

# **SAS<sup>®</sup> Offer Optimization for Communications 5.3 User's Guide**



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# About This Book

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## Audience

This documentation focuses on explaining the tasks that you can perform by using the SAS Offer Optimization for Communications interface. You might be assigned to a specific role, which determines the tasks that you can perform. SAS Offer Optimization for Communications is designed for the following roles:

- Administrators responsible for setting up and maintaining the application environment and data. Administrators also have the rights over all tasks that can be performed by using the SAS Offer Optimization for Communications interface.
- Business analysts responsible for designing and creating reports and performing tasks that are involved in the workflow of the application.
- Business users responsible for analyzing report data and making decisions based on that data.

For details, see [“Managing Roles and Capabilities” on page 11](#).

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## Prerequisites

Before you start working with SAS Offer Optimization for Communications, make sure that all the following prerequisite tasks are complete as mentioned in the sequence below:

1. Complete tasks that are detailed in the *SAS Communications Analytics Architecture: Administrator’s Guide*.
2. Complete tasks that are detailed in the *SAS Customer Analytics for Communications: Administrator’s Guide*.
3. Complete tasks that are detailed in the *SAS Offer Optimization for Communications: Administrator’s Guide*.

In addition, here are the prerequisites for using SAS Offer Optimization for Communications:

- A user ID and password for logging on to SAS Offer Optimization for Communications.
- A supported browser installed on your desktop client.
- A user ID and password for logging on to SAS Enterprise Miner to create and register analytical models.

- A user ID and password for logging on to SAS Web Report Studio to generate reports.
- Access to data sources or stored processes that can be used to obtain data for reports.



# What's New in SAS Offer Optimization for Communications 5.3

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## Overview

SAS Offer Optimization for Communications 5.3 has the following changes and enhancements:

- customer offer ranking based on actual invoices
- new reports for the Customer Offer Ranking workflow step
- dynamic generation of analytical base tables
- documentation enhancements

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## Customer Offer Ranking Based on Actual Invoices

In the Customer Offer Ranking workflow step, you can choose to rank best offers for customers of a microsegment. You can select either the default method or the method that ranks the best offers based on actual invoices of the customers. When you select the method based on invoices, you can change the ranking setup that you had configured at the microsegment level. In addition, in this method of offer ranking, the best offers that are produced for representative customers are ranked again for each customer. The ranking is based on the invoices that are calculated for each of the best offers that are produced for the representative customer. Therefore, the ranks that are derived by using this method are more accurate. However, it is recommended that you choose this method if your target population is not very large.

---

## New Reports for the Customer Offer Ranking Workflow Step

The following two new revenue impact, differential analysis reports are generated when you run the Customer Offer Ranking workflow step:

- Revenue Differential Analysis Report – Microsegment
- Revenue Differential Analysis Report – Project

You can view these reports on the **Reports** tab of the SAS Offer Optimization for Communications interface. This report gives the comparative analysis of revenue impact based on the two methods of customer-level offer ranking. The first method is the default method of associating the best offers of representative customers to individual customers. The second method is the re-ranking of the best offers based on the actual invoices of the customers.

---

## Dynamic Generation of Analytical Base Tables

The analytical base tables (ABTs) that are required as input for the microsegmentation and offer ranking workflow steps can now be generated dynamically. For this, you have to log on to SAS Customer Analytics for Communications. As a result of this enhancement, the ABTs can be generated more easily and quickly.

---

## Documentation Enhancements

### ***Documentation Restructuring Based on Functional Components***

In the previous release, the SAS Offer Optimization for Communications documentation included information about all its components— business intelligence (BI) reports, customer analytics, and the SAS Offer Optimization for Communications interface. The documentation is now structured according to the respective components.

SAS Communications Analytics Architecture documentation  
includes complete information about business intelligence (BI) reports that can be viewed in SAS Web Report Studio.

SAS Customer Analytics for Communications documentation  
includes complete information about the analytical components such as customer segmentation, customer acquisition, customer churn, cross-sell and up-sell, and customer lifetime value.

SAS Offer Optimization for Communications documentation  
includes information about producing the best offers for customers by using the SAS Offer Optimization for Communications interface.

### ***Addition of the Data Reference Guide***

The data model diagrams, data dictionary, and data mapping documents are merged as the *SAS Offer Optimization for Communications 5.3: Data Reference Guide* book. This book contains the following three parts:

- physical data model diagrams
- data dictionary
- data mapping

As a result, data modelers can refer to this comprehensive book to get complete information about various data marts.

# Accessibility Topic Title

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## Overview

SAS Offer Optimization for Communications 5.3 includes the following accessibility and compatibility features that improve usability of the product for users with disabilities. These features are related to accessibility standards for electronic information technology that were adopted by the U.S. Government under Section 508 of the U.S. Rehabilitation Act of 1973, as amended.

If you have questions or concerns about the accessibility of SAS products, send e-mail to [accessibility@sas.com](mailto:accessibility@sas.com).

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## Accessibility Features of the Supported Browser

The supported Web browsers for SAS Offer Optimization for Communications 5.3 are Microsoft Internet Explorer and Mozilla Firefox. For information about the accessibility features of Internet Explorer, use the Contents and Indexes option on the Internet Explorer Help menu to locate the topics on "accessibility." Similarly, for Mozilla Firefox, use the Help Contents option on the Help menu.

---

## Standard Keyboard Navigation

SAS Offer Optimization for Communications can be navigated by using the keyboard. The following table includes some guidelines:

### *Standard Keyboard Navigation Controls*

Task	Keyboard Control
Move forward through controls	TAB
Move backward through controls	SHIFT+TAB
Display the contents of drop-down lists	CTRL+DOWN ARROW
Scroll through contents of drop-down lists	DOWN ARROW and UP ARROW

Task	Keyboard Control
Activate buttons, icons, links, menu selections, and list items when they are not dimmed	ENTER
Select check boxes when they are not dimmed	SPACEBAR
Select a different radio button when a radio button is not dimmed	DOWN ARROW, UP ARROW, RIGHT ARROW, and LEFT ARROW

# Recommended Reading

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Here is the list of documents that you can refer to while using this document:

- *SAS Communications Analytics Architecture: Administrator's Guide*
- *SAS Customer Analytics for Communications: Administrator's Guide*
- *SAS Offer Optimization for Communications: Administrator's Guide*
- *SAS Communications Analytics Architecture: User's Guide*
- *SAS Customer Analytics for Communications: User's Guide*

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## **Part 1**

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# Introduction to SAS Offer Optimization for Communications

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## Chapter 1

# About SAS Offer Optimization for Communications

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## Overview of SAS Offer Optimization for Communications

The communications industry is undergoing an unprecedented change as a result of convergence that is enabled by IP broadband. Products, applications, solutions, and offers that were previously disconnected have to be delivered on to a single platform. Convergence is forcing communications service providers in formerly niche markets such as telecommunications, media, and entertainment to become connected business partners. To succeed in a converged market, communications service providers have to evolve rapidly and adapt effectively to the ongoing business changes. While meeting these challenges, communications service providers also have to satisfy customers' expectations and win their loyalty. As a result, attracting and retaining profitable customers becomes a critical factor for maximizing profits. Therefore, communications service providers need a technology infrastructure that helps them make the right offers, at the right time, and through the right channel.

SAS Offer Optimization for Communications addresses the churn problem in the communications industry. This solution also gives you the insight that you need to effectively implement business strategies, retain and nurture customer relationships, and

maximize profits. SAS Offer Optimization for Communications is empowered with the award-winning capabilities of SAS solutions—analytics, data integration, and business intelligence. With its next-generation service architecture, SAS Offer Optimization for Communications offers an extensible platform to reduce customer churn, increase customer lifetime value, and provide authentic data for various channels of customer interaction.

---

## Benefits of Using SAS Offer Optimization for Communications

### ***Reduced Customer Churn***

SAS Offer Optimization for Communications anticipates churn behavior through the real-time churn-modeling techniques. It further leverages the automated segmentation model to target the at-risk customers who have higher churn rates. SAS Offer Optimization for Communications, through its core analytical components, aims to retain customers by deriving appropriate offers for them and enabling communications service providers to promote them through appropriate service channels.

### ***Higher Profits***

SAS Offer Optimization for Communications takes a quantum leap forward in the speed and accuracy of behavior analysis and prediction by automating the crucial processes of customer profiling, segmentation, and modeling. Using state-of-the-art statistical intelligence and algorithms, the solution quickly analyzes customer behavior. This analysis, in turn, enables communications service providers to identify and target their high-value customers with timely cross-sell and up-sell offers. As a result, communications service providers can meet their customers' communications needs and satisfy their demand for new services. The result is higher profits and more satisfied customers. As customer retention rates rise and customer-acquisition costs drop, profits continue to increase.

### ***Greater Market share***

SAS Offer Optimization for Communications leverages behavior analysis and modeling to deal with customer churn. This feature enables communications service providers to predict which customers are likely to leave, even before the thought occurs to the customer. It also enables rapid dissemination of this churn data to key decision makers and customer contact points within the corporation. As a result, communications service providers can have a powerful edge in retaining their valued customer base, in spite of competitive efforts to entice those customers away. Decreased churn and higher customer retention translate to significant gains in the market share.

### ***Improved Return on Investment***

With SAS Offer Optimization for Communications, communications service providers incur lower up-front costs in order to obtain the tools that are necessary to gather, analyze, and store data. Using this data, communications service providers can assess customer churn. Moreover, they can further leverage this data to create effective customer retention programs. As a result, they can measure improved return on

investment (ROI) in terms of decreased churn, higher marketing response rates, and drop in overall customer acquisition expenditures.

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## **Solution Features**

### ***Customer-Centric Database***

SAS Offer Optimization for Communications is empowered with fully documented, customer-centric dimensional models that contain information about an operator's portfolio of customers. The information contains historical, highly detailed, transformed, and aggregated customer data. The data layer is designed to support maximum flexibility in the types of relationships that can exist in operations.

### ***Optimized Data Management***

SAS Offer Optimization for Communications requires data from various operational and transactional systems such as the billing system, the customer relationship management system, the order management system, and the activity-based management system. The flexible architecture ensures seamless integration with all these systems to extract the required data and information.

### ***Support for Multiple Product Lines***

SAS Offer Optimization for Communications is available for fixed and mobile communications service providers with prepaid or postpaid customers. It is also available for a few hybrid price plans that are designed by combining the two types of product lines.

### ***Optimized Analytical Techniques***

SAS Offer Optimization for Communications implements the state-of-the-art optimization techniques for all its core analytical objectives:

- Divide the target segment into homogenous clusters.
- Derive representative customers for each cluster.
- Determine the best offers in ranked order for each representative customer and for each customer of the target segment.

### ***Seamless Integration with Other Analytical Models***

SAS Offer Optimization for Communications needs certain analytical inputs such as customer lifetime value, churn scores, cross-sell and up-sell scores, payment risk scores, and profitability values. Hence, it is tightly integrated with all these models that facilitate customer retention.

### ***Dual Modes of Operation***

SAS Offer Optimization for Communications operates in two modes, design mode and batch mode.

**Design mode**

In the design mode, users perform tasks by using the SAS Offer Optimization for Communications interface. Also, in this mode, a sample of customers is drawn from the customer base. Therefore, all activities and analyses are based on sample data. Users can configure and perform tasks until they are satisfied with the results. Users can save the configuration setup and the results for batch mode processing.

**Batch mode**

The configuration setup that users finalize in the design mode is promoted in the batch mode. In the batch mode, tasks are performed automatically without much manual intervention. Results are derived and reports are generated based on the data of the entire customer base.

**Automated Workflow**

SAS Offer Optimization for Communications ensures a structured working environment for all its user groups through its predefined workflow. The automated workflow supports the following objectives of the solution:

- Provide a guided development and management of the solution strategy in order to support customer retention initiatives.
- Automate functional tasks and analytical processes.
- Support a flexible architecture to enable changes in the workflow based on unique requirements of the communications service provider.
- Offer prebuilt capabilities to support a collaborative environment for all user groups.

**Effective Reporting**

At each stage of the workflow, SAS Offer Optimization for Communications enables users to generate customized reports and analyze results. This feature helps users verify and confirm results with their business requirements. Based on these reports, users can decide whether they have to configure a certain workflow step again.

SAS Offer Optimization for Communications also supports the business reporting features. These reports help decision makers to quickly develop strategies for their business goals and take appropriate actions at the right time.

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## **How Does SAS Offer Optimization for Communications Work?**

SAS Offer Optimization for Communications is a comprehensive solution that interacts with external source systems in order to produce best offers for customers. This solution can be divided into the following components:

**Foundation mart**

stores communications-related data that is extracted from external source systems.

**Solution-specific data layer**

stores data that is required for application processing, analytical processing, and business reporting.

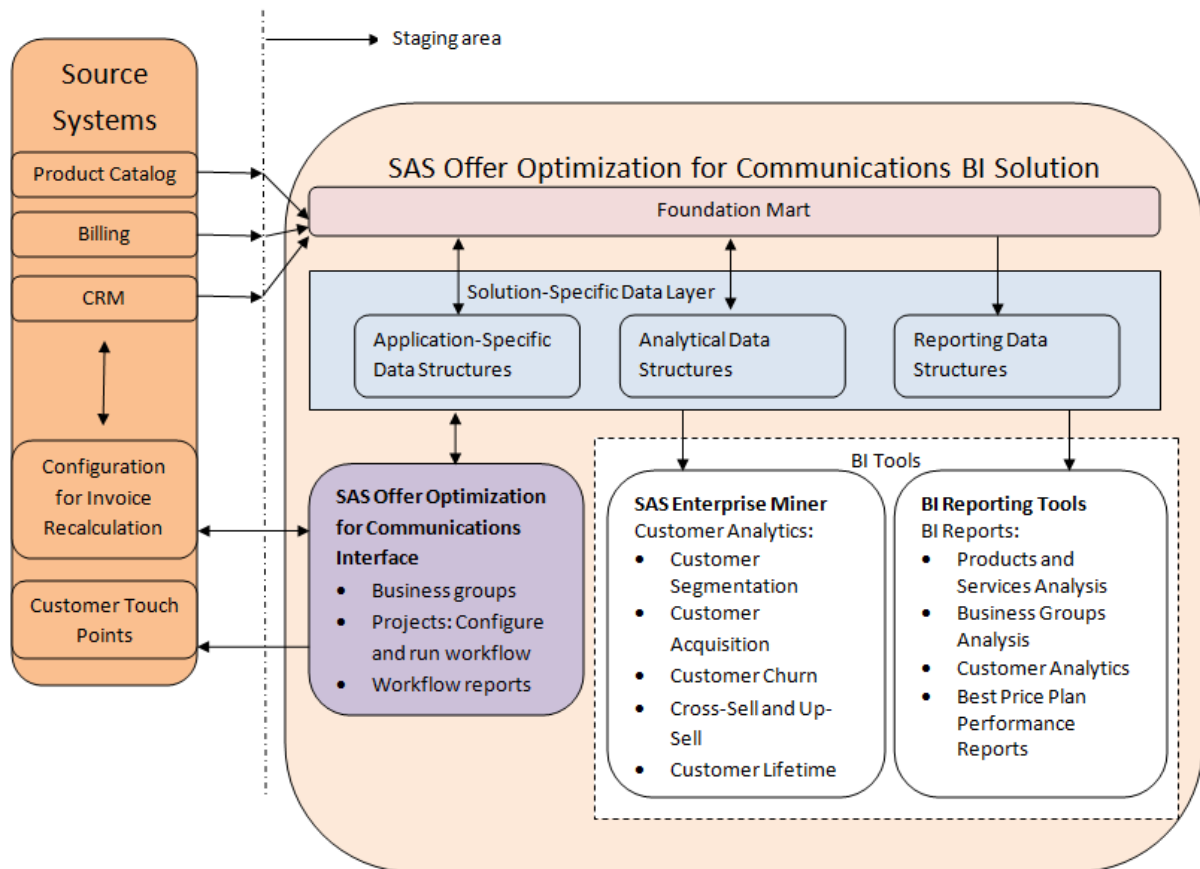
SAS Offer Optimization for Communications interface

workflow-based application to define business groups, configure and run projects, view reports, and produce best offers for customers in the target segment.

BI Tools

workbench for analytical modelers to define analytical models. Also, provides reporting tools for business analysts to analyze business reports and make business decisions.

**Figure 1.1** Working of SAS Offer Optimization for Communications



The SAS Offer Optimization for Communications workflow explains the interactions among various components. To summarize, the solution workflow contains the following steps:

1. Populate data into the common data layer from the external source systems through the staging area.
2. Populate data into the solution-specific data layer:
  - BI reporting data. For details, see the *SAS Communications Analytics Architecture: Administrator's Guide*.
  - Analytical data. For details, see the *SAS Customer Analytics for Communications: Administrator's Guide*.
  - Application-specific data. For details, see the *SAS Offer Optimization for Communications: Administrator's Guide*.

3. Log on to SAS Offer Optimization for Communications with the profile of an administrator.
  - a. Define business groups.
  - b. Run process to add customers to business groups.

*Note:* For tasks that are detailed in step 3, see *Chapter 6 Managing Business Groups* in this guide.
4. Log on to SAS Customer Analytics for Communications to complete tasks pertaining to the following analytical models:
  - customer segmentation
  - customer acquisition
  - customer churn
  - cross-sell and up-sell
  - customer lifetime value

For details, see the *SAS Customer Analytics for Communications: User's Guide*.

5. View business reports in SAS Web Report Studio. For details, see *SAS Communications Analytics Architecture: User's Guide*.
  - a. Analyze BI reports for customer analytics.
  - b. Analyze business groups reports.
  - c. Identify business problems associated with each business group.
6. Log on to SAS Offer Optimization for Communications with a certain profile.
  - a. Define projects with specific objectives for different business groups.
  - b. Configure and run project workflow to derive representative customers.
  - c. Export information about representative customers to external source systems.
  - d. Import billing details of representative customers and recalculate invoices.
  - e. Produce best offers for customers in the target segment.
  - f. Promote the project to batch mode.

*Note:* For tasks that are detailed in step 6, see the relevant chapters of this guide.

7. Run the project in batch mode and produce best offers for each customer in the customer base.
8. Export information about best offers to external source systems.

*Note:* For details about steps 7 and 8, see *SAS Offer Optimization for Communications: Administrator's Guide*.

9. Log on to SAS Web Report Studio with a certain profile and view reports to evaluate the performance of SAS Offer Optimization for Communications. For details, see the *SAS Communications Analytics Architecture: User's Guide*.

---

## Accessing Help for SAS Offer Optimization for Communications

Help is embedded in the SAS Offer Optimization for Communications interface as various help components. For example, help pop-ups and tooltips give required information to users whenever needed.





## Chapter 2

# Managing Access to SAS Offer Optimization for Communications

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## Managing Roles and Capabilities

Different users of SAS Offer Optimization for Communications might have access to different functionality depending on the roles that are assigned to them. Each role is mapped to a set of predefined capabilities. A capability, also known as an application action, defines operations that a user can perform. SAS Offer Optimization for Communications has three predefined roles—administrator, business analyst, and business user. Capabilities are further categorized into three levels—General, Analytical, and Advanced.

### **General Capabilities**

Each role is assigned the general capabilities. The following are examples of general capabilities:

- View information about a business group.
- View information about a project and its workflow.
- View reports.
- Send e-mail notifications.

### **Analytical Capabilities**

Analytical capabilities are assigned to administrators and business analysts. However, administrators and business analysts are not assigned the same analytical capabilities. The analytical capabilities of adding and managing business groups are assigned only to administrators. Similarly, the analytical capabilities of creating and managing reports in SAS Web Report Studio are assigned only to business analysts. The following are examples of analytical capabilities that are commonly assigned to administrators and business analysts:

- Create, manage, and share projects.
- Define or import workflow of the project.
- Run and manage workflow steps of the project.
- Define reports in SAS Offer Optimization for Communications.

### Advanced Capabilities

Advanced capabilities are assigned to administrators and business analysts. The following are examples of advanced capabilities that are assigned to both the roles:

- Delete a project.
- Reset a workflow step of a project.

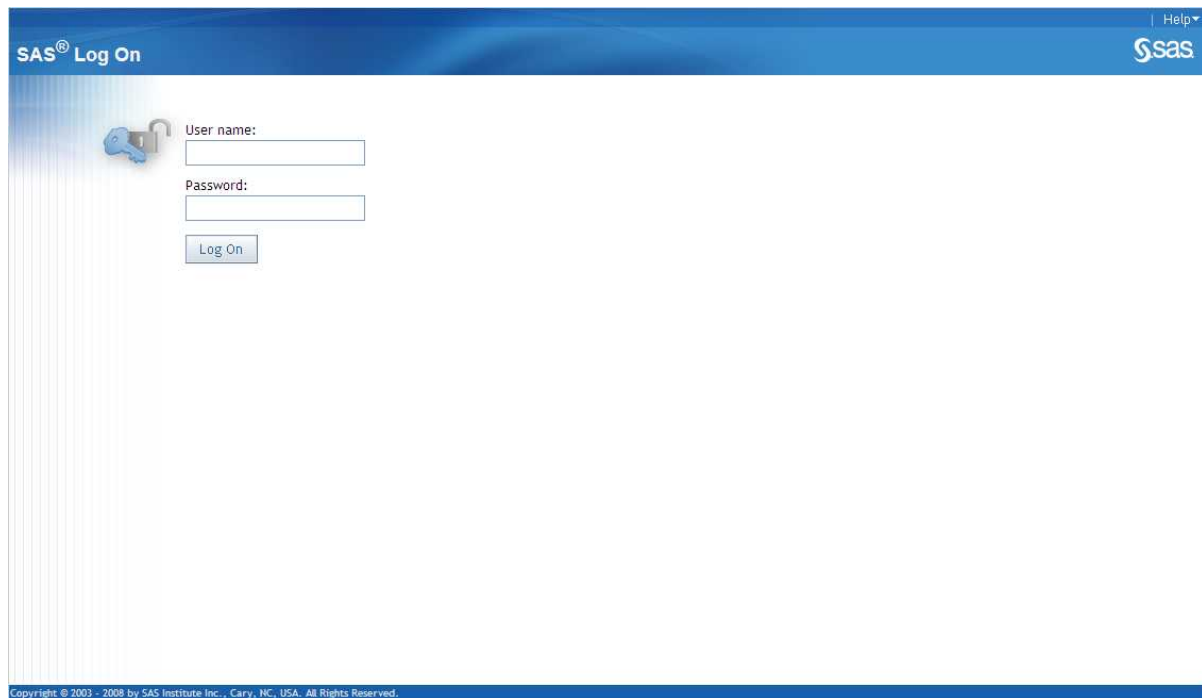
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## Log On to SAS Offer Optimization for Communications as a Registered User

To log on to SAS Offer Optimization for Communications:

1. To display the SAS Offer Optimization for Communications logon window, click on the URL that is supplied by your system administrator or paste it in the address field of your browser. For example, you might enter **http://server01.abc.com:8080/SASOfferOptForComm** as the URL.

**Display 2.1** Log On Window for SAS Offer Optimization for Communications



The screenshot shows the SAS Log On window. The title bar is blue with "SAS® Log On" on the left and "sas" on the right. The main area is white with a blue key icon on the left. To the right of the icon are two text input fields: "User name:" and "Password:". Below the "Password:" field is a "Log On" button. At the bottom of the window, there is a small copyright notice: "Copyright © 2003 - 2008 by SAS Institute Inc., Cary, NC, USA. All Rights Reserved."

2. To log on:
  - a. In the **User name** field, enter your user ID.

- b. In the **Password** field, enter the password for the user ID that you have just specified.
- c. Click **Log On**.

The main application window appears. For details, see [“Overview of the SAS Offer Optimization for Communications Interface”](#) on page 15.

*Note:* Your password is case-sensitive. Also, your user ID might be case-sensitive depending on the operating system that is used to host the Web application server. If you need assistance, contact your system administrator.

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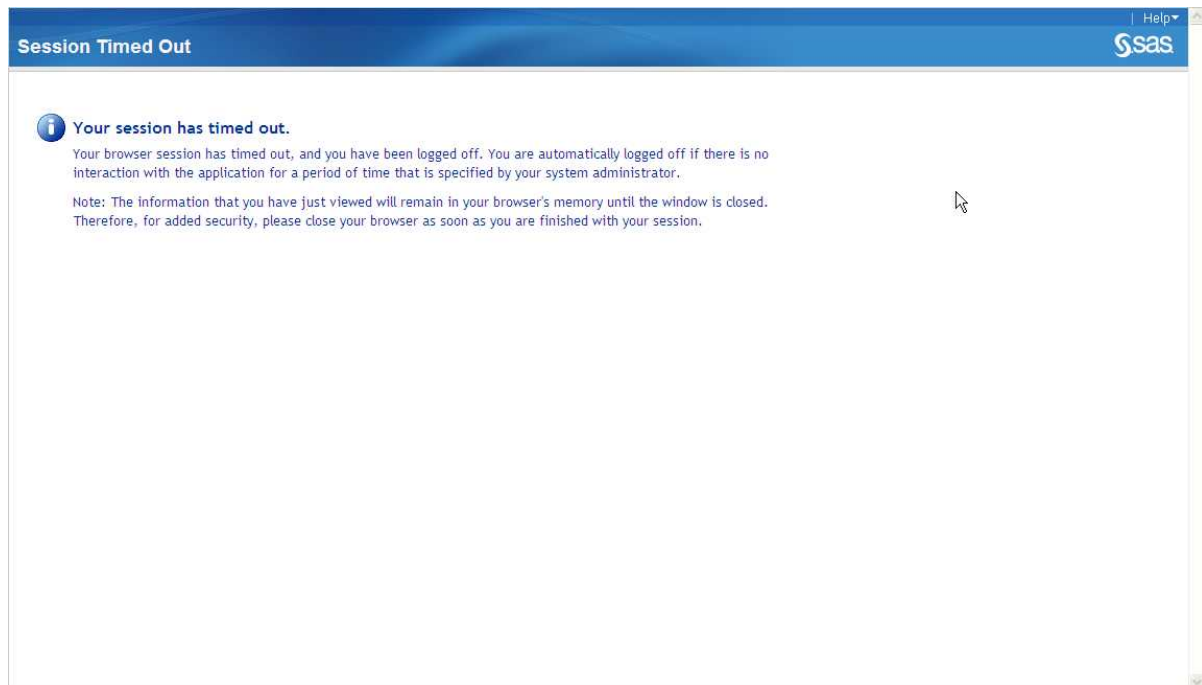
## Log Off from SAS Offer Optimization for Communications

To log off from SAS Offer Optimization for Communications, on the Application bar, click **Log Off**.

If your connection to SAS Offer Optimization for Communications remains inactive for a certain time, then your session might time out. By default, the session time-out due to inactivity is 30 minutes. Your administrator can change this duration. The application prompts you about your inactive session, and you can log on and continue with your session. However, if you lose your connection, then you must begin at the same point where you last saved your work. As a best practice, save your work frequently.

The following is an example of the message that appears when your session has timed out.

**Display 2.2** Session Timed Out Message for SAS Offer Optimization for Communications





## Chapter 3

# The SAS Offer Optimization for Communications Interface

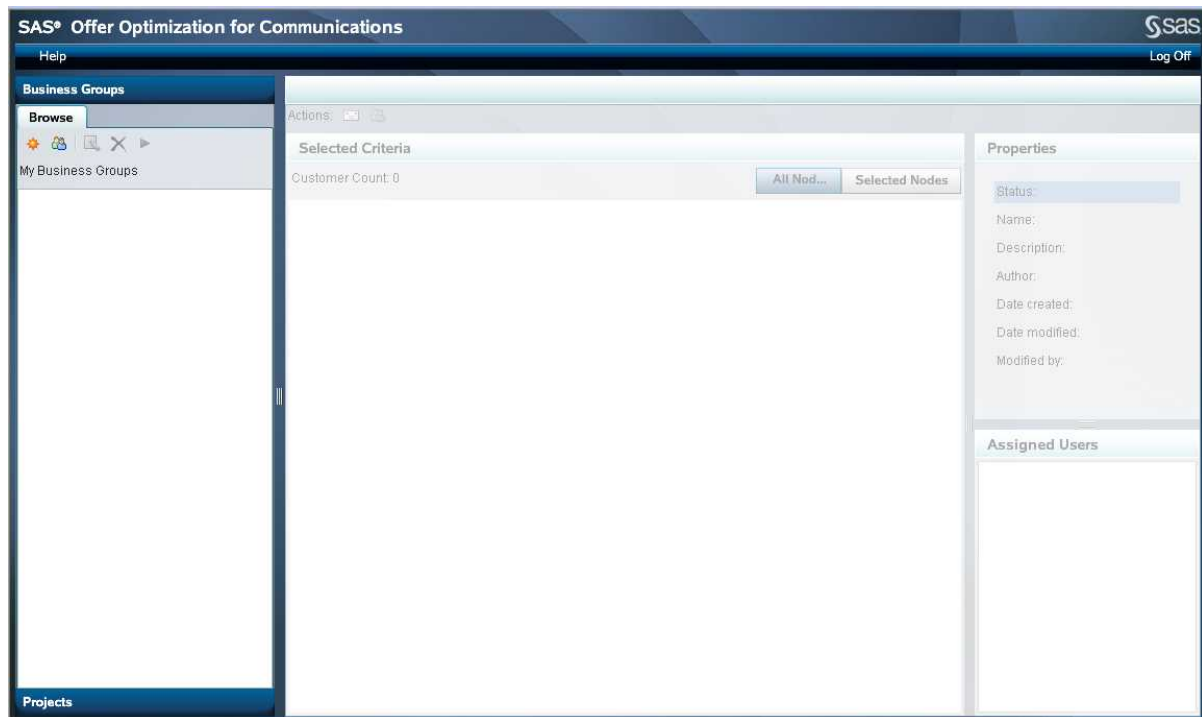
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## Overview of the SAS Offer Optimization for Communications Interface

When you log on to SAS Offer Optimization for Communications, the main application window appears. The main application window comprises the application bar, the navigation pane, and the object details pane. The navigation pane and the object details together form the workspace. When you log on for the first time, both the panes are empty. This indicates that your administrator has not defined any business groups.

**Display 3.1** First Logon of SAS Offer Optimization for Communications

However, after your administrator defines one or more business groups, by default, the **Business Groups** section is selected in the navigation pane. The object details displays information only after you select a business group object in the navigation pane.

**Figure 3.1** SAS Offer Optimization for Communications User Interface

- 1 Application bar
- 2 Navigation pane
- 3 Object details pane

---

## Using the Application Bar

### Overview

The application bar is located at the top of the application window and is part of the application banner. The application bar contains the **Help** menu and the **Log Off** option.

### The Help Menu

The following options are available on the **Help** menu:

#### **SAS on the Web**

##### **Offer Optimization for Communications 5.3**

opens the product page of SAS Offer Optimization for Communications 5.3. This page gives information about the documentation that is available for SAS Offer Optimization for Communications 5.3.

##### **SAS Home Page**

opens the home page of the SAS corporate Web site.

##### **About SAS Offer Optimization for Communications 5.3**

displays copyright and other information about SAS Offer Optimization for Communications 5.3.

### The Log Off Option

The **Log Off** option enables you to log off from the application.

---

## Overview of the Navigation Pane

The navigation pane contains two collapsible sections, **Business Groups** and **Projects**. You can view and work in only one section at a time.

#### The **Business Groups** section

displays a list of business groups that you have defined. The **Business Groups** section also provides you a toolbar for creating and managing business groups. For details, see [“Working in the Navigation Pane of the Business Groups Workspace” on page 27](#).

#### The **Projects** section

displays two categories of project lists. The **Projects** section also provides you a toolbar for creating and managing projects. For details, see [“Working in the Navigation Pane of the Projects Workspace” on page 53](#).

---

## Overview of the Object Details Pane

The information in the object details pane changes depending on the section that you select and the task that you initiate in the navigation pane. In the object details pane, you perform tasks that you initiate in the navigation pane. The title bar that is displayed at the top of the object details pane uniquely identifies the object details pane. Information in this pane is further divided into tabs and panes.

For details, see [“Working in the Object Details Pane of the Business Groups Workspace” on page 29](#) and [“Working in the Object Details Pane of the Projects Workspace” on page 54](#).

---


## Help Overview

The following types of online Help are available with SAS Offer Optimization for Communications:

### Tooltip Help

displays short, descriptive information about fields, columns, and icons in a pane. Tooltip Help appears automatically, when you move your pointer over an item on your screen. For example, tooltips display the purpose of each toolbar option.

### Pop-up Help

displays detailed information about fields and columns in a pane. Pop-up Help is represented using the Help icon. Click  to view the information, which is displayed in a pop-up dialog box. For example, while working in a window, users might need complete details of certain fields, in order to provide appropriate information.

### Help Text

displays information persistently in the interface near an associated field, group of fields, or a table. For example, data entry instructions and introductory text for fields and tables are provided.



## Chapter 4

# Performing Common Tasks in SAS Offer Optimization for Communications

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---

## Overview of Commonly Performed Tasks

Here are the common components of the SAS Offer Optimization for Communications interface:


- panes
- sections
- tables
- lists

This chapter explains the common tasks that you can perform when you work on these components.

## Resize a Pane

You can resize a pane if the default size of the pane does not display complete information. Also, you can resize a certain pane in order to provide more area for other panes. .

To resize a pane:

1. Move your pointer to the horizontal or vertical divider.
2. When your pointer changes to a , drag to resize the pane.

---

## Select a Section in the Navigation Pane

In the navigation pane, you can work either in the **Business Groups** section or the **Projects** section. To switch between the two sections, click the respective section heading. The view of the object details pane changes depending on the section that you select in the navigation pane.

---

## Select an Object in a Section

### *About Sections*

The business groups and projects that you define are identified as individual objects in the respective sections of the navigation pane. At a time, you can work on a single object of a particular section. Before performing any task, you have to select the appropriate object from the respective section.

### *Select a Business Group*

1. In the navigation pane, select the **Business Groups** section by clicking the section heading.
2. Select the **Browse** tab.
3. From **My Business Groups** list, select the business group on which you want to perform a task.

### *Select a Project*

1. In the navigation pane, select the **Projects** section by clicking the section heading.
2. Select the **Browse** tab.


3. In the **My Projects** list, select the project on which you want to perform any task. Alternatively, you can also select a project that is available in the **Shared Projects** list.

---

## Resize a Window

You can resize a window if the default size of the window does not display complete information.

To resize a window:

1. Move your pointer to any of the borders of the window.
2. When your pointer changes to a , drag to resize the window.

---

## Working With Tables

### *Change the Width of a Column*

If the default width of a column does not display complete information, you can change the column width. To change the width of a column, drag the boundary on the right side of the column heading until the column is the width that you want.

### *Move a Column*

If the order in which the columns are displayed does not meet your needs, you can change the sequence of the columns. To move a column, click the column heading and drag the column to the desired location.

### *Change the Sort Order of a Column*

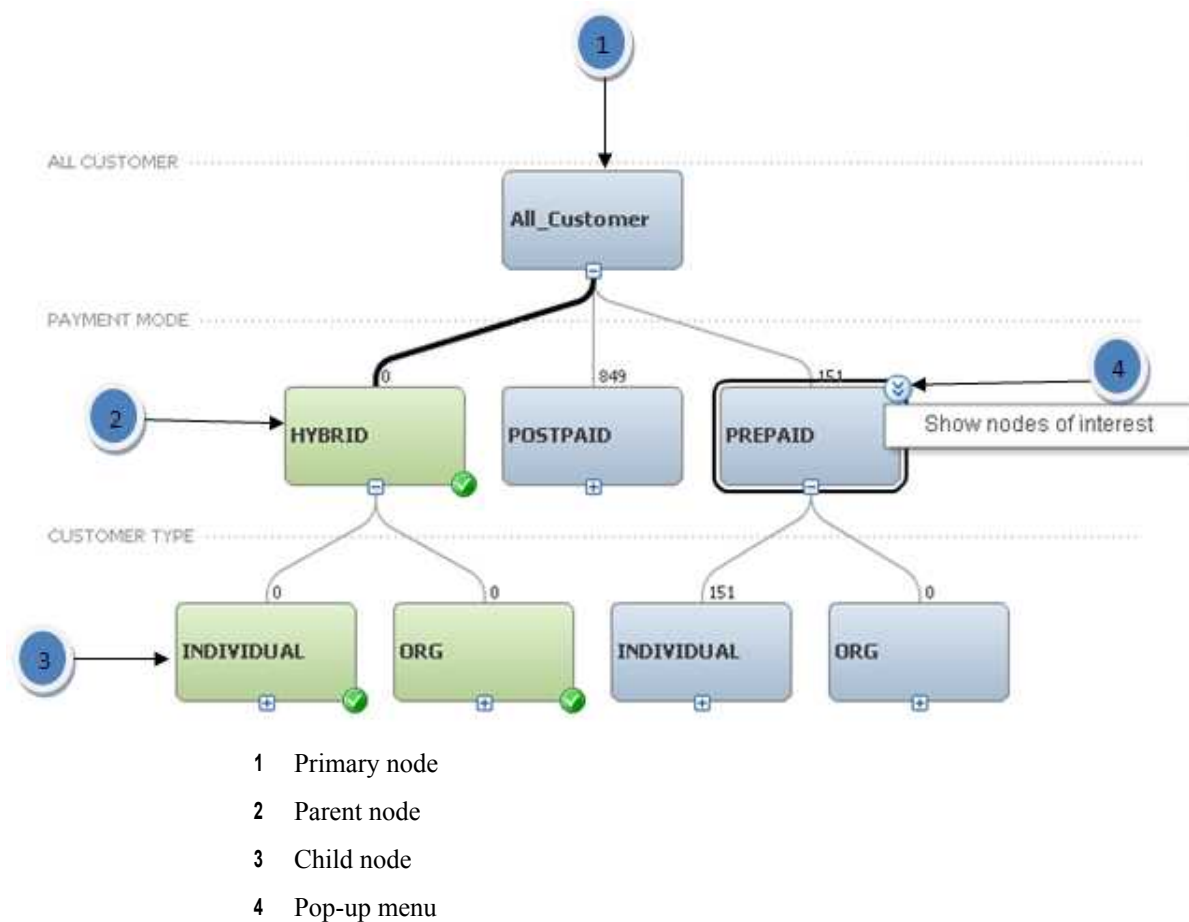
You can sort data by only a single column at a time. To change the order in which a column is sorted, click the up or down arrow that is displayed in the column heading.

---

## About Hierarchical Lists

### *Overview*

In certain panes, information is displayed in a list that progresses from top to bottom. These lists are called hierarchical lists. A hierarchical list contains one or more levels of information displayed in the form of nodes. Each node represents a certain value or a definition. The hierarchical structure indicates the relationships and dependencies that exist between the nodes.

**Figure 4.1** Structure of a Hierarchical List

## Node Types

The first level of the hierarchical list contains a single node, which is called the primary node. Any subsequent level of the list is called a child level. At each child level, there can be one or more nodes, which are called child nodes. Each child node originates from a single parent node, which is a child node at a previous level.

## Mode Types

A hierarchical list can be either in view mode or edit mode.

In view mode, the hierarchical list displays information that you select or define at various levels. You can expand and collapse the child nodes.

In edit mode, each node has a pop-up menu. The pop-up menu enables you to perform certain tasks.

## Examples

Hierarchical lists are used while defining business groups and target segments. For details, see [“Working with Hierarchical Lists for Defining Selection Criteria for Business Groups”](#) on page 35 and [“Working with Hierarchical Lists for Defining a Target Segment”](#) on page 81.

## **Part 2**

---

# Working in the Business Groups and Projects Workspaces

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## Chapter 5

# Introduction to the Business Groups Workspace

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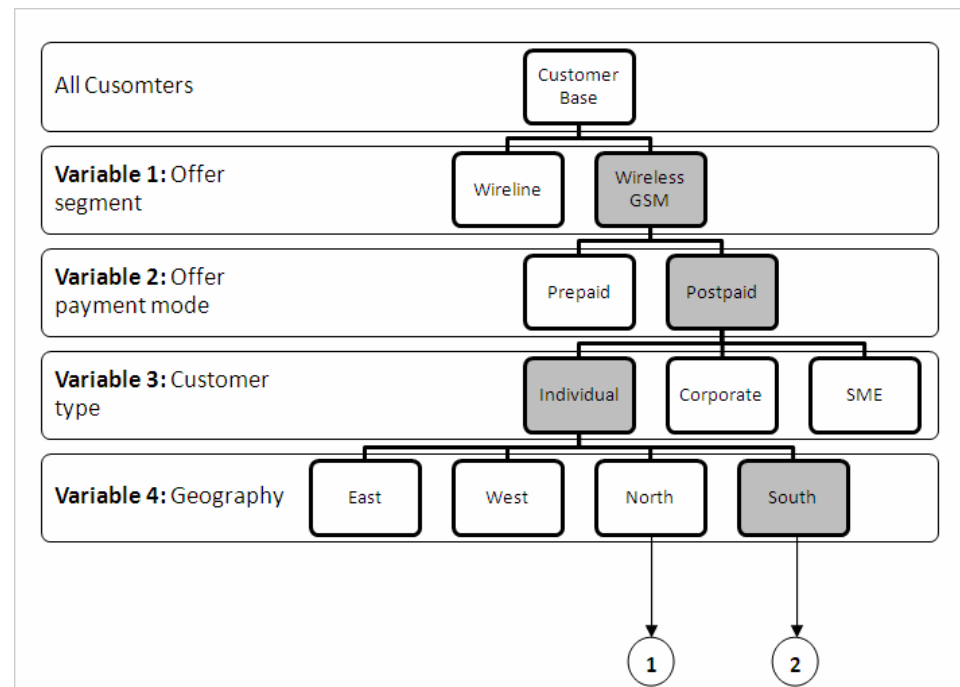
## About Business Groups

Communications service providers divide their customer base into distinct groups in order to map it with their business operations and goals. The customer base is divided into groups based on certain business rules. Business rules are the strategic parameters that are defined according to the goals that are set by an organization. These parameters are mostly static and therefore do not change frequently.

In order to divide the customer base according to the strategic parameters, SAS Offer Optimization for Communications enables you to define distinct customer groups. Each group is identified by a name and a description and is called a business group. Business groups are created based on a set of predefined variables. The values of each variable are also predefined. The unique combination of a variable and the values that you select for that variable is the selection criterion for the business group. You can define one or more selection criteria for a business group. In addition, you can define a hierarchy in which you want to define the selection criteria. Customers who satisfy all selection criteria are added as members of the business group. Moreover, the selection criteria that you define for a business group are unique across business groups. In other words, the selection criterion that you have added to a business group cannot be added to another business group. As a result, a customer can belong to only one business group.

You can create and manage business groups using the business groups workspace.

For example, you can define a business group with the following selection criteria:

**Figure 5.1** Example of Selection Criteria for a Business Group

1 Deselected value

2 Selected value

Therefore, customers who satisfy the following criteria are added to the business group:

Offer segment = Wireless GSM

Offer payment mode = Postpaid

Customer type = Individual

Geography = South

## Overview of the Business Groups Workspace

The business groups workspace contains two panes:

The navigation pane

displays a list of business groups, which you can access. In the navigation pane, you can also initiate tasks for creating and managing business groups.

The object details pane

displays information about the business group that you select in the navigation pane. In the object details pane, you can also perform various tasks related to the business groups.

You can resize the navigation pane and the object details pane by using the vertical divider that is available between the two panes.



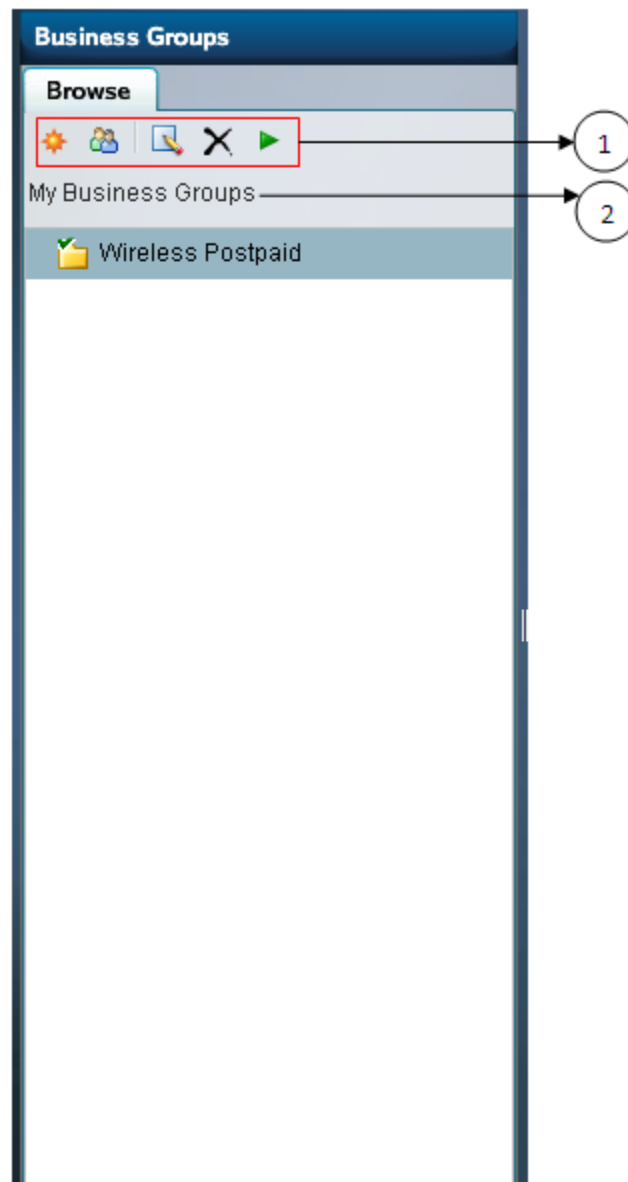
---

## Working in the Navigation Pane of the Business Groups Workspace

### Overview

The navigation pane includes the following components:

**Figure 5.2** Navigation Pane of a Business Group



- 1 Section toolbar
- 2 Business groups list

## Section Toolbar Options

The section toolbar enables you to initiate tasks for creating and managing business groups. The options on the section toolbar might differ depending on the role that is assigned to you.




**Table 5.1** Section Toolbar Options for a Business Group

Icon	Action
	defines a new business group.
	defines user access for business groups.
	modifies details of a business group.
	deletes a business group.
	runs a process in order to add customers to the business group.

## Business Groups List

The **My Business Groups** list displays the business groups for which your administrator has granted you access rights. The current status of a business group is indicated using the following icons:

**Table 5.2** Processing Status for a Business Group

Icon	Status	Description
	<b>Ready to run or Awaiting inputs</b>	represents an active business group. Selection criteria might or might not be specified for this business group.
	<b>Successful</b>	indicates that customers are added to this business group.
	<b>Failed</b>	indicates that one or more errors occurred when the process to add customers to this business group was run.

*Note:* If you have administrative rights, then the list displays all business groups that are defined in the application.



---

## Working in the Object Details Pane of the Business Groups Workspace

### Overview

The object details pane displays information about a business group. At the top of the object details pane, the header bar is displayed. The header bar displays the name of the selected business group.

The **Actions** toolbar is located below the title bar. Using this toolbar, you can complete the following tasks for the selected business group:

- To send an e-mail notification, click .
- To define user access, click .

The object details pane displays information about the selected business group in the following panes:

- **Selected Criteria**
- **Properties**
- **Assigned Users**

### The Selected Criteria Pane

The **Selected Criteria** pane shows a hierarchical list, which indicates the business rules defined for the business group. For details, see [“Viewing the Customer Selection Criteria” on page 47](#).

### The Properties Pane

The **Properties** pane gives details about the business group, such as name, description, author, and date of creation and modification. For details, see [“Viewing Properties of a Business Group” on page 48](#).

### The Assigned Users Pane

The **Assigned Users** pane displays the list of users who can access the business group and view its details. For details, see [“Viewing Users of the Business Groups” on page 48](#).



## Chapter 6

# Managing Business Groups

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## About Managing Business Groups

You can create a business group only if you have administrative rights. As an administrator, you can perform the following tasks:

- Add customers to a business group.
- Assign users to a business group.
- Change the details of a business group.
- Delete a business group.

If you do not have administrative rights, you can view only the details of the business groups that are created and managed by your administrator.

---

## Define a Business Group

Defining a business group involves the following main tasks:

- Identify the business group with a name and a description.
- Define the selection criteria for adding customers to the business group.

*Note:* Before you begin defining a business group, make sure that you are familiar with hierarchical lists. For details, see [“About Hierarchical Lists” on page 21](#).

To create a business group:

1. In the navigation pane, select the **Business Groups** section.
2. On the section toolbar, select . The New Business Group window appears.

**Display 6.1** General Tab of the New Business Group Window

The screenshot shows a window titled "New Business Group" with a close button (X) in the top right corner. Below the title bar are two tabs: "General" (selected) and "Customer Selection". The "General" tab contains two text input fields: "Name:\*" and "Description:". To the right of the "Description:" field is a "Create" button. At the bottom of the window are three buttons: "Save", "Run", and "Cancel". A mouse cursor is visible over the "Create" button.

3. On the **General** tab, enter the following details:
  - a. Enter a name for the business group. The business group will be identified by this name.
  - b. Enter a short description for the business group.
4. Click **Create**.
- TIP** If you do not want to define the business group, click **Cancel**. The window closes, and you will lose the information that you have entered.
5. Select the **Customer Selection** tab. You can access this tab only after the business group is created successfully. By default, the primary node representing the entire customer base is displayed in the hierarchical list.

**Display 6.2** Customer Selection Tab of the New Business Group Window

The screenshot shows the 'New Business Group' window with the 'Customer Selection' tab active. The window title is 'New Business Group'. Below the tabs, there is a text area that says 'Define selection criteria for adding customers to the business group.' with a help icon. Below this, it says 'Customer Count: 0'. To the right of the count are two buttons: 'All Nodes' and 'Selected Nodes'. Below these is a list of nodes, with 'ALL CUSTOMER' selected. Below the list is a button labeled 'All\_Customer'. At the bottom right of the window are three buttons: 'Save', 'Run', and 'Cancel'.

6. Define the criteria for selecting customers for the business group. For details, see [“Working with Hierarchical Lists for Defining Selection Criteria for Business Groups”](#) on page 35.

- a. Add one or more child levels.
  - b. Select the nodes that you want to add as selection criteria.

**TIP** **Customer count** displays the number of customers who satisfy the selection criteria that you have defined for this business group. This number also indicates the total number of customers in the business group.

7. Click **Save**.
8. (Optional) To add customers to the business group, click **Run**.



---

## Working with Hierarchical Lists for Defining Selection Criteria for Business Groups

### Prerequisites

Before using the hierarchical lists, make sure that you are familiar with their basic functionality. For details, see [“About Hierarchical Lists” on page 21](#).






### Overview



When you define selection criteria for adding customers to a business group, the hierarchical list opens in edit mode. To specify the selection criteria, you have to first add one or more child levels. The sequence in which you add variables defines the hierarchy of the variables that you want to consider for selecting customers. After this, you have to select one or more child nodes at each level to indicate the values that you want to consider for each variable. The hierarchical list has two views. You can either view all nodes or only selected nodes.

### Icons in a Node

Each node has one or more icons. A few of the icons that are displayed in a node might differ depending on the action that you take on the node. The following table lists all icons that are displayed in a node and the purpose of each icon.

**Table 6.1** *Icons in a Node*

Icon	Purpose
	opens a pop-up menu.
	enables you to scroll horizontally across the child nodes. Also, shows distribution of customers who are represented by the child node.
	indicates that the child node is selected and included in the selection criteria of the business group that you are defining.
	indicates that this node is considered in the selection criterion of some other business group. The node to which this icon is attached is deactivated.
	indicates that a new child node is added for a selected parent node after you have saved the business group. That is, a new value is added for a variable that you have included in the selection criteria of a business group.

Icon	Purpose
	expands the child nodes that originate from a parent node.
	collapses the child nodes that originate from a parent node.

### ***Pop-up Menu of a Node***

Each node of the hierarchical list has a pop-up menu. The options on the pop-up menu differ depending on the current mode of the hierarchical list and the type of the node. The following options are available on the pop-up menu:

**Show nodes of interest**

displays the nodes that you have selected at various levels of the hierarchical list.

**Show all nodes**

displays all nodes of the hierarchical list.

**Add child level**

displays a list of variables that are not added at previous levels of the hierarchical list. From the list, select a variable that you want to add at the specific level.

**Select node**

selects a child node. The value that this node represents is added in the selection criteria.

**Deselect node**

deselects a child node. The value that this node represents is removed from the selection criteria.

**Clean node**

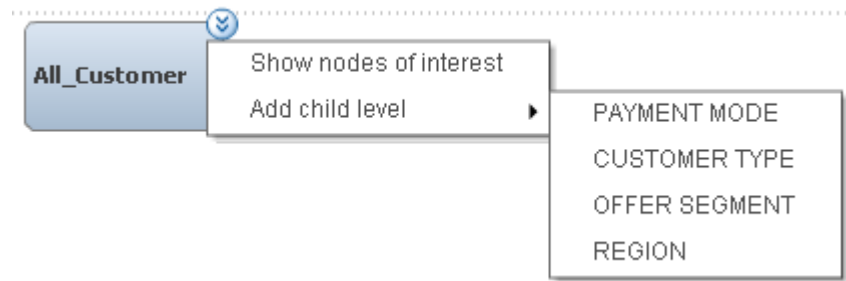
cleans a dirty node.

### ***Add One or More Child Levels***

You can define one or more child levels. The number of child levels that you can define depends on the number of variables that you have defined for setting up the business rules of a business group. Each child level represents a variable. A child node represents a value of the variable that is selected at the child level.

To add child levels:

1. Click the primary node.
2. From the pop-up menu, select **Add child level**.

**Display 6.3** Add Child Level

3. From the list, select a variable that you want to add as the first level of the selection criterion. The values of the variable that you add are displayed as child nodes. For example, if you select the geography variable, then the values East, West, North, and South are added as child nodes.

*Note:* At each subsequent level, the variable that is added at the previous level is not available for selection.

4. (Optional) Select a child node, and then select **Add child level** from the pop-up menu. Select the variable that you want to add as the next level of the selection criterion. The values of this variable are added as child nodes for each parent node. For example, you add the payment mode variable at the next level. For each parent node, two child nodes, prepaid and postpaid, are added.

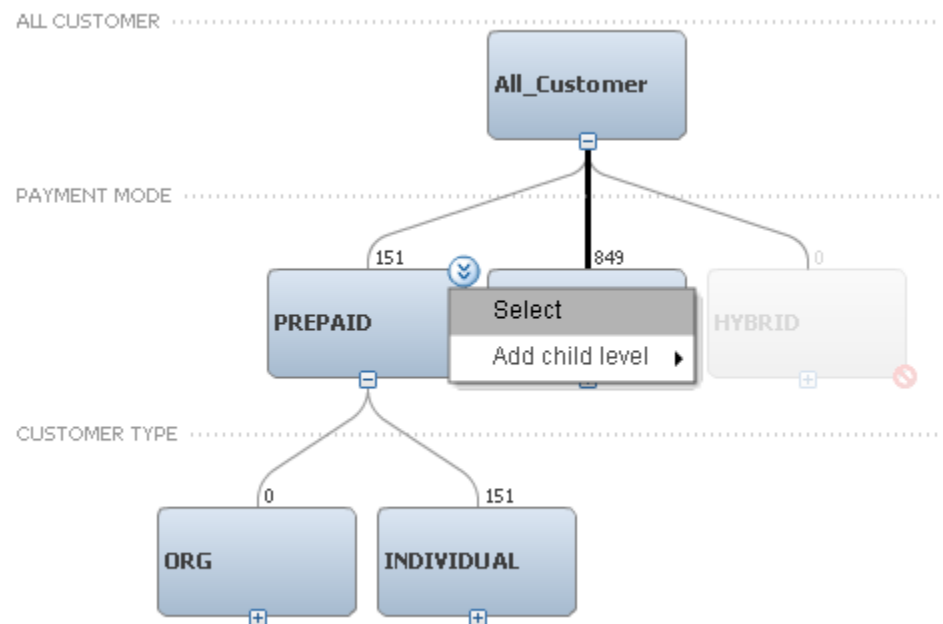
**TIP** Similarly, you can add child nodes for the next levels.

### Select a Child Node

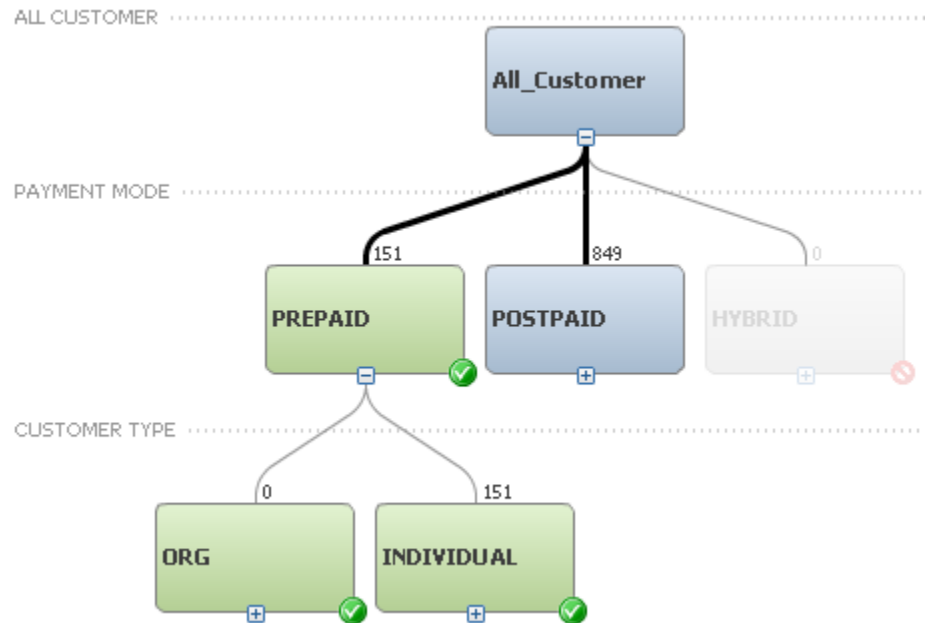
After you add variables, you can select the values for the variables. If you select a node at the highest level (from the top), then all the child nodes that originate from the parent node are automatically selected. This is also true for child levels that you have not yet added. Therefore, you need to individually select nodes from bottom to top if you want to select only particular values for the selection criteria.

To select a child node:

1. Click the node that you want to include in the selection criteria.

**Display 6.4** Select Node

- From the pop-up menu, select the **Select** option. The selected child node is depicted in a different color to distinguish it from the child nodes that are not selected.

**Display 6.5** Selected Nodes

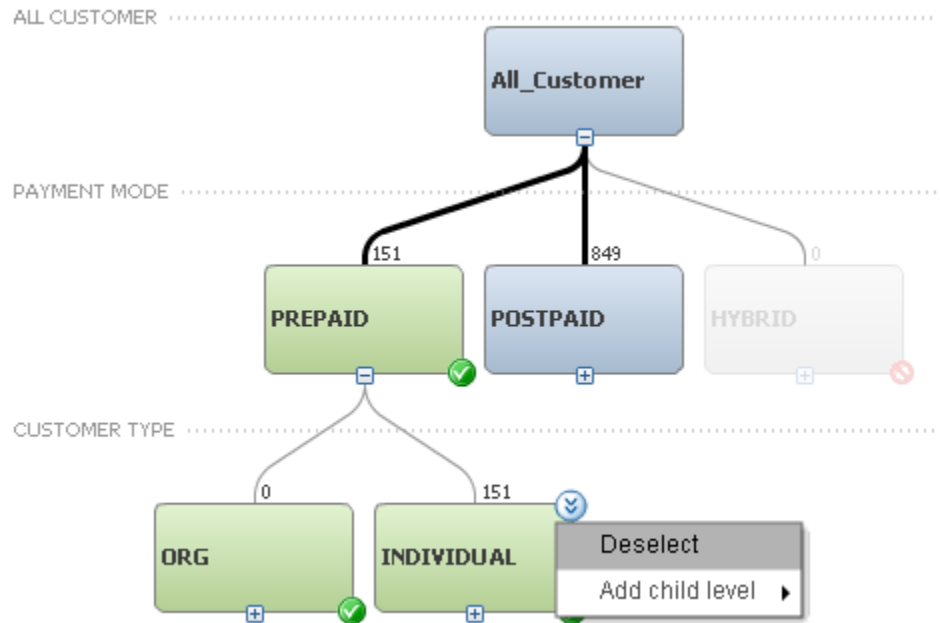
*Note:* In some cases, you might not be able to select the parent node in the selection criteria. The reason can be that one or more child nodes of this parent node are already used as selection criteria for some other business group.

## Deselect a Node

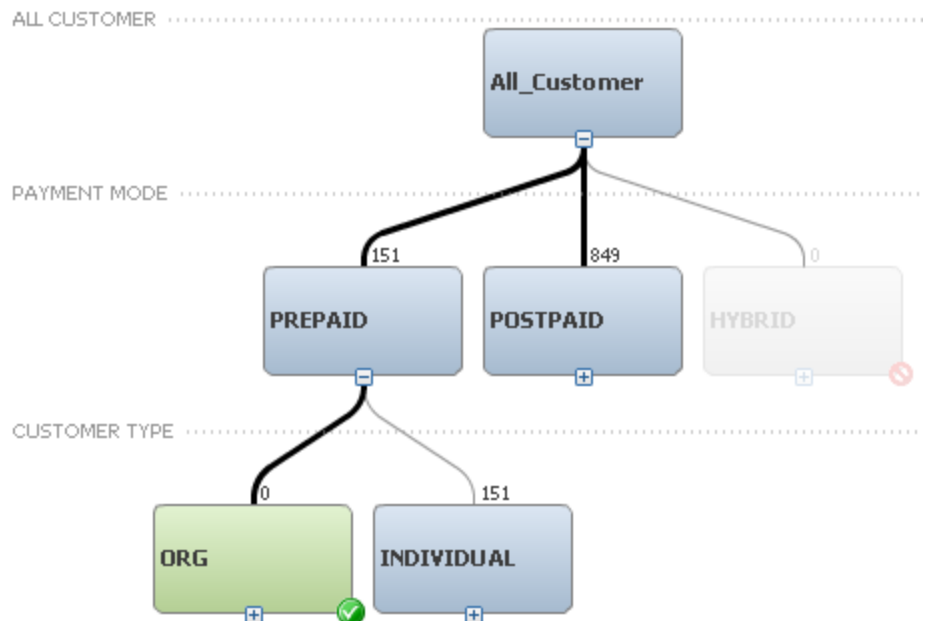
You can remove a node that you have added in the selection criteria. You can either deselect a parent node or a particular child node.

To deselect a node:

1. Click the node that you want to deselect.



2. From the pop-up menu, select **Deselect**. If this is a parent node, all the child nodes that originate from this node, are also deselected. Otherwise, only the selected node is excluded from the selection criteria.



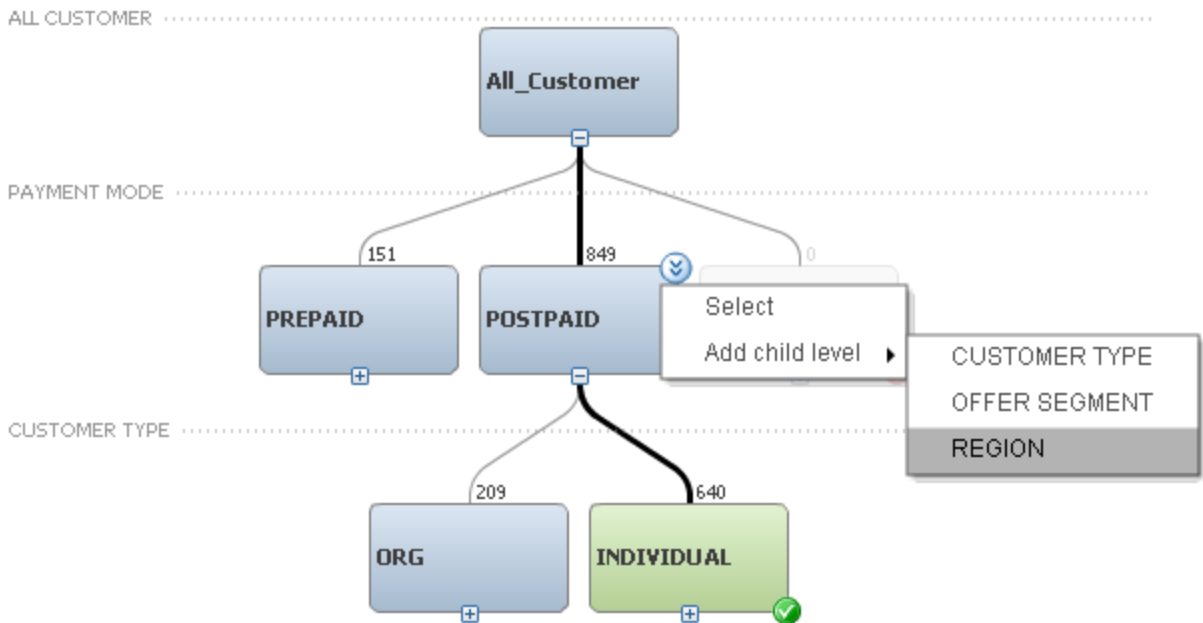
## Change a Child Level

You can change the hierarchy of variables that you have defined.

To change a child level:

1. Click a child node, which is at the level that you want to change.
2. From the pop-up menu, select **Add child level**.
3. Select a variable from the list. The list contains variables that are not added at any levels or that are added at subsequent levels.

**Display 6.6** Change a Child Level



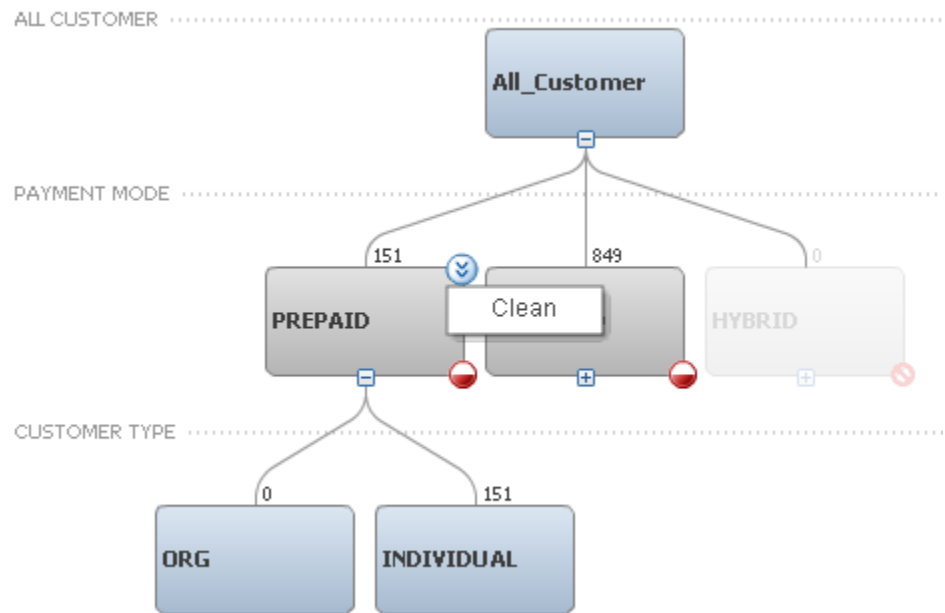
## Clean a Node

A parent node that you have selected can be marked as a dirty node. This indicates that a new child node is added below this parent node, and you have to reconsider your selection. If you clean the selected parent node, then it will be deselected. You can check the new child node that is added, and then decide whether you want to select the parent node or select specific child nodes individually.

*Note:* If you clean a dirty node, you must run the business group.

To clean a node:

1. Select the dirty node that you want to clean.

**Display 6.7 Clean Node**

- From the pop-up menu, select **Clean node**. The icon that represents a dirty node disappears.

**Change the View of the Hierarchical List**

You can view either all nodes of the hierarchical list or focus only on the selected nodes. There are two methods to change the mode of the hierarchical list.

To view only the selected nodes, use any one of the following methods:

- From the pop-up menu of a node, select **Show nodes of interest**.
- Click **Selected Nodes**.

To view all nodes of the hierarchical list, use any one of the following methods:

- From the pop-up menu of a node, select **Show all nodes**.
- Click **All Nodes**.

---

**Example: Defining a Business Group****Define Selection Criteria**

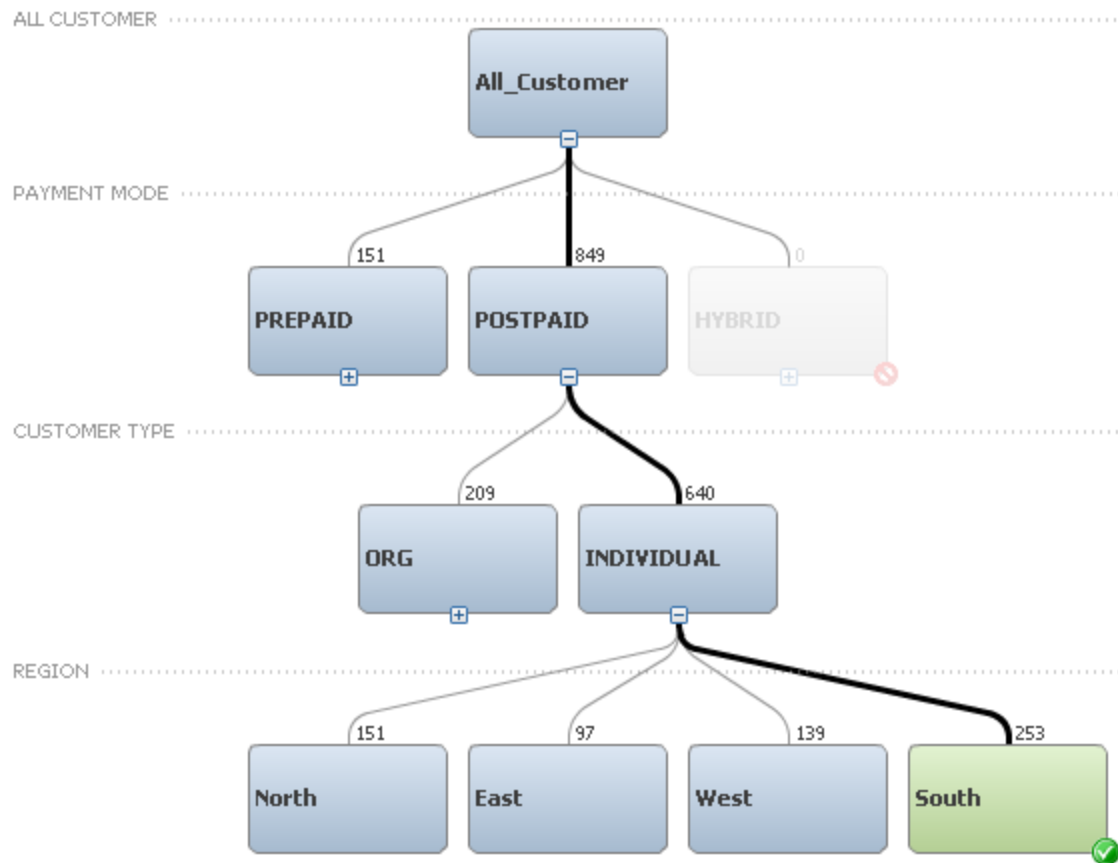
In this example, you define a business group named Wireless Postpaid. You want to define the following levels of selection criteria.

**Table 6.2** Selection Criteria for a Business Group

Variable Name	Available Values	Selected Value
Payment mode	Postpaid, Prepaid, and Hybrid	Postpaid
Customer type	Individual and Organization	Individual
Region	East, West, North, and South	South

To define these selection criteria:

1. Add child levels in the following order:
  - a. Payment mode
  - b. Customer type
  - c. Geography
2. Expand the nodes that are displayed below the **Postpaid** node. Make sure that you are viewing child nodes that originate from this parent node.

**Display 6.8** Selection Criteria for a Business Group

3. Select the **South** child node that originates from the **Individual** parent node. The required nodes are automatically selected.
4. Click **Save**.



## Reading the Customer Count at Various Levels

At each node, a number that represents the customer count is displayed. This feature helps you understand the distribution of your customer base according to the business rules that you have set up. For the selection criteria that you have defined above, the distribution of your customers at various levels of the selection criteria can be as follows.

**Table 6.3** Customer Distribution in a Business Group

Level	Selected Node	Customer Count	Description
0	Primary	1000	The total population in the customer base is 1000.
1	Postpaid	849	Out of the 1000 customers, 849 are postpaid customers.
2	Individual	640	Out of the 849 postpaid customers, 640 customers are of the Individual type.
3	South	253	Out of the 640 customers, 253 customers belong to the South region. Therefore, the customer count for this business group is 253.

## Adding Customers to a Business Group

### Overview

After you define a business group, you have to identify the customers who belong to this business group. In order to perform this task, you have to run a process. This process filters customers from the customer base, depending on the selection criteria that you have defined for the business group. A customer can belong to only one business group.

There are two methods for adding customers to a business group. You can use either the section toolbar in the navigation pane or the Edit Business Group window.

### Add Customers to a Business Group Using the Section Toolbar


To add customers to a business group:

1. In the navigation pane, select the **Business Groups** section.

2. From the **My Business Groups** list, select the business group to which you want to add customers.

**TIP** Business groups to which customers are already added are identified using



3. On the section toolbar, click . If the process runs successfully, then the status of the business group changes to **Successful**.

*Note:* If there are any errors while adding customers to a business group, the status of the business group changes to **Failed**. Resolve the errors and run the process again.


### Add Customers to a Business Group Using the Edit Business Group Window

To add customers to a business group:

1. In the navigation pane, select the **Business Groups** section.
2. From the **My Business Groups** list, select the business group to which you want to add customers.

**TIP** Business groups to which customers are already added are identified using




3. On the toolbar, click . The Edit Business Group window appears.
4. Click **Run**. If the process runs successfully, then the status of the business group changes to **Successful**.

*Note:* If there are any errors while adding customers to a business group, the status of the business group changes to **Failed**. Resolve the errors and run the process again.

---

## Defining User Access for Business Groups

### Overview


As an administrator, you can define user access for a business group. You can assign a user to multiple business groups. Conversely, you can assign multiple users to a business group. You can assign users to a business group using the  icon, which is available on the toolbar of both the panes.

Users who are assigned to a business group can view the details of that business group. The assigned users can also create projects for the business group or view details of other projects that are defined for the business group.

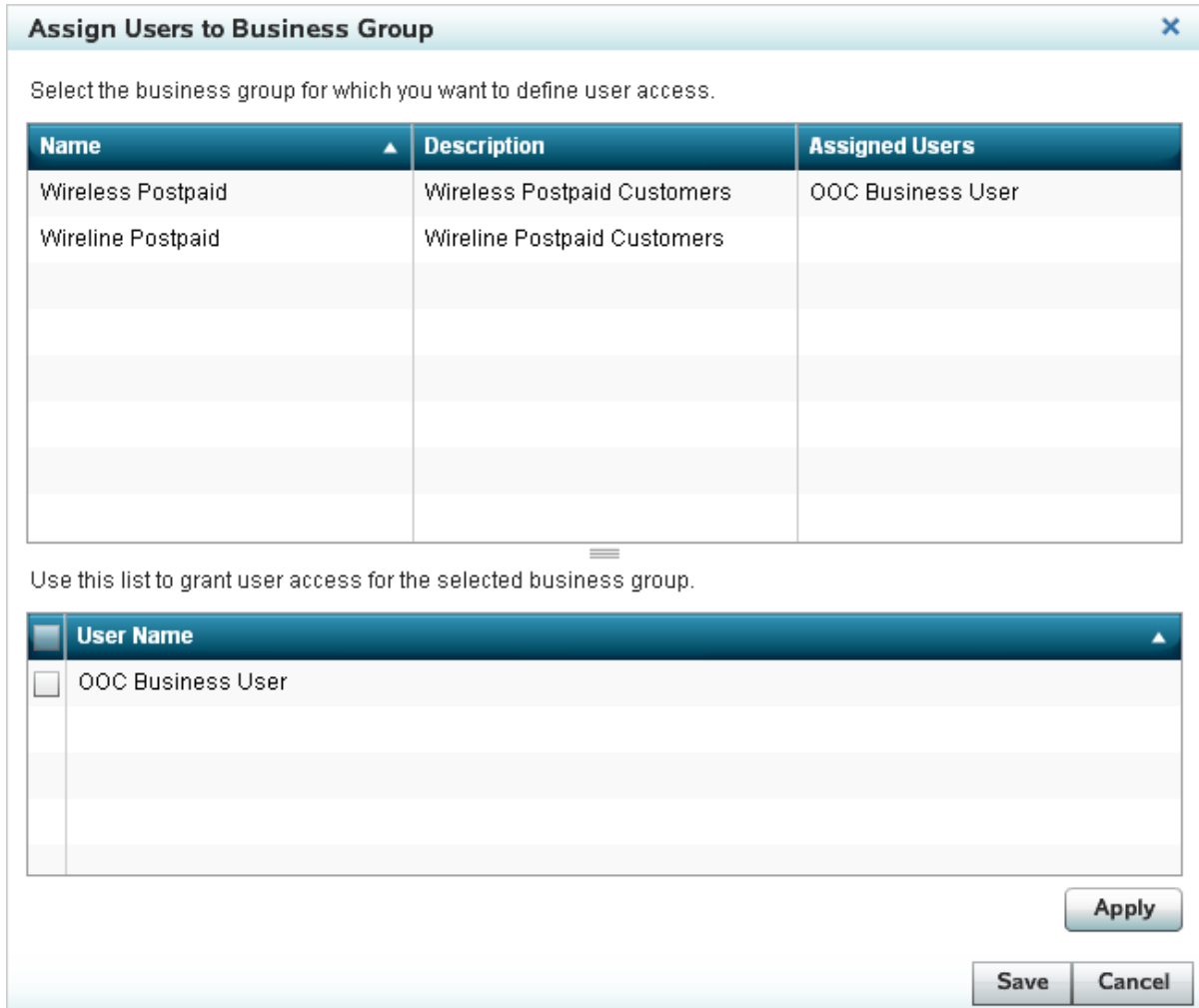
### Assign Users to Business Groups Using the Section Toolbar

Using the section toolbar in the navigation pane, you can assign multiple users to a business group.

To assign users to a business group:

1. In the navigation pane, select the **Business Groups** section.
2. On the section toolbar, select . The Assign Users to Business Groups window appears.

**Display 6.9** Assign Users to Business Group Window



The window titled "Assign Users to Business Group" contains a table for selecting a business group and a list for selecting users.

Select the business group for which you want to define user access.

Name	Description	Assigned Users
Wireless Postpaid	Wireless Postpaid Customers	OOO Business User
Wireline Postpaid	Wireline Postpaid Customers	

Use this list to grant user access for the selected business group.

User Name
<input type="checkbox"/> OOO Business User

Buttons: Apply, Save, Cancel

3. Select the business group to which you want to assign users.
4. Select the users whom you want to assign to the business group.
5. Click **Apply**.

**TIP** Repeat steps from 3 to 5 to define user access for another business group.


6. Click **Save**.

**TIP** Users can see the business groups that are assigned to them in the **My Business Groups** list.

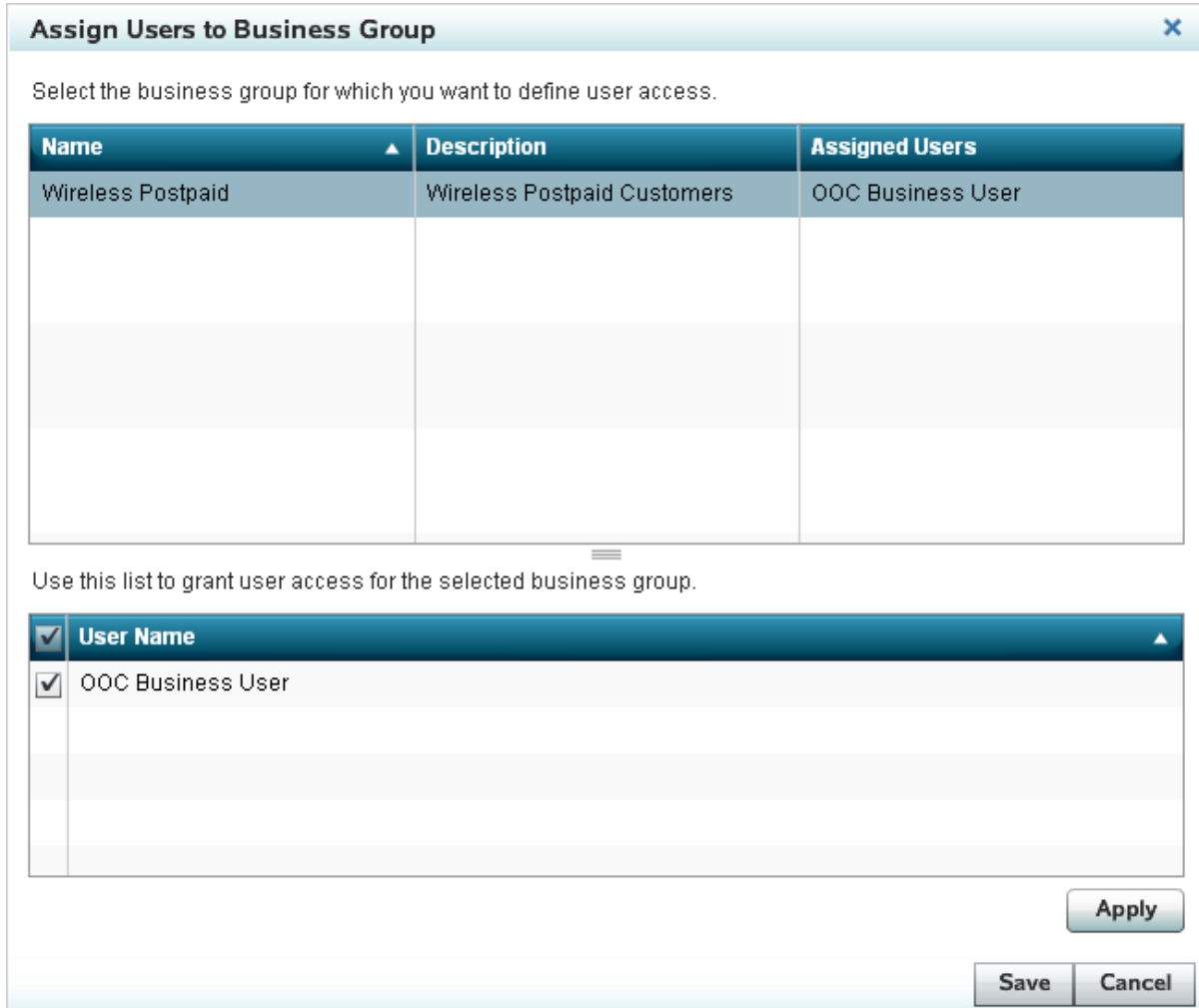
### Assign Users to a Business Group Using the Actions Toolbar

Using the **Actions** toolbar, you can assign users to the business group that is currently selected.

To assign users to the currently selected business group:

1. Make sure that the correct business group is selected. You can confirm this by viewing the name of the business group that is displayed in the header bar of the object details pane.
2. On the **Actions** toolbar, select . The Assign Users to Business Groups window appears.

**Display 6.10** Assign Users Window



The window titled "Assign Users to Business Group" contains a table for selecting a business group and a list for selecting users.

Select the business group for which you want to define user access.

Name	Description	Assigned Users
Wireless Postpaid	Wireless Postpaid Customers	OOO Business User

Use this list to grant user access for the selected business group.

<input checked="" type="checkbox"/> User Name
<input checked="" type="checkbox"/> OOO Business User

Buttons: **Apply**, **Save**, **Cancel**

3. Select the users whom you want to assign to the business group.
4. Click **Apply**. The business group is added to the **My Business Groups** list for the selected users.
5. Click **Save**.

## Viewing Details of a Business Group

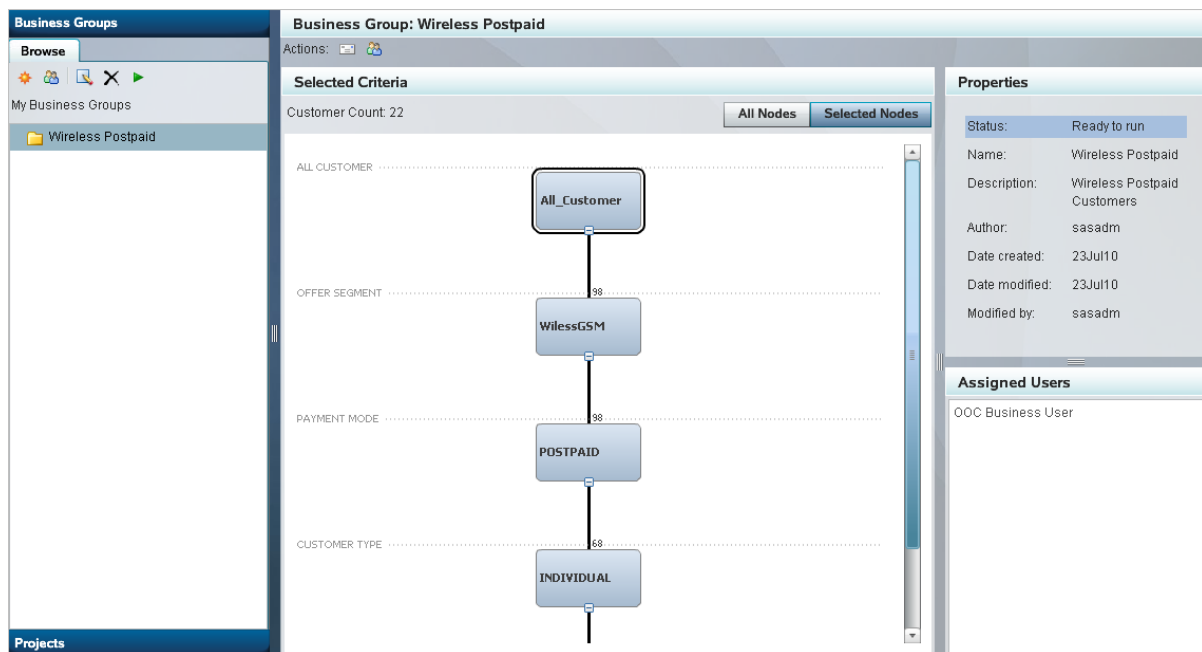
### Select a Business Group

As an administrator, you can view details of all business groups. However, if you do not have administrative rights, then you can view details of only those business groups that your administrator has assigned to you. The business groups that are assigned to you are displayed in the **My Business Groups** list.

To select a business group:

1. In the navigation pane, select the **Business Groups** section.
2. Select the **Browse** tab.
3. Select the business group from the **My Business Groups** list. The details of the business group are displayed in the object details pane.

**Display 6.11** Business Groups Workspace



### Viewing the Customer Selection Criteria

The **Selected Criteria** pane shows a hierarchical list that indicates the selection criteria for this business group. Each level represents a variable, and each node indicates the value for the variable. You can view either all nodes or only the selected nodes.

**TIP** **Customer count** displays the number of customers who satisfy the selection criteria that you have defined for this business group. This number also indicates the total number of customers in the business group.

## Viewing Properties of a Business Group

The **Properties** pane displays the following information about the business group:

### Status

displays the current status of the business group.

**Table 6.4** Processing Status for a Business Group

Status	Description
Ready to run	indicates that you can run the process to add customers to this business group.
Awaiting inputs	indicates that you have to specify the selection criteria for adding customers to this business group.
Running	indicates that the process to add customers to this business group is in progress.
Successful	indicates that customers are added to this business group.
Failed	indicates that one or more errors occurred when the process to add customers was run.

### Name

displays the name of the business group. This name is also displayed in the header bar of the object details pane.

### Description

displays the description of the business group.

### Author

displays the name of the user who has defined the business group.

### Created

displays the date on which the business group was defined.

### Modified

displays the date on which the details of the business group were modified.

### Modified by

displays the name of the user who has modified the details of the business group.

## Viewing Users of the Business Groups

The **Assigned Users** pane displays the users who can view the details of the business group. Only these users can create and manage projects that are associated with this business group. An empty list indicates that the administrator has not assigned any users for this business group.

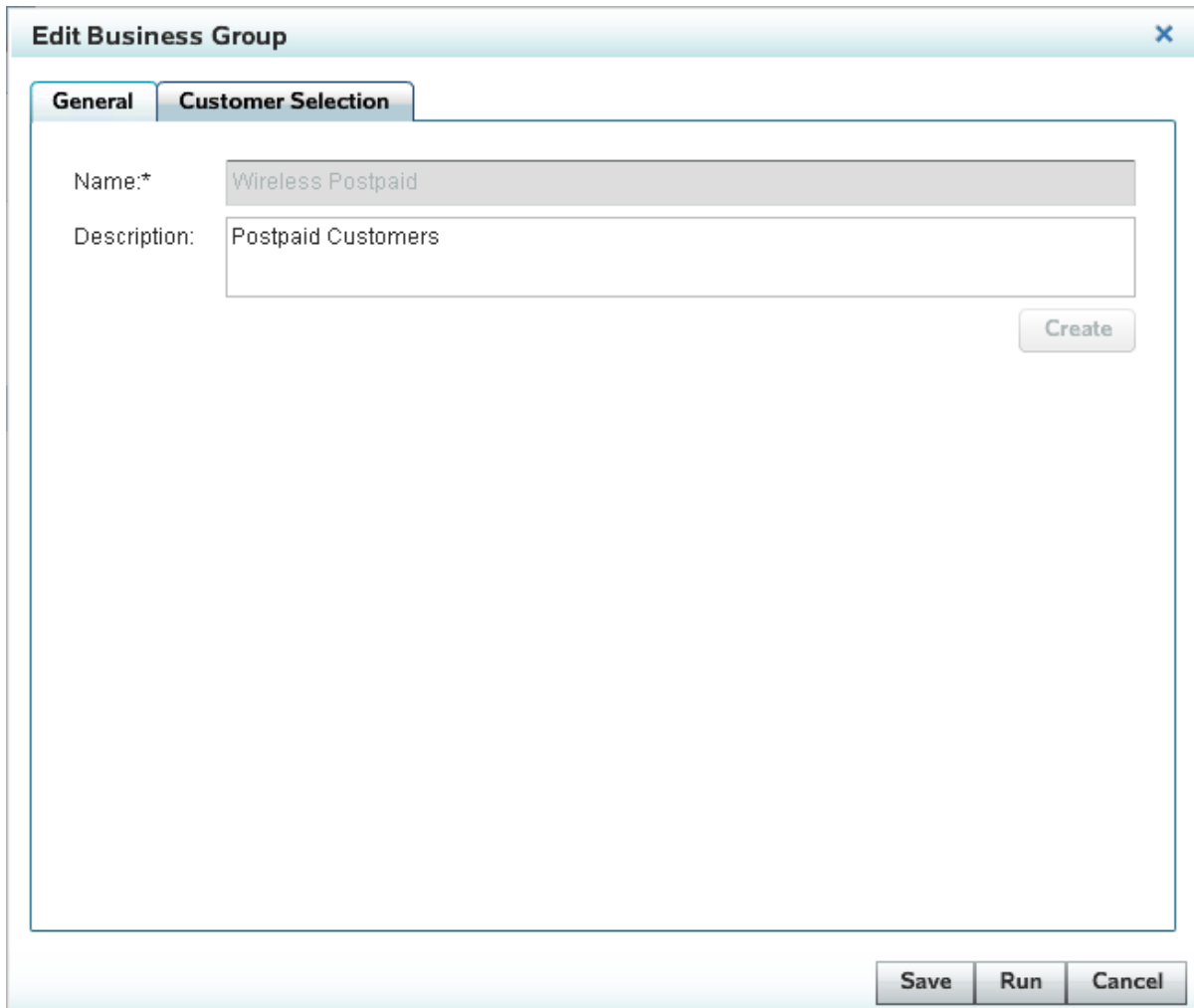
## Edit a Business Group

You can edit a business group only if you have administrative rights. Editing the general details of a business group does not affect any underlying task. However, if you are changing the selection criteria, then you have to consider the effect of this action on the associated tasks. For details, see *SAS Offer Optimization for Communications Administrator's Guide*. Also, if you change the selection criteria, make sure that you also run the process of adding customers to the business group.

To edit a business group:

1. In the navigation pane, select the **Business Groups** section.
2. From the **My Business Groups** list, select the business group that you want to edit.
3. On the section toolbar, select . The Edit Business Group window appears.

**Display 6.12** Edit Business Group Window



The screenshot shows the 'Edit Business Group' window. It has a title bar with the text 'Edit Business Group' and a close button (X). Below the title bar are two tabs: 'General' and 'Customer Selection'. The 'General' tab is selected. Inside the 'General' tab, there are two text input fields. The first is labeled 'Name:\*' and contains the text 'Wireless Postpaid'. The second is labeled 'Description:' and contains the text 'Postpaid Customers'. To the right of the 'Description:' field is a 'Create' button. At the bottom of the window, there are three buttons: 'Save', 'Run', and 'Cancel'.

4. Select the tab on which you want to make changes.
5. Change the details of the business group.


6. (Optional) Click **Save**.
7. Click **Run**.

---

## Delete a Business Group

You can delete a business group only if you have administrative rights and only if it does not have any projects that are running in the batch mode. Therefore, before deleting a project, pull the projects that are in the batch mode to the design mode. For details see, [“Pull a Project to Design Mode” on page 70](#). If you delete a business group that has one or more projects associated with it, then these projects are also deleted. For details about the back-end activities that you have to complete after you delete a business group, see *SAS Offer Optimization for Communications Administrator's Guide*.

To delete a business group:

1. In the navigation pane, select the **Business Groups** section.
2. From the **My Business Groups** list, select the business group that you want to delete.
3. On the section toolbar, select .

---

## Running Back-End Processes

After you create business groups, administrators have to perform back-end activities. For details, see *SAS Offer Optimization for Communications Administrator's Guide*. You can then begin working on projects.

---

## Viewing Reports for Business Groups

SAS Offer Optimization for Communications offers you business reporting features to analyze customer distribution and usage and revenue patterns across business groups. For details, see *SAS Communications Analytics Architecture: User's Guide*.



## Chapter 7

# Introduction to the Projects Workspace

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## About Projects

SAS Offer Optimization for Communications is built around the concept of projects. After you analyze business groups reports, you can identify the problems associated with each business group. You can then define one or more projects for each business group. A project is a user-defined group associated with a particular business group and focuses on a specific business problem. A project enables you to group, organize, and track all your tasks that you need to perform in order to address the business problem. You can create and manage your projects using the **Projectsworkspace**.

A project can be in any one of the following modes:

### Design mode

A project is in design mode until you run all the workflow steps. After you complete all the workflow steps successfully, you complete one run of your project in design mode. You can then push a project to batch mode.

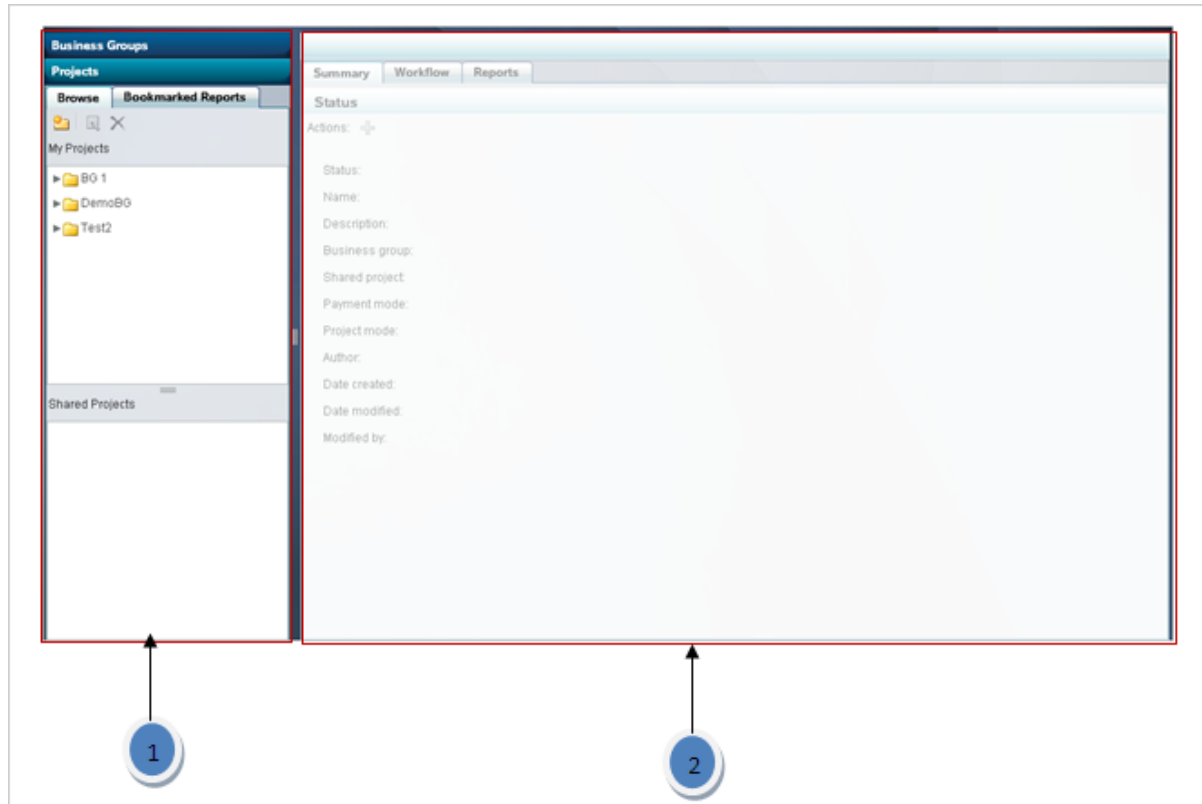
### Batch mode

After you push a project to batch mode, all workflow steps that you perform in design mode are automatically run on the entire population (customer base). You can view the progress of the project run on the **Workflow Diagram** tab. If you are not satisfied with the results that are derived in batch mode, you can pull a project back into design mode. You can configure and run the workflow steps again and then push it to batch mode.

## Overview of the Projects Workspace

The Projects workspace contains two panes.

**Figure 7.1** The Projects Workspace



- 1 Navigation pane
- 2 Object details pane

The navigation pane

displays a list of your projects and also a list of projects that are created by other users. Here, you can initiate tasks for creating and managing projects in the navigation pane.

The object details pane

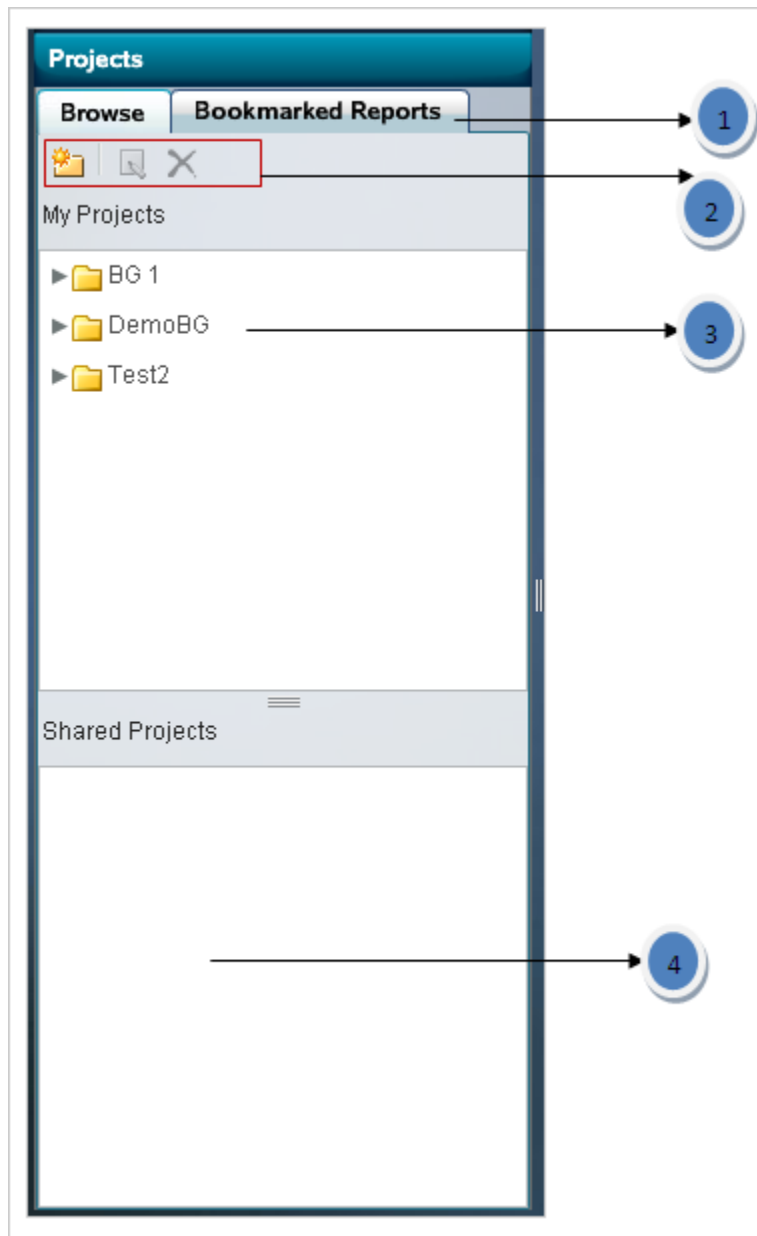
displays information about the selected project. Here, you can complete tasks that you initiate in the navigation pane.

## Working in the Navigation Pane of the Projects Workspace

### Overview

The navigation pane contains the following components.

**Figure 7.2** Navigation Pane of the Projects Workspace



1 Tabs

2 Section toolbar

- 3 My projects list
- 4 Shared projects list




Tabs

The navigation pane contains two tabs, **Browse** and **Bookmarked Reports**. On the **Browse** tab, you can select the project that you want to work on. On the **Bookmarked Reports** tab, you can view reports that are generated automatically when you run a project.

Toolbar Options

Depending on the role that is assigned to you, the following options are available on the section toolbar for creating and managing projects.

Table 7.1 Section Toolbar Options in the Projects Navigation Pane

Icon	Purpose
	defines a new project.
	enables you to change the project details.
	deletes a project.

My Projects List

The **My Projects** list displays the projects that you own.

Shared Projects List

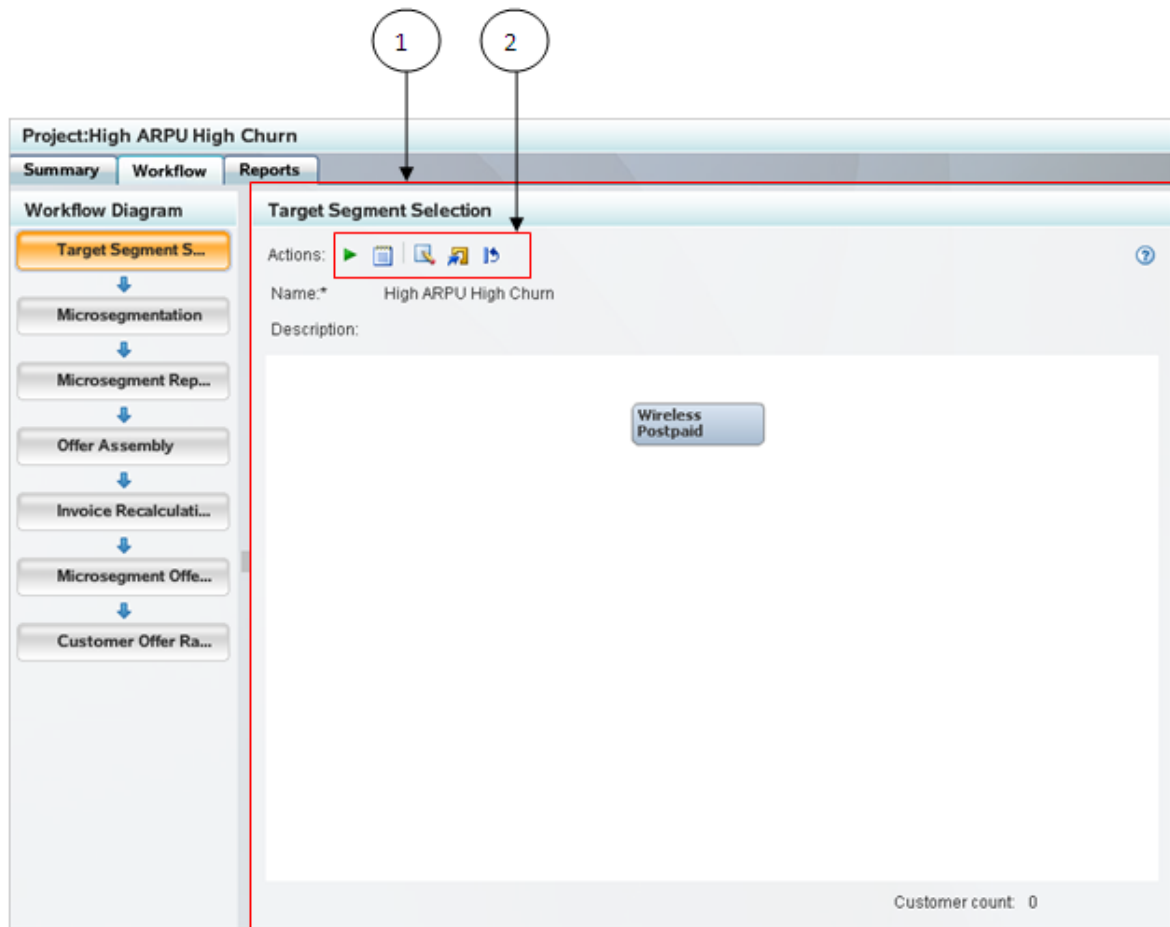
The **Shared Projects** list displays the projects that are defined and shared by other users. You can view only the details of the projects that are displayed in this list.

---

# Working in the Object Details Pane of the Projects Workspace

Overview

The object details pane contains three tabs, **Summary**, **Workflow**, and **Reports**. Each tab is further divided into panes.



- 1 Actions toolbar
- 2 Workflow step pane

### The Summary Tab

The **Summary** tab displays information about the project that is currently selected in the navigation pane.

### The Workflow Tab

The **Workflow** tab provides a guided approach for all your activities with the project. The **Workflow** tab contains the following panes:

#### Workflow Diagram pane

shows a diagram that indicates individual stages of the project workflow. Each stage of the project is called a workflow step. The diagram pane also displays the processing status of each workflow step.

#### Workflow Step pane

displays information about the current workflow step. The **Workflow Step** pane contains the **Actions** toolbar with which you can configure and run workflow steps.

### ***The Reports Tab***

The **Reports** tab enables you to define, organize, and view reports at various stages of the workflow. You can also add bookmarks for reports that you want to generate automatically when you run a project.

## Chapter 8

# Managing Projects

---

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## About Managing Projects

Depending on your assigned role, you can create projects and work on them. You can create projects for business groups that are assigned to you. A project can be associated with only one business group. However, you can create multiple projects for a business group. When you create a project, you are the author and the owner of the project. Therefore, you can also modify or delete projects that you have created. However, if your administrator changes the owner of the project, you as an author can view only details of the project. The owner of the project can work on the project and perform all the tasks related to it.

---

## Create a Project

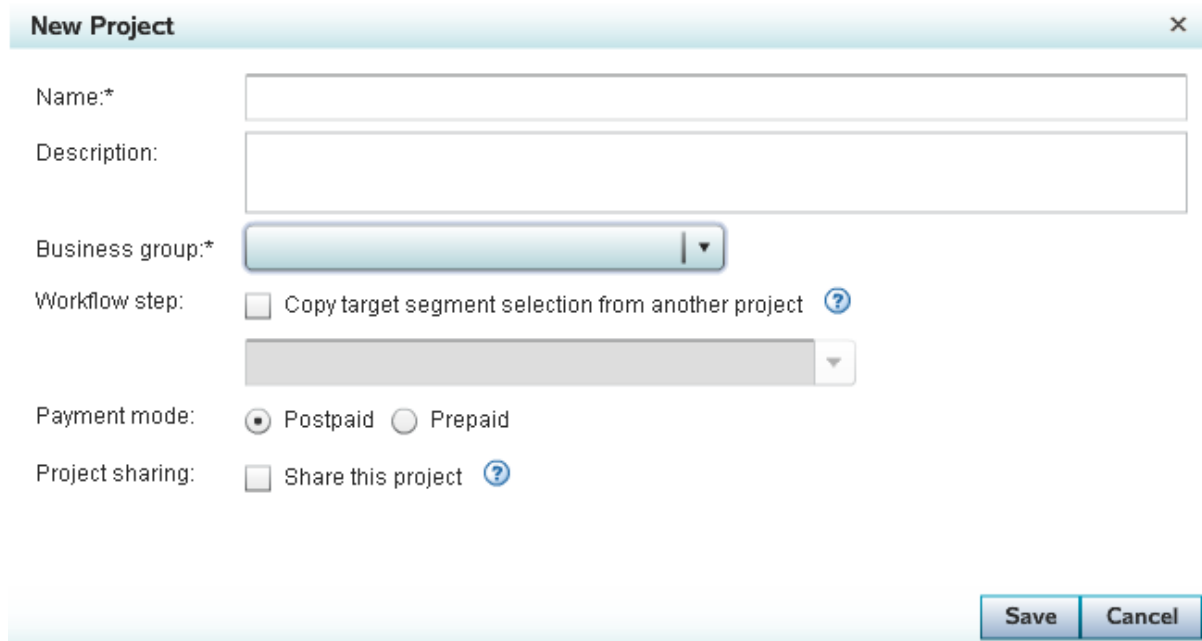
You can define a project for a business group that is assigned to you. After you create a project, a default workflow is attached to it. You can view this workflow on the **Workflow** tab.

When you define a project, you are the author and the owner of the project. Therefore, you can perform all tasks for a project until the administrator changes the project owner. After your administrator changes the owner, you can view only the details of the project.

To create a project:

1. In the navigation pane, select the **Projects** section.
2. Select the **Browse** tab.

3. On the section toolbar, select . The New Project window appears.

**Display 8.1** New Project Window


4. Enter the following details:
  - a. In the **Name** field, enter a suitable name for the project.
  - b. In the **Description** field, enter a short description for the project.
  - c. Select the business group for which you are defining this project. The **Business group** list displays only those business groups that are assigned to you.
  - d. To share your project with other users, select the **Share this project** check box.
  - e. In order to copy the target segment selection workflow step, select the **Copy target segment selection from another project** check box. This option enables you to copy the criteria that you define for filtering customers from the business group.
  - f. From the list, select the project whose target segment selection workflow step that you want to copy. The list displays projects of the business group that you have selected.
  - g. Select the **Payment mode**. This option enables you to filter customers from the business group based on the payment mode. This option also ensures that the customers in the target segment have the same type of payment mode. For example, if you select the **Prepaid** option, then customers who have prepaid payment mode are filtered from the business group. In other words, the target segment that you define for this project will contain customers who have prepaid payment mode.
5. Click **Save**. The project is added to your **My Projects** list.
 


**TIP** If you do not want to create the project, click **Cancel**. The window closes and you will lose the information that you have entered.



## Change the Project Owner

When you create a project, you are the default owner of the project. However, according to the business requirements, your administrator can assign the ownership of the project to another user.

To change the project owner:

1. In the navigation pane, select the project for which you want to change the owner.
2. In the object details pane, select the **Summary** tab.
3. On the **Actions** toolbar, select . The Change Project Owner window appears.

**Display 8.2** Change Project Owner Window



The screenshot shows a window titled "Change Project Owner" with a close button (X) in the top right corner. Inside the window, there are two labels: "Current owner:" followed by the text "sasadm", and "New owner:" followed by a dropdown menu. The dropdown menu currently displays "OOC Business User" and has a downward arrow on its right side. At the bottom right of the window, there are two buttons: "Save" and "Cancel".

**TIP** The **Current owner** field displays the name of the user who is the current owner of the project.

4. From the **New owner** list, select the user whom you want to assign as the owner of the project. The list displays users that are assigned to the business group associated with the project.
5. Click **Save**.

## Viewing Project Details

### Select a Project

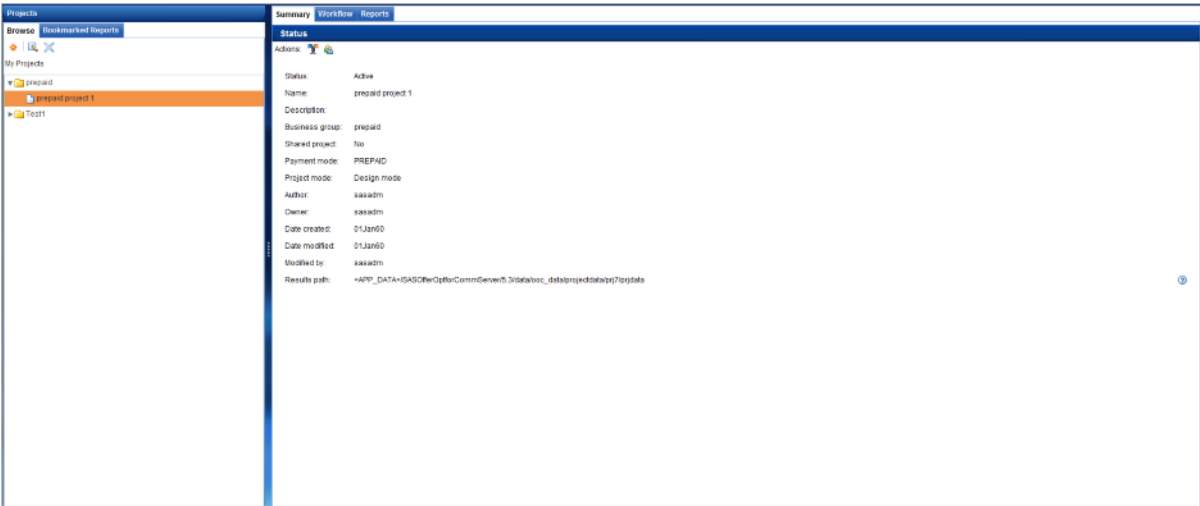
You can view details of a project for which you are either an author or an owner. You can also view details of shared projects. The projects that you own are displayed in the **My Projects** list. The projects that other users share are displayed in the **Shared Projects** list.

To select the project whose details you want to view:

1. In the navigation pane, select the **Projects** section.
2. Select the **Browse** tab.

- 3. From the **My Projects** list or from the **Shared Projects** list, select the project whose details you want to view. The project details are displayed in the object details pane.

Display 8.3 Projects Workspace




Viewing the Properties of a Project

The **Properties** pane displays the following information about the project:

**Status**  
displays the current status of the project.

Table 8.1 Processing Status for a Project

Status	Description
Active	indicates that a project has one or more active workflow steps.
Modified	indicates that a workflow step of a project is being configured.
Running	indicates that one of the workflow steps is being run.
Successful	indicates that all workflow steps of a project workflow are successfully run.
Failed	indicates that a workflow step of a project has not run successfully. If the project is in design mode, you can view the error details. To do so, select the workflow step and on the <b>Actions</b> toolbar, click  . Contact your administrator if you need any assistance with the error details. If the project is in the batch mode, your administrator can access the log file and view the error details.

**Name**

displays the name of the project. This name is also displayed in the header bar of the object details pane.

**Description**

displays the description of the project.

**Business group**

displays the name of the business group that is associated with the project.

**Shared project**

indicates whether the project is shared with other users.

**Payment mode**

indicates the mode of payment of customers. The target segment that is defined for this project will contain customers who have the selected payment mode.

**Project mode**

displays the project's current mode. A project can be either in design mode or batch mode.

**Author**

displays the name of the user who has defined the project.

**Owner**

displays the owner of the project. For a new project, the author and the owner are the same user. However, after you create a project, your administrator can change the owner. The user who is the owner of the project can perform all tasks for a project and run its workflow.

**Date created**

displays the date on which the project is defined.

**Date modified**

displays the date on which the details of the project are modified.

**Modified by**

displays the name of the user who has modified the details of the project.

**Results path**


displays the location on the server where the results of the project are stored.

---

## Edit a Project

You can edit a project if you are the owner of the project. You can edit only specific information about a project.

To edit a project:

1. In the navigation pane, select the **Projects** section.
2. Select the **Browse** tab.
3. From the **My Projects** list, select the project that you want to edit.
4. On the section toolbar, select . The Edit Project window appears.

**Display 8.4** Edit Project Window

5. Change the project information according to your requirements.

*Note:* You can change either the description of the project or the shared status of the project.

6. Click **Save**.


**TIP** Click **Cancel** if you want to discard the changes that you have made.

---

## Delete a Project

You can delete a project if you are the owner of the project, but only if the project is in design mode. If you want to delete a project that is in batch mode, you have to first pull it to design mode. For details, see [“Pull a Project to Design Mode” on page 70](#).

To delete a project:

1. In the navigation pane, select the **Projects** section.
2. Select the **Browse** tab.
3. From the **My Projects** list, select the project that you want to delete.
4. On the toolbar, select .

## Part 3

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# Workflow Steps

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## Chapter 9

# Introduction to the Project Workflow

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## About Project Workflows

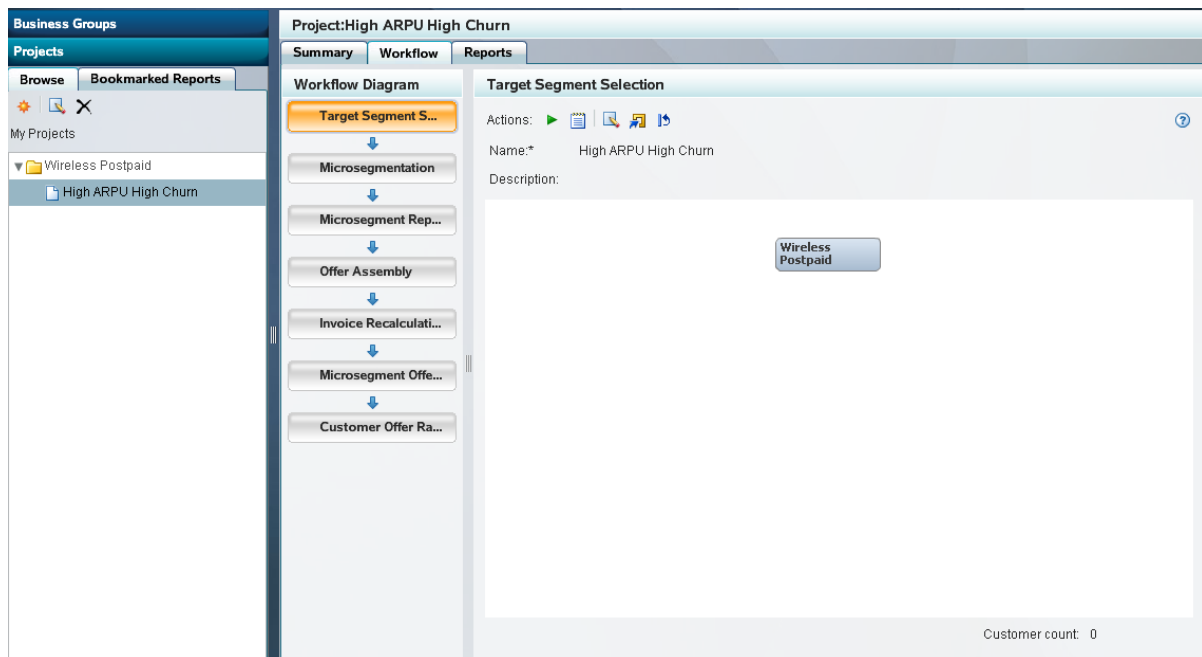
In SAS Offer Optimization for Communications, each project has a workflow that enables you to complete your tasks in a structured manner. The project workflow provides you a guided approach for performing tasks that are associated with your project. You can initiate and complete your project tasks on the **Workflow** tab. The **Workflow** tab further contains the **Workflow Diagram** pane and the **Workflow Step** pane.

---

## Using the Workflow Diagram Pane

### Overview

The **Workflow Diagram** pane shows the workflow steps of the project. It also gives the sequence of workflow steps and displays the processing status of each workflow step.

**Display 9.1** Project Workflow Tab**Workflow Steps**

A workflow step represents an individual stage of the workflow. Here is the list of project workflow steps and the objective of each step:

1. **Target Segment Selection**

Derive a subset of customers from the business group based on certain filter criteria. The subset of customers is called a target segment.

2. **Microsegmentation**

Create homogeneous groups (also called clusters) of the target segment using the appropriate clustering technique. Identify each group with a unique description in accord with the business definition. Such a group is also called a microsegment.

3. **Microsegment Representation**

Derive a predefined number of customers from each microsegment such that the revenue and usage patterns of these customers represent the corresponding values for the entire microsegment. These customers are called representative customers.

4. **Offer Assembly**

Determine suitable offers for the representative customers from the product catalog based on certain business rules.

5. **Invoice Recalculation**

Retrieve invoice information for each combination of representative customer and offer and recalculate invoices for the current usage of representative customers.

6. **Microsegment Offer Ranking**

Produce best offers in ranked order for representative customers.

7. **Customer Offer Ranking**







Produce best offers in ranked order for all customers in a microsegment.

## Processing Status

Each workflow step can either be active or inactive. A workflow step is automatically activated when the previous workflow step runs successfully. An active workflow step can have any one of the following processing status:

**Table 9.1** Processing Status of Workflow Steps

Icon	Status	Description
	Successful	The workflow step was successfully run without any errors.
	Failed	Errors occurred when this workflow step was run. You have to resolve the errors and run the workflow step again.
	Running	The workflow step is currently running.
	Modified	The workflow step is configured, and you can run the workflow step.

---

## Working in the Workflow Step Pane






### Overview

The **Workflow Step** pane displays information about the current workflow step. This information includes configuration details and results of the workflow step. In this pane, you can perform certain common tasks for a workflow step of a project that is in design mode. For a project that is in batch mode, the workflow step pane displays the configuration and results of each workflow step. If you want to make any changes, you have to pull the project to design mode.

### Actions Toolbar

The **Actions** toolbar enables you to perform certain common tasks for each workflow step. The options that are available in the **Actions** toolbar might differ depending on the task that you perform. You can use this toolbar to perform tasks on a workflow step of a project that is in design mode. If a project is in the batch mode, the options on this toolbar are deactivated.

**Table 9.2** Options on Actions Toolbar

Button	Purpose
	customizes the default setup of the workflow step.
	reverts the changes that were made to the setup of the workflow step.
	displays information about errors that occurred when the workflow step was run.
	runs the workflow step.
	imports details from a workflow step of another project. This option is available only for the <b>Target Segment Selection</b> workflow step.

## Working with the Project Workflow

### Select a Project

When you work on a workflow step, make sure that you select the correct project. For quick reference, the project name is displayed in the header bar of the object details pane.

To select a project:

1. In the navigation pane, select the **Projects** section.
2. Select the **Browse** tab.
3. From the **My Projects** list, select the project that you want to work on.
4. In the object details pane, select the **Workflow** tab.

### Configure and Run Workflow Steps














The **Workflow** tab enables you to perform project tasks. Refer to the **Workflow Diagram** pane to get a quick overview of the progress of the project. In the **Workflow Step** pane, you can view the information about a workflow step.

You can configure a workflow step only after you have successfully run the previous workflow step. When you successfully run all workflow steps, a project completes its one run in design mode.

*Note:* You can work on the project workflow if you are the owner of the project.

To complete a project run in design mode:

1. Select the **Workflow** tab.

2. In the **Workflow Diagram** pane, select **Target Segment Selection**.
  - a. On the **Actions** toolbar, select .
  - b. Configure the workflow step. For details, see [“Defining a Target Segment” on page 76](#).
  - c. On the **Actions** toolbar, select .
3. In the **Workflow Diagram** pane, select **Microsegmentation**.
  - a. On the **Actions** toolbar, select .
  - b. Configure and run the workflow step. For details see, [“Create Microsegments” on page 92](#).
4. In the **Workflow Diagram** pane, select **Microsegment Representation**.
  - a. (Optional) On the **Actions** toolbar, select .
  - b. (Optional) Configure the workflow step. For details, see [“Draw Representative Customers Based on the Customized Parameter Setup” on page 104](#).
  - c. On the **Actions** toolbar, select .
5. In the **Workflow Diagram** pane, select **Offer Assembly**.
  - a. (Optional) On the **Actions** toolbar, select .
  - b. (Optional) Configure the workflow step. For details, see [“Assemble Offers for Representative Customers” on page 111](#).
  - c. On the **Actions** toolbar, select .
6. In the **Workflow Diagram** pane, select **Invoice Recalculation**.
  - a. (Optional) On the **Actions** toolbar, select .
  - b. (Optional) Configure the workflow step. For details, see [“Recalculate Invoices” on page 113](#).
  - c. On the **Actions** toolbar, select .
7. In the **Workflow Diagram** pane, select **Microsegment Offer Ranking**.
  - a. On the **Actions** toolbar, select .
  - b. Configure the workflow step. For details, see [“Configure Offer Ranking Setup at Microsegment Level” on page 117](#).
  - c. On the **Actions** toolbar, select .
8. In the **Workflow Diagram** pane, select **Customer Offer Ranking**.
  - a. (Optional) On the **Actions** toolbar, select .
  - b. (Optional) Configure the workflow step. For details, see [“Configuring the Offer Ranking Setup at Customer Level” on page 121](#).
  - c. On the **Actions** toolbar, select .

---

## Design Mode and Batch Mode of a Project


### Overview

After you complete a project run in design mode, you can promote it to batch mode. When a project is in batch mode, you have to perform certain back-end activities in order to run its workflow. However, you can view the progress of the current or last batch run of the project on the **Workflow** tab. At any time, you can pull the project back into design mode if you want to configure a workflow step.

### Push a Project to Batch Mode

You can push a project to batch mode if the **Project mode** is **Design**. All the workflow steps of the project must be complete.


To push a project to batch mode:

1. In the navigation pane, select the project that you want to promote to batch mode.
2. In the object details pane, on the **Actions** toolbar, select . The Push Project to Batch Mode window appears.
3. Select the frequency for scheduling the project runs in batch mode. For example, select the **Weekly** option if you want to run the project every week. The frequency that you select here is used by the scheduler to schedule the projects in batch mode. For details, see *SAS Offer Optimization for Communications Administrator's Guide*.
4. Click **Save**. In the **Properties** pane, the **Project mode** changes to **Batch**. After you promote a project to batch mode, options on the **Actions** toolbar will not be available. You can view only the status and results of each workflow step.

### Pull a Project to Design Mode

A project that is promoted to batch mode can be pulled back to the design mode.

To pull a project to design mode:

1. In the navigation pane, select the project that you want to pull back to the design mode.
2. In the object details pane, on the **Actions** toolbar, select . In the **Properties** pane, the **Project mode** changes to **Design** mode.

## Chapter 10

# Performing Common Tasks for Workflow Steps

---

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---

## About Common Workflow Tasks

After you define a project, the default workflow with predefined workflow steps is displayed in the **Workflow Diagram** pane. You must perform workflow steps in the sequence shown in the diagram. For each workflow step, you can perform certain common tasks. The tasks that you can perform differ depending on the workflow step that you are currently working on. Using the **Actions** toolbar, you can perform the following common tasks:

- Configure a workflow step.
- Run a workflow step.
- View the log for a workflow step.
- Reset a workflow step.

*Note:* You can perform any of these tasks on a workflow step only if the project is in design mode and you are the owner of the project.


---

## Configure a Workflow Step

SAS Offer Optimization for Communications provides a default configuration setup for each workflow step. If you do not want to customize this setup, you can directly run the workflow step. You can also change the setup according to your business requirements. You can configure and run a workflow step until you are satisfied with the results of the workflow step. However, if you change the configuration of a workflow step, all the subsequent workflow steps that have successfully run are reset to the default setup. Therefore, you have to configure and run these workflow steps again.

*Note:* You can configure a workflow step only if the project is in design mode.

To configure a workflow step:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select the workflow step that you want to configure.
3. On the **Actions** toolbar, select . A window appears.
4. Change the details as needed.
5. Click **Save**.


*Note:* After you change the configuration of a workflow step, make sure that you run the workflow step.

---

## Run a Workflow Step

After you configure a workflow step, you can immediately run the workflow step using the **Run** button that is available in the window. You can also run a workflow step using the **Actions** toolbar.

To run a workflow step:


1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select the workflow step that you want to run.
3. On the **Actions** toolbar, select . The processing status of the workflow step changes to **Successful** or **Failed**.

---

## View the Log for a Workflow Step

If any errors occur when you run a workflow step, then the errors are maintained in a log file.

To view the log for a workflow step:


1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select the workflow step.
3. On the **Actions** toolbar, select . A window that displays the log details appears.
4. View the error details.
5. Click **OK**.

---

## Reset a Workflow Step

In order to discard the changes that you have made to the default configuration for a workflow step, you can reset the workflow step. However, when you reset a workflow step, the subsequent workflow steps that you have configured and run are deactivated. You have to configure and run them again.

To reset a workflow step:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select the workflow step.
3. On the **Actions** toolbar, select . The processing status of the workflow step changes to **Active**.





## Chapter 11

# Target Segmentation

---

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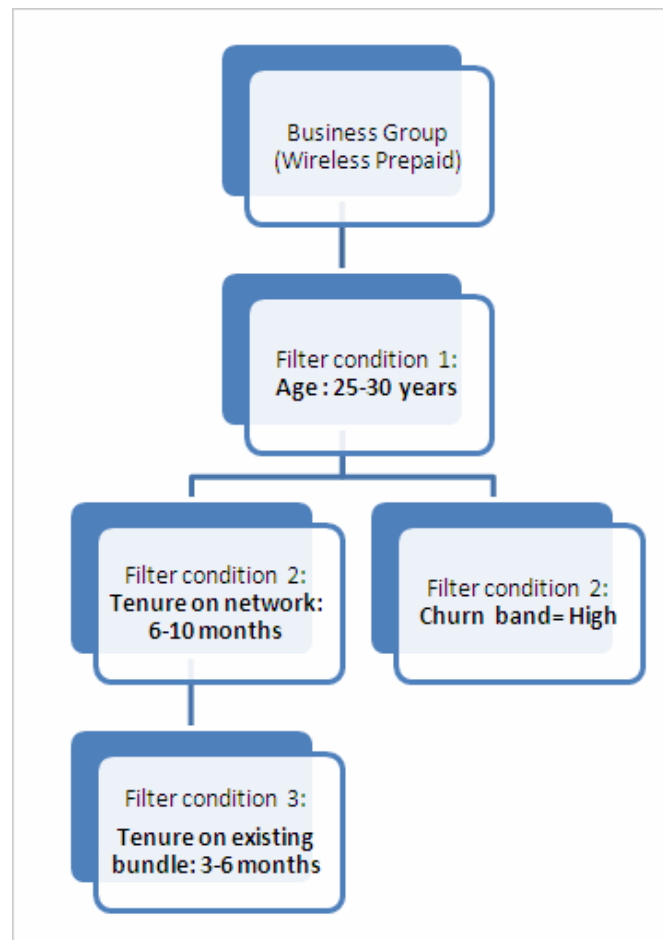
---

## About Target Segments

After you analyze the business groups reports, you can identify the highly profitable customers of a business group, who usually have a high ARPU (average revenue per user). In order to focus on this subset of a business group, you have to define the target population. The target population is derived from the business group based on certain business rules. These business rules are different from the business rules that are defined for a business group. The subset of customers that is derived from the business group is called a target segment.

SAS Offer Optimization for Communications enables you to define a target segment based on a set of predefined variables. Using these variables, you can define filter criteria for deriving the target segment from the business group. You can define the filter criteria using a hierarchical list. This feature enables you to explore the customer distribution in the business group based on a set of conditions. Moreover, you can define the target segment after analyzing the customer counts at each level of the filter criteria.

For example, you can define filter criteria for a target segment as shown in the diagram below.

**Figure 11.1** Sample Filter Criteria for a Target Segment


---

## Defining a Target Segment

### Overview

Defining a target segment involves the following tasks:

- Identify the target segment with a name and a description.
- Define filter criteria for deriving the target segment from the business group.

*Note:* Before you begin defining a target segment, make sure that you are familiar with hierarchical lists. For details, see [“About Hierarchical Lists”](#) on page 21.

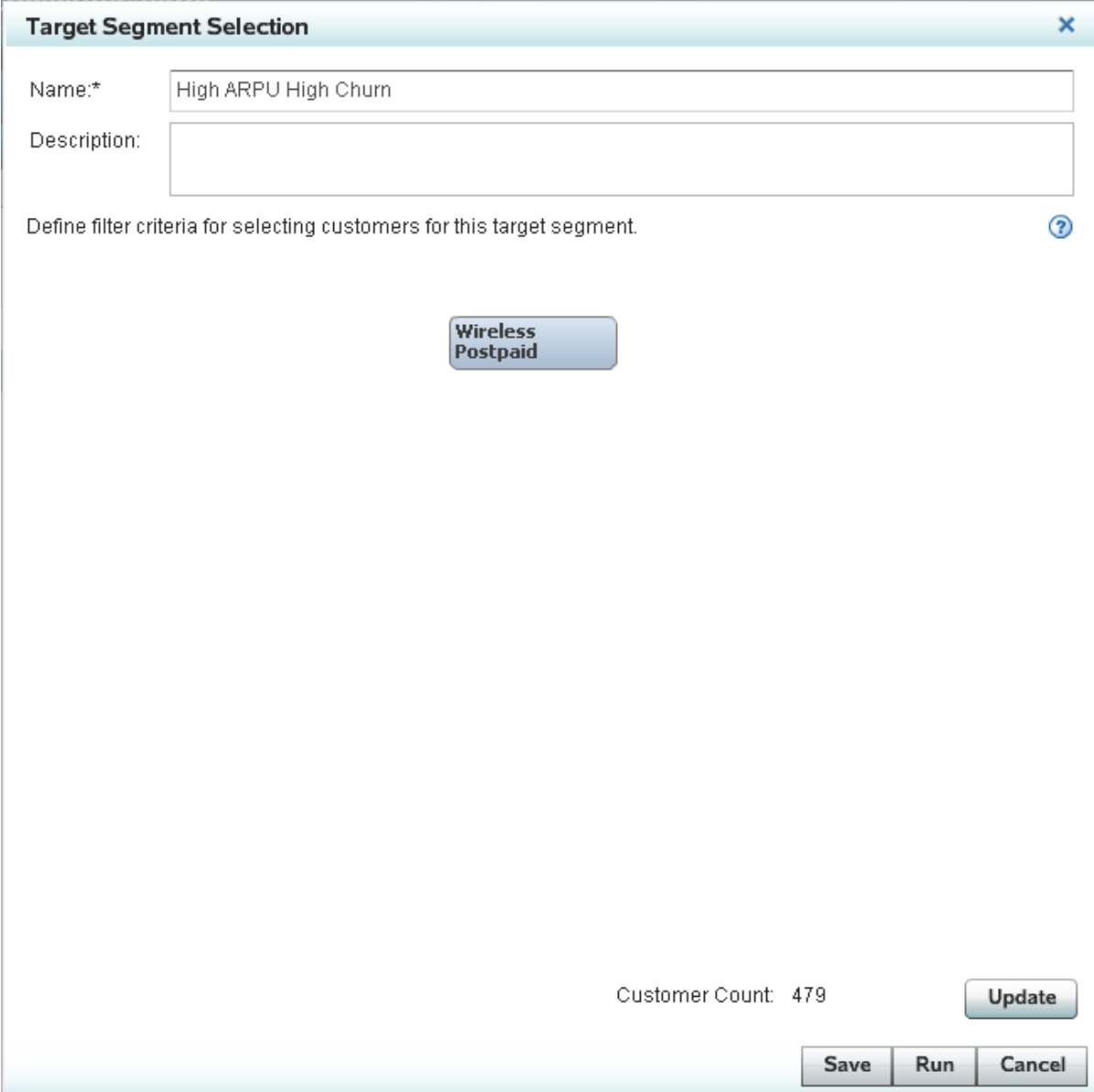
### Define a Target Segment

To define a target segment:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Target Segment Selection**.

3. On the **Actions** toolbar, select . The Target Segment Selection window appears.

**Display 11.1** Target Segment Selection Window



The screenshot shows the 'Target Segment Selection' window. It has a title bar with a close button. Inside, there are two text input fields: 'Name:\*' with the value 'High ARPU High Churn' and 'Description:' which is empty. Below these is a text label 'Define filter criteria for selecting customers for this target segment.' with a help icon. A hierarchical tree view shows a single node 'Wireless Postpaid'. At the bottom right, it displays 'Customer Count: 479' and an 'Update' button. A row of three buttons 'Save', 'Run', and 'Cancel' is at the very bottom.

4. Enter the following information about the target segment.
  - a. In the **Name** field, enter the default name for the target segment is displayed. You can change this name.
  - b. In the **Description** field, enter a brief description about the target segment.
5. In the hierarchical list, select the primary node. The primary node represents the business group from which you will derive the target segment.
6. From the pop-up menu of the node, select **Add** to add a filter definition. The Filter Definition window appears.





10. Click **Save**. The filter definition is added as a child node of the primary node.

**Display 11.4** Filter Hierarchy

**Target Segment Selection**

Name:\* High ARPU High Churn - Target Segment

Description: Customers with High ARPU High Churn

Define filter criteria for selecting customers for this target segment. ?

```

graph TD
    A[Wireless Postpaid] --- B[Age Band]
  
```

Customer Count: 479

Update

Save Run Cancel

11. (Optional) Select the primary node or the child node, and repeat steps from 6 to 9 to define more levels of filter definitions.

*Note:* You can add one or more child nodes to a parent node. The customer count will always be the number of customers who satisfy the filter conditions at the lowest level of the child nodes. For details, see [“Working with Hierarchical Lists for Defining a Target Segment”](#) on page 81.

---

## Working with Hierarchical Lists for Defining a Target Segment


### Overview

The hierarchical list enables you to define filter criteria for a target segment. At each level of the hierarchical list, you can add one or more nodes. Each node has a pop-up menu, which enables you to work on the filter criteria.

In the edit mode, the pop-up menu of a node enables you to perform the following tasks.

- Add a child node.
- Edit a node.
- Delete a node.
- Copy a node.
- Move a node.

### Pop-up Menu of a Node

In the selected node, click . The pop-up menu appears. The following options are available on the pop-up menu of a node:

#### **Add**

enables you to add a node, which represents a filter definition of the target segment.

#### **Edit**

enables you to edit a filter definition.

#### **Copy**

enables you to create a copy of a filter definition.

#### **Delete**

enables you to delete a filter definition and all the child definitions attached to it.

#### **Move**

enables you to move a filter definition from one level to another.

### Add a Child Node

You can add a node for a parent node. Each child node represents a filter definition. A child node automatically inherits the filter definition that is defined at the parent node.

To add a child node:

1. Select the parent node below that you want to add the new node.
2. From the pop-up menu, select **Add**. The Filter Definition window appears in which you can specify the filter conditions.

### **Delete a Node**

To delete a node:

- ### Move a Node

You can move a node from its current level to another level, which can be either above or below the current level. If the node has one or more child nodes, then they are also

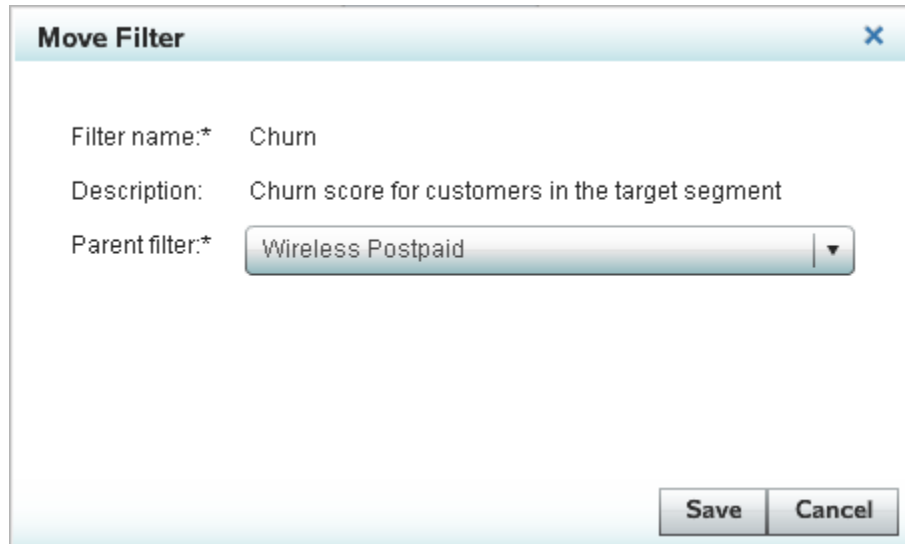


moved with their parent node. However, you cannot move a parent node to the level of its own child node.

To move a node:

1. Select the node that you want to move.
2. From the pop-up menu, select **Move**. The Move Filter window appears.

**Display 11.6** Move Filter Window



The screenshot shows a 'Move Filter' dialog box. It has a title bar with the text 'Move Filter' and a close button (X). The dialog contains three labeled fields: 'Filter name:\*' with the text 'Churn', 'Description:' with the text 'Churn score for customers in the target segment', and 'Parent filter:\*' with a dropdown menu currently showing 'Wireless Postpaid'. At the bottom right of the dialog are two buttons: 'Save' and 'Cancel'.

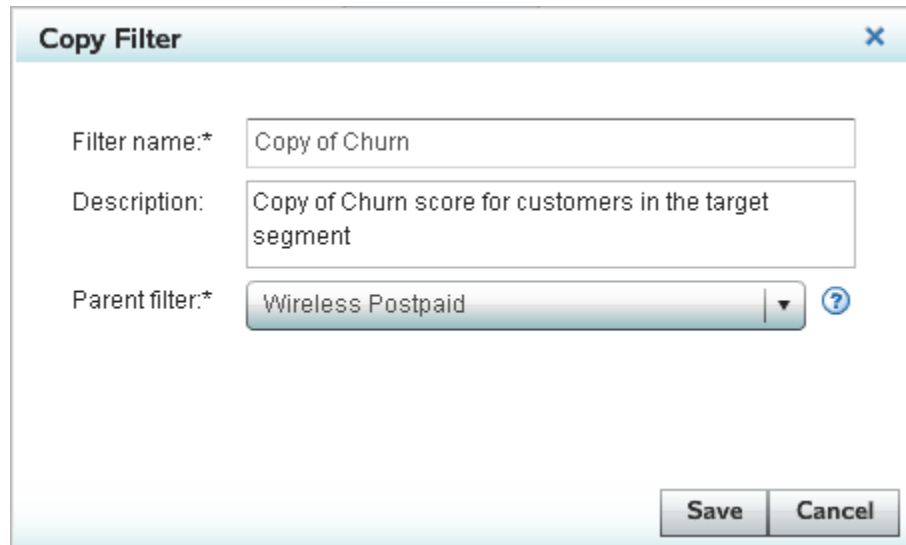
3. Select the parent node where you want to move the node.
4. Click **OK**.

### **Copy a Node**

You can copy a node from its current level to another level, which can be either above or below the current level. If you want to copy a parent node along with its child nodes, you have to copy each node individually.

To copy a node:

1. Select the node that you want to copy.
2. From the pop-up menu, select **Copy**. The Copy Filter window appears.

**Display 11.7** Copy Filter WindowA screenshot of a 'Copy Filter' dialog box. The dialog has a title bar with 'Copy Filter' and a close button. It contains three input fields: 'Filter name:\*' with the text 'Copy of Churn', 'Description:' with the text 'Copy of Churn score for customers in the target segment', and 'Parent filter:\*' with a dropdown menu showing 'Wireless Postpaid' and a help icon. At the bottom right are 'Save' and 'Cancel' buttons.

Copy Filter

Filter name:\* Copy of Churn

Description: Copy of Churn score for customers in the target segment

Parent filter:\* Wireless Postpaid

Save Cancel

3. Select the parent node where you want to copy the node.
4. Click **OK**.

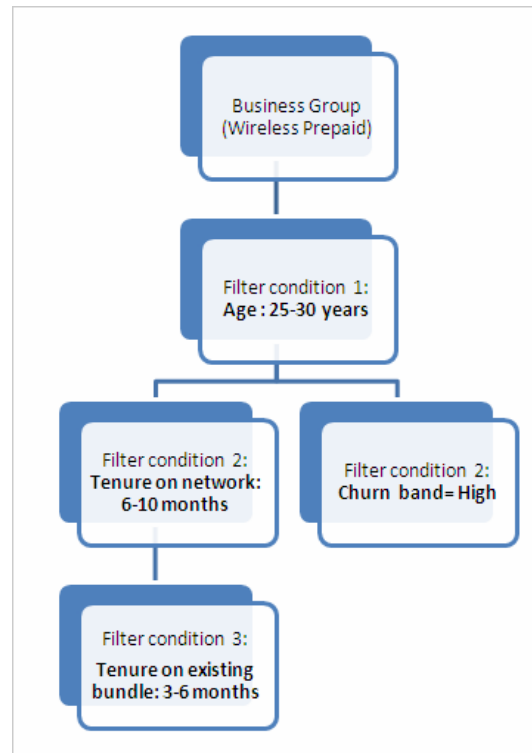
### **Edit a Node**

You can change the filter conditions that each node represents.

To edit a node:

1. Select the node that you want to edit.
2. From the pop-up menu, select **Edit**. The Filter Definition window appears. In this window, you can view the filter conditions that you have defined.



**Figure 11.2** Sample Filter Criteria for a Target Segment

The target segment contains customers who satisfy either of the following set of conditions:


**Condition set 1**

Customers with age greater than 25 years whose tenure on the network is greater than six months and tenure on the existing offer is greater than three months.

**Condition set 2**

Customers of age greater than 25 who have a high churn score.

To define the filter criteria:

1. In the hierarchical list, add a node for the **Wireless Prepaid** business group.
2. In the New Filter window, enter the filter name and description.
3. Click  and, in the row that is added in the table, enter the following details:


**Variables**

From the list, select the **Age band code** variable.

**Operators**


From the list, select the = (equal to) operator.

**Values**

Click . From the list, select the **25–30** age band.

**TIP** Click **Update**. The number of customers in the business group whose age is greater than 25 is displayed.

4. Click **Save**.
5. In the hierarchical list, select the **Age** node and select **Add** from the pop-up menu.
6. In the New Filter window, enter the filter name and description.

7. Click  and, in the row that is added in the table, enter the following details:


**Variables**

From the list, select the **Tenure on network** variable.


**Operators**

From the list, select the = (equal to) operator.

**Values**

Click . From the list, select the **6–10 months** churn band.

**TIP** Click **Update**. The number of customers in the business group whose age is greater than 25 and whose tenure on network is in the 6–10 months band is displayed.

8. Click **Save**.
9. In the hierarchical list, select the **Age** node and select **Add** from the pop-up menu.
10. In the New Filter window, enter the filter name and description.
11. Click  and, in the row that is added in the table, enter the following details:


**Variables**

From the list, select the **Churn band code** variable.


**Operators**

From the list, select the = (equal to) operator.

**Values**

Click . From the list, select the **High** churn band.

**TIP** Click **Update**. The number of customers in the business group whose age is in the 25–30 age band and whose churn score is high is displayed.

12. Click **Save**.
13. In the hierarchical list, select the **Tenure on network** node and select **Add** from the pop-up menu.
14. In the New Filter window, enter the filter name and description.
15. Click  and, in the row that is added in the table, enter the following details:


**Variables**

From the list, select the **Tenure on existing bundle** variable.

**Operators**

From the list, select the = (equal to) operator.

**Values**

Click . From the list, select the **3–6 months** band.

**TIP** Click **Update**. The number of customers in the business group who satisfy the following criteria is displayed:

- Age of the customer is in the 25–30 range.
- Tenure on network is in the 6–10 months band.
- Tenure on existing offer is in the 3–6 months band.

16. Click **Save**.

**TIP** The target segment would contain customers who satisfy either or both of the following set of conditions:


- Age is in the 25–30 band, and churn score is high.
- Age is in the 25–30 band, tenure on network is in the 6–10 months band, and tenure on existing bundle is in the 3–6 months band.

---

## Import the Target Segment Selection Workflow Step

When you define a project, you can decide whether you want to copy the target segment from another project. However, if you want to make this decision at a later stage, you can import the target segment from another project using the **Actions** toolbar. This feature enables you to replicate a target segment across projects of a business group. You can further configure the target segment according to your requirements.

To import the target segment selection workflow step:


1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select the **Target Segment Selection** workflow step.
3. On the **Actions** toolbar, select . The Import Target Segment Selection window appears.
4. From the list, select the project whose target segment selection workflow step you want to copy. The list displays projects of the business group that you have selected for your current project.
5. View the filter criteria that are defined for the target segment of the selected project. Make sure that you are importing the workflow step from the correct project.
6. Click **Save**.

---

## Derive Customers for a Target Segment

In order to filter customers from the business group, you have to run the **Target Segment Selection** workflow step.

To derive customers for a target segment:

1. In the navigation pane, select the **Projects** section.
2. From the **My Projects** list, select the project that you are working on.
3. In the object details pane, select the **Workflow** tab.
4. In the **Workflow Diagram** pane, select **Target Segment Selection**.
5. On the **Actions** toolbar, select . If the process runs successfully, a subset of customers is derived from the business group based on the filter criteria. This subset of customers forms the target segment. The target segment is the actionable population for the subsequent workflow steps of the project.

**TIP** Alternatively, to run the workflow step, in the Target Segment Selection window click **Run**.

---

## Target Segmentation Reports

After you run the **Target Segment Selection** workflow step, you can define reports for this workflow step. These reports can be generated each time you run the project. For details, see *Chapter 16 Generating Workflow Reports* of this guide.





## Chapter 12

# Microsegmentation

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---

## Overview of Microsegmentation

### *Definition*

Microsegmentation divides the target segment into a specific number of groups such that customers within each group have similar revenue and usage patterns. Microsegmentation involves two processes—clustering and profiling.

### *Clustering*

In the clustering process, using the statistical clustering technique, the target segment is divided into customer groups that are called clusters. Each cluster represents a group of customers who have homogeneous patterns for variables that are related to usage and revenue. Conversely, there is heterogeneity across clusters. For example, one cluster might have customers who have high usage for voice calls and another might have customers with very low usage for voice calls.

The clustering technique requires the following inputs:

- Variables that define the revenue and usage pattern of the customers.
- Parameters that are required by the clustering technique.

SAS Offer Optimization for Communications provides a default setup for these inputs. The mandatory variables (also called statistically significant variables) are automatically selected. Similarly, a default value is set up for each clustering parameter.

**Table 12.1** Recommended Default Values for Clustering Parameters

Parameter Description	Default Value
Maximum number of clusters	5
Elbow criterion	0.01
Convergence criterion	0.01

You can create clusters based on the default setup. Alternatively, you can also change the default setup and create microsegments.

## Profiling


Profiling enables you to add a business description for each cluster. Each such cluster that is associated with a business description is called a microsegment. Microsegments form the actionable groups for further processes of the workflow.

---

# Create Microsegments

## Create Clusters

To create clusters:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Microsegmentation**.
3. On the **Actions** toolbar, select . The Microsegmentation window appears.

Display 12.1 Microsegmentation — Clustering Tab

Microsegmentation

Clustering

Profiling

Variables

Parameters

Summary

Category: VARIABLE CATEGORY 3

Subcategory: BEH

Variable Name	Minimum	Maximum	Average	Standard Deviation
<input type="checkbox"/> SUM PK IB PSU CN L12M	71	3,207	1,239	705
<input type="checkbox"/> SUM PK IB PSU CN L9M	71	3,207	1,239	705
<input type="checkbox"/> SUM PK IB PSU CN L6M	71	3,207	1,239	705
<input checked="" type="checkbox"/> SUM PK IB PSU DR L12M nls	708	17,161	6,955	3,740
<input checked="" type="checkbox"/> SUM PK IB PSU DR L9M	708	17,161	6,955	3,740
<input type="checkbox"/> SUM PK IB PSU DR L6M	708	17,161	6,955	3,740
<input type="checkbox"/> SUM IB PSU DR L6M	1,724	35,507	13,895	7,450

☒ Variables that appear dimmed are mandatory variables.

Run

?

Save

Cancel

*Note:* SAS Offer Optimization for Communications provides a default setup to create clusters. If you want to create clusters based on this setup, skip steps from 4 to 7 and perform step 8 directly.

4. Select the **Clustering** tab. In the wizard pages, specify the inputs that are required for creating clusters in the target segment.
5. (Optional) Select the **Variables** page and complete the following steps:
  - a. Select the **Category** and **Subcategory** of the variable. The **Variables** list displays mandatory and non-mandatory variables that are defined for the selected combinations of the categories and subcategories. Mandatory variables are automatically selected, and these are statistically significant variables. In addition to these variables, you can select non-mandatory variables according to your business requirements.
  - b. Review the values that are displayed in each column of the variable. This information might help you when you select non-mandatory variables. The

column values indicate how the variable is represented in the target segment. For example, consider the **TOT OB SMS CNT** variable that represents the total number of outbound SMS in the target segment. The values that are displayed in the **Minimum**, **Maximum**, **Average**, and **Standard Deviation** columns indicate the corresponding values for usage of outbound SMS in the target segment.

- c. Select the additional variables that you want to consider for creating clusters in the target segment.


**TIP** Repeat steps from 5a to 5c above to include variables that belong to a combination of another category and subcategory.

6. (Optional) Select the **Parameters** page and specify the parameter values:

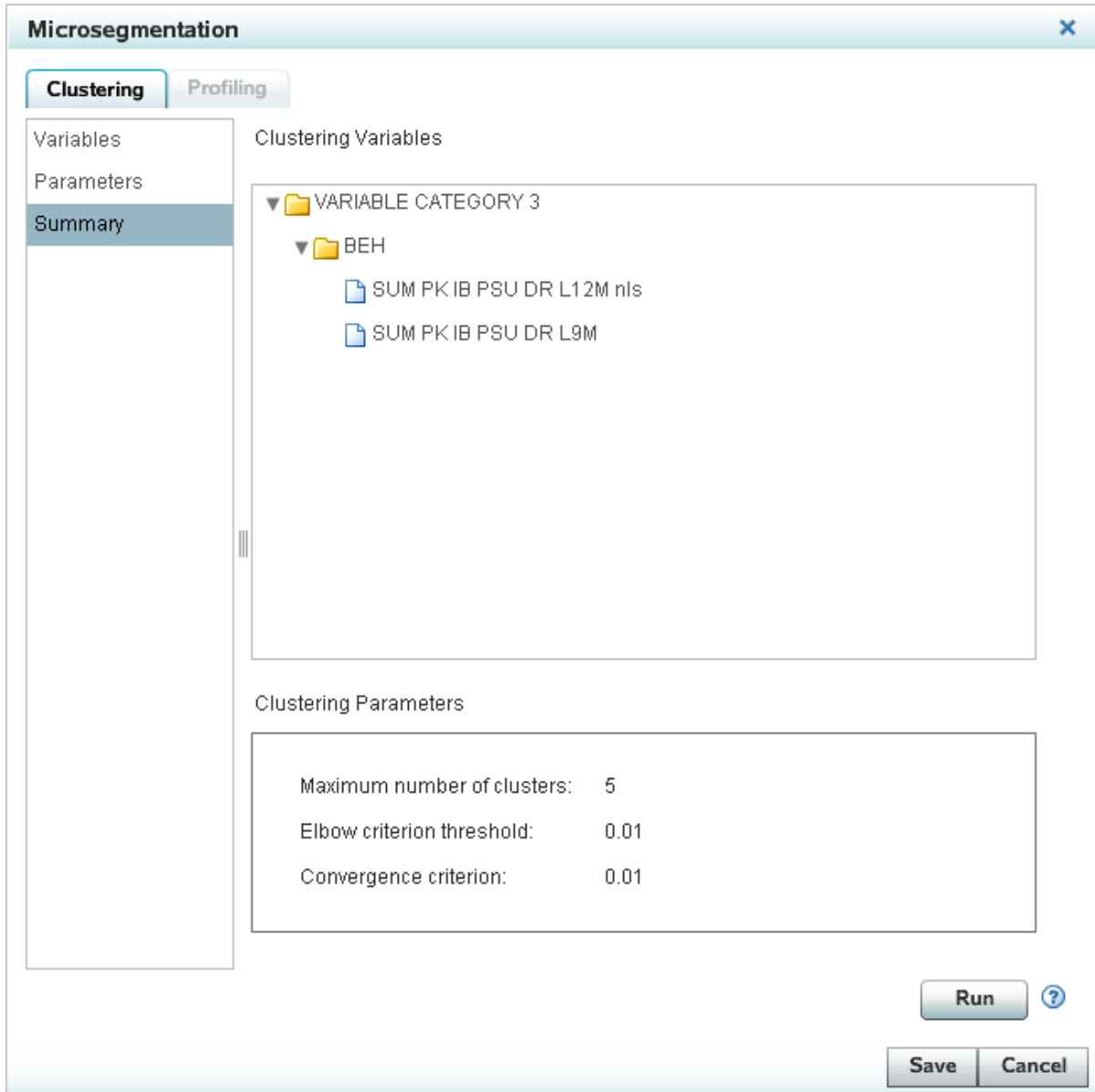
**Display 12.2** Microsegmentation Parameters Page

The screenshot shows the 'Microsegmentation' application window. The 'Clustering' tab is active. The left sidebar has 'Parameters' selected. The main panel displays the 'Maximum number of clusters' as 5. Under 'Advanced parameters', the 'Elbow criterion threshold' and 'Convergence criterion' are both set to 0.01. The bottom right contains 'Run', 'Save', and 'Cancel' buttons.

- a. In the **Maximum number of clusters** field, enter or select the value for the maximum number of clusters that you want to create in the target segment. However the number of clusters that are created depends on the clustering technique that is used for creating clusters.

- b. Click  and enter values for **Elbow criterion threshold** and **Convergence criterion**. It is recommended that you consult your statistical analyst when you enter values for these variables. For details, see “[Clustering Parameters](#)” on page 149.
7. (Optional) To view the variables that you have selected and the parameter setup that you have configured, select the **Summary** page.

**Display 12.3** Clustering — Summary Page





**Microsegmentation**

**Clustering** | Profiling


Variables  
Parameters  
**Summary**

Clustering Variables

- ▼ VARIABLE CATEGORY 3
  - ▼ BEH
    -  SUM PK IB PSU DR L12M nls
    -  SUM PK IB PSU DR L9M

Clustering Parameters

Maximum number of clusters:	5
Elbow criterion threshold:	0.01
Convergence criterion:	0.01

**Run** 

**Save** **Cancel**

8. Click **Run**. A new page, **Report** is added.
9. Select the **Clustering Report** page and view the clustering summary.

Display 12.4 Clustering Report



- Review the values that are displayed for various clustering statistics such as Frequency, Dispersion, Centroid Radius, Nearest Cluster, and Centroid Distance.
- View the graphs that are generated. These graphs explain the homogeneity within the clusters.
  - The Cluster ID versus Frequency graph indicates the number of customers in each cluster.
  - The Cluster ID versus Dispersion graph indicates the variation of the observations within the cluster. The lesser the variation, the higher is the homogeneity within the cluster.
  - The Cluster ID versus Farthest observation graph indicates the distance between the cluster centroid and the observation that is the farthest from the cluster centroid. This graph represents the radius of the cluster. The greater the radius, the greater is the spread of the observations within the cluster.

- The Cluster ID versus Centroid distance graph indicates the distance between the centroids of the current cluster and the cluster that is nearest to it.

*Note:* If the clusters that are created do not satisfy your business requirements, you can configure the clustering setup again. Repeat steps from 2 to 7.

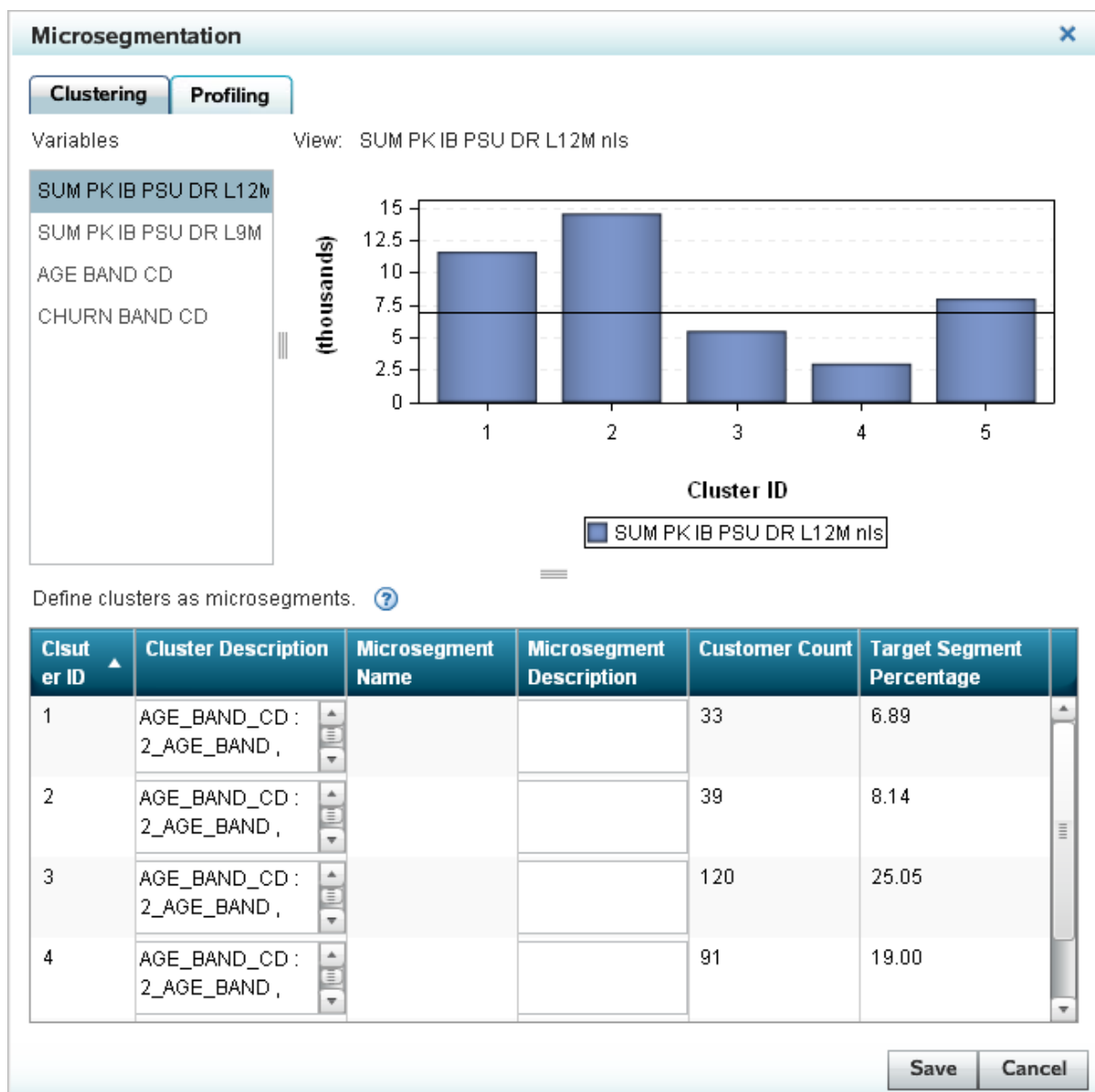
10. Click **Save**.

### Define a Business Profile for a Cluster

To define a business profile for a cluster:

1. Select the **Profiling** tab. The **Profiling** tab is enabled after clusters are successfully created. On this tab, you can approve the clusters that are statistically derived.

**Display 12.5** Microsegmentation — Profiling Tab



- From the **Variables** list, select variables and view the representation of those variables across the clusters. The graphical representation of each variable across clusters can help you to enter an appropriate description for the cluster.
- Enter a suitable name and description for each cluster. These details help you identify the cluster in accord with your business definitions. For example, you can enter the following description for a microsegment: *Very high number outbound voice calls to Onnet mobile in peak hours. Call duration is relatively high. Voice usage charges are high. Low MMS and SMS usage.*

*Note:* You can proceed with the **Microsegment Representation** workflow step only after you enter a name for each cluster in the target segment.

- Click **Save**. For each microsegment, the following information is displayed in the **Microsegmentation** workflow step pane:

**Display 12.6** Microsegmentation Workflow Step Pane

The screenshot displays the 'Microsegmentation' workflow step pane for a project named 'High ARPU High Churn'. The interface is divided into several sections:

- Business Groups:** A sidebar on the left showing 'My Projects' with a tree view containing 'Wireless Postpaid' and 'High ARPU High Churn'.
- Workflow Diagram:** A central pane showing a sequence of steps: 'Target Segment S...', 'Microsegmentation', 'Microsegment Rep...', 'Offer Assembly', 'Invoice Recalculati...', 'Microsegment Offe...', and 'Customer Offer Ra...'. Arrows indicate the flow between these steps.
- Microsegmentation Summary:** A pane on the right showing details for the current step. It includes:
  - Cluster ID:1 Microsegment Name:MS1**
  - Table:**

Cluster Description	Microsegment Description	Customer Count	Target Segment
AGE_BAND_CD : 2_AGE_BAND ,		33	6.89
  - Cluster ID:2 Microsegment Name:MS2**
  - Cluster ID:3 Microsegment Name:MS3**
  - Cluster ID:4 Microsegment Name:MS4**
  - Cluster ID:5 Microsegment Name:MS5**
  - Clustering Variables:** A section showing 'VARIABLE CATEGORY 3'.

#### Cluster ID

displays the cluster number that is generated after running the clustering process.

#### Microsegment Name

displays the name of the microsegment.

#### Microsegment Description

displays the description of the microsegment.

#### Customer Count

displays the number of customers in the microsegment.

#### Target Segment Percentage

displays the percentage this microsegment forms in the target segment. For example, if this value is 35, then it indicates that this microsegment forms 35% of the target population.



---

## Microsegmentation Reports

After you run the **Microsegmentation** workflow step, you can define reports for this workflow step. These reports can be generated each time you run the project. For details, see For details, see [Chapter 16 Generating Workflow Reports on page 133](#) .



## Chapter 13

# Microsegment Representation

---

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---

## Overview of Microsegment Representation

### Definition

Microsegment representation involves drawing one or more customers from each microsegment such that the usage and revenue patterns of the customers who are drawn represent the entire microsegment. The process of drawing representative customers requires a parameter setup. Moreover, the algorithm for selecting representative customers differs depending on whether you want to consider the eligibility criteria when you draw the representative customers. For details, see [“Eligibility Criteria” on page 147](#).

### Parameter Setup

SAS Offer Optimization for Communications provides a default parameter setup for the **Microsegment Representation** workflow step. You can directly draw representative customers from each microsegment based on this default setup. You can also change the default value, and then draw the representative customers.

For each microsegment, you can set up different parameter values. The parameter setup enables you to provide the following inputs:

- Include or exclude eligibility rules.
- Select the sampling method.
- Fix the number of representative customers that is to be drawn from a microsegment.

## Sampling Methods

SAS Offer Optimization for Communications supports two sampling methods for drawing representative customers. Irrespective of the sampling method that is used, the customer that is closest to the cluster centroid is selected as the representative customer. For each sampling method, the algorithm for drawing representative customers differs, depending on whether eligibility rules are considered. For details, see [“Eligibility Criteria” on page 147](#).

### Centroid method

In the centroid method, if the eligibility criteria are not considered, then the centroid sampling method derives only one representative customer from the microsegment. However, if eligibility criteria are considered, then the microsegment is divided into eligibility bands depending on the number of unique combinations of the eligibility rules. The centroid method derives a representative customer from each eligibility band. For example, say that six unique combinations of eligibility rules are applicable for a microsegment. Then six representative customers (one from each eligibility band) that are closest to the cluster centroid are selected from that microsegment.

### Spread-based method

In the spread-based method, depending on the number of representative customers that is drawn from the microsegment, the microsegment is divided into a corresponding number of spread bands. If eligibility criteria are not considered, then the customer that is closest to the cluster centroid is selected from each spread band. However, if eligibility criteria are considered, then before creating spread bands, each microsegment is divided into the eligibility bands depending on the number of unique combinations of the eligibility rules. A customer who exists in an eligibility band and in a spread band and is also closest to the cluster centroid is selected. In this case, it might so happen that there are no customers who belong to a particular eligibility band and also to a particular spread band. Therefore, the number of representative customers that is actually drawn from the microsegment can be less than or equal to the value obtained by multiplying the number of eligibility bands with spread bands. For example, if you want to draw three representative customers, then the microsegment would be divided into three spread bands. If six eligibility bands are applicable for the microsegment, then 18 (3 x 6) representative customers should be drawn. However, it might happen that there are no customers in a particular combination of a spread band and an eligibility band. Therefore, the number of customers that is actually drawn can be less than 18.

---

## Draw Representative Customers Based on the Default Parameter Setup

To draw a representative customer from each microsegment using the default parameter setup:

1. On the **Workflow** tab, in the **Window Diagram**, select **Microsegment Representation**.
2. Review the default setup based on which of the representative customers will be derived for each microsegment.

**Display 13.1** *Default Microsegment Representation*[illegible]**Microsegment Name**

displays the name of the microsegment.

## Customer Count

displays the number of customers in the microsegment.

### Target Segment Percentage

displays the percentage that this microsegment forms in the target segment. For example, if this value is 35, then it indicates that this microsegment forms 35% of the target population.

## Sampling Method

displays the default sampling method that will be used to derive representative customers from the microsegment.


### Number of Spread Bands

displays the number of spread bands in the microsegment. For the centroid sampling method, this value is 1. Therefore, only one representative customer will be drawn from the microsegment. However, for the spread-based sampling method, a representative customer will be drawn from each spread band of the microsegment.

### Number of Representative Customers

displays the number of representative customers that will be drawn from the microsegment. For the centroid sampling method, this value is 1. However, for

the spread-based sampling method, the number of representative customers that will be drawn depends on the number of the spread bands of the microsegment.


3. On the **Actions** toolbar, select . Depending on the default parameter setup, representative customers are drawn from each microsegment.

---

## Draw Representative Customers Based on the Customized Parameter Setup

The default parameter setup uses the same parameter values for each microsegment. Therefore, if you want to set up different parameter values for one or more microsegments, you can configure the **Microsegment Representation** workflow step.

To draw representative customers based on customized parameter setup:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Microsegment Representation**.
3. On the **Actions** toolbar, select . The Microsegment Representation window appears.

**Display 13.2** Microsegment Representation Window

**Microsegment Representation** ✕

☐ Include eligibility criteria ?

Select one or more microsegments from which you want to draw representative customers, and then specify parameter values.

Microsegment Name	Customer Count	Target Segment Percentage	Sampling Method	Number of Spread Bands
MS2	55	8.59	SPREADBASED_US	2
MS3	55	8.59	CENTROID_US	1
MS1	105	16.41	SPREADBASED_US	2
MS4	162	25.31	SPREADBASED_US	2
MS5	112	17.50	SPREADBASED_US	2

Sampling method: CENTROID\_US ?

Number of spread bands: 1 ?

Apply ?

Save
Run
Cancel

4. To draw representative customers based on the eligibility combinations that are defined for the microsegments, select the **Include eligibility criteria** check box.
5. Select the microsegments for which you want to change the parameter setup. The following details are displayed for each microsegment:

**Microsegment Name**

displays the name of the microsegment.

**Customer Count**

displays the number of customers in the microsegment.

**Target Segment Percentage**

indicates the percentage that this microsegment forms in the target population. For example, if this value is 35, then it indicates that this microsegment forms 35% of the target population.

**Sampling Method**

displays the default sampling method that is used to derive representative customers from the microsegment.

**Number of Spread Bands**

displays the number of spread bands in the microsegment. For the centroid sampling method, this value is 1. Therefore, only one representative customer will be drawn from the microsegment. However, for the spread-based sampling

method, a representative customer will be drawn from each spread band of the microsegment.

6. Enter the appropriate values for the following parameters:
  - a. Select the sampling method. The available options are **Centroid** and **Spread-based**.
  - b. Enter or select the number of representative customers that you want to draw. If you select the **Centroid** sampling method, then this field defaults to 1 and you cannot change this value. However, if you select the **Spread-based** sampling method, you can enter or select a value that is greater than 2 but less than 15.

**Display 13.3** Microsegment Representation Parameters

Microsegment Representation

☐ Include eligibility criteria

Select one or more microsegments from which you want to draw representative customers, and then specify parameter values.

Microsegment Name	Customer Count	Target Segment Percentage	Sampling Method	Number of Spread Bands
MS4	91	19.00	SPREADBASED_US	2
MS2	39	8.14	SPREADBASED_US	2
MS1	33	6.89	SPREADBASED_US	2
MS3	120	25.05	SPREADBASED_US	2
MS5	76	15.87	SPREADBASED_US	2

Sampling method: SPREADBASED\_US

Number of spread bands: 2

Apply


Save

Run

Cancel

- c. Click **Apply**.

**TIP** Repeat steps from 6a to 6c if you want to set up parameter values for other microsegments.

7. Click **Save**. The summary of the parameter setup is displayed in the **Microsegment Representation** pane.
8. On the **Actions** toolbar, select . The representative customers are drawn based on the parameter setup.





### Representative Customer Summary

The Representative Customer Summary report gives information about clustering variables that are selected to create clusters in the target segment. This report indicates how a selected variable is represented in the microsegment. It also indicates the actual value of the variable for a representative customer.

**Display 13.5** Representative Customer Summary Report

REPCUST\_SUMMARY

Description:

Select chart type

MCSGMT BUSS NAME	REP CUST ID	VRBL DSPLY NAME	REP CUST ACTUAL ST VAL	MCSGMT MEAN	MCSGMT MAX	MCSGMT MIN
MS2	342_POSTPA	SUM PK IB PE	13,199	14,578	17,161	13,199
MS5	401_POSTPA	SUM PK IB PE	7,080	8,003	9,805	6,832
MS4	429_POSTPA	SUM PK IB PE	4,189	2,999	4,236	708
MS3	478_POSTPA	SUM PK IB PE	5,512	5,523	6,735	4,272
MS1	483_POSTPA	SUM PK IB PE	11,648	11,648	12,874	9,957
MS2	489_POSTPA	SUM PK IB PE	14,517	14,578	17,161	13,199
MS5	604_POSTPA	SUM PK IB PE	7,073	8,003	9,805	6,832

Footnote:

### Representative Customer Variable Summary

The Representative Customer Variable Summary report provides the list of variables that are considered for creating clusters in the target segment. Moreover, this report gives the average value of each variable for the microsegment and the representative customer.

This report enables you to compare variable values across representative customers of a microsegment. For example, for the variable that represents the number of calls, this report gives both the average number of calls in the microsegment and the average number of calls for each representative customer of that microsegment.

Display 13.6 Representative Customer Variable Summary Report

REPCUST\_VRBL\_SUMMARY

Description:

▶ Select chart type

MCSGMT BUSS NAME	REP CUST ID	VRBL DSPLY NAME	MCSGMT AVG	REPCUST AVG
MS4	332_POSTPAID_CL	NUM OF CALLS	6,661	0
MS2	342_POSTPAID_CL	NUM OF CALLS	27,199	17,880
MS5	401_POSTPAID_CL	NUM OF CALLS	15,002	9,688
MS4	429_POSTPAID_CL	NUM OF CALLS	6,661	8,752
MS3	478_POSTPAID_CL	NUM OF CALLS	9,882	15,050
MS1	483_POSTPAID_CL	NUM OF CALLS	22,243	22,120
MS2	489_POSTPAID_CL	NUM OF CALLS	27,199	33,960

Footnote:



## Chapter 14

# Offer Assembly


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## Assemble Offers for Representative Customers

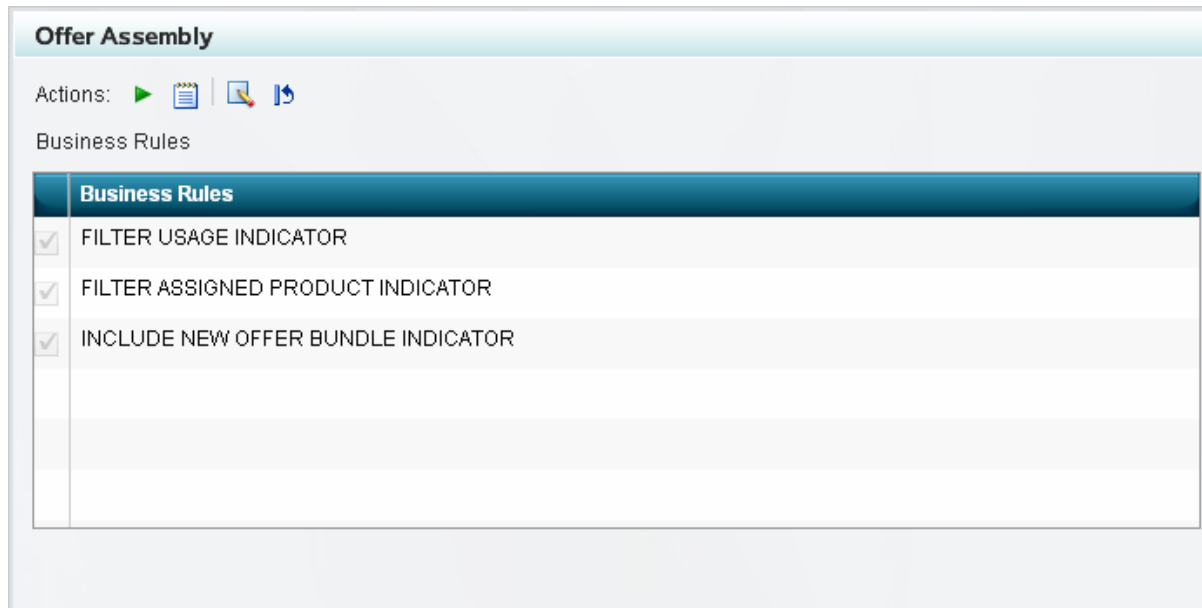
In the **Offer Assembly** workflow step, offers for which the representative customer are eligible are assembled from the product catalog. SAS Offer Optimization for Communications interfaces with the external system to exchange data. The information about the representative customers is exported to the external system, and the relevant information about the offers is imported into SAS Offer Optimization for Communications.

You can assemble offers based on a set of predefined business rules. You can view these default business rules when you select the **Offer Assembly** workflow step. After you confirm the default business rules, you can directly run this workflow step. To do so, on the **Actions** toolbar, select . You can also change the business rules that you want to consider for assembling the offers.

To change the business rules to assemble offers from the external system:


1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Offer Assembly**. The business rules based on which offers are assembled from the external system are displayed.

**Display 14.1** Offer Assembly Rules




3. On the **Actions** toolbar, select . The **Offer Assembly** window appears.

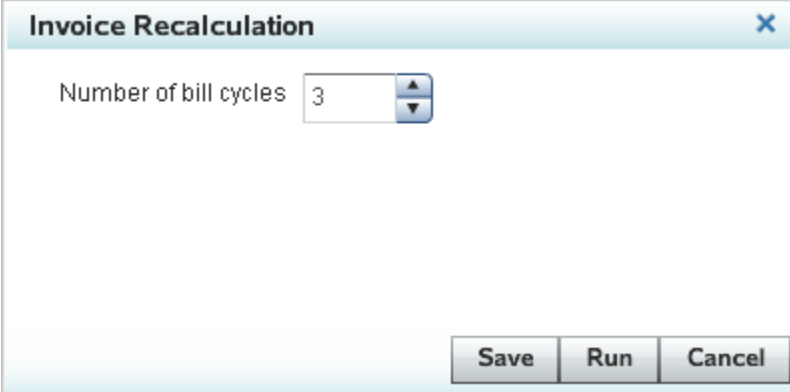


SAS Offer Optimization for Communications enables you to retrieve invoice information for a predefined number of bill cycles. If you want to recalculate invoices for the default number of bill cycles, you can directly run this workflow step. To do so, on the **Actions** toolbar, select . You can edit this workflow step if you do not want to calculate the invoices for the default number of bill cycles.


To edit the number of bill cycles, complete these steps:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Invoice Recalculation**.
3. On the **Actions** toolbar, select . The Invoice Recalculation window appears.

**Display 14.3** Invoice Recalculation Window



4. In the **Number of bill cycles** field, enter or select the number of bill cycles for which you want to extract the billing data.
5. Click **Save**.
6. (Optional) Click **Run**.

**TIP** Alternatively, on the **Actions** toolbar, select .



## Chapter 15

# Offer Ranking

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## Generating Best Offers in Ranked Order

### Overview

From the offers that are assembled for a representative customer, the offer ranking workflow steps produce best offers in ranked order. The offer ranking workflow steps are available at two levels:

#### Microsegment level

In this type of offer ranking, best offers are produced in ranked order for each representative customer of a microsegment.

## Customer level

## Default customer-level offer ranking

In this type of offer ranking, best offers are produced in ranked order for each customer of a microsegment. Best offers are produced for a customer based on the best offers that are derived for the corresponding representative customer. Therefore, best offers are produced at customer level, depending on how you configure the microsegment representation workflow step.

**Table 15.1** Rules for Producing Best Offers at Customer Level

Microsegment Representation Configuration		
Sampling Method	Eligibility Criterion	Best Offers
Centroid	No	The best offers that are produced for the representative customer of the microsegment are assigned to all customers with that microsegment.
Centroid	Yes	The best offers that are produced for each representative customer of an eligibility band are assigned to all customers with that eligibility band.
Spread-based	No	The best offers that are produced for the representative customer of a spread band are assigned to all customers with that spread.
Spread-based	Yes	The best offers that are produced for the representative customer of the combination of a spread band and an eligibility band. These best offers are then assigned to all customers with that combination of the spread band and the eligibility band.

## Customer-level offer ranking based on invoices

In this method, the best offers that are produced at microsegment-level offer ranking can be ranked again for each customer of the microsegment. The ranks are generated based on the ranking setup that you configure in the Customer Offer Ranking window. In addition, invoices are recalculated for each combination of the customer and the best offer that is derived for the corresponding representative customer. Based on the invoice information and the ranking variables that you have set up, the best offers are ranked again for each customer of the target segment.

In this method, the best offers are ranked again based on the actual invoice information. Therefore, the ranks that are derived by using this method can be more accurate.

## Ranking Setup


The best offers are derived based on the ranking setup that you configure. The ranking setup includes selection of certain predefined ranking variables such as bill differentials and revenue. The offer ranking workflow steps produce best offers based on the variables that you select. You can also specify the number of best offers that you want to derive for a customer.

---

## Configure Offer Ranking Setup at Microsegment Level

Offer ranking at microsegment level involves producing best offers for representative customers of all microsegments. The number of best offers that you want to produce for a representative customer is fixed across microsegments. However, you can configure the ranking variables for each microsegment.

To configure offer ranking setup at microsegment level:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram**, select **Microsegment Offer Ranking**.
3. On the **Actions** toolbar, select . The Microsegment Offer Ranking window appears.

**Display 15.1** Microsegment Offer Ranking

**Microsegment Offer Ranking**

Number of ranked offers to derive: Top  offers

Select one or more microsegments and specify values for ranking variables.

Microsegment Name	Microsegment Description	Customer Count	Representative Customer Count	Target Segment Percentage
MS1		33	2	9.19
MS2		39	2	10.86
MS3		120	2	33.43
MS4		91	2	25.35
MS5		76	2	21.17

Specify values for ranking variables. ?

Offer Ranking Measure	Optimization Operation	% Weight	Permitted Deviation	Missing Value Replacement

Update Microsegments

SaveRunCancel

- In the **Number of ranked offers to produce** field, enter or select the number of best offers that you want to produce for each representative customer. The value that you select here is applicable to all microsegments in the target segment.
- View the details of the microsegments.

**Microsegment Name**

displays the name of the microsegment.

**Microsegment Description**

displays a business-specific description of the microsegment.

**Customer Count**

displays the number of customers in the microsegment.

**Representative Customer Count**

displays the number of representative customers that is derived for the microsegment.

**Target Segment Percentage**

indicates the percentage of population that the microsegment forms in the target segment.

6. Select one or more microsegments from the list for which you want to configure the ranking variables.

*Note:* You must configure the ranking variables for all microsegments. Otherwise, you cannot save the offer ranking setup.

7. Select the ranking variable that you want to consider for ranking the best offers and specify value for each column.

**Display 15.2** Microsegment Offer Ranking Parameters

Microsegment Offer Ranking

Number of ranked offers to derive: Top  offers

Select one or more microsegments and specify values for ranking variables.

Microsegment Name	Microsegment Description	Customer Count	Representative Customer Count	Target Segment Percentage
MS1		33	2	9.19
MS2		39	2	10.86
MS3		120	2	33.43
MS4		91	2	25.35
MS5		76	2	21.17

Specify values for ranking variables.

Offer Ranking Measure	Optimization Operation	% Weight	Permitted Deviation	Missing Value Replacement
Total Bill Amount for Voicemail				
Total nonusage bill amount				
Total Charge for Voicemail Repair				
Total Repair Charge				
Total Bill Amount including discount				
Total Discount Amount				
Total Bill Amount	MIN	100	3	MAX
Total Charge for International Voice				

Update Microsegments

Save

Run

Cancel

*Note:* The ranking procedure derives the best offers depending on how you configure the ranking variables. Therefore, make sure that you configure the correct set of variables.

8. Click **Update Microsegments** to assign the setup of the ranking variables to the selected microsegments.

**TIP** Repeat steps from 3 to 8 to define ranking variables for other microsegments.


9. Click **Save**. The ranking variables that you configure for each microsegment are displayed in the **Microsegment Offer Ranking** pane.

---

## Derive Best Offers in Ranked Order at Microsegment Level

After you configure the setup for ranking the best offers at the microsegment level, run the process that produces the best offers for representative customers of each microsegment.

To derive best offers for representative customers of each microsegment:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Microsegment Offer Ranking**.
3. On the **Actions** toolbar, select .

After the processing is complete, the best offers that are derived for each representative customer of the microsegment are displayed. For each best offer, information such as the details of the base offer and the offer bundle to which the best offer belongs is displayed. Also, you can compare the billing amount that is generated for the best offer with that of the current offer and also analyze the percentage change in both the amounts.

**TIP** If the customer's current offer is derived as one of the best offers, then that best offer is highlighted as shown in the diagram below.

**Display 15.3** Microsegment Offer Ranking

Microsegment Offer Ranking

1

Description:

Offer Ranking Measure	Optimization Operation	% Weight	% Permitted Deviation	Missing Value Replacement
TOTAL_BILL_AMT nm	MIN	70	10	MIN
Discount Amount	MAX	30	5	MIN

Top offers for representative customers

Representative Customer	Base Offer Name	Offer Bundle ID	Offer Bundle Name	Offer Rank	Bill on Current Offer	Bill on New Offer	Bill Differential	% Change
42030_POST PAID_CUST	2_POST_BA SE_OFFER_	offer_2_14_18	138_OFFER_BUNDLE_NM	2	7,695.43	5,058.53	-2,636.90	-34.27
42030_POST PAID_CUST	5_PRE_BAS E_OFFER_N	offer_5_9_10...	377_OFFER_BUNDLE_NM	3	7,695.43	5,680.14	-2,015.29	-26.19
42030_POST PAID_CUST	8_PRE_BAS E_OFFER_N	offer_8_11_12	416_OFFER_BUNDLE_NM	4	7,695.43	5,887.36	-1,808.07	-23.50
42030_POST PAID_CUST	4_POST_BA SE_OFFER_	offer_4_15_16_18	331_OFFER_BUNDLE_NM	5	7,695.43	6,986.72	-708.71	-9.21
42030_POST	1	offer_1_13_1	7_OFFER_B	6	7,695.43	7,695.43	0.00	0.00

2

3

4

5


After the processing is complete, you can also view the Offer Ranking Variable Summary report on the **Reports** tab. For details, see [“Microsegment Offer Ranking Report”](#) on page 125.

## Configuring the Offer Ranking Setup at Customer Level

### Overview

The **Customer Offer Ranking** workflow step produces best offers for all customers of each microsegment. In order to produce best offers for each customer of a microsegment, you can use the ranking setup that you have configured at the microsegment level. Alternatively, you can change the ranking setup that you configured at customer level, and then derive the best offers.


**Rank Best Offers for a Customer Using the Default Setup**

The ranking setup that you have configured at the microsegment level is by default available to you when you rank best offers at customer level. If you want to use the same setup, run the process for computing the ranked offers. To do so, on the **Workflow** tab, select **Customer Offer Ranking**. On the **Actions** toolbar, select .

**Change the Ranking Setup at Customer Level**

When you produce best offers at customer level, you can change the number of best offers that you want to produce for each customer.

To configure the ranking setup at customer level:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Customer Offer Ranking**.
3. On the **Actions** toolbar, select . The Customer Offer Ranking window appears.



Display 15.4 Customer Offer Ranking

Customer Offer Ranking

Number of ranked offers to produce: Top 5 (1 - 10) offers

☒ Rank best offers for each customer based on actual invoices

Microsegments

Microsegment Name	Microsegment Description	Customer Count	Representative Customer Count	Target Segment Percentage
1		72	1	20.00
2		150	1	40.00
3		138	1	35.00
4		24	1	5.00
5		9	1	0.00

Ranking Variables

Offer Ranking Measure	Optimization Operation	% Weight	% Permitted Deviation	Missing Value Replacement

Update Microsegments

Save Run Cancel

4. In the **Number of ranked offers to produce** field, enter or select the number of best offers that you want to compute for each customer of a microsegment. The same number of best offers is produced for all customers across all microsegments.

*Note:* The number of best offers cannot exceed the number of best offers that you have set up at microsegment level.

5. (Optional) Select the **Rank best offers for each customer based on actual invoices** check box. This option enables you to produce best offers for customers based on the information on their actual invoices. In addition, you can change the ranking setup that you had configured at microsegment-level offer ranking.

To change the offer ranking setup:

- From the Microsegments list, select one or more microsegments for which you want to change the ranking variables.

*Note:* You must configure the ranking variables for all microsegments. Otherwise, you cannot save the offer ranking setup.

- b. Select the ranking variable that you want to consider for ranking the best offers and specify a value for each column.

*Note:* The ranking procedure derives the best offers depending on how you configure the ranking variables. Therefore, make sure that you configure the correct set of variables.

- c. Click **Update Microsegments** to assign the setup of the ranking variables to the selected microsegments.

**TIP** Repeat steps from 5a to 5c to define ranking variables for other microsegments.


6. Click **Save**. The ranking variables that you have configured for each microsegment are displayed.
7. (Optional) If you want to produce the ranked offers, click **Run**.

---

## Derive Best Offers in Ranked Order for a Customer

Whether you use the default setup or configure the setup for ranking best offers at customer level, you have to run the process that produces best offers at customer level. In other words, best offers of each customer of the target segment are produced.

To produce best offers at customer level:

1. Select the **Workflow** tab.
2. In the **Workflow Diagram** pane, select **Customer Offer Ranking**.
3. On the **Actions** toolbar, select . When the workflow step runs successfully, the customer offer ranking summary is displayed.

**Display 15.5** Customer Offer Ranking Summary

**Customer Offer Ranking**

▶ MS1

▼ MS2

Description:

Offer Ranking Measure	Optimization Operation	% Weight	% Permitted Deviation	Missing Value Replacement
Total Bill Amount	MIN	100	3	MAX

▶ MS3

▶ MS4

▶ MS5

## Microsegment Offer Ranking Report

After you run the **Microsegment Offer Ranking** workflow step, the Offer Ranking Variable Summary report is generated on the **Reports** tab. This report is also generated on the **Bookmarked Reports** tab when you run this workflow step in design or batch mode.

The Offer Ranking Variable Summary report gives the values of the ranking measures that you configure when you define the ranking setup at microsegment level. For each ranking measure, comparative values are generated for the current and the recommended best offer. For example, you configure the TOTAL BILL AMOUNT as the ranking measure. The Offer Ranking Variable summary gives the following information for each representative customer of a microsegment:

- current amount based on the current offer
- calculated amount based on the recommended best offer
- difference amount
- percentage change

**Display 15.6** Offer Ranking Variable Summary Report

Offer Ranking Variable Summary									
Description:									
Select chart type									
Microsegment Name	Representative Customer ID	Variable Name	Offer Bundle Name	Offer Rank	Actual Amount	Estimated Amount	Differential Amount	Percentage Change	
1	42030_PO..	TOTAL_BI...	7_OFFER...	6	7,695.43	7,695.43	0.00	0.00	
1	42030_PO..	Discount A..	7_OFFER...	6	3,368.25	3,368.25	0.00	0.00	
1	42030_PO..	TOTAL_BI...	91_OFFE...	9	7,695.43	16,765.36	9,069.93	117.86	
1	42030_PO..	Discount A..	91_OFFE...	9	3,368.25	9,305.95	5,937.70	176.28	
1	42030_PO..	TOTAL_BI...	121_OFFE...	8	7,695.43	16,580.61	8,885.18	115.46	
1	42030_PO..	Discount A..	121_OFFE...	8	3,368.25	9,458.03	6,089.78	180.80	
1	42030_PO..	TOTAL_BI...	138_OFFE...	2	7,695.43	5,058.53	(2,636.90)	-34.27	
1	42030_PO..	Discount A..	138_OFFE...	2	3,368.25	3,144.28	(223.97)	-6.65	
1	42030_PO..	TOTAL_BI...	185_OFFE...	1	7,695.43	3,454.80	(4,240.63)	-55.11	
1	42030_PO..	Discount A..	185_OFFE...	1	3,368.25	1,761.06	(1,607.19)	-47.72	
1	42030_PO..	TOTAL_BI...	251_OFFE...	10	7,695.43	17,758.87	10,063.44	130.77	
1	42030_PO..	Discount A..	251_OFFE...	10	3,368.25	9,025.60	5,657.35	167.96	
1	42030_PO..	TOTAL_BI...	331_OFFE...	5	7,695.43	6,986.72	(708.71)	-9.21	
1	42030_PO..	Discount A..	331_OFFE...	5	3,368.25	4,185.32	817.07	24.26	
1	42030_PO..	TOTAL_BI...	377_OFFE...	3	7,695.43	5,680.14	(2,015.29)	-26.19	
1	42030_PO..	Discount A..	377_OFFE...	3	3,368.25	3,104.70	(263.55)	-7.82	
Footnote:									

## Revenue Impact Analysis Reports

### Overview

The Revenue Impact Analysis reports are generated after you run the Customer Offer Ranking workflow step. These reports give the impact on the revenue of the communications service providers if the customers accept the best offers that are recommended to them.

The Revenue Impact Analysis reports are available at three levels.



## Revenue Report – Microsegment

The Revenue Report – Microsegment report projects the percentage change in revenue for each ranked offer of a microsegment. The report gives comparative analysis of the impact on the revenue depending on the ranked offer that all customers of the microsegment select.

**Display 15.8** Revenue Report at Microsegment Level

Revenue Report - Microsegment				
Description:				
Select chart type				
Microsegment Name	Offer Rank	Percentage Change	Existing Revenue of All Customers	Estimated Revenue of All Customers
1	1	34.58	138,265.60	186,073.59
1	2	24.79	138,265.60	172,542.48
1	3	18.97	138,265.60	164,495.96
1	4	16.62	138,265.60	161,244.61
1	5	5.00	138,265.60	145,172.24
2	1	31.31	260,878.20	342,553.69
2	2	28.97	260,878.20	336,456.18
2	3	0.00	260,878.20	260,878.20
2	4	-5.77	260,878.20	245,829.91
2	5	-7.72	260,878.20	240,737.45
3	1	-28.64	258,926.80	184,768.66
3	2	57.05	258,926.80	406,636.64
3	3	56.01	258,926.80	403,939.91
3	4	55.09	258,926.80	401,565.02
3	5	54.70	258,926.80	400,553.90
4	1	82.76	46,820.40	85,566.64
4	2	74.08	46,820.40	81,505.24
4	3	72.67	46,820.40	81,312.44
Footnote:				

### Example of report data

For the microsegment M41, if all customers of this microsegment select the best offer that is ranked second, then the percentage change in the revenue can be 22. However, if all the customers in the microsegment select the best offer that is ranked third, then the percentage change in the revenue can be 12.

## Revenue Report — Representative Customer

In the Revenue Report – Representative Customer report, the impact of revenue is projected for each ranked offer that is recommended to a representative customer of a microsegment. The report gives comparative analysis of the impact on the revenue depending on the ranked offer that all customers that are related to the representative customer select.

**Display 15.9** Revenue Report at Representative Customer Level

Revenue Report - Representative Customer						
Description:						
Select chart type						
Microsegment Name	Representative Customer ID	Offer Bundle Name	Offer Rank	Percentage Change	Existing Revenue of All Customers	Estimated Revenue of All Customers
4	37899_POSTPAID_CUST	375_OFFER_BUNDLE_...	1	82.76	46,820.40	85,566.64
4	37899_POSTPAID_CUST	382_OFFER_BUNDLE_...	2	74.08	46,820.40	81,505.24
4	37899_POSTPAID_CUST	278_OFFER_BUNDLE_...	3	73.67	46,820.40	81,313.41
4	37899_POSTPAID_CUST	155_OFFER_BUNDLE_...	4	71.81	46,820.40	80,444.19
4	37899_POSTPAID_CUST	283_OFFER_BUNDLE_...	5	69.52	46,820.40	79,368.09
5	40866_POSTPAID_CUST	208_OFFER_BUNDLE_...	1	73.42	14,014.00	24,303.40
5	40866_POSTPAID_CUST	398_OFFER_BUNDLE_...	2	72.93	14,014.00	24,235.03
5	40866_POSTPAID_CUST	31_OFFER_BUNDLE_NM	3	72.86	14,014.00	24,224.25
5	40866_POSTPAID_CUST	9_OFFER_BUNDLE_NM	4	72.51	14,014.00	24,175.59
5	40866_POSTPAID_CUST	257_OFFER_BUNDLE_...	5	70.93	14,014.00	23,953.49
1	43323_POSTPAID_CUST	94_OFFER_BUNDLE_NM	1	34.58	138,265.60	186,073.59
1	43323_POSTPAID_CUST	318_OFFER_BUNDLE_...	2	24.79	138,265.60	172,542.48
1	43323_POSTPAID_CUST	132_OFFER_BUNDLE_...	3	18.97	138,265.60	164,495.96
1	43323_POSTPAID_CUST	359_OFFER_BUNDLE_...	4	16.62	138,265.60	161,244.61
1	43323_POSTPAID_CUST	124_OFFER_BUNDLE_...	5	5.00	138,265.60	145,172.24
2	44144_POSTPAID_CUST	418_OFFER_BUNDLE_...	1	31.31	260,878.20	342,553.69
2	44144_POSTPAID_CUST	30_OFFER_BUNDLE_NM	2	28.97	260,878.20	336,456.18
2	44144_POSTPAID_CUST	88_OFFER_BUNDLE_NM	3	0.00	260,878.20	260,878.20
Footnote:						

**Example of report data**

Consider the 61\_POSTPAID\_CUST representative customer who belongs to the microsegment M1. If all customers that are related to the 61\_POSTPAID\_CUST representative customer select the best offer that is ranked fourth, then the percentage change in the revenue can be 11. However, if the customers select the best offer that is ranked fifth, then the percentage change in the revenue can be 10.

## Precise Difference Reports

### Overview

The Precise Difference reports are generated after you run the **Customer Offer Ranking** workflow step. These reports give a comparative analysis of impact on the revenue of the CSPs based on the two methods of ranking best offers for a customer. For details, see [“Generating Best Offers in Ranked Order” on page 115](#).

The Precise Difference reports are available at two levels.

- project
- microsegment

These reports are generated based on the ranking setup that you have configured for the offer ranking workflow steps. Each report gives a comparative analysis of percentage change in revenue for the two methods of ranking best offers. This percentage change is






## Precise Difference Report — Microsegment

The Precise Difference Report – Microsegment report projects the percentage change in revenue for each ranked offer that is derived for customers in the microsegment. The report gives further comparative values for revenue differential that is computed based on the two methods of deriving best offers for customers. The values in this report are aggregated at a microsegment level.

**Display 15.11** Precise Difference Report — Microsegment Level

Precise Difference Report - Microsegment						
Description:						
Select chart type						
						
Microsegment Name	Offer Rank	Existing Revenue of All Customers	Revenue Differential with Association	Percentage Differential with Association	Revenue Differential with Precision	Percentage Differential with Precision
1	1	138,265.60	47,807.99	34.58	(27,116.26)	-19.61
1	2	138,265.60	34,276.88	24.79	(15,638.31)	-11.31
1	3	138,265.60	26,230.36	18.97	(7,397.63)	-5.35
1	4	138,265.60	22,979.01	16.62	1,922.02	1.39
1	5	138,265.60	6,906.64	5.00	9,228.79	6.67
2	1	260,878.20	81,675.49	31.31	(95,813.67)	-36.73
2	2	260,878.20	75,577.98	28.97	(50,780.27)	-19.47
2	3	260,878.20	0.00	0.00	(24,237.78)	-9.29
2	4	260,878.20	(15,048.29)	-5.77	(1,207.71)	-0.46
2	5	260,878.20	(20,140.75)	-7.72	16,009.23	6.14
3	1	258,926.80	(74,158.14)	-28.64	(28,373.79)	-10.96
3	2	258,926.80	147,709.84	57.05	(4,160.99)	-1.61
3	3	258,926.80	145,013.11	56.01	16,142.44	6.23
3	4	258,926.80	142,638.22	55.09	37,454.16	14.47
3	5	258,926.80	141,627.10	54.70	65,792.95	25.41
4	1	46,820.40	38,746.24	82.76	(20,828.16)	-44.49
4	2	46,820.40	34,684.84	74.08	(10,594.87)	-22.63
4	3	46,820.40	24,402.04	52.12	(6,009.60)	-12.83
Footnote:						

For example, you want to analyze the revenue impact for the project P1, which has three microsegments, M1, M2, and M3. Let us assume that three best offers are derived for the customers in each microsegment. The Precise Difference Report – Microsegment report gives a comparative analysis on the revenue impact for each combination of a microsegment and the best offer. Further, the analysis is for the best offers that are derived by using the two methods.

- The Differential with Association columns give the revenue impact for the ranked offers that are derived based on the default method. In this method, best offers of representative customers are associated as the best offers of individual customers in the microsegment.
- The Differential with Precision columns give the revenue impact for the ranked offers that are derived based on the actual invoices of the customers in the microsegment. In this method of offer ranking, actual invoices of all customers are recalculated for the best offers that are produced for the corresponding representative customers. Based on this information, these best offers are ranked once again.



## Chapter 16

# Generating Workflow Reports

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## Organizing Workflow Reports

In order to evaluate the results of a workflow step, you can generate multiple reports at various stages of your project workflow. Based on these reports, you can also decide whether you should proceed with the next workflow step or configure the current workflow step again.

If you manage and organize your reports for each project in a structured manner, you can easily retrieve the required report. SAS Offer Optimization for Communications enables you to organize your reports by defining report categories and report groups. For each workflow step, report categories are predefined. You can define report groups for a combination of a workflow step and a report category. For example, for the Customer Representation workflow step, the following report categories can be predefined:


- Analysis reports
- Strategy reports

For the analysis reports category, you can further define a report group named cohesiveness of microsegments. For the strategy reports category, you define a report group named comparison of representative customers.

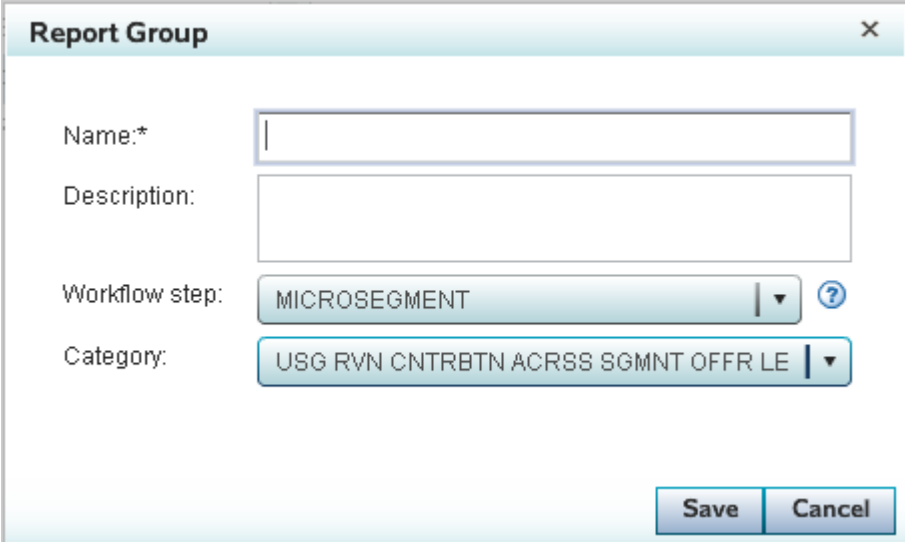
## Create a Report Group

You can define multiple report groups for a combination of a project, a workflow step, and a report category. For each report group, you can further define various types of reports.

To create a report group:

1. In the **Projects** section, select the project for which you define report groups.
2. In the navigation pane, select the **Reports** tab.
3. On the toolbar, select . The Report Group window appears.

**Display 16.1** Report Group Window



4. Enter the following details about the report group:
  - a. In the **Name** field, enter the name of the report group. This name appears in the reporting structure that is displayed in the **Report Groups** pane.
  - b. In the **Description** field, enter a short description of the reports that will be categorized under this report group.
  - c. From the **Workflow step** list, select the workflow step for which you are defining the report group.
  - d. From the **Category** list, select the category for which you want to define the report group.
5. Click **Save**.

**TIP** If you do not want to define the report group, click **Cancel**. The window closes, and you will lose the information that you have entered.

---

## Deleting Report Structures

### Overview

You can delete the entire structure that you have created for organizing your project reports. Alternatively, you can delete only a certain level of the report structure. You can delete the report structure at the following levels:

Workflow step

deletes all the report groups from all the report categories.

Report category


deletes the report groups that are defined for the selected category.

Report group

deletes a particular report group.


### Delete All Report Groups of a Workflow Step

To delete all reports groups of a workflow step:

1. Select the project for which you want to delete the report groups.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the workflow step for which you want to delete the report group.
4. On the toolbar, click . All report groups that are defined for various report categories are deleted.


### Delete All Report Groups of a Report Category

To delete all reports groups of a report category:

1. Select the project for which you want to delete the report groups.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the workflow step for which you want to delete the report group.
4. Expand the list items until you see the report categories that are defined for the workflow step.
5. Select the report category from the list.
6. On the toolbar, click . All report groups that are defined for the selected report category are deleted.

### Delete a Report Group

To delete a report group:

1. Select the project for which you want to delete a report group.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the workflow step for which you want to delete the report group.
4. Expand the list items until you see the report categories that are defined for the workflow step.
5. Select the report category and expand the list items that are defined for the report category.
6. Select the report group that you want to delete.
7. On the toolbar, select . The report group that you have selected, is deleted.

*Note:* If you have added a bookmark for this report group, it will be automatically deleted from the **Bookmarked Reports** tab.

---


## Bookmark a Report Group

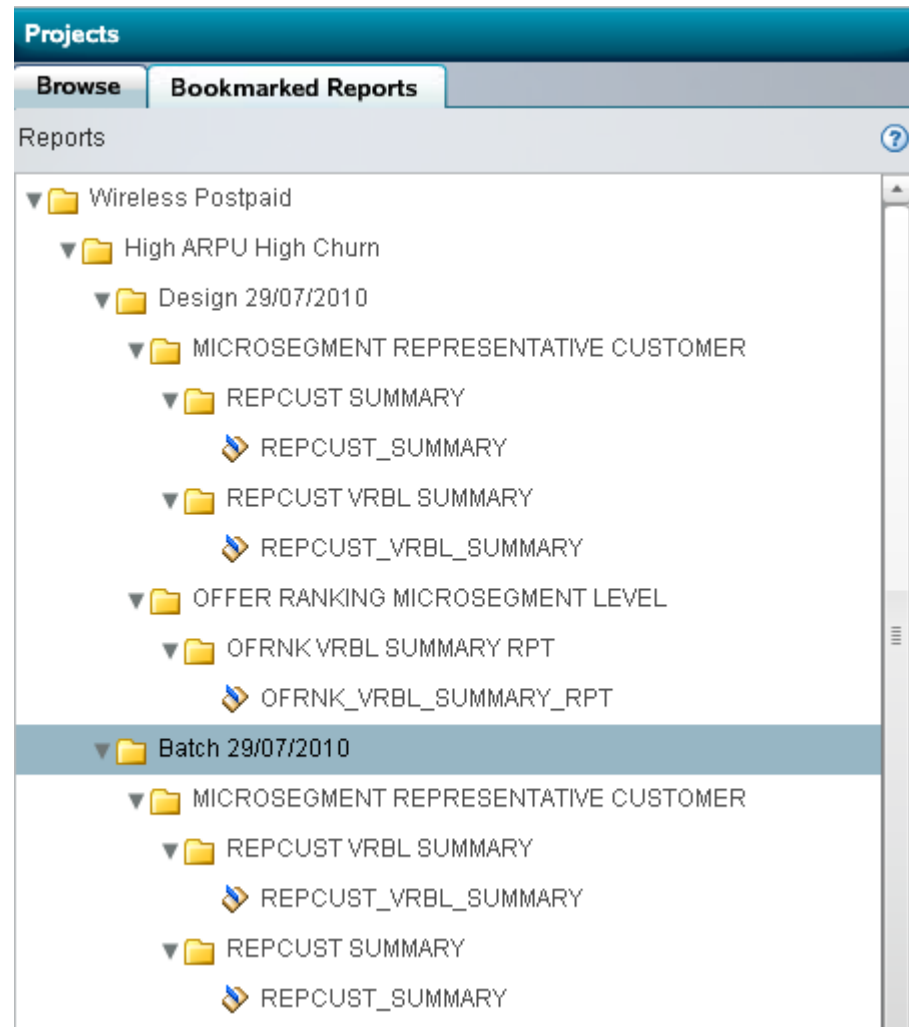
The bookmark report group feature automates the process of generating reports for each workflow step of a project. This feature automatically generates the reports that you have bookmarked when you run a workflow step in design mode or batch mode.

After you bookmark a report group, you cannot perform any of the following tasks:

- Add a report to the report group.
- Edit a report that belongs to the report group.
- Delete a report that belongs to the report group.

To bookmark a report group:

1. In the navigation pane, from the **My Projects** list, select a project for which you want to bookmark reports.
2. In the object details pane, select the **Reports** tab.
3. From the **Reports** list, expand the items below the workflow step and report category until you see the report group that you want to bookmark.
4. Select the report group, and then on the toolbar select . The report group that you select is added to the **Bookmarked Reports** tab in the **Projects** section along with the parent report structure in the following order:
  - Business group name
  - Project name
  - Run ID of the project in batch or design mode
  - Workflow step
  - Report category
  - Report group

**Display 16.2** Bookmarked Reports Structure

## Generating Workflow Reports

### Overview of Report Types

For each report group, you can define multiple reports. You can represent the data in a report either graphically or in the form of a data table. SAS Offer Optimization for Communications enables you to represent data in the following two graphical formats:


- pie chart
- vertical bar chart

These reports show the information about various workflow steps for the current run of the project.

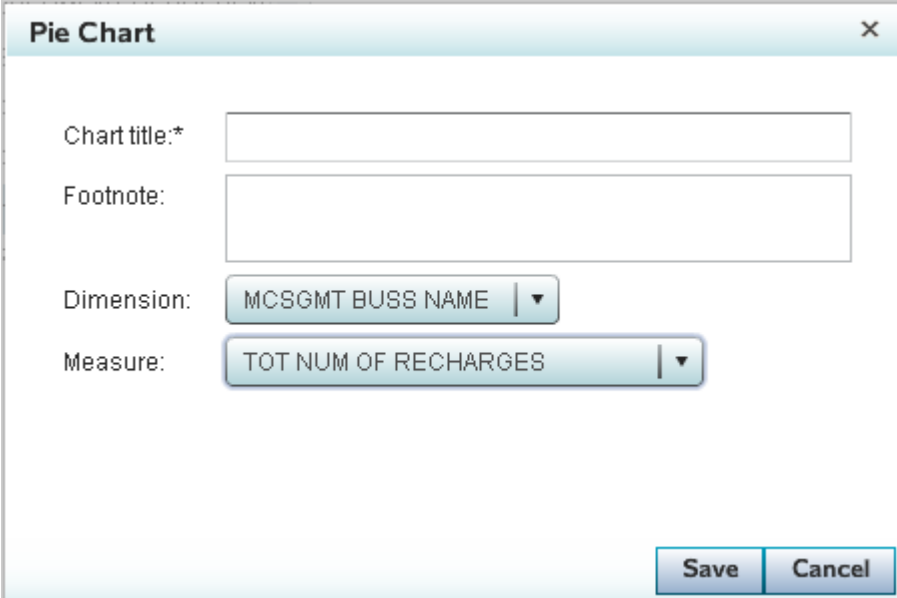
## Create a Pie Chart

A pie chart displays your data in the form of a disc that is divided into slices by radial lines. Each slice represents the relative contribution of each part to the whole.

To define a pie chart:

1. Select the project for which you want to define a pie chart.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the report group for which you want to define a report.
4. Expand the **Select report type** list.
5. Select  from the report type list. The Pie Chart window appears.

**Display 16.3** Pie Chart Window



The screenshot shows the 'Pie Chart' configuration window. It has a title bar with 'Pie Chart' and a close button. Inside, there are four fields: 'Chart title:\*' with an empty text box, 'Footnote:' with an empty text box, 'Dimension:' with a dropdown menu showing 'MCSGMT BUSS NAME', and 'Measure:' with a dropdown menu showing 'TOT NUM OF RECHARGES'. At the bottom right, there are 'Save' and 'Cancel' buttons.

6. Enter the following details:

### Title

Enter a title for the report. The title will be displayed at the top of the report.

### Footnote

Enter notes that you want to appear at the bottom of the report. For example, you can enter information about the currency that is used for representing amounts.

### Dimension

Select the categorical variable that will be represented using the pie chart. For example, variables such as Time, Geography, Offer Payment mode, and Customer type are dimensions.

### Measure

Select the value variable that will be represented by each slice of the pie chart. For example, variables such as total usage charges, total voice call charges, and total message charges are measures.


7. Click **Save**.



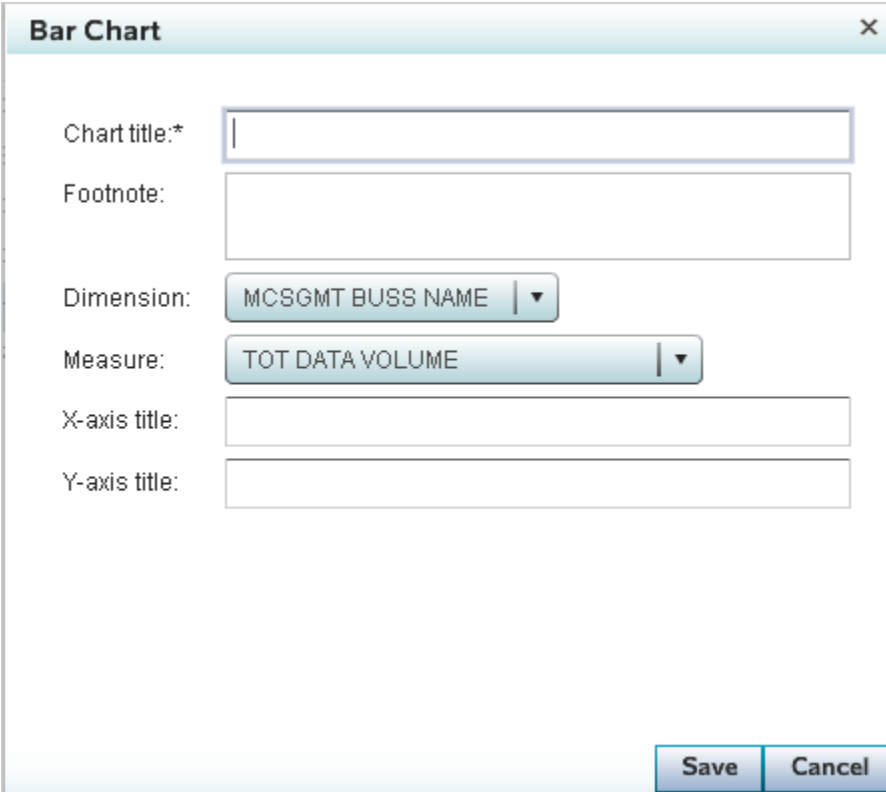
## Create a Bar Chart

A bar chart represents data in the form of a grid and some vertical bars. Each column represents quantitative data.

To generate a bar chart:

1. Select the project for which you want to define a bar chart.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the report group for which you want to define a report.
4. Expand the **Select report type** list.
5. Select  from the report type list. The Bar Chart window appears.

**Display 16.4** Bar Chart Window



The image shows a 'Bar Chart' configuration window with the following fields and controls:

- Chart title:\***: A text input field.
- Footnote:**: A text input field.
- Dimension:**: A dropdown menu showing 'MCSGMT BUSS NAME'.
- Measure:**: A dropdown menu showing 'TOT DATA VOLUME'.
- X-axis title:**: A text input field.
- Y-axis title:**: A text input field.
- Buttons:** 'Save' and 'Cancel' buttons at the bottom right.

6. Enter the following details:

### Title

Enter a title for the report. The title will be displayed at the top of the report.

### Footnote

Enter notes that you want to appear at the bottom of the report. For example, you can enter information about the currency that is used for representing amounts.

### Dimension

Select the variable that will be represented on the horizontal (X-axis) axis. Variables such as Time, Geography, and Customer type are examples of dimensions.

**Measure**

Select the variable that will be represented on the vertical (Y-axis) axis. This variable is the quantitative variable. Variables such as total usage charges, total voice call charges, and total number of churned customers are examples of measures.

**X— axis title**

Enter a title that you want to display for the category axis. This title will be displayed along the horizontal (X) axis.

**Y— axis title**

Enter a title that you want to display for the value axis. This title will be displayed along the vertical (Y) axis.

**Show legend**


Select the check box if you want to display the legend for the graph.

7. Click **Save**.

**Create a Data Table**

A data table displays data in the form of rows and columns.

To generate a data table:

1. Select the project for which you want to define a pie chart.
2. In the object details pane, select the **Reports** tab.
3. In the **Report Groups** pane, select the report group for which you want to define a report.
4. Expand the **Select report type** list.
5. Select  from the report type list. The Data Table window appears.

**Display 16.5** Data Table Window

The screenshot shows a window titled "Data Table" with a close button (X) in the top right corner. Inside the window, there are two text input fields: "Chart title:\*" and "Footnote:". Below these fields are two side-by-side lists of items, each with a checkbox to its left. The left list is titled "Dimension" and contains: TARGET SEGMENT NAME, CAL MONTH NAME, CAL QUARTER NAME, \*MCSGMT BUSS NAME, BASE OFFER NAME, MICROSEGMENT MEAN, and BASE OFFER PYMNT MODE NAME. The right list is titled "Measure" and contains: TOT CUST CNT IN MS FLTR, TOT CALLS, TOT MOU, TOT DATA CALLS, TOT DATA VOLUME, TOT MESSAGE, and TOT MESSAGE VOLUME. At the bottom of the window, there is a note: "Dimensions marked with a \* are mandatory." and two buttons: "Save" and "Cancel".

Dimension	Measure
<input type="checkbox"/> TARGET SEGMENT NAME	<input type="checkbox"/> TOT CUST CNT IN MS FLTR
<input type="checkbox"/> CAL MONTH NAME	<input type="checkbox"/> TOT CALLS
<input type="checkbox"/> CAL QUARTER NAME	<input type="checkbox"/> TOT MOU
<input type="checkbox"/> *MCSGMT BUSS NAME	<input type="checkbox"/> TOT DATA CALLS
<input type="checkbox"/> BASE OFFER NAME	<input type="checkbox"/> TOT DATA VOLUME
<input type="checkbox"/> MICROSEGMENT MEAN	<input type="checkbox"/> TOT MESSAGE
<input type="checkbox"/> BASE OFFER PYMNT MODE NAME	<input type="checkbox"/> TOT MESSAGE VOLUME

Dimensions marked with a \* are mandatory.

Save Cancel

6. Enter the following details:

**Title**

Enter a title for the report. The title will be displayed at the top of the report.

**Footnote**

Enter notes that you want to appear at the bottom of the report. For example, you can enter information about the currency that is used for representing amount values.

**Dimension**

Select the category variables that are to be displayed in the data table. You have to select at least one mandatory variable from the list. Variables such as Time, Geography, and Customer type are examples of dimensions.

*Note:* When you select more than one dimension, information is displayed for each unique combination of the dimension values. For example, you select the microsegment name and the payment mode as the dimensions. If there are two microsegments (MS1 and MS2), and two payment modes (Prepaid and Postpaid) then the data table will display information for each of the following combinations.

- MS1 Prepaid
- MS1 Postpaid
- MS2 Prepaid
- MS2 Postpaid

**Measure**

Select the value variables that are to be displayed in the data table. Variables such as total usage charges, total voice call charges, and total number of churned customers are examples of measures.

7. Click **Save**.

---

## Managing Workflow Reports


**Overview**

You can edit, delete, or export a report. You can perform these tasks using the respective options that are available for each report.

**Edit a Report**

You cannot edit a report if you have added a bookmark for the report group to which this report belongs.


To edit a report:

1. Select the project for which you want to edit a report.
2. In the object details pane, select the **Reports** tab.
3. From the **Report Groups** list, select the report group to which the report belongs.
4. Select the report that you want to edit.
5. Click . The window for modifying the report attributes appears.
6. Make changes according to your requirements.
7. Click **Save**.

**Delete a Report**

You cannot delete a report if you have added a bookmark for the report group to which this report belongs.


To delete a report:

1. Select the project for which you want to edit a report.
2. In the object details pane, select the **Reports** tab.
3. From the **Report Groups** list, select the report group to which the report belongs.
4. Select the report that you want to delete.
5. Click .

## Export a Report

You can export the report data to a comma-separated (.csv) file. This feature will enable you to import the report data into other applications such as Microsoft Excel and perform further analysis of the data.

To export a report:

1. Select the project for which you want to export a report.
2. In the object details pane, select the **Reports** tab.
3. From the **Report Groups** list, select the report group to which the report belongs.
4. Select the report whose data you want to export.
5. Click .
6. Select the location in which you want to save the .csv file and type a suitable filename.

*Note:* Similarly, you can also export data of reports that are available on the **Bookmarked Reports** tab.




---

## Changing the Zoom Level for a Report

Reports that belong to a particular group are displayed in tiles. You can minimize, maximize, or reset the zoom level of the tiles.

For each report, the zoom levels are displayed as icons in the right corner of the tile.

**Table 16.1** Zoom Options for Reports

Icon	Purpose
	minimizes the report tile.
	maximizes the report tile.
	resets the report tile to its original size.



## Part 4

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# Appendixes

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## Appendix 1

# Eligibility Combination Matrix

### Overview

Eligibility criteria are the rules that you can enforce on customers for availing themselves of offers that exist in the product catalog. However, you can decide whether you want to configure the eligibility rules. Eligibility criteria are defined based on customer attributes.

### Procedure for Defining Eligibility Criteria

The process of defining eligibility criteria includes the following steps:

1. Identify customer attributes that impact eligibility rules.
2. Capture unique values of each attribute.
3. Define a unique combination of attribute values.
4. Assign a unique ID for each combination. This combination is called an eligibility rule.
5. Associate each customer with an eligibility rule and assign the corresponding eligibility ID to a customer.
6. Consider only those customers who have an eligibility combination ID.

### Example: Eligibility Combination Matrix

For defining eligibility criteria, you can consider the following customer attributes:

- region
- customer type
- education level

You can then list the possible values that each attribute can have. For example, the region attribute can have four values, namely, East, West, North, and South. The customer type can be individual, corporate, or SME (small and medium size enterprise).

Each unique combination of attribute values is assigned an eligibility ID, and an eligibility combination matrix can be defined.

Each customer is associated with an eligibility ID.

### ***Impact of Eligibility Criteria on Business Groups***

The eligibility matrix is defined before you create business groups. Therefore, depending on the selection criteria that are defined, a business group can contain customers with only specific eligibility IDs.

### ***Impact of Eligibility Criteria on Microsegment Representation***

You can consider eligibility criteria when you configure the microsegment representation workflow step. If eligibility criteria are considered, then a representative customer is drawn from each eligibility band of a microsegment.

### ***Impact of Eligibility Criteria on Customer Offer Ranking***

If eligibility criteria are considered in the microsegment representation workflow step, then it automatically applies to the customer offer ranking workflow step. While deriving offers for each customer of a microsegment, the best offers are produced for the representative customer of a certain eligibility band. These offers are then assigned to the other customers who belong to that eligibility band.

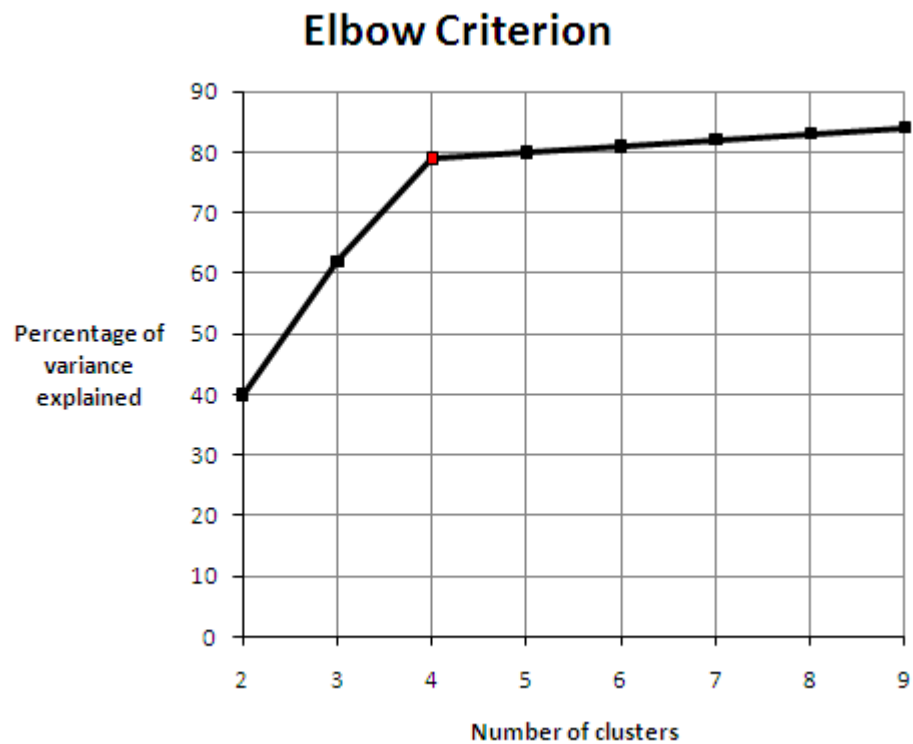
## Appendix 2

# Clustering Parameters

### Elbow Criterion

The elbow criterion states that the number of clusters to be created should be such that adding another cluster does not provide any additional information. To understand this rule further, plot a graph of the percentage of variance that is explained by the clusters against the number of clusters. The graph indicates that the first few clusters add significant information. That is, these clusters explain a lot of variance. However, at a certain point, the marginal gain generated by adding new clusters will drop, producing an angle (an “elbow”) on the graph. To establish this angle (point), you need to define some threshold on the marginal gain. In other words, you need to define the elbow criterion threshold.

**Figure A2.1** Elbow Criterion



**Convergence Criterion**

The clustering procedure runs in iterations. After each iteration of the clustering procedure, the cluster centroids are updated. Iterations stop when the relative change in the cluster centroids is less than or equal to the convergence criterion. For complete convergence, it is recommended that you should enter the minimum value for this parameter. However, complete convergence also depends on the number of iterations of the clustering procedure. In order to achieve complete convergence, the number of iterations of the clustering procedure should be set to a large value.

# Glossary

---

**business group**

a subset of the customer base that is derived as a result of high-level business segmentation based on relatively static business attributes such as offer segment (wireless, land-line), offer payment mode (prepaid, postpaid), customer type, and customer's geographical area.

**business rule**

a statement that defines or constrains some aspect of the business. Business rules describe the operations, definitions, and constraints that apply to an organization in achieving its goals.

**category variable**

a classification variable with a finite number of distinct (discrete) values. These variables are typically used to split data into subsets. For example, in a bar chart, each unique value is displayed as a bar on a DISCRETE axis. In another example, the variable payment mode can have two values, prepaid and postpaid. Customers can be classified based on this variable as prepaid customers and postpaid customers.

**child level**

the level of information added below the primary node of a hierarchical list.

**child node**

a node of a hierarchical list that originates from a single node at a previous level.

**cluster**

a subset of a target segment that is derived based on certain analytical algorithms in order to ensure homogeneity of usage and revenue patterns within the group.

**clustering**

a common technique for statistical data analysis. Clustering is the assignment of a set of observations into subsets (called clusters) so that observations in the same cluster are similar in some sense. For example, in the communications domain, customers with high usage and high churn scores can belong to the same cluster.

**dimension**

a data element that categorizes values in a data set into non-overlapping categories that can be used to group, filter, and label the data in meaningful ways. Hierarchies within a dimension typically represent different groupings of information that pertains to a single concept. For example, a Time dimension might consist of two hierarchies: (1) Year, Month, and Date, and (2) Year, Week, and Day.

**eligibility rule**

a mechanism that is used for assessing customers who are availing themselves of offers. These rules are applicable only for the offers that are available in the product catalog. Eligibility rules are defined based on customer-level attributes such as age, customer type, region, and educational level. Each such combination of unique attributes is assigned a unique ID.

**hierarchical list**

a user interface element that helps to select values by organizing variables into parent-child relationships, typically where a parent member represents the consolidation of its children. A hierarchical list progresses from top to bottom.

**microsegment**

a cluster that is associated with a business description.

**parent node**

a node of a hierarchical list from which one or more nodes originate.

**primary node**

the topmost single node of a hierarchical list.

**profiling**

the process of adding a business description for each cluster in the workflow diagram.

**project**

the named collection of activities and reports to implement a business strategy for addressing a business pain. For example, a project can be created for reducing churn of highly profitable customers in the North region.

**ranking**

the process of ordering observations according to values of particular variables.

**representative customer**

a customer that is derived from each microsegment such that the usage and revenue pattern of this customer represent the entire microsegment. The number of representative customers that is drawn from a microsegment depends on the underlying statistical method.

**target segment**

a subset of the business group that is derived based on certain variables such as demographics, tenure, and churn score.

**workflow**

a model for a sequence of activities, declared as work of a person, a group, an organization, or one or more mechanisms. Workflows are generally designed to enable a work process that can be documented and learned.

**workflow diagram**

a diagram that indicates the order in which activities of a project are to be performed.

**workflow step**

each individual activity of a project that is depicted in a workflow diagram.

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