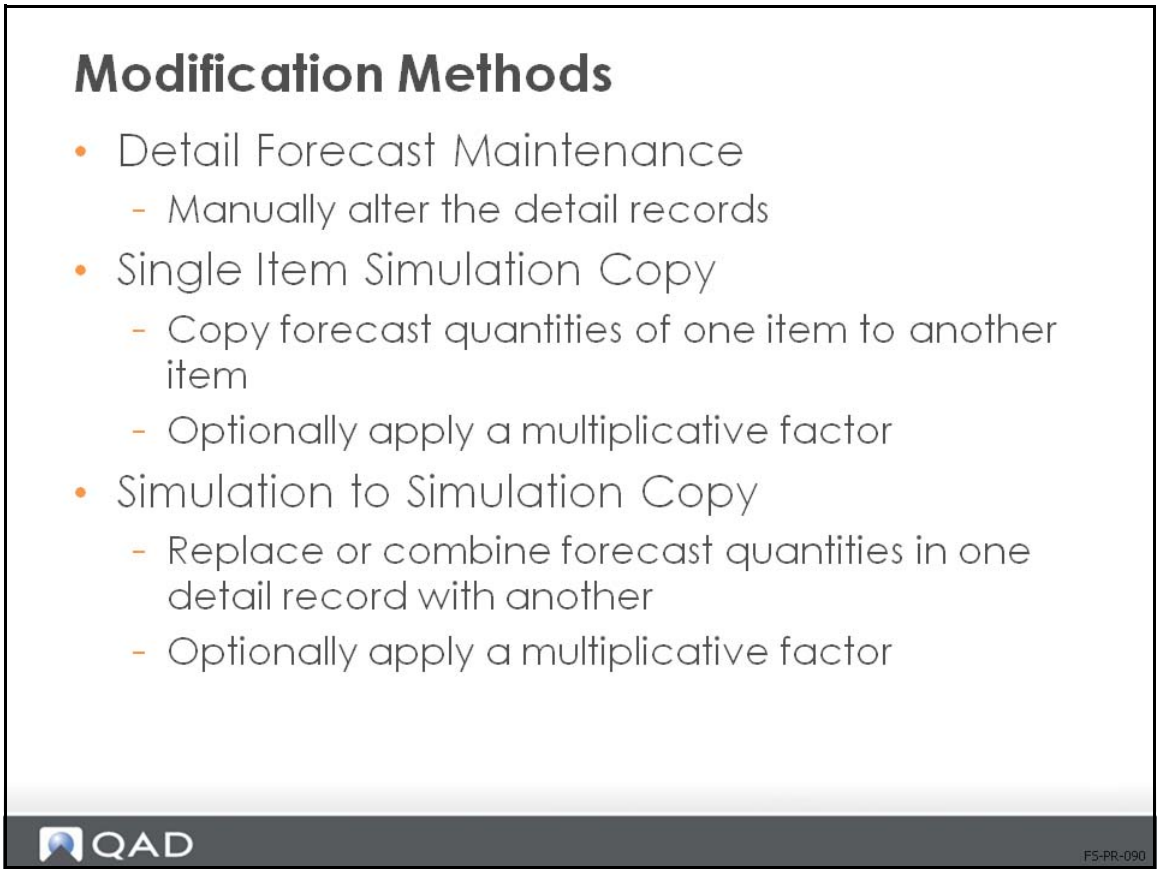
- Sales history data is analyzed to predict sales quantities for the year specified
- This calculation can take some time to process. Submit it in batch mode
- The calculation requires a criteria template
  - You can use the criteria template defined in Simulation Criteria Maintenance (22.7.1) and stored in the system by forecast ID
  - Or you can define the template here
- Items must exist in the item master
- When Ship-To and regions are defined to select the sales history data, only permanent Ship-To addresses in the address master 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, run the calculation again
- Control access to this function with security

Modifying Forecast Results



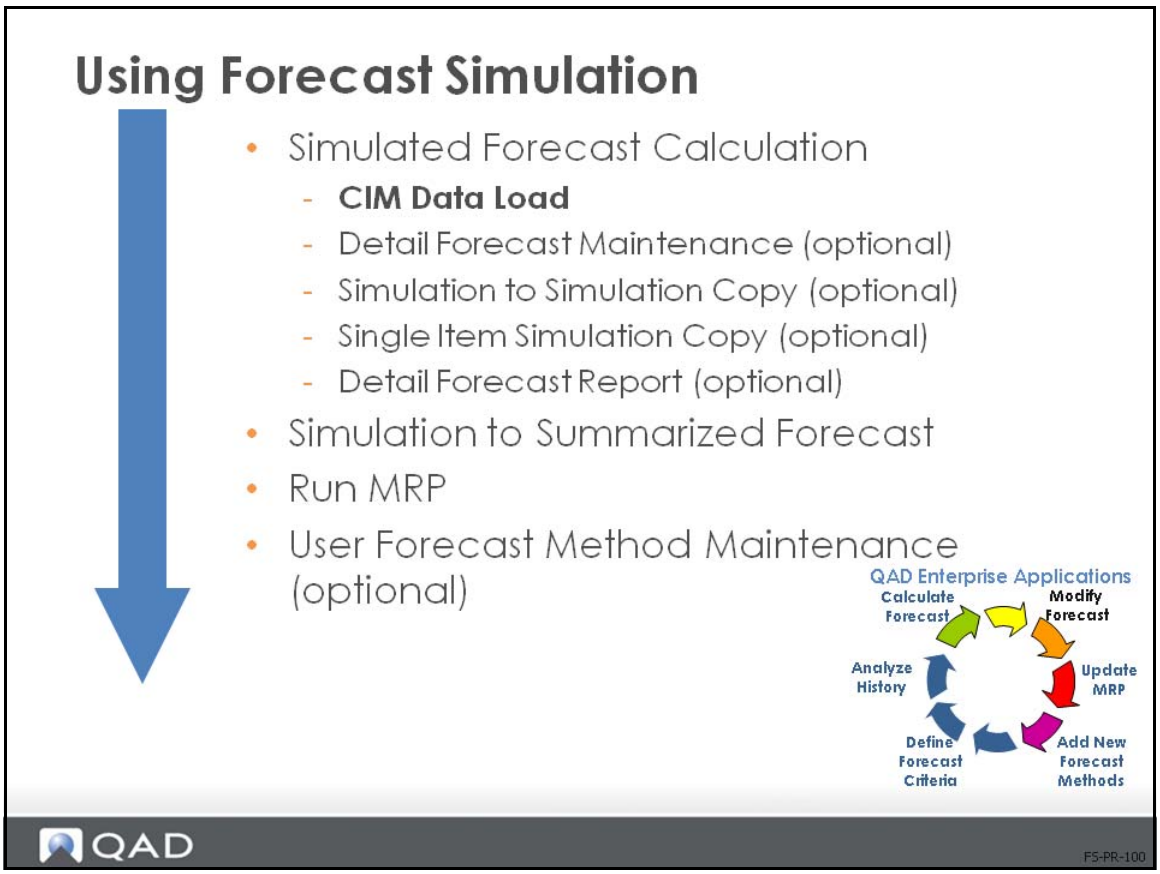
- Adjust the forecast results whenever there is a reason to expect future demand to differ from sales history
  - Abnormal sales demand (outlier)
  - Unwanted decimal sales quantities from calculations
- Adjust results before copying forecast quantities to MRP

Modification Methods



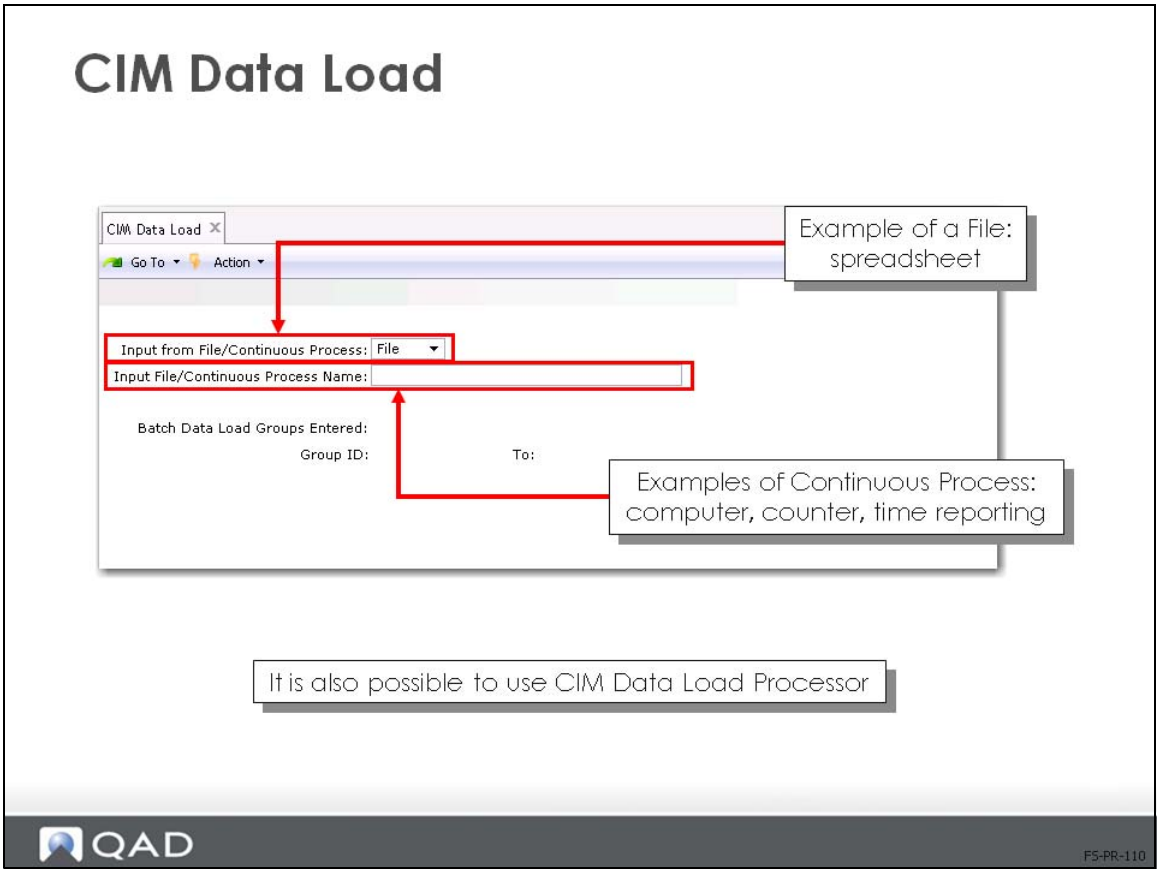
- Three most common ways to adjust forecast quantities manually are:
  - Detail Forecast Maintenance (22.7.7)
  - Simulation to Simulation Copy (22.7.11)
  - Single Item Simulation Copy (22.7.12)
- You can also load forecast records from outside QAD Enterprise Applications with a CIM load

Load Forecast



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 database for processing. Import data can be in ASCII file format or acquired in real time. Each import record's data must be in the sequence it would be when you were entering it manually using a QAD Enterprise Applications maintenance function.

The CIM process has several steps:

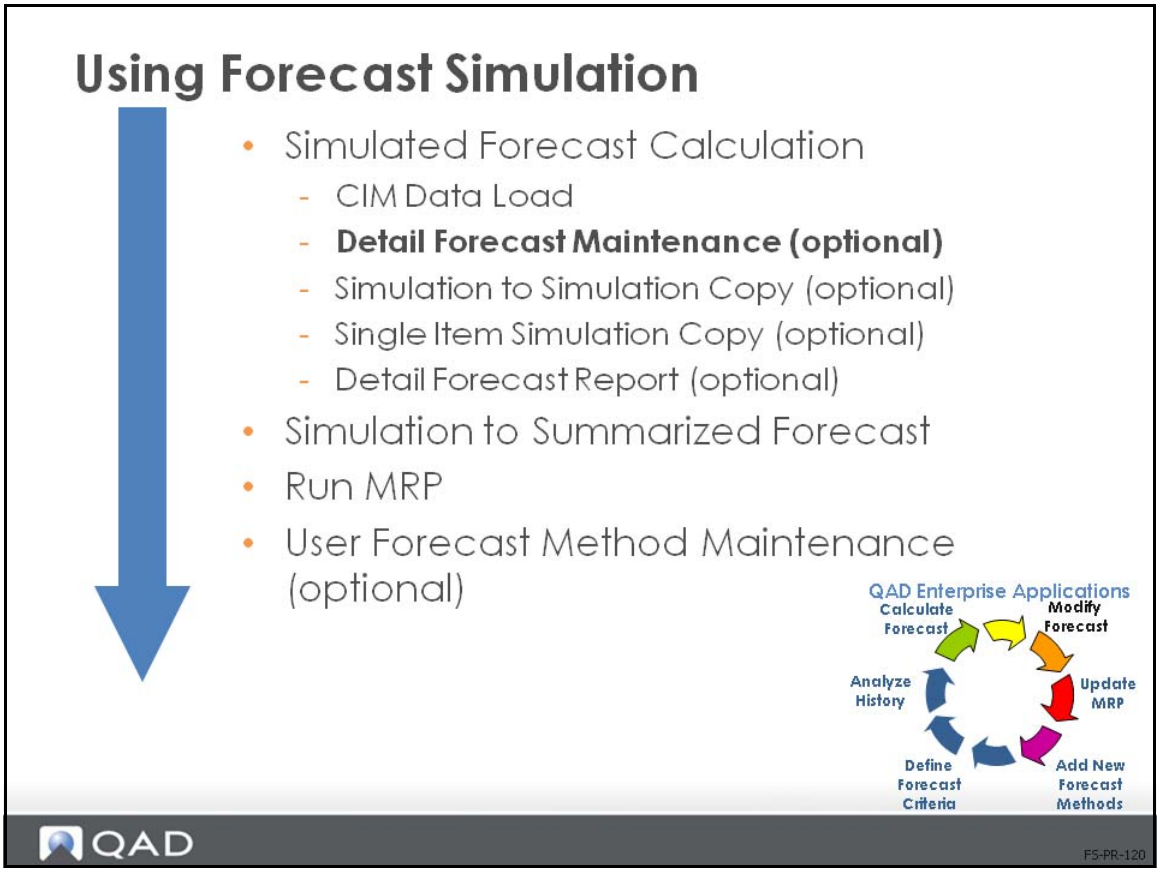
1. Run CIM Data Load (36.15.1) to load the external data you specify into batch load data files
2. Specify which data to load by file name, if applicable, and data type—either a prepared file or real-time process
3. Run CIM Data Load Processor (36.15.2) to take the imported data and update the appropriate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

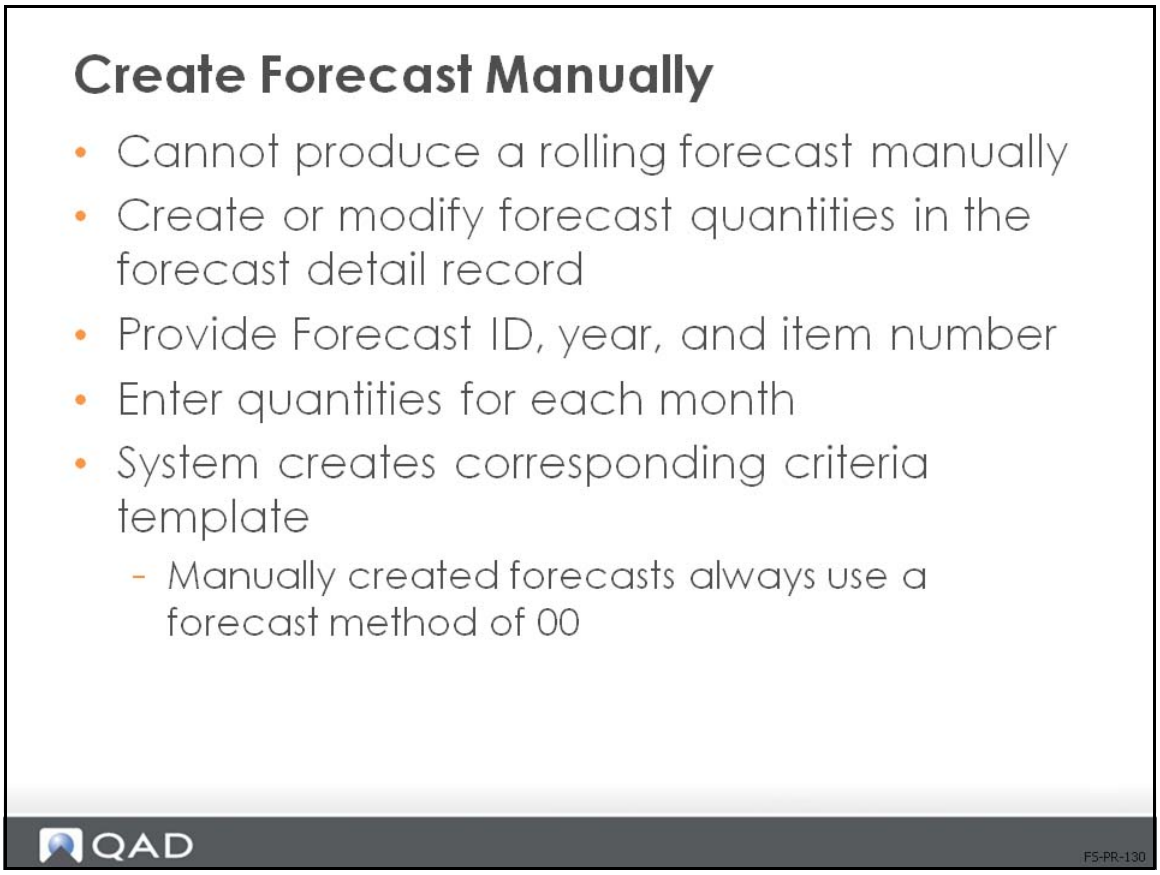
CIM Data Load (36.15.1) does not automatically format data; pre-formatting of input files is required.

Create Forecast Manually



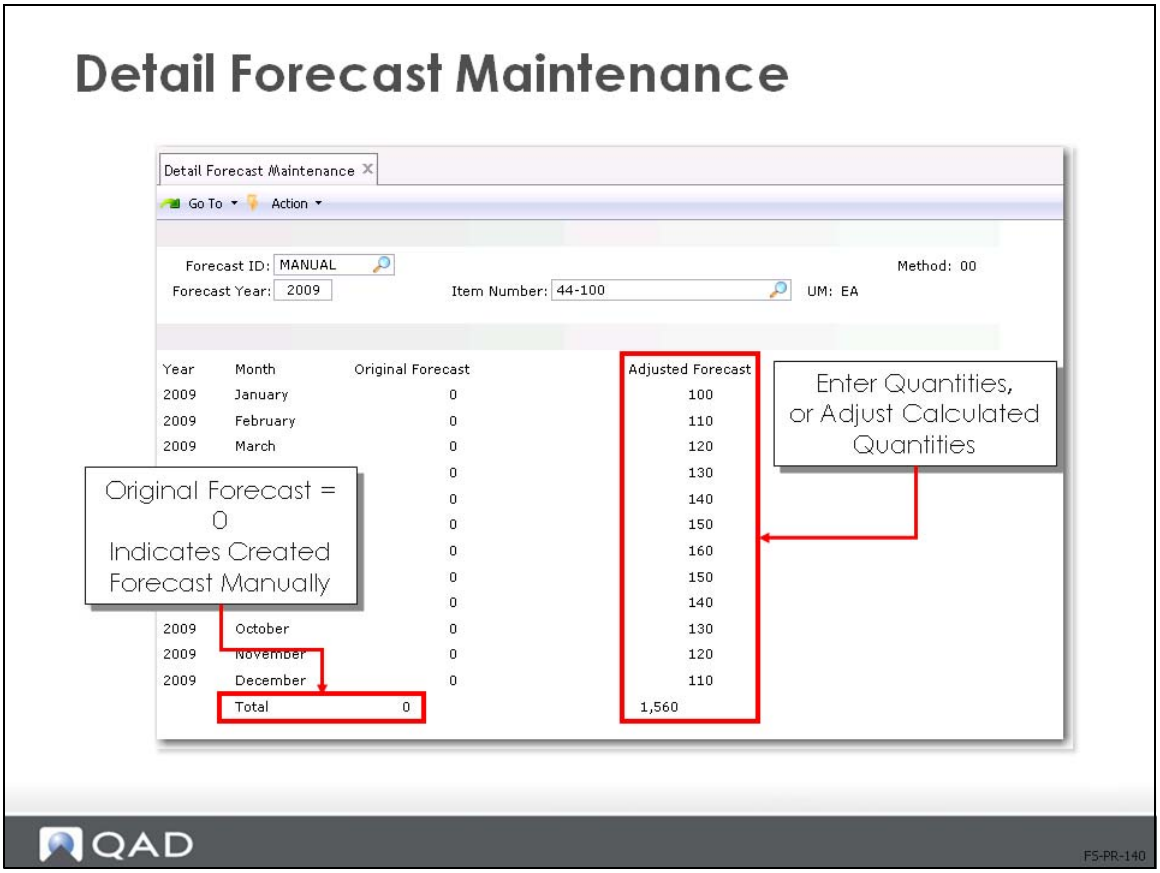
- Manual adjustments to forecast quantities are often made to reflect the experience of management in predicting future demand
- Enables you to adjust and aggregate forecast

Guidelines for Creating Records Manually



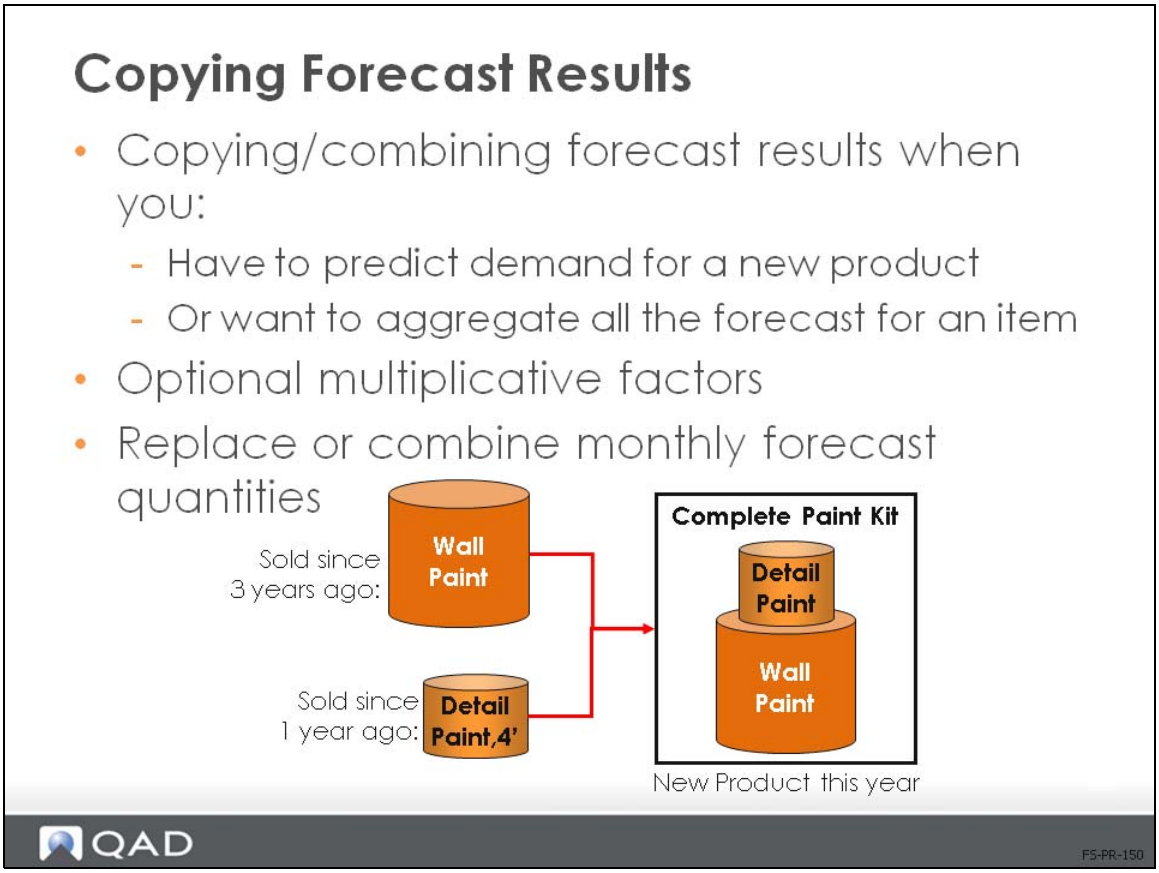
- Records are created for January through December, therefore limiting the forecast to a yearly forecast
- You can create new records, or modify records from a CIM Load or the Run Forecast Simulation Calculation
- Still must provide the forecast template criteria: ID, year, and items
- Calculation is 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



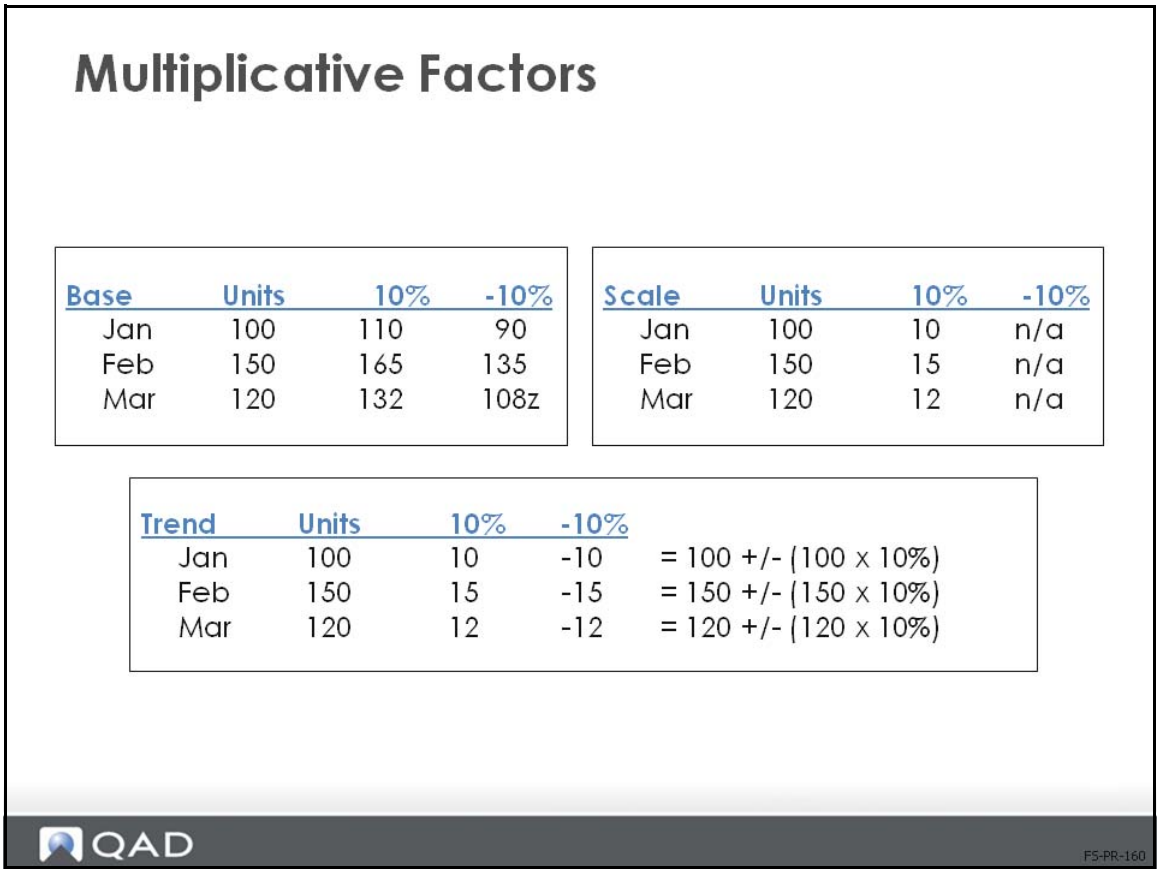
- Cannot manually create a rolling forecast, only yearly
- Simulated Forecast or CIM Data Load (36.15.1) generate the original forecast quantities
  - Run the calculation again to reproduce original forecast
- The Adjusted Forecast quantity column is where you manually change the original results
  -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

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

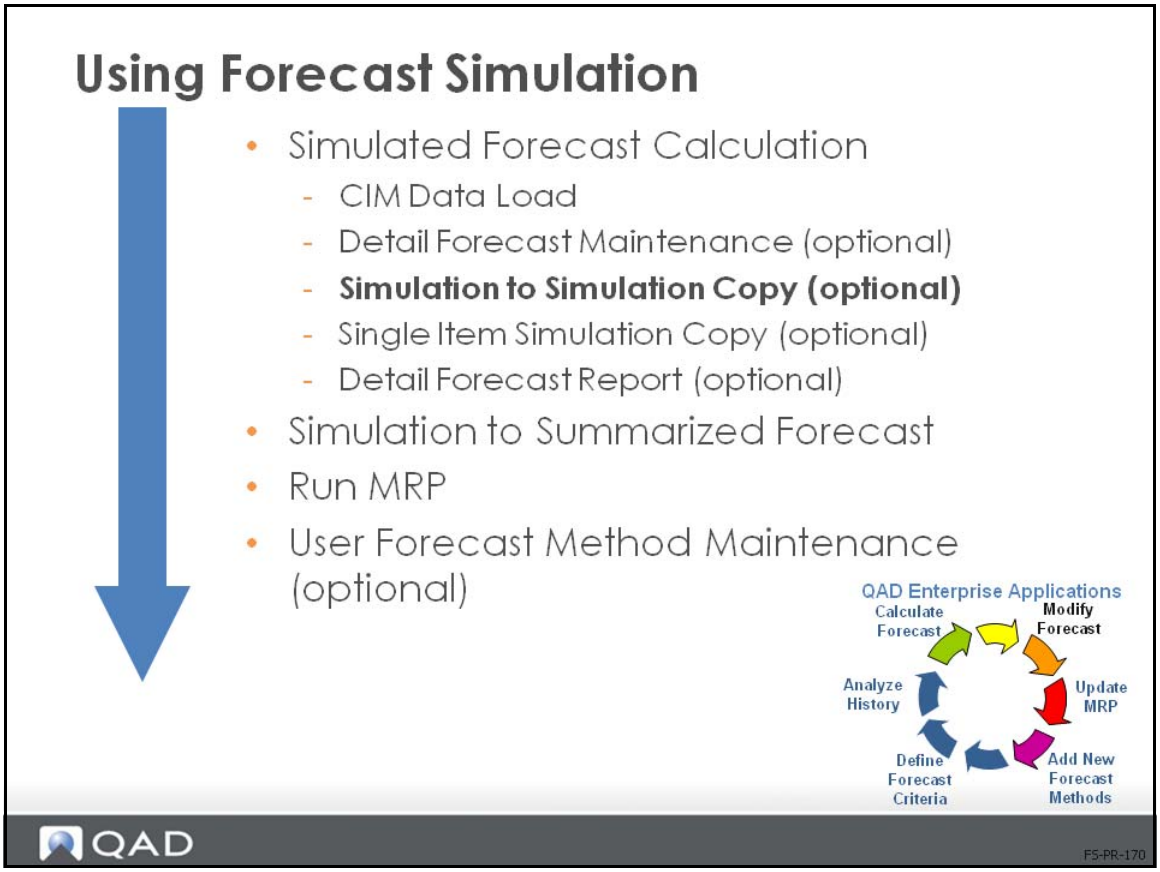


- Single Item Simulation Copy (22.7.12) lets you scale forecast results for the new item as some percentage of the old item
- Simulation to Simulation Copy (22.7.11) enables you to apply multipliers to the entire item range

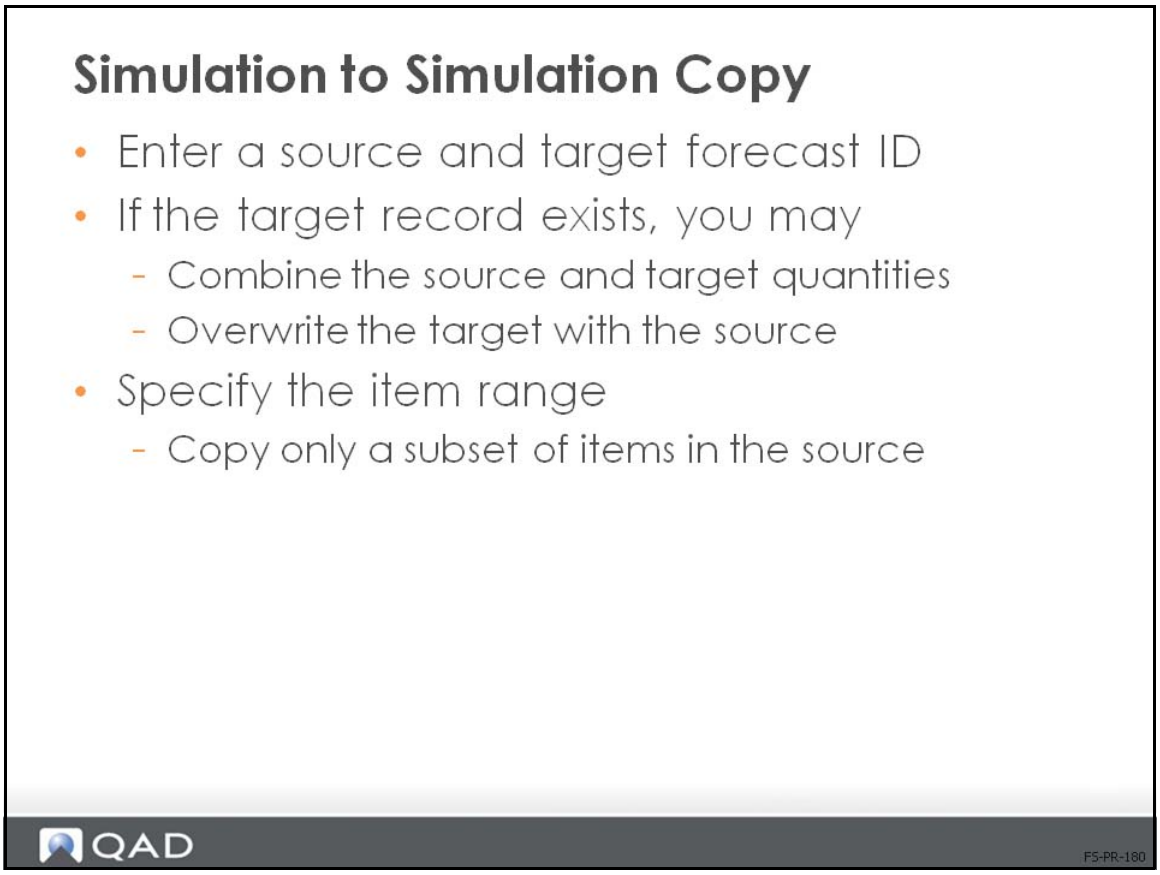
Note Scale cannot be negative.

- 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

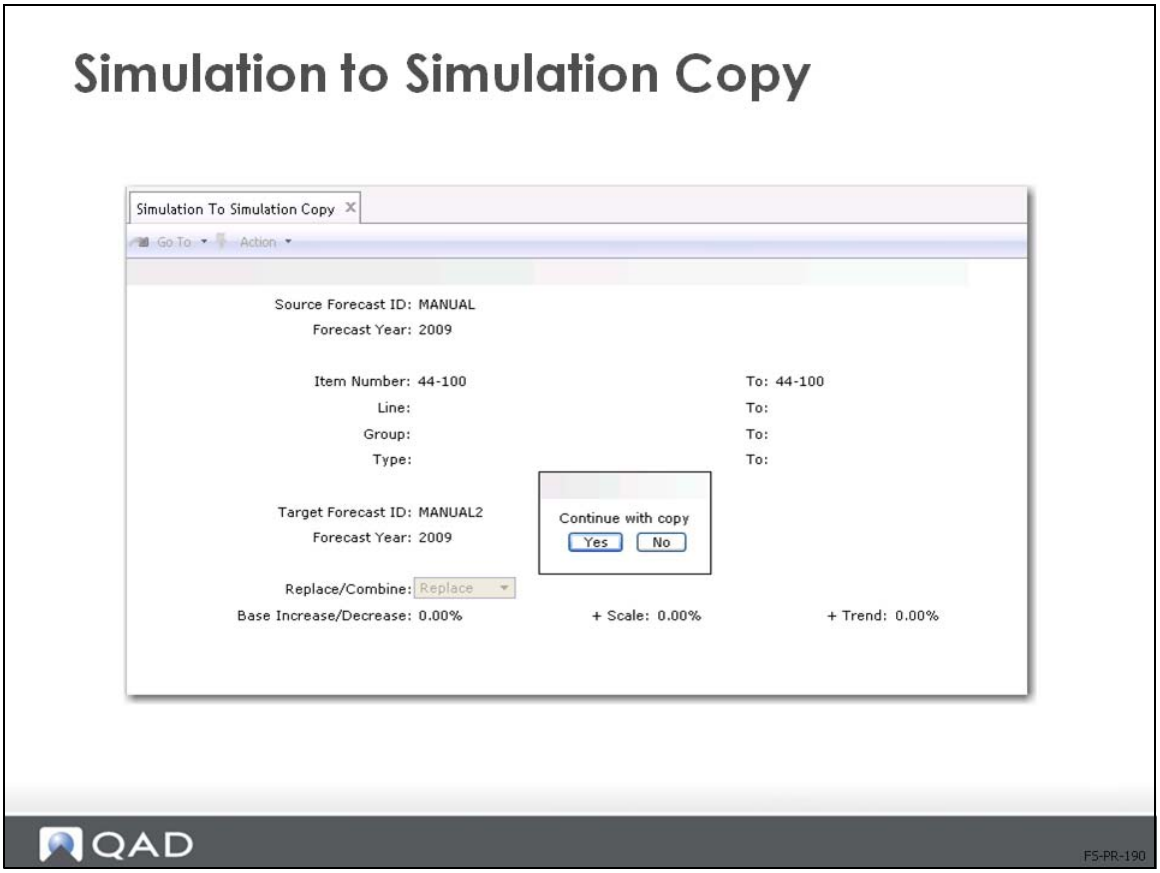


- There are two ways to copy a forecast
  - Simulation to Simulation Copy (22.7.11) and
  - Single Item Simulation Copy (22.7.12)



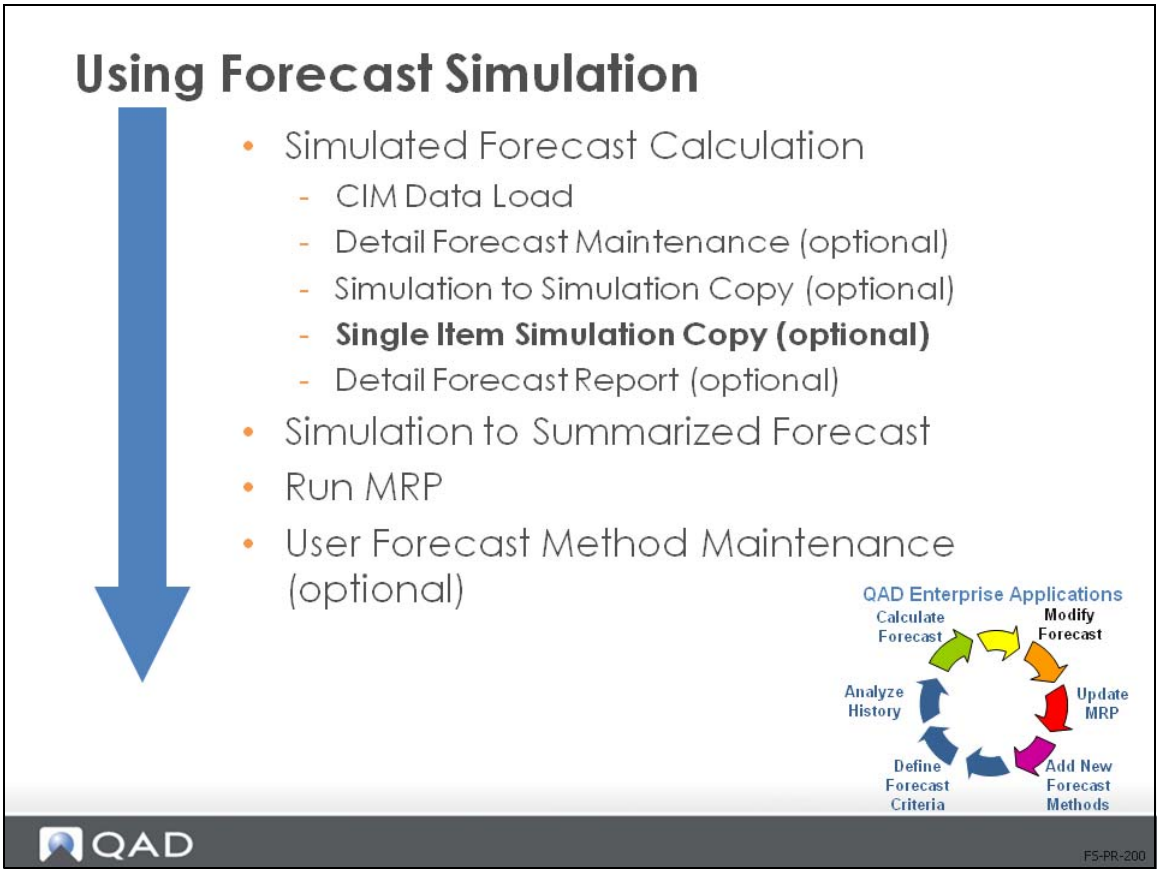
- Enables you to copy (replace) or combine criteria temples and/or detail records
  - Valuable when you aggregating forecasts
  - Targets are changed/overwritten, source remains unchanged
  - If item ranges of target and source are different, the target range is expanded

Simulation to Simulation Copy

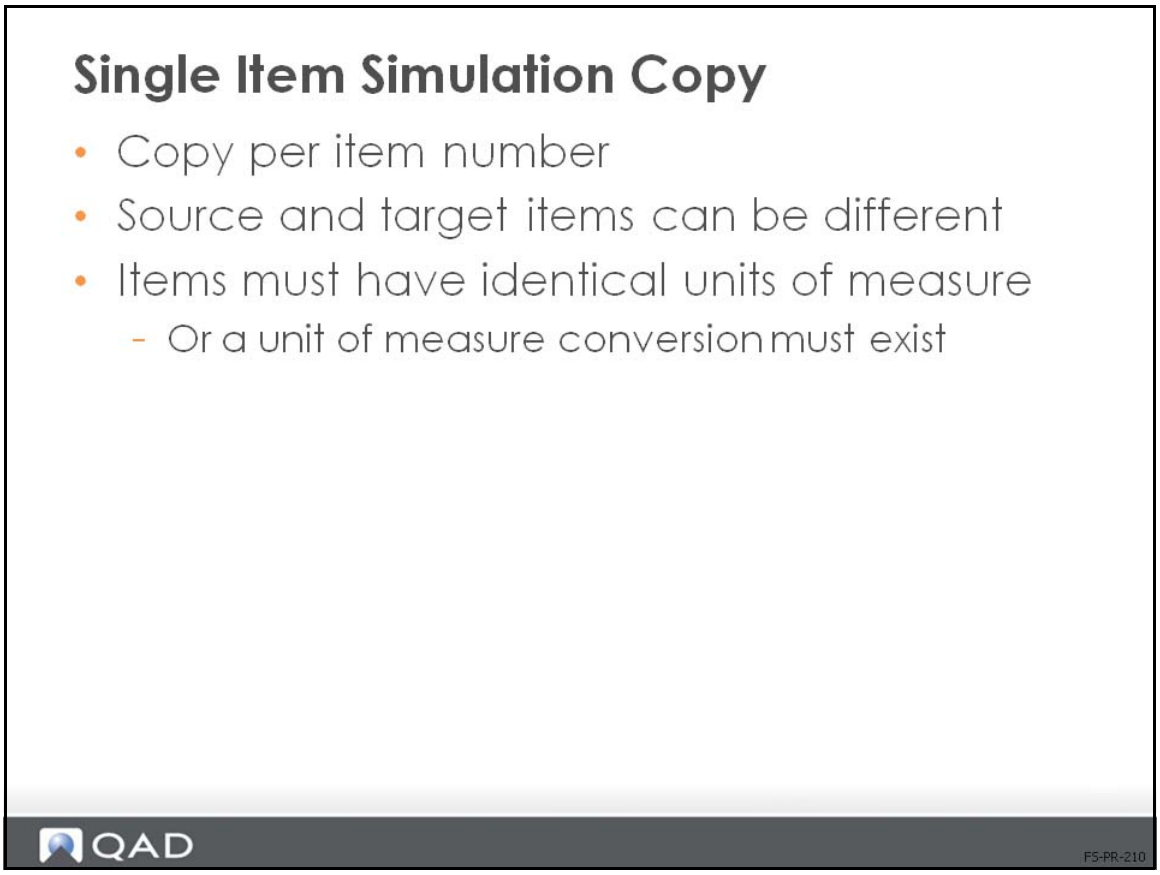


- Choose between replacing or combining forecast quantities
- If target forecast record exists, must use forecast method 00 for target
  - If target does not exist, record is created with method 00
- View the results in Detail Forecast Inquiry (22.7.8) or Detail Forecast Report (22.7.9)

Single Item Simulation Copy



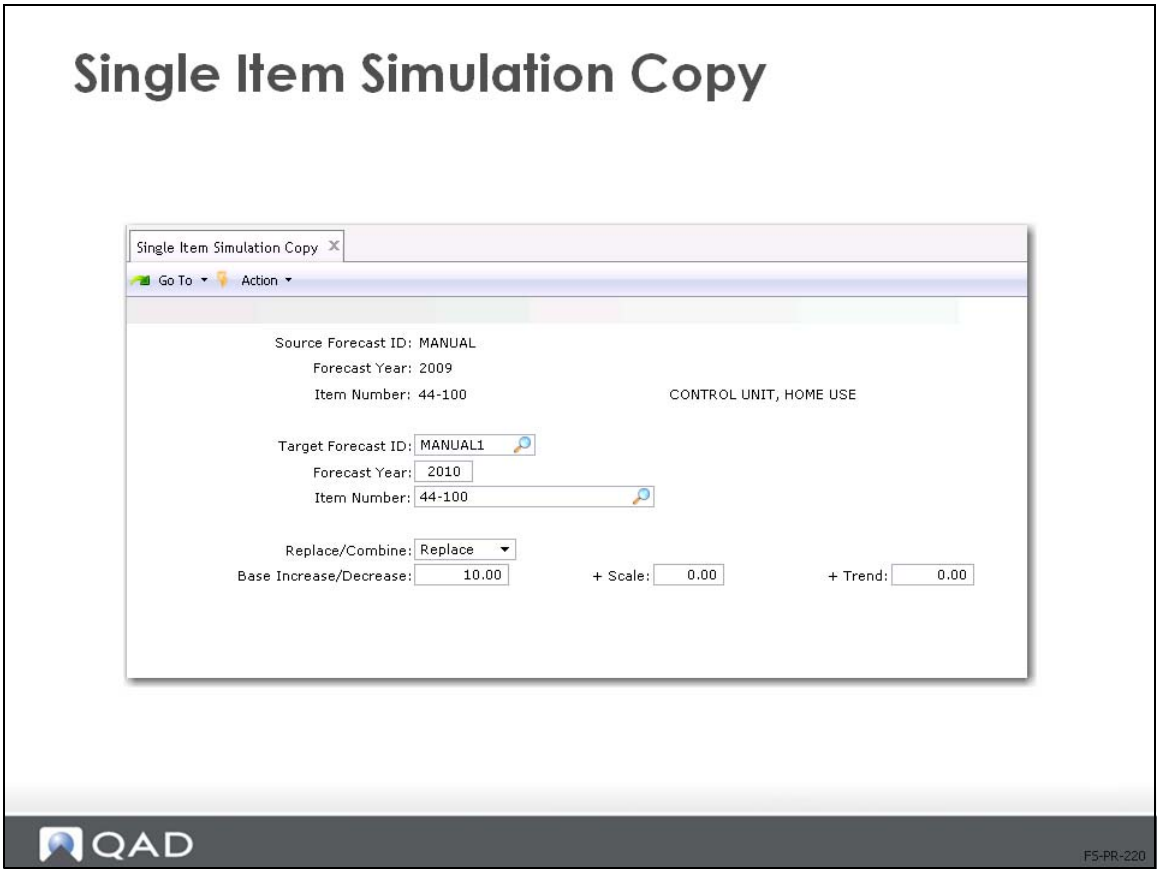
- The second method for copying forecasts copies sales history from one item to another
- Helpful for new items that have similar sales patterns as existing items



- 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

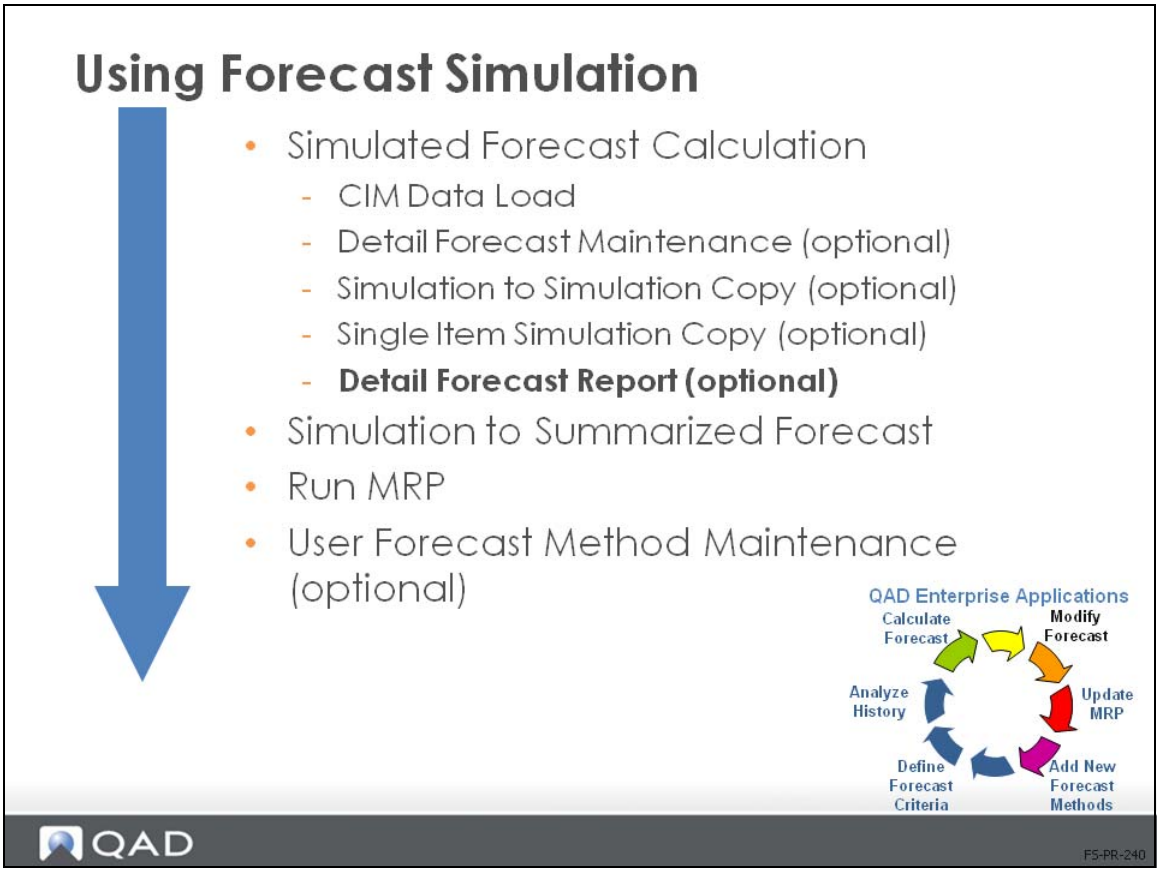


- Use this function to create forecast for a new item based on historical sales of another item
- This function is similar to Simulation-to-Simulation Copy (22.7.11), but here forecast records are copied for a single item
  - The source record for an item is copied to another forecast ID with a different 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 when 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 Control this function with a password.

Important Be cautious when copying/combining forecast results. From a statistical point of view, the result is not a valid forecast. Aggregate/combine historical sales data before doing the forecast calculation. Multipliers are applied to the source quantity before replacing or adding to the target quantity.

Detail Forecast Report




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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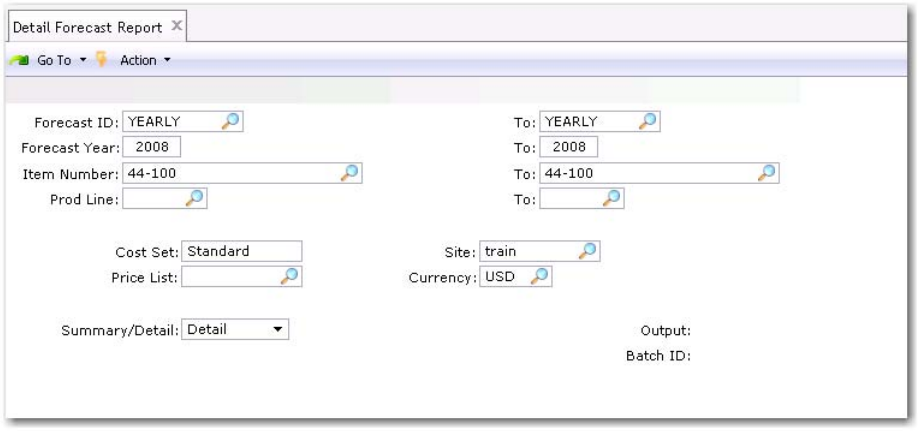
FS-PR-250

Detail Forecast Report



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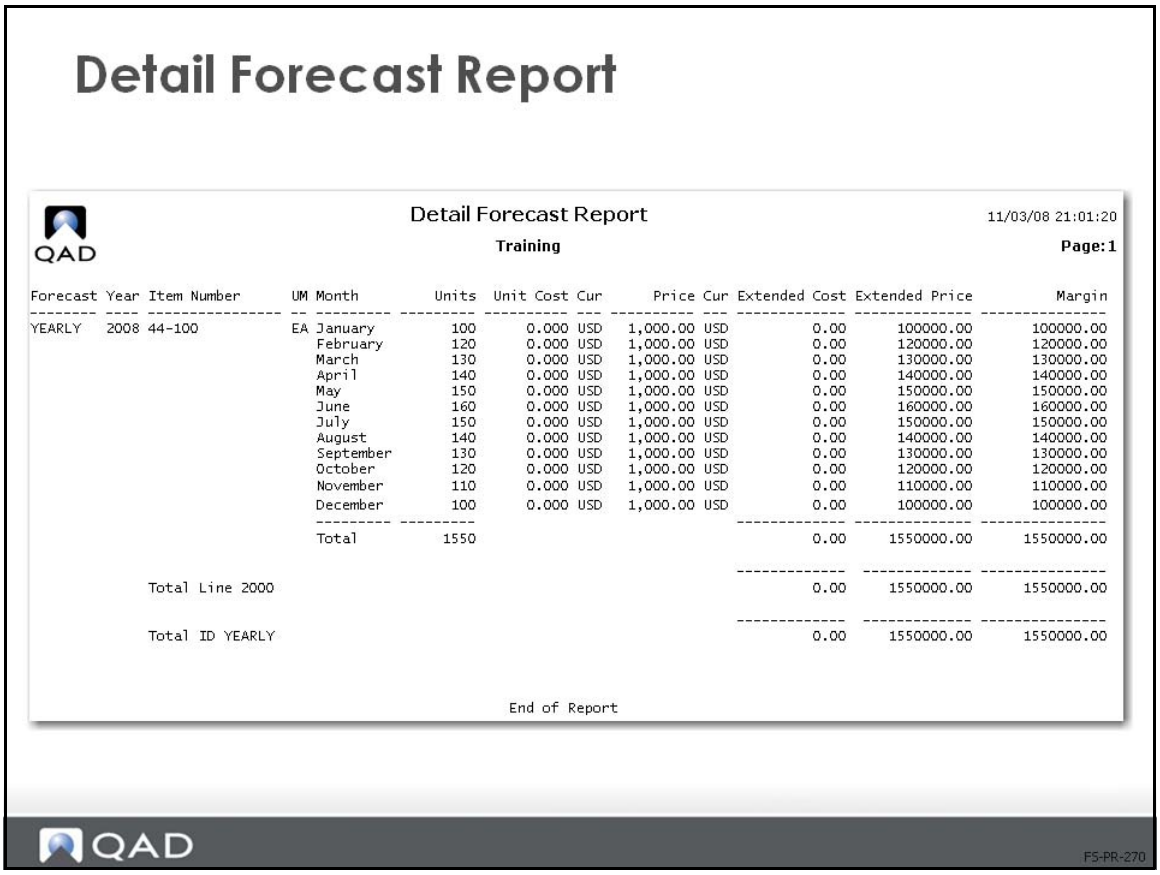
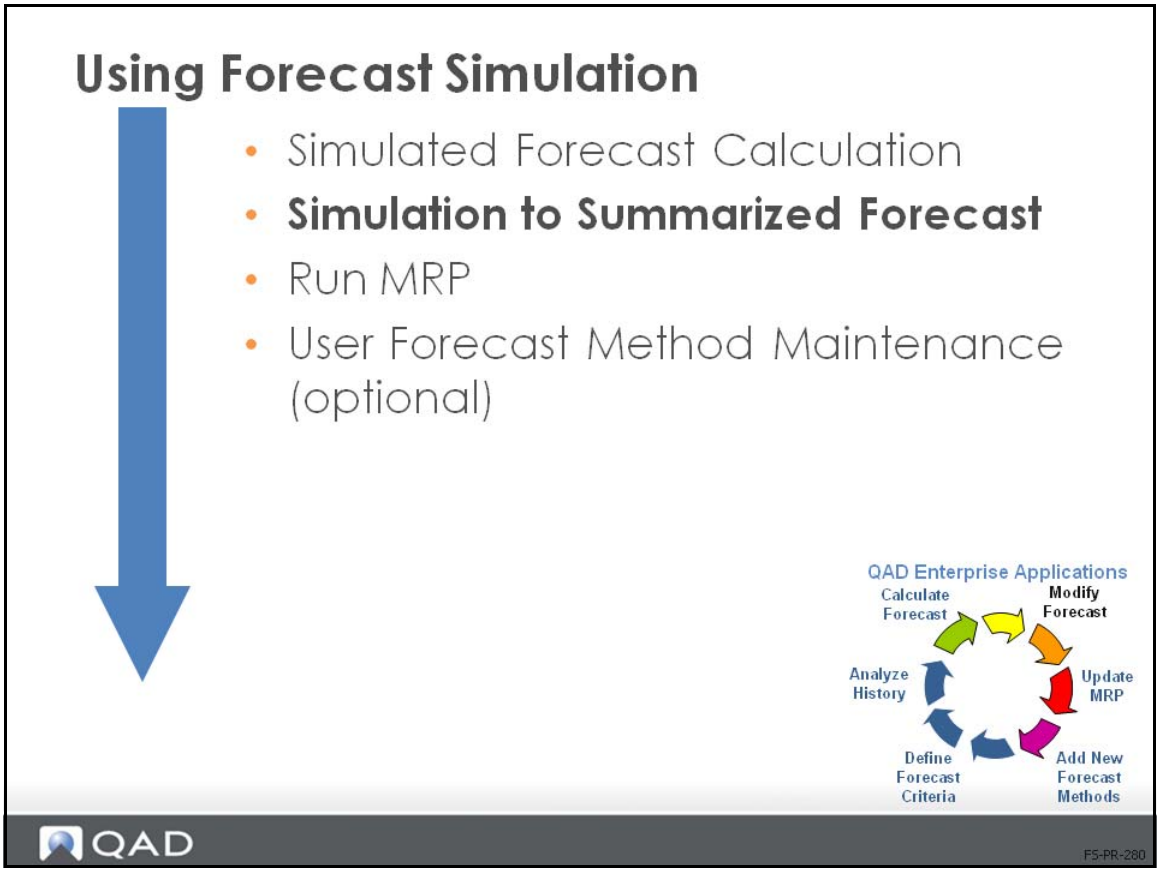
FS-PR-260



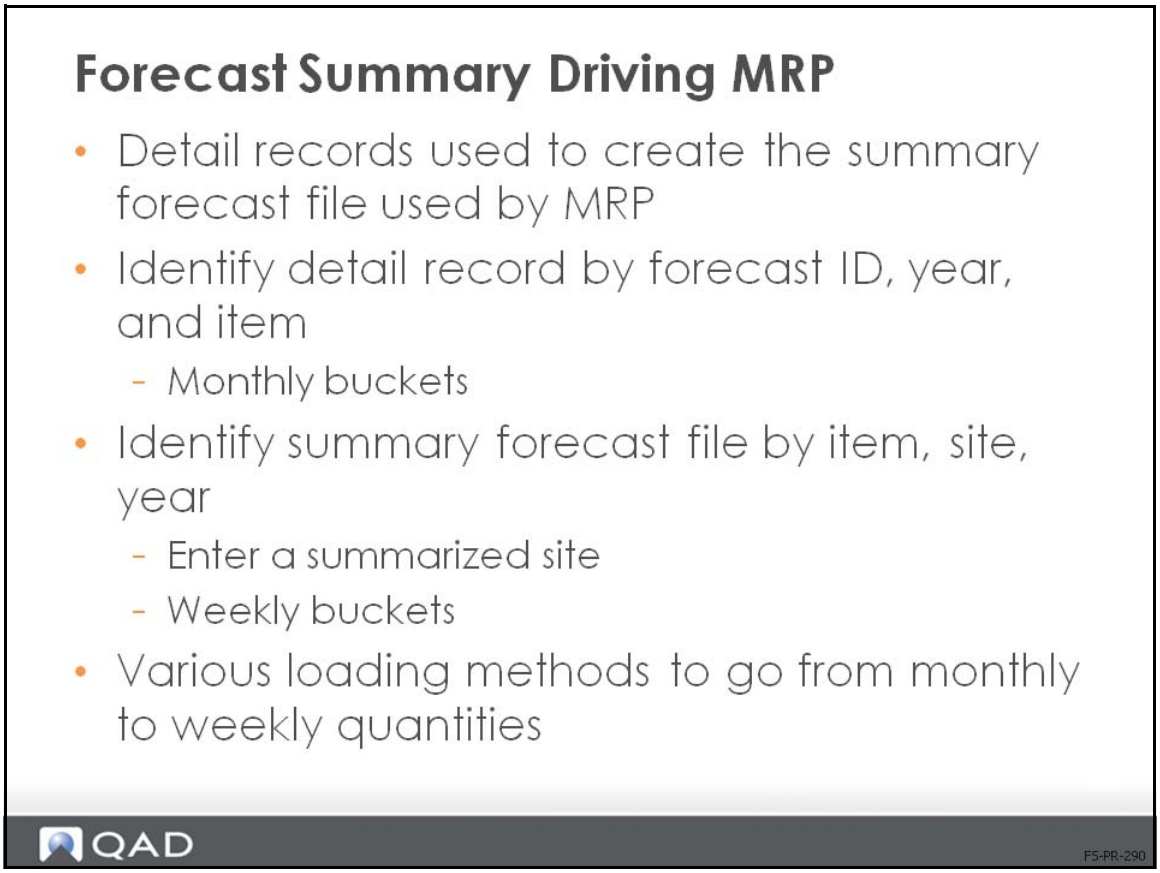
- Sample report data

Forecast Summary



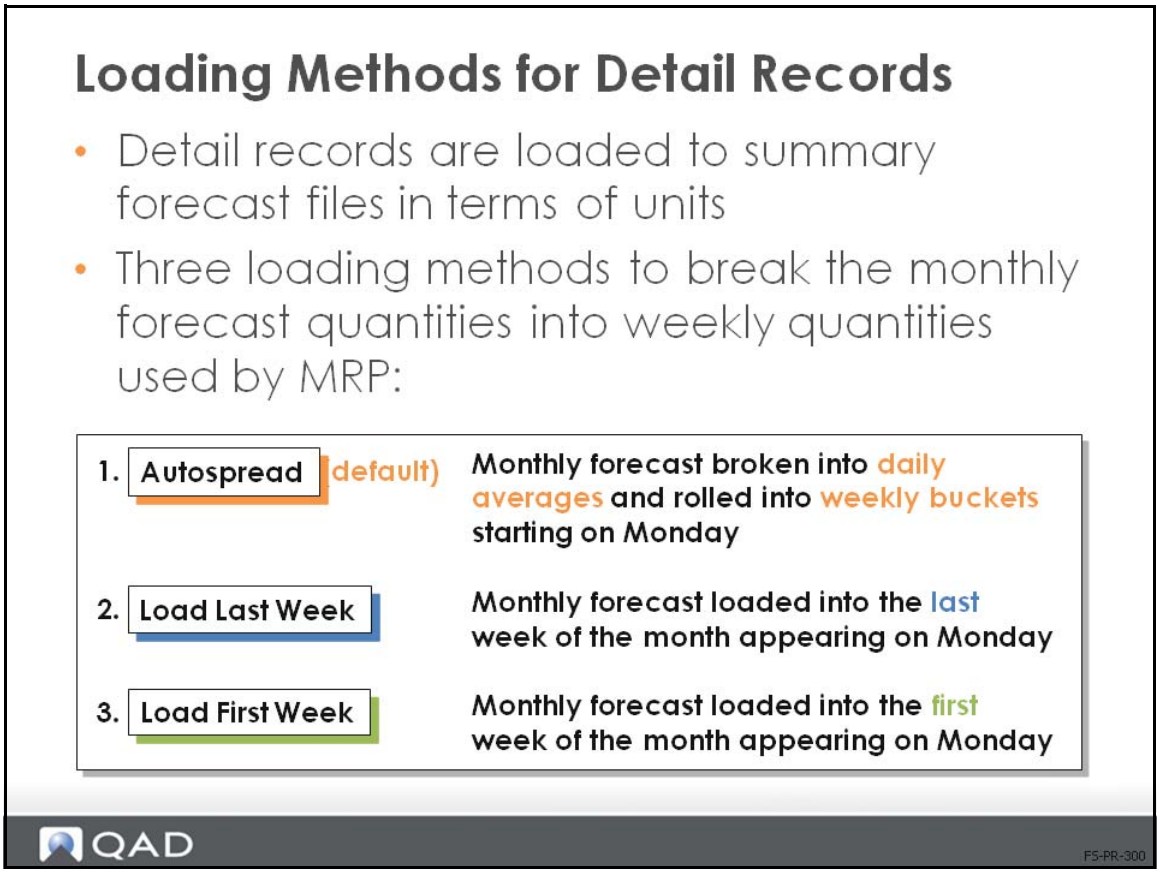
- The forecasted demand is used to drive MRP
- Simulation to Summarized Forecast (22.7.13) loads forecast quantities to the summary forecast file MRP uses

Driving MRP

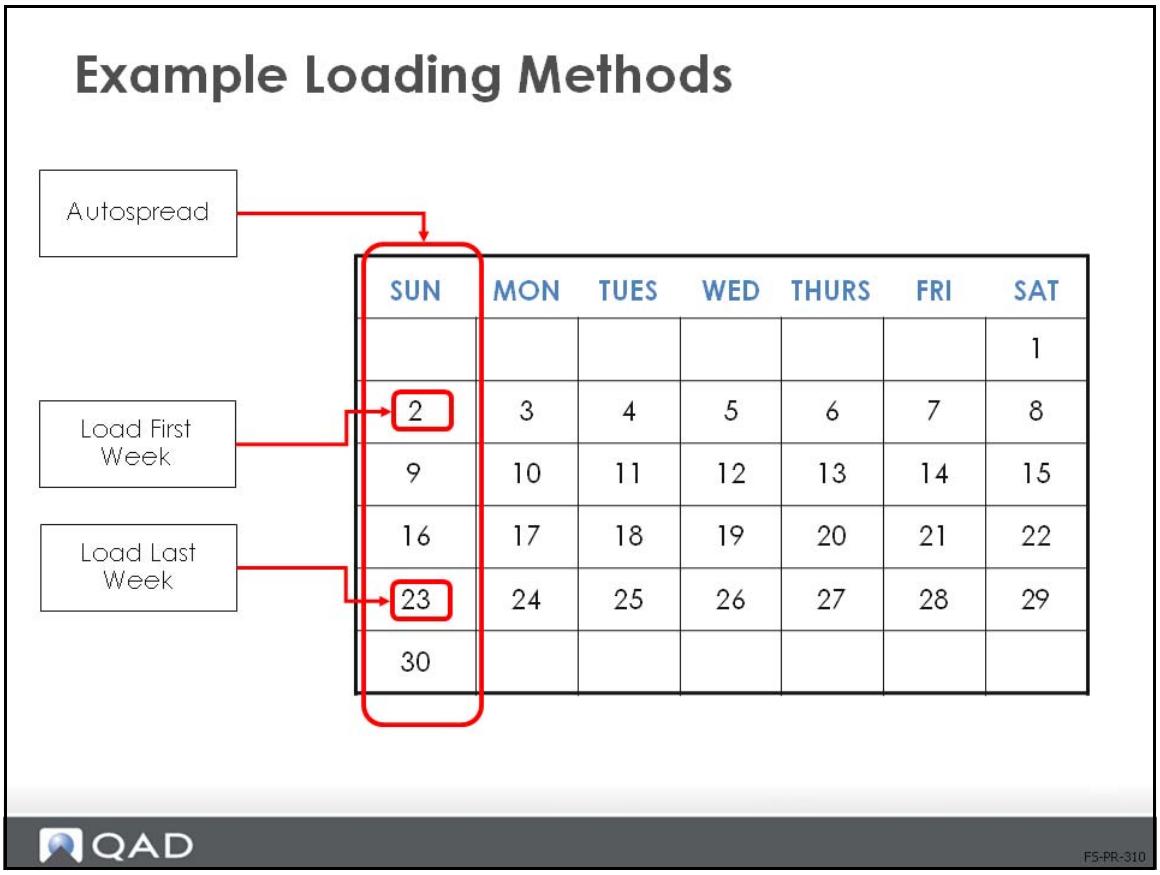


- All calculations have been run and modified, as necessary
- The detail records are summarized into one file for the MRP calculation

Loading Methods

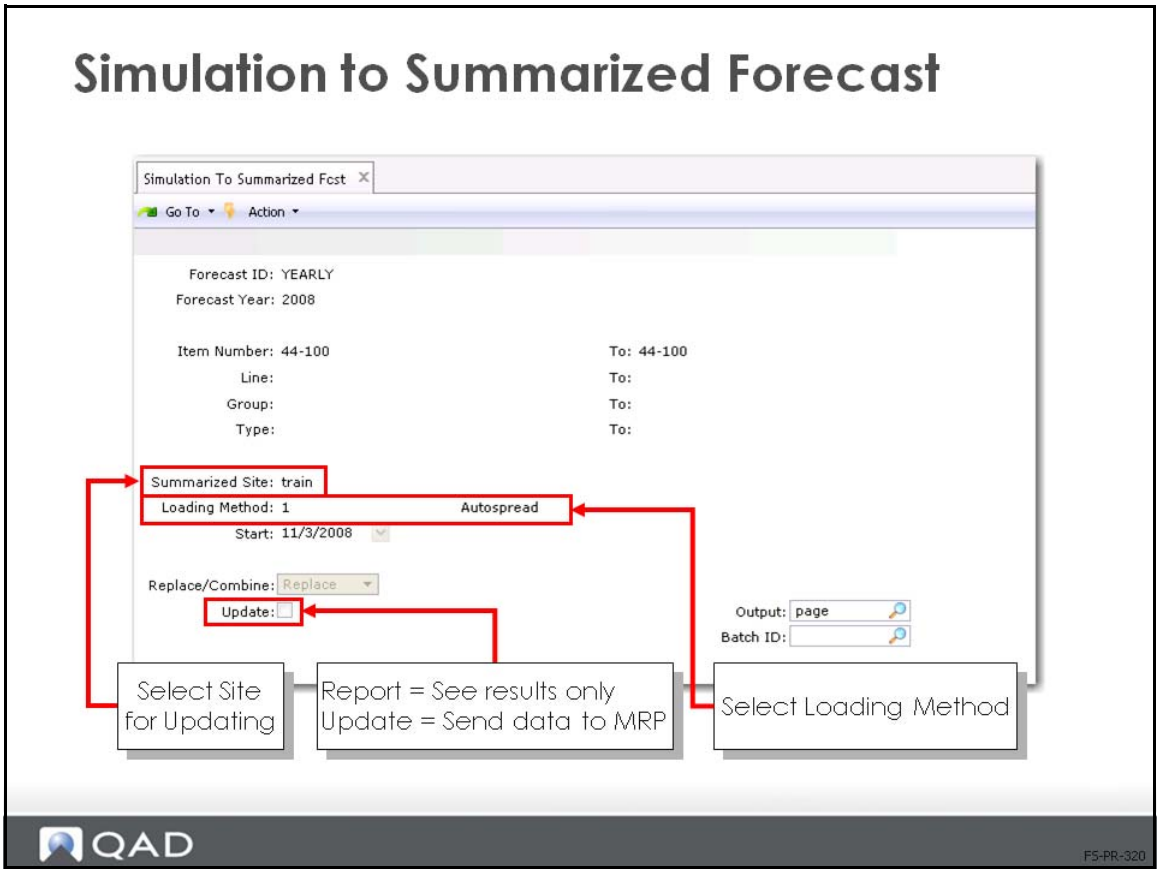


- Monthly buckets are loaded as weekly buckets for the MRP calculation



- 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

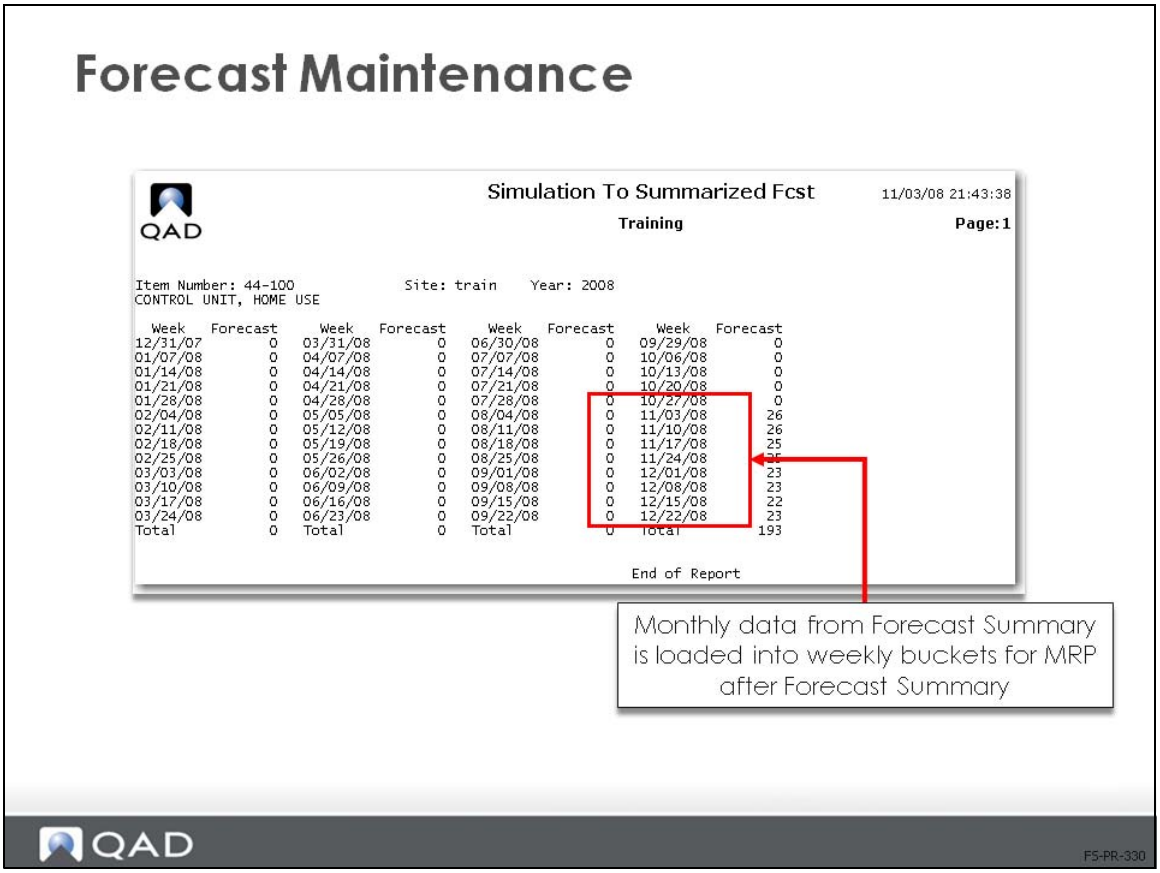


- Forecast detail records are used to create, replace, or combine summary forecast files
- Select a summarized site for updating

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

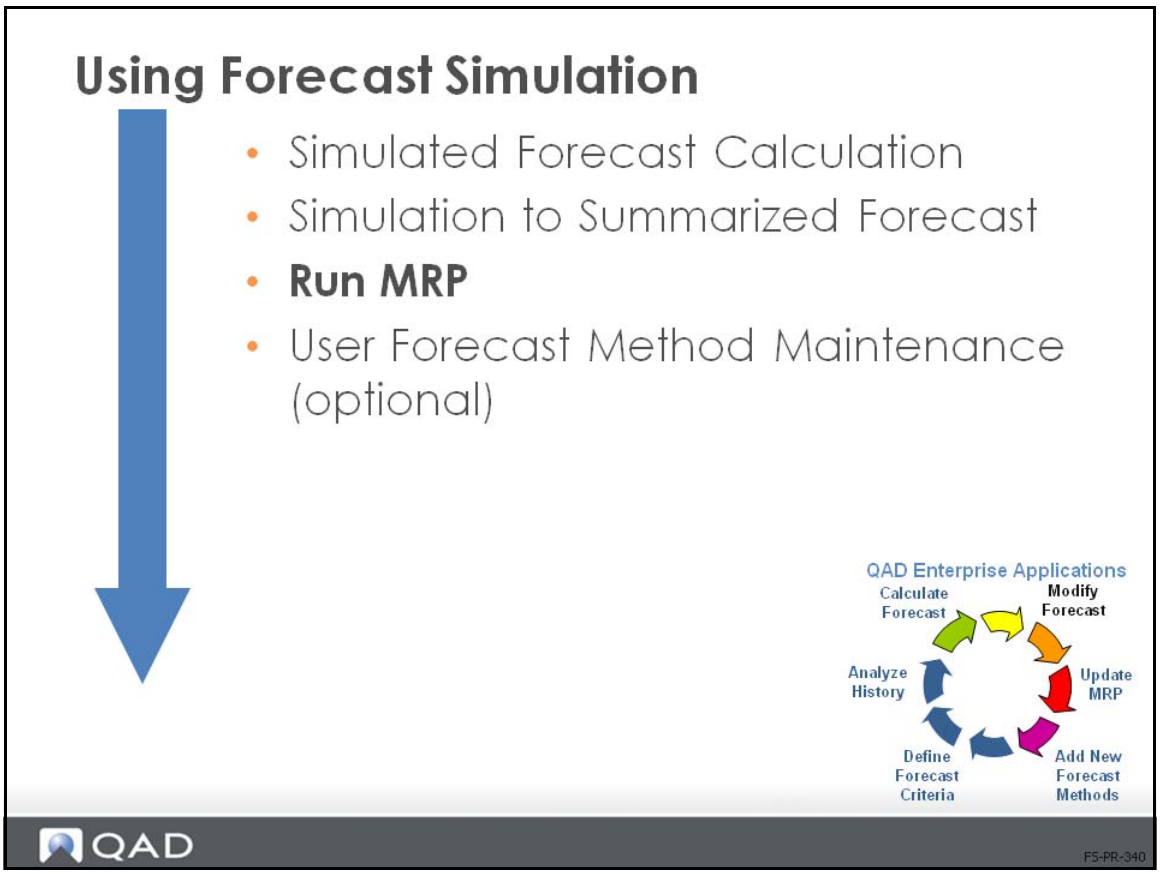
Updates to the summary forecast file are permanent and cannot be undone manually except by changing the file in Forecast Maintenance (22.1) (a Master Scheduling task)

Results

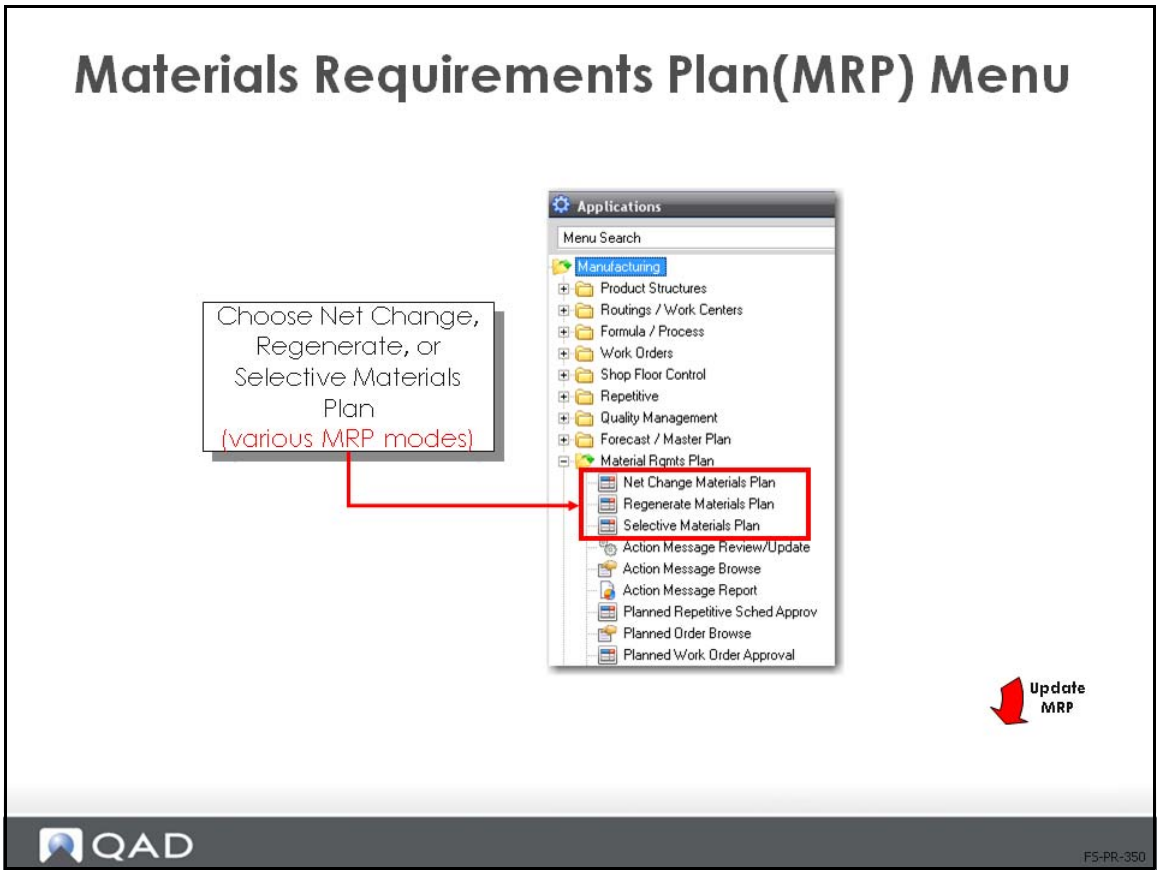


- After running Simulation to Summarized Forecast (22.7.13) with Update/Report set to Update, the data is loaded into Forecast Maintenance (22.1)
- The simulation affects MRP now.
  - Before data was loaded, the Forecast Simulation had no effect on MRP

Run MRP



The next step is to run MRP.



Three calculations are available in QAD Enterprise Applications:

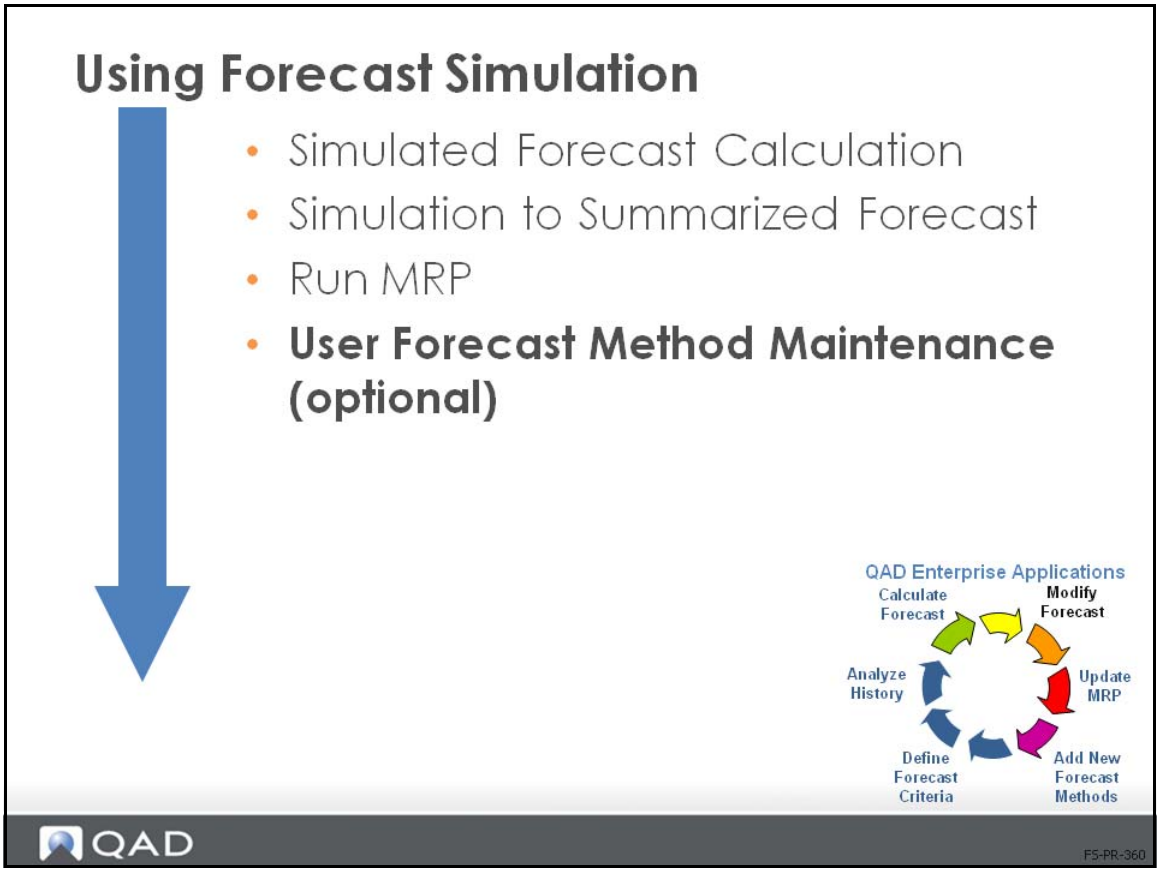
1 Net Change Materials Plan (23.1)
Only calculates changes since the last MRP calculation

2 Regenerate Materials Plan (23.2)
Complete recalculation of all demand and supply
Required to run when the MRP is first used

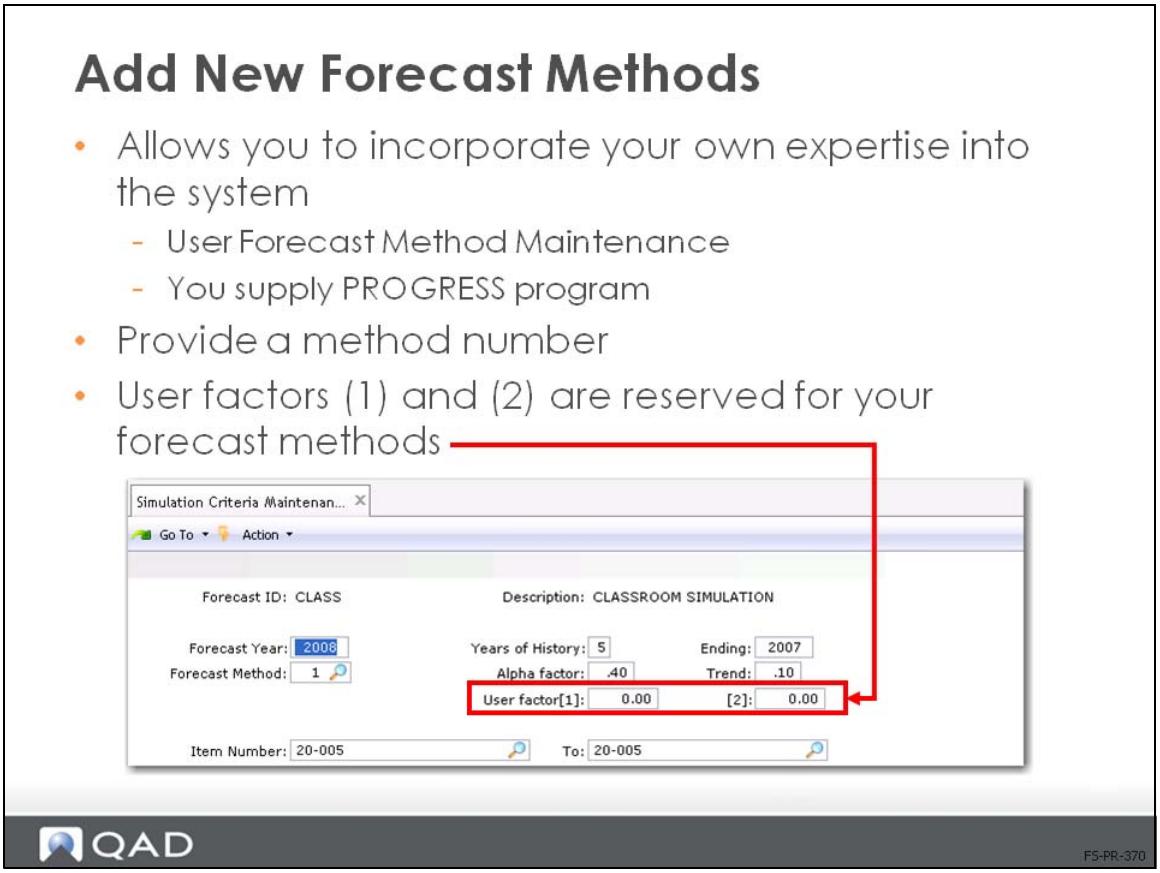
3 Selective Materials Plan (23.3)

Calculates only manually selective factors

User Forecast Method Maintenance

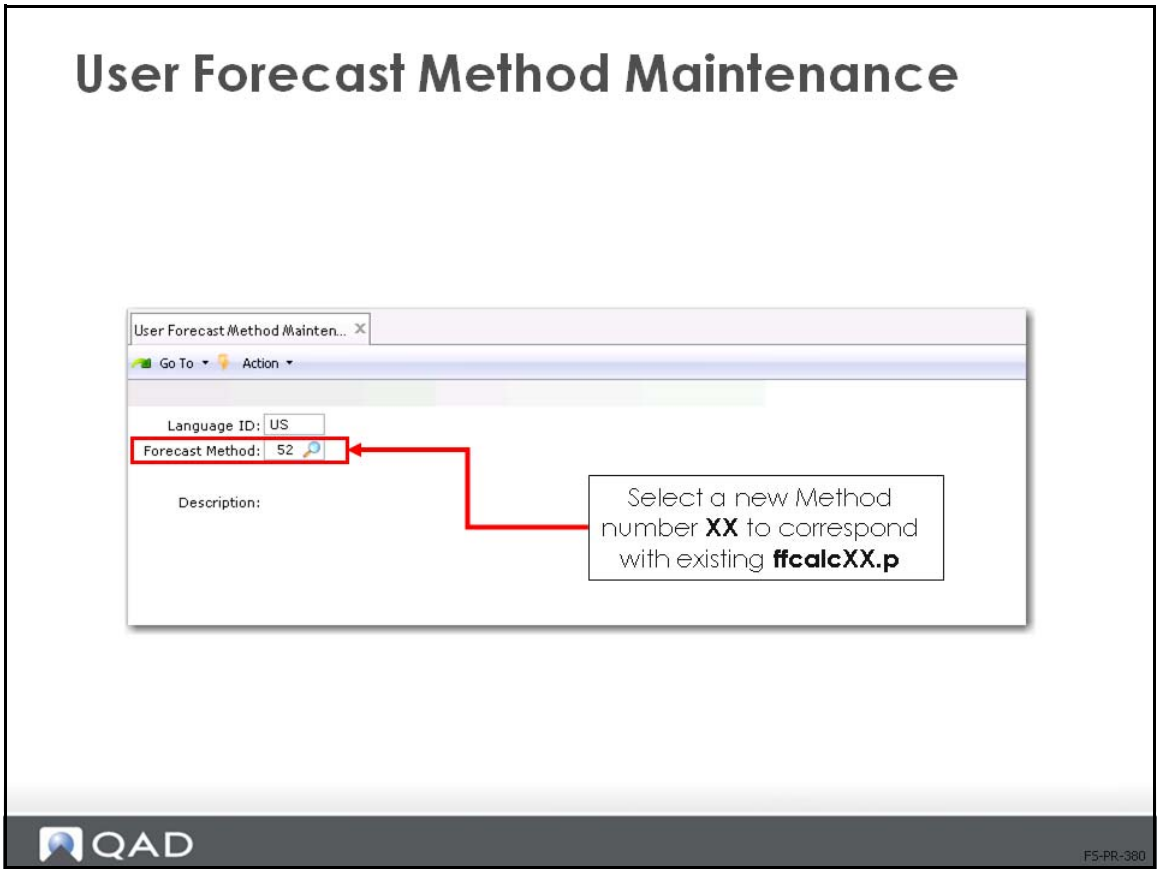


Add New Forecast Methods



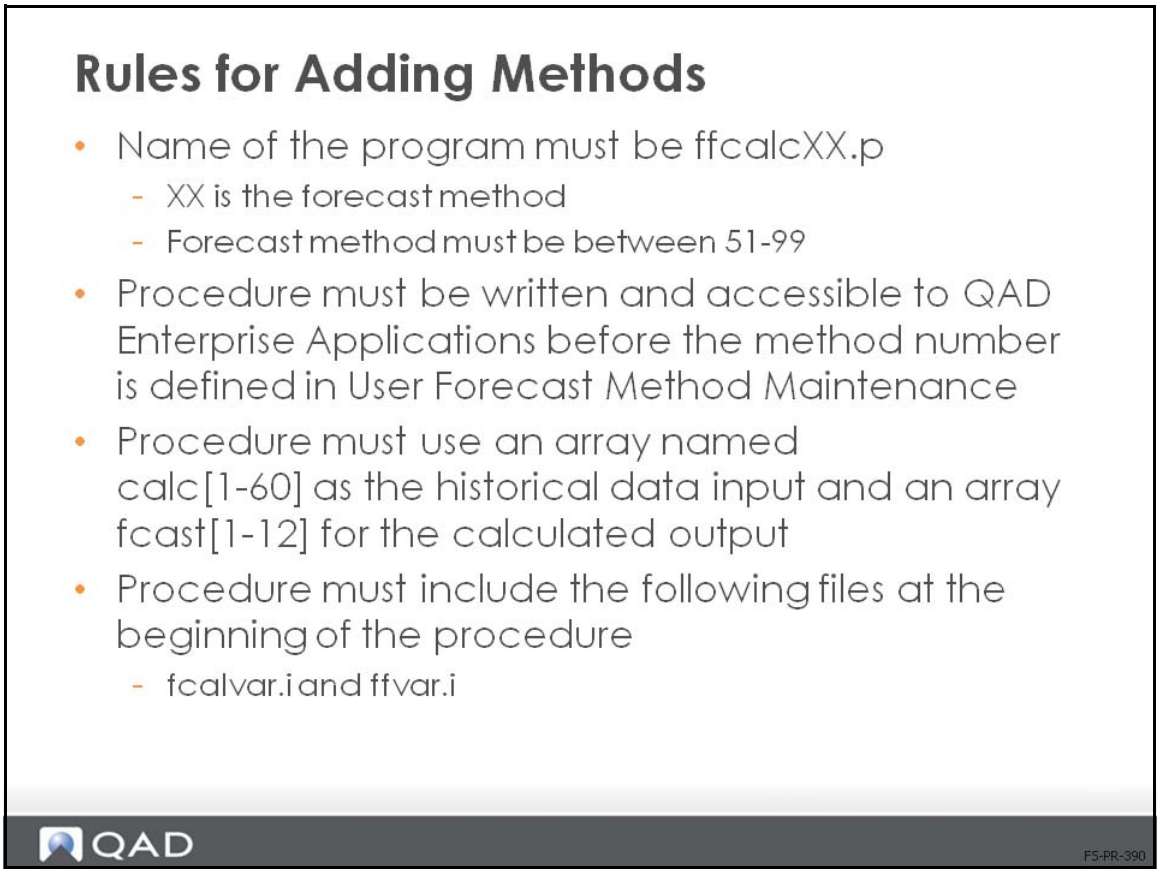
- Allows you to incorporate your own expertise into the system by specifying your own method in Simulation Criteria Maintenance
- Use User Forecast Method Maintenance to define the new method
  - You supply Progress program
  - Provide a method number
- User factors (1) and (2) are reserved for your forecast methods

User Forecast Method Maintenance



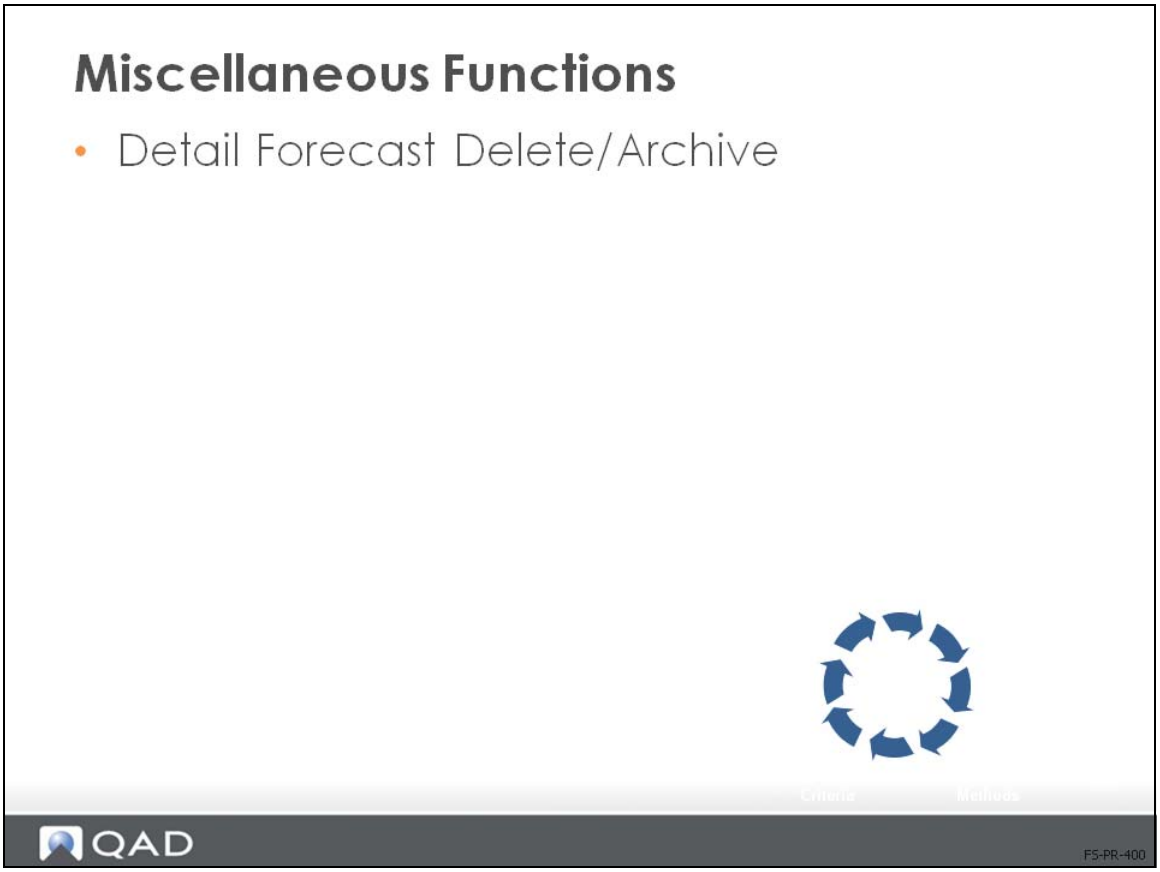
- Required if you want to use other statistical methods in a forecast calculation
- It is required to name your user-supplied Progress program `ffcalcXX.p`
  - XX is the forecast method and must be between `51-99`

Rules for Adding Methods



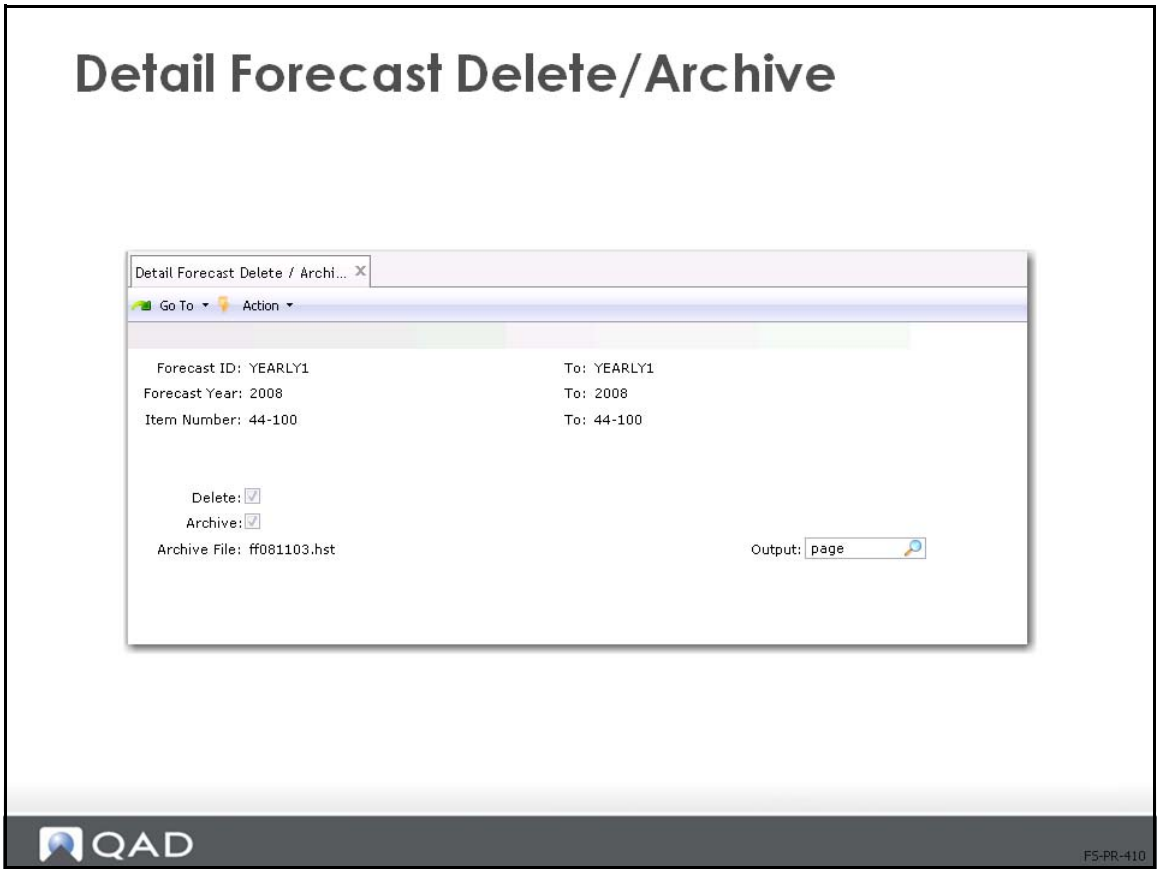
- Write the procedure and make it accessible to QAD Enterprise Applications before the method number is defined in User Forecast Method Maintenance
- Procedure must use an array named `calc[1-60]` as the historical data input and an array `fcast[1-12]` for the calculated output
- Procedure must include the following files at the beginning of the procedure
  - `fcalvar.i`
  - `ffvar.i`

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

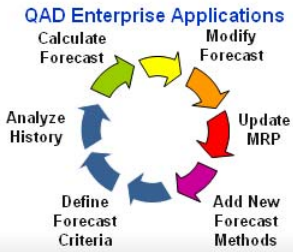
Detail Forecast Delete/Archive



- With Delete = Yes, forecast records satisfying the selection criteria are deleted from the database
- When Archive is also set to Yes, deleted data is stored in a file name `ffYYMMDD.hst`
  - `The ff` prefix indicates that this file is a simulated forecast record and `YYMMDD` is the date you ran it
    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
- Control this function with a password

Forecast Simulation Processing: Summary

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



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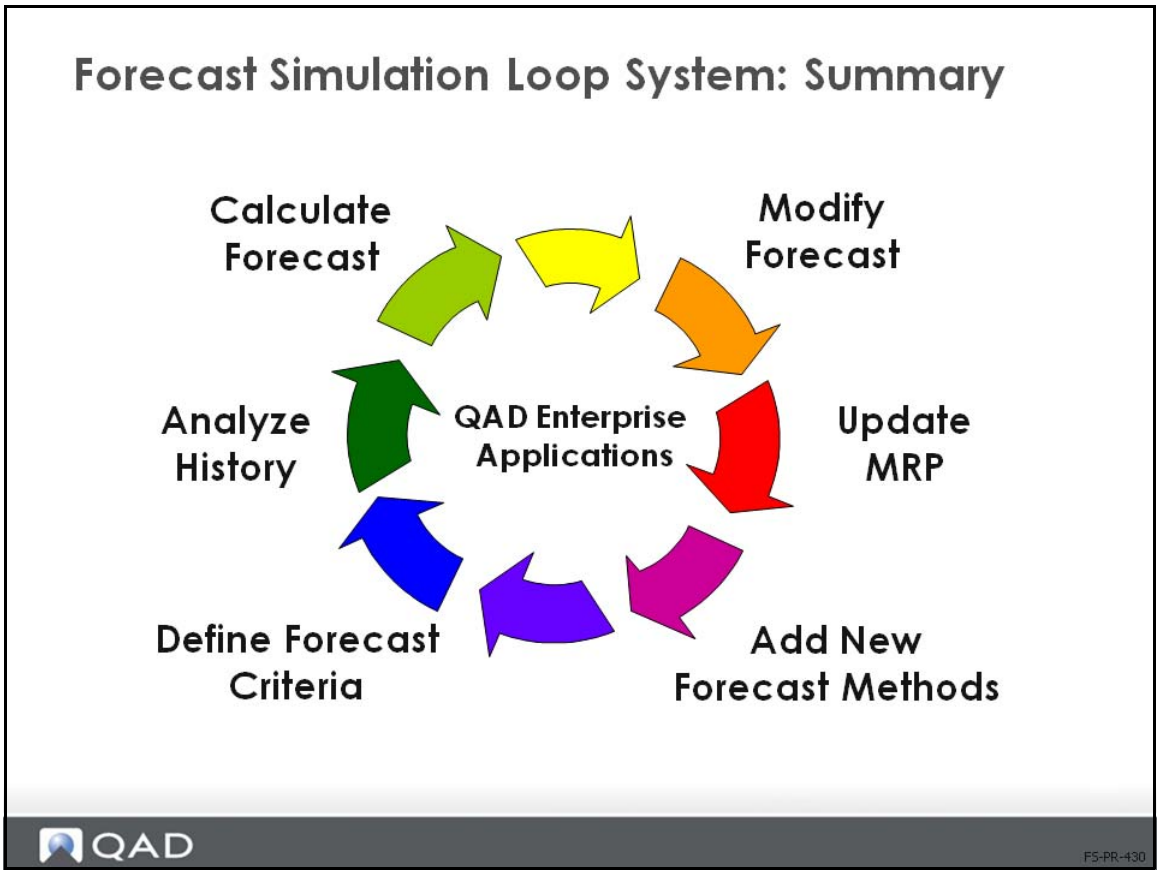
Forecast Simulation Loop System: Summary
Calculate Forecast
Modify Forecast
Analyze History
QAD Enterprise Applications
Update MRP
Define Forecast Criteria
Add New Forecast Methods
QAD
FS-PR-430

Exercise: Create Sales History

Instruction: In this exercise, you create a sales forecast manually and upload it to the Master Production Schedule Forecast for processing by MRP. Sales forecasts are typically made for a month; MPS is typically made for a week.

1. Using Detail Forecast Maintenance (22.7.7):
   a. Enter the current year as Forecast ID and forecast year, and enter Item Number 01010.
   b. Click Next. In the column Original Forecast, there is no data, as there is no sales history from which to work.
   c. 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.
   a. Set Forecast ID to the current year. This setting finds the current Adjusted Forecast.
   b. Leave the Loading Method set at the default of 1, which is autospread.
   c. Click Next and direct output to page to view the result. The system has spread the monthly forecast into weekly buckets.
   d. 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 can 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 value do you 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 value?

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 is it advisable 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, 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, 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. Note this difference between Master Scheduling and Forecast Simulation.

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 periods 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 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 12 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, run the original calculation again. After the calculation is run, the template and detail records are updated. Previous templates and records are deleted. This result 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 averages into weekly buckets, distributing weekly averaged totals throughout the month
   b. Load first week
   c. Load last week