Oracle® Retail Analytic Parameter Calculator for Markdown Optimization

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Oracle Retail Analytic Parameter Calculator for Markdown Optimization User Guide, Release 13.3

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Oracle Retail Analytic Parameter Calculator for Markdown Optimization User Guide, Release 13.3

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Preface

Analytic Parameter Calculator for Markdown Optimization (APC-MDO) is an analytical tool used to calculate demand parameters and produce results in a format appropriate for other applications.

Audience

This document is intended for analysts and scientists who will configure and use APC-MDO.

Documentation Accessibility

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Related Documents

For more information, see the following documents in the Oracle Retail Analytic Parameter for Markdown Optimization documentation set:

- *Oracle Retail Analytic Parameter Calculator for Markdown Optimization Configuration Guide*
- *Oracle Retail Analytic Parameter Calculator for Markdown Optimization Installation Guide*
- *Oracle Retail Analytic Parameter Calculator for Markdown Optimization Release Notes*

For more information about MDO, see the following documents in the Oracle Retail Markdown Optimization documentation set:

- *Oracle Retail Markdown Optimization Administration Guide*
- *Oracle Retail Markdown Optimization Configuration Guide*
- *Oracle Retail Markdown Optimization Data Model Guide*
- *Oracle Retail Markdown Optimization Grid Designer User Guide*
- *Oracle Retail Markdown Optimization Implementation Guide*
- *Oracle Retail Markdown Optimization Installation Guide*
- *Oracle Retail Markdown Optimization Operations Guide*
- *Oracle Retail Markdown Optimization Release Notes*
- *Oracle Retail Markdown Optimization User Guide*

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- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

Review Patch Documentation

When you install the application for the first time, you install either a base release (for example, 13.3) or a later patch release (for example, 13.3.1). If you are installing the base release, additional patch, and bundled hot fix releases, read the documentation for all releases that have occurred since the base release before you begin installation. Documentation for patch and bundled hot fix releases can contain critical information related to the base release, as well as information about code changes since the base release.

Oracle Retail Documentation on the Oracle Technology Network

Documentation is packaged with each Oracle Retail product release. Oracle Retail product documentation is also available on the following Web site:

http://www.oracle.com/technology/documentation/oracle_retail.html

(Data Model documents are not available through Oracle Technology Network. These documents are packaged with released code, or you can obtain them through My Oracle Support.)

Documentation should be available on this Web site within a month after a product release.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Getting Started

Analytic Parameter Calculator for Markdown Optimization (APC-MDO) is an analytical tool used to calculate the demand parameters seasonality and price elasticity and view the results of the calculations. These demand parameters are produced in the format required by the analytical application.

This chapter contains the following:

- Introduction
- User Requirements
- Checking Your Browser Settings
- Logging Into APC-MDO
- APC-MDO Data
- Overview of the APC-MDO User Interface
- APC-MDO Stages
- The APC-MDO Process
- Loading a Configuration
- Tools

Introduction

This chapter provides a general overview of the features and functionality found in the APC-MDO application. The APC-MDO application is organized into stages. Each stage occupies a separate screen in the UI. Each stage contains parameters that are configurable. The basic functionality of the UI itself is the same in each screen. That basic functionality is described in this chapter. The details regarding the configuration of the parameters in each stage are described in the subsequent chapters.

User Requirements

APC-MDO is designed to be used by a scientist or analyst who is familiar with data analysis, statistical analysis, and the markdown optimization process.

Data analysis experience is needed in order to:

- validate that data has been loaded correctly
- interpret results
- summarize results

As an APC-MDO user, you must have an understanding of the historical data and an understanding of how the retail industry works in order to use APC-MDO effectively. In particular, you must have enough of an understanding of the historical data and the length of the life cycle of the items in the data to be able to identify:

- the weeks at the beginning of the historical data that contain the tail-end data for items whose life cycle began before the start of the historical data
- the weeks at the end of the historical data that contain items whose life cycle ends after the historical data

You must also understand which promotions and holidays provide the most lift. Only the most significant events should be enabled for APC-MDO to be effective. If you enable more than 25 events a year, the results may not be reliable.

Checking Your Browser Settings

APC-MDO is a Web-based application that is supported on Microsoft Internet Explorer version 7 and 8. Before using APC-MDO, it is important to check your browser settings. This section describes the browser settings for both versions of Microsoft Internet Explorer. It includes the following topics:

- Setting Up Internet Explorer 7
- Setting Up Internet Explorer 8

Setting Up Internet Explorer 7

Note: In addition to the Internet Explorer Web browser, your personal computer must be set up with Microsoft Excel 2003, if you want to export APC-MDO data or access APC-MDO standard reports.

Complete the following steps:

- **Configure Internet Explorer's Security Settings**—add the APC-MDO URL to the appropriate zone (Local intranet or Trusted sites) to ensure that the APC-MDO application will use the appropriate security settings. For more information, see Configuring Internet Explorer's Security Settings.

  Important: Do not use the Internet zone to configure browser settings for APC-MDO. Use only the Local intranet zone or the Trusted sites zone, as explained in Configuring Internet Explorer's Security Settings.

- **Adjust Internet Explorer's Language Settings**—if you are using a different language on your computer, you can adjust Internet Explorer to also use the same language. For more information, see Adjusting Internet Explorer's Language Settings.

- **Review Cache Settings**—the default cache setting for Internet Explorer is Automatic, and normally these settings do not need to be adjusted. However, if you do want to check your cache settings, refer to Reviewing Internet Explorer's Cache Settings.

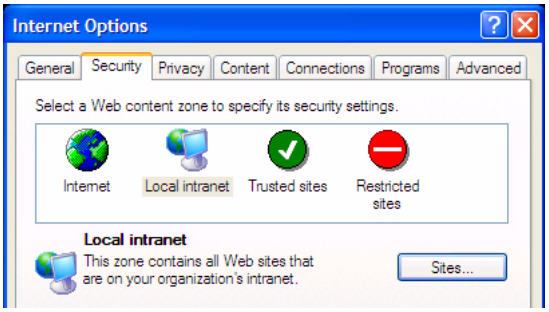
Configuring Internet Explorer's Security Settings

To configure Internet Explorer for APC-MDO:

1. Open Internet Explorer.

2. From the Tools menu, select **Internet Options**.
3. From the **Internet Options** dialog box, click the **Security** tab.
4. From the **Security** tab, click **Local intranet**, or, if you have been instructed to do so by your Systems Administrator, **Trusted sites**, and then click the **Sites** button.

Figure 1–1 Internet Options Dialog Box

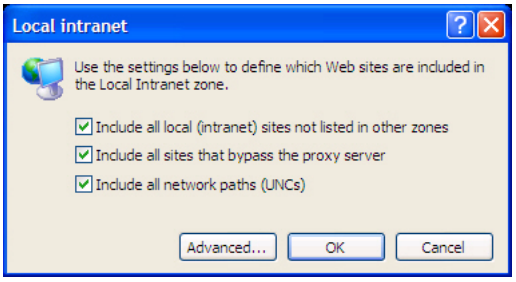


Important: Do not select Internet unless you have been instructed to do so by the administrator. In most cases, the APC-MDO application will be available on your company's intranet or on a Oracle Retail trusted site.

If you selected Local intranet, go to step 5. If you selected Trusted sites, go to step 6.

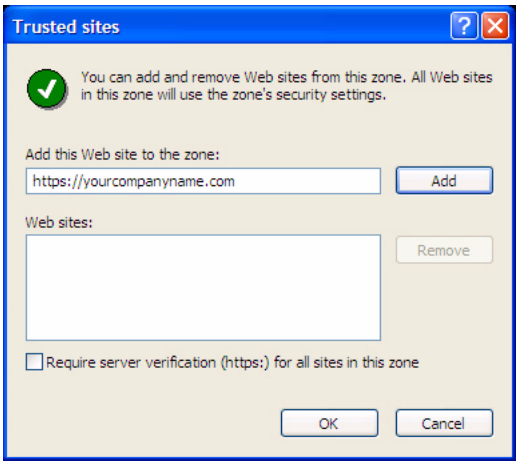
5. On the Local Intranet dialog box, click the **Advanced** button, as in the following example:

Figure 1–2 Local Intranet Dialog Box



6. On the resulting **Local intranet** or **Trusted sites** dialog box, add the APC-MDO URL if it is not already listed.

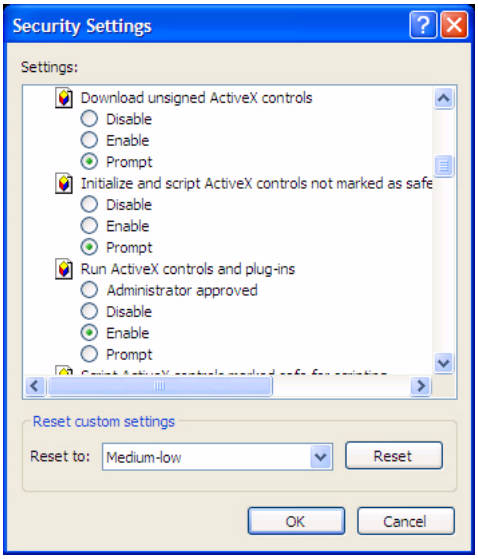
Figure 1–3 Internet Explorer Trusted Sites



To do so, type the APC-MDO URL in the **Add this Web site to the zone** text box. Click **Add**. When the URL appears in the Web sites list, click **OK**.

7. If the **Local Intranet** dialog box from step 5 is still open, click **OK** to close it.
8. Based on the selection your made in step 4, from the **Security Tab** of the **Internet Options** dialog box, select either **Local intranet** or **Trusted sites**. Click the **Custom Level** button.
9. The **Security Settings** dialog box opens.

Figure 1–4 Internet Explorer Security Settings

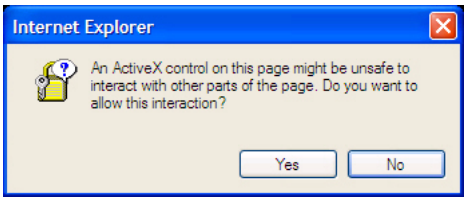


10. Make sure the following commands are set to Prompt or Enable:
    - Download signed ActiveX controls
    - Run ActiveX controls and plug-ins
    - Script ActiveX controls marked safe for scripting
    - File download
    - Active scripting

- Allow script–initiated windows without size or position constraints
- Initialize and script ActiveX controls not marked as safe—a Microsoft ActiveX® control is required each time you export to Excel. While this ActiveX control is signed, it is not marked as safe (meaning that it could potentially be used to do unsafe things). If you set this option to Prompt, you will be prompted each time you select the APC-MDO Export action.
- Click **OK**.

The following example shows the prompt that appears when there is a request from an application to use an ActiveX control that is not marked as safe.

Figure 1–5 Active X Warning



11. On the Internet Options dialog box, click **OK** to return to the browser.

Adjusting Internet Explorer's Language Settings

To adjust the language settings for Internet Explorer, do the following:

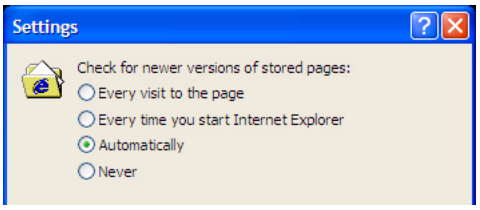
1. From Internet Explorer, select **Tools** - **Internet Options**.
2. Click the **Languages** button located across the bottom of the window.
3. Click the **Add** button to add another language. Select your desired language from the list, and click **OK**.
4. To remove a language, click once onto a language from the list of existing languages, and click **Remove**.
5. Click **OK** to exit the Languages dialog box.
6. From the Internet Options window, click **Apply** to apply your changes. Click **OK** to exit.

Reviewing Internet Explorer's Cache Settings

To review Internet Explorer's cache settings:

1. From the **Tools** menu, select **Internet Options**.
2. From the **Internet Options** dialog box, select the **General** tab.
3. From the **Temporary Internet Files** section of the screen., click the **Settings** button.
4. On the **Settings** dialog box, select **Automatically**, if it is not selected already, and click **OK**. An example is listed below:

Figure 1–6 Internet Explorer Temporary Internet File Settings



Note: You can also select Every visit to the page.

5. On the **Internet Options** dialog box, click **OK** to return to the browser.

Setting Up Internet Explorer 8

To configure Internet Explorer 8 for APC-MDO:

1. Open Internet Explorer.
2. From the **Tools** menu, select **Internet Options**.
3. From the **Internet Options** dialog box, click the **Security** tab.
4. From the **Security** tab, click **Local intranet**, or, if you have been instructed to do so by your Systems Administrator, **Trusted sites**, and then click the **Sites** button.

   Note: Do not select Internet unless you have been instructed to do so by the administrator. In most cases, the APC-MDO application will be available on your company's intranet or on a Oracle Retail trusted site.

   If you selected Local intranet, go to step 5. If you selected Trusted sites, go to step 6.
5. On the **Local Intranet** dialog box, click the **Advanced** button.
6. On the resulting **Local intranet** or **Trusted sites** dialog box, add the APC-MDO URL if it is not already listed.

   To do so, type the APC-MDO URL in the **Add this Web site to the zone** text box. Click **Add**. When the URL appears in the Web sites list, click **OK**.
7. If the **Local Intranet** dialog box from step 5 is still open, click **OK** to close it.
8. Based on the selection your made in step 4, from the **Security Tab** of the **Internet Options** dialog box, select either **Local intranet** or **Trusted sites**. Click the **Custom Level** button.
9. The **Security Settings** dialog box opens.
10. From the default Internet Explorer settings, ensure that the following options are set to **Prompt** or **Enable**:
    - **Automatic prompting for ActiveX controls**
    - **Allow previously unused ActiveX controls to run without prompt**
    - **Allow script–initiated windows without size or position constraints**
11. Ensure that the **Only allow approved domains to use ActiveX without prompt** option is set to **Disable**.

12. Click **OK**.
13. In case you have Pop-up Blocker enabled, add the host name from the APC-MDO URL as an exception using the following steps:
    a. On the **Internet Options** dialog box, click the **Privacy** tab.
    b. On the **Privacy** tab, in the **Pop-up Blocker** section, click **Settings**.
    c. On the **Pop-up Blocker Settings** dialog box, enter the host name in the **Address of website to allow** field, and click **Add**.
    d. Click **Close**.
14. On the Internet Options dialog box, click **OK** to return to the browser.

Logging Into APC-MDO

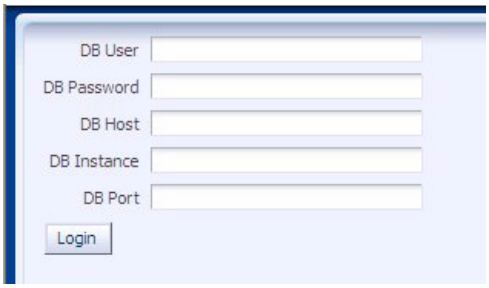
The login screen, shown in Figure 1–7, "APC-MDO Login Screen", requires the user to provide the DB user, DB password, DB host name, DB instance, and DB port for the database.

After the database authenticates the user, the APC-MDO application is available. APC-MDO is a single-user application. Only one user should log into the application at a time. If more than one user logs in at the same time, problems may occur with data concurrency.

Once APC-MDO is installed, you can access the application using the following URL:

http://<server>:<port>/apc/faces/Login

Figure 1–7 APC-MDO Login Screen



APC-MDO Data

APC-MDO requires at least two years of historical data. However, long life-cycle customers will need more data. These data requirements exist because the data at the beginning and end of the historical period may have to be removed from the data analysis for the following reasons:

- The year-dependent season codes that overlap the first eight weeks (on average) of historical data can, in general, not be used. Year-dependent season codes are used to classify items by their start dates, and a year-dependent season code that overlaps the first eight weeks of historical data generally contains items whose true start date occurred before the start of the historical period.
- The last eight weeks (on average) also cannot be used because the year-dependent season codes may contain items that extend past the end of the historical period.

The length of the life cycles of the items in the data determines which season codes can or cannot be used.

The seasonality correlation determines which seasonality curves are reliable by comparing one season code to another season code one year earlier or one year later. Because of this, the process requires at least two years of historical data. Without two years of data, APC-MDO will skip running the correlation.

The Corrections stage generates a catch-all curve and a padding curve. This requires a complete set a historical data for the specified fiscal year. This requirement can be satisfied with at least two years of historical data.

Historical data must be aggregated to a high-enough level that APC-MDO can provide meaningful demand parameters. If APC-MDO performs calculations at levels such as color/store, the weekly rate of sales may be too low (below five units per week). The typical solution is to aggregate to a higher location level.

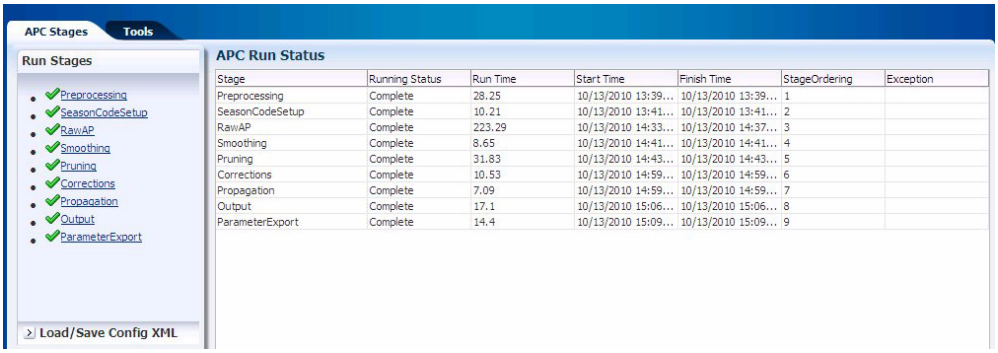
Overview of the APC-MDO User Interface

Each APC-MDO screen contain two main tabs: the APC Stages tab and the Tools tab. The APC Stages tab is the work area where you configure the parameters for each stage. The Tools tab provides access to the application-wide tools you can use to analyze your configuration of APC-MDO.

Each of these two main tabs is divided into two sections (as shown in Figure 1–8, "APC Stages Tab"): the Navigation Panel, which is on the left) and the Contents Area, which is on the right. You use the Navigation Panel to access the sub-tabs for each of the two main tabs. You use the Contents Area to do the actual application work.

The APC Stages tab, shown in Figure 1–8, "APC Stages Tab", contains sub-tabs for each of the nine APC-MDO stages. When you click on the name of a stage, a tab for that stage appears in the Content Area. As you click on each subsequent stage, that stage also appears in the Content Area, overlapping the previous one. See "APC-MDO Stages" on page 9 for a high-level description of each stage.

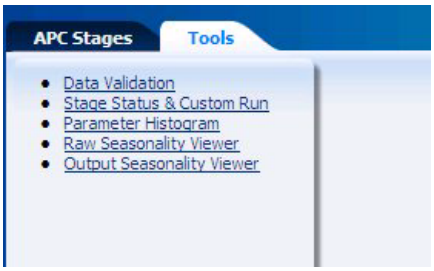
Figure 1–8 APC Stages Tab



The APC Stages tab also provides access to the Load/Save Config XML functionality. You can save the configuration XML file for the APC-MDO configuration you have created. You can load this configuration in order to replace the current configuration for the application. Use this functionality after an upgrade to replace the default configuration with the working configuration. See details in "Loading a Configuration" on page 1-12.

The Tools tab, shown in Figure 1–9, "Tools Tab", contains sub-tabs for each of the five configuration analysis tools. See "Tools" on page 13 for details about each analysis tool.

Figure 1–9 Tools Tab



When you first log into the application you see the APC Stages tab with the Navigation Panel listing all the stages.

The stage screens have both common and unique buttons for navigation and operation. Here is a list of the common features generally available in the User Interface.

- Draw Chart – generates the chart after the necessary criteria have been selected.
- Load/Save Config – used to load or save the XML file that contains the application configuration.
- Reset All – clears all the options you selected for the Charts in the Raw Seasonality Viewer and the Output Seasonality Viewer so that you can select new options.
- Restore Default – clears any values that you have entered into the override fields and replaces them with the defaults.
- Run – starts the processing of a stage. In order to start a run, you must first select the stage.
- Search Curves – finds the requested curves after the necessary criteria have been selected. Once the curve is selected from the list, the chart can be generated.
- Logout and Help – available at the top of each screen.
- For all options in all stages, a check box is used for parameters that are enabled or disabled and a text entry box is used to enter alternate values.
- System defaults are shown in italics to the right of certain text entry boxes.
- The headings Start/End, Minimum/Maximum, Low/High, and Preceding/Following are used for ranges of values.
- Check marks in Navigation Panel – indicates that the checked Stage has a status of complete.

APC-MDO Stages

Each of the nine stages of APC-MDO is described in a separate chapter of this guide. These nine stages are:

1. Preprocessing – filters the historical data and does the first determination of item eligibility.
2. Season Code Setup – determines the season codes to use and maps them to items.
3. Raw AP – produces the demand parameters.
4. Smoothing – calculates seasonality correlations.
5. Pruning – removesunreliable demand parameters.

6. Corrections – corrects seasonality curves to account for holidays and promotions.
7. Propagation – removes holiday lift and promotion lift and copies seasonality curves to other fiscal years.
8. Output – converts APC-MDO results into the format required for data export.
9. Parameter Export – generates the output text files.

The APC-MDO Process

The operation of APC-MDO is divided into stages. Each stage gathers related information and calculations together. The results of the computation of each stage can be kept for as long as the computation is valid. The stages can be run in order, or a stage can be skipped if the results are still valid. Skipping stages, if a valid option, can improve performance.

Note: If you edit parameters on multiple screens/tabs before you run any stage, some changes may not be persisted. If you have made changes to some properties and this occurs, then you should run each stage individually before going on to the next one.

Within each stage, you can perform the following three operations:

- Modifying the input values for the stage. Each stage has default values that you can change. Changing default values requires an in-depth understanding of how APC-MDO works and of the retail details of your business. You can modify the fields without immediately running the stage. Note that the Base Historical Period can only be modified after the Season Code stage has been successfully run. This dependency exists because the Base Period dialog box displays the results of the Season Code stage calculations.

  Note: You must examine certain parameters to determine whether or not they should be configured before initially running any stages. See "Changing Parameter Settings" for details.

- Running the stage. Each stage performs its calculations during the run operation. In order to start a run, you must first select a stage. Stages cannot be run simultaneously. After you run a stage, you can modify some of the fields in the stage. However, until you re-run the stage, the results of the stage do not change. Thus, you can continue to modify the fields or change them back to original values.
- Viewing the stage results. You can view the calculated results for the Preprocessing and Pruning stages after that stage has finished running.

In general, you cannot run all stages of APC-MDO on the first run. You need at least two runs. In the first run, run APC-MDO through the Smoothing Stage, but not beyond. Based on this first run, set the Base Historic Period (in the Pruning Stage) by visually examining the chain-level seasonality curves using the Raw Seasonality Viewer. If the curve has a sharp fall-off, you should look at the sales dollars. You should make sure you have between 80% and 90% of the original sales dollars. After you have properly set the Base Historic Period, you can then run the remaining stages (from Pruning onward). However, to set the Base Historic Period from the results of Raw-AP you must run at least two runs when you first use APC-MDO with

brand-new data. (After the Base Historic Period is set, you can run all stages in a single run.).

Here is a summary of the complete APC-MDO workflow.

1. Logging in – one user can log in at a time. Only one user can use APC-MDO at a time.
2. Data Validation – a summary of historical data can be used to check that the historical data has been loaded correctly. This information only needs to be checked when the historical data is new or has been reloaded during a data refresh.
3. Preprocessing – use to begin the process of filtering the historical data.
4. Examination of the Preprocessing Results – view details about how much data has been filtered out by preprocessing. Verify that at least 80% of the sales dollars remain.
5. Season Code Selection – use to define the season code.
6. Levels Selection – within the Raw AP stage, select the merchandise and location levels for which APC-MDO will calculate the demand parameters.
7. Entering the Raw AP Filtering Parameter – Raw AP filtering (in addition to preprocessing filtering).
8. Running the Raw AP Calculation – produces the demand parameters.
9. Examination of the Demand Parameters – view seasonality curves using the Raw Seasonality viewer.
10. Performing Smoothing – calculate the seasonality correlations.
11. Entering the Base Historical Period – used to override a fiscal year. This can only be set after the Season Code Setup stage is run.
12. Pruning – prune the partitions by setting reliability tolerances for demand parameters. This is used to eliminate unreliable partitions.
13. Examination of the Pruning Results – view results of the partition filtering by using the Parameter Histogram viewer.
14. Examination of the Summary Statistics – click **View Results** to view details about the pruning filtering (the partitions after pruning).
15. Performing Corrections – adjust curves for holidays and promotions.
16. Performing the Propagation of the Seasonality Curves – copy curves to other fiscal years.
17. Parameter Export – generate files for other analytical products.

Changing Parameter Settings

The following parameters must be examined before running any of the stages in APC-MDO. You do this in order to determine whether or not the parameter values should be changed. Usually these are the only parameters you will need to change in order to run APC-MDO.

- Season Code Setup
  - Start Date Code
  - End Buckets

  - Map Attributes
- Raw AP
  - Merchandise Hierarchy
  - Location Hierarchy
- Pruning
  - Base Historical Period
- Corrections
  - Catch-All Curve Fiscal Year
  - Padding Curve Fiscal Year (The fiscal year for this parameter and the above parameter must be a complete fiscal year.)
  - Holidays
  - Promotions (Only enable promotions and holidays that have a large traffic lift.)
- Output – escalation path

Stage Dependencies

Each stage must be run in the order listed in the Navigation Panel of the APC Stages tab. Each stage is dependent on the previous one (that is, all previous stages must have a status of complete before the current stage can be run).

Loading a Configuration

When you click **Load Config**, you see the following dialog box.

Figure 1–10 Load Config

Use this dialog box to load the XML file that contains the configuration you created and saved. This XML file contains a snapshot of your APC-MDO configuration.

Using Existing Configuration File After an Upgrade

If you upgrade to a new version of APC-MDO from an older version, you can use your existing configuration file with the new version of APC-MDO by completing the following steps:

1. Update the version of the XML file to 13.3, as shown in the following example:

   <APC xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="apc13_config.xsd" **version="13.3"**>
2. Create a copy of the database table asds_calculation_parameters
3. Delete all the rows in the following database tables:
   - asds_calculation_parameters
   - asds_log_tbl

- asds_param_calc_run_tbl

4. Make the following changes to an existing XML (only if it has successfully completed an APC-MDO run). The two lines you must change are <MaxElasticityError>10</MaxElasticityError> and <PaddingCurveType>0</PaddingCurveType>

```
<Pruning>
<PruningSettings partitionOverride="FALSE">
<MaxElasticityError>10</MaxElasticityError>
<EligibleItemsThreshold>10</EligibleItemsThreshold>
<AvgWeeklySalesThreshold>25</AvgWeeklySalesThreshold>
<TrueSeasonalityLengthThreshold>10</TrueSeasonalityLengthThreshold>
<BHDPCorrelationThreshold>.50</BHDPCorrelationThreshold>
<SaveTopLevelCurves>TRUE</SaveTopLevelCurves>
<PruneSingleCycleCurves>TRUE</PruneSingleCycleCurves>
<PruneBasicCurves>TRUE</PruneBasicCurves>
<PruneByYear>TRUE</PruneByYear>
</PruningSettings>
<BasePeriods>
</BasePeriods>
</Pruning>

<Corrections>
<CreateCatchAll>TRUE</CreateCatchAll>
<CatchAllCurveFiscalYear>2006</CatchAllCurveFiscalYear>
<PaddingCurveWeight>.4</PaddingCurveWeight>
<PaddingCurveType>0</PaddingCurveType>
<PaddingCurveFiscalYear>2006</PaddingCurveFiscalYear>
<PaddingCurveGamma>2.0</PaddingCurveGamma>
<WeeksPrepend>6</WeeksPrepend>
<WeeksFromStart>52</WeeksFromStart>
</Corrections>
```

5. If the existing XML file from the old version of APC-MDO has the Holiday Sets or the Promotions specified, then all the overlapping Holidays and Promos must be disabled or modified so that no two events occur in the same week. (For more information, see the chapter "Corrections".)
6. After completing the modifications to the XML file, you can insert the XML directly into the asds_calculation_parameters table with configuration_id=1, or load the XML file in the UI using the Load Config functionality.

Tools

APC-MDO provides the following tools, which are accessed from the Tools tab:

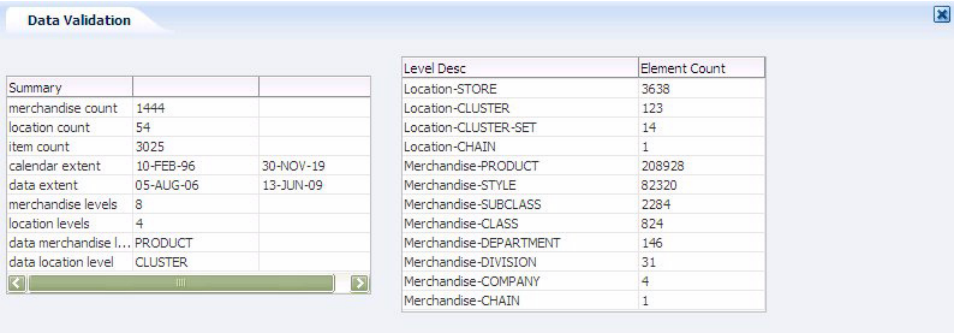
- Data Validation – provides a summary of the historical data for a given period of time.
- Stage Status and Custom Run – provides access to the stage status and provides a way to run all the stages or a subset of the stages sequentially without interruption.
- Parameter Histogram – displays a histogram of the elasticities or inventory effect for selected partitions that have passed pruning.
- Raw Seasonality Viewer – displays a graph of selected seasonality curves after the Raw AP stage has been run.

- Output Seasonality Viewer – displays a graph of selected seasonality curves after the Output stage has been run.

Data Validation

Here is an example of the Data Validation data.

Figure 1–11 Data Validation



APC-MDO validates historical data and loads it into the APC-MDO database after the application is first configured. The data validation chart is useful for examining a summary of the data after a change, such as a data refresh, has occurred in the historical data.

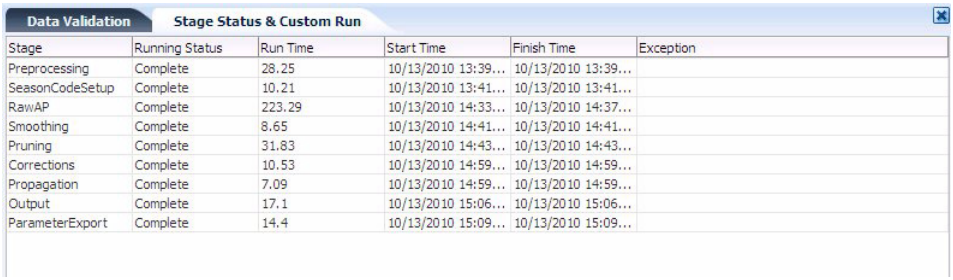
The data validation chart contains the following:

- merchandise count – the number of distinct merchandise IDs in the historical items.
- location count – the number of distinct location IDs in the historical items.
- item count – the total number of historical items. An item is defined as the combination of merchandise and location nodes at a certain merchandise and location level.
- calendar extent – the extent of the asds_calendars_in_tbl imported from the related application.
- data extent – the extent of the historical data.
- merchandise levels – from the asds_client_hierarchy_tbl, the input table that is constructed from the merch_hierarchy_in_tbl.
- location levels – the count of the location levels.
- data merchandise levels – the name of the merchandise level used.
- data location levels – the name of the location level used.
- Level Desc/Element Count – the counts for each location and merchandise hierarchy level.

Stage Status and Custom Run

Here is an example of the Stage Status and Custom Run data.

Figure 1–12 Stage Status and Custom Run



The Stage Status and Custom Run option provides access to a display that shows the status of each stage along with any dependencies. It includes the start and finish time (if that stage has completed) of each stage.

The possible values for status include:

Table 1–1 Stage Status Values

Status Value	Meaning of Status Value
Complete	The stage ran to completion.
Running	The stage is currently in the process of executing.
Stopped	The user terminated the run.
Incomplete	The stage has not finished.
Exception	An error occurred.

In order to run multiple stages sequentially without interruption, you can select the rows in the table directly, using Ctrl+Left Click to add more rows to your selection and click **Run**. By using this feature you can set up APC-MDO to run without needing to monitor the process.

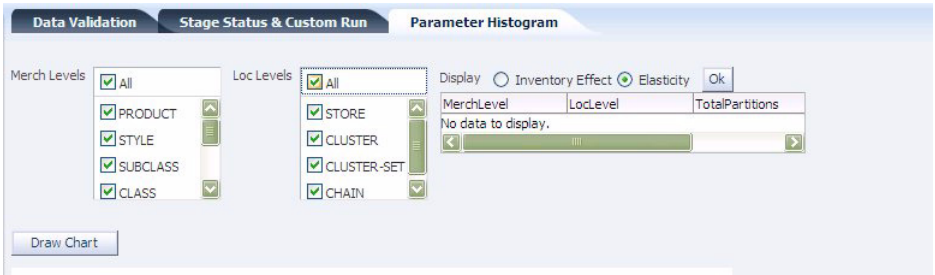
Parameter Histogram

The Parameter Histogram option provides a histogram of the demand parameters, elasticity or inventory effect, for partitions after pruning is complete. The histogram provides information that can help when adjusting the parameter configuration.

The Histogram screen is divided into two major sections, shown in Figure 1–13, "Parameter Histogram Screen" and Figure 1–14, "Parameter Histogram Chart".

Here is an example of the options section.

Figure 1–13 Parameter Histogram Screen



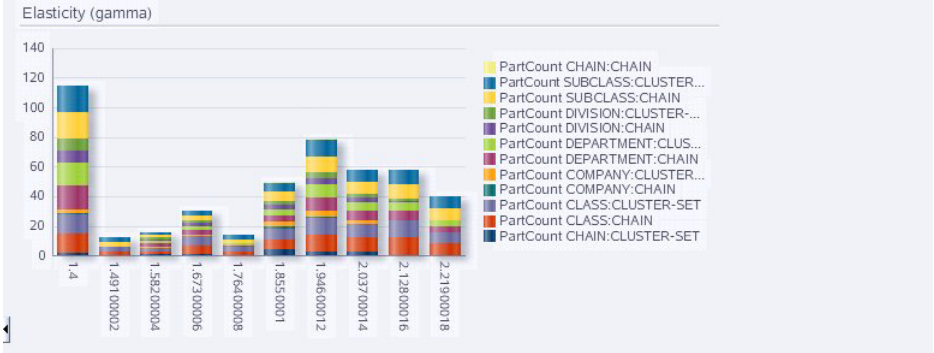
The top section contains selected lists for merchandise levels and location levels. These levels are derived from the levels you selected during the Raw AP stage. Using these two lists, you select the merchandise levels and locations levels you are interested in seeing charted.

Once you have selected the levels you are interested in, you must also select the demand parameter you are interested in seeing charted: Inventory Effect or Elasticity. Select one of these options and click **OK**. The display list is populated with all the combinations of the merchandise and location levels you originally selected.

After you have made all the necessary selections in the top part of the screen, click **Draw Chart** in order to generate the histogram.

Here is an example of the chart section.

Figure 1–14 Parameter Histogram Chart



Each of the merchandise level/location level combinations is assigned a different color. The partitions and their associated colors are listed to the right of the chart.

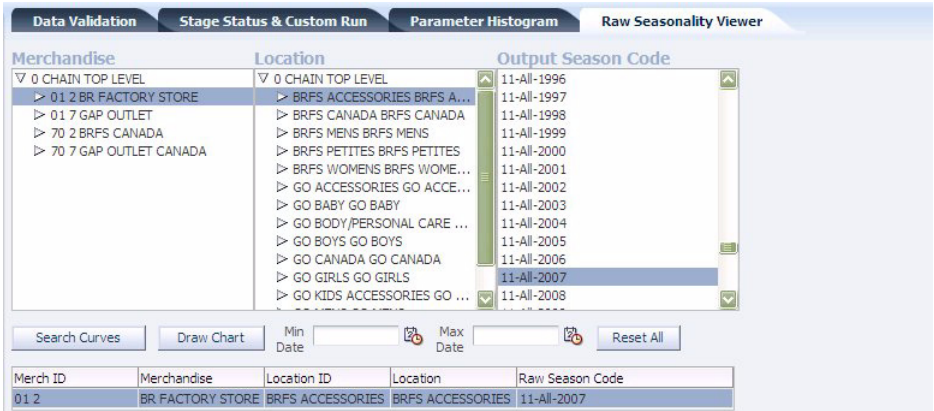
Scroll over the chart to see information about individual partitions.

Raw Seasonality Viewer

The Raw Seasonality Viewer, shown in Figure 1–15, "Raw Seasonality Viewer" and Figure 1–16, "Raw Seasonality Viewer Chart", provides a graph of the seasonality curves after the Raw AP stage has been run.

Here is an example of the Raw Seasonality options.

Figure 1–15 Raw Seasonality Viewer

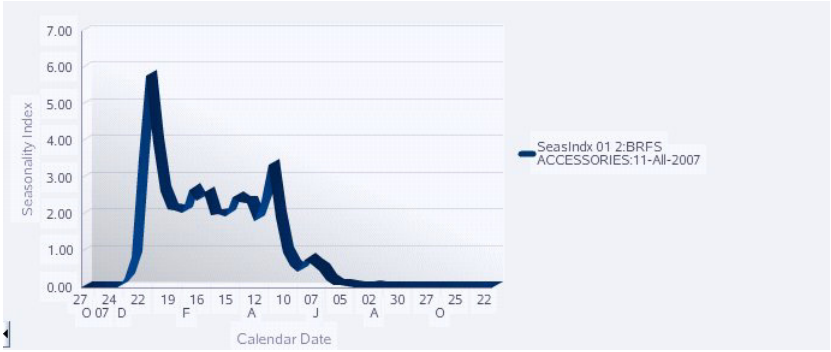


Use the topmost section to select the merchandise levels, location levels, and season codes you are interested in seeing graphed. Click **Search Curve**. You will see a list of the available seasonality curves.

To generate the graph, select the seasonality curves you want to display and click **Draw Chart**.

Here is an example of the Raw Seasonality Viewer chart.

Figure 1–16 Raw Seasonality Viewer Chart



The list of available seasonality curves and their associated colors are listed to the right of the chart. A graph is displayed for each seasonality curve listed.

You can narrow the time range used in the x axis by entering the Minimum and Maximum dates you are interested in, using the format MM/DD/ YYYY. Once you enter the date range, Click **Select Curve**, highlight the seasonality curve you want, and then click **Draw Chart**. The graph is drawn for the time range you specified.

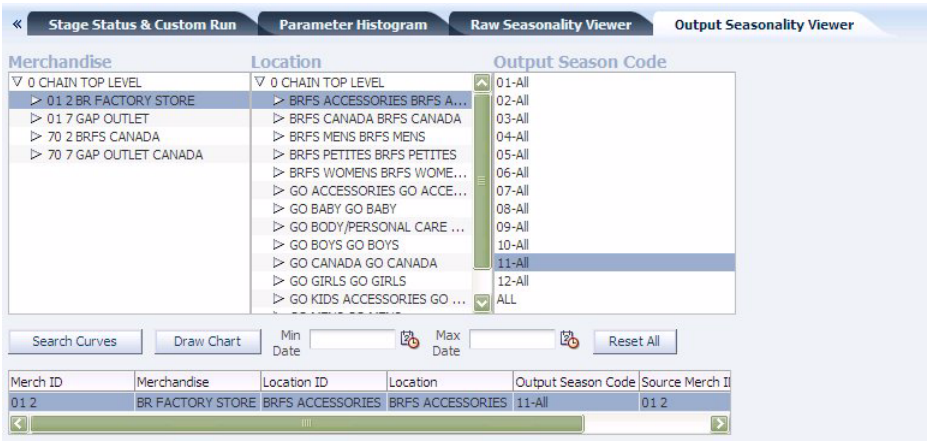
Use **Reset All** to clear all the fields and make new selections.

Output Seasonality Viewer

The Output Seasonality Viewer, shown in Figure 1–17, "Output Seasonality Viewer" and Figure 1–18, "Output Seasonality Viewer Chart", provides a graph of the seasonality curves after the Output stage has been run.

Here is an example of the Output Seasonality options.

Figure 1–17 Output Seasonality Viewer

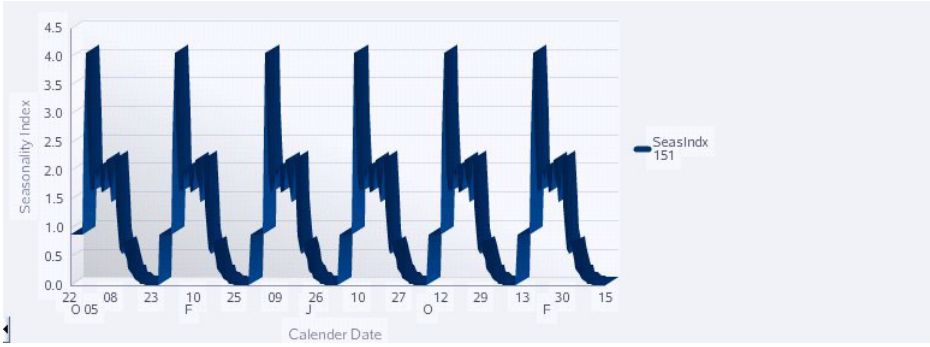


Use the topmost section to select the merchandise levels, location levels, and season codes you are interested in seeing graphed. Click **Search Curve**. You will see a list of the available seasonality curves.

To generate the graph, select the seasonality curves you want to display and click **Draw Chart**.

Here is an example of the Output Seasonality Viewer chart.

Figure 1–18 Output Seasonality Viewer Chart



The list of available seasonality curves and their associated colors are listed to the right of the chart. A graph is displayed for each seasonality curve listed.

You can narrow the time range used in the x axis by entering the Minimum and Maximum dates you are interested in, using the format MM/DD/ YYYY. Once you enter the date range, Click **Select Curve**, highlight the seasonality curve you want, and then click **Draw Chart**. The graph is drawn for the time range you specified.

Use **Reset All** to clear all the fields and make new selections.

2

Preprocessing

This chapter contains descriptions of the parameters contained in the Preprocessing stage, which are used for filtering, as well as the default values and range of values for each parameter and an example of the Preprocessing results.

The default values of the parameters of the Preprocessing stage can be used to run the Preprocessing stage.

This chapter contains the following sections:

- "Introduction"
- "The Preprocessing Interface"
- "The Preprocessing Parameters"
- "Preprocessing Results Page"

Introduction

The Preprocessing stage filters the historical data to produce a subset of data that will produce reliable demand parameters. It filters at the item and the item-week level. It performs the initial pruning of bad activity data. It does the first stage of determining item eligibility and figures certain values that can later be used in the calculation of raw parameters.

The Preprocessing Interface

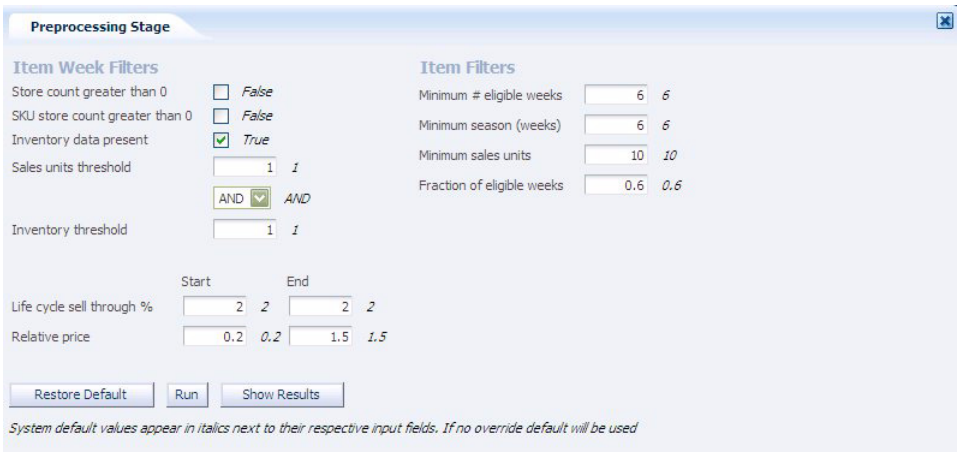
Access the Preprocessing page by clicking **Preprocessing** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Preprocessing Parameters

The Preprocessing Stage, shown in Figure 2–1, "Preprocessing Stage", consists of two logical sections: Item Week Filters and Item Filters. The parameters contained in each section are described below.

Figure 2–1 Preprocessing Stage



Item Week Filters

The Item Week Filters section of the Preprocessing stage contains the parameters listed in Table 2–1, " Item Week Filters". These filters are used to remove Item-Weeks that do not meet the requirements listed below.

Table 2–1 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Store count greater than 0 – used to filter activities with null or zero store count.	False	True/False
SKU store count greater than 0 – used to filter activities with null or zero sku store count.	False	True/False
Inventory data present – this check box is used to indicate that the inventory data is thought to be reliable. If inventory data is thought to be reliable, then Preprocessing and RawAP will use inventory data for filtering and other calculations. If inventory data is thought to be unreliable, then it is ignored.	True	True/False
Sales unit threshold – used to filter sales unit activities with sales units below threshold values. Note that the Sales unit threshold parameter and the Inventory threshold parameter can be used in combination (using the AND selection) or separately (using the OR selection).	1	> = 1
Inventory threshold – used to filter inventory activities with inventory units below threshold values. Note that the Sales unit threshold parameter and the Inventory threshold parameter can be used in combination (using the AND selection) or separately (using the OR selection).	1	> = 0
Life cycle sell thru % – the item start and end dates are calculated using percentage sell through. The start date is the date when Life cycle sell through % (Start) is reached. The end date is the date when Life cycle sell through % (End) is reached. Life cycle sell through % (Start) is expressed relative to 0% so entering 2 means that the start date is when 2% of total sales has been achieved. Life cycle sell through % (End) is expressed relative to 100% so entering 2 means that the end date is when (100-2)% i.e., 98%, of total sales has been achieved.	Start: 2.0 End: 2.0	Start: > = 0; < = 50 End: > = 0; < start date
Relative price – relative price thresholds are used to filter out item weeks with a ratio of sales price to maximum ticket price that fall outside the specified range for the start date and the end date.	Start: 0.2 End: 1.5	Start: > 0 End: > start value

Item Filters

The Item Filters section of the Preprocessing stage contains the parameters listed inTable 2–2, " Item Filters". These filters are used to remove Items that do not meet the requirements listed below.

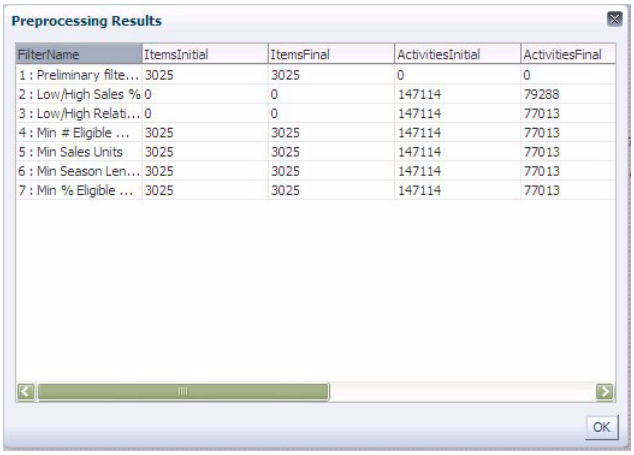
Table 2–2 Item Filters

Filter Name and Description	Default Value	Range of Values
Minimum # eligible weeks – a certain number of weeks are necessary in order to determine item eligibility.	6	> 0
Minimum season (weeks) – a certain season length (the number of weeks between the first and last activity) is required in order to determine item eligibility.	6	> 0
Minimum sales units – the total number of units sold must be at least this value.	10	> 0
Fraction of eligible weeks – the percentage of eligible weeks, expressed as a fraction of the season length. The season length is the number of weeks between the start and end dates. (See Life cycle sell thru % above.)	0.6	> 0.0; < = 1.0

Preprocessing Results Page

The Preprocessing Results table is shown in Figure 2–2, "Preprocessing Results".

Figure 2–2 Preprocessing Results



The Preprocessing Results page displays when you click **View Results** on the Preprocessing stage screen. Use the results of the preprocessing filtering to alter the settings, if necessary. The filters are applied in the order listed in the table. The initial count is the value before the filters are applied. Items are defined as the intersection of the Merchandise Hierarchy and the Location Hierarchy. Activities are defined per item week.

For more information about the results displayed in the Preprocessing Results page, see the following:

- Row 1 – Preliminary Fitlering – is a combination of all the filters in the first five rows in Table 2–1, " Item Week Filters".
- Information about Row 2 can be found in Table 2–1, " Item Week Filters" in the description of the Life cycle sell thru % filter.

- Information about Row 3 can be found in Table 2–1, " Item Week Filters" in the description of the Relative price filter.
- Infomration about Rows 4, 5, 6, and 7 can be found in Table 2–2, " Item Filters".

The percentage of surviving activities and surviving items might not be the same as the percentage of surviving units sold and surviving dollars sold. For example, suppose item A sold 5000 units in one year for a total of $50,000, and item B sold 50 units in the same year for a total of $5,000. The total units from A and B is 5050, and the total dollars is $55,000. If filtering removes item B, the total units removed is less than 1% of 5050, and the total dollars removed is less than 10% of $55,000, even though we removed half of the items (from A and B, we removed B). Thus, it is possible for the percentage of removed activities and removed items to be much higher than the percentage of removed units or removed dollars.

3

Season Code Setup

The Season Code Setup stage involves working with the season code demand parameter.

This chapter contains the following sections:

- "Introduction"
- "The Season Code Setup Interface"
- "The Season Code Setup Parameters"

Introduction

The Season Code Setup stage determines the season codes to be used and maps them to items. It creates additional partitioning in the dataset by introducing a time dimension. This stage contains parameters for start week, end buckets, adjacent weeks, and attributes, all of which are discussed in the following sections.

The Season Code Setup Interface

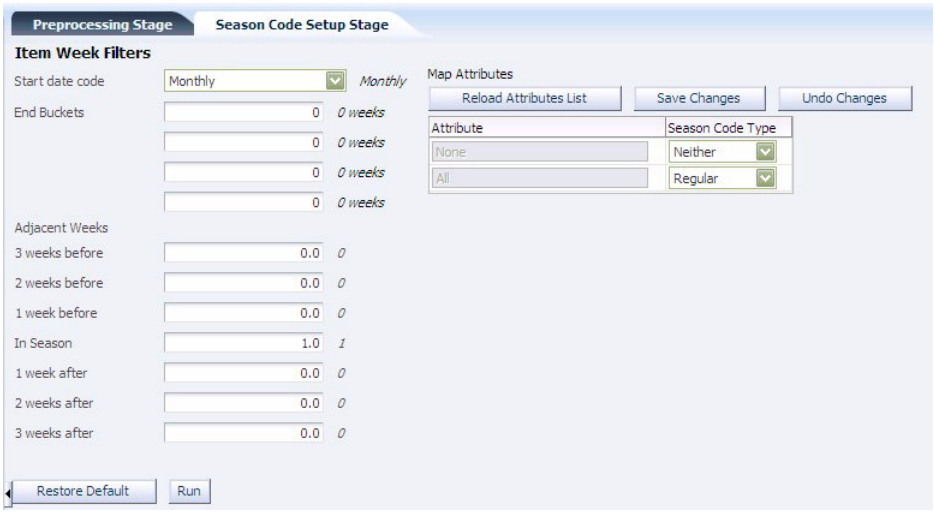
Access the Season Code Setup page by clicking **Season Code Setup** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Season Code Setup Parameters

The Season Code Setup Stage, shown in Figure 3–1, "Season Code Setup Stage", consists of three logical sections: Start Date Codes/Buckets, Adjacent Weeks, and Map attributes. The parameters contained in each section are described below.

Figure 3–1 Season Code Setup Stage



Start Date Code

Items (the intersection of the merchandise hierarchy and the location hierarchy) are assigned to a season code. Season codes identify the division of items by a time dimension. Seasonality curves are associated with season codes. The start date code is another name for the season code.

Season codes can be year-dependent or year-independent. All the season codes used in the Season Code Setup stage are year-dependent.

The start date is defined by the beginning of the life cycle (life cycle sell through of 2%) and the end of the life cycle (life cycle sell through of 98%) These are defined in the Preprocessing stage.

The default start date code type is Monthly. Other options (which you choose from the drop-down list) include Weekly, Biweekly, Custom Start & End Date, and Pure Custom. All the items within a given start date code type are assigned the same start date code, which is associated with that type.

Start date codes are formatted as MM-<attribute_string>-YYYY. The defaults are MM-ALL-YYYY and MM-NONE-YYYY.

End Buckets

End Buckets can be used to further partition the start date codes based on the season length. The end buckets define the extensions to the start date code lengths at either end of the start date code. Each start date code can have a maximum of four buckets. The numbers defining the length of the buckets must be listed sequentially, beginning with the lowest number. End buckets are optional.

End buckets are formatted as an extension of the start date code formatting. For example:

01-2008-10 is used for an item that is in the start date code 01-2008 and has a bucket of <= 10 weeks.

01-2008-40 is used for an item that is in the start date code of 01-2008 and has a bucket of <= 40 weeks.

The default value for the end buckets is no season lengths. The range of values is a sequence of 0, 1, 2, 3, or 4 positive integers. The sequence must be a strictly increasing sequence.

Adjacent Weeks

Adjacent weeks are infrequently used. When adjacent weeks are used, the start date code includes items that are adjacent to a season and that contribute to the smoothing of the seasonality curve. The weeks before extend the beginning of the start date code. The weeks after extend the end of the start date code.

The weight is a multiplier used in the construction of the seasonality curve. A weight of zero does not assign the item to the adjacent season code. A weight of one treats the item as if it were a normal item in the season code. The weighting does not affect the normal contribution of an item to its base season code.

The values for the adjacent weights are:

Table 3–1 Adjacent Weight Parameters

Name	Default Value	Range of Values
Adjacency weight (start - 3 weeks before)*	0.0	> = 0.0, < = 1.0
Adjacency weight (start - 2 weeks before)*	0.0	> = 0.0, < = 1.0
Adjacency weight (start - 1 week before)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end+ 1 week after)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end + 2 weeks after)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end + 3 weeks after)*	0.0	> = 0.0, < = 1.0

Attribute Mapping

Attributes are used to associate every piece of merchandise with a customer-specific season code type. Attributes serve to sub-divide the merchandise. The season codes are assigned to different seasonality curves based on which attribute is mapped to which season code type.

Attributes are loaded from the APC-MDO database table asds_item_level_user_attr by clicking the **Reload Attributes List** button.

Note that when the Season Code Setup page initially loads, the attributes are loaded from the previous XML and ASDS_ITEM_LEVEL_USER_ATTRS_TBL.

Season code types can be Regular, Basic, Both, or Neither. Basic curves are year-independent; they ignore the start date and the end date. Regular season codes are year-dependent; they take the start date and end date into account. In order to map a specific attribute to a specific season code, select a season code type from the drop-down list.

Note that the **Save Changes** button and the **Undo Changes** button are used only with the Attribute Mapping table. **Save Changes** writes your updates to the XML file. **Undo Changes** does not revert your changes after you click **Save Changes**. That is, once you have used **Save Changes** to write your changes to the XML file, you cannot undo those changes.

4

Raw AP

The Raw AP stage is used to configure the demand parameters.

This chapter contains the following sections:

- "Introduction"
- "The Raw AP Interface"
- "The Raw AP Parameters"

Introduction

The Raw AP stage produces the demand parameters. It analyzes the filtered and partitioned data to estimate raw seasonality parameters and price elasticity. The results are summarized at various merchandise/location hierarchy levels.

The Raw AP Interface

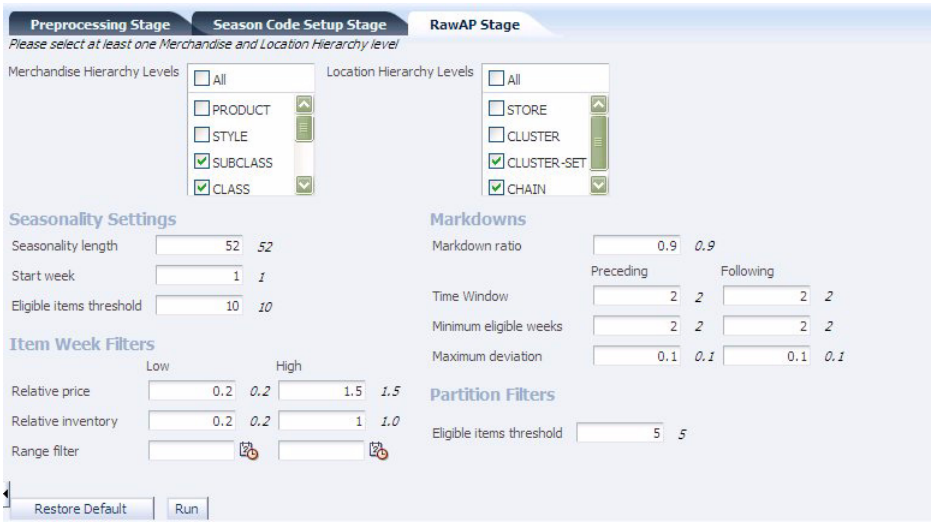
Access the Raw AP page by clicking **Raw AP** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Raw AP Parameters

The Raw AP Stage, shown in Figure 4–1, "Raw AP Stage", consists of five logical sections: Hierarchy Levels, Seasonality Settings, Item Week Filters, Markdowns, and Partition Filters. The parameters contained in each section are described below.

Figure 4–1 Raw AP Stage



Selecting Hierarchy Levels

Select the merchandise and location levels for which APC-MDO should calculate demand parameters. APC-MDO calculates demand parameters for the partitions of the levels that are the cross-products of all the levels you select. For example, if you select Chain and Division for the merchandise levels and Chain and Region for the location levels, then APC-MDO calculates demand parameters for the partitions in Chain/Chain, Chain/Region, Division/Chain, and Division/Region.

APC-MDO UI uses the "Used" column in asds_client_hierarchy_tbl to determine which merchandise hierarchy and location hierarchy levels to display in the Raw AP stage display. The "Used" column is configurable. A value of *N* indicates the levels that are at or below the optimization level.

Seasonality Settings

The Seasonality Settings section of the Raw AP stage contains the parameters listed in Table 4–1, " Seasonality Settings". The seasonality settings establish the length and start date of the raw seasonality curve.

Table 4–1 Seasonality Settings

Setting Name and Description	Default Value	Range of Values
Seasonality length – determines the length of the raw curves for regular (non-basic) season codes. The length from the start determines how many weeks after the start date are in the curve. This value does not take length buckets into consideration.	52	> = 1
Start week – raw curves for basic season codes are always 53 weeks long. This parameter sets the starting week of the basic season code curves in terms of fiscal week number.	1	> = 1, < = 52
Eligible items threshold – the minimum number of items that a Merchandise Hierarchy/Location Hierarchy/Season Code partition must contain so that Raw-AP can produce a seasonality curve for the partition.	10	>= 0, <= 50

Item-Week Filters

The Item-Week Filters section of the Raw AP stage contains the parameters listed in Table 4–2, " Item Week Filters". The following item-week filters are more stringent than the preprocessing filters.

Table 4–2 Item Week Filters

Filter Name and Description	Default Values	Range of Values
Relative price – used to filter out item-weeks with a ratio of sales price to maximum ticket price that falls outside the specified range.	0.2, 1.5	> = 0, > lower value
Relative inventory – the upper and lower bounds for the value for inventory relative to maximum inventory.	0.2, 1.0	> = 0, > lower value
Range filter – used to eliminate unreliable data using start date and end date for the period. Both the start date and the end date are Null by default. A Null value means that the field is not used in the filter. One or both of the fields can have a value of Null. If both of the fields are Null, then the data is not filtered.	Null/Null	

Markdowns

The Markdowns section of the Raw AP stage contains the parameters listed in Table 4–3, " Markdowns Parameters".Use the markdowns parameters to define what you consider a markdown to be.

Table 4–3 Markdowns Parameters

Markdowns Parameters Name and Description	Default Value	Range of Values
Markdown ratio – a maximum of the ratio of the average sales price during the following weeks to the average sales price during the preceding weeks. In other words, this parameter controls how much of a price decrease is required in order for the price decrease to count as a markdown.	0.9	> 0.0; < 1.0
Time window – defines the weeks before and after the markdown. The preceding weeks value is the # weeks before the markdown occurred. The following weeks value is the # weeks after the markdown and includes the week of the markdown. A week is a calendar week.	2	> = 2
Minimum eligible weeks – the minimum of the actual number of weeks in the Time Window that have data. The Time Window is in calendar weeks, and not every calendar week actually has sales data. So the actual number of weeks with data that are within the Time Window can actually be smaller than the Time Window.	2	2
Maximum deviation – the standard deviation of the regular price in the weeks before and after the markdown. Provides stability on the variance.	0.1	> 0.0

Partition Filters

The eligible items threshold filter is used to filter merchandise/location/season code partitions with the number of eligible items below the specified threshold. It looks at the items that have already been filtered using the above filters. This defines the minimum number of items required for raw AP to continue calculating demand parameters. The default value is 10. The range is > = 0.

5

Smoothing

The Smoothing stage is used to calculate seasonality correlations.

This chapter contains the following sections:

- "Introduction"
- "The Smoothing Interface"
- "The Smoothing Parameters"

Introduction

The Smoothing stage calculates the seasonality correlations. This process calculates the year-to-year correlation for different years of data by using the portion of the seasonality curve that falls between the low and high sales percentages. By default, the first 2% and the last 15% are not considered in defining the seasonality correlation period. This prevents an artificial inflation of the seasonality curves.

The Smoothing Interface

Access the Smoothing page by clicking **Smoothing** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Smoothing Parameters

The Smoothing Stage, shown in Figure 5–1, "Smoothing Stage", consists of one section: Seasonality Correlation Period. The parameters contained in this section are described below.

Figure 5–1 Smoothing Stage

Seasonality Correlation Period

This stage has two parameters (low and high) for the seasonality correlation period Sales%. Table 5–1, " Seasonality Correlation Period" contains the description for these parameters.

Table 5–1 Seasonality Correlation Period

Filter Name Description	Default Value	Range of Values
Sales% - the low and high sales percentage values	Low: 2% High: 85%	Low: > = 0% High: < = 50%

6

Pruning

The Pruning stage is used to remove unreliable demand parameters.

This chapter contains the following sections:

- "Introduction"
- "The Pruning Interface"
- "The Pruning Parameters"
- "Pruning Filtering Results"
- "Pruning Seasonality Results"

Introduction

The Pruning stage is used to remove unreliable demand parameters.It removes merchandise/location/season code partitions from APC-MDO. The two pruning methods are:

- remove all partitions except for those in the Base Historic Period
- determine which curves in the Base Historic Period are sufficient and reliable

The Pruning Interface

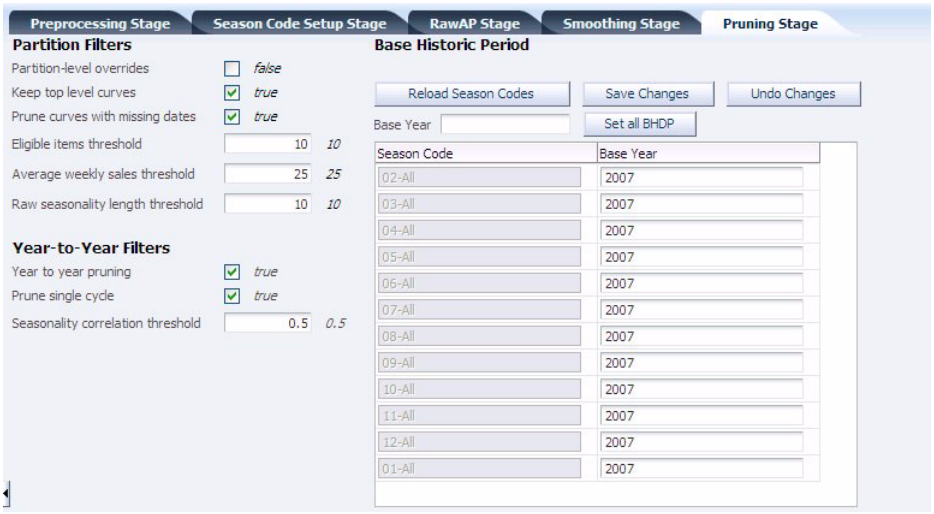
Access the Pruning page by clicking **Pruning** on the Navigation Panel Train.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Pruning Parameters

The Pruning Stage, shown in Figure 6–1, "Pruning Stage", consists of three logical sections: Partition Filters, Year-to-Year Filters, and Base Historic Period. The parameters contained in each section are described below.

Figure 6–1 Pruning Stage



Data Sufficiency

Default data sufficiency thresholds are appropriate for most clients. If a client has low item counts or low rates of sale at the lowest parameter level, then the corresponding threshold can be lowered. More parameters will be kept, but future reliability may suffer. Note that pruning curves with missing dates and top-level curves are generally kept enabled.

Partition Filters

The Partition Filters section of the Pruning stage contains the parameters listed in Table 6–1, " Partition Filters".

Table 6–1 Partition Filters

Filter Name and Description	Default Value	Range of Values
Partition-level overrides – pruning can be done at the partition level if all partitions are defined in the asds_pruning_parameters table. This will override the pruning parameters. Any partitions not specified in this table will not be pruned.	False	True/False
Keep top level curves – all the highest level curves are kept, regardless of threshold values.	True	True/False
Prune curves with missing dates – pruning of basic curves with missing dates is permitted.	True	True/False
Eligible items threshold – partitions with fewer numbers of eligible items than the threshold value are removed. Eligibility is defined during preprocessing.	10	> = 0.0
Average weekly sales threshold – partitions with average weekly sales below the threshold are removed. Weekly sales are the sum of all sales for all activities for a given week.	25	> = 0
Raw seasonality length threshold – curves can be discarded when the number of weeks from the first non-zero seasonality value to the last non-zero seasonality value is less than the threshold. In Raw AP, it is possible, that many seasonality values of zero have been added to the curves. Note that basic season codes have a length of 53, so picking a value greater than 53 will prune out any basic season codes.	10	> = 0

Year-to-Year Filters

The year-to-year pruning setting requires additional analysis. The default seasonality correlation is 0.5, but curves between 0.5 and 0.7 should be inspected or run through parent-to-child correlation analysis. Curves with only one year of data should also be inspected or run through parent-to-child correlation analysis.

The Year-to-Year Filters section of the Pruning stage contains the parameters listed in Table 6–2, " Year-to-Year Filters".

Table 6–2 Year-to-Year Filters

Filter Name and Description	Default Value	Range of Values
Year-to-year pruning – allows pruning based on the BHP.	True	True/False
Pruning single cycle – allows pruning of curves with only one year of data.	True	True/False
Seasonality correlation threshold – removes curves if the maximum correlation between the BHP curve and the other curves with that merchandise and location ID and the same year-invariant season code is lower than the threshold. For example, if the merchandise/location ID of 1/1 had a curve for 2001 - 01, 2002-01, and 2003-01, and the 2003-01 curve is the bhp curve, if the correlation between either 2001-01 and 2003-01 or 2002-01 and 2003-01 is greater than the threshold, then it passes the threshold.	0.5	> = 0.0; < = 1.0

Base Historic Period

The Base Historic Period (BHP) table can only be loaded by clicking the **Reload Season Codes** button after the Season Code setup stage is complete. **Save Changes** writes your updates to the XML file. **Undo Changes** does not revert your changes after you click **Save Changes**. That is, once you have used **Save Changes** to write your changes to the XML file, you cannot undo those changes.

Note that season codes from the previous XML and from asds_season_code_tbl are loaded when the Pruning stage first loads.

The table contains two columns. The first column lists the year-independent client-specific season codes. The second column lists the base fiscal year.

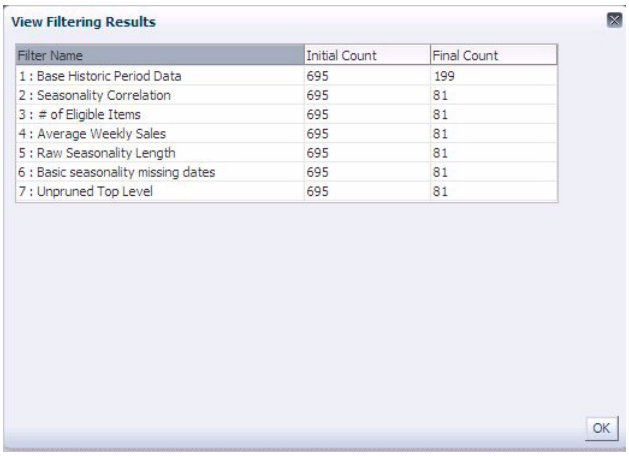
Different rows can have different years. Alternatively, you can set the fiscal year for all rows by selecting a base year and then clicking the **Set all BHDP** button.

The year selected must contain some historical data; however, it does not have to be a complete year of data. For example, you cannot select the year 1980 if the year contains no historical data. Note that this rule is not enforced. The only rule that is enforced is the rule requiring that the year must be later than 1900.

Pruning Filtering Results

The Pruning Filtering Results are shown in Figure 6–2, "Pruning Filtering Results".

Figure 6–2 Pruning Filtering Results

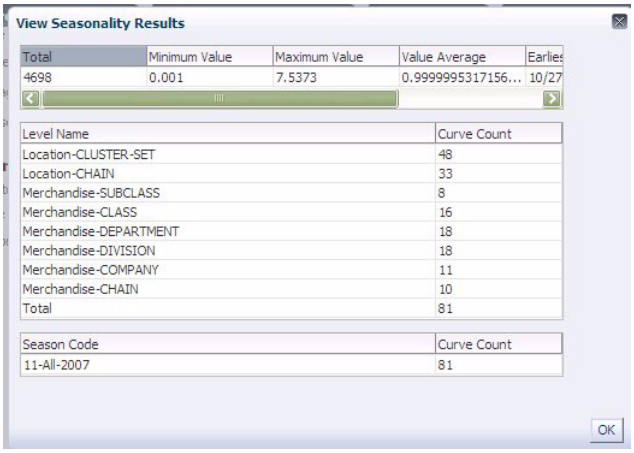


The Filtering Results page displays the initial count before the specified filter is applied and the final count after the specified filter is applied. The filters are listed in the order they are applied.

Pruning Seasonality Results

The Pruning Seasonality results are shown in Figure 6–3, "Pruning Seasonality Results".

Figure 6–3 Pruning Seasonality Results



The Seasonality Results page displays when you click the **View Seasonality Results** button. It provides a check on the quality of the data. It is divided into three sections and shows the counts of the curves that survived pruning.

The first section displays information about season codes over all partitions. The value for Value Average should be close to 1.

The second section displays the number of curves by level.

The third section displays the number of seasonality curves per season code.

7

Corrections

The Correction stage is used to modify seasonality curves.

This chapter contains the following sections:

- "Introduction"
- "The Corrections Interface"
- "The Corrections Parameters"

Introduction

In the Corrections stage, the curves for the regular season codes are extended, all curves are padded, and corrections are calculated. The purpose of this is to correct seasonality curves in order to account for holiday and promotion lifts.

The Corrections Interface

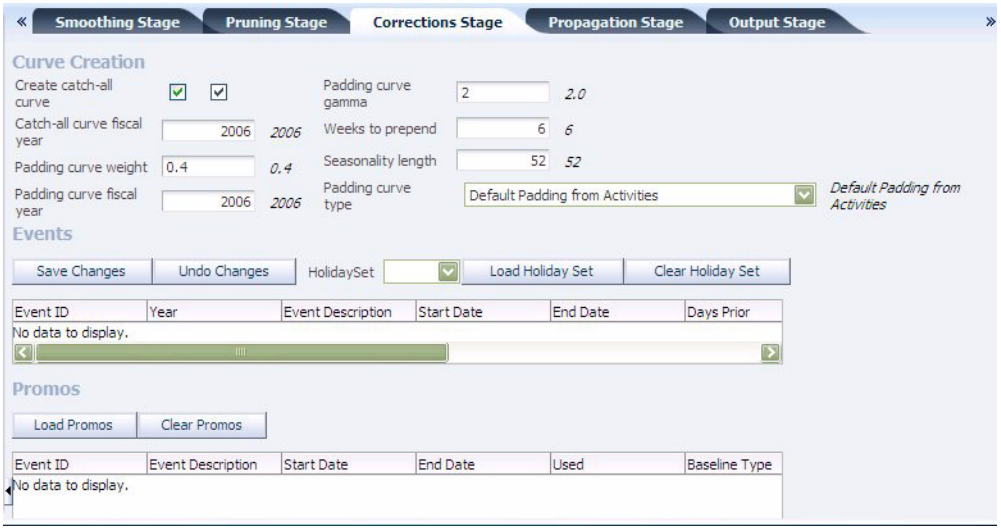
Access the Corrections page by clicking **Corrections** on the Navigation Panel Train.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Corrections Parameters

The Corrections Stage, shown in Figure 7–1, "Corrections Stage", consists of two logical sections: Curve Creation and Events (which includes Holidays and Promotions). The parameters contained in each section are described below.

Figure 7–1 Corrections Stage



Curve Creation

The parameters listed in Table 7–1, " Catch-All Curves" are used to configure the padding of all curves and the extension of regular season code curves.

Table 7–1 Catch-All Curves

Catch-All Curve Parameter Name and Description	Default Value	Range of Values
Create catch-all curve – the catch-all seasonality curve is created above the Chain/Chain level so that all items will be given a minimum of one seasonality curve.	True	True/False
Catch-all curve fiscal year – the year specified for the creation of the seasonality curve.	No default value	A fiscal year from the historical data.

The padding curve parameters listed in Table 7–2, " Padding Curves" include Padding Curve Weight, Padding Curve Fiscal Year, Weeks to Prepend, and Seasonality Length. These parameters determine:

- the shape of the padding curve
- how much of the curve is applied to each extended curve

The padding seasonality curve is determined by creating a depriced curve for the highest merchandise/location partition for each season code in the given fiscal year. The final seasonality curve is calculated as weight * padding curve + (1 - weight) * seasonality curve.

The fiscal year entered for the padding curve must be completely within the range of the historical data.

Table 7–2 Padding Curves

Padding Curve Parameter Name and Description	Default Value	Range of Values
Padding curve weight – the value used in determining the final seasonality curve.	0.4	> 0.0; < 1.0
Padding curve fiscal year – the year specified for the creation of the padding curve.	No default value	No range
Padding curve gamma – used to deprice historic sales in order to construct the padding curve.	2.0	
Weeks to prepend – number of weeks to add to the curve	0	>= 0
Seasonality length – the seasonality curve is extended before it is padded. If the length of the curve from start date to end date is longer than the length of the Raw AP, then the difference is added. Otherwise, it is not changed. This applies to regular season codes only.	52	>= 1
Padding curve type – four padding curve types are available, as listed below.	Padding From Activities	

Padding Curve Types

The four padding curve types, set in asds_custom_padding_tbl, are:

- Activities – the padding curve pads are based on the sum of depriced sales from activities over the calendar date. Any missing calendar dates are padded by aggregating depriced sales by fiscal week for the base historic year.
- Custom Padding by Calendar Date – the padding curve pads are based on the contents of the table's calendars dates and then padding the missing dates by the same value. The curve used with this selection is padding_type=1 in the asds_custom_padding_tbl.
- Custom Padding by Fiscal Week – the padding curve pads are based on the contents of the table's fiscal weeks and then padding the missing dates by the same value. The curve used with this selection is padding_type=2 in the asds_custom_padding_tbl.
- Custom Padding by Calendar Date then Fiscal Week – the padding curve pads are based on the contents of the table's calendar dates, padding the table pads according to the contents of the table's fiscal weeks, and then padding the missing dates by the same value. The curves used with this selection are both padding_type=1 and padding_type=2 in the asds_custom_padding_tbl.

Events

The Corrections stage is responsible for estimating the lift for events. These estimates are used in the Propagation stage.

Save Changes writes your updates to the XML file. **Undo Changes** does not revert your changes after you click **Save Changes**. That is, once you have used **Save Changes** to write your changes to the XML file, you cannot undo those changes.

Holidays

This section describes the holiday list.

Note that when Corrections stage initially loads, it will load the holiday sets and promotions from the previous XML configuration (if this configuration exists).

After you select the holiday set from the drop-down list, you can load the holidays into APC-MDO using the **Load Holiday Set** button or clear the list holidays using the **Clear Holidays** button. The holidays are located in asds_event_holiday_set_tbl.

The baseline type determines how to smooth the seasonality curve. If you select the linear option, APC-MDO looks at *X* days before and *X* days after and draws a straight line between them.

Promotions

This section describes the promo list.

You can load promotions into APC-MDO using the **Load Promos** button or clear the list using the **Clear Promos** button. The promotions are located in asds_event_promos_tbl.

Configuring Holidays and Promotions

When you are configuring the holidays and promotions, you cannot set up two events in the same week. Two events may occur in the same week in one of two ways.

- if the start dates and end dates for both events occur within the same calendar week
- if the values for one event's Days Prior or Days After overlaps with the time range of another event.

If an event overlap is detected in the Corrections stage, the Propagation stage will fail (described in the Stage Status). You can view the database table tmp_overlap_lifts to determine the location of the overlapping events (in rows where lift_count > 1). You can use the dates specified in the table to analyze the event sets and disable the overlapping records before continuing with your configuration.

8

Propagation

The Propagation stage is used to remove holiday lifts and promotion lifts from.

This chapter contains the following sections:

- "Introduction"
- "The Propagation Interface"
- "The Propagation Parameters"

Introduction

The Propagation stage is used to copy historical seasonalities backward and forward in time. This includes re-applying corrections according to the event calendar configured in the previous stage. This stage removes promo lifts and holiday lifts.

During propagation, you can:

- decide whether or not to remove a promotion from a curve
- determine how many years to create output curves for
- determine the type of output seasonality, single cycle or multi-cycle

The Propagation Interface

Access the Propagation page by clicking **Propagation** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Propagation Parameters

The Propagation Stage, shown in Figure 8–1, "Propagation Stage", consists of one section: Seasonality Coverage. The parameters are described below.

Figure 8–1 Propagation Stage

Seasonality Coverage

The seasonality coverage parameters are listed inTable 8–1, " Seasonality Coverage Parameters".

Table 8–1 Seasonality Coverage Parameters

Propagation Parameter Name and Description	Default Value	Range of Values
First fiscal year – The first fiscal year and the last fiscal year are used to create copies of the base curves for each of the years you enter. Holidays are re-applied to these curves, so it is important that the coverage matches the events table, or the moving holiday and promotions corrections will not be applied for those years. Seasonality curves should be propagated at least five years beyond the current year.	2005	> 2004
Last fiscal year – The first fiscal year and the last fiscal year are used to create copies of the base curves for each of the years you enter. Holidays are re-applied to these curves, so it is important that the coverage matches the events table, or the moving holiday and promotions corrections will not be applied for those years. Seasonality curves should be propagated at least five years beyond the current year.	2010	> 2004
Remove promos from seasonality – used to remove promotions from the seasonality curves.	False	True/False
Apply moving holiday corrections – used to propagate moving holiday corrections. It is recommended that this almost always be enabled.	True	True/False
Seasonality cycles – the value is either single-cycle or multi-cycle. The life-cycle-length histogram and information about your planned outdates should determine whether you should use multi-cycle or single-cycle seasonalities. For the multi-cycle seasonality type, each curve has multiple yearly seasonal cycles, one cycle per year. The length of the curve is determined by the first fiscal year and the last fiscal year. A multi-cycle is limited to 52 weeks. For the single-cycle seasonality type, each curve has a single cycle. The length of the curve is determined by the Raw AP and Corrections stages. The number of curves is determined by the first fiscal year and the last fiscal year. A single cycle can be longer than 52 weeks.	Multi	Single/Multi

9

Output and Parameter Export

The output files are produced in the format required by the analytical application. Once you are finished with the Output stage, you are taken to the Parameter Export stage.

This chapter contains the following sections:

- "Introduction"
- "The Output Interface"
- "The Output Parameters"
- "Parameter Export"

Introduction

The Output stage is used after the analyst has completed the configuration. It converts propagated seasonalities and other parameters into the final format required by the analytical application. You can enable or disable particular parameters in the output. You can also specify the merchandise hierarchy-location hierarchy search escalation path. When the output stage loads, it loads the escalation levels, if exists, from previous XML.

The Output Interface

Access the Output page by clicking **Output** on the Navigation Panel.

Details about using the interface to APC-MDO can be found in the "Getting Started" chapter.

The Output Parameters

The Output Stage, shown in Figure 9–1, "Output Stage", consists of two logical sections: Item Week Filters and Escalation path. The parameters contained in these sections are described below.

Note: The escalation must exactly match the calculated parameter levels or Parameter Export cannot be run

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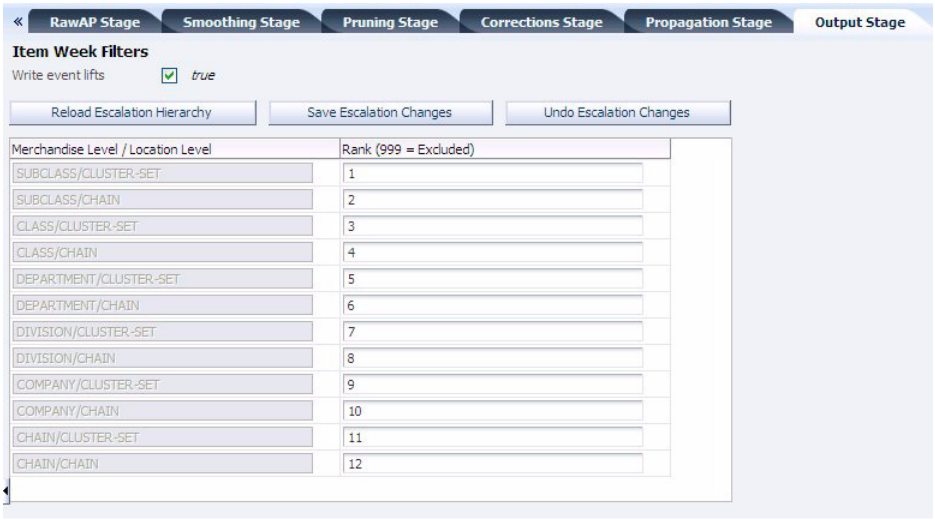
Figure 9–1 Output Stage



Item Week Filters

The following values determine the APC-MDO output.

Table 9–1 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Write event lifts – enables event lifts as an output value.	True	True/False

Escalation Path

You load the escalation hierarchy using the **Reload Escalation Hierarchy** button. **Save Escalation Changes** writes your updates to the XML file. **Undo Escalation Changes** does not revert your changes after you click **Save Escalation Changes**. That is, once you have used **Save Escalation Changes** to write your changes to the XML file, you cannot undo those changes.

The Rank defines the escalation path, which is part of the APC-MDO output (but is not used by APC-MDO). The default escalation path is first along the location hierarchy, and then along the merchandise hierarchy. It is based on the levels selected in the Raw AP stage and is only available after the Raw AP stage has been run. It runs consecutively from the lowest value to the highest value. The value 999 indicates that the associated level should not be included in the escalation path. If you do not enter a value for the rank, the associated level will not be included in escalation path.

Use the **Save Config** button to save the configuration you have created. You are prompted to indicate where the file should be saved. For more information on the Save Config functionality, see the "Getting Started" chapter.

Use the **Restore Default** button to return to the original default values.

Parameter Export

Once all the previous stages are complete, you see the Parameter Export screen, shown in Figure 9–2, "Parameter Export Stage". Run this stage to produce the Zip files. These files are written to the directory specified in the apc.properties file. This directory is not located on the local machine where the browser is running; it is located on the

machine where APC-MDO is installed. For more information on specifying this directory, see the APC-MDO *Configuration Guide*.

Note that the Parameter Export tab is always available from the Stages Navigation Panel. However, if the Output stage has not been run,you will see a message indicating that the Output stage has not been completed. In this situation the **Run** and **Stop** buttons will not be present.

Figure 9–2 Parameter Export Stage

Two Zip files are produced, each with four text files. One Zip file contains text files that specify the values for the scalar demand parameters such as elasticity. The other Zip file contains text files that specify the values for the seasonality curves.

Here is a list of the text files:

- Scalar demand parameters
  - price_parameter_values_tbl.txt
  - price_client_search_levels_tbl.txt
  - price_promo_events_tbl.txt
  - cplv_parameters_out_tbl.txt
  - cplv_search_levels_out_tbl.txt
- Seasonality Curves
  - price_seasonality_maps_tbl.txt
  - price_seasonality_values_tbl.txt
  - cplv_item_seas_cd_map_out_tbl.txt
  - cplv_search_levels_out_tbl.txt
  - cplv_seasonalities_out_tbl.txt

Glossary

Aggregation

Combining data to a higher level in order to obtain more effective data that has a higher rate of sales.

Alpha

The learning rate. A large alpha places high weight on the last week. Alpha can be considered as the inverse of the number of weeks of sales to consider. For example, when considering ten weeks of sales, then alpha = 0.1.

Attribute

Used to categorize an item's season, inventory flow, or...., and to distinguish between different selling patterns.

Attribute Mapping

Mapping the type of seasonality curve to the type of merchandise (indicated by the attribute for the merchandise). The two types of seasonality curves are Basic and By Start Date.

ASDS

The database schema used by APC-MDO.

Base Historical Period

The year-specific season code for each year-independent season code that is used to calculate the output demand parameters. For example, the base historical period for the season code January is January-2005.

Basic Season Code

A season code that does not have a start date or an end date. It is year-independent.

Catch-all Curve

This curve is defined at the highest merchandise/location level and is associated with a single season code that is mapped to all historical items.

Corrections Stage

One of the APC-MDO stages. It extends regular season code curves and calculates the event lift.

Data Sufficiency

Enough data for reasonably meaningful calculations.

Demand Model

It consists of a set of demand parameters that are combined to determine the modeled sales units for a given item/week.

Demand Parameters

A set of numeric values that are required for the calculation of forecast model values for the customer. Demand parameters include seasonality values, price elasticity, inventory effect parameters, store count effect parameters, and promotional lifts.

Depriced

Corrected value for sales based on price elasticity (price effect removed).

Effective End Date

The last day a markdown can be recommended.

Effective Start Date

The first day a markdown can be recommended.

Eligible Item

An item that meets the defined eligibility requirements. This is defined in the Preprocessing stage. Only eligible items can be used to generate demand parameters.

Eligible Week

Historical data that corresponds to a particular week for an eligible item. Only eligible weeks can be used to generate demand parameters.

Escalation Path

The order to use when searching through the merchandise levels and the location levels. The first level to be searched is always the top search level and the last level to be searched is always the bottom search level.

Filter

The process of removing historical data that should not be used in calculating demand parameters.

Filtered Eligible Item/Week

The eligible item/weeks that pass the following three filters:

- the ration of sales price to max ticket price is within the user-specified range
- the weeks of a particular item belong to the date range that corresponds to the user-specified min/max percent of cumulative sales units of the item
- the ratio of end-of-week inventory units on hand to the max end-of-week inventory units for that item is greater than or equal to the user-specified threshold.

Historical Data

Past sales data that is used by AS to determine demand parameters.

Inventory Effect

Inventory effect is intended to approximate the effect of inventory depletion on the sales rate. As the inventory of an item depletes, it is possible for the sales rate to slow down. This can happen because the customer is unable to find the correct size or preferred color, for example. It can also happen because some stores stock out.

Inventory Ratio

The ratio of inventory at the end of the week to the maximum inventory of all weeks.

Item

A combination of merchandise and location nodes at a certain merchandise and location level. For example, possible items are Style/Region, SKU/Chain, or Chain/Chain.

Item Partition

A set of items for which the APC-MDO calculates a single set of demand parameters. The APC-MDO does not calculate demand parameters for a single item. Instead, the APC-MDO assigns demand parameters to a set of items. The APC-MDO divides the entire set of items in the historical data into partitions, and, for each partition, it calculates a single set of demand parameters for that partition. A single set of demand parameters consists of one seasonality curve and on value for each of the other demand parameters.

Level

One of the following:

- any element of the merchandise hierarchy or the location hierarchy
- any combination of levels in the individual hierarchies

Life Cycle

The time period during which an item is sold.

Lift

An increase in the sales for an item as a result of a promotion or a holiday sale.

Location Hierarchy

The levels or groupings of stores in your company. Typically the levels in location hierarchies are chain, region (or zone), and store

Lowest Pass Level

The merchandise/location level combination that corresponds to the lowest merchandise and location levels from the list of merchandise and location levels that are used to calculate demand parameters.

Merchandise Hierarchy

The levels or groupings of product in your company, typically extending from SKU or size at the lowest level to company at the highest.

Merchandise/Location Partition

A combination of the merchandise hierarchy node, the location hierarchy node, and the season code, used to create a grouping that is suitable for statistical analysis.

Moving Holiday

A moving holiday is defined as any holiday whose fiscal week can change over the course of multiple years, and whose presence causes a lift in sales. Examples include Labor Day and Thanksgiving.

A moving holiday's date is defined as the actual calendar date that the moving holiday occurs on. A moving holiday is also defined with a range of dates in which sales are affected by the holiday

Multi-cycle Curve

A multi-cycle curve contains multiple cycles of the seasonality pattern, one for each future year. A cycle is limited to 52 weeks.

Output Stage

One of the APC-MDO stages. It determines output parameters, sets values for alpha, and sets the escalation path.

Padding Curve

The time series of weekly sums of depriced sales, normalized for weeks that belong to the user-specified fiscal year.

Preprocessing Stage

One of the APC-MDO stages. It is used for the initial filtering of bad weeks of data and bad items.

Price Effect

The price effect is a function of the relative price, which is computed as Relative price = salesPrice / fullPrice. The relative price is combined with input and configuration parameters to determine the price effect.

Price Elasticity

A measure of the increase in sales as the price decreases. Some items, such as Halloween candy, do not have price elasticity because demand is not determined by price.

Propagation Stage

One of the APC-MDO stages. This stage is used to remove moving holiday lifts and promotional lifts from seasonality curves.

Pruning Stage

One of the APC-MDO stages. It removes the demand parameters and seasonality curves that are unreliable.

Raw

Before pruning.

Raw AP Stage

One of the APC-MDO stages. This stage calculates the demand parameters.

Regular Season Code

A season code that has a start date and an end date. It is year-dependent.

Relative Price

relative price = sales price / full price.

Reliable Partition

A partition that has passed the pruning stage.

Richness

The number of items that are mapped, using the escalation logic defined in the search tables, to each merchandise level. Richness is a measure of the hierarchy levels at

which items are mapped to parameters. Richness can change after seasonality curves are filtered out.

Sales Units

The number of units sold for a week.

Season Code

The item attribute that represents an item's inventory flow. Season codes can be monthly, quarterly (for example, Spring or Summer), or based on a client-provided merchandise attribute.

Two types of season code exist within APC-MDO: year-dependent season codes and year-independent season codes.

A year-dependent season code is associated with an item that began or was selling during a particular fiscal year (for example, January 2004 or the first quarter of 2005).

A year-independent season code is associated with an item that began or was selling during a time period that is not identified with a particular year (for example, January or first quarter).

Season Code Setup Stage

One of the APC-MDO stages. It defines season codes and maps season codes to items.

Seasonality

Seasonal variations in the demand for merchandise.

Seasonality Correlation

A calculation of the year-to-year correlation for different years of data.

Single Cycle Curve

A single-cycle is specific to a future year and contains only one cycle. A cycle can be longer than 52 weeks.

Smoothing Stage

One of the APC-MDO stages. It calculates the seasonality curve reliability that is used to prune unreliable seasonality curves during the Pruning stage.

Stage

Data processing in APC-MDO consists of multiple stages that are executed sequentially. The input and output data for each stage persists in the database.

Standard Interface

The specification for the formatting of the historical data feeds.

Start Date

The earliest calendar date that the item started selling. The start date is associated with a year-dependent season code only.

Store Count Effect

The reduction in the relative strength of sales due to size/store level stock-outs.

Store Effect

The number of unique stores for a given item/week that either have positive sales units or positive end-of-week inventory units for that item.

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