



BusinessObjects User's Guide

Version 5.1

Windows

BusinessObjects™

Version 5.1

User's Guide

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Finding the Information You Need

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It's in the Documentation

Business Objects documentation continues to deliver timely and indepth coverage of product information. Not just facts about product features, but a world of knowledge in the way of tips, samples, and troubleshooting instructions.

For your convenience, Business Objects documentation comes in a variety of formats including Windows online help, HTML, Acrobat PDF, paper, and multimedia. What's more, you can gain quick access to it at any time directly from the product you are working with.

Documentation has been carefully designed to meet your needs for speed and ease of navigation. All the information you need is there just a few mouse clicks away.

The next sections highlight the key features of our documentation.

A Documentation Service on the Web

From the Help menu of all our products, you can check out More Tips and Samples, the Business Objects documentation service on the Internet. From here, you can discover the latest updates, tips, samples, and troubleshooting.

You can also get there by pointing your browser to the following URL:

<http://www.businessobjects.com/services/infocenter>

From the Tips and Tricks page, registered customer support contacts can explore the electronic version of the Business Objects documentation set. It offers extensive information on all Business Objects products, updates, troubleshooting, tips, and much more.

In addition, registered DEVELOPER SUITE customers can download new documentation and code samples.

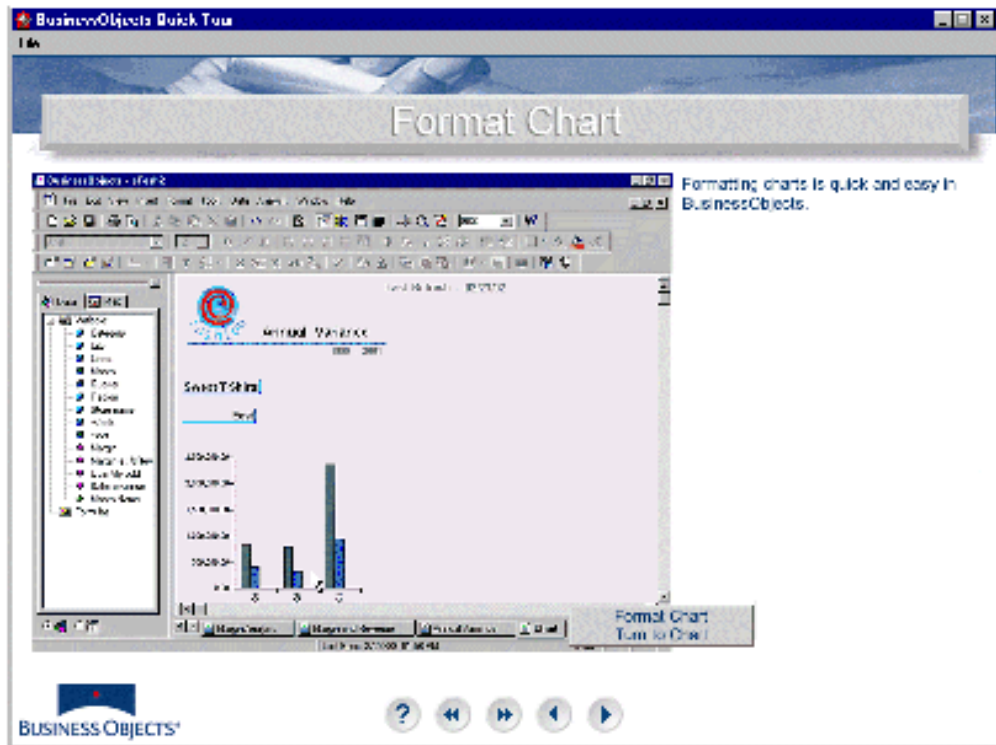
Multimedia

Business Objects multimedia comprises the BUSINESSOBJECTS Quick Tour, the INFOVIEW Quick Tour, and the BUSINESSMINER tutorial, all of which cover the essential features of these products.

The BusinessObjects Quick Tour

The BUSINESSOBJECTS Quick Tour is a multimedia presentation that takes you on a guided tour of the key features of BUSINESSOBJECTS. Its didactic approach makes it an ideal primer for first-time users of the product.

You may wish to use it as an accompaniment to the guide *Getting Started with BusinessObjects*.

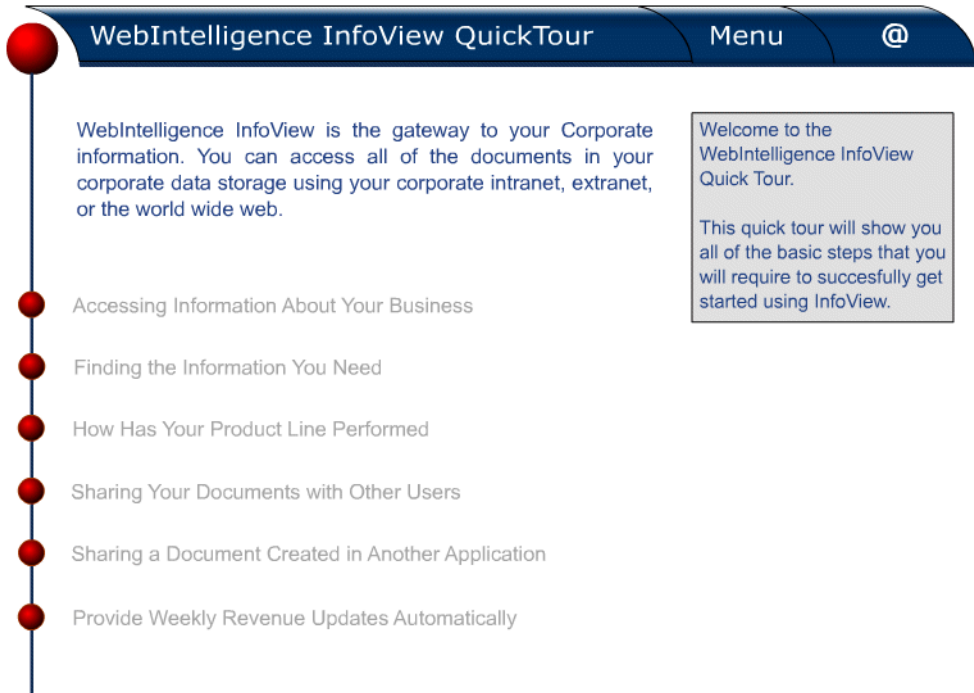


An actual screen from the BusinessObjects Quick Tour

The InfoView Quick Tour

The INFOVIEW Quick Tour is a multimedia presentation that highlights the key features of INFOVIEW. Intended primarily for new users, it offers an overview of all the features necessary for managing and distributing documents.

The INFOVIEW Quick Tour can be used as an accompaniment to the guide *Getting Started with WebIntelligence*.



An actual screen from the InfoView Quick Tour

The BusinessMiner Tutorial

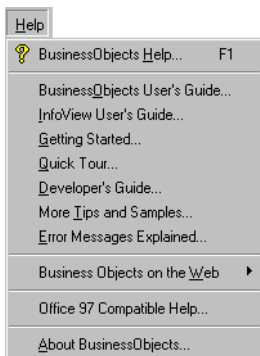
This multimedia tutorial teaches novice users how to use the powerful desktop datamining software, BUSINESSMINER. Each lesson in this tutorial has a narrated, animated presentation which shows users how to answer a business question using BUSINESSMINER. Users can then try out the demonstrated tasks themselves by following the step-by-step exercises in the accompanying guide.

Online Guides

User's Guides

All user's guides are available as Acrobat Portable Document Format (PDF) files. Designed for online reading, PDF files enable you to view, navigate through, or print any of their contents. The full list of Business Objects guides is provided in the *Deployment Guide*.

From a Business Objects product, you can open a guide from the commands of the Help menu.



The Help menu of BusinessObjects provides commands for viewing documentation.

During installation, the BUSINESSOBJECTS installer program automatically copies these files to:

Business Objects\BusinessObjects 5.0\Online Guides\En

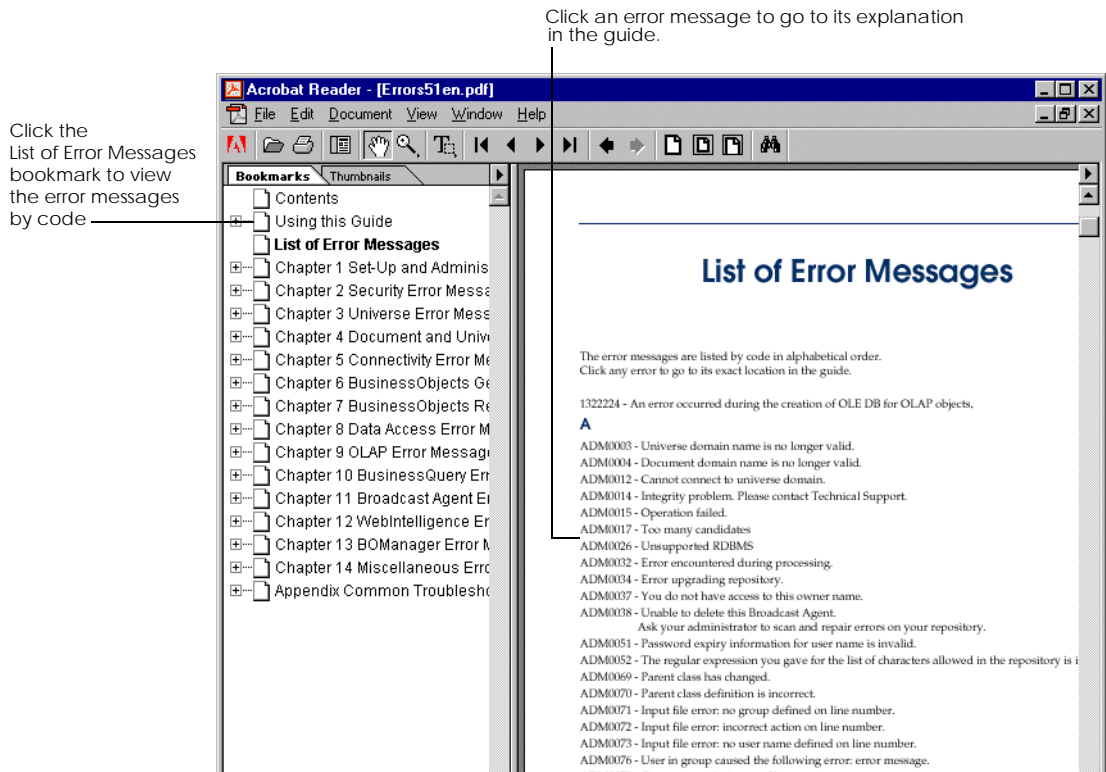
You can open a document from the Help menu provided that you have installed the Adobe Acrobat Reader, version 3.0 or higher on your machine. This Reader is available on the Business Objects CD-ROM. You can also download it for free from the Web site of Adobe Corporation.

The Error Message Guide

The *Error Message Guide* is a compilation of the error messages that can appear with ordinary use of Business Objects products.

This guide provides you with detailed troubleshooting information so that you can determine the reasons for an error and take the appropriate steps to resolve it. It allows you to search for error messages by code. Each error message appears with its probable cause and the recommended course of action.

You can open this online guide from any of the Business Objects products by selecting the Error Messages Explained command from the Help menu. From IINFOVIEW, click Error Messages in the navigation bar.



The Error Message Guide in PDF format.

Online Help

For Business Objects Windows desktop products, online help is available in the form of .hlp and .cnt files that comply with the standards of Microsoft Windows online help.

From INFOVIEW, online help is available for both INFOVIEW and WEBINTELLIGENCE.

What to Do for More Information

If you cannot find the information you are looking for, then we encourage you to let us know as soon as you can. We welcome any requests, tips, suggestions, or comments you may have regarding the contents of this or other Business Objects documentation. You can contact us by e-mail at:

documentation@businessobjects.com

To find out information about Business Objects products and services, visit our Web site at:

<http://www.businessobjects.com>

About this Guide

This user's guide is about BUSINESSOBJECTS 5.1 business intelligence software. It describes the different ways to access data to use in your reports, how to create and format these reports and how to analyze the data in them.

Audience

This guide is aimed at non-technical users who intend to use BUSINESSOBJECTS to build reports using personal or corporate business data.

These users should be familiar with the Microsoft Windows desktop environment and conventions.

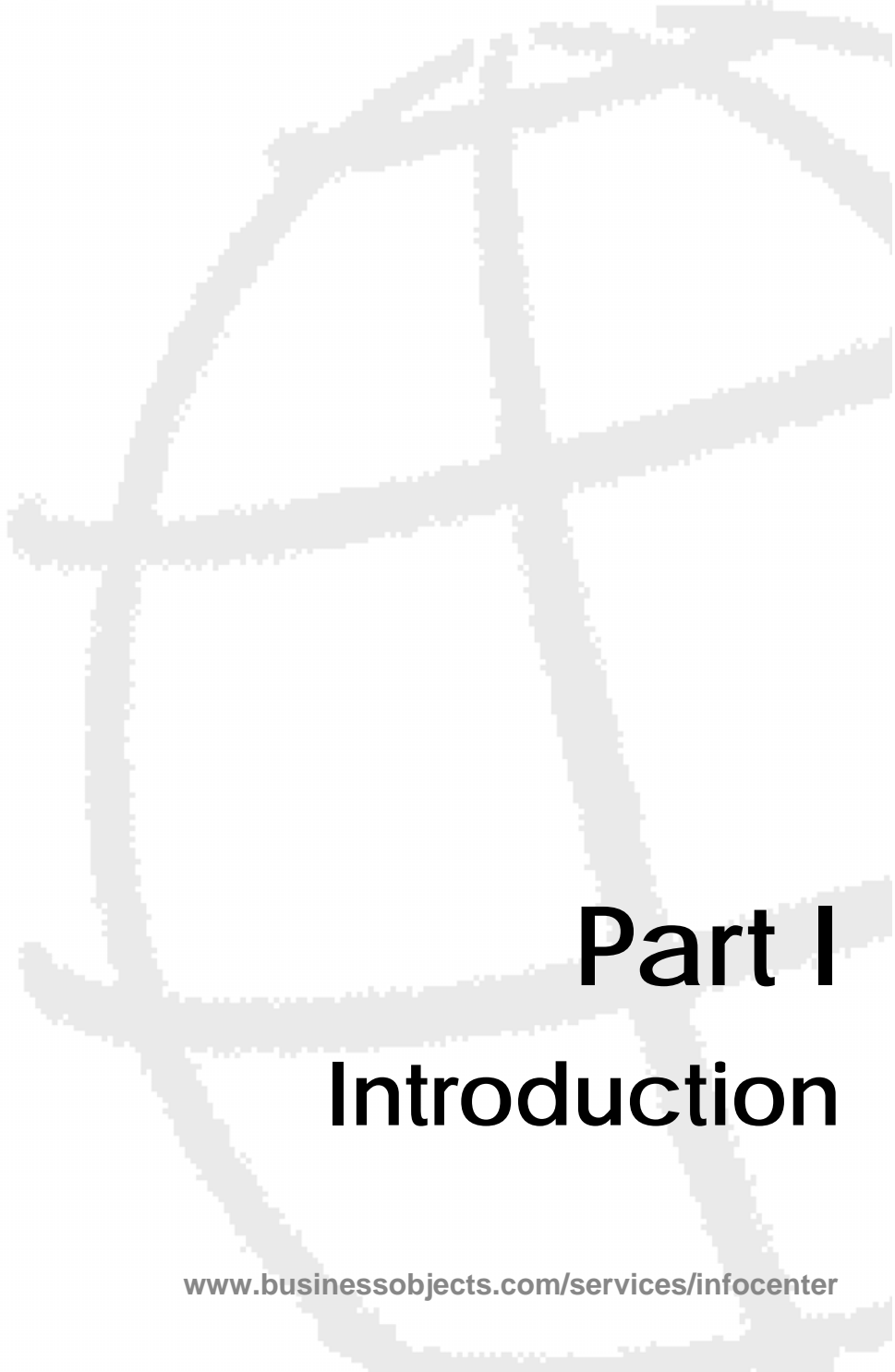
Conventions Used in this Guide

The conventions used in this guide are described in the table below.

Convention	How Used
SMALL CAPITALS	The names of all products such as BUSINESSOBJECTS, WEBINTELLIGENCE, SUPERVISOR, DESIGNER.
This font	The names of BUSINESSOBJECTS classes, objects and conditions. For example, Customer, Sales, Revenue, Service, etc.
This font	Code, SQL syntax, computer programs . For example: @Select(Country\Country Id)
(...)	Placed at the end of a line of code, the symbol (...) indicates that the next line should be entered continuously with no carriage return.



BUSINESS OBJECTS®



Part I

Introduction

www.businessobjects.com/services/infocenter

In this chapter

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 - Presenting and analyzing data 28
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What is BusinessObjects?

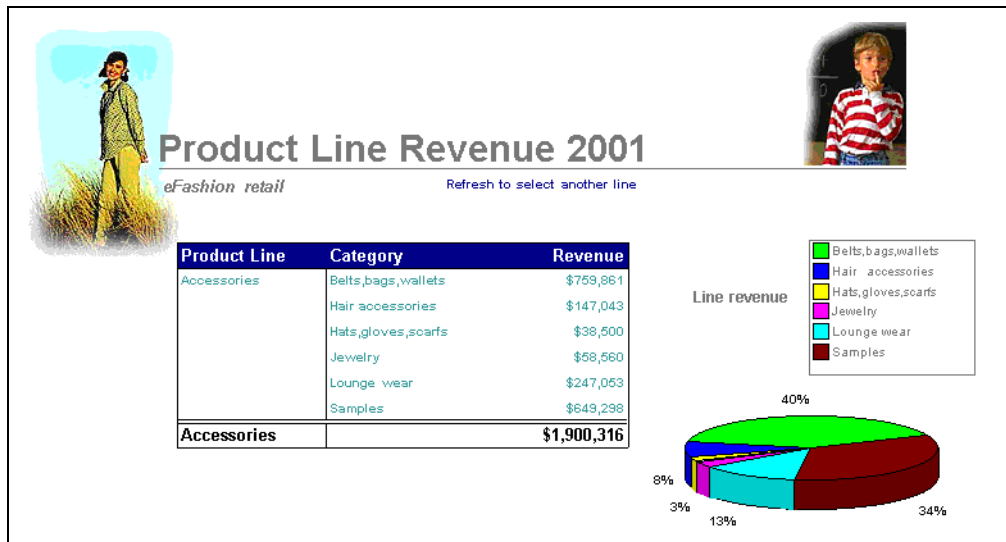
BUSINESSOBJECTS is an integrated query, reporting and analysis solution for business professionals that allows you to access the data in your corporate databases directly from your desktop and present and analyze this information in a BUSINESSOBJECTS document.

BUSINESSOBJECTS makes it easy to access this data, because you work with it in business terms that are familiar to you, not technical database terms like SQL. You don't need any knowledge of the database structure or technology.

Once you've used BUSINESSOBJECTS to access the data you need, you can present the information in reports as simple as tables or as sophisticated as dynamic documents with drillable charts.

You can then save those documents for your own personal use, send them to other users, or publish them to the corporate repository for potentially even broader circulation.

This section gives an overview of what BUSINESSOBJECTS does and how it works.



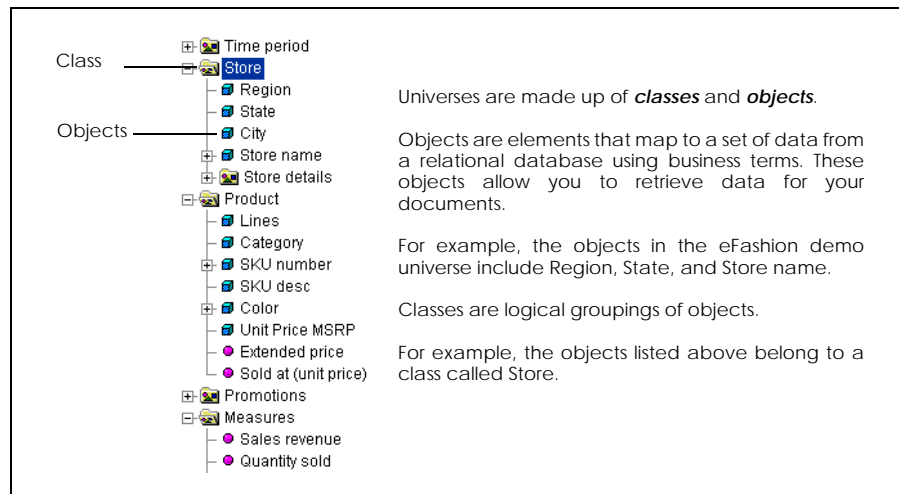
Part of a report with data displayed in a table and in a chart.

Where does the data come from?

BUSINESSOBJECTS makes it easy to access data from your corporate database because it has a business-intelligent, semantic layer that isolates you from the technical issues of the database. This semantic layer is called a *universe*. A universe maps to data in the database, using everyday terms that describe your business environment. This means you can select exactly the data that interests you using your own business terminology.

In your company or organization, universes are created by a universe designer, using BUSINESSOBJECTS DESIGNER. The designer then makes universes available to you and other users, so that you can access the data you want from the database through an intuitive, user-friendly interface

A BusinessObjects Universe.



Using this interface, you build a BUSINESSOBJECTS *query* using an editor called the *Query Panel*, by adding and organizing *objects* from a universe. Objects are elements that map to a set of data from a relational database in terms that pertain to your business situation. When you run the query, BUSINESSOBJECTS connects to the database and retrieves the data mapped to the objects you selected.

A query is a type of *data provider*. The data provider contains the data you have chosen to retrieve from the data source. Using this data set, you can build interactive reports.


BUSINESSOBJECTS lets you access data from a wide range of sources: from relational and multidimensional databases, from packaged applications, from personal data files, and, using Microsoft Visual Basic for Applications procedures, from virtually any source.

Presenting and analyzing data

Once you have the data you need, you can present it in a number of ways. You can present it in a simple table:

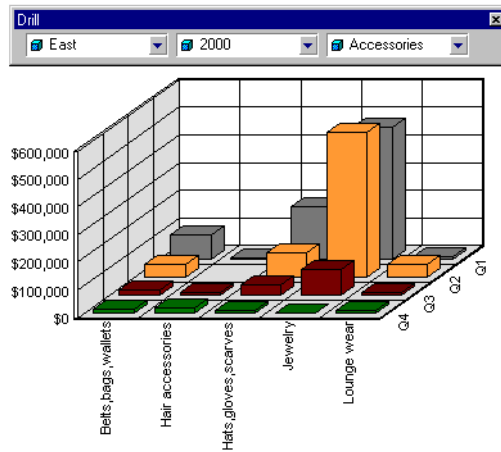
City	Quantity sold	Sales revenue
New York	19,109	\$3,151,022
Houston	13,342	\$2,246,198
Los Angeles	9,869	\$1,656,676
San Francisco	7,900	\$1,336,003
Austin	6,919	\$1,135,479
Chicago	6,519	\$1,134,085
Washington	6,491	\$1,053,581
Boston	5,269	\$887,169
Colorado Springs	5,116	\$843,584
Miami	4,830	\$811,924
Dallas	4,932	\$803,421
	Sum:	\$15,059,143

Or create sophisticated reports containing large amounts of data, organized and formatted to make it easy for people to go directly to the information that interests them:

 Product Sales by City		
for year 2001		
Austin	sales revenue	\$1,135,479.10
	margin	\$424,790.00
Boston	sales revenue	\$887,169.20
	margin	\$336,574.10
Chicago	sales revenue	\$1,134,085.40
	margin	\$439,865.00
Colorado Springs	sales revenue	\$843,584.20
	margin	\$309,966.00
Dallas	sales revenue	\$803,420.80

You can add images and embedded objects and format your documents to high presentation standards for viewing on screen or for printing.

On-report analysis allows you to switch your business perspective by dragging and dropping data, insert on-report calculations or drill into a report for detailed information:



Sharing the information

You can quickly and easily share the documents you have created with other users in your company, either by sending them directly to selected individuals or groups, or by publishing them as corporate documents. When you distribute documents in these different ways, you use the BUSINESSOBJECTS *repository*. The repository stores the documents you send so that other users can retrieve and view them. It also stores information about the documents it stores, such as name of sender, date and time, and also which users in the company have the right to retrieve and view a document.

You can retrieve documents that other users have sent, including WEBINTELLIGENCE and BUSINESSQUERY documents which you can open and view in BUSINESSOBJECTS. You can also use BROADCAST AGENT to send documents for scheduled processing.

Note: For information on sending, retrieving, printing, and publishing and scheduling documents, see the *InfoView User's Guide*. You can open an electronic version of this guide directly from the BUSINESSOBJECTS Help menu.

What about security?

The repository is set up and administered by the BUSINESSOBJECTS *supervisor*. All of the rights you have as a user are granted by your BUSINESSOBJECTS supervisor using BUSINESSOBJECTS SUPERVISOR. The supervisor defines:

- The parts of the BUSINESSOBJECTS interface you can access. Your supervisor can restrict the availability of BUSINESSOBJECTS functionality, such as access to certain menu commands.
- Your database connections
- The universes you can access for creating and editing queries

The rights accorded to each user define the user's *profile*. This profile-based security system allows a single document to be distributed to many users -- with end users having access only to the information that they are authorized to see.

Keeping a document's data up-to-date

Databases are regularly updated with new data. A document generated at a given point in time reflects the data as it existed at that time, but it may be inaccurate now. BUSINESSOBJECTS lets you update the data in a document while keeping the same presentation and formatting, either manually, or automatically at specified times. When you update a document, BUSINESSOBJECTS reconnects to the database, and retrieves the updated data. This is called *refreshing* a document.

eFashion Demo Materials and Samples

To help you get up and running with BUSINESSOBJECTS, a demonstration database, universe and sample reports are included in the BUSINESSOBJECTS eFashion demo kit. The *Getting Started with BusinessObjects* tutorial and the multimedia Quick Tour are both based on these materials, as are many of the examples in this user's guide.

The eFashion demo database contains retail data from a clothing chain. It tracks 211 products (663 product color variations), sold over 13 stores in the US, over three years.

Upgrading from earlier versions of BusinessObjects

This section concerns those users who are upgrading from an earlier version of BUSINESSOBJECTS to BUSINESSOBJECTS 5.1.

Upgrading from BusinessObjects 5.0

Documents created in BUSINESSOBJECTS 5.0 are fully compatible with BUSINESSOBJECTS 5.1.

Upgrading from BusinessObjects 4.1

You can open documents created using BUSINESSOBJECTS 4.1 in BUSINESSOBJECTS 5.1. However, 4.1 users cannot read documents created using BUSINESSOBJECTS 5.1. You will also not be able to apply templates created using version 4.1 to reports created using version 5.x and vice versa.

Documents created in BUSINESSOBJECTS 4.1 are fully compatible with BUSINESSOBJECTS 5.1. However, BUSINESSOBJECTS 5.1 uses standard Microsoft fonts whereas BUSINESSOBJECTS 4.1 used fonts which are slightly different from standard Microsoft fonts. If you want documents created in BUSINESSOBJECTS 4.1 to retain the same look when you open them in BUSINESSOBJECTS 5.1, see “Viewing a document created in BusinessObjects 4.1” on page 192 for the options you need to set to do this.

Upgrading from BusinessObjects 3.1

You cannot open documents created in BUSINESSOBJECTS 3.1 in BUSINESSOBJECTS 5.1. If you want to open documents created in BUSINESSOBJECTS 3.1, you need to open and save them in BUSINESSOBJECTS 4.1 and then open them in BUSINESSOBJECTS 5.1.

What’s new in BusinessObjects 5.1?

Although not a major release over BUSINESSOBJECTS 5.0, BUSINESSOBJECTS 5.1 has some important new features.

Save as PDF

BUSINESSOBJECTS 5.1 allows you to save BUSINESSOBJECTS documents in Adobe Portable Document Format (PDF). All users need to view BUSINESSOBJECTS documents saved as PDF documents is the free Adobe Acrobat Reader. An

industry standard for viewing and printing, PDF documents allow users to view and navigate through the different reports in a BUSINESSOBJECTS document and obtain high quality printed copies.

Add hyperlinks to reports

New to 5.1, you can add hyperlinks such as mail addresses and web site addresses to your reports. BUSINESSOBJECTS now automatically recognizes keywords for several different protocols including http to connect to web sites, electronic mail addresses, FTP and more. These hyperlinks are maintained when you save the report in HTML or PDF format.

Zero Administration BusinessObjects

An important new extension to BUSINESSOBJECTS functionality, you can deploy BUSINESSOBJECTS 5.1 using either the traditional client/server deployment or using a new three-tier web deployment. This new web deployment is called a zero-administration deployment of BUSINESSOBJECTS.

In a zero-administration deployment of BUSINESSOBJECTS, only the BUSINESSOBJECTS client software is installed on the Windows PC; all middleware is stored and administered on the WEBINTELLIGENCE web server and the server-side processing is handled by the WEBINTELLIGENCE system. This means zero-administration on the client computer yet still gives the client all the powerful query, reporting and analysis features of BUSINESSOBJECTS.

A zero-administration deployment of BUSINESSOBJECTS allows you to:

- Install and automatically update the BUSINESSOBJECTS 5.1 client software from INFOVIEW via an Internet browser.
- Connect to the BUSINESSOBJECTS repository using a web connection and use middleware installed on the server.
- When connected to BUSINESSOBJECTS via a web connection, you can save documents either locally, or in personal storage space on the server.

BUSINESSOBJECTS 5.1 can be installed in two ways:

- from INFOVIEW via an Internet browser

If you install BUSINESSOBJECTS using the web installer you can retrieve data from queries built on BUSINESSOBJECTS universes, from personal data files stored locally on your PC, and, optionally, using VBA procedures.

- from the product CD

If you install BUSINESSOBJECTS from the CD, you can also install optional middleware required to retrieve data using additional data providers such as stored procedures or OLAP servers.

In a zero-administration deployment of BUSINESSOBJECTS, BUSINESSOBJECTS 5.1 can be started in two ways:

- from INFOVIEW

By setting BUSINESSOBJECTS as your document editor and viewer in the INFOVIEW options page, you can open BUSINESSOBJECTS directly from INFOVIEW either by clicking on a BUSINESSOBJECTS document in one of the document lists or by clicking the Create Document button on the navigation bar.

- from the Windows start menu

You have two ways of connecting to the BUSINESSOBJECTS repository. You can open BUSINESSOBJECTS from the Windows Start menu and connect to a repository via a web connection and use middleware installed on the web server. If you have installed BUSINESSOBJECTS and the appropriate middleware from the CD, you can also connect to a BUSINESSOBJECTS repository via a traditional client/server connection and retrieve data using stored procedures or OLAP servers (if this access has been set up in the company), connection types not available using a web connection.



Part II

Accessing Data

www.businessobjects.com/services/infocenter

Chapter 2

Introduction to Accessing Data with BusinessObjects

In this chapter

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Overview

This chapter is about accessing data, i.e., how to get data from your database to the reports that you create with BUSINESSOBJECTS. It introduces the different data sources that are available, and how, using BUSINESSOBJECTS, you can access these to get the information you need, when you need it.

What data sources are available?

BUSINESSOBJECTS let you access data from a wide range of sources. You can access data from

- Relational databases (RDBMS), such as ORACLE, Microsoft SQL Server, Informix and IBM DB2.
- Multidimensional (OLAP) databases, such as Microsoft OLAP Services, Hyperion Essbase, and ORACLE Express.
- Text files and spreadsheets
- Packaged applications such as SAP
- Virtually any data source using Microsoft Visual Basic for Applications (VBA) procedures.

How do you access data sources?

BUSINESSOBJECTS lets you access your data through a graphical user interface. You need no technical knowledge of the underlying data structures to get the information you want. What you do need, however, is knowledge of your business.

To access a data source with BUSINESSOBJECTS, you build a *data provider*. The types of data providers supported in BUSINESSOBJECTS depends on whether you install BUSINESSOBJECTS from the installation CD or install BUSINESSOBJECTS via an Internet browser.

The types of data provider that BUSINESSOBJECTS supports are described in the table below:

Data providers	Description	CD install	Install via Internet browser
Queries on universes	A universe consists of classes and objects that represent the parts of a database that contain the data you need, in everyday language that is meaningful to you. In a query on a universe, you select the objects, such as Customer Name, Year, or Region. This is by far the most common type of data provider in BUSINESSOBJECTS.	Yes	Yes
Stored procedures	You can only use stored procedures if your supervisor or IS department has provided them, and if the RDBMS at your site supports them. A stored procedure is a SQL (Structured Query Language) script, saved and executable on your database.	Yes	No
Free-hand SQL	You can use free-hand SQL if you are familiar with SQL, which is the language used to interact with relational databases. In free-hand SQL, you open or write a SQL script, which you then run against the database.	Yes	No
Personal data files	You can retrieve data from Excel, dBASE and text files.	Yes	Yes

Data providers	Description	CD install	Install via Internet browser
VBA procedures	Procedures written in Microsoft Visual Basic for Applications (VBA) enable you to retrieve data from almost any data source.	Yes	Yes
OLAP servers	<p>You can view the contents of an Online Analytical Processing (OLAP) server, and select the data you want to display in your report.</p> <p>OLAP servers are multidimensional databases that store summarized data, ready for business analysis. To use OLAP servers in BUSINESSOBJECTS, you must install the BUSINESSOBJECTS OLAP ACCESS PACK for the multidimensional database at your site.</p> <p>BUSINESSOBJECTS supports the following OLAP servers:</p> <ul style="list-style-type: none"> • Microsoft OLAP Services • Hyperion Essbase • IBM DB2 OLAP Server • Informix MetaCube • Oracle Express 	Yes	No
SAP	BUSINESSOBJECTS interfaces with SAP applications, enabling you to use data from SAP BW and SAP BAPI.	Yes	No

Note: OLAP and SAP data providers are documented in dedicated guides that you receive when you purchase your OLAP or SAP Access Pack. The other types of data providers are documented in this guide.

Can all BusinessObjects users build data providers?

You can build data providers only if you have purchased the REPORTER module of BUSINESSOBJECTS.

What's more, the BUSINESSOBJECTS supervisor can restrict access to certain types of data providers, or even certain objects within a universe, for example. So, you may be able to build just queries on universes but no other type of data provider, and then be able to use only certain objects.

The way the supervisor sets up access to data providers and other BUSINESSOBJECTS features depends entirely upon the query and reporting needs of your organization.

Note: By default, all BUSINESSOBJECTS users can refresh data providers, to get the latest information from their database.

Who sets up database connections?

In order to access and retrieve data from a database, you need a database connection. For example, if your company or organization stores its corporate data in an Informix database, someone somewhere has to make BUSINESSOBJECTS “talk” to this data source.

In 99% of cases, you, the BUSINESSOBJECTS end user, do not have to concern yourself with setting up database connections. Thus, BUSINESSOBJECTS lets business users get the information they need, when they need it, without any technical knowledge of what's going on behind the scenes.

This does not mean that power BUSINESSOBJECTS users cannot define their own database connections. For example, in free-hand SQL, you can define a connection, write a SQL script, then run the script against the connection you created.

If you want to find out more about who sets up database connections for the different types of data providers that you can use, consult the following table.

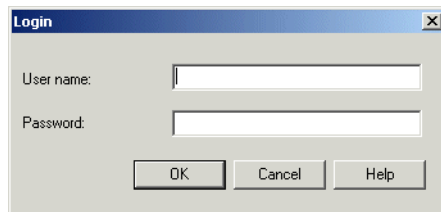
Data providers	Who sets up the database connection?
Queries on universes	The universe designer sets up the connection in the universe, so the connection is completely hidden from you when you build or edit queries. Note: The supervisor may modify the existing connection or assign a new connection to the universe.
Stored procedures	The supervisor creates the connection to access the stored procedure.
Free-hand SQL	In free-hand SQL, you can create your own connection to the database. Once you have created the connection, you can make it available to other users.
Personal data files	When you access data in a personal data file, you select the file and in doing so, you “connect” to it. This is not a technical task, it’s just a question of selecting the right file.
VBA procedures	A VBA procedure runs a VBA macro which retrieves data for your BUSINESSOBJECTS report. The person who creates the macro defines the connection to the data source in the macro code.
OLAP servers & SAP	The database administrator at your site sets up the servers so that you can access them from BUSINESSOBJECTS.

Restrictive connections

If you are working with a universe that is set up with a restrictive connection, you need to supply the database username and password to run a query. This username/password is not the one that you use to log onto BUSINESSOBJECTS; it is the username/password of the underlying database (e.g. an Oracle or SQL Server database) that the universe accesses. This database normally remains hidden to you, but the universe designer can set up a restrictive connection to add an extra layer of security. Depending on the type of restrictive connection, you need to supply the database username and password in some or all of the following situations:

- When you first run a query (for more information on running a query, see “Building a query in the Query Panel and running the query” on page 65).
- When you refresh a query (for more information on refreshing a query, see “Refreshing BusinessObjects Documents” on page 209).
- When you parse a query to test its validity (for more information on parsing a query, see “Using SQL From BusinessObjects Queries” on page 116).

You see the following dialog box, in which you enter your username/password:

A screenshot of a 'Login' dialog box. The dialog has a title bar with the word 'Login' and a close button (X). Inside the dialog, there are two text input fields. The first is labeled 'User name:' and the second is labeled 'Password:'. Below the input fields are three buttons: 'OK', 'Cancel', and 'Help'.

If you do not know your database username and password, see your BUSINESSOBJECTS administrator.

Can you combine data from different sources in one report?

Absolutely. With BUSINESSOBJECTS, you can build powerful reports with data from corporate databases which you can access using queries on universes, free-hand SQL, etc., and data from your own spreadsheets, text files etc.

For more information, refer to Chapter 6 "Combining Data From Different Sources" on page 149.

Workflows For Accessing Data

There are two basic workflows for building data providers to access your data in BUSINESSOBJECTS. You can build a data provider

- When you create a new document
 - *and* -
- When you are working in an existing document.

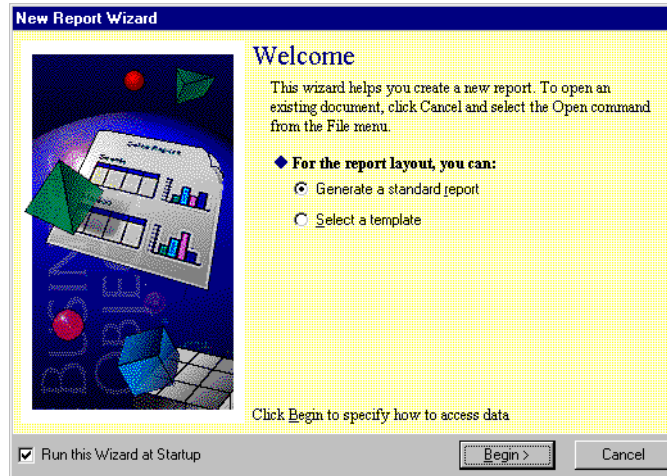
Also in an existing document, you can obtain a different set of results by editing a data provider.

The following sections explain these different workflows.

Building a data provider when you create a new document

Building a data provider when you create a new document is a typical way of using BUSINESSOBJECTS. You create the document in order to see your business data - and to do that, you have to build a data provider to access data from a data source.

To help you build a data provider when you create a new document, BUSINESSOBJECTS launches the New Report Wizard when you start the application for the first time:

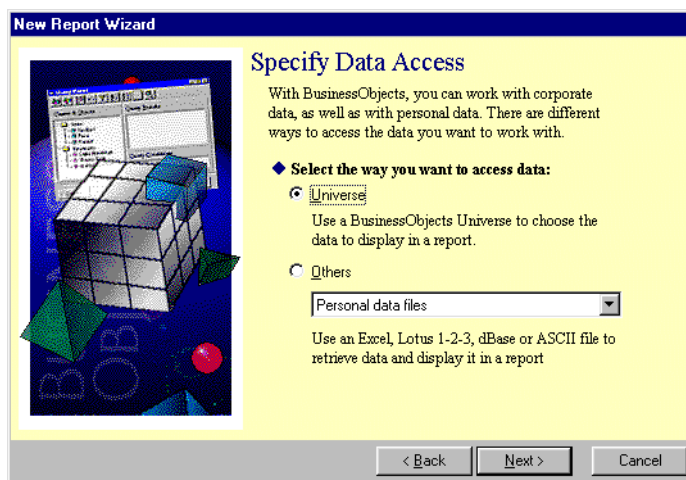


New Report Wizard

Tip: To run this wizard once you have launched BUSINESSOBJECTS, click the New Report Wizard button on the Standard toolbar.

To build a new data provider using the wizard:

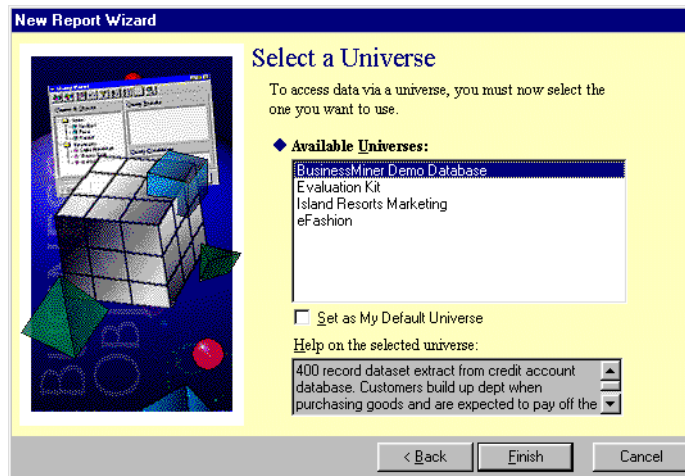
1. Select an option for the report layout, then click Begin.
The Specify Data Access dialog box appears:



2. The next step depends on what you want to do:

If you want to...	Then...
Build a query on a universe	<ol style="list-style-type: none"> 1. Click Universe, then click Next. 2. Go to the next step.
Use a stored procedure, free-hand SQL, a personal data file or a VBA procedure	<ol style="list-style-type: none"> 1. Click Others, then select an option from the list box. 2. Click Finish. The dialog box that appears will allow you to build your data provider and retrieve the data for your report.

If you chose to build a query on a universe in the previous step, the Select a Universe dialog box now appears:



3. Select the universe that you want to use, then click Finish. The Query Panel appears. In the Query Panel, you can view all the classes and objects in the universe you selected, and use these to build your query. For more information, refer to “The Query Panel” on page 61.

Reminder: OLAP and SAP data providers are documented in dedicated guides that you receive when you purchase your OLAP or SAP Access Pack.

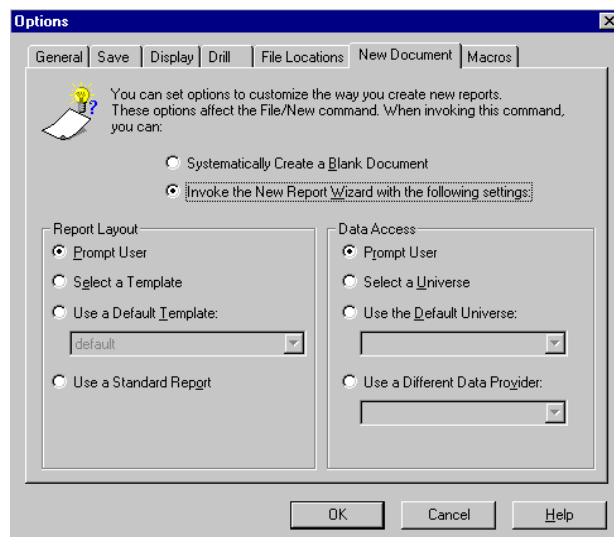
Setting a default type of data provider for new documents

Do you always use the same type of data provider when you create new documents? If so, you can set an option so that the type of data provider you always use will be preselected in the New Report Wizard. In other words, you will not have to select the type of data provider you want every time you create a document.

Tip: If you always use queries on universes, you can also select the default universe to use.

To set a default type of data provider:

1. Select the Options command on the Tools menu.
In the Options dialog box that appears, click the New Document tab.
2. Click *Invoke the New Report Wizard with the following settings:*



3. In the Data Access group box, select the type of data provider you want to use.
 - The *Use a Default Universe* option lets you select the universe you want.
 - *Use a Different Data Provider* lets you select a data provider type from the drop-down list.
4. Click OK to close the dialog box.

Building a query in an existing document

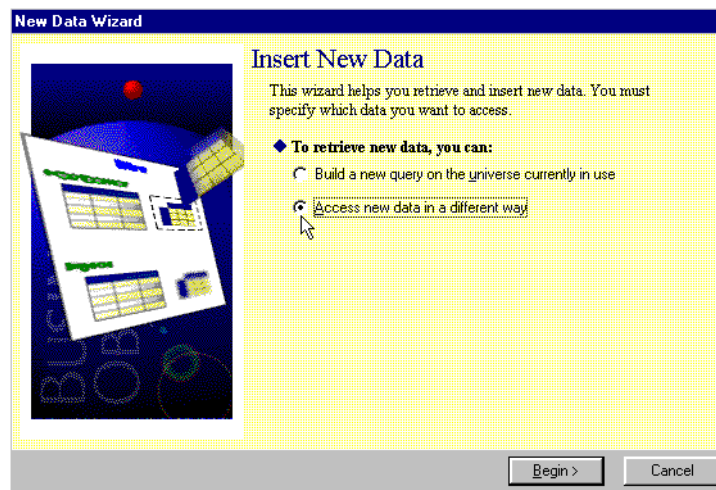
You don't have to create a new document every time you want to see new data in BUSINESSOBJECTS. You can build data providers inside existing documents. This feature enables you not only to see more data that comes from the same source as the document's initial query, but also to combine data from different sources in the same report. Here's an example.

Example How do the official figures compare with my personal targets?

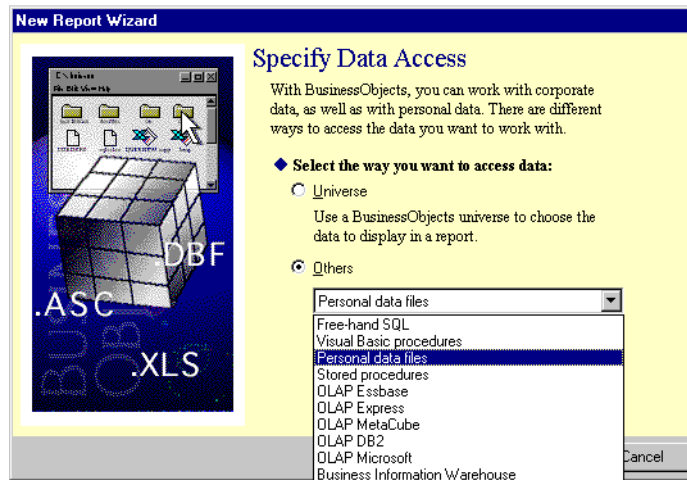
Your company's sales information is stored in your corporate database, which you access by running a query on a universe in BUSINESSOBJECTS. You already have a BUSINESSOBJECTS document containing this information.

You keep your quarterly targets in a Microsoft Excel spreadsheet, and want to compare the corporate figures with your personal data. To do this, you:

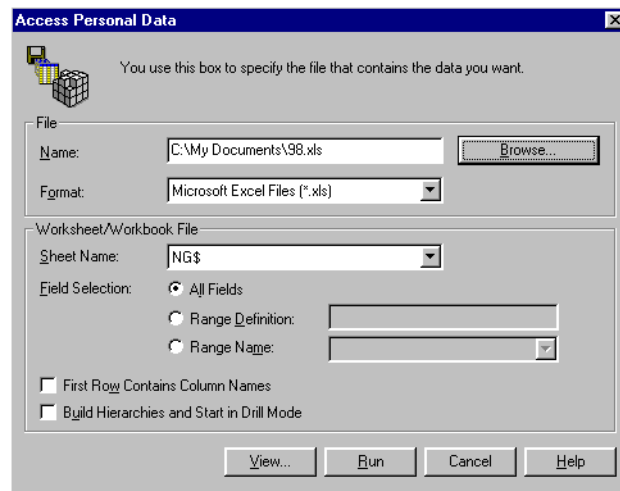
1. Open the document containing the corporate data.
2. Select the New Data Provider command on the Data menu.
3. In the Wizard that appears, click *Access new data in a different way*:



- In the next screen, click *Personal data files*:



- Click Finish, and in the dialog box that appears, browse to the Excel file that contains your personal data:



- Click Run.
BUSINESSOBJECTS makes the data from the spreadsheet available in your report. For information on how to insert it in the report, refer to “Creating Tables” on page 226.

To build a data provider inside an existing document

1. Select the New Data Provider command on the Data menu.
2. Follow the wizard to select the type of data provider you want.
3. Build then run the data provider.
 - BUSINESSOBJECTS retrieves the data, thereby making it available in the document.
 - For information on inserting the new data, refer to “Creating Tables” on page 226.

Tip: If you want to see the new data as soon as BUSINESSOBJECTS has retrieved it, you should use the Table, Crosstab or Chart commands on the Insert menu. You then just have to follow the wizard to access the data you want.

For more information, refer to “Guided Table Insertion” on page 234.

Editing data providers

Editing a data provider means changing its definition in order to bring new or different data to the document you are working on. It's often quicker and easier to edit a data provider than to build a new one.

Example I need more data

You're working in a document with sales figures by year, but you need some regional information to complete the picture. Rather than building a new query, and then having to manage multiple data providers in the same document, you can simply add result objects to the existing query. Here's how to do it:

1. Select the Edit Data Provider command on the Data menu.
 2. In the Query Panel, add the objects you want (e.g., Region, City) to the Result Objects box. You can do this by double-clicking each object's icon in the Classes and Objects list.
 3. Click Run.
BUSINESSOBJECTS returns the new data to the report, and, provided that your data is displayed in a table, the new columns automatically appear.
-

Other ideas for editing a data provider include:

- You want to restrict the volume of data returned by setting conditions or maximum number of rows.
- You want the data to be sorted in a given order at the query level.

To edit a data provider

1. Select the Edit Data Provider command on the Data menu.
2. The next step depends on whether or not the document contains more than one data provider:

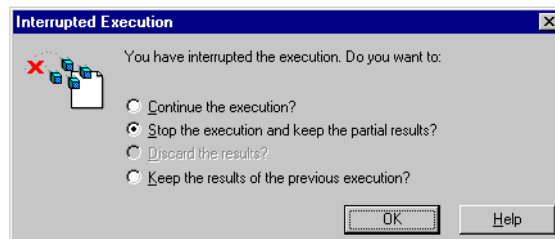
If the document contains...	Then...
One data provider	The editor (Query Panel, Access Personal Data dialog box, etc.) for the data provider appears.
More than one data provider	The List of Data Providers dialog box appears. Select the data provider you want to edit, then click OK.

3. Edit then run the data provider.
BUSINESSOBJECTS returns the new data set to your report.


Cancelling data providers

Cancelling a data provider means interrupting the data provider while it is fetching data to create or refresh a report. You may want to do this because you want to change the data provider or because you have a query that is taking too long.

1. To cancel a data provider, press the Esc key.
The Interrupted Execution dialog box appears on your screen.



2. Select which results you want to view in the report.

If	Then
you want to view the results that will be created by the data provider you were running,	select <i>Continue the execution.</i>
you want to view the partial results created by the data provider when you interrupted the execution,	select <i>Stop the execution and keep the partial results.</i> When you have partial results in a report, the following notification appears in the status bar: <div style="text-align: center;">  Partial Results </div>
you want to discard the results created by the data provider when you interrupted the execution,	select <i>Discard the results.</i>
you want to view the results of the previous execution,	select <i>Keep the results of the previous execution.</i>

3. Click OK.

Chapter 3

Building Queries on Universes

In this chapter

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 - What exactly is a universe? 56
 - Who is responsible for creating universes? 56
 - So what are queries on universes? 56
 - Demonstration materials 57

- **Building a Basic Query on a Universe 60**
 - Displaying the Query Panel 60
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 - Saving the definition of a query 66

- **Building a More Powerful Query 67**
 - Defining scope of analysis 67
 - Applying conditions 70
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 - Setting options and running a query 74

- **Running a Query on a Different Universe 76**

Overview

This chapter is about accessing data by using BUSINESSOBJECTS native technology: building queries on universes.

What exactly is a universe?

BUSINESSOBJECTS universes make it easy to access data, because they contain objects of data in business terms that are familiar to you. What's more, you need no knowledge of the database structure, or of database technology, to be able to create powerful reports with data that is relevant to your work.

Universes provide the business-intelligent, semantic layer that isolates you from the technical issues of the database. A universe maps to data in the database, in everyday terms that describe your business situation.

Universes are made up of *classes* and *objects*. For example, the objects in a human resources universe would be Names, Addresses, Salaries, etc. Classes are logical groupings of objects. Each class has a meaningful name, such as Vacation (for objects pertaining to employees' vacations). Each object maps to data in the database, and enables you to retrieve data for your reports.

Who is responsible for creating universes?

In your company or organization, universes are created by a universe designer, who works with a BUSINESSOBJECTS application called DESIGNER. The designer then makes universes available to you and other users at your site, so that you can access the data you want from the database.

A demo universe that maps to a demo database, as well as some sample reports, are delivered with BUSINESSOBJECTS. A full description of these is provided in "Demonstration materials" below.

So what are queries on universes?

Queries enable you to retrieve data from a database, via a universe. You build a query to bring data to a report, either when you create the report or when you want to view new data.

When you build a query, you select objects from a universe, then run the query. BUSINESSOBJECTS connects to the database, and retrieves the data mapped by the objects you selected.

Demonstration materials

Two demonstration databases, Island Resorts Marketing and eFashion, and their accompanying universes and reports are included in the BUSINESSOBJECTS package. They are installed with BUSINESSOBJECTS, and used in the examples in this guide. Microsoft Access was used to create the databases.

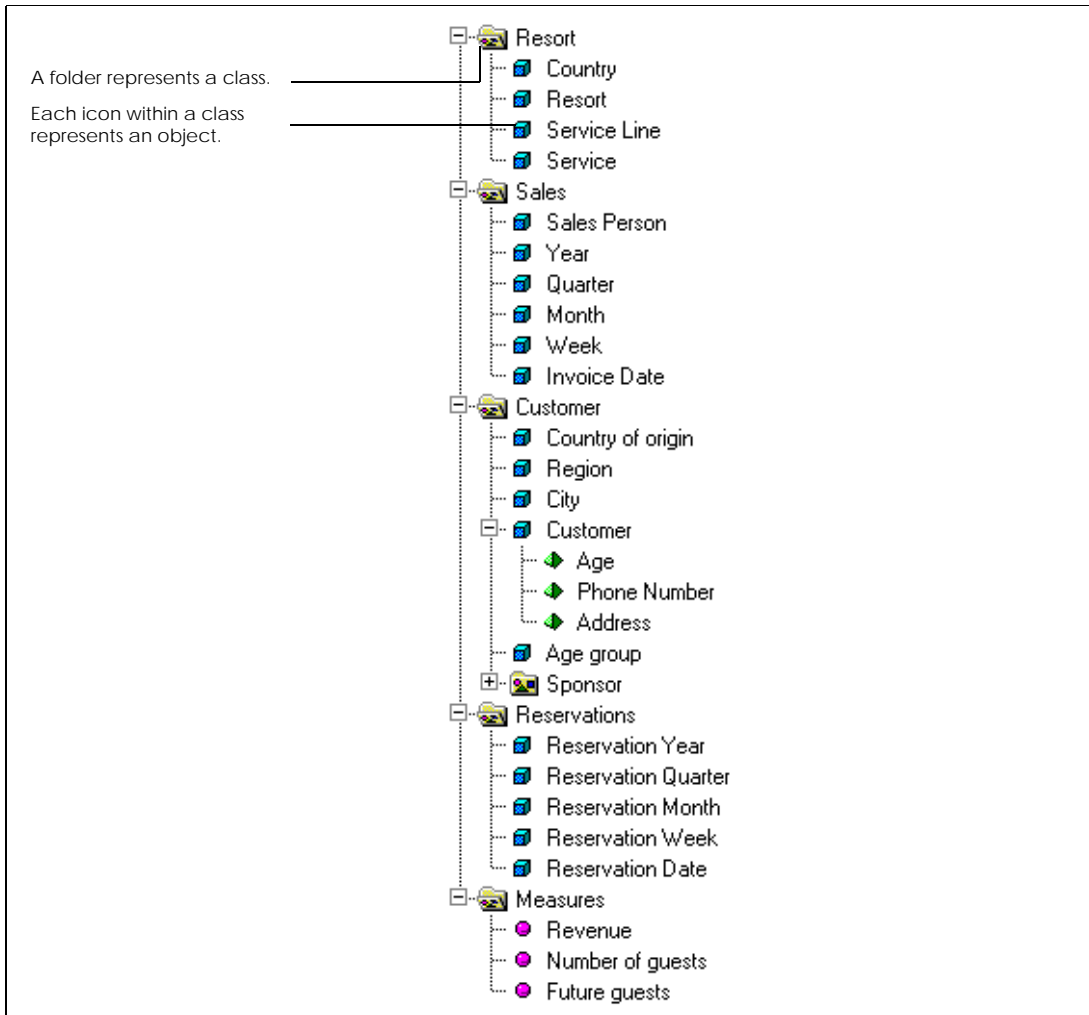
Island Resorts Marketing

The universe, which accesses the data in the database, is called Island Resorts Marketing. It is designed for an imaginary tour operator that runs beach clubs in different resorts around the world. You use it to retrieve data on sales and reservations for resorts and customers, over time. The illustration on page 58 shows the universe's classes and objects as they appear in BUSINESSOBJECTS.

Because universes provide a business-intelligent semantic layer between you and the database, the names of the classes and objects in the demonstration universe are self-explanatory. For example, the Resort class contains objects that map to data on resorts:

- The Resort object retrieves the names of the company's resorts.
- The Service object retrieves data for the types of services in each resort: accommodation, food and drinks, and recreation.
- The Service Line object retrieves data for the types of service in each resort, e.g., family suite (for accommodation), restaurant (for food and drinks), etc.

For more information on classes and the different types of objects you find in BUSINESSOBJECTS, refer to "Classes and sub-classes" and "Dimension objects, measure objects and detail objects" on page 59.



The demonstration universe, Island Resorts Marketing

Classes and sub-classes

The demonstration universe contains five classes: Resort, Customer, Sales, Reservations and Measures. The purpose of classes is to provide logical groupings of objects. For example, the Customer class contains objects that you map to data on customers in the database.

The `Customer` class contains a sub-class, which is entitled `Sponsor`. A sub-class is to a class what a sub-folder is to a folder.

Dimension objects, measure objects and detail objects

When creating universes, universe designers define and qualify objects. The qualification of an object reveals how it can be used in analysis in reports.

An object can be qualified as a dimension, a detail, or a measure. Each type of object serves a different purpose:



Dimension object



Detail object



Measure object

- Dimension objects retrieve the data that will provide the basis for analysis in a report. Dimension objects typically retrieve character-type data (customer names, resort names, etc.), or dates (years, quarters, reservation dates, etc.)
- A detail object is always associated to one dimension object, on which it provides additional information. For example, `Address` is a detail object that is associated to `Customer`. `Address` provides additional information on customers, i.e., their addresses.
- Measure objects retrieve numeric data that is the result of calculations on data in the database. In the demo universe, `Revenue` is the calculation of number of items sold multiplied by item price. Measure objects are usually located in the `Measures` class.

Measure objects are semantically dynamic: the values they return depend on the objects they are used with. For example, if you include `Resort` and `Revenue` in a query, revenue per resort is calculated. If you include `Customer` and `Revenue`, revenue per customer is calculated, and so on.

eFashion

The eFashion demo database contains retail data from a clothing chain. It tracks 211 products (663 product color variations), sold over 13 stores in the US, over three years. It contains approximately 90,000 rows of data.

Building a Basic Query on a Universe

You can bring data to a report by building a query on a universe. You complete this task in the Query Panel, a graphical interface that enables you to build a query by dragging and dropping objects from the universe. The Query Panel is illustrated on page 61.

There are three steps in building a basic query on a universe.

Step	Description
Step 1	Display the Query Panel
Step 2	Build the query in the Query Panel and run the query
Step 3	Save the query definition

Displaying the Query Panel

How you display the Query Panel depends on whether you're creating a new document or building a new query inside an existing document. You can use the following commands and toolbar buttons:

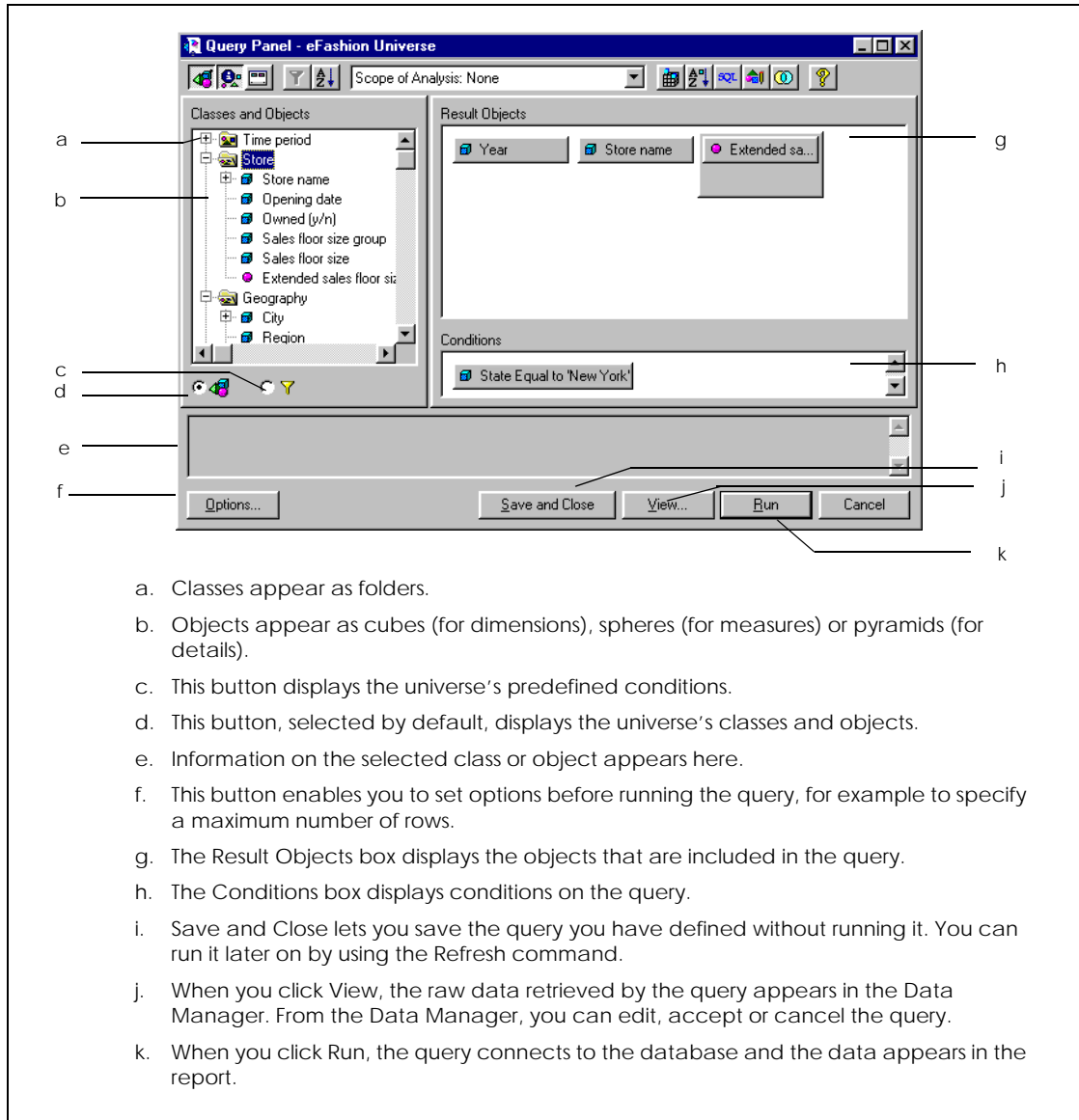


New Report Wizard

If you want	Then
to create a new document,	click the New Report Wizard button (Standard toolbar).
to edit a query or other type of data provider in the current document,	from the Data menu, select Edit Data Provider.
to create a new query or other type of data provider in the current document,	from the Data menu, select New Data Provider.

If you need more information, refer to “Workflows For Accessing Data” on page 44.

The Query Panel, illustrated on page 61, displays the contents of your BUSINESSOBJECTS universe, and lets you select the data you want with simple mouse clicks.



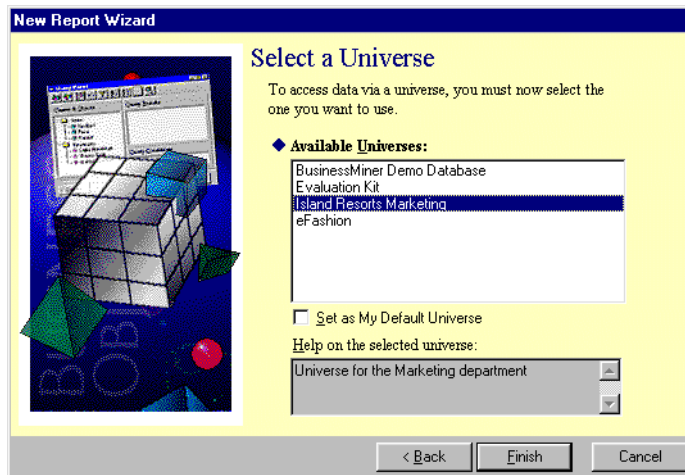
- a. Classes appear as folders.
- b. Objects appear as cubes (for dimensions), spheres (for measures) or pyramids (for details).
- c. This button displays the universe's predefined conditions.
- d. This button, selected by default, displays the universe's classes and objects.
- e. Information on the selected class or object appears here.
- f. This button enables you to set options before running the query, for example to specify a maximum number of rows.
- g. The Result Objects box displays the objects that are included in the query.
- h. The Conditions box displays conditions on the query.
- i. Save and Close lets you save the query you have defined without running it. You can run it later on by using the Refresh command.
- j. When you click View, the raw data retrieved by the query appears in the Data Manager. From the Data Manager, you can edit, accept or cancel the query.
- k. When you click Run, the query connects to the database and the data appears in the report.

The Query Panel

Displaying the Query Panel

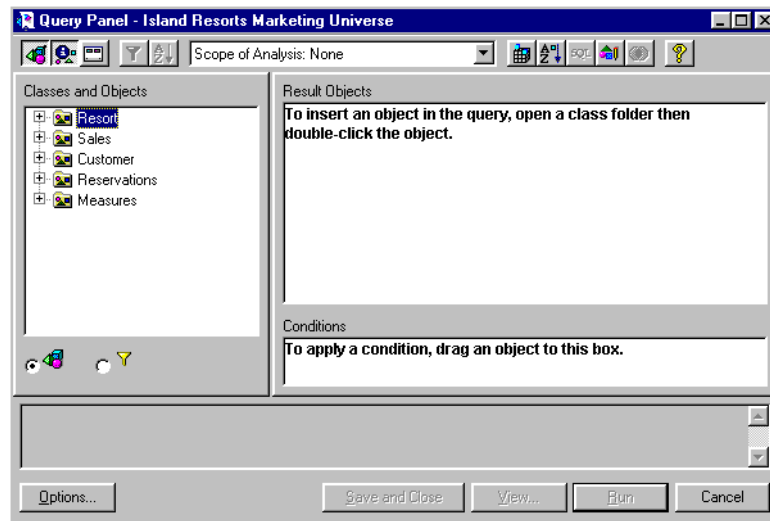
You've launched BUSINESSOBJECTS for the first time and the New Report Wizard appears. You use the wizard to display the Query Panel for the Island Resorts Marketing universe. Here are the steps you take:

1. In the New Report Wizard, click **Begin**.
The Specify Data Access dialog box appears, with the *Universe* option already selected.
2. Click **Next**.
The Select a Universe dialog box appears.
3. Click **Island Resorts Marketing**:



4. Click Finish.

The Query Panel appears with the classes of the Island Resorts Marketing universe displayed:



Building a query in the Query Panel and running the query

Building and running a query includes the following steps:

Step	Description
Step 1	Display all the objects that you can include in a query
Step 2	Include objects in a query
Step 3	Remove objects from a query
Step 4	Change the order of objects in a query
Step 5	Run the query

Steps 2, 3, and 4 are not completely sequential. For example, you can include objects in a query, remove some of them, and then include other objects.

Displaying the objects that you can include in a query

In the Query Panel, the Classes and Objects box presents the classes, sub-classes and objects of the universe that you are using. Objects represent the data that you can retrieve via the universe. Classes are logical groupings of objects. Classes can also contain sub-classes, as folders can contain sub-folders.

When the Query Panel appears, only the universe's classes are visible. Click the + plus to the left of a class icon to view the class's objects and sub-classes.

Including objects in a query

When you include an object in the query, you instruct BUSINESSOBJECTS to retrieve the data for that object from the database. For example, to display revenue by resort in your report, you include the Revenue and Resort objects in the query.

You include an object in a query by placing it in the Result Objects box. There are three ways of doing this. You can:

- Click an icon in the Classes and Objects list, and drag it to the Result Objects box.
- Double-click an object in the Classes and Objects list.
- Click a class folder and drag it to the Result Objects box. All the objects in the class appear in the Result Objects box.

Once you have placed objects in the Result Objects box, you have built a basic query.

Removing objects from a query

If you decide you want to remove an object from the query you are building, click its icon in the Result Objects box. You can now remove the object by:

- Dragging the icon to the Classes and Objects list.
- Pressing the Delete key.
- Clicking your right-mouse button, then selecting the Delete command on the pop-up menu that appears.

Repeat to remove other objects from the query.

Changing the order of the objects in a query

The order in which the objects appear in the Result Objects box determines the order in which the data will appear in the report. To move an object, click its icon. You can now:

- Drag the icon to the left or the right, then release the mouse button.

Swap the icon with another object icon in the Result Objects box, by holding down the Shift key, dragging it until it is above the object you want to swap, then releasing your mouse button.

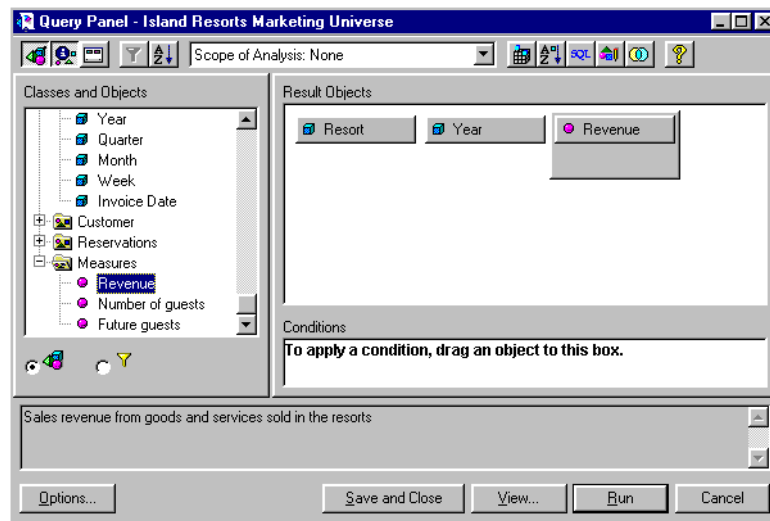
Running the query

Once you have built the query you want, you click Run to have the query retrieve the data from the database.

Example Building a query in the Query Panel and running the query

You have displayed the Query Panel for the Island Resorts Marketing universe and want to move objects from the Classes and Objects box to the Result Objects box to build your query.

1. Click the + sign next to the Resort class, the Sales class and the Measures class. Doing this reveals the objects in each class.
2. Double-click the objects you want. For example, to find out yearly revenue in each resort, double-click Resort, Year and, in the Measures class, Revenue. The Query Panel now looks like this:



3. Click Run.

BUSINESSOBJECTS retrieves the data for Resort, Year and Revenue, and displays this in a new document:

Resort	Year	Revenue
Bahamas Beach	FY93	\$287,929.00
Bahamas Beach	FY94	\$307,400.00
Bahamas Beach	FY95	\$376,115.00
French Riviera	FY93	\$295,940.00
French Riviera	FY94	\$280,310.00
French Riviera	FY95	\$259,170.00
Hawaiian Club	FY93	\$479,685.00
Hawaiian Club	FY94	\$519,530.00
Hawaiian Club	FY95	\$480,445.00

.....

Note: If the universe designer has set the up the universe with a restrictive connection, BUSINESSOBJECTS prompts you to enter your database username and password before retrieving the data. For more information on restrictive connections, see “Restrictive connections” on page 43.

Saving the definition of a query

You can build a query without having to run it right away. This feature lets you:

- Save a query so that you can continue defining it at a later stage.
 - Save a query that you have finished defining, but that you do not want to run right away, for example because you know network traffic is heavy.
1. Build a query by moving objects into the Result Objects and Conditions boxes in the Query Panel.
 2. Click Save and Close.
The result objects from the query appear as column headings. You then refresh the query in order to view the data.

Building a More Powerful Query

You build a simple query by adding objects to the Query Panel. The procedures described in the following sections enable you to build a more powerful query by controlling the data that your queries retrieve. You can:

- Define scope of analysis, which means that you retrieve data that you will later use for analysis in the report.
- Limit the query results to data that satisfies conditions.
- Sort data, for example alphabetically.
- Retrieve a specified number of rows of data.
- Eliminate duplicate rows of data from the query result.

Note: All the above tasks are easy to perform for non-technical end users. In Chapter 4 "Going Further with Queries on Universes" on page 77, you can find information on more powerful query building procedures that are designed for advanced users. For example, advanced users can create their own objects inside a universe.

Defining scope of analysis

Analysis means looking at data from different viewpoints and on different levels of detail. In reports, you can use scope of analysis to ensure that the data included in your report can be displayed at the appropriate level of detail for your analysis. Setting a scope of analysis allows you to work in drill mode, which enables you to display data in progressively greater detail.

"Scope of analysis" means a subset of data, returned by a query, that you will use for analysis in your report. The data for your scope of analysis does not appear in the report until you decide that you want to use it in analysis.

The scope of analysis you can define depends on *hierarchies* in the universe. A hierarchy, which the designer sets up when creating the universe, consists of dimension objects ranked from "less detailed" to "more detailed". The objects that belong to hierarchies are the ones you can use to define scope of analysis.



Scope of Analysis

To view the hierarchies in the universe you are working with, click the Scope of Analysis button on the Query Panel toolbar. The Scope of Analysis dialog box appears:

The screenshot shows the 'Scope of Analysis' dialog box. At the top, it says 'Select dimension objects to retrieve data for analysis.' Below this are two radio buttons: 'by Class' and 'by Hierarchy'. The 'by Hierarchy' option is selected. The main area is a tree view with the following structure:

- Resort Hierarchy
 - Country
 - Resort
 - Service Line
 - Service
- Sales Hierarchy
 - Year
 - Quarter
 - Month
 - Week
 - Invoice Date
- Customer Hierarchy
- Reservations Hierarchy

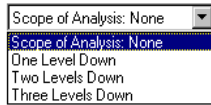
Annotations with arrows point to the '+' sign next to 'Resort Hierarchy' and the checkmark next to 'Resort'. A line also points from the text 'Hierarchies are represented by folders.' to the 'Resort Hierarchy' folder icon.

Note: If a universe contains no hierarchies, its classes are used as hierarchies by default.

To define default scope of analysis

Once you include one object that belongs to a hierarchy in a query, you can define a default scope of analysis that includes other objects at other levels from the same hierarchy. Including more levels in your scope of analysis allows you to view lower levels of detail in your analysis. For example, the **Resort** object belongs to the **Resort** hierarchy. Once you include **Resort** in a query, you can automatically include **Service Line** and **Service** objects in your scope of analysis, as these objects also belong to the **Resort** hierarchy.

To use this feature, first insert an object from a hierarchy in the Result Objects box. Then, click the arrow on the Scope of Analysis list box on the Query Panel toolbar:



This list enables you to include one, two or three objects from the hierarchy in your scope of analysis. For example, if you insert *Resort* in the Result Objects box, then click *One Level Down*, your scope of analysis contains the object below *Resort* (i.e., *Service Line*) in the *Resort* hierarchy. Click the option that corresponds to the number of objects you want to include in your scope of analysis. This option is now active in the Scope of Analysis list box.

When you run the query, the report displays the data for the objects that you included in the Result Objects box of the Query Panel. The data for the objects in your scope of analysis is not displayed, but it is available for use in analysis.

To define scope of analysis manually

Instead of using the default method described in the previous section, you can manually select the dimension objects you want. To do this:



Scope of Analysis

1. Click the Scope of Analysis button in the Query Panel toolbar. The Scope of Analysis dialog box appears.
2. Click inside the checkbox of each object you want to include in your scope of analysis.
3. Click OK to return to the Query Panel. In the Scope of Analysis list box on the Query Panel toolbar, “Custom Level” is shown, which indicates that you manually defined your scope of analysis.

Tip: You can select all the objects in a hierarchy by clicking the hierarchy’s check box in the Scope of Analysis dialog box.

Applying conditions

A condition is a way of limiting the data that a query returns. Here's a simple example.

Example Limiting query results by using a condition

The `Resort` object retrieves five values: Australian Reef, Bahamas Beach, French Riviera, Hawaiian Club and Royal Caribbean.

You can apply a condition on the `Resort` object to stipulate that you want to retrieve the data for only Bahamas Beach and Royal Caribbean of the resorts.

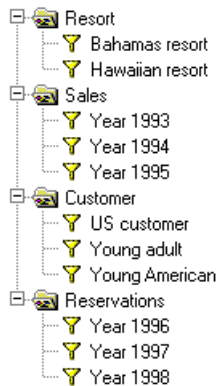
In `BUSINESSOBJECTS`, you can set three types of conditions on a query:

Conditions	Description
Predefined conditions	<p>When universe designers build universes, they can create predefined conditions for you to use. For example, the Island Resort Marketing universe contains predefined conditions such as Year 98, which lets you obtain reservations for 1998 only.</p> <p>You can apply one or more predefined conditions when you build a query. However, you can neither delete predefined conditions from a universe, nor can you edit their definition.</p>
Simple conditions	<p>Enable you to limit data returned by a result object. For example, you can find out about certain customers by applying a simple condition on the Customer object, then selecting the customer names that appear in a dialog box.</p>
Complex conditions	<p>Enable you to limit the query results by any object in the universe.</p> <p>For more information on complex conditions, refer to "Applying Complex Conditions on Queries" on page 93.</p>

Predefined
Conditions

To apply a predefined condition

1. Click the Predefined Conditions radio button, which is located below the Classes and Objects box in the Query Panel.
The Predefined Conditions box replaces the Classes and Objects box.
The predefined conditions in the Island Resorts Marketing universe are illustrated here:



2. Double-click the predefined condition you want to apply.
The condition appears in the Conditions box.
When you run the query, only the data corresponding to the predefined condition appears in the report.

Tip: For information on using two or more conditions in the same query, refer to “Applying Groups of Conditions” on page 107.

To remove a predefined condition

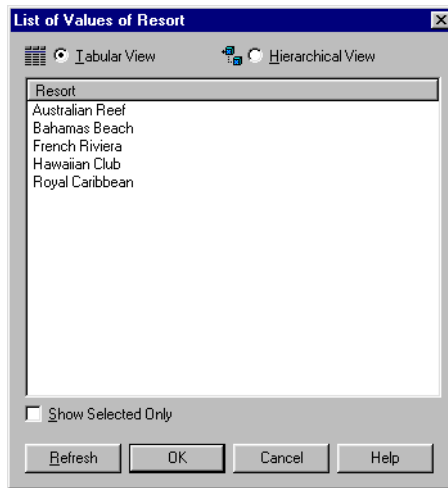
Click the condition’s icon in the Conditions box, then press the Delete key.

To apply your own simple condition

Before you can apply a simple condition on an object, you must include the object in the query. Then:



1. Click the object's icon in the Result Objects box.
2. Click the Simple Condition button on the toolbar.
The list of values for the object is retrieved from the database, and appears in the List of Values dialog box:



3. Hold down the Ctrl key on your keyboard, click the values you want the object to retrieve, then click OK.
The condition appears in the Conditions box.
When you run the query, only the data corresponding to the value(s) you selected will appear in the report.

To select different values for a simple condition

Once you have applied a simple condition on an object in a query, you can modify it by selecting different values for the object to return. To do this:

1. In the Conditions box of the Query Panel, click the value(s) that appear(s) on the right-hand side of the condition.
The Classes and Objects box becomes the Operands box.
2. Double-click the *Show list of values* operand.
The object's list of values appears in the List of Values dialog box.

3. If you want to select more values for the condition, hold down the Ctrl key and then, in the List of Values dialog box, click each value that you want the object to retrieve.
4. Click any selected values that you do not want the object to retrieve, and click OK.

To delete a simple condition

Click the condition in the Conditions box, then press the Delete key.

Applying sorts

Sorts control the order in which data appears: ascending or descending. For example, you can apply a sort on a measure object so that its data appears in ascending order, i.e., from lowest to highest values.

The following table summarizes the order in which data appears:

	Text	Numbers	Dates
Ascending order	A-Z	lowest to highest	past to present
Descending order	Z-A	highest to lowest	present to past

To apply a sort on an object

1. Click an object in the Result Objects box.
2. Click the Sort button on the toolbar.
A sort icon appears below the object icon in the Result Objects box.



To remove a sort

There are two ways of doing this:

- Click the sort icon and press the Delete key.
- Drag the sort icon from the object in the Result Objects box, to the Classes and Objects list, where you release your mouse button.

In both cases, the sort icon disappears from the object in the Result Objects box.

To invert a sort

Double-click the sort icon below the object. The arrow in the sort icon appears the other way up, to indicate that you have inverted the sort.

Sorts and free-hand SQL

If you apply a sort on a query and then use the SQL statement generated by the query to create a new report, the SQL statement will ignore the sort. You need to either adjust the order of the columns in the SQL statement to create the report you want or modify the order of the columns in the report itself.

To define sort priority and apply transparent sorts

When you apply more than one sort on a query, you may want to define sort priority. Also, you can apply transparent sorts, i.e., on objects that are not result objects, provided that the database at your site supports this feature.

To define sort priority or apply transparent sorts, click the Manage Sorts button on the Query Panel toolbar. The Sorts dialog box appears.

To find out more about these tasks, click the Help button in the Sorts dialog box.



Setting options and running a query

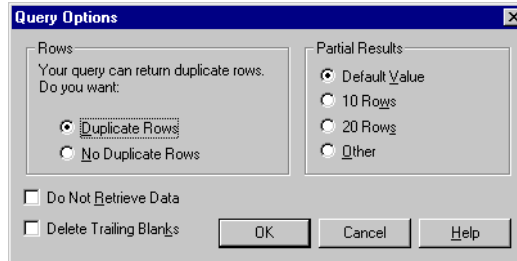
Before running a query, you can set options that enable you to:

- Specify the number of rows of data that you want the query to return. The *Default Value* option corresponds to the maximum number of rows that the universe designer specified for queries on the current universe, in the DESIGNER module.
- Eliminate duplicate rows of data. This feature is useful if you think that the query will return many rows containing the same data.
- Retrieve no data when you run the query. In this case, the query's SQL is generated, but no connection to the database is made. The names of the objects included in the query appear as column headings in the report.

This option is useful if you want to save the query you have built, but refresh it at an off-peak time.

To set options, then run a query:

1. Click Options in the Query Panel.
The Query Options dialog box appears.



2. Click *No Duplicate Rows* if you want to eliminate duplicate rows of data from the query result.
3. To obtain a partial result, you can:
 - Click 10 rows or 20 rows.
 - Enter a number of rows in the Other field. You can use the arrows to raise or lower the value.
4. Click *Do Not Retrieve Data* if you do not want the query to connect to the database when you run it.
When you refresh the query, this option will be automatically switched off, meaning that the query will connect to the database and the data will appear in the report.
5. Click OK to return to the Query Panel.
Once you are satisfied with the query you have built, click Run.
The query connects to the database, and retrieves the data you specified. The report that appears displays the data for the objects that you placed in the Result Objects box in the Query Panel.

Running a Query on a Different Universe

BUSINESSOBJECTS allows you to run a query on one universe and then run the same query on a different universe. By doing this, you can test your query on a pilot universe before applying it to your real data. The following procedure describes how to run a query on a different universe after having run it on an initial universe.

1. Open the report containing the query.
2. From the Data menu, choose View Data.
The Data Manager dialog box opens.
3. Choose the query you want to use in the Data Providers list, then click the Definition tab.
4. Click the button to the right of the current universe name.
5. In the dialog box that appears, select the universe you want to use, then click OK.
6. Click the Results tab, then Refresh.
7. Click OK to close the Data Manager.

Chapter 4

Going Further with Queries on Universes

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Overview

This chapter describes how to benefit from the most powerful query features in BUSINESSOBJECTS. You learn how to

- Create your own objects
- Customize lists of values
- Apply complex conditions
- Work with multiple conditions
- Combine the results of multiple queries into one data set
- View, edit and reuse the SQL generated by BUSINESSOBJECTS queries.

Creating User Objects

A universe consists primarily of classes and objects, created by the universe designer. If the objects in a universe do not meet your needs, you can customize the universe by creating your own objects, which are called *user objects*.

User objects appear in the User Objects class in the universe. You include them in queries in the same way that you include regular objects. Moreover, you do not need to define a connection to a database to define a user object.

Why create a user object?

Based on one or more existing objects, user objects enable you to:

- Make calculations at the database level.
- Apply functions to text, for example to capitalize data.
- Group data.

Here's an example of a user object.

Example Obtaining total ordered revenue by creating a user object

.....
To obtain the revenue generated by an order, you create the Total user object with the following formula:

`=Quantity Ordered*Product Price`

where Quantity Ordered and Product Price are objects in your universe. When you include the Total user object in a query, the calculation is made at the database level and the calculated results appear in your report.

What does a user object consist of?

A user object has a name, a type (character, date or numeric), a qualification (dimension, measure or detail) and a formula. The formula contains a combination of functions, objects, user objects, operators, and text.

User objects are end-user personal objects that are not shared with other end-users. User objects are defined for each universe and stored on a local file inside the “\Universe” folder. For example, when creating a user object on top of a specific universe, say BEACH.UNIV, this user object will then be stored locally on a file called the BEACH.UDO (inside the Universe folder).

What are the restrictions on user objects?

You can work only with the user objects that you create yourself, and you cannot move user objects from the User Objects class. Also, user objects are available only in the universe in which they were created.

User objects are not shared. Reports that include user objects can only be viewed by other end-users. This is because user objects are stored locally in a specific user object definition file. Other end-users, who do not have the same user object definition file are not able to access the user object definitions. If an end-user tries to refresh or edit a query that contains another user's user objects, the user objects are automatically removed from the query and report.

Despite these restrictions, the universe designer can turn user objects into regular objects, which can be made available in other universes, and for other users.

Note: Scheduling reports containing user objects is not a supported feature. User objects are removed when the report is refreshed. For more information refer to the *InfoView User's Guide*.

How can an end-user share user objects with other users?

If an end-user wants to share user objects with other users, they should ask the universe designer to include these user objects in the related universe in order to make them available to all BUSINESSOBJECTS end-users. The universe designer includes the file UNIVERSE_NAME.UDO in the universes where the user objects are to be used.

Creating, editing and deleting user objects

BUSINESSOBJECTS lets you create user objects in two different ways.

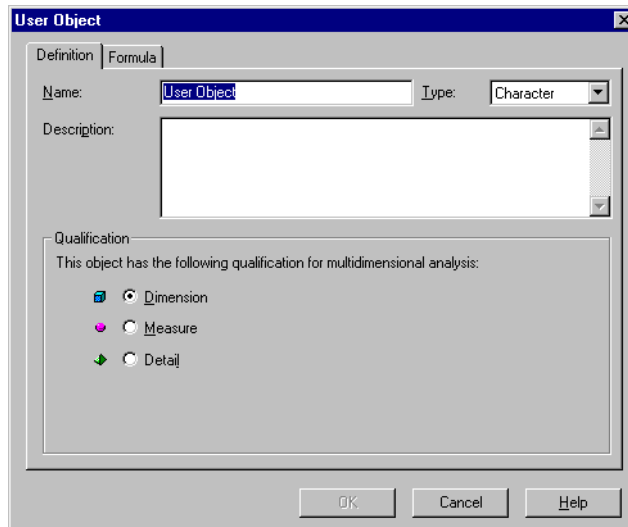


If you want to	Then
create user objects that you can use only in the universe that contains the current query,	click the User Objects button on the Query Panel toolbar. You cannot delete user objects this way.
create, edit, or delete user objects in any of the universes available to you,	use the Universes command on the Tools menu in the main application window.

The following sections describe how to create, edit and delete user objects using the Universes command.

To create a user object in any universe available to you

1. Select the Universes command on the Tools menu.
The Universes dialog box appears.
2. Select the universe in which you want to create the user object, then click User Objects.
The User Objects dialog box appears.
3. Click Add.
The User Object dialog box appears:



4. In the Definition tab, type the name of the user object in the Name field.
5. In the Type list, select the type of the user object (Character, Number or Date).
6. In the Description field, type a help text on the object.
The help text appears when you select the user object in the Query Panel.
7. In the Qualification box, click a radio button to qualify the user object as a dimension, a measure or a detail.
8. Click the Formula tab to write the formula for the user object.
For information on how to write the formula, refer to “To write the formula of a user object” on page 83.

9. Click OK.

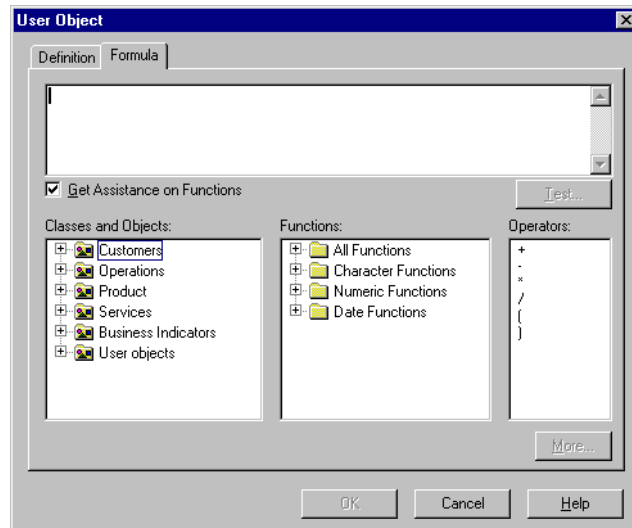
The user object you have created appears in the User Objects dialog box. The next time you build or edit a query on the universe, the user object you have created will appear in the User Objects class.



Reminder: You can create a user object by clicking the User Objects button on the Query Panel toolbar. However, using this method you can create user objects only in the universe you selected for the query you are working on.

To write the formula of a user object

1. Display the User Object dialog box by following steps 1 to 3 under “To create a user object in any universe available to you” on page 82.
2. Click the Formula tab, then check *Get Assistance on Functions*:



3. Double-click the objects, functions and operators you want to use in the user object's formula.
 - When you double-click an object or an operator, it appears in the Formula box. The functions and operators you can select depend on the database at your site.
 - When you double-click a function, the Function[FunctionName] dialog box appears.

4. In the Function[FunctionName] dialog box, type an argument in each field.
 - If the function's arguments include objects, user objects, functions or operators, you can double-click these in order to insert them in the function's formula.
 - The arguments appear in the Formula box.
5. If necessary, type text, numbers or dates in the formula.
You must type quotes (") before and after text and numbers, but type a single quote (') before and after dates.
6. Click OK, then click Test to check the syntax of the formula.

To edit a user object

Editing a user object enables you to change the object's name, qualification, and definition (formula). To edit a user object:

1. Click the Universes command on the Tools menu.
The Universes dialog box appears.
2. Select the universe that contains the user object that you want to edit, then click User Objects.
The User Object dialog box appears.
3. Select the user object you want to edit, then click Edit.
4. In the Definition tab of the User Objects editor, change the name, the type and/or the help text of the user object.
5. In the Qualification box, click a radio button to change the user object's qualification.
6. Click the Formula tab if you want to edit the user object's formula.
7. Click OK.

To delete a user object

1. Click the Universes command on the Tools menu.
2. In the Universes dialog box, select the universe that contains the user object you want to delete, then click User Objects.
3. In the User Objects dialog box, select the user object you want to delete, then click Delete.

Creating a time hierarchy for a user object

When one of your user objects is a date-type dimension, you can create a time hierarchy for the object.

1. In the User Object dialog box, make certain that the object is a date-type dimension.
2. Click Automatic Time Hierarchy.
The Automatic Time Hierarchy dialog box appears.
3. In the Automatic Time Hierarchy dialog box, click Year, Quarter, and/or Month.
When you click Year, Quarter, and/or Month, you create a new user object that will appear below the initial user object in the hierarchy.
4. If you want, enter a name and help text for each new user object in the Name box and Description box, respectively, then click OK.

Customizing Lists of Values

A list of values presents the values returned by an object. BUSINESSOBJECTS lets you use lists of values in order to select the value(s) you need when defining conditions on objects in a query, or when running a query that contains a prompt.

How are lists of values created?

In DESIGNER, the universe designer decides whether or not to associate a list of values to an object. Once associated to an object, the list of values can be viewed or edited in DESIGNER, or in BUSINESSOBJECTS.

The first time you view a list of values for an object, BUSINESSOBJECTS runs a query and retrieves the object's values from the database. In other words, a list of values is by default equivalent to a query containing one object.

How can you customize lists of values in BusinessObjects?

BUSINESSOBJECTS lets you customize lists of values in the following ways:

- By editing the list's corresponding query.
For example, you can limit the data returned by the list of values by applying a condition.
- By assigning data from personal data files to lists of values.

This feature is especially useful if you always use the same values, e.g., city names, when applying conditions. You can view only the values you need without having to connect to your remote database. For more information, refer to “Assigning personal data to a list of values” on page 88.

Tip: You can also define lists of values in free-hand SQL scripts. For more information refer to “Creating a prompt with a list of values for a free-hand SQL script” on page 133.

A word about .LOV files

When you use or view a list of values on an object for the first time, BUSINESSOBJECTS creates a .lov file which contains the query definition and the values it returns. By default, .lov files are located in sub-folders inside the UserDocs folder.

Editing lists of values

In DESIGNER, the universe designer decides whether or not a list of values can be edited in BUSINESSOBJECTS. Therefore, you can only edit a list of values if the designer has granted you the right to do so.

Because a list of values is first and foremost a query, you edit the list of values by editing its corresponding query in the Query Panel. You can edit the query by:

- Applying conditions to restrict the values returned.
- Applying sorts to make the values appear in a specific order.
- Building a combined query.
- Including additional objects in the query.

Here's an example of how you can benefit from this feature.

Example **Showing family names and first names in a list of customers**

.....

The Customer object has a list of values that you want to use in a query condition. The goal is to let users select the customers they're interested in when they run the query.

However, some of your customers have the same family name. To let users see exactly which customers they're selecting, you edit the Customer list of values by adding the First Name object. The list of values now returns both family and first names; these will appear when users are prompted to select values from the list.

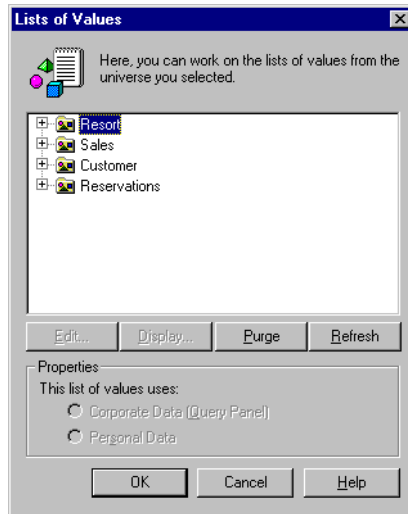
.....

To edit a list of values:

1. Select the Universes command on the Tools menu.
The Universes dialog box appears.

2. Click the universe that contains the list of values you want to edit, then click Lists of Values.

The List of Values dialog box appears:



3. Open a class by clicking its + sign, click the object whose list of values you want to edit, then click Edit.
The Query Panel appears.
4. Edit the query, then click Run.
BUSINESSOBJECTS populates the list of values according to the new definition of the query.
5. To view the changes in the list of values, click Display, then click OK.
6. Click OK to close the dialog box.
You can now use the edited list of values in a query condition.

Assigning personal data to a list of values

If you always use one of a small number of values when applying conditions, you can limit your choices by assigning personal data to an object's list of values. Assigning personal data to the list of values decreases the time required for the query because it is quicker to retrieve values from a list than it is to query the database.

The following example describes how a list of values can return a limited set of values from a text file, rather than a complete set of values from the corporate database.

Example Assigning personal data from a text file to a list of values

The database you access contains data on all major cities in the USA. As a regional sales manager, you only ever need to view the results for three cities: New York City, Albany and Buffalo.

To save time and to focus on the data you need, you create a text file containing the names of the three cities. Next, you assign the text file to the City object's list of values.

The next time you want to select a value when applying a condition on the City object, you only view the three city names, rather than the names of all the cities in the database. Also, no connection to the database is made when you view the list of values, so you save time and cut down on network traffic.

What kinds of data can you use?

The personal data you assign to a list of values must be stored in a file that you can access from your computer. The file types you can use are:

- Text
- Microsoft Excel (including version 97)
- dBASE.

What kinds of delimiters can you use to separate the data?

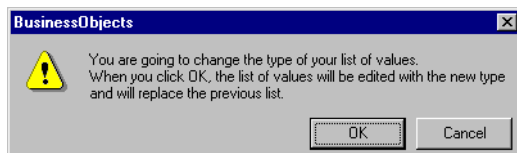
The data in the file must be separated by any of the following:

- Tabulation
- Space
- Character

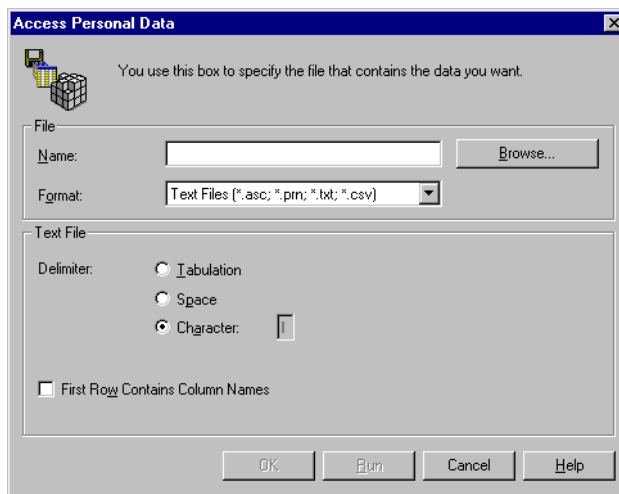
To assign personal data to a list of values

1. Select the Universes command on the Tools menu.
The Universes dialog box appears.
2. Click the universe that contains the list of values you want to edit, then click Lists of Values.
The List of Values dialog box appears.

3. Click the + sign to the left of the class containing the object you want, then click the object.
4. If *Personal Data* is not already active, click this option now.
The following message box appears:



5. Click OK.
The message box closes and the Access Personal Data dialog box appears:



6. Click Browse to locate the file that contains the list of values you want to use, select the appropriate delimiter, then click Run.
 - The Access Personal Data dialog box closes.
 - The list of values now points to the file you selected, not to the database.
7. To view the new list of values, click Display, then click OK.
8. Click OK to close the List of Values dialog box.

Viewing, refreshing and purging lists of values

BUSINESSOBJECTS lets you view, refresh and purge lists of values at any time. To do so:

1. Select the Universes command on the Tools menu.
The Universes dialog box appears.
2. Select the universe that contains the list of values you want, then click Lists of Values.
The Lists of Values dialog box appears.
3. Open a class by clicking its + sign, then select the object whose list of values you want to view, refresh or purge.
4. Click the button you want:

Button	Action
Display	<p>BUSINESSOBJECTS displays the values in the List of Values of <i>Object Name</i> dialog box.</p> <p>To view the list in table or hierarchy format, click <i>Tabular View</i> or <i>Hierarchical View</i> respectively. These options are useful if the list of values contains more than one object, i.e., it combines two or more columns of values:</p> <ul style="list-style-type: none"> • In <i>Tabular View</i>, the columns appear next to each other. • In <i>Hierarchical View</i>, the values from the first column appear as a folder. The folder contains the values of the second column. If there is a third column, the second column appears as a folder that contains these, and so on.
Refresh	BUSINESSOBJECTS runs the query for the list of values, and a refreshed list appears.
Purge	BUSINESSOBJECTS empties the .lov file corresponding to the list of values.

5. Click OK to close the dialog box.

Tip: You can populate a purged list of values by clicking Refresh.

Applying Complex Conditions on Queries

You can limit the data that queries return by applying conditions. You apply complex conditions by combining an object with an operator (e.g., greater than), and an operand (e.g., values that you type, or another object).

In addition to complex conditions, you can use predefined conditions and simple conditions. Here are some guidelines for choosing among the three types of conditions:

If you want	Then use
to use conditions defined by the universe designer using DESIGNER that you can apply to a query, but that you cannot edit or delete from a universe,	predefined conditions.
to use conditions that you apply by selecting values from an object list of values and that let you limit the data returned <i>only by result objects</i> ,	simple conditions.
to use conditions that let you choose the exact operator and operand on <i>any object in the universe</i> ,	complex conditions.

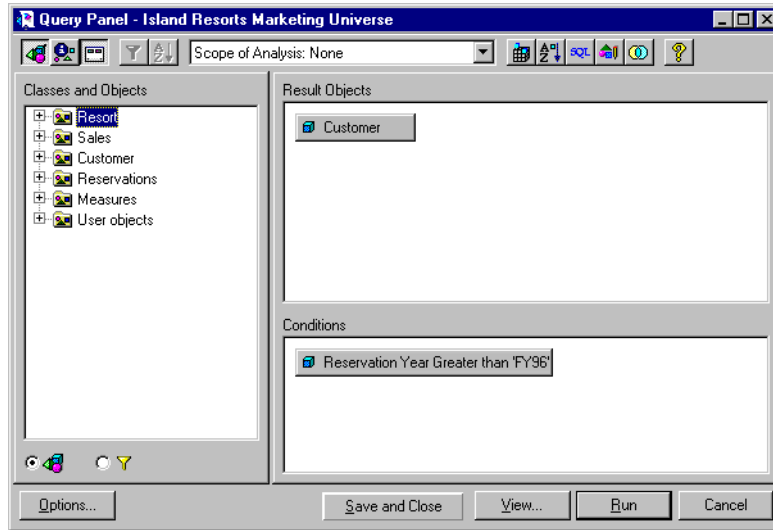
To illustrate how you can benefit from complex conditions, here's an example.

Example Which customers made reservations for 1997 and 1998?

You want to market new products to customers who made reservations for 1997 and 1998. All you need is that list of names - and you obtain it by applying a complex condition on Reservation Year, without using Reservation Year as a result object in the query. Here's how to do it:

1. Insert the Customer object in a query on the Island Resorts Marketing universe.
2. Drag the Reservation Year object to the Conditions box.
The Classes and Objects list turns into the Operators list.
3. Double-click the *Greater than* operator.
The Operators list turns into the Operands list.

4. Double-click the *Show list of values* operand.
The List of Values of Reservation Year dialog box appears.
5. Click FY96 (you only want 97 and 98), then click OK.
The Query Panel now looks like this:

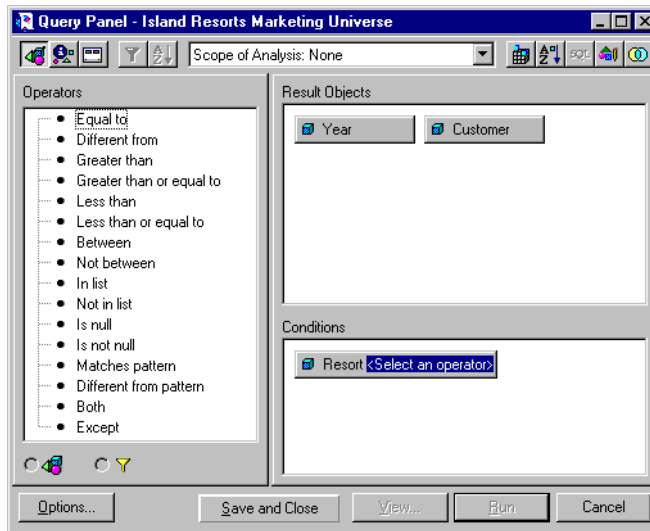


6. Click Run.
The list of customers appears in the report.
-

Applying a complex condition on a query

Applying a complex condition requires three steps. First, you select the object you want, then the operator (e.g., greater than), then the operand (e.g., values that you type, or another object). The following procedure explains how to do it, and gives information to help you choose the operator and operand you need:

1. In the Query Panel, drag the object you want to use from the Classes and Objects list to the Conditions box.
The Classes and Objects list turns into the Operators list:

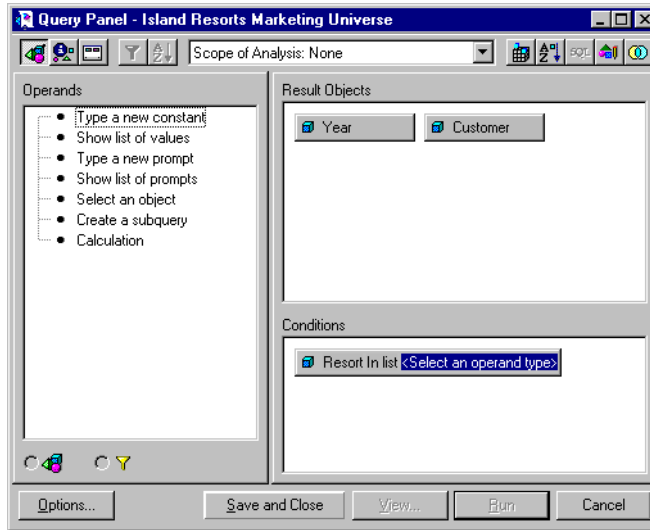


The following table helps you to select the operator you need:

To obtain data that...	For example...	Double-click...
Is equal to <i>one</i> given value	A particular Year	<i>Equal to</i>
Is different from <i>one</i> given value	Countries not including France	<i>Different from</i>
Is greater than a given value	Revenue over \$100,000	<i>Greater than</i>
Is greater than or equal to a given value	Customers who are 60 or over	<i>Greater than or equal to</i>

To obtain data that...	For example...	Double-click...
Is lower than a given value	Revenue under \$100,000	<i>Less than</i>
Is lower than or equal to a given value	Customers who are 60 or under	<i>Less than or equal to</i>
Falls between two given values	Weeks between 25 and 36	<i>Between</i>
Falls outside two given values	All the weeks of the year excluding weeks 25 to 36	<i>Not between</i>
Is the same as any of a list of values	Revenues from only two resorts	<i>In list</i>
Is different from given values	Non-European customers	<i>Not in list</i>
Contains empty rows	Customers who have not paid (i.e., without invoice dates)	<i>Is null</i>
Does not contain empty rows	Customers who have paid (i.e., their invoice dates are in the database)	<i>Is not null</i>
All contains the same letter or letters	Customers whose names begin with the letters S	<i>Matches pattern</i>
Does not contain a given letter or pattern of letters	Customers whose names do not begin with S	<i>Different from pattern</i>
Satisfies two conditions on one object	Customers who settled an invoice in June and in July	<i>Both</i>
Excludes a given value	Customers who stayed at resorts other than French Riviera	<i>Except</i>

- Double-click the operator you want to use.
The Operators list turns into the Operands list:



The operands in the list depend on the operator you selected.

- Double-click the operand you want.
The following table helps you select the operand you need and tells you what to do next:

If you want to compare the condition object with...	Double-click...	Then...
Values that you type	<i>Type a new constant</i>	Type the values with a separator (comma, semi-colon, etc.) between each one. The separator to use is defined in the Windows Control Panel (Regional Settings).
Values that you select from the object's list of values	<i>Show list of values</i>	<ol style="list-style-type: none"> Hold down the Ctrl key. Click the value(s) you want, then click OK.

If you want to compare the condition object with...	Double-click...	Then...
Values that you will select when you run the query	<i>Type a new prompt</i> - or - <i>Show list of prompts</i>	<ol style="list-style-type: none"> 1. Type your question. 2. Press the Enter key. Select a prompt from the dialog box that appears.
Another object (which can be a user object)	<i>Select an object</i>	Double-click the object in the Classes and Objects box.
Any value returned by another query	<i>Create a subquery (ANY)</i>	Build a query in the new query tab that appears. For more information, refer to “Applying a condition with a subquery” on page 103.
All values returned by another query	<i>Create a subquery (ALL)</i>	
The result of a calculation (sum, minimum, maximum, average or count)	<i>Calculation</i>	Follow the screens of the wizard that appears. For more information, refer to “Applying a condition with a calculation” on page 100.

Tips for applying complex conditions

This section provides some tips on getting the most out of BUSINESSOBJECTS complex conditions.

Using wildcard characters

Conditions with the *Match pattern* and *Different from pattern* operators are great for finding lists of similar values, such as customer names beginning with S.

Wildcards are special characters that can denote any single character, or any number of characters. BUSINESSOBJECTS supports the standard wildcard characters, which are:

Wildcard	Description
%	Replaces several characters, or in the response to a prompt. For example, N% returns all values beginning with an N (New York, Nevada, etc.)
_	Replaces a single character in a constant. For example, GR_VE returns Grave, Grove, Greve, etc.

Using In list

The In list operator lets you select multiple values for a document. These multiple values can be a condition on a query that you want to build or can be the basis for an interactive document in which other users are prompted to select values from the list you created to view data limited to their needs.

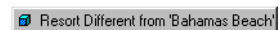
You type your list of values in the text field of the Enter or Select Values dialog box or if you click Values in this dialog box you can select them from a list. When you type in your values, separate each value with the setting defined in your Windows Regional Options.

Note: A semicolon is used when it's associated with a prompt.

The maximum number of values allowed in a list depends on restrictions in the target DBMS or on the length of the SQL statement generated by BusinessObjects. (BusinessObjects can generate SQL of up to 65,536 characters.)

Using Different from, Not in list and Except

Different from, *Not in list* and *Except* are all operators that exclude certain data from your query results. For example, you could use this condition

 Resort Different from 'Bahamas Beach'

to obtain a list of customers who have not stayed at Bahamas Beach.

However, when you use *Different from* or *Not in list*, you might still get the values you don't want. The condition illustrated above would not exclude customers who had stayed at Bahamas Beach if these customers had also stayed at other resorts. However, if you used *Except*, the query would exclude *all* Bahamas Beach customers, whether they had stayed at other resorts or not.

Note also that:

- You can only specify one value with *Different from*, but multiple values with *Not in list*.
- You can only specify one value with *Except*. However, you can build combined queries using MINUS to exclude, for example, Bahamas Beach customers and 1996 customers.

For more information, refer to “Building Combined Queries” on page 111.

Editing complex conditions

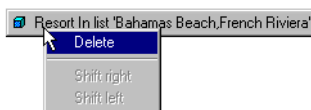
You can edit a complex condition by changing its object, operator and/or operand. Here’s how to do it:

1. In the Conditions box of the Query Panel, click the part of the condition that you want to change.
2. Depending on the element you clicked, select a different element in either the Classes and Objects list, or the Operators list, or the Operands list.

Note: If you use a different operator, you may also have to use a different operand.

Deleting complex conditions

1. Right-click the condition’s icon in the Conditions box.
2. Select the Delete command on the pop-up menu:



Applying a condition with a calculation

BUSINESSOBJECTS lets you limit query results with calculations in complex conditions. This type of condition is useful in answering questions such as “Which products generated above average revenue?” at the query level.

You apply a condition with a calculation by using the *Calculation* operand. BUSINESSOBJECTS then displays a wizard which guides you through the steps required to make the calculation.

To apply a condition with a calculation

Use the following procedure to apply a condition with a calculation. There's an example on page 102.

1. In the Query Panel, move an object to the Conditions box.
The Classes and Objects box becomes the Operators box.
2. Double-click Equal to.
The Operators box becomes the Operands box.
3. Double-click Calculation.
The Complex Calculation wizard appears. The first screen asks you to select a calculation object.
4. Open the folder containing the object, click on the object, then click Begin.
The next screen asks you to select a function to apply on the object.
5. Select the function from the list, then click Next.
The next screen asks you to define the level of calculation.
6. Select a level of calculation.

If	Then
you want to obtain a single result row,	click Globally, then click Next.
you want to obtain several result rows,	click <i>By one or more objects</i> , select the objects from the list, then click Next.

The next screen asks you to choose between making an independent calculation and comparing the result of the calculation with the values of one or more objects.

7. Select how you want to synchronize your calculation.

If	Then
you want to make a calculation independently of your objects,	click <i>Independently of your objects</i> , then click Next.
you want to make a calculation for each value of one or more of your objects, which allows you to limit the calculation to particular objects,	click <i>For each value of one or more objects</i> , select the objects from the list, then click Next.

The next screen asks you to set the number of values to compare.

8. Select whether you want to compare the object with at least one value or with all values.

If	Then
you want to compare the object with at least one value, which allows you to limit the values compared with the object,	click <i>At least one value</i> , then click Finish.
you want to compare the object with all values,	click <i>All values</i> , then click Finish.

The Query Panel reappears with the query defined with a condition on a calculation.

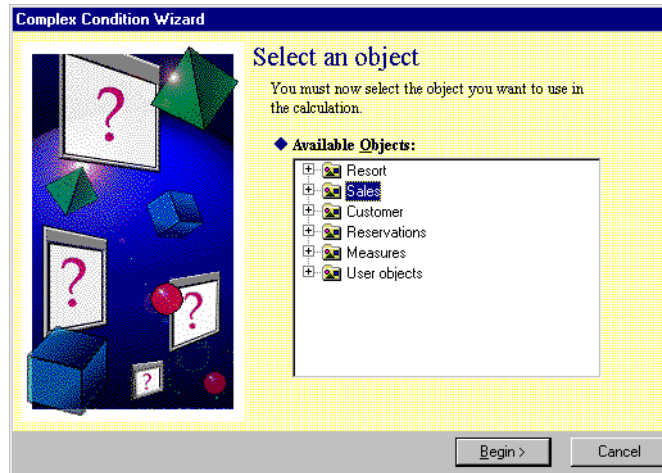
9. Click Run.

Example When did each customer last pay for a product?

You want to find out the date of each customer's last invoice so that you can contact those customers who have not been buying your products. To obtain this data, you need to apply a complex condition with a calculation. The calculation compares the invoice dates for each customer, then returns only the last date. Here's how to do it:

1. Insert the Customer and Invoice Date objects in a query on the Island Resorts Marketing universe.
2. Drag the Invoice Date object to the Conditions box.
3. Double-click the *Equal to* operator.

4. Double-click the *Calculation* operand.
The Complex Condition Wizard appears:



5. Open the Sales class, click the Invoice Date object, then click Begin.
6. Click Maximum (you want the last invoice date), then click Next.
7. In the next dialog box, click *Globally*, then click Next.
8. In the next dialog box, click *For the value of one or more objects*, then Customer. This option forces the calculation to return the last invoice date per customer.
9. Click Next, click Next again, then, in the Query Panel, click Run. One invoice date per customer appears in the report.

Applying a condition with a subquery

A subquery is a query within a query. It returns a single column of data which is compared with the data retrieved by the main query. You use subqueries for situations such as finding a single individual in a list of individuals who meet the conditions of the query. For example, of all customers who made reservations, what is the name and address of the customer who made the first reservation?

Complex conditions on queries consist of three elements: an object, an operator and an operand. Conditions that include the *Create a subquery (ALL)* operand, or the *Create a subquery (ANY)* operand, generate a subquery. The operator (e.g., greater than, less than etc.) you include in the condition determines whether the data returned by the subquery is, for example, excluded from the main query result.

The operands that generate a subquery are described here:

This operand...	Compares...	And answers questions such as...
Create a subquery (ALL)	All the values returned by the subquery with the values returned by the main query	Which customers have not bought my latest product?
Create a subquery (ANY)	Any values returned by the subquery with the values returned by the main query	Which products generated above average revenue?

To apply a condition with a subquery

Here's how to apply a condition with a subquery. An example follows on page 102.

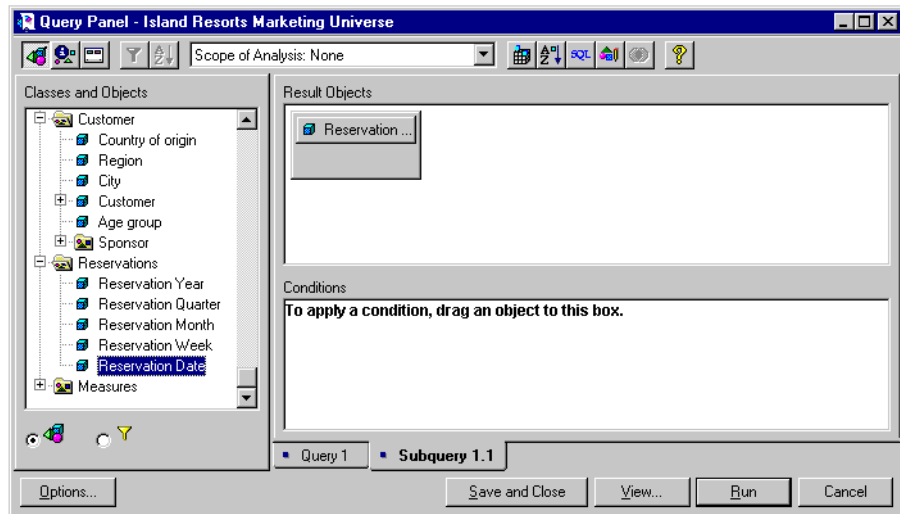
1. In the Query Panel, drag an object from the Classes and Objects box and drop it in the Conditions box.
2. Double-click the operator you want to use.
 - Some operators (e.g., *Both*, *Between*, *Match pattern*) cannot be used with subqueries.
 - For information on which operator to choose, refer to the table on page 95.
3. Double-click the *Create a subquery (ALL)* operand or the *Create a subquery (ANY)* operand.
A tab is created for the subquery (Subquery 1.1).
4. In the Subquery 1.1 tab, insert an object in the Result Objects box.
Note that you can only include one result object in the subquery.
5. If necessary, apply a condition on the subquery.
6. Click Run.

Note: The subquery's tab always appears to the right of the main query. A number appears in the tab, (Subquery n.n). The number is automatically incremented to show you the relationship between a query and its subquery or subqueries.

Example Which customer made the earliest reservation?

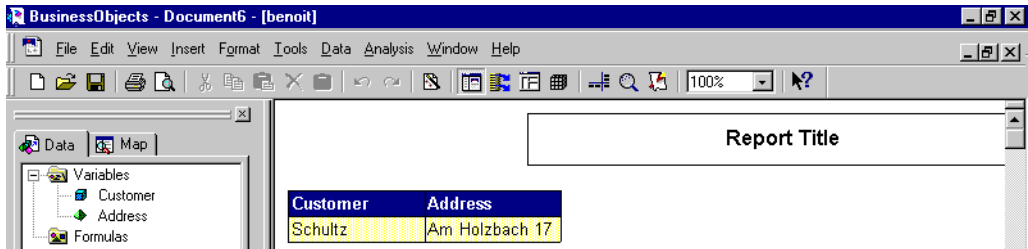
You want to offer a bottle of champagne to the customer who made the earliest reservation. To obtain the name and address of this customer:

1. Insert the Customer object and the Address object in a query on the Island Resorts Marketing universe.
2. Drag the Reservation Date object to the Conditions box.
3. Double-click the *Less than or equal to* operator.
4. Double-click the *Create a subquery (ALL)* operand.
The Subquery 1.1 tab now appears in the Query Panel.
5. In the Subquery 1.1 tab, insert the Reservation Date object in the Result Objects box.
The Query Panel now looks like this:



6. Click Run.

The name and address of the customer who made the earliest reservation appears in the report:

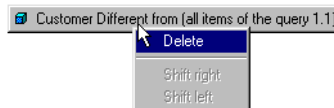


Deleting a subquery

A subquery is generated by a condition containing the *Create a subquery (ALL)* operand or the *Create a subquery (ANY)* operand. Therefore, you delete a subquery by deleting the condition in the main query.

To delete the condition:

1. Right-click the condition's icon in the Conditions box.
2. Select the Delete command on the popup menu that appears:



Applying Groups of Conditions

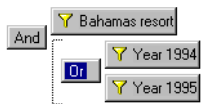
You use conditions to limit the data retrieved by queries. A group of conditions consists of two or more conditions (predefined, simple or complex) applied on the same query.

You use groups of conditions when a single condition does not enable you to obtain the data that you need.

Organizing groups of conditions

A group of conditions consists of two or more conditions applied on the same query. In the Conditions box in the Query Panel, conditions are linked by an operator (AND or OR).

In a group that contains only two conditions, you double-click the operator to change it from AND to OR, or vice versa. When you double-click the operator in a group that contains at least three conditions, you create an indentation in the group, as illustrated here:



In groups that contain three or more conditions, you can also:

- Create indentations without replacing the operator, by dragging the operator horizontally.
- Move conditions within the group.
- Delete a condition from a group.

The following table explains how to organize groups of conditions in different ways:

To...	Do this...
Change a group's operator from AND to OR and vice versa	<ul style="list-style-type: none"> • Double-click the AND or OR operator.
Indent or outdent conditions within a group of conditions	<ol style="list-style-type: none"> 1. Click the AND or OR operator with your right-mouse button. 2. On the pop-up menu that appears, click <i>Shift right</i> or <i>Shift left</i>.

To...	Do this...
Move a condition from one group to another	<ol style="list-style-type: none"> 1. Click the condition and hold down your mouse button. 2. Drag the condition to another group of conditions, then release your mouse button.

AND and OR

In the Conditions box in the Query Panel, multiple conditions are automatically linked by an operator:

- AND specifies a result that is true for both conditions.

For example, the following group of predefined conditions on a query containing the *Customer* object specifies customers who stayed at Bahamas Beach in 1995:



- OR specifies a result that is true for either the first or the second condition.

For example, the following group of predefined conditions on a query containing the *Customer* object specifies any customers from 1995 and any customers who stayed at Bahamas Beach:



You can replace AND with OR, and vice versa, by double-clicking it. When you apply three or more conditions on a query, double-clicking the operator creates an indentation in the group of conditions.

Tip: Avoid groups of conditions such as *Year Equal to 1994 AND Year Equal to 1995*. This example would return no data, because *Year* cannot be equal to two different values in SQL. To obtain, for example, the list of customers from both 1994 and 1995, you would have to build a combined query using the INTERSECT operator. For information on combined queries and how to build them, refer to “Building Combined Queries” on page 111.

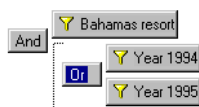
To apply groups of conditions

1. In the Query Panel, apply a condition (predefined, simple or complex).
2. Apply a second condition.
The conditions are automatically linked by the AND operator.
3. Apply more conditions if necessary.

Example Which customers bought a given product in a given timeframe?

You need the list of customers who stayed at the Bahamas Beach resort in 1994 or 1995. This requires two conditions: *Resort=Bahamas Beach* and *Year Inlist 1994,1995*. Here's how to do it:

1. Include the Customer object in a query on the Island Resorts Marketing universe.
2. Click the Predefined Conditions radio button below the Classes and Objects box.
The list of predefined conditions in the universe appears.
3. Click the + sign to the left of the Resort class, and double-click *Bahamas resort*.
4. Click the + sign to the left of the Sales class, then double-click *Year 1994*.
5. Double-click *Year 1995*.
The conditions are linked by an AND operator.
6. Double-click the AND that links *Year 94* with *Year 95*.
AND changes to OR, and the group of conditions is indented, as illustrated here:



7. Click Run.

Deleting groups of conditions

1. Click the operator (AND or OR) that links the group of conditions that you want to delete.
2. Click your right-mouse button.
3. On the pop-up menu that appears, click Delete.

Building Combined Queries

BUSINESSOBJECTS lets you combine the data returned by up to eight queries as one set of results. These combined queries enable you to:

- Obtain a single column of data from multiple objects.
- Obtain data common to two sets of results, such as customers from a given region and a given age group.
- Exclude the results of one query from the results of another.

Note: Building combined queries allows you to combine or exclude data from the query result by using operators to combine the results of multiple queries. You can contrast this with using the In list and Not in list operators when you apply a complex condition on a query. The In list and Not in list operators include or exclude data from a query result based on a list of values that you enter.

Building a combined query

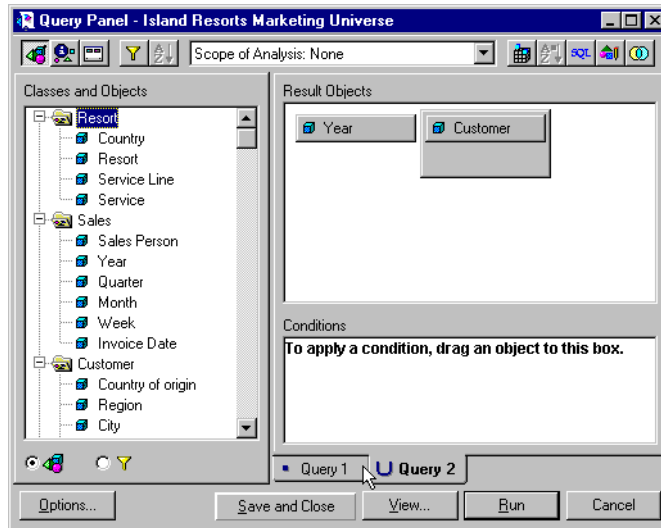
Here's how to build a combined query:

1. In the Query Panel, build a query.
2. Click the Combine Queries button on the Query Panel toolbar.
 - The existing query appears in the Query 1 tab.

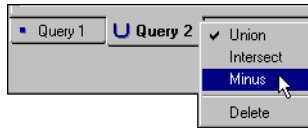


Combine Queries



- A second tab, Query 2, also appears and is now active:

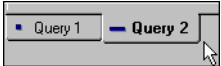


3. If you want to use a different operator, click the Query 2 tab with your right-mouse button, then click the operator you want on the pop-up menu that appears:



The following table describes which operator to use for the result you want.

Use...	To...
UNION	<p>Combine the data from two objects in a single column in the report.</p> <p>UNION is especially useful for working with incompatible objects. For example, you need to find out the dates on which your customers made reservations or paid their invoices. This query requires two incompatible objects: Invoice Date and Reservation Date. If you include these objects in a regular query, BUSINESSOBJECTS returns two blocks of data. By building a combined query with UNION, with Invoice Date in one tab and Reservation Date in the other, the data appears in one column in the report.</p> <p>UNION is the default operator.</p> <p>The symbol for the UNION operator is shown here:</p> 
INTERSECT	<p>Obtain data common to two sets of results, such as customers from a given region and a given age group.</p> <p>The example, “Which customers bought a given product in a given timeframe?” on page 109, illustrates the use of INTERSECT.</p> <p>The symbol for the INTERSECT operator is shown here:</p> 

Use...	To...
MINUS	<p>Exclude the results of one query from the main query result. For example, you can use MINUS to find out which customers bought product A but <i>not</i> product B. You cannot obtain this data with a condition such as <i>Product different from B</i>, because the condition would include customers who bought A <i>and</i> B. The symbol for the MINUS operator is shown here:</p> 

4. Build the rest of the query in the Query 2 tab.
5. If necessary, repeat the above steps to include more queries. You can include up to eight queries in a combined query.
6. Click Run.
The data from the combined query appears in the report.

Tip: You can delete one of the queries you have combined by clicking its tab with your right-mouse button, then by clicking the Delete command on the pop-up menu that appears.

Restrictions on combined queries

It's worth knowing that:

- Queries that you combine must contain the same number of objects in order to return the same number of columns of data.
- When you build a combined query to return data from more than one object in one column, i.e., using the UNION operator, you must use objects of the same type (character, date or number).
- You can include up to eight queries in a combined query.

To illustrate how you can benefit from combined queries, the following example explains how to obtain data common to two sets of results.

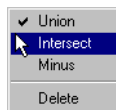
Example Which customers bought products in both 1994 and 1995?

Finding customers who match two criteria is a common business goal. You cannot obtain the list of paying customers from two years by

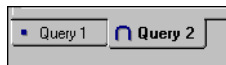
- Applying a complex condition with the *In list* operator; in this case, you would obtain customers from either 1994 or 1995, or possibly both.
- Two conditions (*Year equal to 1994* and *Year equal to 1995*) because in SQL, *Equal to* can only be used for one value.

The trick is to build a combined query which returns the intersection of customers from 1994 and 1995. Here's how to do it:

1. Include the **Customer** object in a query on the Island Resorts Marketing universe.
2. Drag the **Year** object to the **Conditions** box.
3. Double-click *Equal to*, then *Type a new constant*, then type 1994.
4. Press Enter, then click the **Combine Queries** button on the Query Panel toolbar.
 - The existing query appears in the Query 1 tab.
 - A second tab, **Query 2**, also appears and is now active.
 - **Customer** is already a result object in Query 2.
5. In the **Query 2** tab, drag the **Year** object to the **Conditions** box.
6. Double-click *Equal to*, then *Type a new constant*, then type 1995.
7. Press Enter, then click the **Query 2** tab with your right-mouse button. The operators you can use to combine the queries appear on a pop-up menu:



8. Click **Intersect**.
The **INTERSECT** symbol appears on the **Query 2** tab as shown here:



9. Click **Run**.
A list of customers who bought products in *both* years appears in the report.



Combine Queries

Using SQL From BusinessObjects Queries

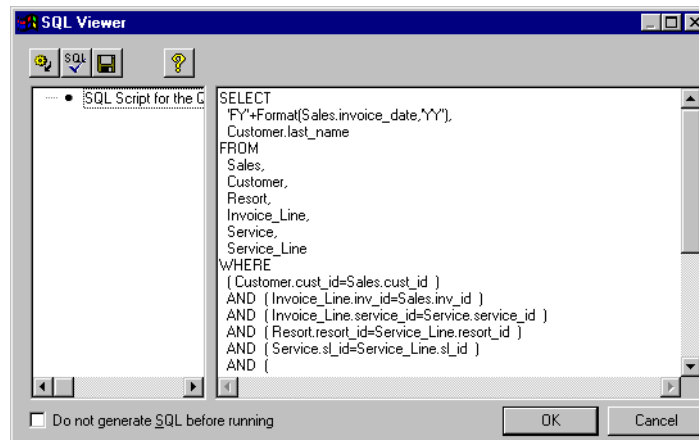
When you build a query in the Query Panel, BUSINESSOBJECTS writes the query's corresponding Structured Query Language (SQL) script. If you know SQL and want to find out how BUSINESSOBJECTS resolves a query, you can view the SQL script.

You can also reuse the SQL that BUSINESSOBJECTS generates by saving it to a file. And because BUSINESSOBJECTS also lets you edit your queries' SQL scripts, you can build complex queries in the Query Panel, change the SQL to suit your needs, then save the script. You can then run the saved script using another application. BUSINESSOBJECTS does the hard work for you!

To view, edit or save a query's SQL script:

1. Click the View SQL button on the Query Panel toolbar.

The query's SQL script appears in the SQL Viewer dialog box:



Note: BUSINESSOBJECTS may have created a complex SQL script to resolve the query, for example if the query contains incompatible objects or certain types of conditions. Such SQL scripts can be split into several SELECT statements, which BUSINESSOBJECTS indicates as folders in the left pane of the SQL Viewer dialog box.

2. To edit the script, click inside it and type the changes you want.
3. Click Regenerate to go back to the SQL of the original query.



4. Check *Do Not Generate SQL before running* if you want to keep the changes you have made.
 - This option automatically parses the script when you click OK and ensures that the query SQL is not regenerated as long as the objects in the result set or conditions remain unmodified.
 - If you do not click this option, any SQL changes you have made will be lost when you click OK.
5. Click Parse to check the validity of the script.



Parse

Note: If the universe designer has set the up the universe with a restrictive connection, BUSINESSOBJECTS prompts you to enter your database username and password before parsing the script. For more information on restrictive connections, see “Restrictive connections” on page 43.



Save

6. Click Save to save the edited script to a file.
7. Click OK to return to the Query Panel.

Chapter 5

Using Other Types of Data Providers

In this chapter

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-

Overview

This chapter explains how to bring data to your BUSINESSOBJECTS reports by using stored procedures, free-hand SQL, personal data files and Visual Basic for Applications (VBA) procedures.

Note: Using BUSINESSOBJECTS, you can also access data in OLAP databases and SAP applications. Information on how to work with these is not covered in this guide. OLAP and SAP data providers are documented in dedicated guides that you receive when you purchase your OLAP or SAP Access Pack.

Setting up hierarchies for drill mode

Drill mode enables you to analyze data on different levels of detail. You perform analysis by navigating up, down and across hierarchies of data in a report. You drill down on the data to examine the details of more consolidated data. You drill up on data to examine totals for the underlying data. Your ability to drill on data requires that the data be organized into hierarchies.

You can have BUSINESSOBJECTS automatically build hierarchies from the dimensions returned by stored procedures, free-hand SQL, personal data files and VBA procedures.

Note: You can only work in drill mode if you have installed the EXPLORER option with BUSINESSOBJECTS.

When you use queries on universes to retrieve data for your reports, you can build hierarchies with the Scope of Analysis feature.

You can also build hierarchies when you use stored procedures, free-hand SQL, personal data files and VBA procedures. Each of these data providers lets you use the *Build Hierarchies and Start in Drill Mode* option. You learn how to use this option in the following sections.

Some points worth knowing about the hierarchies BUSINESSOBJECTS builds from stored procedures, free-hand SQL, personal data files and VBA procedures:

- You can edit the hierarchies and build new ones inside the report. You can even change the qualification of the data returned, for example to change a detail object into a dimension so that you can include it in your hierarchy.

- BUSINESSOBJECTS can automatically create hierarchies if the dimensions returned have a logical structure (Year, Quarter, Month, for example).
- The name given to a hierarchy is also the name of the first dimension it contains.

Using Stored Procedures

This section introduces stored procedures, and explains how to use them to bring data to your BUSINESSOBJECTS reports.

What are stored procedures?

Stored procedures are sets of SQL statements that are saved as executable files in a database. The database administrator is often the person who creates stored procedures at your site, but all database users who know SQL and who have access to the database can create stored procedures. Once created, stored procedures are made available to end users.

How can you use stored procedures in BusinessObjects?

In BUSINESSOBJECTS, stored procedures are data providers that retrieve data for reports, in the same way that a queries on universes do. In the New Report Wizard, you select the stored procedure you want to use. You can then enter parameters to specify the data that you want the stored procedure to retrieve. You can keep these parameters for the next time the stored procedure is run.

Tip: You can create and edit stored procedures in free-hand SQL in BUSINESSOBJECTS.

Restrictions on stored procedures

- The BUSINESSOBJECTS supervisor grants access to the database or account where stored procedures are located.
- BUSINESSOBJECTS supports stored procedures for certain databases only. Consult the Database Guide for the RDBMS you work with, to find out if it supports stored procedures.
- Stored procedures may contain the COMPUTE, PRINT, OUTPUT and STATUS statements. These statements will not be executed in BUSINESSOBJECTS.

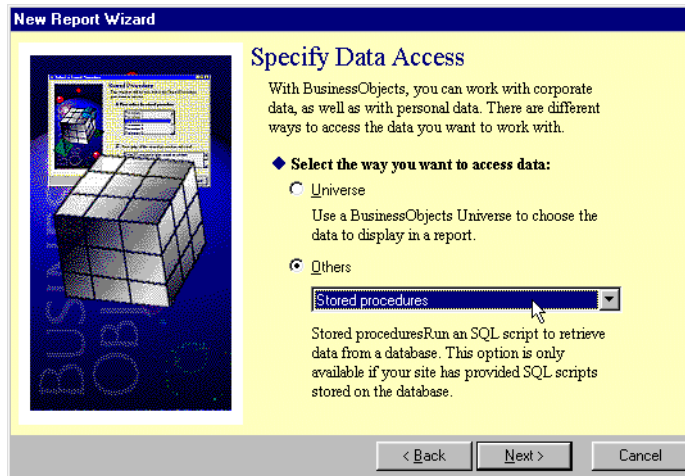
Using a stored procedure to bring data to a report

Here's how to use a stored procedure to bring data to a report:

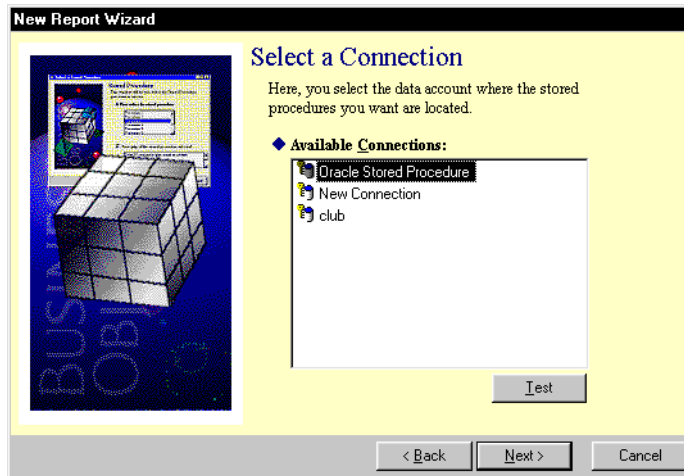


New Report Wizard

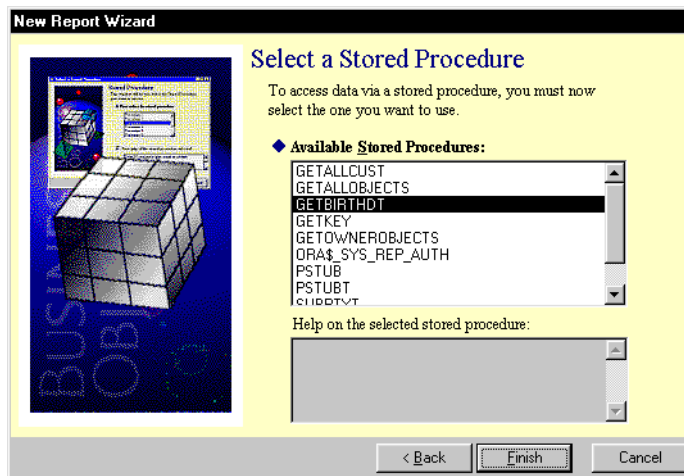
1. Click the New Report Wizard button on the Standard toolbar. The New Report Wizard appears.
2. Select an option for the report layout, then click Next. The Specify Data Access dialog box appears.
3. Click *Others*, then click *Stored procedures*:



4. Click Next, then select a connection:

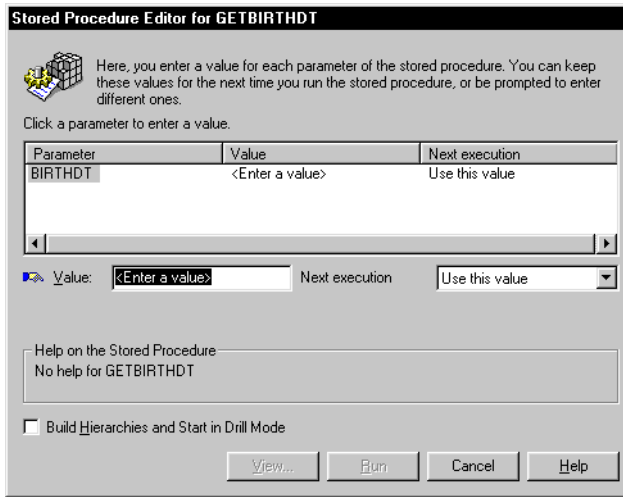


5. Click Next, then select a stored procedure:



6. Click Finish.

The Stored Procedure Editor appears:



7. Click the first parameter in the Parameters column, then type a value in the Value box.

8. Select an option in the Next Execution list box:

- *Use this value* means that the value you entered will be used the next time you run this stored procedure.
- *Prompt me for a value* means that you will be prompted to enter a different value the next time that you run this stored procedure. A dialog box will appear, where you enter the different value.

9. Check *Build Hierarchies and Start in Drill Mode* if you want to perform drill down analysis as soon as the data appears in the report.

10. Click Run.

The data from the stored procedure appears in the report.

Changing a stored procedure's parameters

To work with different data in a report you created by using a stored procedure, all you have to do is change the stored procedure's parameters, then run the stored procedure. Here's how to do it:

1. Open the report containing data from the stored procedure.
2. Select the Edit Data Provider command on the Data menu.
 - If the List of Data Providers dialog box appears, click the stored procedure you want to edit, then click OK.
 - The Stored Procedure Editor appears:

3. Click the first parameter in the Parameters column.
4. In the Value box, type the new value for this parameter.
5. In the Next Execution list box, select *Use this value* or *Prompt me for a value*.
 - *Use this value* means that the value you entered will be used the next time you run this stored procedure.
 - *Prompt me for a value* means that you will be prompted to enter a different value the next time that you run this stored procedure. A dialog box will appear, where you enter the different value.
6. Click Run.

The different data set appears in the report.

Using Free-Hand SQL

Free-hand SQL is a type of data provider that enables you to work with SQL scripts in BUSINESSOBJECTS. You can open and run existing SQL scripts; users who know SQL can write their own scripts.

With free-hand SQL, you can use the different types of SQL orders supported by the database at your site: pre-defined queries, stored procedures, PL/SQL and Transact SQL.

You can also use free-hand SQL to make changes to the database, if the BUSINESSOBJECTS supervisor has granted you the right to do so.

Creating a report using free-hand SQL

When you create a report using free-hand SQL, you can:

- Write a new script or open an existing one, including SQL generated by BUSINESSOBJECTS queries in the Query Panel.
- In the SQL script, you can define lists of values and prompts.
- Create a new connection to the database or use an existing one.
- View raw data before it appears in the report, which lets you check that you're getting the result you want.
- Parse the script for SQL errors, and save any changes you make to a file.

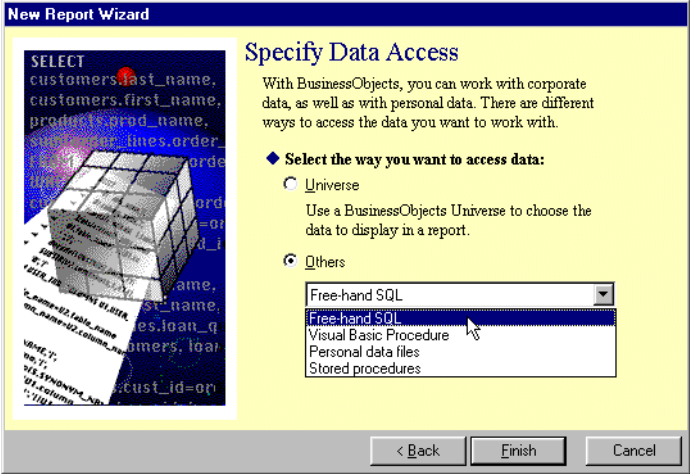
To create a report using free-hand SQL:



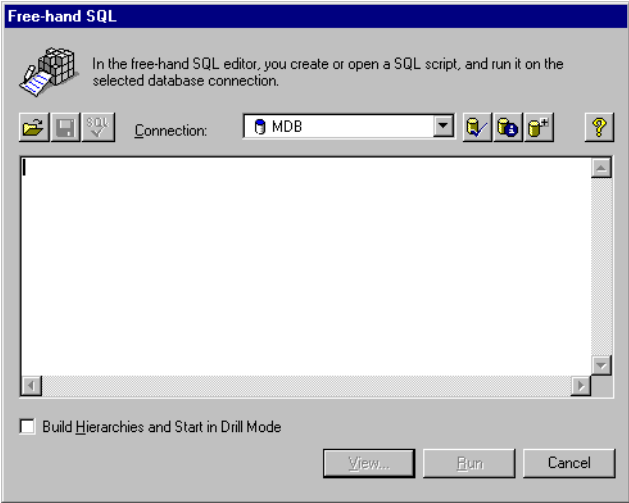
New Report Wizard

1. Click the New Report Wizard button on the Standard toolbar. The New Report Wizard appears.
2. Select an option for the report layout, then click Next. The Specify Data Access dialog box appears.

3. Under *Others*, click *Free-hand SQL*, then click *Finish*:



The Free-hand SQL editor appears:



4. The next step depends on what you want to do:

If you want to...	First...	Then...
Write a new SQL script	Type the script.	Go to the next step.

If you want to...	First...	Then...
Open an existing script	In the Free-Hand SQL editor, click Open: 	Use the dialog box that appears to locate the SQL script file.



Parse

- Click the Parse button to check the script for SQL errors.

Note: COMPUTE statements in free-hand SQL scripts will not be executed.

ORDER BY statements in free-hand SQL scripts are not executed. In order to apply a sort on a query, you need to order the columns in the SQL statement. You can also arrange the column order in reports.



Create a new connection

- To make a connection to the database:
 - Select a connection in the *Connection* list box, or
 - Click the *Create a new connection* button.
For the steps to follow, refer to “Creating or editing a connection for free-hand SQL” on page 131 below.
- Check *Build Hierarchies and Start in Drill Mode* if you want to perform drill down analysis as soon as the data appears in the report.
- Click Run.
The data from the SQL script appears in the report.

Editing a free-hand SQL script

To get different results from a free-hand SQL script that you’ve already run, all you have to do is edit the script then rerun it. Here’s how to do it:

- Open a report containing data from a free-hand SQL script, then select the Edit Data Provider command on the Data menu.
 - If the List of Data Providers dialog box appears, click the script you want to edit, then click OK.
 - The SQL script appears in the Free-Hand SQL editor.



Parse



Save

2. Make the necessary changes to the script. As you work, you can:
 - Click Parse to check the script for SQL errors.
 - Click View to see the raw data the script retrieves.
 - Click Save to keep the changes you make.
3. Click Run.
BUSINESSOBJECTS retrieves the new data and displays it in the report.

Tip: You can also get different data by running an existing free-hand SQL script on a different database connection. To do this, select a different connection box in the Free-Hand SQL editor. Refer to “Creating or editing a connection for free-hand SQL” below for more information.

Creating or editing a connection for free-hand SQL

To get data by using free-hand SQL, you need to define a connection to your database in BUSINESSOBJECTS. This is not the case when you run queries on universes, as the connection required is delivered with the universe.

Working in the Free-Hand SQL editor

You create and edit connections for free-hand SQL in the free-hand SQL editor. You work in the editor in the following ways:

- When you create a new report using the New Report Wizard
- When you insert a new table, crosstab or chart in an existing report by running a free-hand SQL script (Table/Crosstab/Chart commands, Insert menu), or
- When you edit a free-hand SQL script by selecting the Edit Data Provider command on the Data menu.

Once inside the Free-Hand SQL editor, you’re ready to create or edit a connection.

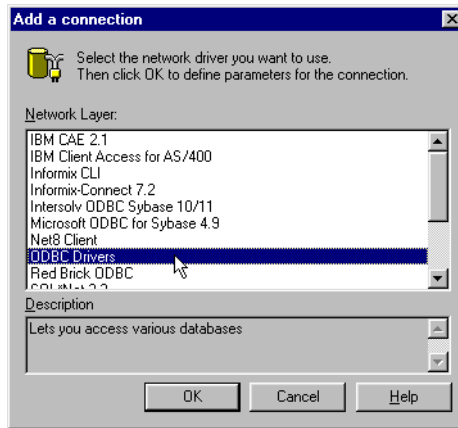
To create a connection

1. In the Free-Hand SQL editor, click the *Create a new connection* button. The Add a Connection dialog box appears.



Create a new
connection

2. Click the network layer for the connection, then click OK:



The dialog box that appears depends on the network layer you selected.

3. Type a name in the Name box, and select the RDBMS to use in the Database Engine list box.
4. Enter the connection parameters in the Login Parameters box. These parameters are specific to the database you are going to connect to. Database-specific information is provided in the online help, which you can access by clicking the Help button in the dialog box.
5. In the Type list box, select Personal or Shared.
 - *Personal* means only you can use the connection.
 - *Shared* means that you can share the connection with other users.
6. Click the Advanced tab to enter further parameters for the connection.
7. Click Test to check that the connection is correctly defined, then click OK.

To edit an existing connection



Edit connection

1. In the Free-Hand SQL editor, select the connection in the *Connection* list box, then click the *Edit connection* button. The dialog box that appears lets you change the parameters for the connection. The dialog box title depends on the driver and the database you're using.
2. Make the necessary changes, for example change the data source, or select different options in the Advanced tab.

3. Click Test, then click OK.

You can now:

- Click Run to run a script against the connection.
- Click View to get the raw data the new connection retrieves for the current script, which can be useful if you've changed data source.
- Click Cancel to save the connection for later use.

Customizing free-hand SQL scripts

Free-hand SQL lets you run new or existing SQL scripts to retrieve data for your reports. You can customize scripts so that they prompt users to filter the data retrieved by selecting values from lists of values.

Creating a prompt with a list of values for a free-hand SQL script

A prompt is a question that incites users to select values when they run queries. In this way, users filter the query to get the data that's pertinent to them.

On top of that, a prompt can call a list of values which enables users to select values rather than typing them in a text field. The list of values shows users exactly what values they can work with, and prevents them from typing data incorrectly.

In free-hand SQL, you can add a prompt and a list of values to a SQL script. This section provides:

- The syntax required for creating a prompt with a list of values.
- A step-by-step procedure.
- An example.

Syntax for prompts and lists of values in free-hand SQL

The SQL that creates the prompt and the list of values must appear in the WHERE clause. The syntax is as follows:

```
@prompt('prompt','data type',{ 'value','value', etc. },mono/  
multi,free/constrained)
```

The following table describes each argument. Below the table you will find a sample script containing a prompt that calls a list of values.

Argument	Description	Default
@prompt	<p>The function that enables you to create the prompt for the free-hand SQL script. This function can take up to five arguments. The only mandatory argument is 'prompt'. If this is the only argument, the syntax is as follows:</p> <pre>@prompt('Which year? ', , , ,)</pre> <p>In this case, BUSINESSOBJECTS uses default values for the other arguments.</p> <p>The above syntax can be replaced by</p> <pre>@variable('Which year?')</pre>	N/A
prompt	<p>Text that appears when you run the SQL script. The prompt appears in a dialog box and incites the user to enter pertinent values such as years or customer names.</p> <p>This argument takes a character string inside single quotes ('), for example</p> <pre>'Which customer?'</pre>	None
data type	<p>Refers to the type of data that the list of values returns (character, number or date). This argument takes a character:</p> <ul style="list-style-type: none"> • A for character type, • N for numbers and • D for dates. <p>This argument is optional.</p>	A
value, value etc.	<p>Indicates the list of values that will be called when you run the script. This argument takes up to a maximum of 256 character strings inside single quotes ('), for example</p> <pre>'Chicago', 'New York', 'San Francisco'</pre> <p>This argument is optional. If you do not use it, no list of values is available and you will have to enter values manually when you run the scripts.</p>	None

Argument	Description	Default
mono/multi	Specifies whether or not users have the right to select more than one value from the list of values. This argument takes one of the following parameters: <ul style="list-style-type: none"> • mono, which does not allow multiple selection. • multi, which allows multiple selection. 	mono
free/ constrained	Specifies whether or not users have the right to enter values manually. This argument takes one of the following parameters: <ul style="list-style-type: none"> • free, which lets users enter values manually. • constrained, which forces users to select values from the list of values. 	free

Here's an example of a free-hand SQL script which prompts users to select a value from a list.

Example Prompting users to select a year when they run a free-hand SQL script

The following free-hand SQL script prompts the user to select one year (1996, 1997 or 1998) from the list of values. How?

- The *mono* argument restricts the selection to one value.
- The *constrained* argument forces users to select the value from the list.

Note: This script will work with a Microsoft Access database.

Here's the script:

```
SELECT
    Customer.last_name,
    Service.Service,
    Reservations.res_date
FROM
    Customer,
    Service,
    Reservations,
    Reservation_Line
WHERE
    ( Customer.cust_id=Reservations.cust_id )
    AND ( Reservation_Line.res_id=Reservations.res_id )
    AND ( Reservation_Line.service_id=Service.service_id )
    AND (Format(Reservations.res_date,'YYYY') = @prompt('Which
Year?', 'A', {'1996', '1997', '1998'}, mono, constrained))
```

.....

To create a prompt with a list of values in a free-hand SQL script

1. Display the SQL script in the Free-Hand SQL editor, either by creating a new report or by selecting the Edit Data Provider command on the Data menu in a report that was created using free-hand SQL.
2. In the WHERE clause, after the table.column statement for which you want to create a prompt with a list of values, type the prompt. Refer to “Syntax for prompts and lists of values in free-hand SQL” on page 133 if necessary.
3. Click Run.
The prompt appears in a dialog box.
4. Type or select the value(s) you need, then click OK.
The data appears in the report.

Using Personal Data Files

Personal data files are a type of data provider that enables access to data in Microsoft Excel spreadsheets, dBASE files, and text files.

What are the benefits of using personal data files?

The main benefits of using personal data files are as follows:

- You can display corporate data next to personal data in the same report.
For example, you can compare your company's budget (corporate data) with your own running costs (personal data). You can obtain such a report by building a query to retrieve the corporate data, then by inserting a new table that displays data from a personal data file.
- If you have no connection to a remote database or if there is no RDBMS at your site, you can use personal data files as your only data source.
- You can use BUSINESSOBJECTS reporting and analysis features to work on data that comes from other applications.

Creating a report using a personal data file

Creating a report from a personal data file is a two-stage procedure:

- First, you specify the personal data file that you want to use for the report. This is described under “Selecting the personal data file for the report”, below.
- Second, you set options that depend on the type of file you selected in the first stage. For example, the options to set for a spreadsheet are different from those for a text file. This is described under “Setting options for a personal data file” on page 140.

Selecting the personal data file for the report

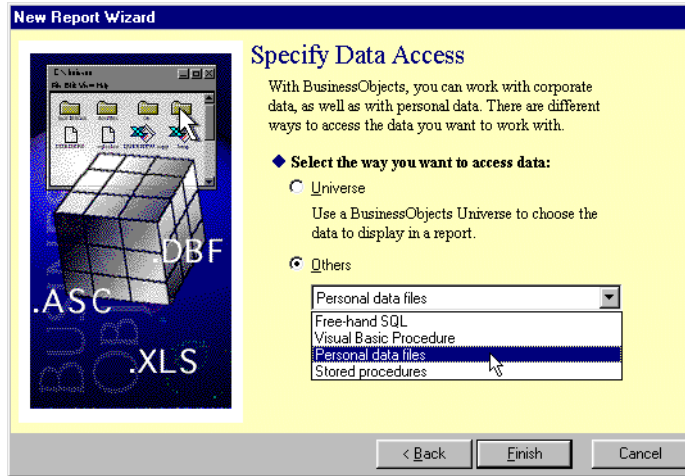
Here's how to use the New Report Wizard to get to the personal data file containing the data you need:



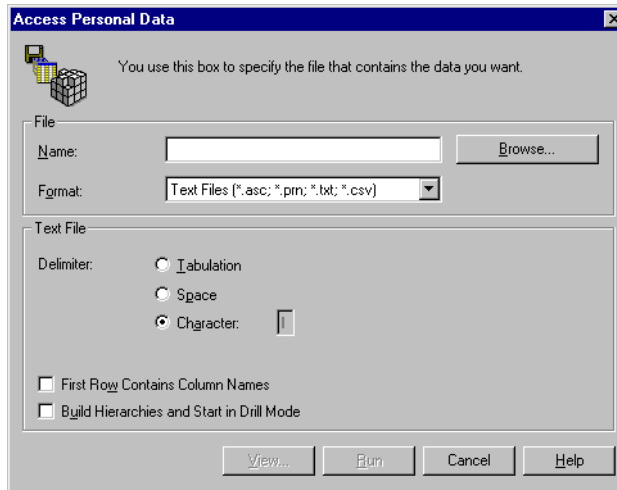
New Report Wizard

1. Click the New Report Wizard button on the Standard toolbar.
The New Report Wizard appears.
2. Select an option for the report layout, then click Next.
The Specify Data Access dialog box appears.

3. Under *Others*, click *Personal data file*, then click Finish:

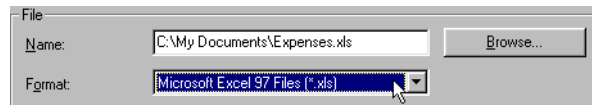


The Access Personal Data dialog box appears:



4. Click Browse to locate the file that contains the data you want.
 - The Open a File to Access Personal Data dialog box appears.
 - When you have located the file and closed the dialog box, the path to the file appears in the Name field of the Access Personal Data dialog box.
 - The Format field displays the format of the file you selected.
 - The options in the dialog box are now specific to the file type you're working with.
 - If you've selected a dBASE file, no further options are available so just click Run.

Note: BUSINESSOBJECTS supports Microsoft Excel 97 files. When using this type of file, you must make sure that the Format field displays *Microsoft Excel 97 Files (*.xls)*:



If you're using a Microsoft Excel 95 workbook, select *Microsoft Excel Files (*.xls)* in the Format field.

5. Set the options you want (refer to “Setting options for a personal data file” on page 140 for more information).
6. Check *Build Hierarchies and Start in Drill Mode* if you want to perform drill down analysis as soon as the data appears in the report.
7. Click Run.
The data from the personal data file appears in the report.

Setting options for a personal data file

In the Access Personal Data dialog box, BUSINESSOBJECTS displays options that are relevant to the format of the file you have selected. Other options are available irrespective of the file format. The table below describes each option in detail.

File format	Options available	Description
All Files (*.*)	<i>First Row Contains Column Names</i>	The first row of data in the file appears as column headings in the BUSINESSOBJECTS report. This option is not available for dBASE files.
	<i>Build Hierarchies and Start in Drill Mode</i>	Creates hierarchies that you will use in the report to analyze data in drill mode. BUSINESSOBJECTS can create hierarchies automatically only if the dimensions you use in the personal data file have a logical structure (Year, Quarter, Month for example). When the report appears, drill mode is active, and you can immediately begin analyzing data.
Text Files (.asc; .prn; .txt; .csv)	Delimiter <ul style="list-style-type: none"> • Tabulation • Space • Character 	Lets you indicate the way the data is delimited in the text file. The default settings per file type are as follows: <ul style="list-style-type: none"> • (.asc) • space (.prn) • tabulation (.txt) • semi-colon (.csv)

File format	Options available	Description
Microsoft Excel (.xls) Microsoft Excel 97 (.xls)	<i>Sheet Name</i>	Lists the worksheets from the file you selected, and lets you select the worksheet containing the data you want.
	<i>Field Selection</i> <ul style="list-style-type: none"> • All Fields • Range Definition • Range Name 	<p>Lets you specify fields of data in the worksheet.</p> <p>Retrieves all the data from the worksheet.</p> <p>Retrieves the data from the range of cells you indicate (e.g., A1:Z20 for Microsoft Excel.)</p> <p>Retrieves the data from a range defined in the worksheet.</p>
dBASE	No dBASE-specific options are available	

Using Visual Basic for Applications Procedures

A VBA data provider is a powerful and flexible tool accessing external data. Very often you will want to access automation servers through VBA to retrieve their proprietary data. VBA allows you to retrieve data from various sources: ADO, DAO, RDO, Application Object Models, EDK, low-level APIs, etc.

To create a VBA data provider, you write a VBA procedure which takes the interface `DpVBAInterface` as a parameter. You can write this procedure from within the VBA environment of `BUSINESSOBJECTS`. `DpVBAInterface` is the interface to the VBA data provider Automation object which is described in detail in the *BusinessObjects SDK Reference Guide*.

The procedure for writing a VBA data provider is:

1. Create a connection to the data source.
2. Create a data cube.
3. Set the data cube dimensions.
4. Populate the cube with data from the data source.

Once the data cube is populated, you can generate a report based on this data in `BUSINESSOBJECTS`.

Creating a report using a VBA data provider

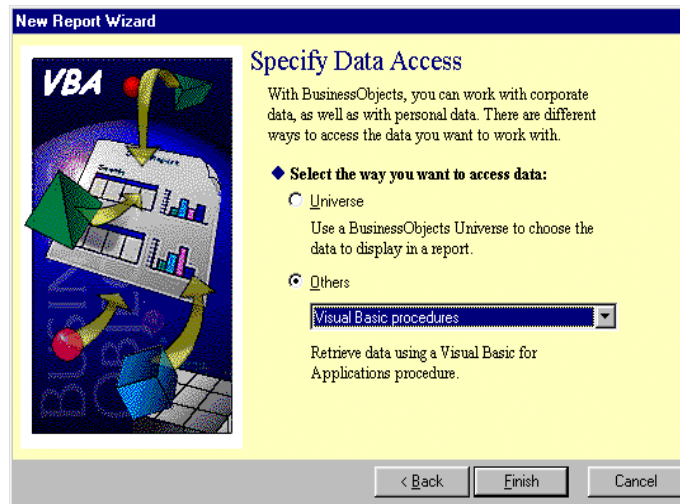
To create a report using a VBA data provider:

1. Click the New Report Wizard button on the Standard toolbar.
The New Report Wizard appears.

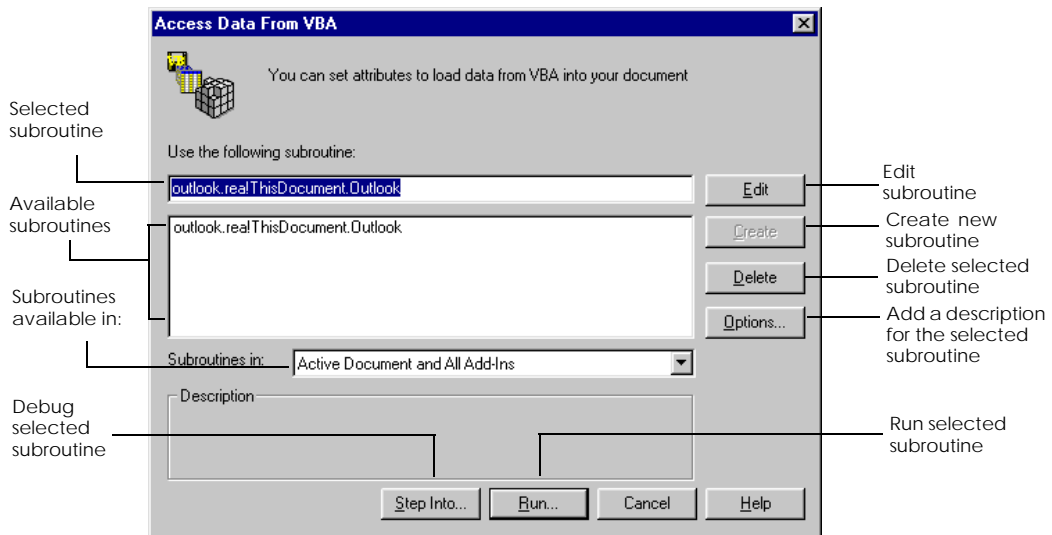


New Report Wizard

2. Select an option for the report layout, then click Next. The Specify Data Access dialog box appears.



3. Under *Others*, click *Visual Basic procedures*, then click Finish. The Access Data From VBA dialog box appears:



4. Type the name of the new VBA subroutine you wish to write and click Create. The Visual Basic Editor opens on the skeleton of the subroutine. The subroutine is always created in ThisDocument.
5. Compile the project and select Close and Return to BUSINESSOBJECTS from the File menu.
6. Select the subroutine in the Access Data from VBA dialog box, and click Run.

Example **Accessing Email data using VBA**

In this example we will create a BUSINESSOBJECTS report containing details of the last ten messages to arrive in a Microsoft Outlook Inbox.

You will need to have Microsoft Outlook 97 or a later version installed.

Referencing the Microsoft Outlook object library

To access Microsoft Outlook with VBA, you need to reference the Microsoft Outlook Object Library. To do this:

1. In the BUSINESSOBJECTS Visual Basic Editor, from the Tools menu, select References...
2. Select Microsoft Outlook Object Library, and click OK.

This enables you to use the Microsoft Outlook programming tools in your VBA data provider.

Declarations

The subroutine that you create in the Access Data from VBA dialog box has a single argument, `dpInterface`. This is an interface to the VBA data provider. (For details of `DpVBAInterface` see *BusinessObjects SDK Reference Guide*.)

A comment is automatically added showing you where to insert your code.

```
Sub Outlook(dpInterface As DpVBAInterface)
    ' TODO: Add VBA Data Provider code here.
    ' For information, refer to DpVBAInterface online help.
End Sub
```

The following variables are then declared:

```
Dim olkApp As Outlook.Application
Dim nspNameSpace As NameSpace
Dim objInboxFolder As Object
Dim objMail As Object
```


Accessing the Inbox

The class `olkApp` is initialized as follows:

```
Set olkApp = CreateObject("Outlook.Application")
```

Then `nspNameSpace` is set to point to the Messaging API:

```
Set nspNameSpace = olkApp.GetNamespace("MAPI")
```

The variable, `objInboxFolder`, is set to point to the Outlook Inbox:

```
Set objInboxFolder = nspNameSpace.GetDefaultFolder _  
    (olFolderInbox)
```

Creating the data cube

The following code instantiates the cube object.

```
dpInterface.UserString(1) = "User String for Outlook Data _  
    Provider"  
  
Dim oCube As DpVBACube  
Set oCube = dpInterface.DpVBACubes.Item(1)
```

The number of columns in the data cube is set to 7, and `oCol` is declared as a column.

```
Dim oColumns As DpVBAColumns  
Set oColumns = oCube.DpVBAColumns  
oColumns.SetNbColumns (7)  
Dim oCol As DpVBAColumn  
Dim i As Integer
```

We now set about constructing each column.

Creating the columns

First, the variable `oCol` is set to point to a new column. It is assigned a name, a type, and a qualification.

```
' 1st column
Set oCol = oColumns.Item(1)
oCol.Name = "From"
oCol.Type = boCharacterObject
oCol.Qualification = boDimension
```

Next, the first ten `SenderNames` of the Inbox are assigned to corresponding Items in `oCol`.

```
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.SenderName
Next i
```

This is repeated for each column:

```
' 2nd column
Set oCol = oColumns.Item(2)
oCol.Name = "To"
oCol.Type = boCharacterObject
oCol.Qualification = boDimension
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.To
Next i
```

```
' 3rd column
Set oCol = oColumns.Item(3)
oCol.Name = "Cc"
oCol.Type = boCharacterObject
oCol.Qualification = boDimension
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.CC
Next i
```

```
' 4th column
Set oCol = oColumns.Item(4)
oCol.Name = "Subject"
oCol.Type = boCharacterObject
oCol.Qualification = boDimension
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.Subject
Next i

' 5th column
Set oCol = oColumns.Item(5)
oCol.Name = "Size"
oCol.Type = boNumericObject
oCol.Qualification = boMeasure
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.Size
Next i

' 6th column
Set oCol = oColumns.Item(6)
oCol.Name = "Created"
oCol.Type = boDateObject
oCol.Qualification = boDimension
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.CreationTime
Next i

' 7th column
Set oCol = oColumns.Item(7)
oCol.Name = "Received"
oCol.Type = boDateObject
oCol.Qualification = boDimension
```

```
For i = 1 To 10 'objInboxFolder.Items.Count
    Set objMail = objInboxFolder.Items.Item(i)
    oCol.Item(i) = objMail.ReceivedTime
Next i
```

Finally, we perform a check to ensure all the data is present and correct. If it is not, the procedure is cancelled and an error message is returned:

```
dpInterface.CheckDataIntegrity (boCheckAll)
```

You should now compile this code and select Close and Return to BUSINESSOBJECTS from the File menu, to create your report.

.....

Chapter 6

Combining Data From Different Sources

In this chapter

- ❑ **Overview 150**
- ❑ **Which Data Sources Are Available? 151**
- ❑ **Including Data from Different Sources in the Same Report 151**
 - Which data providers can you combine in one report? 152
 - Using separate data providers for separate blocks in one report 152
 - Displaying data from separate data providers in the same block 154
- ❑ **Linking Data Providers 158**
 - What situations require you to link data providers? 158
 - Deleting the link between data providers 163
- ❑

Overview

The data you need may not all come from the same source. For example, you may have business objectives in a corporate database and personal data that you store in a spreadsheet. BUSINESSOBJECTS enables you to combine data from different sources in the same report.

This chapter explains

- The different data sources you can use
- How to include data from different sources in the same report
- When BUSINESSOBJECTS automatically links data from different sources, and when you have to make the link yourself.

Which Data Sources Are Available?

BUSINESSOBJECTS lets you access data from a wide range of sources. You can access data from

- Relational databases (RDBMS), such as ORACLE, Microsoft SQL Server, and Informix.
- Multidimensional (OLAP) servers such as Microsoft OLAP Services, ORACLE Express, and IBM DB2.
- Text files and spreadsheets.
- Packaged applications such as SAP.
- Virtually any data source using Microsoft Visual Basic for Applications (VBA) procedures.

Including Data from Different Sources in the Same Report

You access data sources in BUSINESSOBJECTS by building data providers for the data sources. To include data from different sources in the same report, you display data from different data providers. For example, if you want to display data from a SYBASE database and a Microsoft Excel file in the same report, you could retrieve the data from the SYBASE database by building a query or by using a stored procedure and retrieve the data from Excel by accessing a personal data file. BUSINESSOBJECTS supports the following types of data providers:

- Queries on universes
- Stored procedures
- Free-hand SQL
- Personal data files
- VBA procedures
- OLAP servers
- SAP

Which data providers can you combine in one report?

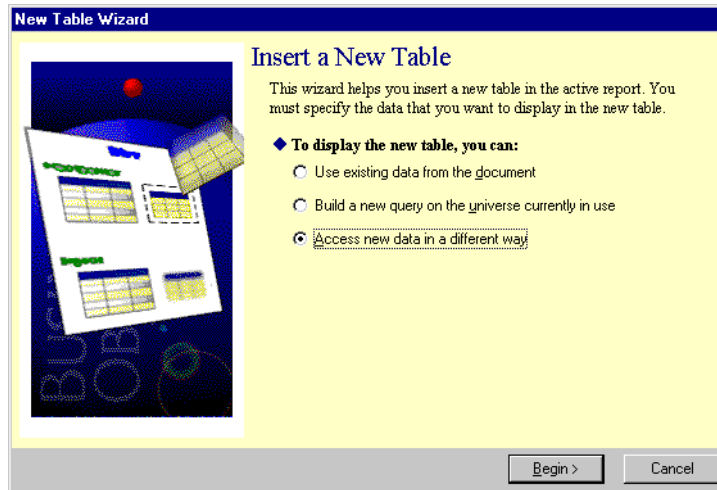
You can combine data from any BUSINESSOBJECTS-supported data provider with data from any other BUSINESSOBJECTS-supported data provider in a single report. For example, in a report that displays data from a query on a universe, you can build a new query on a different universe. You can also use a different type of data provider: a stored procedure, a free-hand SQL script, a personal data file, or an OLAP server.

Using separate data providers for separate blocks in one report

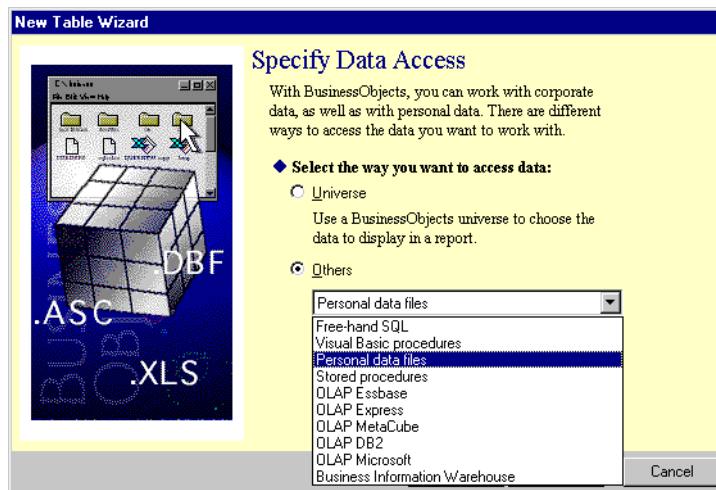
You can display data from separate data providers in one block or separate blocks in a BUSINESSOBJECTS report. To display data from separate data providers in one block, you first create a separate block with the separate data provider and then combine data from the blocks. To create a separate block in a report using a separate data provider, follow this procedure.

1. Open a report.
2. Click the Table command (or the Crosstab command or the Chart command) on the Insert menu.
Your choice depends on the type of block you want to insert.
3. With your mouse, draw a rectangle where you want the new block to appear. When you release the mouse button, a wizard appears. Which wizard (New Table, New Crosstab, or New Chart) appears depends on the command you clicked on the Insert menu.

- To use a separate data provider, click *Access new data in a different way*, then click Next. The New Table wizard with *Access new data in a different way* selected is shown in the following figure.



The Specify Data Access screen appears. The Specify Data Access screen is shown in the following figure.



- Click the type of data provider you want to use, then click Finish. The editor for the data provider appears.

6. Define and run the data provider.

BUSINESSOBJECTS can automatically link data providers. BUSINESSOBJECTS prompts you to link the new data provider with the existing data provider if:

- No *common* dimension exists between them. BUSINESSOBJECTS will automatically link two data providers without prompting you if both have a dimension with the same name, belonging to the same universe. BUSINESSOBJECTS will prompt you to link data providers if they both have a dimension named “Year,” but one data provider comes from a universe and the other comes from an Excel spreadsheet.

- And, the new block is in a section.

The new data appears in the new block.

Further information

For further information on linking data providers, refer to the section Linking Data Providers on page 158.

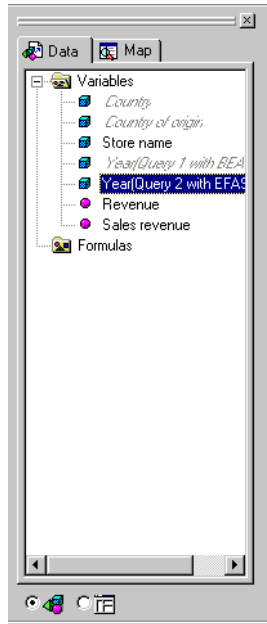
Displaying data from separate data providers in the same block

Once you have created a separate block in a report from a separate data provider and you manually or BUSINESSOBJECTS automatically has linked the data providers, you can display data from the separate data providers in one block. You can do any of the following:

If	Then
you want to display data in an existing table or crosstab,	use the Pivot tab in the Table Format dialog box.
you want to display data in an existing chart,	use the Pivot tab in the Chart Format dialog box.
you want to display data in any type of existing block,	use the Slice and Dice Panel.

Which variables from linked data providers can you display?

Compatibility rules determine which variables from separate data providers can be combined in the same block. When you cannot include a variable in a block, it appears dimmed and italicized as shown in the following figure.

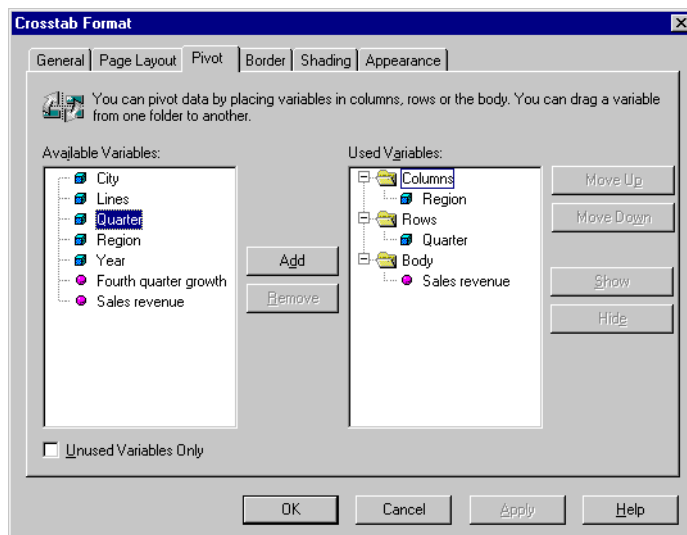


You can use the common dimension from either data provider. Most often, you can use measures from both data providers in the same block.

Displaying data in an existing table or crosstab

1. Click inside the table or crosstab that you want to modify with data from another data provider.
2. Click the Table command or the Crosstab command on the Format menu.

3. In the Table Format dialog box, click the Pivot tab, then click Variables.



4. In the Used Variables box, click the folder that represents where you want to display the data: Columns, Rows, Body.
5. In the Available Variables box, click the variable you want to add, then click Add.
6. Click OK.

Displaying data in an existing chart

1. Click inside the chart that you want to modify with data from another data provider.
2. Click the Chart command on the Format menu.
3. In the Chart Format dialog box, click the Pivot tab.
4. In the Used Variables box, click the folder that represents the axis where you want to display the data: Columns, Rows, Body.
5. In the Available Variables box, click the variable you want to add, then click Add.

6. Click OK.

In 2-D charts, all the variables are located in the X-Axis and Y-Axis folders. In 3-D matrix charts, the variables are located in all three folders: X-Axis, Y-Axis, and Z-Axis.

Adding data in slice and dice mode



Slice and Dice

1. With a report open, display the Slice and Dice Panel.
Variables for all the blocks in the report are displayed in the Available Variables box.
2. Drag the icon of the variable you want to add to the report from the Available Variables box and drop it either in the Section box or in the Block Structure box.
3. Repeat the previous step for other variables you want to add.
4. Click Apply.

Linking Data Providers

Linking data providers enables data from different sources to be computed in the same table, crosstab, or chart in a report.

What situations require you to link data providers?

BUSINESSOBJECTS automatically links data providers with a common dimension. Two dimensions in separate data providers are common when they belong to the same universe and have the same name. BUSINESSOBJECTS prompts you to link data providers if there is no common dimension between the data providers.

Tip: If you simply want to add columns of data to a report, use the Edit Data Provider command on the Data menu instead of building a new query. This method lets you add result objects to the initial query; BUSINESSOBJECTS automatically inserts the new columns of data in the report or creates a new report.

Example

BUSINESSOBJECTS prompts you to link data providers

Here's an example scenario where BUSINESSOBJECTS prompts you to link data providers:

- You create a new document by running a query on a universe.
 - You format the report as a master/detail, using for example the Year dimension.
 - You want to compare yearly revenue with your sales targets, so you insert a new table in the Year section.
 - Rather than inserting data from the document, or using the universe you ran the first query on, you pull in data from the spreadsheet that contains your personal targets.
 - Even though the spreadsheet contains the Year column, BUSINESSOBJECTS prompts you to link the personal data file with the query already in the report, because you're inserting the new data in a section that's generated by the query data.
-

Which dimension should act as the link?

It is necessary that the dimension you use to link data providers be the same type (numeric or alphanumeric) in both data providers. If not, two rows of data will appear for the linked object when you create a table that uses the object.

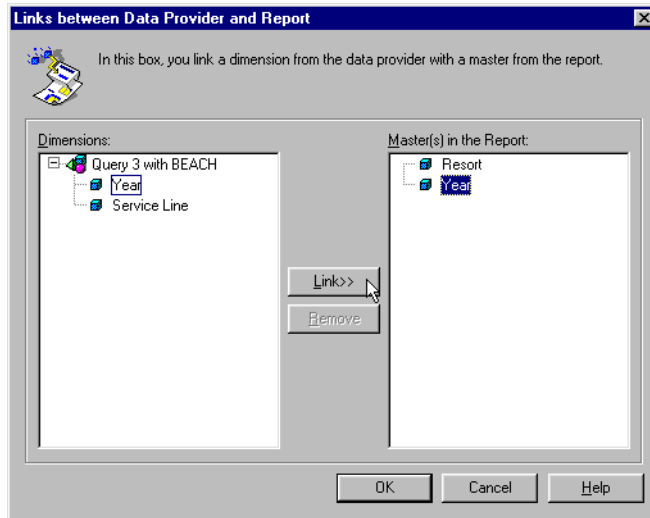
Additionally you should use only dimensions that return the same type of values. It doesn't make sense to create a link between dimensions with totally different lists of values (Year and Region, for example).

To link data providers when you're inserting a new block

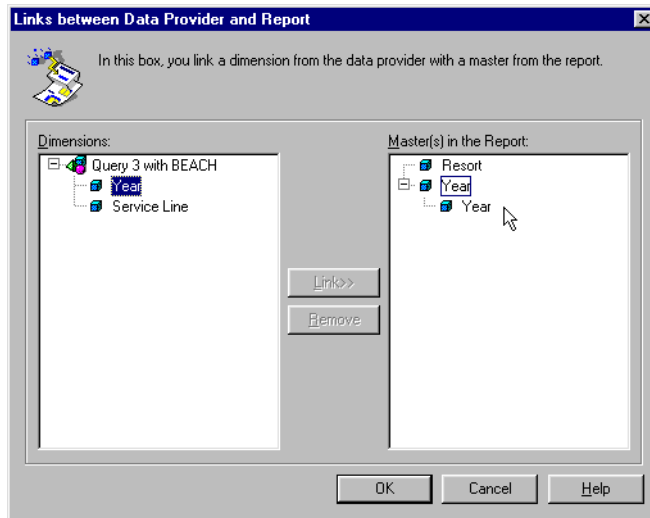
1. Select the Table, Crosstab or Chart command on the Insert menu.
2. In the Wizard that appears, select *Access new data in a different way*, then click **Begin**.
The Specify Data Access dialog box appears.
3. Select the type of data provider you want to run, then click **Finish**.
4. Build and run the data provider.
BUSINESSOBJECTS displays a dialog box which prompts you to link the new data provider with the data in the report.

5. To make the link:

- Select the linking dimension from the new data provider by clicking an icon in the Dimensions box.
- Select the report's section master by clicking an icon in the Master(s) in the Report box.
- Click Link:



The dimension you clicked in the Dimensions box appears below the dimension in the Master(s) in the Report box:



6. Click OK.

The new data appears in the report. Measures are automatically calculated.

Note: If the Links Between Data Provider and Report dialog box appears, and you click OK or Cancel without creating a link, you will obtain a Cartesian product.

Linking existing data providers

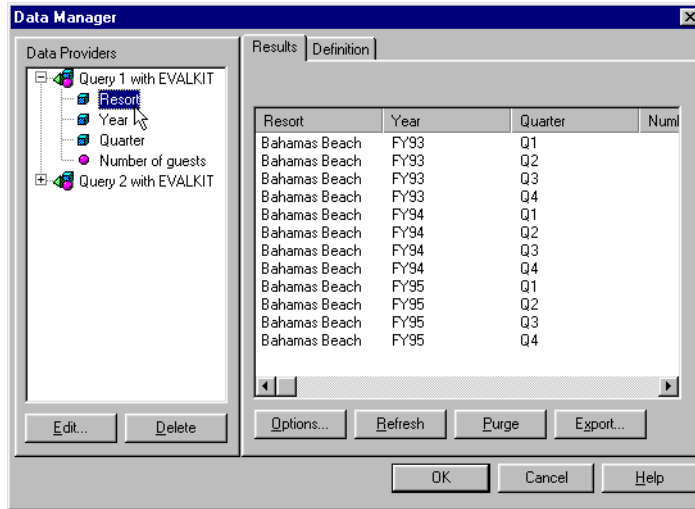
The procedure above describes how to link data providers when you're bringing new data to a report section. But what if you find yourself in the following situation?

- Your report contains two tables - one from a universe, the other from a personal data file.
- There's no link between the tables because when you inserted the second table, you simply placed it alongside the existing table without having previously linked their data providers.
- You now want to create the master/detail format, which is possible because the tables share a dimension with the same name and same type.

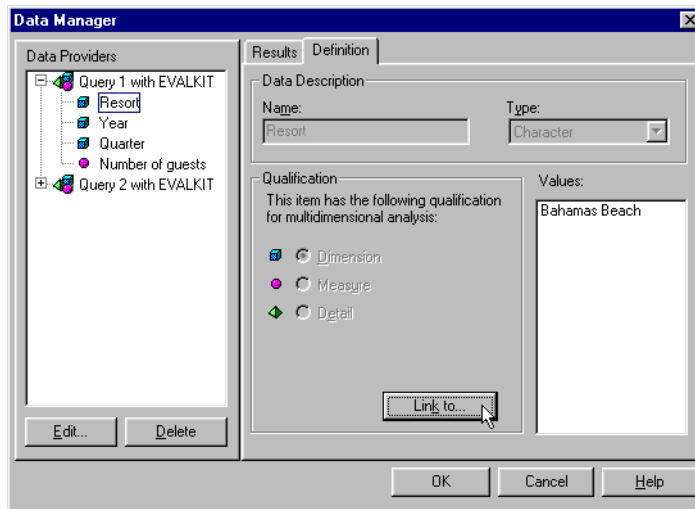
The procedure for linking existing data providers is as follows:

1. Open the document containing the data providers you want to link.
2. Select the View Data command on the Data menu.
The Data Manager appears.

- In the Data Providers box, click the dimension you are going to use as the link between the data providers.
In the illustration below, the Resort dimension has been selected:

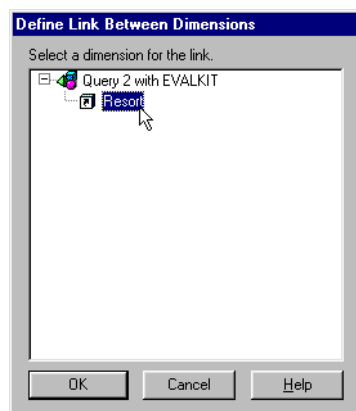


- Click the Definition tab, then click the Link To button:



The Define Link Between Dimensions dialog box appears. It lists the dimensions you can use to link the two data providers.

- Click the dimension you want to use as the link.
The symbol next to the dimension name now changes to indicate that the dimension is the link between two data providers:



This symbol will also now appear when you click the dimension in the Data Manager.

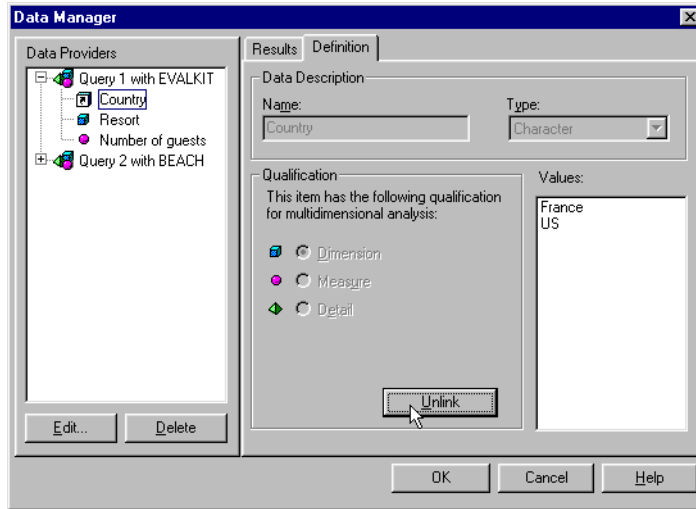
- Click OK to close the dialog box, then click OK in the Data Manager.
You can now use the linking dimension to apply a master/detail format in the report.

Deleting the link between data providers

To delete the link between data providers, you delete the link of the common dimension that links the data providers. You would delete the link between data providers to use all the variables in a single data provider to build an independent query. The procedure for deleting the link of the common dimension is as follows:

- Select the View Data command on the Data menu.
The Data Manager appears.
- In the Data Providers box, click the dimension that acts as the link.

3. Click the Definition tab, then click Unlink:



4. Click OK to close the Data Manager.

Chapter 7

Managing Data Providers

In this chapter

- ❑ **Overview 166**
- ❑ **Renaming Data Providers 167**
 - Why rename data providers? 167
 - To rename data providers 168
- ❑ **Getting Statistics on Data Providers 170**
- ❑ **Purging and Deleting Data Providers 171**
- ❑ **Using Data Providers Efficiently 173**
- ❑

Overview

In what ways can you manage queries and other data providers in BUSINESSOBJECTS documents? This chapter answers that question by describing how to:

- Rename data providers
- Get statistics such as the date and time a data provider was last refreshed, and how many rows of data were returned
- Empty data providers of their data (called *purging*), and deleting data providers you no longer need.

Reminder: *Data provider* is the BUSINESSOBJECTS generic term for all types of queries: queries on universes, stored procedures, free-hand SQL, personal data files and VBA procedures.

Renaming Data Providers

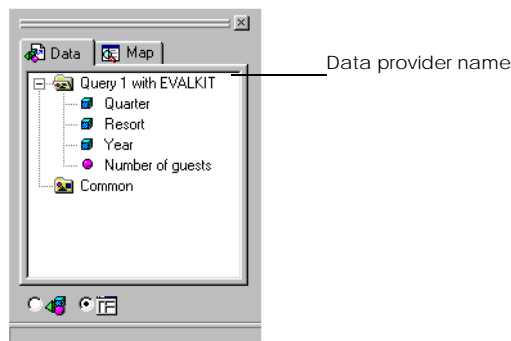
BUSINESSOBJECTS assigns a name to all data providers. Here are some examples:

Data provider name	Description
Query 1 on EVALKIT	The first query built on the EVALKIT universe in the current document.
PS1 on Stock	Stored procedure run on a database account called Stock.
SQL 1 with Sales	A free-hand SQL script run on a database connection named Sales.
PD1 in C:\My Documents\Forecast.xls	Personal data coming from a spreadsheet stored in My Documents.
VBA 1 with ThisDocumentApp	The first VBA data provider built in the current document, where ThisDocumentApp is the name of the VBA macro itself.

Why rename data providers?

Renaming data providers is by no means required in BUSINESSOBJECTS. You can work with the software without ever thinking about these names!

However, data provider names appear in several places in BUSINESSOBJECTS, e.g., in the Report Manager:



Here are a few cases where you might want to rename data providers.

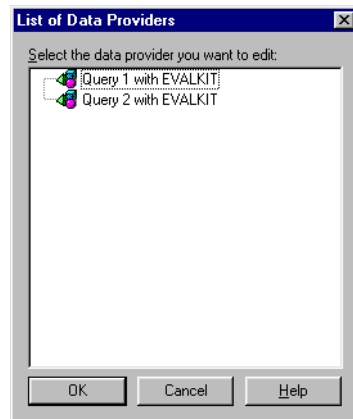
Documents with data from different sources

In documents containing two or more data providers, the names of variables may also contain the name of the data provider that they belong to. For example, Resort (Query 2 on EVALKIT) is the Resort dimension from the second query built on the EVALKIT universe.

This additional information only appears if the data providers in the document contain variables with the same name. In such cases, to help you distinguish between variables with the same name, which in fact come from different data sources, BUSINESSOBJECTS automatically inserts the full variable name, e.g., Resort (Query 2 on EVALKIT) in column headings in the report.

Selecting the data provider you want to edit

Editing a data provider in a document with multiple data providers also causes each data provider's name to appear. When you select the Edit Data Provider command on the Data menu, you are prompted to select one data provider in the following dialog box:



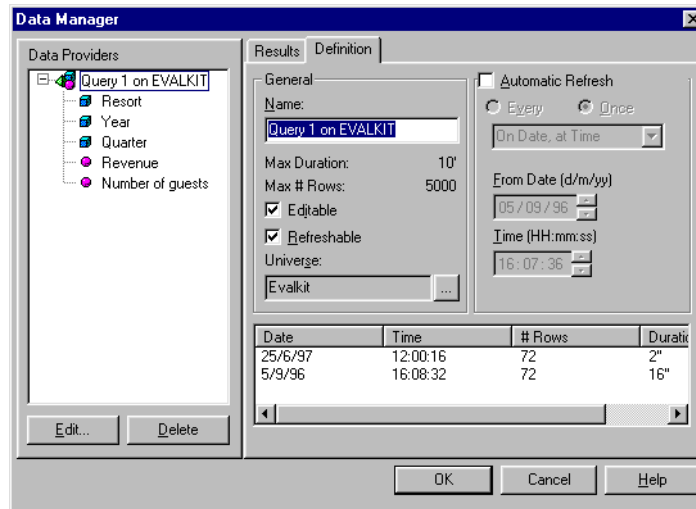
Giving data providers more meaningful names can help you know right away which one you want.

To rename data providers

You rename data providers in the Data Manager. Here's how to do it:

1. Open the document containing the query you want to rename.
2. Select the View Data command on the Data menu.
The Data Manager appears.

- Click the icon of the data provider you want to rename, then click the Definition tab:

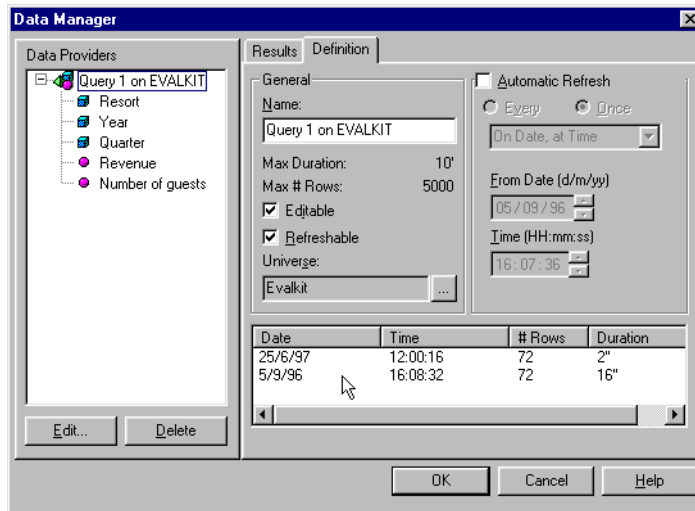


- Type the new name in the Name box, then click OK.

Getting Statistics on Data Providers

BUSINESSOBJECTS allows you to find out useful information on data providers, such as when a query was last refreshed, how many rows of data a personal data file returned, and how long it took to refresh a free-hand SQL script. To get these statistics:

1. Open the document containing the data provider.
2. Select the View Data command on the Data menu.
The Data Manager appears.
3. Click the icon of the query you want to find out about, then click the Definition tab.
The information appears in the bottom right corner of the dialog box:



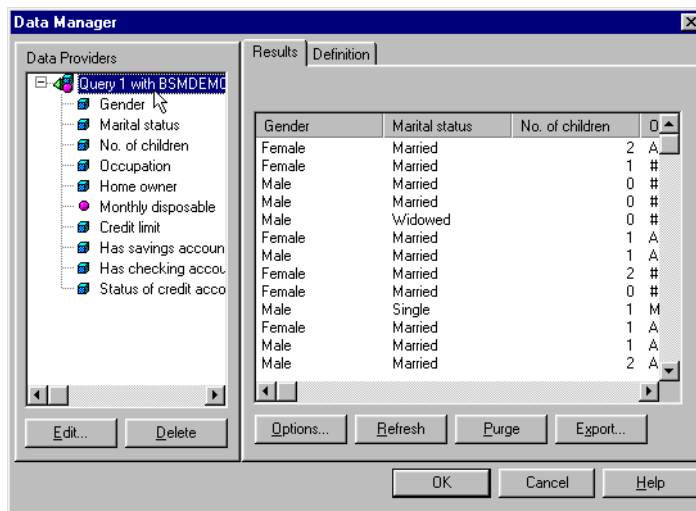
Purging and Deleting Data Providers

What's the difference between purging and deleting a data provider? *Purging* means emptying a data provider of its results, whereas *deleting* means getting rid of the data provider for good - an action which cannot be undone.

So, why purge or delete a data provider? Purging reduces the size of a document, so is useful when you want to send the document to other users, or save it on a diskette, for example. You should only delete a data provider, however, if you are certain that you and other users no longer need it.

To purge or delete a data provider:

1. Open the document containing the data provider.
2. Select the View Data command on the Data menu.
The Data Manager appears.
3. Click the icon of the query you want to purge or delete:



4. Click Purge or Delete.

5. Click Yes in the confirmation box that appears, then click OK to close the Data Manager.

Tip: You can populate a purged data provider by selecting the Refresh Data command on the Data menu. Note that this command refreshes all the data providers in the active document.

Using Data Providers Efficiently

If you have multiple reports on separate report tabs and these reports draw their data from the same source, you do not need to create a separate data provider for each report. Instead you create a “base” data provider that contains the data used by all the reports. This approach is better because BUSINESSOBJECTS performs one data retrieval for each data provider; it is more efficient to retrieve data once and share it among reports than to retrieve the same data several times.

Example Create reports showing revenue by country and resort, and revenue by country

In this example the Revenue and Country objects are common to both reports. Instead of creating a data provider for each report you create a data provider containing the Revenue, Country, and Resort objects and use these objects in both reports. To do this:

1. Create a report showing revenue by country and resort by dragging the Country, Resort and Revenue objects into the report. (See “Building a Basic Query on a Universe” on page 60 for an explanation of how to build a report on a universe.)
2. Add an additional report tab by selecting Insert > Report.
3. Drag the Country and Revenue objects to the new report tab to create the revenue by country report.

When you run this report, BUSINESSOBJECTS retrieves the data once and shares it between the two reports rather than retrieving the data twice.

Note: You can use the Query Panel to modify a data provider by selecting Data > Edit Data Provider. Do this rather than create a new data provider if you wish to add a new report to a new tab and the new report uses the same or similar data to your existing report(s).

Chapter 8

Exporting Data From BusinessObjects

In this chapter

- ❑ **Overview 176**
 - What external formats are available? 176
 - Copying and pasting from BusinessObjects to another application 176
- ❑ **Exporting Data From BusinessObjects 178**
 - TXT file display 180
- ❑

Overview

Exporting data from BUSINESSOBJECTS enables you to use it in other applications. All you have to do is save the result of a data provider in a format that is recognized by the application you want to use.

What external formats are available?

You can export data from BUSINESSOBJECTS to the following formats:

- Text.

You can open the text file in many different applications, and on platforms other than Windows (Macintosh, OS/2 or UNIX, for example).

- Spreadsheet format (Microsoft Excel).

When you view the exported data in the spreadsheet application, each value appears in a separate cell.

- RDBMS format (including .dbf format for dBASE).

When you export data from BUSINESSOBJECTS to RDBMS format, you create a relational table in the database. The table contains the columns of data returned by the data provider.

This feature enables you to extract a subset of data from a very large table, then export the result to your RDBMS. Once exported, the data can be retrieved by running a data provider in BUSINESSOBJECTS. The universe designer can build a new universe, or edit an existing universe, to map to the data in the new table. Alternatively, you can access the data directly by using free-hand SQL.

Copying and pasting from BusinessObjects to another application

You can copy objects such as tables and charts in BUSINESSOBJECTS, or copy the whole report contents, and then paste them into a Microsoft Office application, for example, such as Excel or Word.

To copy and paste an object:

1. Hold down the Alt key and click the table you want to copy.
2. Press Ctrl C.
3. Move to the target application.
4. Press Ctrl V.

Copying and pasting a whole report

You can also copy a whole report and then paste the report data either as images, for presentation purposes, for example; or as text so that you can work on the data further in the target application. The table below summarizes how you can copy and paste different types of report components:

If you copy a report with....	You can...
Tables, crosstabs and cells	Paste the data in them as an image or as text
Charts and images	Paste them as images

Example Copying and pasting from BUSINESSOBJECTS to Microsoft Excel

The following example shows how to copy data from BUSINESSOBJECTS to Microsoft Excel:

1. From the Edit menu, choose Copy All.
BUSINESSOBJECTS copies the contents of the currently active report to the clipboard.
2. Open the Microsoft Excel workbook where you want to paste your data.
3. From the Edit menu, choose Paste Special.
4. Choose how you want to paste the data.

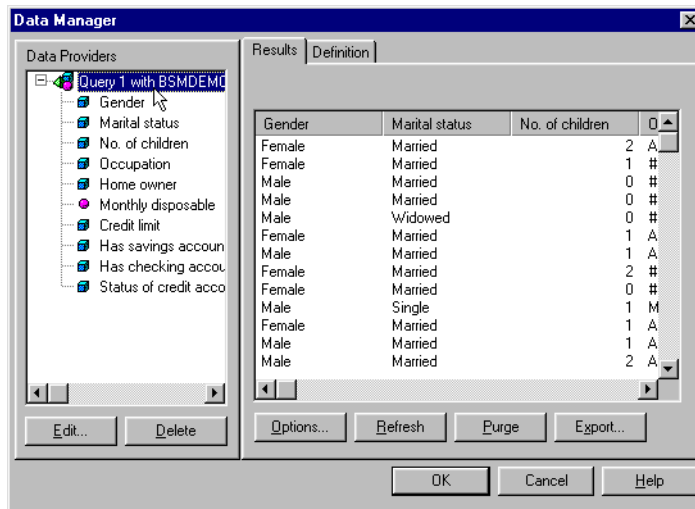
Choose...	To....
Text	Copy the clipboard contents as data that you can then work on in Excel.
Picture	Copy the clipboard contents as a Picture image. For example, a BUSINESSOBJECTS table is copied as an image and you will not be able to work on the data. This is the recommended format for pasting images.
Bitmap	Copy the clipboard contents as a Bitmap image. If you choose to paste a Bitmap image, bear in mind that this format can take up a lot of memory and disk space.

The clipboard contents are pasted into the Excel workbook.

Exporting Data From BusinessObjects

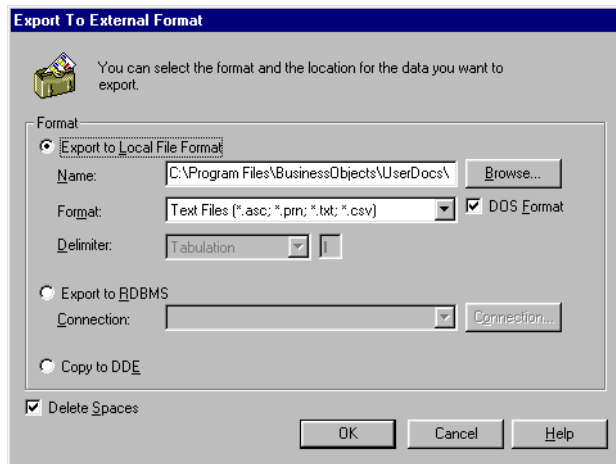
This section explains how to export data from BUSINESSOBJECTS to the format you need. Here's how to do it:

1. Open the report containing the data you want to export.
2. Click the View Data command on the Data menu.
The Data Manager appears.
3. In Data Providers box, click the icon of the data provider containing the data you want to export:



4. Click Export.

The Export to External Format dialog box appears:



5. Select the way you want to export the data.

The following table describes the options available and the actions required:

Option	Description	Actions
<i>Export to Local File Format</i>	Exports the data to a text, spreadsheet or dBASE file.	<ol style="list-style-type: none"> 1. Select the file type in the Format list box. 2. Click Browse to specify the file name and location. 3. If you are exporting the data to a text file, you can: <ul style="list-style-type: none"> • Change the delimiter by typing a different character in the Delimiter box • Check <i>DOS Format</i>. 4. Click OK.
<i>Export to RDBMS</i>	Exports the data to a relational database.	<ol style="list-style-type: none"> 1. Select the connection, or click the Connection button to create a new one. 2. Click OK.

Option	Description	Actions
<i>Copy to DDE</i>	Copies the data to the clipboard, enabling you to paste the data into another application such as Microsoft Excel.	<ul style="list-style-type: none"> Click OK.

Tip: Check *Delete Spaces* to get rid of blanks in the data you are exporting.

You can now use the data from BUSINESSOBJECTS in the applications that support the external format you selected.

Note: When you export to a local file, integers in the report appear as decimals in the file, e.g. 1 appears as 1.00.

Date settings and the year 2000

We strongly advise you to set a four-digit year style on the Date tab of the Windows Regional Settings Properties dialog box. This ensures that you will not lose century information if you are exporting data from BUSINESSOBJECTS to text files.

TXT file display

When you exported data to TXT files in versions prior to BUSINESSOBJECTS 4.1, character strings were surrounded by double quotes in addition to being set off by your selected delimiter. In BUSINESSOBJECTS 4.1 and later versions, there are no double quotes surrounding the character strings. For example, in versions prior to BUSINESSOBJECTS 4.1, you might have seen “jean” y “55” where y is the character delimiter. In BUSINESSOBJECTS 4.1 and later versions, this becomes jean y 55.



BUSINESS OBJECTS®



Part III

Creating Reports

www.businessobjects.com/services/infocenter

Chapter 9

Report Basics and Report Manager

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❑

Overview

This chapter covers the basics you need to know to work with BUSINESSOBJECTS.

Starting BusinessObjects

The way you start BUSINESSOBJECTS depends on how it has been set up in your company. You may be able to start BUSINESSOBJECTS from INFOVIEW via an Internet browser as well as from the Windows Start menu. Your system administrator will give you all the necessary information on how you should start your BUSINESSOBJECTS. Using BUSINESSOBJECTS via INFOVIEW is fully documented in the *InfoView User's Guide*. Starting BUSINESSOBJECTS from the Windows start menu is explained below.

Starting BusinessObjects from the Windows Start menu

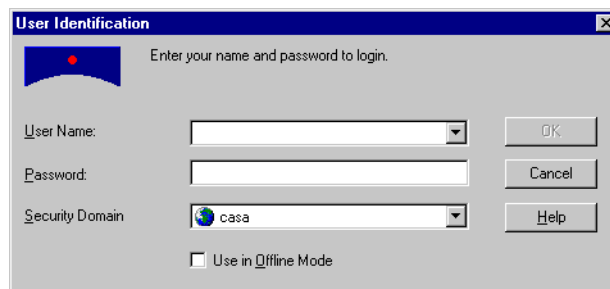
The way you log on to BUSINESSOBJECTS depends on the way BUSINESSOBJECTS has been set up in your company. When you start BUSINESSOBJECTS, you may have to enter a user name and password, and you may have to choose a security domain.

If this is the case, the user name, password, and security domain are assigned by your BUSINESSOBJECTS supervisor or system administrator.

To start BUSINESSOBJECTS:

1. Click the BUSINESSOBJECTS program icon in the BUSINESSOBJECTS group in the Programs menu.

The User Identification dialog box appears:

A screenshot of the 'User Identification' dialog box. The title bar reads 'User Identification' with a close button. Below the title bar is a blue header with a red dot and the text 'Enter your name and password to login.' The main area contains three input fields: 'User Name' (a dropdown menu), 'Password' (a text box), and 'Security Domain' (a dropdown menu showing 'casa'). To the right of these fields are three buttons: 'OK', 'Cancel', and 'Help'. At the bottom, there is a checkbox labeled 'Use in Offline Mode' which is currently unchecked.

2. Enter your user name and password, and choose your security domain, if applicable, and click OK.

3. The User Identification box closes and the BUSINESSOBJECTS window opens

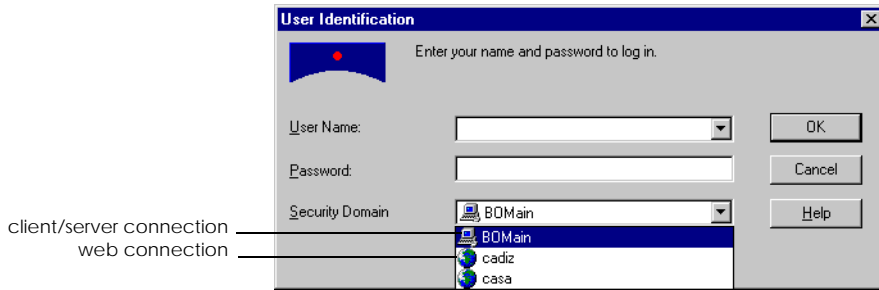
Note: In some configurations, the User Identification dialog box does not appear when you start BUSINESSOBJECTS.

Choosing a security domain

Depending on the way BUSINESSOBJECTS is set up in your company, you may have a choice of security domains. There are two types of security domain connection and the features available to you in BUSINESSOBJECTS may change according to the type of security domain you connect to. Certain menu items may become unavailable or you may not have access to all types of data provider or to the same list of universes.

The type of security domain connection is identified by an icon:

- A connection to a repository via a BUSINESSOBJECTS web connection is identified by a globe icon.
- A connection to a repository via a BUSINESSOBJECTS client/server connection is identified by a computer icon.



Using offline mode

Depending on how BUSINESSOBJECTS has been set up, you may have the option of starting BUSINESSOBJECTS in offline mode. Using BUSINESSOBJECTS in offline mode means that you are not connected to a repository which in turn means that, whatever your connection type, you will not be able to retrieve and send documents using BROADCAST AGENT. However, what you *can* do once you have opened BUSINESSOBJECTS in offline mode depends on the type of connection you chose to use in offline mode.

Client/Server connection

If you are using a BUSINESSOBJECTS client/server connection offline and not connected to a repository, you can still work with documents and universes stored locally on your computer and even create and refresh documents if you have a connection to the database, and the database connection and security information is stored on your computer.

Web connection

If you are using a web connection offline, you will not be able to retrieve documents from, and send documents to, Personal Document folders on the web server, and will not be able to create queries or refresh documents because all the database and connection information is stored on the web server.

In offline mode, you can continue to work on documents stored locally; you can work on the formatting of your reports or analyze data in existing reports, for example, and work with the data contained in the document to build new reports.

If BUSINESSOBJECTS cannot establish the connection you requested with the web server, it may give you the option of starting BUSINESSOBJECTS in offline mode if your user rights allow you to work offline.

No remote connection

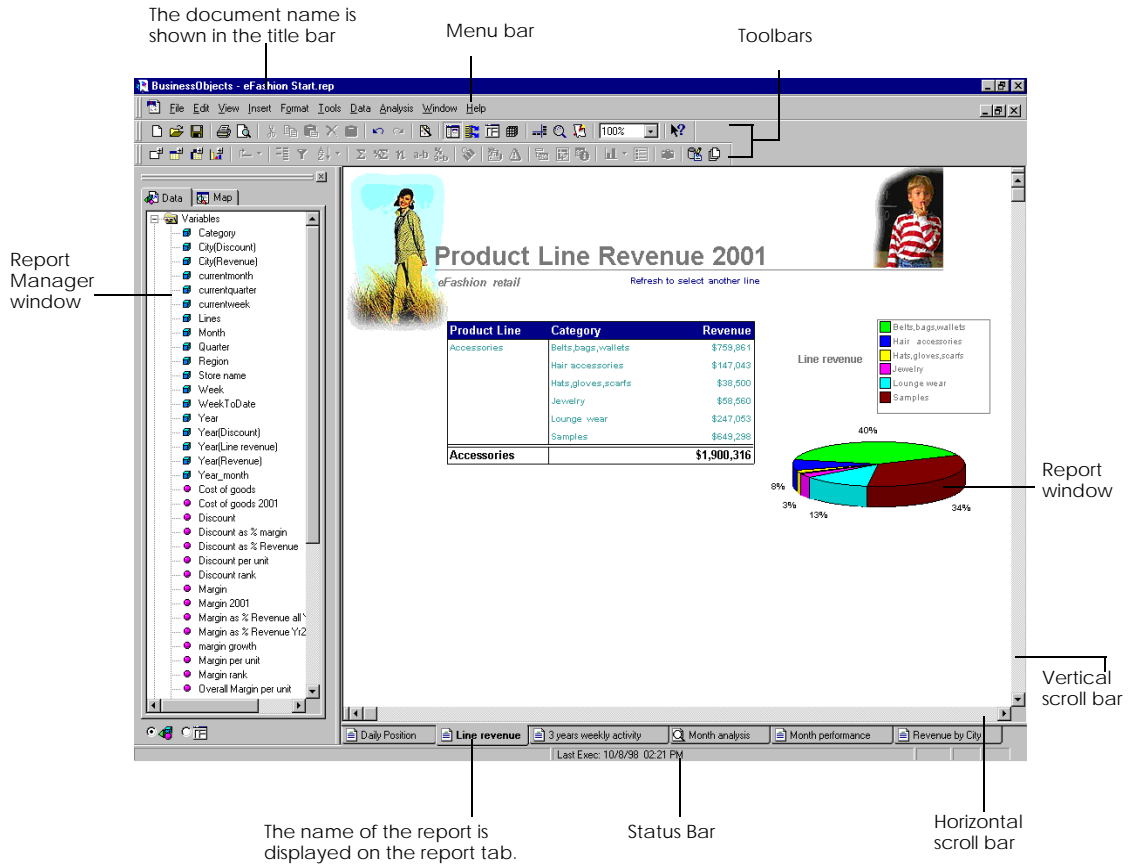
You may also choose to start BUSINESSOBJECTS in offline mode because you know you have no remote connection at all - for example, on a plane - and want to continue to work on documents you have stored locally.

Note: The right to use BUSINESSOBJECTS offline is given to you by your BUSINESSOBJECTS supervisor or system administrator. Depending on how BUSINESSOBJECTS has been set up in your company, you may not even have the option of logging on to BUSINESSOBJECTS in offline mode.

BusinessObjects Workspace

The BUSINESSOBJECTS workspace is illustrated below. BUSINESSOBJECTS has three main parts:

- the menus and toolbars
- the Report Manager window
- the report window

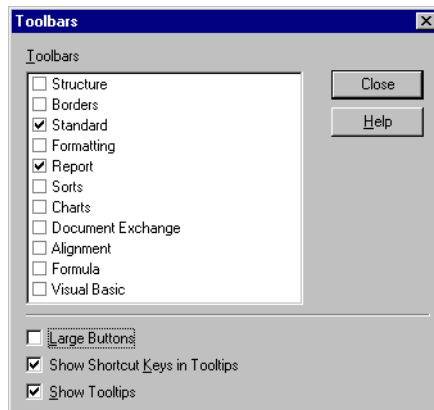


Menus and toolbars

The menus contain all the commands for the tasks you need to carry out in BUSINESSOBJECTS. Many of these commands also have buttons on one of the BUSINESSOBJECTS toolbars.

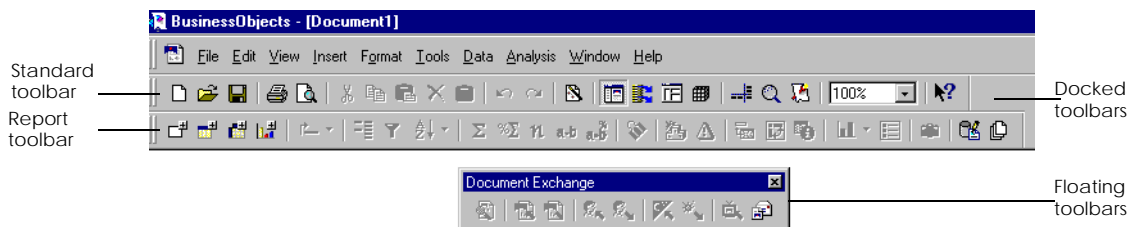
You can hide and display the toolbars as needed:

1. From the View menu, choose Toolbars.
The list of toolbars is displayed as shown below:



2. Check the ones you want to display and uncheck the ones you want to hide.
3. Click Close to close the toolbar window.

Tip: You can also display and hide toolbars by right-clicking on any toolbar. To display or hide a toolbar, click its name on the popup menu.

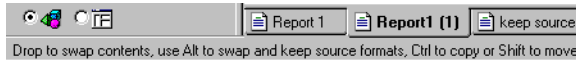


Status bar

The status bar, at the bottom, of the BUSINESSOBJECTS window, displays status and help messages.

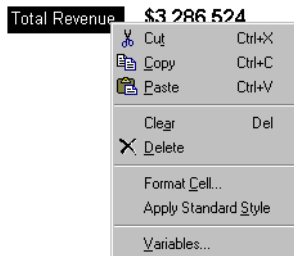
The help messages give a brief description of menu commands as you highlight them with your mouse cursor display instructions when you are carrying out certain actions to remind you of the options you have available.

The status messages give information such as the time the data in the report was last updated and information on what BUSINESSOBJECTS is currently doing, connecting to the database, for example, or loading a document.



Right-click menus

Commonly used options are available through context-sensitive menus. Right-click on the area that you want to work on to pop up a menu. The options in the menu only apply to the area you clicked on. This is a very quick and convenient way of accessing options.



When you right-click on a free-standing cell, only the options applicable to that type of cell are displayed in the menu.

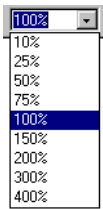
Keyboard shortcuts

Keyboard shortcuts are available for most menu and dialog box options. Keyboard shortcuts are given next to commands in the menus and sometimes in the tooltips. You also use keyboard combinations to carry out certain tasks. Watch the status bar for reminders on these shortcuts.

Organizing your workspace

This section describes the options you can set to customize how your BUSINESSOBJECTS workspace looks.

Setting the display size



You can magnify a part of the display to see it close up, or reduce the display to see more in the report window.

To change the size of the display:

- Click the arrow next to the zoom control box on the Standard toolbar and choose a value from the list.

You can also type a value directly into the zoom control box.

You can set values between 10% and 400%.

Setting Windows display properties

We advise you to avoid working with the large fonts that you can set in the Windows Display properties. If you use this setting, certain menu and dialog box labels may be truncated. We also recommend that, on the Appearance tab of the Display properties, you set the Scheme to Windows Standard.

Choosing a view to work in

You can view your reports on screen in different ways.

Structure

Structure view displays only the names of the variables, or the formulas you have in your report and not the associated data.

	=<Year>	Sum:
=<Lines>	=<Sales revenue>	=Sum(<Sales revenue>)
Sum:	=Sum(<Sales revenue>)	=Sum(<Sales revenue>)

A crosstab shown in Structure view

To switch Structure view on and off:

- From the View menu, choose Structure.

Page Layout

In Page Layout view, you can see how elements will be positioned on the printed page. You can also see the headers, footers and margins of your report. Some settings, such as page break settings, and the correct result of certain page functions can only be seen in Page Layout view.

The view switched on when you last closed the current document will also be switched on when you next open the document.

To switch Page Layout on and off:

- From the View menu, choose Page Layout.

Viewing a document created in BusinessObjects 4.1

BUSINESSOBJECTS 5.1 uses standard Microsoft fonts. BUSINESSOBJECTS 4.1 used fonts which are slightly different from standard Microsoft fonts.

If you're using documents created in BUSINESSOBJECTS 4.1, you can display and print data in the fonts used in BUSINESSOBJECTS 4.1 so that your documents retain the same look.

To do this:

1. From the Tools menu, choose Options.
The Options dialog box is displayed.
2. Click the General tab.
3. Check the option *Print as BusinessObjects 4.1*.

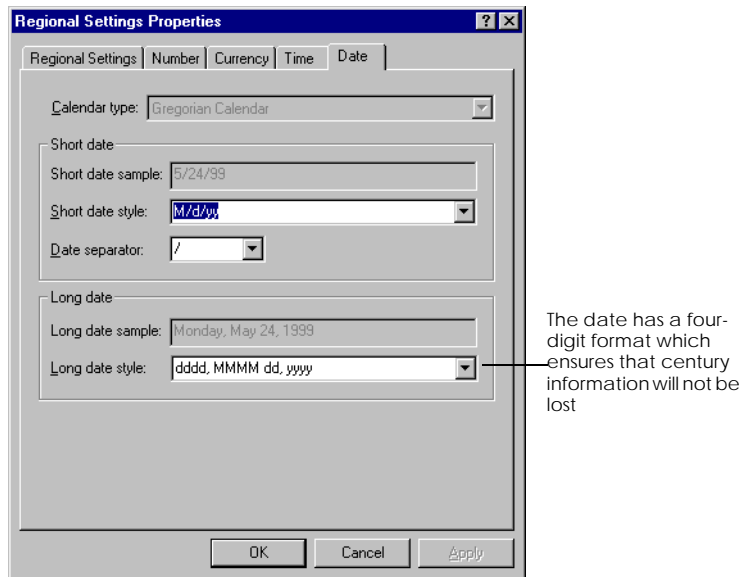
Note: When you check or uncheck this option, you may need to minimize and then maximize the BUSINESSOBJECTS document window to see the change in the display.

Regional settings

BUSINESSOBJECTS supports international settings. This means that the regional settings in the Windows Control Panel affect how BUSINESSOBJECTS displays and sorts numbers, currency, times and months in reports. Make sure these settings are correctly set.

To do this:

1. From the Start menu, choose Settings and then Control Panel.
2. Double-click on Regional Settings to open the Regional Settings dialog box.



In the illustration above, the regional settings have been set to United States English. This means BUSINESSOBJECTS will use US conventions for numbers, dates and times and will use the dollar sign as the default currency sign.

Date settings and the year 2000

We strongly advise you to set a four-digit year style on the Date tab of the Regional Settings Properties dialog box. This ensures that you will not lose century information if you are exporting data from BUSINESSOBJECTS to text files.

Report Manager

The Report Manager is a key part of the BUSINESSOBJECTS workspace from which you can manage many different aspects of your work.

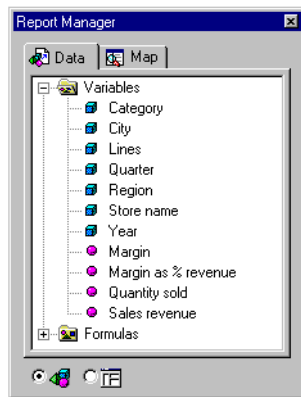
To display the Report Manager

You can show or hide the Report Manager window by using the button on the Standard toolbar.



Report Manager

- Click the Report Manager button on the Standard toolbar to display or hide the Report Manager window.



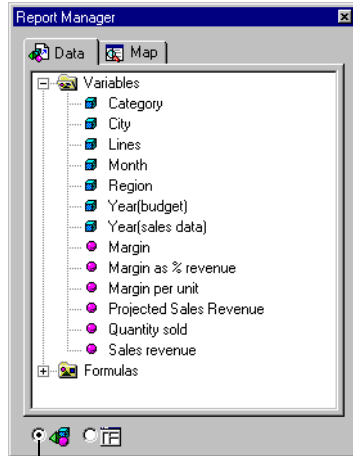
The Report Manager has two tabs. Each tab is used to manage a different aspect of your work in BUSINESSOBJECTS.

- The Data tab allows you to manage the variables and formulas contained in a BUSINESSOBJECTS document.
- The Map tab allows you to navigate through reports and to work on the structure and organization of reports and report components.

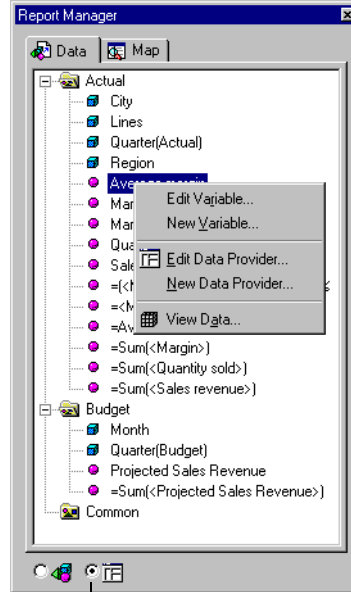
Tip: When the Report Manager window opens, it is docked on the left-hand side of your report window. You can undock the Report Manager window and drag it to any other convenient location on your screen. Hold down the Ctrl key while moving the Report Manager window to prevent it from docking

Managing the data in a document

The Report Manager Data tab contains a list of all the variables and formulas in the document. You can view the data list in two different ways:



View in alphabetical order



View by data provider

- In alphabetical order: in this view, the data in the document is listed in alphabetical order with the variables in the Variables folder and the formulas in the Formulas folder.
- By data provider: in this view the variables are grouped into the data providers from which they were returned.

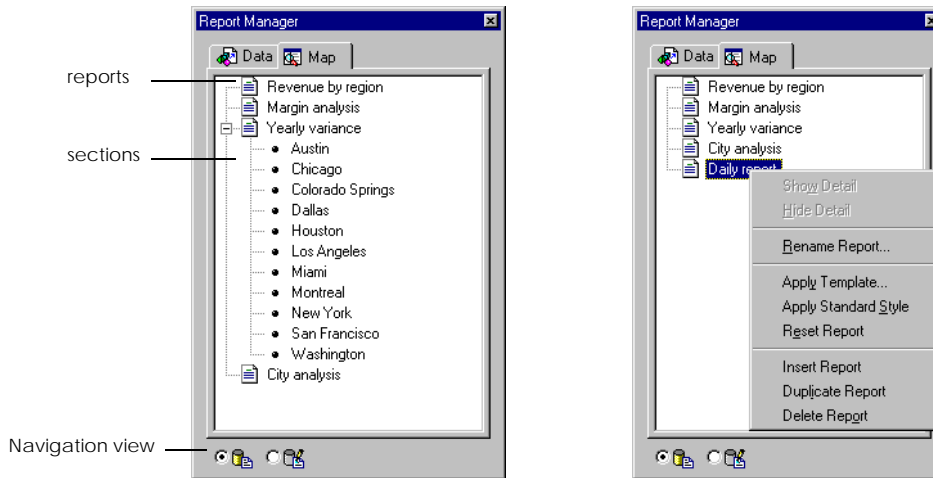
You can drag variables from this list and drop them into the report window to construct tables and other components in your report.

If you right-click on a variable in the list, a menu is displayed which allows you to:

- edit the data provider to bring in other data
- create a new data provider
- view the data
- open the Variables dialog box to create a new variable
- edit local variables

Navigating through reports

The Report Manager Map tab allows you to manage the structure of your document. It has two views.



In navigation view, a list of all the reports in your document is displayed. For the report currently displayed on your screen, section names are also displayed.

If you click on an item in the list in the Report Manager, the corresponding report or section is displayed in the report window.

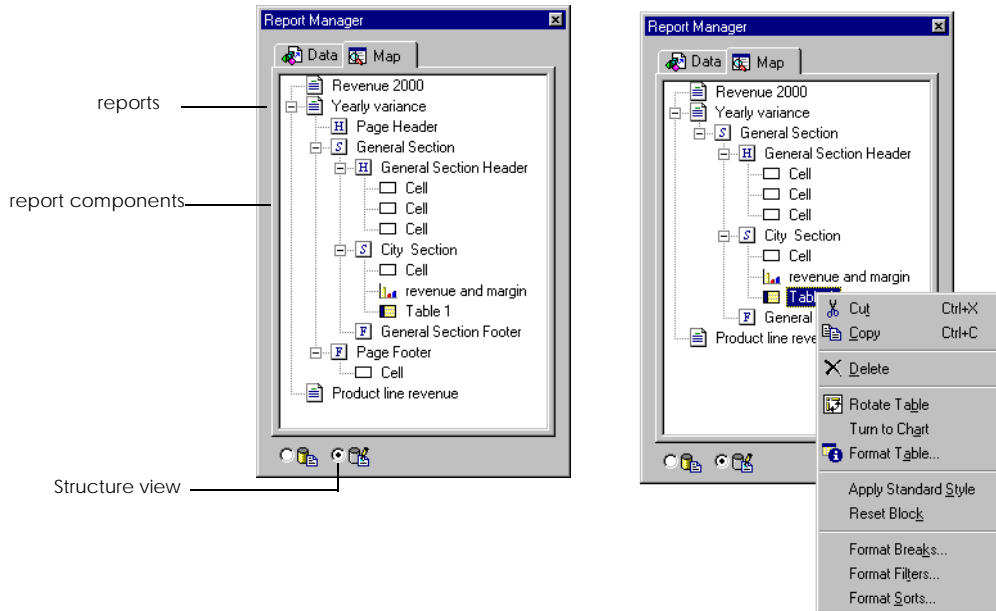
If you right-click on a report in the list, a menu is displayed which allows you to:

- rename, duplicate or delete the selected report
- apply a template or standard styles to the selected report
- insert a new report

Structuring and formatting reports

In structure view, the Map tab displays a list of all the reports in the document and a list of all the components in the selected report.

Each report component (header, section, cell, table, chart etc.) is represented by an icon and a name. The names of components hidden in the report are displayed in italics.



When you click on an icon in the Report Manager window, the corresponding section or component is displayed in the main report window.

If you right-click on an icon, a menu is displayed. If you right-click on a table icon, for example, you can:

- format the table
- turn the table to a chart
- format any breaks, sorts or filters applied to the selected table
- apply the standard report style
- copy, cut or delete the table

Managing Reports

This section describes how to manage reports inside a BUSINESSOBJECTS document.

Inserting a blank report

Creating a blank report enables you to design special features before you display any data in it. For example, you can work on the report's title or apply a page background first, then build a query or other data provider to display data in the report.

To create a blank report inside an existing document

- Select the Report command from the Insert menu.

A new, blank report appears inside the document

To insert a blank report by default

You can set BUSINESSOBJECTS to always create a blank report inside a new document when you select the New command from the File menu or click the New button on the toolbar. To do this:



New

1. Select the Options command from the Tools menu.
The Options dialog box opens.
2. Click the New Document tab.
3. Click *Systematically Create Blank Document*.
The next time you click the New button or select the New command from the File menu, a blank report inside a new document appears.

Copying a report

To make a copy of an existing report inside the document:

1. Right-click on the tab of the report you want to copy.
2. Choose Duplicate Report from the pop-up menu that appears.
A copy of the active report appears in a new tab inside the document. The name that appears in the tab is <<Report Namen +(1)>>. For example, if the report you copied is named Sales, the new report is named Sales (1).
Note that the Duplicate Report command is also available on the Edit menu.

Displaying, renaming and deleting reports

One document can contain many reports. Each report has a tab, which appears at the bottom of the document window:



To switch from one report to another

- Click the tab of the report you want to display.

To rename a report

1. Right-click the report tab.
2. Choose Rename Report from the menu.
3. In the dialog box that appears, type the name you want to give the report, then click OK.

The name you typed appears in the report's tab. Note that the Rename Report command is also available on the Format menu.

To delete a report

You can delete a report from a document if the document contains more than one report. You cannot delete the last report in a document.

1. Right-click the report tab.
2. Choose Delete Report from the menu.
A dialog box appears asking you to confirm or cancel that you want to delete the report.

To delete more than one report

1. Holding down the Shift key, click the tab of each report you want to delete.
2. Click your right-mouse button.
3. Choose Delete Report from the menu.

Note that the Delete Report command is also available on the Edit menu.

Note: You cannot undo the deletion of a report.

Managing reports using Report Manager

You can also manage reports directly from the Report Manager Map tab. See page 196 for information on how to do this.

Undoing actions



Undo/Redo

If you make a mistake or want to undo something you have just done because you are not pleased with the result, you can use the Undo button on the Standard toolbar.

- The Undo button lets you undo up to ten successive actions.
- The Redo button lets you redo up to ten previously undone actions.

To undo actions, you can also use the keyboard shortcut Ctrl + Z.

Opening Documents

BUSINESSOBJECTS 5.1 is fully compatible with:

- All documents created in BUSINESSOBJECTS 5.0 and 4.x
- BUSINESSQUERY documents
- WEBINTELLIGENCE documents

This section describes how to open these documents.

Restrictions on WebIntelligence and BusinessQuery documents

WEBINTELLIGENCE and BUSINESSQUERY documents that you open in BUSINESSOBJECTS appear with the standard BUSINESSOBJECTS document template. Formatting applied in WEBINTELLIGENCE and BUSINESSQUERY is lost.

Opening a document

If the document is stored locally on your computer:



Open

1. Click the Open button on the Standard toolbar.
The Open dialog box appears.
2. Choose the type of document you want to open from the *Files of type* list.
3. Locate the document you want to open and click OK.

Tip: BUSINESSOBJECTS keeps track of the last documents opened. These files are named at the end of the File menu. Just choose the file you want to open from the list.

Opening several documents at once

Opening several documents at once is useful if you have complex documents that take a long time to open. You can select all the documents you want to use and then get on with another task while you are waiting for them all to open.

To do this:



Open

1. Click the Open button on the Standard toolbar.
The Open dialog box appears.
2. Choose the type of document you want to open from the *Files of type* list.

3. Select the documents you want to open using the Shift key to select adjacent documents and the Ctrl key to select non adjacent documents.
4. Click OK.

Using Personal Document folders

The Personal Documents folder is reserved storage space on the web server where you can save documents for your personal use. Only you can use this folder. You will only have access to Personal Documents if you connect to BUSINESSOBJECTS via a web connection.

To help you organize and find your documents more easily, you can use categories. The categories you use here are personal categories and you are the only person who can create, delete and modify them.

You can view the documents saved in Personal Documents list either from BUSINESSOBJECTS or from INFOVIEW.

Note: For information on viewing personal document lists in INFOVIEW, see the *InfoView User's Guide*.

Retrieving a personal document

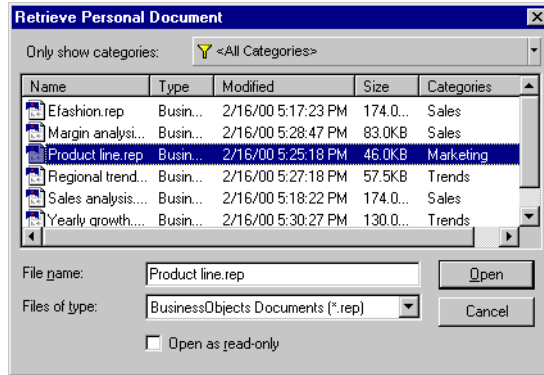
If you are connected to a BUSINESSOBJECTS web connection, you can retrieve documents you have saved in your personal documents folder on the web server.



Retrieve from
Personal Documents

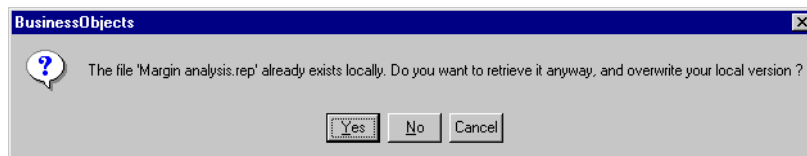
To retrieve a document saved in your personal documents folder:

1. From the File menu, choose Retrieve From/Personal Documents. The Retrieve Personal Document dialog box opens.



2. Select the file you want to open from the list and click Open. You can only retrieve one file at a time. A copy of the document is downloaded to your computer and opened.

Note: When you open a BUSINESSOBJECTS document from Personal Documents, BUSINESSOBJECTS copies the document locally. If you work on this document, save it in Personal Documents and then retrieve the same document during a different work session, BUSINESSOBJECTS displays the following message to tell you that you already have a document with the same name on your computer:



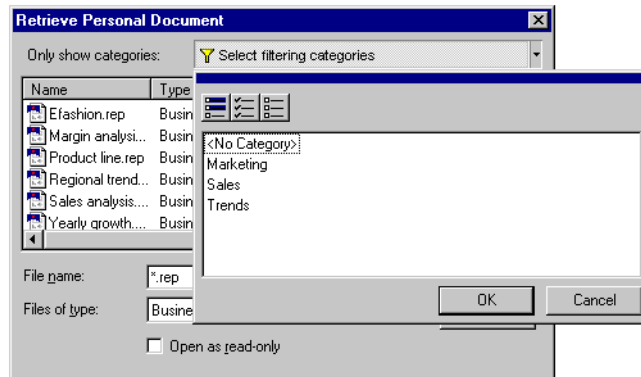
If you know that you saved the latest copy of this document in Personal Documents, you can quite safely overwrite the local copy.

Using categories to find personal documents

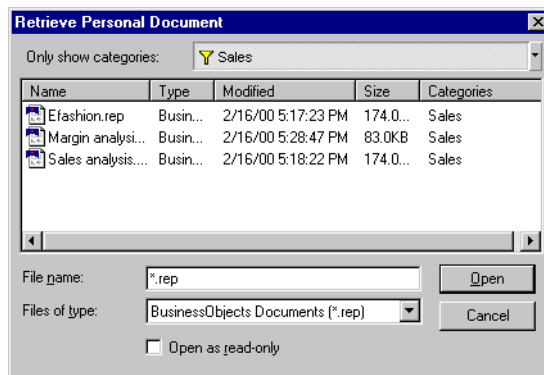
Documents can be assigned to filtering mechanisms called categories. Categories help you sort and find documents in your personal documents list by filtering the list to display only documents belonging to the selected category.

To filter the document list by category:

1. Click the arrow to the right of the All Categories button.
The Categories box opens. If you haven't created any categories, this list has one entry only, <No Category>.
2. Select one or more categories from the list.
Use the Shift and Control keys to make multiple selections. If you select <No Category>, BUSINESSOBJECTS filters the personal document list to display those documents to which no category has been assigned.



3. Click OK.
The list is filtered to display only the documents assigned to the selected category or categories.



Saving a document in your Personal Documents folder

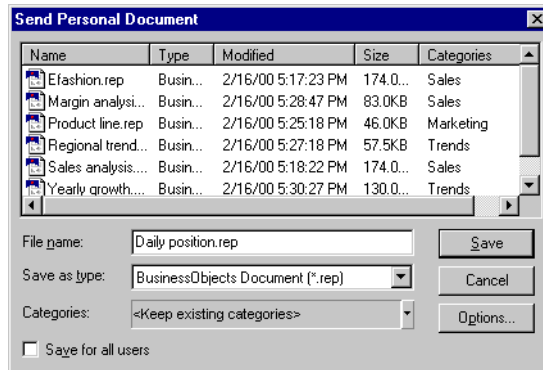


Send to Personal Documents

You can send a document to your personal documents folder if you are connected to a WEBINTELLIGENCE server.

To save a document in your personal documents folder:

1. From the File menu, choose Send to/Personal Documents.
The Send Personal Document dialog box opens:



2. Type a name for the document in the “File name” box.
3. In the *Save as type* list box, choose the format. Choices are:
 - BusinessObjects Document (*.rep),
 - Portable Document Format (*.pdf),
 - Rich Text Format (*.rtf),
 - Text Files (*.txt),
 - BusinessObjects Templates (*.ret),
 - BusinessQuery Files (*.bqy).
 - BusinessObjects Add-ins (*.rea)
4. Assign a category to the document if you wish.
5. Click Save.

The document is saved in your personal documents folder on the web server.

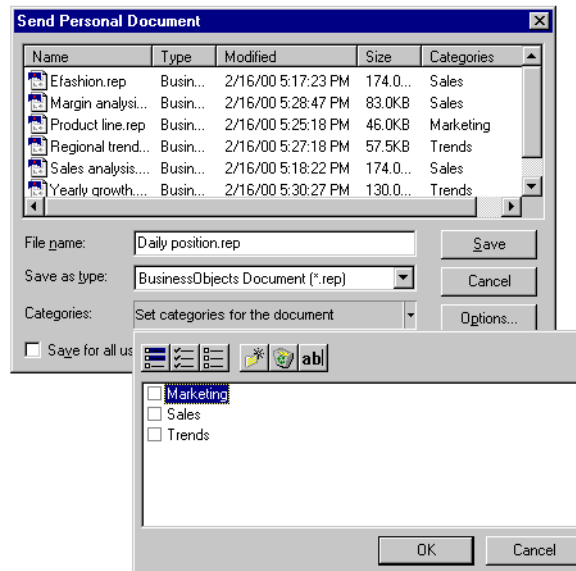
Deleting documents from your Personal Documents folder

If you want to delete documents from Personal Documents, you have to use the personal document list in INFOVIEW. For information on viewing the personal document list in INFOVIEW and deleting documents from it, see the *InfoView User's Guide*.

Assigning categories to a document

You assign categories to a document when you save it. When you are saving a document to which you've already assigned categories, BUSINESSOBJECTS displays <Keep existing categories> in the Categories box and saves the document with these categories unless you make any changes. To assign a category:

1. Click the arrow to the right of the Categories box.
The Categories box opens.



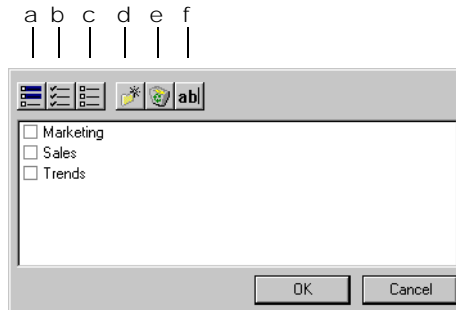
2. Check the categories you want to assign to the document, uncheck any you wish to remove and click OK.
The selected categories are displayed in the Categories box.
3. Click Save to save the document with the assigned categories.

Creating a new personal category

You manage the categories assigned to your personal documents. You can create, delete and rename categories according to your personal needs. To create a new category:

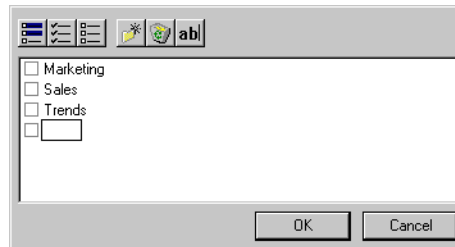
1. Click the arrow to the right of the Categories box.
The Categories box opens.

2. Click the Add Category button.



- a Displays only the selected category
- b Check all categories
- c Uncheck all categories
- d Add new category
- e Delete the selected category
- f Rename the selected category

3. Type in a name for the category in the newly created box.



Renaming a personal category

Select the category you want to rename.



Rename Category

1. Click the Rename button.
2. Type in the modifications.

Deleting a personal category



Delete Category

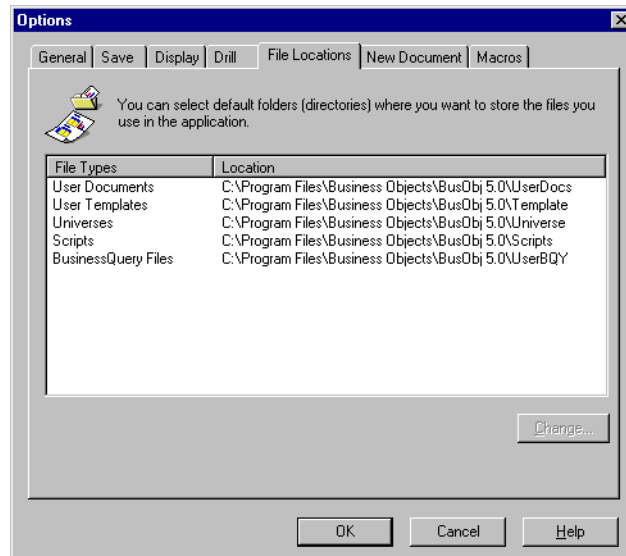
1. Select the category you want to delete.
2. Click the Delete button.

Changing default file locations

When you choose Open, the Open dialog box opens by default in the UserDocs folder in the BUSINESSOBJECTS. You can change this setting.

To do this:

1. From the Tools menu, choose Options.
The Options dialog box opens.
2. Click the File Locations tab.
3. Click on the file type in the list and click the Change button.
The Browse for Folder dialog box opens.
4. Locate and open the folder you want to set as the default and click OK.
The new folder and path is displayed in the list.



Refreshing BusinessObjects Documents

A document generated at a given point in time reflects the data as it existed at that time, but it may be inaccurate now. In BUSINESSOBJECTS, you can update the data in a document while keeping the same presentation and formatting. When you update a document, BUSINESSOBJECTS reconnects to the database or file, and retrieves the updated data. This is called *refreshing* a document.

Refreshing a document ensures that the data is kept up-to-date with changes in the database or personal data file.

You can update the data displayed in a BUSINESSOBJECTS document if you have a connection to the data source.

Note that if your document contains data retrieved using a web connection as well as data retrieved using a client/server connection you will not be able to refresh both data providers at the same time. You will have to connect to the web connection to refresh one set of data and then connect to the client/server connection to refresh the other set of data.

Different ways of refreshing documents

BUSINESSOBJECTS allows you to refresh documents in the following ways:

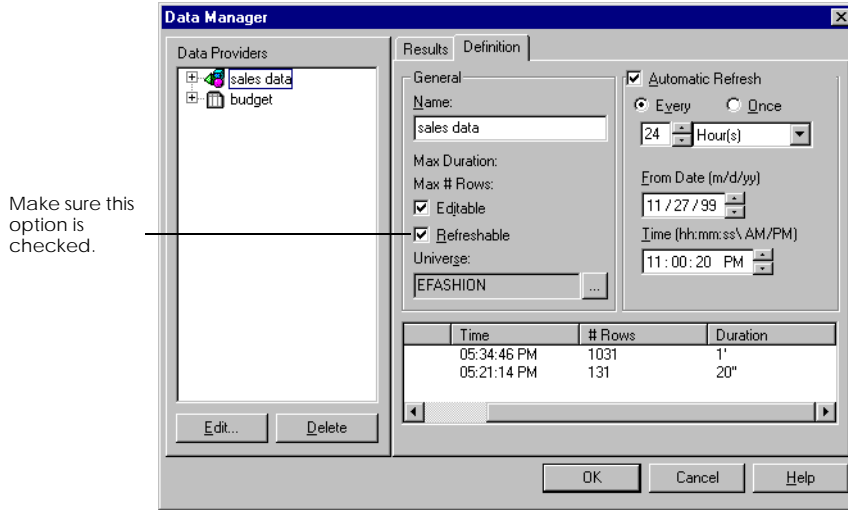
- Manually
- Automatically at specific times or intervals
- By sending the document to Broadcast Agent, the BUSINESSOBJECTS product that manages the scheduled processing of documents.
- Every time you open a document.

Before refreshing a document

When you refresh a document, you refresh the data provider(s) contained in the document. The data provider is the data source; this can be a database query or a personal data file, for example. The user who created a document can specify whether or not the document's data provider(s) can be refreshed. Before trying to refresh a data provider, check that the Refreshable option is has been set.

To do this:

1. From the Data menu, choose View Data.
The Data Manager dialog box opens.



2. Click the Definition tab.
3. In Data Providers box, select the data provider you want to check on and make sure the Refreshable option is checked.
If this option is not checked, you cannot refresh the selected data provider. Only the creator of the document or the BUSINESSOBJECTS supervisor can change this setting.

Before refreshing data providers, you should also check that:

- The most up-to-date data is the data you want.
- Refreshing the data provider will not block the server (database).
- Refreshing the data provider will not block your computer.

Some databases support asynchronous mode, which enables you to refresh a data provider without blocking your computer. If the database at your site does not support asynchronous mode, you can avoid blocking your computer by specifying off-peak times for refreshing data providers.

Your IS department, the universe designer and/or the supervisor should be able to advise you on these points.

Manually refreshing a document



Refresh

To update the data in a document:

- Click the Refresh button on the toolbar.

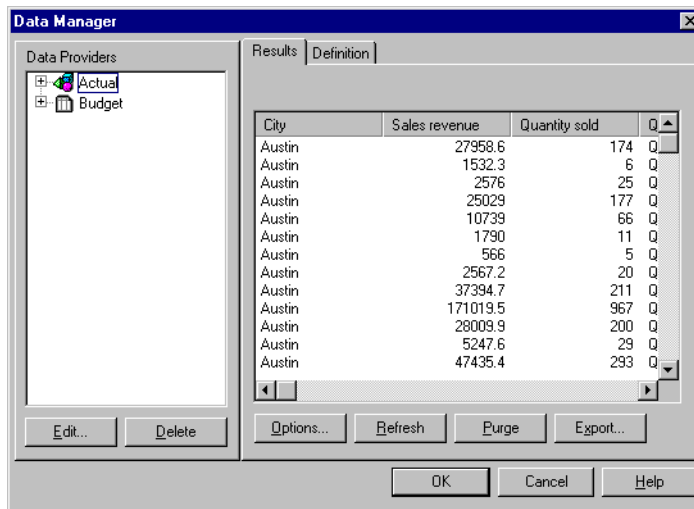
BUSINESSOBJECTS refreshes all the data providers in your document.

Note: If the universe designer has set the up the universe with a restrictive connection, BUSINESSOBJECTS prompts you to enter your database username and password before refreshing the data providers. For more information on restrictive connections, see “Restrictive connections” on page 43.

Refreshing a document with more than one data provider

If your document contains more than one data provider, you can choose which data provider you want to refresh. To do this:

1. From the Data menu, choose View Data.
The Data Manager dialog box opens.
2. Click the Results tab.



3. Select the data provider you want to refresh in the Data Providers list.
4. Click the Refresh button.

Refreshing a document with a prompt

A prompt is a dialog box that asks you to choose which data you want to retrieve and display in your report. This allows you to focus your analysis on a particular year or particular product line, for example. If a report has been set up with a prompt, BUSINESSOBJECTS shows this dialog box when you click the Refresh button. The way a prompt dialog looks depends on how the person who created the report set it up.

In the example below, the custom prompt dialog box asks you to choose a product line before refreshing the report.



Automatically refreshing a document

There are a number of options you can set to refresh your documents on a regular basis or at a set time.

Automatically refresh data providers on opening a document

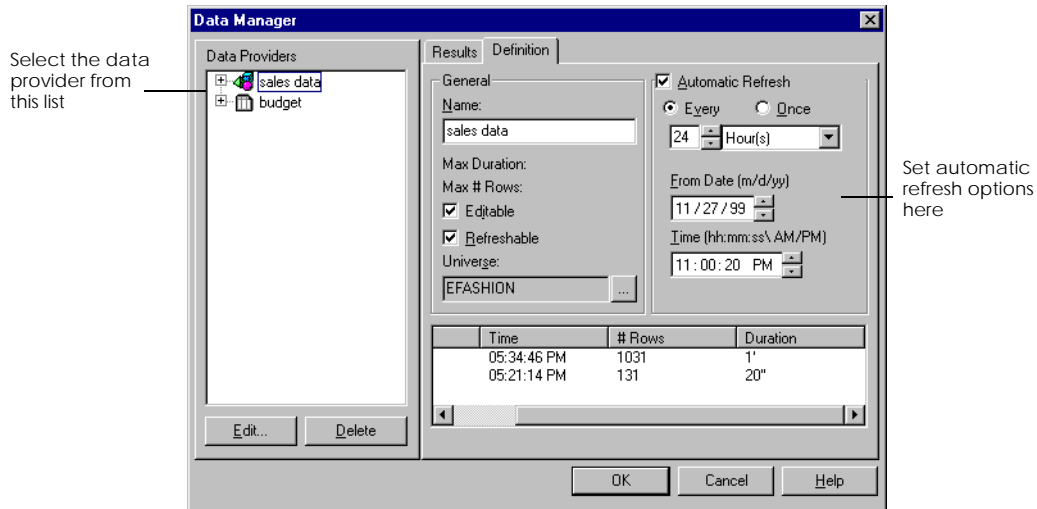
You can set BUSINESSOBJECTS to automatically refresh all data providers in a document each time you open it. To do this:

1. Make sure the document is open.
2. From the Tools menu, choose Options.
The Options dialog box opens up.
3. Click the Save tab.
4. Check *Refresh Document When Opening*, then click OK.

Refresh a data provider once at a set time

If you know the database is to be updated at a certain time on a given date, you can specify that your data provider(s) be automatically refreshed at this point in time. To do this:

1. From the Data menu, choose View Data.
The Data Manager dialog box opens.
2. Click the Definition tab.



3. In Data Providers box, select the data provider you want to work on.
4. Check Automatic Refresh then Once.
5. Select an option from the list box:
 - "On date, at time".
Use this option to refresh the data provider at a given time on a given day.
 - "On date, from time".
Use this option to refresh the data provider after a given time on a set day.
6. Select a date and a time from the respective list boxes, then click OK.

Regularly refresh a data provider

If you know the database is updated every day at a certain time, for example, midnight, you can specify that your data provider(s) be automatically refreshed at 1a.m. every day. To do this:

1. Follow Step 1 to Step 3 in the procedure "Refresh a data provider once at a set

time” on page 213.

2. Check Automatic Refresh, then Every.
3. Set the intervals at which you want to refresh the data provider by entering a value in the box, and selecting Hour(s) or Minute(s) from the list box.
4. Select the start date and time in the From Date and Time boxes, then click OK.

Saving Documents

BUSINESSOBJECTS reports are saved inside BUSINESSOBJECTS documents. BUSINESSOBJECTS also allows you to save your document in different formats so that you can use the data in other applications or share the data with other users. This section describes how to do this. Depending on how BUSINESSOBJECTS is set up in your company, you may have the choice of saving documents locally or in a personal documents folder reserved for you on a server.



Save

Saving a document

1. Click the Save button on the Standard toolbar, or select the Save command on the File menu.
The Save As dialog box appears. By default, the UserDocs folder is active and the file name is Document*n*.
2. If you wish, type a different name in the File Name box.
3. Click Save.
The Save As dialog box closes. The name you gave the document now appears in the title bar of the application window. The default file extension for BUSINESSOBJECTS documents is .rep.

Changing a document's name and/or folder

To save a BUSINESSOBJECTS with a different name or in a different location:

1. From the File menu, choose Save As.
The Save As dialog box appears.
2. Type a new name in the "File name" box.
3. Navigate to the folder in which you want to save the document, then click Save.

Saving a document for all users

If you want to make a document accessible to another user working without a repository, then check the *Save for all users* option in the Save as dialog box (Save As command, File menu).

If you do not do this, users working without a repository will get an error message saying "You are not authorized to use this document" when they try to open your document. This is important to bear in mind if you are sending documents to other users via email, for example.

Saving a document in text or rich text format

When you save a BUSINESSOBJECTS document in text (.txt) or rich text format (.rtf), only the currently selected report is saved. Graphics are not saved in rich text format and text documents. To save a document in text or .rtf format:

1. From the File menu, chooses Save As.
The Save As dialog box appears.
2. In the *Save as type* list box, click:
 - “Text file (*.txt)”, or
 - “Rich text format (*.rtf)”.
3. Click Save.
BUSINESSOBJECTS makes a copy of the document and saves it in the specified format. The original document remains on your screen.

Saving a document in HTML format

You can save a BUSINESSOBJECTS document in HTML format. To do this:

1. From the File menu, choose Save As HTML.
The Save As dialog box opens.
2. Choose the location where you want to save the file and click Save.
3. The HTML options dialog box opens where you can specify how you want your HTML document to be saved. For a full description of the options available on this dialog box and for advice on preparing HTML documents in general, see the *InfoView User's Guide*.

Saving a document in PDF format

BUSINESSOBJECTS 5.1 allows you to save BUSINESSOBJECTS documents in Adobe Portable Document Format (PDF). Once you install the free Adobe Acrobat Reader, you can view and print PDF documents. When you open a BUSINESSOBJECTS document saved in PDF format, you can view and navigate through different reports and obtain high quality printed copies. You cannot edit or analyze the data. To save a BUSINESSOBJECTS document in PDF format:

1. From the File menu, choose Save As.
The Save As dialog box appears.
2. In the *Save as type* list box, choose *Portable Document Format (*.pdf)* and specify where you want to save the PDF file.

3. Click Save.

BUSINESSOBJECTS makes a copy of the document and saves it in PDF format. The original document remains on your screen. The illustrations below show the same document in its original BUSINESSOBJECTS format and after saving in PDF format.

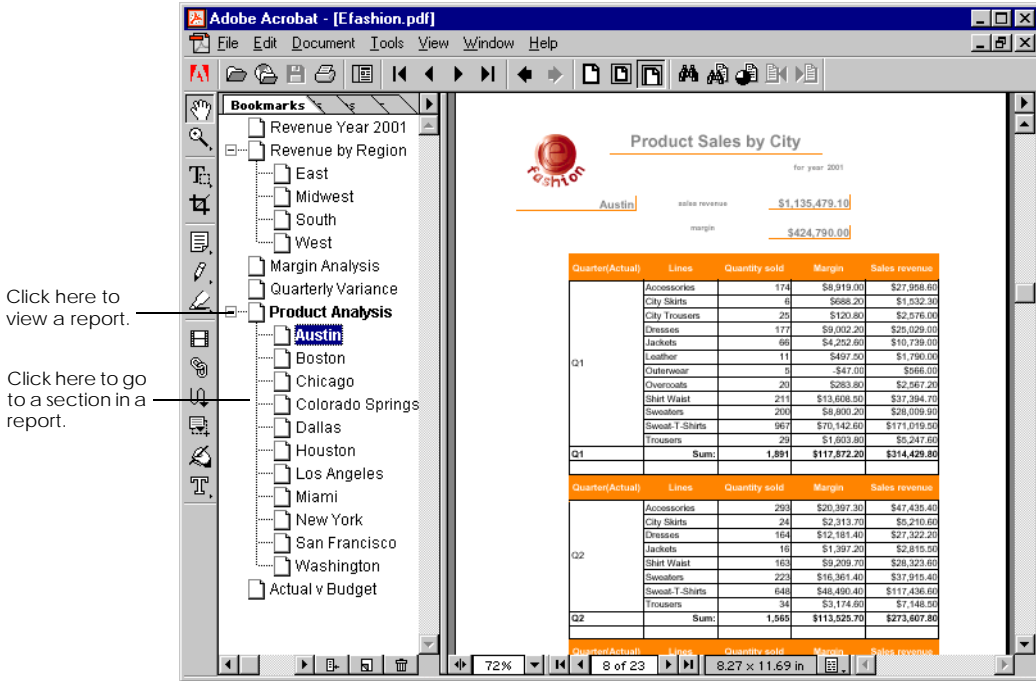
Original
BusinessObjects
document

The screenshot shows the BusinessObjects application window titled 'BusinessObjects - Efashion.rep - [janis@casa]'. The main report area displays 'Product Sales by City' for 'Austin' in '2001'. The report shows a revenue of \$1,135,479.10 and a margin of \$424,790.00. Below this is a detailed table for Q1.

Quarter(Actual)	Lines	Quantity sold	Margin	Sales revenue
Q1	Accessories	174	\$8,919.00	\$27,958.80
	City Skirts	6	\$688.20	\$1,532.30
	City Trousers	25	\$120.80	\$2,576.00
	Dresses	177	\$9,002.20	\$25,029.00
	Jackets	66	\$4,252.60	\$10,739.00
	Leather	11	\$497.50	\$1,790.00
	Outerwear	5	-\$47.00	\$566.00
	Overcoats	20	\$283.80	\$2,567.20
	Shirt Waist	211	\$13,608.50	\$37,394.70
	Sweaters	200	\$8,800.20	\$28,009.90
	Sweat-T-Shirts	967	\$70,142.60	\$171,019.50
Trousers	29	\$1,603.80	\$5,247.60	
Q1	Sum:	1,891	\$117,872.20	\$314,429.80

The interface also shows a left-hand pane with a tree view of reports including 'Revenue Year 2001', 'Revenue by Region', 'Margin Analysis', 'Quarterly Variance', 'Product Analysis' (with sub-items for various cities), and 'Actual v Budget'. The status bar at the bottom indicates 'Last Exec: 2/23/99 01:53 PM'.

Note how the navigation outline is retained in the PDF document, making it easy to navigate quickly through reports and report sections.



Note: The fonts used to generate the PDF document are found in the following folder in your local hard drive:

Program Files\Business Objects\BusinessObjects 5.0\Language

If the fonts used in your BusinessObjects documents do not have an equivalent Adobe Font Metrics (AFM) font in this directory, a substitute font is used.

Saving a document as a BusinessQuery file

BUSINESSQUERY for Excel users build queries on universes in Microsoft Excel. By saving a document as a BUSINESSQUERY file, you can transfer data obtained in BUSINESSOBJECTS to BUSINESSQUERY. You can then work with the query using the functionality of both BUSINESSQUERY and Microsoft Excel.

Saving a document as a BUSINESSQUERY file is only possible if all the following conditions are satisfied:

- The current document contains only one data provider.
- The data provider is a query on a universe.
- The query returns only one microcube.

To save a document as a BUSINESSQUERY file:

1. From the File menu, chooses Save As.
2. Navigate to the folder in which you want to save the document.
Note that the default folder for BUSINESSQUERY files is
C:\BusinessObjects\UserBQY\UniverseName, where UniverseName
corresponds to the universe on which the query was built.
3. Select *BusinessQuery files (*.bqy)* in the *Save as type* list box.
4. If you wish, type a different name in the *File name* box, then click OK.
Otherwise, simply click OK.
5. For information on working with the query in BUSINESSQUERY, refer to the *BusinessQuery User's Guide*.

Note: If you have opened a BUSINESSQUERY document in BUSINESSOBJECTS, you can save it as a BUSINESSQUERY document or as a BUSINESSOBJECTS document. Whether you save the document in BUSINESSQUERY or BUSINESSOBJECTS format, you will be able to continue to work with it in both applications.

Saving WebIntelligence documents

If you have opened a WEBINTELLIGENCE document in BUSINESSOBJECTS, you cannot save it as a WEBINTELLIGENCE document. You can only save it as a BUSINESSOBJECTS document, i.e., a .rep file.

Once you have saved the document, you can send, publish and schedule the document, but only as a BUSINESSOBJECTS document, not as a WEBINTELLIGENCE document. If you want to send, publish and schedule the document as a WEBINTELLIGENCE document, you must use INFOVIEW in your Web browser. See the *InfoView User's Guide* for more information.

Chapter 10 Displaying Data in Tables

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□

Overview

BUSINESSOBJECTS has three basic ways of displaying the data in a report. You can display data in tables, in charts or in free-standing cells.

This chapter deals with the different types of tables, including crosstabs, that you can use in BUSINESSOBJECTS. It describes how to create tables and how to organize the way your data is displayed in them. This chapter also describes how to insert and display data in free-standing cells. Chapter 17 "Creating Charts" on page 405 of this guide describes how to display your data in charts.

Formatting tables and cells, that is working with colors, font and number styles is covered in Chapter 22 "Formatting Tables, Cells and Sections" on page 525.

See also Chapter 13 "Breaking Up Tables and Displaying Calculations" on page 285 which describes breaking up the data in tables to display calculations.

What Types of Tables?

BUSINESSOBJECTS has three types of table. It has two basic table types that display data in a list and crosstabs, which are a special kind of table that allows you to summarize data. These different types of table are described below.

Tables

BUSINESSOBJECTS tables display data in either rows or in columns and have a header and a footer. Header and footer rows and columns are special rows and columns. The header displays information about the row or column e.g. a label or the name of the variable whose values are displayed. The footer displays calculations on the values displayed in the columns or rows.

You can display the variable labels along the top row of the table so that you read the data down the columns as shown below:

City	Year	Sales revenue
Chicago	1999	\$737,914
Chicago	2000	\$1,150,659
Chicago	2001	\$1,134,085
Houston	1999	\$1,211,309
Houston	2000	\$1,990,449
Houston	2001	\$2,246,198
Los Angeles	1999	\$982,637
Los Angeles	2000	\$1,581,616
Los Angeles	2001	\$1,656,676
New York	1999	\$1,667,696
New York	2000	\$2,763,503
New York	2001	\$3,151,022
	Sum:	\$20,273,765

The names of the variables are displayed at the top of the table

The values are listed underneath the column headings

Calculation totals are displayed in the table footer

Or, you can have the variable labels displayed down the left edge of the table so that you read the data across the rows as shown below. This table format is typically used in financial reports such as balance sheets.

City	Chicago	Houston	Los Angeles	New York	Totals
Sales revenue	\$3,022,668	\$5,447,957	\$4,220,929	\$7,582,221	\$20,273,765
Quantity sold	17,976	32,904	26,244	46,358	123,482
Margin	\$1,254,093	\$2,221,906	\$1,668,395	\$3,072,744	\$8,217,138
Margin as % revenue	41.49 %	40.78 %	39.53 %	40.53 %	

The names of the variables are displayed down the left edge of the table

The values are listed along the rows after the row headings

Calculation totals are displayed in the table footer

Crosstab tables

A crosstab is a particular kind of table where data is displayed in columns and in rows. Corresponding data appears at the intersection of the columns and rows; this part of the crosstab is called the body. The body typically displays numerical data.

A crosstab can display both row totals and column totals as well as a grand total. You need at least three variables to display data in a crosstab including one measure. The measure is placed in the body of the crosstab.

The crosstab illustrated below displays sales revenue per year for the top three selling product lines.

The Year variable is displayed in the top row.

This is the Down Edge of the crosstab.

The Line variable is displayed in the left column.

This is the Across Edge of the crosstab.

The Sales Revenue variable is displayed in the body

Row and column totals are displayed in the two footers with a grand total shown in the bottom right-hand cell

	1999	2000	2001	Sum:
Sweat-T-Shirts	\$688,454	\$737,639	\$1,910,247	\$3,336,340
Accessories	\$798,263	\$1,688,991	\$602,589	\$3,089,844
Shirt Waist	\$285,956	\$404,664	\$448,781	\$1,139,402
Sum:	\$1,772,674	\$2,831,295	\$2,961,618	\$7,565,586

	=<Year>	Sum:
=<Lines>	=<Sales revenue>	=Sum(<Sales revenue>)
Sum:	=Sum(<Sales revenue>)	=Sum(<Sales revenue>)

The same crosstab in Structure View shows how the variables are placed in the crosstab

Creating Tables

This section only deals with inserting tables that contain data that already exists in the report i.e. using the variables that are displayed in the list in the Report Manager. There are several ways of inserting a new table in a report. You can:

- Select and drag variables from the Report Manager list and drop them in a blank space in the report. The data is displayed in a table. You can then add other columns as required, rotate the table, move it, turn it into a crosstab and rename the data labels.
- Use the Insert Table/Crosstab wizards.
- Copy an existing table and then replace the variables and delete or add columns and rows as required.

If you want to bring new data into your report, see Chapter 2 "Introduction to Accessing Data with BusinessObjects" on page 37.

Inserting a table from Report Manager

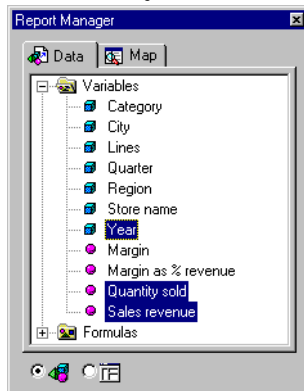
Inserting a table by dragging the variables you want to use from the Report Manager and dropping them into your report is the quick and convenient method. Here's how to do it:



Report Manager

1. Make sure the Report Manager window is open. If it isn't, click the Report Manager button on the Standard toolbar
2. Click on the Data tab of the Report Manager.
A list of all the data you can use in your report is displayed.
3. Select the variables you want to use in your table in the Report Manager.
Use the Ctrl key to select more than one variable.

Create table cursor



Quantity sold	Year	Sales revenue
53,078	1999	\$8,095,814
79,855	2000	\$13,232,246
90,296	2001	\$15,059,143

- Holding down your mouse button, drag the variables out of the Report Manager and onto the report.
The cursor changes to the Create Table cursor and the status bar displays the message *Drop to create a table*.



- Release your mouse button to drop the variables and create a table to display the data.

Rotating tables

You can change the orientation of your table to list data in rows instead of columns or the other way round. To do this:



Rotate Table

- Select the table.
- Click the Rotate Table button on the Report toolbar.
The table is rotated as shown below.

Year	Sales revenue
1999	\$8,095,814
2000	\$13,232,246
2001	\$15,059,143

From this.....

Year	1999	2000	2001
Sales revenue	\$8,095,814	\$13,232,246	\$15,059,143

....to this

Re-organizing data in tables

Once you have inserted your table you can re-organize the columns and rows in it, add more data to it and delete rows and columns to get the layout that best represents your data. You can do all this using your mouse. There's no need to go through dialog boxes or menus.

Swapping two columns or two rows

To swap two columns or two rows:

- Click in one of the rows or columns.
Make sure you click in a cell other than the header cell.



2. Click on the same row or column again and, holding down your mouse, drag your cursor over the second column or row. The cursor changes to the swap cursor and the status bar reads *Drop to swap contents*.
3. Release your mouse button. The two columns or rows have changed position in the table.

Quantity sold	Year	Sales revenue
53,078	1999	\$8,095,814
79,855	2000	\$13,232,246
90,296	2001	\$15,059,143

Year	Quantity sold	Sales revenue
1999	53,078	\$8,095,814
2000	79,855	\$13,232,246
2001	90,296	\$15,059,143

From this.....

To this.....

Moving columns and rows

To move a column or row to a different position in the table.

1. Click on the row or column. Make sure you click in a cell other than the header cell.
2. Click on the same row or column again and, holding down your mouse, drag your cursor to where you want to place the row or column. The cursor changes to the move cursor and the status bar reads *Drop to move contents*.
3. Release your mouse button. The row or column is moved to the new position.



Margin	Year	Quantity sold	Sales revenue
\$3,731,971	1999	53,078	\$8,095,814
\$5,187,885	2000	79,855	\$13,232,246
\$5,667,084	2001	90,296	\$15,059,143

From this.....

Year	Quantity sold	Margin	Sales revenue
1999	53,078	\$3,731,971	\$8,095,814
2000	79,855	\$5,187,885	\$13,232,246
2001	90,296	\$5,667,084	\$15,059,143

To this.....

Copying columns and rows

To copy a column or row:

1. Click on the row or column.
Make sure you click in a cell other than the header cell.
2. Click on the same row or column again and, holding down your mouse button, drag your cursor to where you want to place the row or column.
3. Hold down the Ctrl key.
The cursor changes to the copy cursor and the status bar reads *Drop to copy contents*.



Year	Margin	Sales revenue
1999	\$3,731,971	\$8,095,814
2000	\$5,187,885	\$13,232,246
2001	\$5,667,084	\$15,059,143

From this.....

Year	Year	Sales revenue
1999	1999	\$8,095,814
2000	2000	\$13,232,246
2001	2001	\$15,059,143

To this.....

4. Still holding down the Ctrl key, release your mouse button.
The row or column is copied to the new position

Keeping source formatting

When you swap, move or copy rows and columns you may want to keep any particular formatting you have used on a column or row. In the example below, you have formatted the values in the Year column in Red in a larger font size than the other columns. To keep this formatting on the Year column when you move it to a different position in the table:

- Hold down the Alt key as you drop the column or row into its new position.

Quantity sold	Year	Sales revenue
53,078	1999	\$8,095,814
79,855	2000	\$13,232,246
90,296	2001	\$15,059,143

Year	Quantity sold	Sales revenue
1999	53,078	\$8,095,814
2000	79,855	\$13,232,246
2001	90,296	\$15,059,143

Swap columns only and formatting stays on middle column

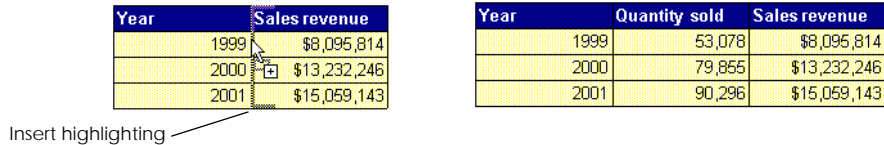
Year	Quantity sold	Sales revenue
1999	53,078	\$8,095,814
2000	79,855	\$13,232,246
2001	90,296	\$15,059,143

Hold down Alt key and formatting is copied to the new position

Adding more data to a table

You can add more data to your table by dragging variables from the Report Manager and inserting new columns or rows in your table.

To insert a row or column in a table:

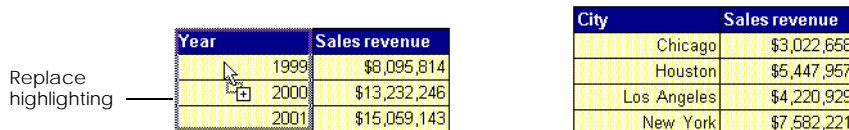


1. In the Report Manager, click on the variable you want to add to your table.
2. Holding down your left mouse button, drag the cursor to the edge of the column or row where you want to add a new one.
3. When the edge of the column or row is highlighted with a gray hatched border and the status bar displays the message *Drop to insert*, release the mouse button.
A new column or row is added to the table to display the new data.

Tip: You can add more than one variable at a time. Use the Ctrl or Shift keys to select more than one variable from the list in the Report Manager.

Replacing data in a table

You can replace the data in a column or a row by dragging a different variable from the Report Manager window and dropping it onto the table.



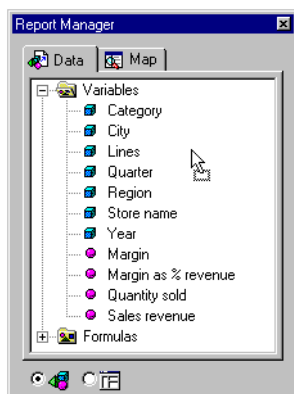
1. In the Report Manager, click on the variable you want to add to your table.
2. Holding down your left mouse button, drag the cursor over the column or row of data you want to replace.

- When the column or row is highlighted with a gray hatched border and the status bar displays the message *Drop to replace contents*, release the mouse button.
The data in the column or row is replaced with the new data.

Removing data from a table

You can remove a row or column of data from a table by dragging it back into the Report Manager window. To do this:

- Click on the row or column.
Make sure you click in a cell other than the header cell.
- Click on the same row or column again and, holding down your mouse button, drag the cursor into the Report Manager window.



Year	City	Sales revenue
1999	Chicago	\$737,914
1999	Houston	\$1,211,309
1999	Los Angeles	\$982,637
1999	New York	\$1,667,696
2000	Chicago	\$1,150,659
2000	Houston	\$1,990,449
2000	Los Angeles	\$1,581,616
2000	New York	\$2,763,503
2001	Chicago	\$1,134,085
2001	Houston	\$2,246,198
2001	Los Angeles	\$1,656,676
2001	New York	\$3,151,022

From this.....

Year	Sales revenue
1999	\$4,599,556
2000	\$7,486,227
2001	\$8,187,981

To this.....

- Release the mouse button.
The column or row of data is removed from the table.

Inserting a crosstab

You can create a crosstab by dragging variables from the Report Manager into the report to create a table and then re-organizing the table into a crosstab. Remember that you need at least two dimensions/details and one measure to create a crosstab. To turn a table into a crosstab:

Year	Lines	Sales revenue
1999	Sweat-T-Shirts	\$688,454
2000	Sweat-T-Shirts	\$737,639
2001	Sweat-T-Shirts	\$1,910,247
1999	Accessories	\$798,263
2000	Accessories	\$1,688,991
2001	Accessories	\$602,589
1999	Shirt Waist	\$285,956
2000	Shirt Waist	\$404,664
2001	Shirt Waist	\$448,781

	1999	2000	2001
Sweat-T-Shirts	\$688,454	\$737,639	\$1,910,247
Accessories	\$798,263	\$1,688,991	\$602,589
Shirt Waist	\$285,956	\$404,664	\$448,781

1. Select a column and drag it to the upper right corner of the table.
You can also drag a variable from the Report Manager window to the upper right corner of the table.
2. When the cursor becomes the Turn to Crosstab cursor and the status bar displays the message *Drop to turn to crosstab*, release the mouse button. The table becomes a crosstab.



Re-organizing crosstabs

You can re-organize a crosstab by swapping or replacing the variables in the headers or by replacing the variable displayed in the body. The example below shows how to swap two headers:

	1999	2000	2001
Sweat-T-Shirts	\$688,454	\$737,639	\$1,910,247
Accessories	\$798,263	\$1,688,991	\$602,589
Shirt Waist	\$285,956	\$404,664	\$448,781

	Sweat-T-Shirts	Accessories	Shirt Waist
1999	\$688,454	\$798,263	\$285,956
2000	\$737,639	\$1,688,991	\$404,664
2001	\$1,910,247	\$602,589	\$448,781

1. Click in the Year header. Click again in the same header.
2. Holding down your mouse button, drag the cursor over the Resort header. The Resort header is highlighted, the cursor changes to the swap cursor and the status bar reads *Drop to swap*.

3. Release the mouse button.
The headers are displayed in the new positions.

Turning a crosstab to a table

You can rearrange the columns and rows in a crosstab into a table. To do this:

1. Click inside the header row of the crosstab.
2. Click again in the same row and, holding down the mouse button, drag the cursor towards the left border of the crosstab.
3. When a horizontal line appears above the cursor, release the mouse button.

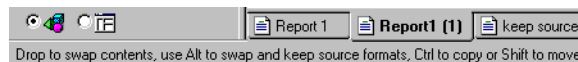


Turn to Table cursor

	1999	2000	2001
Sweat-T-Shirts	\$688,454	\$737,639	\$1,910,247
Accessories	\$798,263	\$1,688,991	\$602,589
Shirt Waist	\$285,956	\$404,664	\$448,781

Tips on dragging and dropping data

- Make sure you have correctly selected the data you want to move.
- Watch how the cursor changes shape as it moves over different parts of the table and how the highlighting on the table changes. This shows you what will happen when you release your mouse button.
- Watch the status bar messages for instructions on what keyboard shortcuts you can use and for what will happen when you release your mouse button.



Undo button

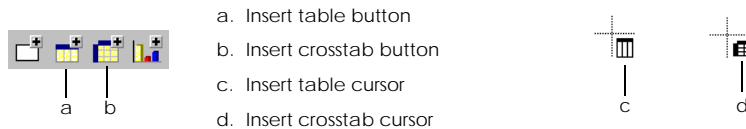
- If you are not happy with the result, use the Undo button on the Standard toolbar or Ctr+Z to undo the action you've just carried out. You can undo up to ten actions.

Guided Table Insertion

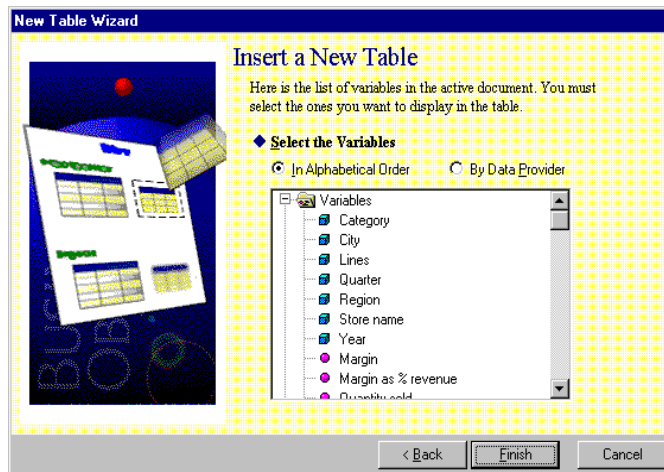
You can also insert tables and crosstabs using the Insert wizards. These wizards guide you through the steps you need to carry out to insert a new table or crosstab in your report.

The following procedure describes how to insert a table or crosstab in a report, using existing data from the document. If you want to insert a table or crosstab using new data see Chapter 2 "Introduction to Accessing Data with BusinessObjects" on page 37 of this user's guide.

1. Click inside a blank space in the report.
2. Click the Insert Table or the Insert Crosstab button on the Report toolbar. The cursor changes to the insert cursor.



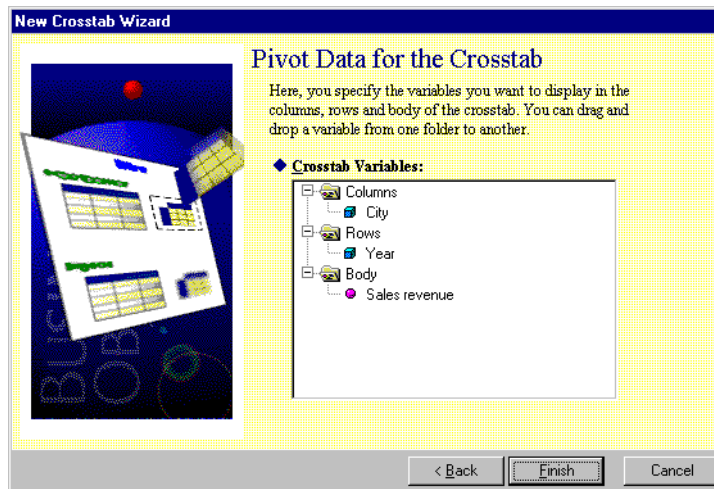
3. Click once in the report where you want the top left-hand corner of the table or crosstab to be positioned. The Insert wizard opens.
4. Click the first option, *Use existing data from the document*, then click *Begin*. Next, choose the data that you want to use:



5. Hold down the Ctrl key and click the variables you want to display in the new table/crosstab.

If you are inserting a....	Click....
Table	Finish. The table appears in the report.
Crosstab	Next, then go to Step 6

6. In the next screen, the variables you selected are organized in three folders. The variable in the Column folder will be displayed in the header down the left edge of the crosstab, the variable in the Rows folder will be displayed in the header in the top row of the crosstab and the variable in the Body folder will be displayed in the body of the crosstab:



7. You can re-organize the variables in the folders by dragging them from one folder to another. When you have organized the variables as required, click Finish.
The crosstab appears in the report.

Editing Tables

This section describes how you can edit existing tables and crosstabs.

Selecting tables, rows and cells

When you work on a table, you can select the whole table, which means all the cells, rows and columns and header cells, or, you can select just part of the table, one row, one column, one cell or several cells together. The next section describes how to select the different parts of a table.

To select a table

1. If part of the table is selected, click a blank space outside it.
2. Hold down your Alt key and click once inside the table.
A hatched gray border appears around the table:

Year	Lines	Sales revenue
1999	Sweat-T-Shirts	\$688,454
2000	Sweat-T-Shirts	\$737,639
2001	Sweat-T-Shirts	\$1,910,247
1999	Accessories	\$798,263
2000	Accessories	\$1,688,991
2001	Accessories	\$602,589
1999	Shirt Waist	\$285,956
2000	Shirt Waist	\$404,664
2001	Shirt Waist	\$448,781

Hatched gray border that appears when the table is selected.

To select two or more tables

1. Click a blank space in the report.
2. Drag the mouse until you have covered part of each block you want to select.

Lines	Sales revenue	Year	Sales revenue
Accessories	\$3,089,844	1999	\$2,360,906
City Skirts	\$104,438	2000	\$3,978,661
City Trousers	\$96,917	2001	\$4,204,603
Dresses	\$880,593		
Jackets	\$190,127		
Leather	\$38,572		
Outerwear	\$388,117		
Overcoats	\$142,777		
Shirt Waist	\$1,139,402		
Sweaters	\$875,977		
Sweat-T-Shirts	\$3,336,340		
Trousers	\$261,068		

3. Release the mouse button.
A hatched gray border appears around each.

To select columns and rows

To select one column or one row:

1. Place the cursor at the top of the column or at the left-hand side of the row
2. When the cursor changes to a black arrow, pointing downwards for a column or to the right for a row, click once.

The column or row is highlighted as shown below:

Lines	Sales revenue
Accessories	\$3,089,844
City Skirts	\$104,438
City Trousers	\$96,917
Dresses	\$880,593
Jackets	\$190,127
Leather	\$38,572
Outerwear	\$388,117
Overcoats	\$142,777
Shirt Waist	\$1,139,402
Sweaters	\$875,977
Sweat-T-Shirts	\$3,336,340
Trousers	\$261,068

The column or row is highlighted, to show that it is selected.

Lines	Sales revenue
Accessories	\$3,089,844
City Skirts	\$104,438
City Trousers	\$96,917
Dresses	\$880,593
Jackets	\$190,127
Leather	\$38,572
Outerwear	\$388,117
Overcoats	\$142,777
Shirt Waist	\$1,139,402
Sweaters	\$875,977
Sweat-T-Shirts	\$3,336,340
Trousers	\$261,068

You can also select a column or a row simply by clicking inside it. This method does not select the column or row header, which is the cell that contains the name of the variable.

Header cell is not selected.

Lines	Sales revenue
Accessories	\$3,089,844
City Skirts	\$104,438
City Trousers	\$96,917
Dresses	\$880,593
Jackets	\$190,127
Leather	\$38,572
Outerwear	\$388,117
Overcoats	\$142,777
Shirt Waist	\$1,139,402
Sweaters	\$875,977
Sweat-T-Shirts	\$3,336,340
Trousers	\$261,068

Only the body cells are selected.

To select adjacent columns or adjacent rows

1. Select one column or row.
2. Holding down the Shift key, click the adjacent column(s) or row(s).

To select columns or rows that are not adjacent

1. Select the first column or row.
2. Holding down the Ctrl key, then click the other column(s) or row(s) you want to select.

Note: You can select one or more columns at a time, or one or more rows at a time, but you cannot select a combination of columns and rows.

To select a cell in a table

- To select a cell, click inside it.

The cell background is blackened, to indicate that it has been selected:

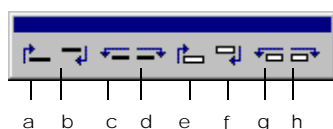
Q1

- To select more than one cell, hold down your Ctrl key, then click inside each one.

Inserting empty columns and rows

You can add columns and rows to existing tables or crosstabs.

1. Select a column, row or cell.
2. Click one of the insert buttons on the Structure toolbar:



- a. Inserts a row above the selection.
- b. Inserts a row below the selection.
- c. Inserts a column to the left of the selection.
- d. Inserts a column to the right of the selection.
- e. Inserts a cell above the selection
- f. Inserts a cell below the selection.
- g. Inserts a cell to the left of the selection
- h. Inserts a cell to the right of the selection


Naming or renaming a column or row

A new column or row does not have a title when you add it to your table. To name a column or row header:

1. Double-click inside the header cell.
2. Type a name.
3. Press the Enter key.

Resizing columns and rows

1. Move the mouse cursor over the right edge of the column (or bottom edge of a row) you want to resize.
2. When the cursor changes to the Resize cursor, hold down the left mouse button and drag the edge to increase or decrease the column (or row) to the required width (or row height).



 Resize cursor

Year	Lines	Sales revenue
1999	Sweat-T-Shirts	\$688,454
2000	Sweat-T-Shirts	\$737,639
2001	Sweat-T-Shirts	\$1,910,247
1999	Accessories	\$798,263
2000	Accessories	\$1,688,991
2001	Accessories	\$602,589
1999	Shirt Waist	\$285,956
2000	Shirt Waist	\$404,664
2001	Shirt Waist	\$448,781

Tip: If you double-click on the resize cursor, the column or row is automatically sized to width or height of the contents.

Copying, pasting and deleting

You can copy, paste and delete report components using menu commands, toolbar buttons and keyboard shortcuts.

Copying tables and crosstabs

1. Select the table.
2. Click the Copy button on the standard toolbar.
3. Click in the location where you want to display the copy of the table.
4. Click the Paste button on the Standard toolbar.

Tip: You can also copy a table or crosstab by selecting it, dragging it to a new position and holding down the Ctrl key as you release the mouse button. The table or crosstab is copied to the new location.



Delete button

Deleting columns and rows

1. Select the column or row.
2. Click the Delete button on the Standard toolbar.

Deleting tables

1. Select the table.
2. Click the Delete button on the Standard toolbar.

Copying and pasting from BusinessObjects to other applications

You can copy objects such as tables and charts in BUSINESSOBJECTS, or copy the whole report contents, and then paste them into a Microsoft Office application, for example, such as Excel or Word. For details on how to do this, see “Copying and pasting from BusinessObjects to another application” on page 176.

Free-standing Cells

BUSINESSOBJECTS reports have two types of cell: cells that make up tables and free-standing cells. A free-standing cell is a single cell that is not attached to any other report component and can be moved and formatted individually. Free-standing cells have many uses in BUSINESSOBJECTS reports. They are containers for text, calculations or graphics and are used among other things for report titles, for adding comments and for displaying page numbers.

Inserting a free-standing cell

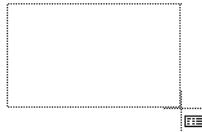


Insert Cell button



Insert Cell cursor

1. Click inside a blank space in the report to make sure no other report component is selected.
2. Click the Insert Cell button on the Report toolbar. The cursor changes to the Insert Cell cursor.
3. Click where you want your cell to appear and, holding down your mouse button, draw a cell.



When you release the mouse button, a cell appears in the area you have drawn. When a new cell is inserted it has a flashing cursor inside it so that you can immediately type in text.

Tip: You can also insert a free-standing cell by copying and pasting an existing cell from the report. To do this, select the cell, hold down the mouse button, hold down the Ctrl key and drag the mouse. When you release the mouse button, a copy of the cell appears.

Dragging a cell out of a table

You can drag a cell out of a table to display the data contained in it in a free-standing cell. To do this:

1. Select the cell.
2. Click in the cell again and, holding down the mouse button, drag the cell out of the table and drop it in a blank space in the report

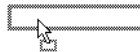
If you drag a cell containing a dimension or detail object out of a table you create a master/detail report as shown below:

City	Year	Sales revenue
Chicago	1999	\$737,914
Chicago	2000	\$1,150,659
Chicago	2001	\$1,134,085
Houston	1999	\$1,211,309
Houston	2000	\$1,990,449
Houston	2001	\$2,246,198
Los Angeles	1999	\$982,637
Los Angeles	2000	\$1,581,616
Los Angeles	2001	\$1,656,676
New York	1999	\$1,667,696
New York	2000	\$2,763,503
New York	2001	\$3,151,022
	Sum:	\$20,273,765

City	Sales revenue
Chicago	\$737,914
Houston	\$1,211,309
Los Angeles	\$982,637
New York	\$1,667,696
Sum:	\$4,599,556

If you drag a measure out of a table you can display a grand total or a section total depending on where you place the cell. In the example below the table total is displayed at the top of the table.

City	Year	Sales revenue
Chicago	1999	\$737,914
Chicago	2000	\$1,150,659
Chicago	2001	\$1,134,085
Houston	1999	\$1,211,309
Houston	2000	\$1,990,449
Houston	2001	\$2,246,198
Los Angeles	1999	\$982,637
Los Angeles	2000	\$1,581,616
Los Angeles	2001	\$1,656,676
New York	1999	\$1,667,696
New York	2000	\$2,763,503
New York	2001	\$3,151,022
	Sum:	\$20,273,765



City	Year	Sales revenue
Chicago	1999	\$737,914
Chicago	2000	\$1,150,659
Chicago	2001	\$1,134,085
Houston	1999	\$1,211,309
Houston	2000	\$1,990,449
Houston	2001	\$2,246,198
Los Angeles	1999	\$982,637
Los Angeles	2000	\$1,581,616
Los Angeles	2001	\$1,656,676
New York	1999	\$1,667,696
New York	2000	\$2,763,503
New York	2001	\$3,151,022
	Sum:	

You can use a grid to automatically align the selection as you drag it. To do so,

- From the Format menu choose Snap to Grid.
- To view the grid, from the View menu choose Grid

Editing cells and cell content

You can work on free-standing cells in the following ways.

Typing text in a cell

Double-click on the cell. If the cell is empty, it has a black border around it and a flashing cursor. If the cell already contains text, the text is also highlighted. Type in your text and press Enter.

Tip: If you get these symbols displayed in a cell #####, this happens because the cell contents are larger than the cell. Resize the cell to fix the problem.

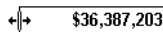
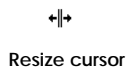
Moving a cell

To move a cell to a different position, click on it once to select it and then click on it again and drag it to a new position.



Resizing a cell

Hold your cursor over the edge of the cell. When the cursor changes to the resize cursor, click and drag the cell border to resize it.



Tip: If you double-click on the resize cursor, the cell is automatically sized to content width. You can also autosize the cell height by holding your cursor over the top or bottom border and double-clicking on the resize cursor.

Chapter 11 Master/Detail Reports

In this chapter

- ❑ **Overview 246**
 - What are master/detail reports? 246
- ❑ **Structuring a Master/Detail Report 247**
 - From a table or crosstab 247
 - From the Report Manager 248
 - Building a master/master/detail report 249
- ❑ **Re-organizing a Master/Detail Report 250**
- ❑ **Managing Sections in Master/Detail reports 251**
- ❑ **Undoing a Master/Detail Report 252**
- ❑

Overview

This chapter describes how to structure your data into a master/detail report.

What are master/detail reports?

Master/detail reports enable you to split large blocks of data into sections. This type of presentation allows you to avoid repeating values and also to display subtotals.

In the example below the table displays data for Resort, Quarter and Revenue. The Quarter column has repeated values. If you set Quarter as a master value, each distinct value of quarter creates a section. You now have four sections, one for each quarter. Each section has a master cell, and a table showing resort and revenue.

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560

⇨

a. For each value of the master, Quarter, a section is created. One master value appears in a cell inside each section. In this section, the master value is "Q1".

b. The detail can be a table, crosstab or chart. It displays data that relates to the master. In this report, the detail is a table that shows revenue per resort.

c. You can clearly see the sections in a master/detail report by activating the Section Delimiters command on the View menu.

a. Q1

b.

Resort	Revenue
Bahamas Beach	\$224,881
French Riviera	\$208,565
Hawaiian Club	\$357,170

c. Q2

Q3

Resort	Revenue
Bahamas Beach	\$263,422
French Riviera	\$226,125
Hawaiian Club	\$395,150

Q4

Resort	Revenue
Bahamas Beach	\$245,269
French Riviera	\$158,565
Hawaiian Club	\$385,560

Structuring a master/detail report

Structuring a Master/Detail Report

You set up a master/detail report by setting a variable as a master cell. This section describes the different ways to do this. You can:

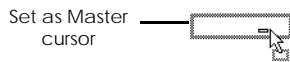
- use a variable in a table or crosstab to create a master cell
- add a variable from the Report Manager to create a master cell

From a table or crosstab

If the data you want to set as the master is already displayed in a table or crosstab, you can drag it out of the table or crosstab and create a section. To do this:

1. Click inside the column or row contains the data you want to use as master.
2. Click inside the data again, hold down the mouse button, and drag the data away from the table or crosstab.

The cursor changes to the Set as Master cursor.



Quarter	Resort	Revenue
Q1	French Riviera	\$208,565
Q1	Bahamas Beach	\$224,881
Q1	Hawaiian Club	\$357,170
Q2	French Riviera	\$242,165
Q2	Bahamas Beach	\$237,872
Q2	Hawaiian Club	\$341,780
Q3	French Riviera	\$226,125
Q3	Bahamas Beach	\$263,422
Q3	Hawaiian Club	\$395,150
Q4	French Riviera	\$158,565
Q4	Bahamas Beach	\$245,269
Q4	Hawaiian Club	\$385,560
	Sum:	\$3,286,524

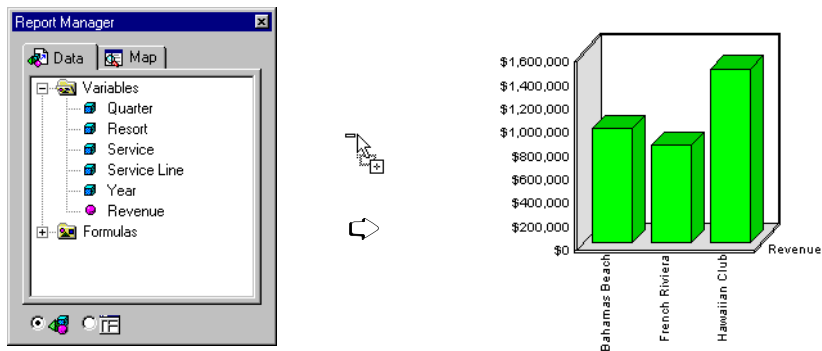
3. Release the mouse button in a blank above the table or crosstab. The column or row of data you clicked is removed from the table or crosstab. For each of its values, a section is created. Each section contains:
 - A master cell which displays one value, and
 - A table or crosstab.

Tip: You can also right-click on the row or column of data you want to set as master and choose Set As Master from the menu.

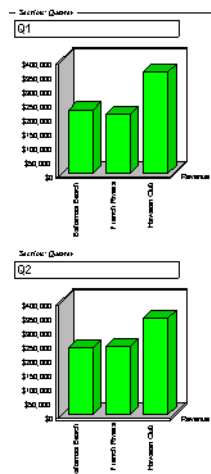
From the Report Manager

If your report contains a chart or the variable you want to set as master is not currently in the table or crosstab, you can add a master cell from the Report Manager window. To do this:

1. If Report Manager is not open, choose Report Manager from the View menu.
2. In the Report Manager Data tab, click the variable you want to use as a master.
3. Drag the variable from the Report Manager window into the Report window. The pointer changes to the insert cell cursor and the status bar displays *Drop to create section*.



4. Drop the variable in the report above the block. A section is created for each value of the variable.



Building a master/master/detail report

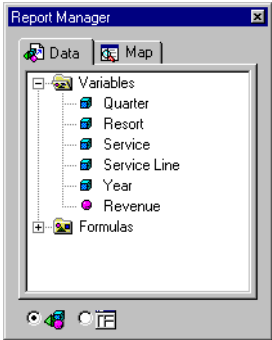
A master/master/detail report has sections within sections. You create this type of report in the same way you create a master/detail report by dragging a value out of a table or crosstab or from the Report Manager and creating a second section.

You can create up to nine sections in a report by adding master cells above or below the current master cells.

Example Making a report with a year and a quarter section

In this example, you have a report with a Quarter section. You want to add a year section so each financial year section displays the data for the four quarters in that year. To do this:

- Drag the Year variable from Report Manager and drop in the report to create a new master cell.



The screenshot shows the Report Manager window on the left with a tree view of variables including Quarter, Resort, Service, Service Line, Year, Revenue, and Formulas. An arrow points to the right, where a report preview is shown. The report is divided into four sections, each labeled 'Section: Quarter' and containing a table of data for that quarter. The tables are labeled Q1, Q2, Q3, and Q4. Each table has columns for 'Resort' and 'Revenue'.

a. Drag the Year variable from the Report Manager window and drop in the area above the Q1 master cell to create a new section and new master cell.

b. If you want the new section under the Quarter section, drop the new variable under the Q1 cell.

Section: Quarter	
Q1	
Resort	Revenue
Bahamas Beach	\$224,881
French Riviera	\$208,565
Hawaiian Club	\$357,170

Section: Quarter	
Q2	
Resort	Revenue
Bahamas Beach	\$237,872
French Riviera	\$242,165
Hawaiian Club	\$341,780

Section: Quarter	
Q3	
Resort	Revenue
Bahamas Beach	\$263,422
French Riviera	\$226,125
Hawaiian Club	\$395,150

Section: Quarter	
Q4	
Resort	Revenue
Bahamas Beach	\$245,269
French Riviera	\$158,565
Hawaiian Club	\$385,560

Re-organizing a Master/Detail Report

You can re-organize the section levels in a master/detail report or change the master to get a different view of your data.

Replace a master with a new variable

- Drag a new variable from the table or crosstab or from the Report Manager window and drop it into the master cell.

Change the order in a master/master/detail

1. Click on one of the master cells.

From this.....

....to this

2. Drag the cell and drop it on the other cell.

The contents are swapped and the section levels are changed.

Sorting, ranking and filters

You can sort, filter and rank data in master/detail reports. You can sort, filter and rank the values in the master cells and/or the data in the tables and crosstabs in the sections. For more information on sorting, ranking and filtering data, see Chapter 12 "Organizing Data in Reports" on page 255.

Managing Sections in Master/Detail reports

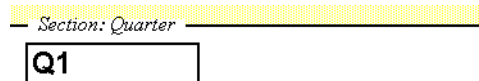
When you create a section, it covers the entire width of the report. Whatever you add or change in one section is added or changed in all the other sections created by the same master.

Displaying section delimiters

Section delimiters are graphical markings that show you where sections begin and end. Each section is named. Showing these delimiters helps you organize and structure your sections.

To display the section delimiters:

1. From the View menu, choose Section Delimiters.
A check mark is displayed next to the command to show that it is turned on.
2. Click once on the report window.
The section delimiters are displayed.



Scaling charts in master/detail reports

If you have a master/detail report which contains charts, you can use different scaling for the charts in the different sections. See “Scaling charts in Master/Detail reports” on page 439 for information on how to do this.

Formatting sections in master/detail reports

You can format the sections in a report by applying shading to the background. If you have set up a report with several sections, you can apply a different type of shading to each section in the report. This can allow you to easily distinguish between the different sections. For information on formatting sections, see “Formatting Sections” on page 526.

Hiding sections in master/detail reports

You can hide sections in master/detail reports so that only the sections you are interested in are displayed. For information on how to do this, see “Hiding and Displaying Report Components” on page 569.

Undoing a Master/Detail Report

You can undo a master/detail report in the following ways:

- By placing the master in the table or crosstab.
- By removing the master from the report.
- By removing the data from the master cell but leaving the cell in the report.

Placing the master in a table or a crosstab

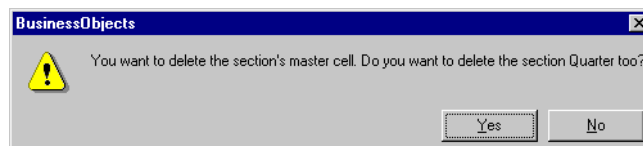
You can remove a master cell by adding it to a table or crosstab in the section. The cell is inserted as an extra column or row of data.

1. Click the master cell.
2. Click the master cell again and, holding down the mouse button, drag the cell to the edge of the column or row where you want to insert it.
3. When the edge of the column or row is highlighted with a gray hatched border and the status bar displays the message *Drop to copy contents*, release the mouse button.

Q1

Resort	Revenue
Bahamas Beach	\$224,881
French Riviera	\$208,565
Hawaiian Club	\$357,170

The following message box is displayed:



- Choose *Yes* to remove the data, the master cell and the section from the report. A new column or row is added to display the data and the section is deleted from the report as shown below:

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
French Riviera	Q1	\$208,565
Hawaiian Club	Q1	\$357,170
Bahamas Beach	Q2	\$237,872
French Riviera	Q2	\$242,165
Hawaiian Club	Q2	\$341,780
Bahamas Beach	Q3	\$263,422
French Riviera	Q3	\$226,125
Hawaiian Club	Q3	\$395,150
Bahamas Beach	Q4	\$245,269
French Riviera	Q4	\$158,565
Hawaiian Club	Q4	\$385,560

- Choose *No* to remove the data and the master cell but to leave the section in the report. A new column or row is added to display the data and the section remains in the report as shown below:

— Section: *Quarter* —

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
French Riviera	Q1	\$208,565
Hawaiian Club	Q1	\$357,170

— Section: *Quarter* —

Deleting the master

- Select the master cell.
- From the Edit menu, choose Delete.
The message box described on page 252 is displayed.

Tip: You can also remove a master cell by dragging it into the Report Manager window.

Clearing the master cell

1. Click the master cell.
2. Select the Clear command from the Edit menu.
The data from the master cell disappears, but the master cell remains.

Chapter 12

Organizing Data in Reports

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Overview

A BUSINESSOBJECTS report can contain a great deal of data. This chapter presents the various ways in which you can organize and present report data to bring certain key information to the instant attention of your readers.

- You can limit the amount of information displayed in a report to focus on a selection only by using filters.
- You can order the information by using ranking or sorting.
- You can highlight interesting data with special formatting by using alerters.

Limiting the Data Displayed

You may not want to display all the data returned by a data provider in a report. You may want to focus on a selection of it only, which is difficult to do if there is a lot of data on the screen. A filter enables you to hide the data you do not want to view behind the scenes and display only the data you need.

There are two types of filter. A global filter affects the whole report. A block-specific filter only filters data for the specified chart, table or crosstab.

Example Filter data to show sales revenue for two regions only

Quarter	Region	Sales revenue
Q1	East	\$2,753,936
Q1	Midwest	\$1,684,987
Q1	South	\$3,391,257
Q1	West	\$1,899,680
Q2	East	\$2,734,537
Q2	Midwest	\$1,642,102
Q2	South	\$2,989,275
Q2	West	\$1,760,148
Q3	East	\$2,364,839
Q3	Midwest	\$1,371,071
Q3	South	\$2,534,113
Q3	West	\$1,930,516
Q4	East	\$2,690,858
Q4	Midwest	\$1,668,480
Q4	South	\$3,082,179
Q4	West	\$1,889,225
	Sum:	\$36,387,203

You can filter the data for Region by selecting two of its values: East and Midwest.

Quarter	Region	Sales revenue
Q1	East	\$2,753,936
Q1	Midwest	\$1,684,987
Q2	East	\$2,734,537
Q2	Midwest	\$1,642,102
Q3	East	\$2,364,839
Q3	Midwest	\$1,371,071
Q4	East	\$2,690,858
Q4	Midwest	\$1,668,480
	Sum:	\$16,910,811

Only the data for these values is now displayed.

In this example you want to show the sales revenue results for two regions only. To do this, you insert a filter on the Region column and choose to display East and Midwest only.

Notice how the filter also affects calculations. The sum is different in the two tables.

Inserting a filter

You can insert a filter on data in tables, crosstabs or charts.

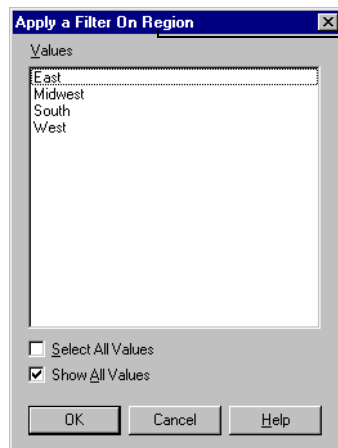
To insert a filter



Insert Filter

1. Click the row, column or chart element you want to filter.
2. Click the Insert Filter button on the Report toolbar, or select the Filter command on the Insert menu.

The Apply a Filter On dialog box appears. It displays the values you can select for the filter:



The title of this dialog box depends on the data you select in the report. Here, data for Region was clicked, so the title is "Apply a Filter on Region".

3. Hold down the Ctrl key and click the values you want to include in the report, then click OK.
The dialog box closes, and the report includes only the values you selected. The Insert Filter button on the toolbar is dimmed.

Tip: To remove the filter, click inside the filtered data, then click the Insert Filter button.

Managing filters

You can manage filters in the Filters dialog box in the following ways:

- Select different values for existing filters.
- Add new filters.
- Insert filters on variables that are not displayed in the report.
- Specify whether a filter be applied on the whole report or on a specific block.
- Remove filters.

The following sections describe these tasks.

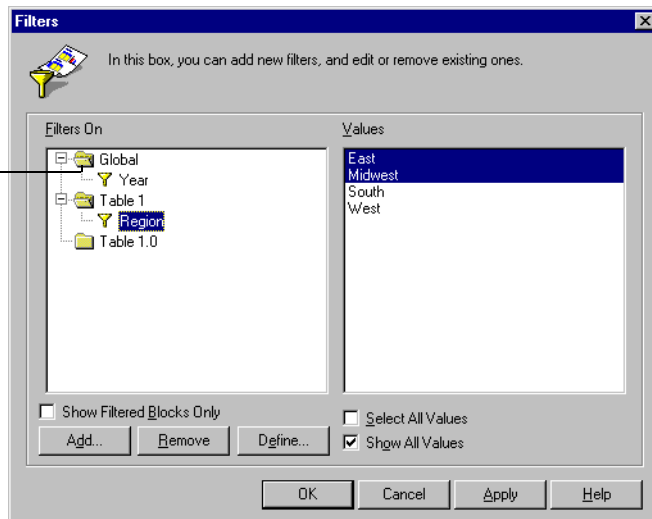
Selecting different values for existing filters

Once you have defined a filter by specifying the values you want to display, you can edit it by selecting different values. For example, instead of displaying data for the East and Midwest regions, you can select different values and display data for the West and South.

To select different values for an existing filter:

1. Click inside the block or master cell where the filtered data appears.
2. Select the Filters command from the Format menu.
The Filters dialog box appears.

Filters placed in this folder affect the whole report.

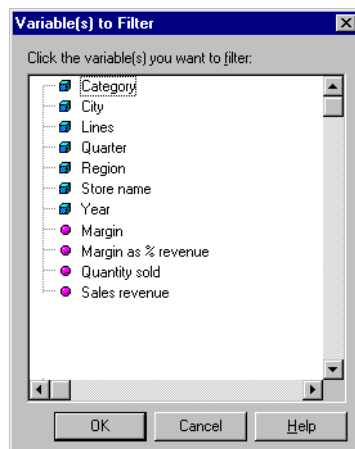


3. In the Filters On list, click the variable whose filter you want to edit. In the Values box, the values that are currently displayed in the report are highlighted (East and Midwest, in the illustration above.)
4. To select different values, you can:
 - Click values that are already selected. The highlighting disappears, which shows that the values will not appear in the report.
 - Select previously unselected values. Before you do this, check *Show All Values* to display all the values for the variable.
 - Click *Select All Values*. Doing this enables you to keep the filter, yet view all the data for the selected variable.
5. When you are done, click OK or Apply.

Adding filters

The Filters dialog box enables you to add filters to the report. To add a filter:

1. Click inside the report, then from the Format menu, choose Filters. The Filters dialog box is displayed.
2. Double-click a folder in the Filters On box:
 - Filters in the *Global* folder affect the whole report.
 - Filters in the *BlockName* folder are block-specific.
3. Click Add. The Variable(s) to Filter dialog box is displayed. It lists all the variables in the document which are not currently filtered, whether or not they are displayed in the current report:



4. Click the variable you want to filter, then click OK.
You return to the Filters dialog box. The variable(s) you clicked in the Variable(s) to Filter dialog box appear(s) in the Filters on box.
5. In the Values box, hold down the Ctrl key and click the values to display.
6. If you selected more than one variable to filter in the Variable(s) to Filter dialog box, repeat step 5, then click OK or Apply.

Tip: You can drag-and-drop a filter between folders. This enables you to change the way a filter is applied. For example, if you drag a filter from a *Block Name* folder to the *Global* folder, then click Apply or OK, you apply the filter on the whole report rather than on one block.

Removing a filter

When you remove a filter, all the data for the variable on which you applied the filter is displayed in the report. For example, if you applied a filter that displays revenue only for the East and Midwest regions, then you remove that filter, the data for all regions is displayed.

To remove a filter:



Insert Filter

1. Click in the data on which you applied the filter.
2. Click the Insert Filter button on the Report toolbar.

Note: You can also choose the Filters command from the Format menu, highlight the filtered variable in the Filters On box, then click Remove.

Displaying filter names in a special field

To keep track of the global filters you have applied to the whole report, you can automatically insert the names of the filtered values you have placed in the global filters folder as a comment or title to your report.

To do this:

1. From the Insert menu, choose Special Field/Global Filters.
The cursor changes to the insert cell cursor.
2. Draw a box in the area of the report where you want insert the names of the filtered values.
3. When you release the mouse button the names are inserted.

Tip: You can also insert the data in an existing cell. To do this:

- Select the cell and then from the Insert menu, choose Special Field/Global Filters.

The names of the filtered values are displayed in the selected cell.

Creating more complex filters

Simple filters enable you to view only the data you need in a report. When you apply a simple filter, all you do is select values for a variable in the report.

Complex filters enable you to display values that satisfy conditions. You define a complex filter by writing a formula.

For more information on using the Formula Editor to write formulas, see Chapter 14 "Formulas, Local Variables & Functions" on page 313.

Example Only display stores with weekly revenue over \$200 000

You publish a weekly report on sales revenue per store but only want to show the results of your better performing outlets.

To do this, you define a complex filter that displays only those stores whose revenue is equal to or over \$200,000. To do this, you write a formula that states that revenue must be greater than or equal to \$20,000. The syntax is as follows:

```
= (<Revenue> >= 20000)
```


Each week, when you refresh your report with the new sales data, only those stores with a revenue over \$200,000 will be listed in the table.

Inserting a complex filter

1. Click inside the section or block that displays the data you want to filter.
2. Click the Filters command on the Format menu.
3. In the Filters dialog box that appears, click a folder in the Filters On box:
 - To apply the filter on the whole report, click Global.
 - To apply the filter on a specific block, click the folder with that block's name.

4. Click Add.
The Variable(s) to Filter dialog box appears.

5. Click the variable you want to filter, then click OK.
6. Click Define.
The Formula Editor opens.
7. Type the formula in the Formula box, or double-click the function(s), variable(s) or operator(s) you need.
8. Click OK to return to the Filters dialog box.
9. If you wish, deselect values for the variable in the Values box.
The filter will only be applied on the remaining selected values.
10. Click Apply or OK.
A complex filter is identified by an asterisk next to the filter symbol.

 Revenue
Complex Filter

Editing a complex filter

1. Click inside the block which contains the filtered data.
2. Click the Filters command on the Format menu.
3. In the Filters On box, click the filter you want to edit, then click Define.
4. Edit the filter's formula in the Formula box, then click OK.
5. If you wish, deselect values for the variable in the Values box. The filter will only be applied on the remaining selected values.
6. Click Apply or OK.

Note: If there is a syntax error in the formula you enter, an error message appears. Click OK to return to the formula. BUSINESSOBJECTS automatically selects the incorrect part of the syntax. Correct the error and click OK. You cannot use the formula if it contains an error.

Ignoring filters

You can force BUSINESSOBJECTS to ignore any filters you have inserted on a report so that when you make a calculation, the calculation is made on all the data, not just the filtered values. To do this, you use the NoFilter function. The syntax is:

`=NoFilter(formula)`

The example below shows how this works.

Year	City	Sales revenue	Year	City	Sales revenue
1999	New York	\$1,667,696	1999	New York	\$1,667,696
1999	Washington	\$693,211	1999	Washington	\$693,211
2000	New York	\$2,763,503	2000	New York	\$2,763,503
2000	Washington	\$1,215,158	2000	Washington	\$1,215,158
2001	New York	\$3,151,022	2001	New York	\$3,151,022
2001	Washington	\$1,053,581	2001	Washington	\$1,053,581
	Sum:	\$10,544,171		Sum:	\$36,387,203

A filter is inserted on the City column so that only the data for New York and Washington is displayed.

In the first table, the sum displayed has only calculated the data for the filtered values, New York and Washington. The formula to calculate this sum is:

```
=Sum(<SalesRevenue>)
```

In the second table, the NoFilter function has been used and the sum displayed has calculated the data for all the values of City. The formula to calculate this sum is:

```
=NoFilter (Sum(<SalesRevenue>))
```

Notice the difference in the two sums.

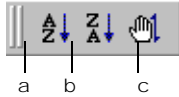
Ordering Data

You can change the order in which data appears in rows and columns by applying a sort on the data. For example, you can sort a column of city names to have the cities appear in alphabetical order. You can apply a sort on text, dates or numbers.

Sorting data

There are three types of sorts which you can apply using the Sorts toolbar. To display the Sorts toolbar:

- Click the Sorts button on the Report toolbar



- a. Ascending sort
- b. Descending order
- c. Custom sort

There are three types of sorts on the Sorts toolbar:

	Text	Numbers	Dates
Ascending order	A-Z	lowest to highest	past to present
Descending order	Z-A	highest to lowest	present to past
Custom sort	You can use a custom sort to order days and months in chronological order. You can customize sorts by placing values in the order you want.		

Note: The default order of appearance of all types of data is ascending.

Applying a sort on report data

1. Click the cell, column, row or chart element containing the data you want to sort.
2. Click the toolbar button for the sort you want to apply.
The data appears in order, and the button you clicked remains pushed, to show that the data has been sorted.

Inverting a sort

1. Click the data you have already sorted
2. Click one of the sort buttons on the toolbar.
For example, if you want to invert an ascending sort, click the Descending Sort button.

Removing a sort

The Sort buttons work as toggle buttons turning sorts on and off, so to remove a sort:

1. Click the data you have already sorted.
2. Click the button you used to apply the sort.

Applying a custom sort

1. Click the cell, column, row or chart element where the data you want to sort is displayed.
2. Click the Custom Sort button on the toolbar.
The Custom Sort dialog box opens.



3. Either
 - Choose an option from the Sort Option list box:

Default	Sorts the values in the order they were in when the Custom Sort dialog box appeared. This option cancels the order you have specified but does not close the dialog box.
Alphanumeric	Displays values in alphabetical or numerical order.
Month	Displays the months of the year in chronological, not alphabetical, order. Only applicable for a variable that returns the months of the year.
Day	Displays the days of the week in chronological, not alphabetical, order. Only applicable for a variable that returns the days of the week.

or

- drag and drop the values in the list into the desired order
- use the Move Up and Move Down buttons to place the values in the desired order

4. Click OK to close the Custom Sort dialog box.

Note: You cannot use custom sorts and alerter. For example, if you set up an alerter to highlight months greater than May, BUSINESSOBJECTS will use the alphabetical sort order instead of the chronological sort order.

The following example shows a table that has two custom sorts.

Example How can I get months to sort correctly?

In this table the months have been sorted to display in chronological order and the product lines have been manually sorted.

	January	February	March	April	May	June	July	August	September	October	November	December
City Skirts	7	0	0	0	7	17	30	19	15	22	12	8
Dresses	193	97	18	33	89	103	137	99	257	205	171	301
City Trousers	12	31	21	12	5	3	9	1	21	27	10	36
Trousers	20	13	16	44	19	8	11	13	34	35	9	20
Jackets	14	30	53	8	33	30	18	30	35	54	14	20
Shirt Waist	169	61	94	88	116	60	70	66	179	222	185	278
Sweaters	244	157	133	80	123	92	189	97	138	190	61	68
Sweat-T-Shirts	415	376	551	351	225	239	218	294	485	557	432	367
Leather	5	10	2	0	0	0	0	1	14	12	2	6
Outerwear	8	31	121	87	225	192	300	94	44	6	1	4
Overcoats	8	12	3	0	0	0	0	2	23	76	25	13
Accessories	1,084	384	709	669	646	412	549	354	338	171	57	91

By default, BUSINESSOBJECTS sorts months in alphabetical order. To sort months correctly in chronological order:

1. Click in the column or row that displays the months.
2. Click the Custom Sort button on the Sorts toolbar.
The Custom Sort dialog box opens.
3. Choose Month from the Sort Option list box and click OK.
Your months are sorted correctly.

Reminder: Months and days are sorted according to the Regional Settings made in the Windows Control Panel. See “Regional settings” on page 193 for more information on checking these settings.

Managing multiple sorts

You can apply more than one sort on report data and specify the order in which you want to apply the sorts. The following example shows how this can be useful.

Example Sort customers by nationality and then by name in alphabetical order

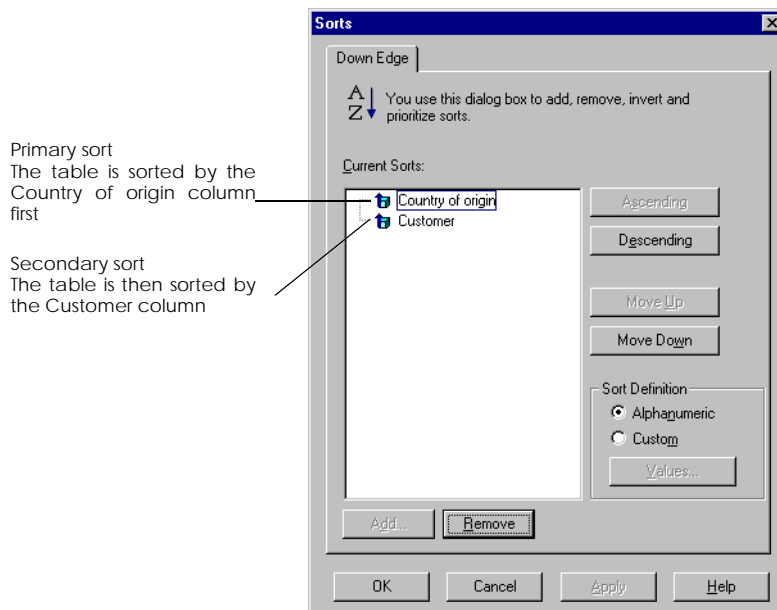
Country of origin	Customer
Germany	Diemers
Germany	Dumstein
Germany	Reinman
Germany	Schiller
Germany	Schultz
Germany	Titzman
Germany	Weimar
Japan	Arai
Japan	Kamata
Japan	Kamimura
Japan	Makino
Japan	Mukumoto
Japan	Okumura
Japan	Oneda
US	Baker
US	Brendt
US	Goldschmidt
US	Larson
US	McCarthy
US	Swenson
US	Travis

In this table data is sorted first by applying an ascending sort to the country column so that the countries are displayed in alphabetical order and then by applying a secondary ascending sort to the customer column so that German customers are sorted by alphabetical order, then Japanese customers in alphabetical order and so on.

Define sort priority in a report

You can change the order in which sorts are applied.

1. Click inside the block or master cell containing sorted data.
2. Click the Sorts command on the Format menu.
The Sorts dialog box appears:



If your report contains a table or a 2-D chart, the dialog box contains one tab only. If your report contains a crosstab or a matrix chart, the dialog box has both tabs, Across Edge and Down Edge. The Down Edge tab displays the sorts applied to columns. The Across Edge tab displays the sorts applied to rows or on the Z-axis of the chart.

3. Click the tab you want to work in, then click the sort that you want to prioritize.
4. Click Move Up to give the sort higher priority, or Move Down to give it lower priority.
The sort icon moves up or down one place in the list of sorts.
5. Click OK or Apply.
The sort priority you defined is applied to the report.

Adding sorts from the sorts dialog box

You can add, remove and re-organize sorts in the Sorts dialog box.

1. Click inside a block or a master cell, then click the Sorts command on the Format menu.
2. Click the tab you want to work in.
3. Click Add.
4. Choose the variable to sort and click OK.
The new sort appears in the Current Sorts box.
5. Set the sort options you want to apply and click OK.

To remove a sort

- Click the Sort in the Current sorts list and click Remove.

Using Ranking to View the Top and Bottom Values

You may only want to show the extreme ranges of the data. For example, you may want to determine your top ten customers.

Ranking enables you to look at the largest numbers and the smallest numbers in a report. Like filtering, it hides the data you do not want to display. The hidden data is not deleted from the report - you can view it again whenever you like by removing the ranking.

Ranking also sorts the data in descending order. Thus, the largest value of the ranking is always at the top of the ranked column and the smallest value at the bottom.

You can rank data contained in tables, crosstabs or master cells in master/detail reports.

Example Display only top three-selling product lines

In the example below, the table shows sales revenue for the product lines in the efashion retail chain. The table on the left shows revenue for all product lines. In the table on the right, the product lines column shows only the top three-selling lines.

Lines	Sales revenue
Accessories	\$9,914,546
City Skirts	\$347,775
City Trousers	\$284,734
Dresses	\$2,915,620
Jackets	\$677,307
Leather	\$187,413
Outerwear	\$1,183,083
Overcoats	\$436,258
Shirt Waist	\$4,018,219
Sweaters	\$2,839,035
Sweat-T-Shirts	\$12,679,893
Trousers	\$903,320

Lines	Sales revenue
Sweat-T-Shirts	\$12,679,893
Accessories	\$9,914,546
Shirt Waist	\$4,018,219

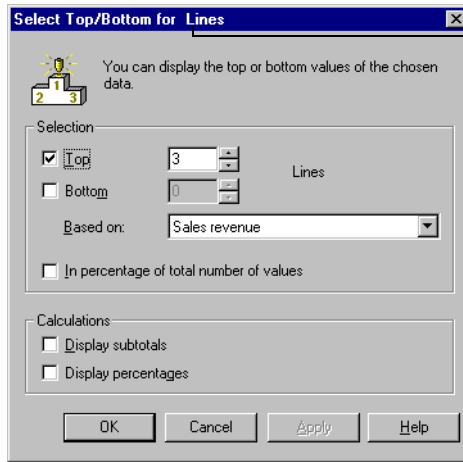
Applying a ranking on report data



Apply Ranking

To apply a ranking:

1. Click to select the data you want to rank. For example, if you want to rank the data for customers, click the column where this data appears.
2. Click the Apply Ranking button on the Report toolbar, or select the Ranking command on the Format menu.



The title of this dialog box depends on the data you select in the report. Here, data for Month was clicked, so the title is “Select Top/Bottom Lines”.

3. The Select Top/Bottom *Variable Name* dialog box appears. It displays the options you can select for the ranking:
The options you can select are:
 - **Top**
Click this check box and type or select from the list for the largest n values. When you click the check box, a default value of 3 is selected.
 - **Bottom**
Click this check box and type or select from the list for the smallest n values. When you click the check box, a default value of 3 is selected.
 - **Based On**
Click to select the measure on which your ranking is to be based. This list includes all measures that you can select from the report. You must select a measure before the ranking can be applied.

- **In percentage of total number of values**
Click this check box if you want to interpret the numbers for Top and Bottom as percentages. When this option is selected a percent sign (%) appears at the Top and Bottom values. These numbers are truncated if necessary to fall in the percentage range of 1 to 100.
- **Display Subtotals**
Click this check box to display the following calculations:

Sum	Shows the sum of all the rows displayed in the table after ranking has been set
Sum Other	Shows the sum of all the rows which are not displayed in the table after ranking has been set
Sum All	Shows the sum of all the rows in the table, those displayed and those hidden

- **Display Percentages**
Click this check box to display calculations as percentages in a new cell.
4. Click the ranking values you want to display in your report, then click OK (or Apply).
The report displays only ranked data for the values you selected. The Apply Ranking button on the toolbar is dimmed.

Ranking in master/detail reports

In master/detail reports, subtotals and percentages can only be shown for cells selected for ranking that are in the table. Master cells that have ranking applied will not display subtotals and percentages.

In master/detail reports, data is ranked for each section.

Ranking and breaks

In a table or crosstab in which breaks have been inserted, data is ranked separately for each break level.

Note: If you have created a local variable using values from different data providers, you will not be able to rank data based on this variable. The variable will not be displayed in the list in the Ranking dialog box.

Example Show sales revenue for top three months and compare with overall revenue

Month Name	Sales revenue	Percentage
September	\$4,061,152	11.16 %
January	\$3,840,310	10.55 %
March	\$3,787,013	10.41 %
Sum:	\$11,688,475	32.12 %
Sum Other:	\$24,698,728	67.88 %
Sum All:	\$36,387,203	100.00 %

This report displays the top three revenue-making months. It shows the combined revenue for September, January and March (Sum) and the total revenue for the other nine months of the year (Sum Other).

Tip: To remove the ranking, click inside the ranked data, then click the Apply Ranking button.

Altering values for an existing ranking

Once you have defined a ranking by specifying the ranking values you want to display, you can edit it by selecting different ranking values. For example, if you have applied a ranking that enables you to view the top and bottom 3 ranking of revenue for customers, you can edit the ranking to show the top 10 instead.

To select different values for an existing ranking:

1. Click inside the data where the ranking was applied.
2. Select the Ranking command on the Format menu.
The Select Top/Bottom *Variable Name* dialog box appears, with the current ranking options selected.
3. Alter the ranking settings as desired, then click OK (or Apply). When you exit from the Dialog box, the values with the new ranking criteria are displayed.

Removing a ranking

When you remove a ranking, all the data on which you applied the ranking that may have been suppressed by the ranking criteria re-appears in the report. For example, if you applied a ranking that displays the top 10 customers by revenue, then you remove that ranking, the data for all customers is displayed.



Apply Ranking

To remove a ranking, first click inside the data on which you applied the ranking. Then, you can:

- Click the dimmed Apply Ranking button on the Report toolbar.
- Select the Ranking command from the Format menu. Remove Top and Bottom check marks. Then click OK or Apply.

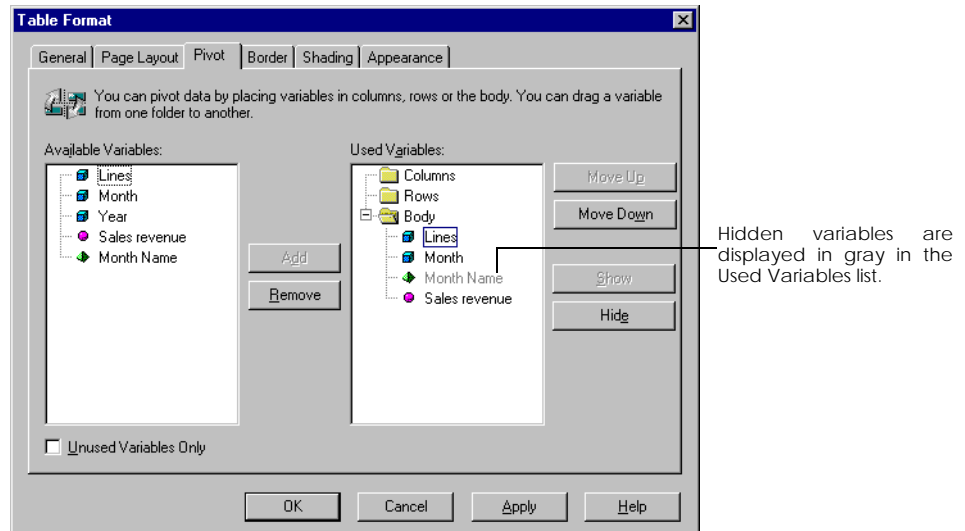
Managing ranking with filters and sorts

To rank data in a report, you must remove any sorts or filters currently applied to that data. If any sorts or filters exist when you try to apply a ranking, an Overwrite? message is displayed. Click Yes to remove the existing sort or filter and continue to apply ranking. Clicking No closes the ranking dialog and returns with no change.

Hiding Columns and Rows of Data

You can hide columns or rows of data so that the data is not displayed in your table but still remains in the report.

1. Right-click inside the table or crosstab.
2. Choose Format Table or Format Crosstab from the menu.
3. Click the Pivot tab in the dialog box that appears.



The Pivot tab for tables and crosstabs

Hiding Data

- In the Used Variables box, click the variable you want to hide, then click Hide.
- To hide more than one variable at the same time, hold down the Ctrl key, click the variables, then click Hide.

Hidden variables are grayed in the Used Variables box.

Showing Data

- To display a previously hidden variable, click it in the Used Variables list, then click Show.

Highlighting Data

You can highlight data in a BUSINESSOBJECTS report using Alerters. Alerters use special formatting to make data that fits certain conditions stand out from the rest of the data. This helps draw attention to trends and exceptions in report data.

Example Which sales representatives generate revenue over \$500 000?

You want to identify excellent salespeople who generate revenue over \$500 000, and poor salespeople who generate revenue below \$50 000.

You define a condition for your good salespeople: "Revenue > 500000" and define a format that will be applied for values that fit this condition: "Top salesperson" red.

Sales Person	Revenue	Performance
Fischer	\$233,886.00	
Galagers	\$743,139.00	Top salesperson
Ishimoto	\$644,883.00	Top salesperson
Nagata	\$4,700.00	Work harder!

You then define a condition for your not-so-good salespeople: "Revenue < 50000". and define a format that will be applied for values that fit this condition: "Work harder!" in green.

You insert an extra column after revenue and name it performance. You then apply the alerter to the performance column.

Note: You cannot use alerters on charts.

Creating an alerter

There are 4 steps involved in creating an alerter:

1. Select the data you want to use.
2. Name and describe the Alerter.
3. Define the range of values.
4. Define how the Alerter will be displayed in the cell.

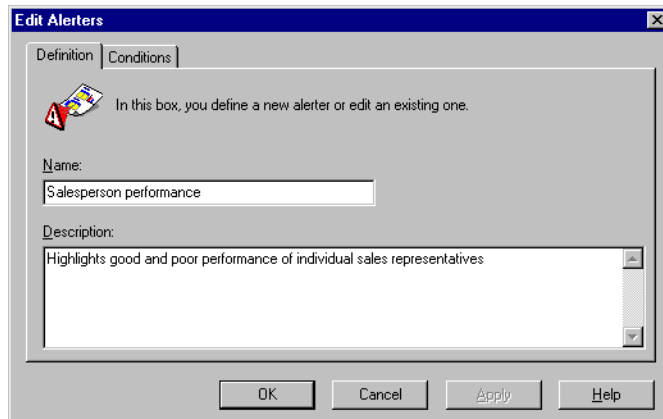
Once you have created an Alerter you can apply it, hide it or display it.

Step 1: Select the data

1. In a report, click a cell, row or column of data.
2. Click the Alerters command on the Format menu.
3. In the Alerters dialog box that appears, click Add.

Step 2: Name and describe the alerter

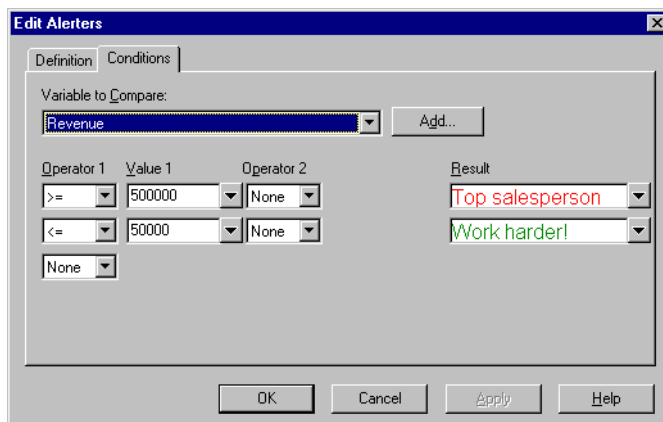
1. In the Name box in the Definition tab, type a name for the alerter.
2. In the Description box, type a help text on the alerter to remind you and others what the Alerter is set to highlight.



3. Click the Conditions tab.

Step 3: Set the conditions

1. Choose a variable from the Variable to Compare listbox.



2. Choose an operator from the Operator 1 listbox.
 - Type a value (number, character or date), or
 - Click the down arrow button to the right of the Value 1 box, then click the Variables command, or the List of Values command. Select a variable or a value.
3. If operator 1 requires the use of a second operator, click the operator to use in the Operator 2 box.
4. Click inside the Value 2 box and repeat step 2.

Step 4: Set the formatting

Specify different formats for each range, using fonts, colors and borders, for example. Or you can enter a text or select a variable that will mask the data that satisfies the conditions you set.

1. Click the arrow next to the Cell Content box.
A popup menu appears.
2. To have the alerter display text, click Text.
3. Type the text, then click OK.
4. To have the alerter display a variable or a formula, click Variables.
5. To format the cell contents, click Format.

6. In the Cell Format box, format the text, then click OK.
7. Click OK to return to the Edit Alerters dialog box.

Switching alerters off and on

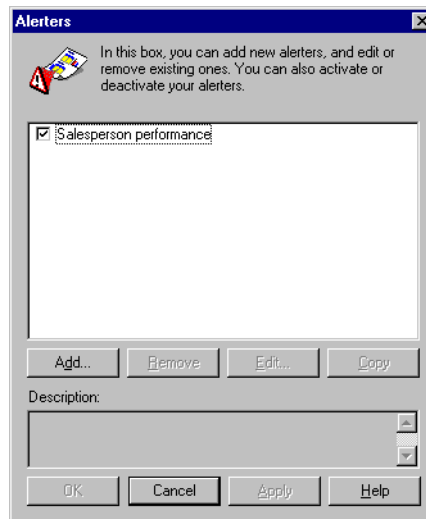
Once you have created alerters, you can apply or deactivate them whenever you like. For example, you can create an alerter, apply it to a report, print the report, then deactivate the alerter. In this case, the alerter appears on the printed report, but no longer appears on your screen.

Turn an alerter on

1. Click the cell, column or row where you want to display the alerter.
2. Click the Alerters command on the Format menu.
3. Click the check box next to the alerter that you want to activate.
4. Click Apply or OK.

Turn an alerter off

1. Click the cell, column or row where the alerter is displayed.
2. Click the Alerters command on the Format menu.



3. Click the check box next to the alerter that you want to deactivate.

4. Click Apply or OK.

Display or hide all alerters in the current report

You can also display or hide all alerters that you have applied to the current report.

1. Click the Options command on the Tools menu.
2. Click the Display tab.
3. In the Report Options box, click Alerters.
If this option is already checked and you want to hide the alerters in your report, click it again to remove the check.
4. Click OK to apply the option and to close the dialog box.

Working on existing alerters

Once you have created an alerter, you can use it as the basis for other new alerters. You copy the existing alerter, then modify its conditions and their corresponding formats.

Copy an alerter

1. Click the Alerters command on the Format menu.
2. Click the alerter you want to copy.
3. Click Copy.
The Edit Alerters dialog box appears.
In the Definition tab, the name of the initial alerter appears in the Name box followed by no2. If you renamed your first alerter so it no longer has the variable name, the name given to the copy is the variable name with nothing added.
4. Type a new name and description for the new alerter.
5. In the Conditions tab, define the first range of values for the alerter.
6. Define the way the result appears in the cell.
7. Repeat Step 5 and Step 6 to define a second range of values if you wish, then click Apply or OK.

Edit an alerter

1. Click the Alerters command on the Format menu.
2. Click the alerter you want to edit.
3. Click Edit.
4. Change the definition of the alerter.
5. Click Apply or OK.

Delete an alerter

1. Click the Alerters command on the Format menu.
2. Click the alerter you want to delete.
3. Click Remove.

Chapter 13

Breaking Up Tables and Displaying Calculations

In this chapter

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Overview

This chapter explains how to break up the data in tables and crosstabs and how to make and display simple calculations in tables and crosstabs. The final section of this chapter describes all you need to know about converting currencies to and from euros in BUSINESSOBJECTS

The following chapters give further information on using calculations in BUSINESSOBJECTS:

- Chapter 14 "Formulas, Local Variables & Functions" on page 313 explains how you can use the power of the BUSINESSOBJECTS formula editor to write your own calculations.
- Chapter 15 "Calculation Contexts and Extended Syntax" on page 341 explains the more sophisticated aspects of writing formulas and gives some background about how the BUSINESSOBJECTS calculation engine works.
- Chapter 16 "Calculation Troubleshooting" on page 373 explains the error messages and other problems you may encounter when inserting formulas and calculations in your reports and explains how to fix these problems.
- For information on using calculations in charts, see "Displaying a Calculation on Data in Charts" on page 456.

Breaks

This section explains how to break up data in tables and crosstabs and describes the different options available to format and manage these breaks.

What is a break?

A break does what its name implies. It breaks up the data in a table or crosstab by grouping the data according to a selected value. This allows you to display all the data for each value of a dimension variable together, and more importantly, it allows you to display subtotals. The example below demonstrates how breaking up a table works.

Example How can I show revenue subtotals for each resort in a table?

The table on the left displays the revenue per quarter per resort with the total revenue displayed at the bottom of the table.

The table on the right displays the same data but, by breaking up the data by resort, you can now show a subtotal for the revenue generated by each resort for the four quarters of the financial year. A mini table is created for each of the three values of resort. This separation, however, is only visual. The three mini tables still belong to one block.

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
	Sum:	\$3,286,524



Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
French Riviera	Sum:	\$835,420

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
Bahamas Beach	Sum:	\$971,444

Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
Hawaiian Club	Sum:	\$1,479,660

	Sum:	\$3,286,524
--	-------------	--------------------

Inserting and removing breaks

You can insert and remove breaks with a simple mouse click. The Insert Break button on the Report toolbar is a toggle button that inserts and removes breaks on data.

To insert a break:



Insert Break

1. Click inside the column or row of data where you want to insert a break.
2. Click the Insert Break button on the Report toolbar.
The data in the table is broken up and the Insert Break button is dimmed.

To remove a break:

1. Click inside the data where the break has been inserted.
The Insert Break button on the Report toolbar is dimmed to show that there is a break on the selected data.
2. Click the Insert Break button.
The Break is removed from the table or crosstab.

Note: You cannot insert breaks on data in charts.

Formatting breaks

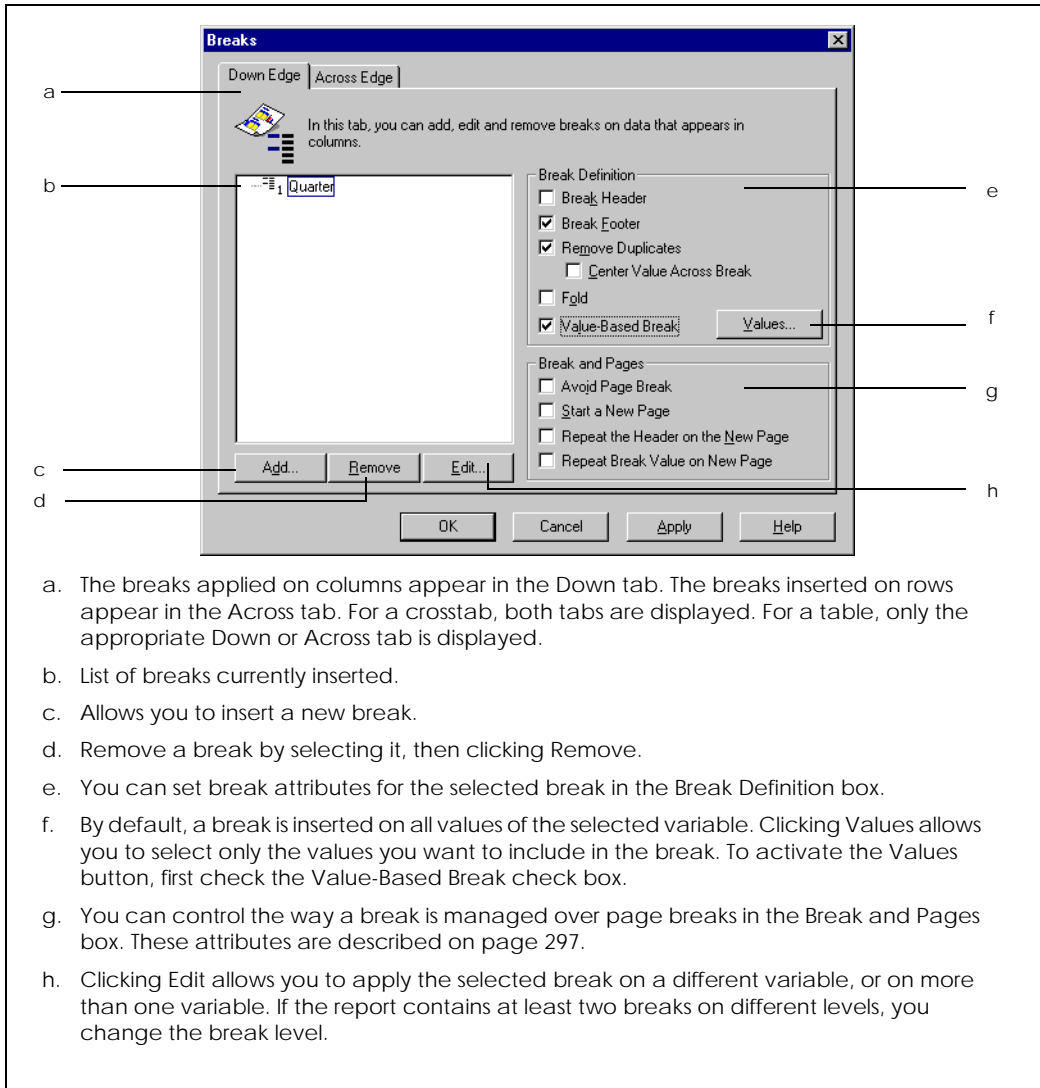
When you first insert a break on data, certain formatting and display options are applied by default. You can edit these settings and set other options in the Breaks dialog box.

To display the Breaks dialog box:

1. Right-click on the column or row where the break has been inserted.
2. Choose Format Breaks from the menu.
The Breaks dialog box is illustrated and described on page 290.

Note: If no break has been inserted on a table or crosstab, all the options in this dialog box are unavailable.

Breaks dialog box



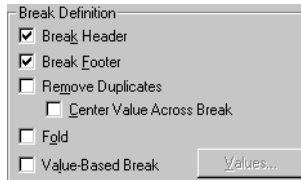
- a. The breaks applied on columns appear in the Down tab. The breaks inserted on rows appear in the Across tab. For a crosstab, both tabs are displayed. For a table, only the appropriate Down or Across tab is displayed.
- b. List of breaks currently inserted.
- c. Allows you to insert a new break.
- d. Remove a break by selecting it, then clicking Remove.
- e. You can set break attributes for the selected break in the Break Definition box.
- f. By default, a break is inserted on all values of the selected variable. Clicking Values allows you to select only the values you want to include in the break. To activate the Values button, first check the Value-Based Break check box.
- g. You can control the way a break is managed over page breaks in the Break and Pages box. These attributes are described on page 297.
- h. Clicking Edit allows you to apply the selected break on a different variable, or on more than one variable. If the report contains at least two breaks on different levels, you change the break level.

Showing headers and footers

When you insert a break, a mini table is created for each value of the variable. You can choose whether or not you want to display a header and/or footer in each mini table.

To do this:

- To display a break header or footer, check the box next to *Break Header* or *Break Footer* in the Breaks dialog box.
- To hide a break header or footer, uncheck the box next to *Break Header* or *Break Footer* in the Breaks dialog box.



The illustration below shows two examples of using break headers and footers with a sum calculation on the Revenue column :

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
	Sum:	\$835,420
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
	Sum:	\$971,444
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
	Sum:	\$1,479,660
	Sum:	\$3,286,524

This table displays a break footer only, a table header and footer, and a sum calculation.

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
French Riviera	Sum:	\$835,420

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
Bahamas Beach	Sum:	\$971,444

Break header

Break footer displays the sub-total for each section

Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
Hawaiian Club	Sum:	\$1,479,660

	Sum:	\$3,286,524
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Table footer displays the total for the table

This table displays a break header and footer, a table footer, and a sum calculation.

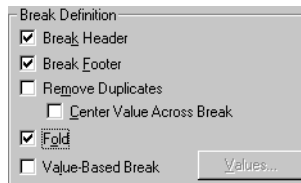
Folding breaks

You can also choose to display only the break headers and footers in a table as shown in the illustration below. The other rows in the table are hidden.

Resort	Quarter	Revenue
French Riviera	Sum:	\$835,420
Resort	Quarter	Revenue
Bahamas Beach	Sum:	\$971,444
Resort	Quarter	Revenue
Hawaiian Club	Sum:	\$1,479,660
Total		\$3,286,524

To do this:

- Check the *Fold* option in the Breaks dialog box.



Merging cells

When you have inserted a break on a row or column, you have several columns or rows displaying the same value. If you wish, you can display this value only once. To do this:

- Check *Remove Duplicates* on the Breaks dialog box.

You can also merge these cells into one and display the name only once. The name is centered over the columns or rows of data that it describes. To do this:

- Check *Center Value Across Break* on the Breaks dialog box.

The examples below show how these options are applied:

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
	Q2	\$242,165
	Q3	\$226,125
	Q4	\$158,565
	Sum:	\$835,420
Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
	Q2	\$237,872
	Q3	\$263,422
	Q4	\$245,269
	Sum:	\$971,444
Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
	Q2	\$341,780
	Q3	\$395,150
	Q4	\$385,560
	Sum:	\$1,479,660
	Sum:	\$3,286,524

Here, the *Remove Duplicates* option is turned on so the resort name is displayed only once.

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
	Q2	\$242,165
	Q3	\$226,125
	Q4	\$158,565
French Riviera	Sum:	\$835,420

Bahamas Beach	Q1	\$224,881
	Q2	\$237,872
	Q3	\$263,422
	Q4	\$245,269
Bahamas Beach	Sum:	\$971,444

Hawaiian Club	Q1	\$357,170
	Q2	\$341,780
	Q3	\$395,150
	Q4	\$385,560
Hawaiian Club	Sum:	\$1,479,660

Sum:	\$3,286,524
-------------	--------------------

Here, the *Remove Duplicates* and *Center Value Across Break* options are turned on. The resort name is displayed once and centered over the rows it describes.



Center Across
Break

You can also use the *Center Across Break* button on the Formatting toolbar. This button removes duplicate values, merges the cells and centers the value over the rows or columns it describes.

Tip: If the Resort column footer cell is empty when you center the resort value across the break, all rows, including the footer row are merged as shown in the table on the left below. If you do not want an empty footer cell to be merged:

1. Type a character in the empty resort footer cell.
2. Right-click on the footer cell and choose Format Cell from the menu. The Format Cell dialog box opens.
3. Click the Font tab.
4. Set the font color to the same color as the cell background, in this example to white, and click OK.
5. Check the Center Values Across Break option in the Breaks dialog box. The empty cells for each value of resort are merged and the footer cells are untouched, as shown in the table on the right below.

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
	Q2	\$242,165
	Q3	\$226,125
	Q4	\$158,565
	Sum:	\$835,420
Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
	Q2	\$237,872
	Q3	\$263,422
	Q4	\$245,269
	Sum:	\$971,444
Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
	Q2	\$341,780
	Q3	\$395,150
	Q4	\$385,560
	Sum:	\$1,479,660
Sum:	\$3,286,524	

Type a character in this cell and set the font color to white.

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
	Q2	\$242,165
	Q3	\$226,125
	Q4	\$158,565
	Sum:	\$835,420
Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
	Q2	\$237,872
	Q3	\$263,422
	Q4	\$245,269
	Sum:	\$971,444
Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
	Q2	\$341,780
	Q3	\$395,150
	Q4	\$385,560
	Sum:	\$1,479,660
Sum:	\$3,286,524	

Making a value-based break

You can choose to only apply a break on certain values in your table. In the illustration below, instead of inserting a break on the whole resort column, the break is inserted on the resort French Riviera only. This breaks up the table to show a revenue subtotal for French resorts as illustrated below:

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
	Q2	\$242,165
	Q3	\$226,125
	Q4	\$158,565
French Riviera	Sum:	\$835,420
Bahamas Beach	Q1	\$224,881
	Q2	\$237,872
	Q3	\$263,422
	Q4	\$245,269
Hawaiian Club	Q1	\$357,170
	Q2	\$341,780
	Q3	\$395,150
	Q4	\$385,560
	Sum:	\$3,286,524

The break footer displays the subtotal on the value-based break

This table footer displays the total for the entire table -- not the remaining sections.

Here, the Break Footer, Remove Duplicates, and Value-Based Break options are turned on. The Show Table Header and Footer options display the table header and the table sum.

To do this, begin with a table with the Format Table, Show Header and Show Footer options turned on:

1. Insert a break on the Resort column.
2. Right-click on the Resort column and choose Format Breaks from the menu. The Breaks dialog box opens.
3. Check the Value-Based Break check box.
When this box is checked, the Values button becomes available.
4. Click the Values button.
The list of values box opens, displaying a list of all the values of the Resort dimension.
5. Select French Riviera from the list and click OK.
6. Click OK again to close the Breaks dialog box.
7. Right click the Revenue column and select Calculations > Sum.
The calculation result sums the French Riviera section and the entire table.

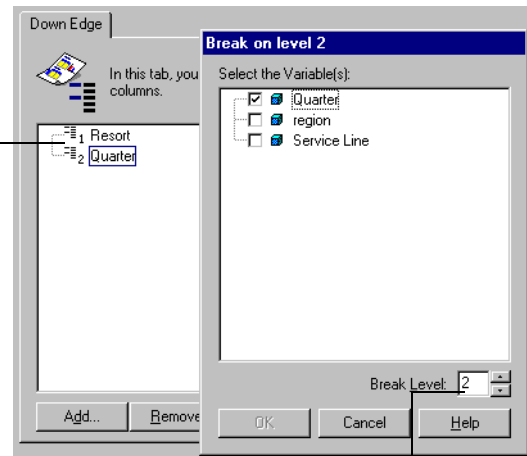
Organizing multiple breaks

You can insert up to nine breaks on a table or crosstab.

When you have more than one break in a table or crosstab, the breaks are assigned levels. BUSINESSOBJECTS assigns level 1 to the first break you insert, level 2 to the second and so on. You can rearrange these levels in the Breaks dialog box. You can also set different options for the different breaks.

In the illustration below, there are two breaks on the data. One on the Resort dimension and one on the Quarter dimension. As you can see, the data is broken up first by resort with information for all four quarters displayed for French Riviera, then for Bahamas Beach and so on. The data in each resort section is then broken up by quarter. You can change this organization at any time and add and remove breaks in the Breaks dialog box.

Quarter	Resort	Service Line	Revenue
Q1	French Riviera	Accommodation	\$139,470
		Food & Drinks	\$27,450
		Recreation	\$41,644
Q1		Sum:	\$208,564
Q2	French Riviera	Accommodation	\$165,720
		Food & Drinks	\$30,250
		Recreation	\$46,195
Q2		Sum:	\$242,165
Q3	French Riviera	Accommodation	\$153,450
		Food & Drinks	\$27,705
		Recreation	\$44,970
Q3		Sum:	\$226,125
Q4	French Riviera	Accommodation	\$104,610
		Food & Drinks	\$21,995
		Recreation	\$31,960
Q4		Sum:	\$158,565
	French Riviera		\$835,420
Q1	Bahamas Beach	Accommodation	\$167,296
		Food & Drinks	\$26,986
		Recreation	\$30,600
Q1		Sum:	\$224,881



List of breaks inserted in the selected table and the order in which they are applied.

Sets the order the break is applied.

To reorganize the order in which breaks are applied:

1. Right-click on a column or row that contains a break and choose Format Breaks from the menu. The Breaks dialog box opens.
2. Click on the break name in the list and click the Edit button.
3. Set the order you want the break to be applied and click OK.

Managing breaks over multiple pages

When a table spans more than one page, there are certain options you can set to make sure that tables are not split incoherently and so that certain elements such as column and row headers are repeated on the new page. You can set the following options in the Break and Pages section of the Breaks dialog box.

To open the Breaks dialog box:

- Right-click on a row or column that contains a break and choose Format Breaks from the menu.

Check this option.....	To.....
Avoid Page Break	Where possible, keep each break section of the table or crosstab on the same page.
Start a New Page	Display each part of the table or crosstab created by a break on a separate page.
Repeat the Header on the New Page	Repeat the header on each new page if a table or crosstab extends over more than one page.
Repeat Break Value on New Page	Repeat the current break value on the new page.

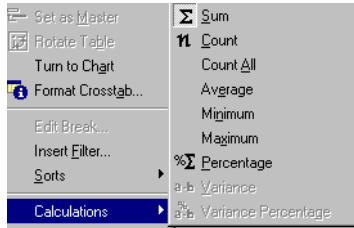
Calculations

BUSINESSOBJECTS has standard calculation functions that enable you to make quick calculations on the data in reports. These calculations are available directly from a menu. The most commonly used calculations are also available on the Report toolbar. This section describes how to make calculations using the menu and toolbar functions.

You can also make calculations by writing your own formulas. This is described in Chapter 14 "Formulas, Local Variables & Functions" on page 313.

Making simple calculations

1. Select the row or column on which you want to make the calculation.
2. From the Data Menu, choose Calculations and then the type of calculation:



Choose...	To...
Sum	Calculate the sum of the selected data.
Count	Count all rows for a Measure object. Count distinct values for a Dimension or Detail object.
Count All	Count the number of rows in the body including all duplicate and empty rows
Average	Calculate the average of the selected data.
Maximum	Display the maximum value of the selected data.
Minimum	Display the minimum value of the selected data.
Percentage	Display the selected data as a percentage.
Variance	Calculate the difference between two selected values.

Choose...	To...
Variance percentage	Calculate the difference between two selected values and display the difference as a percentage.

The result of the calculation is inserted in a new cell in the table or crosstab.

Note: Note: Variance syntax containing the Where operator will work in all cases except when you have two cascading Wheres (a variance using a Where operator that contains a formula that also uses a Where operator) or in certain contexts, e.g. the variance of the variable "<Revenue>" in Report.

Example What's the difference between Count and Count All?

In the example below, if you insert a Count on the Resort column, the result of the calculation is 3 because there are three different resorts, Bahamas Beach, Hawaiian Club and French Riviera. The Count function counts values of a dimension object that are the same only one time. This is called a distinct count.

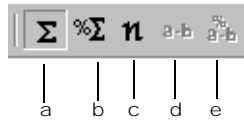
If you insert Count All on the same column, the result is 12 because there are twelve rows of data in the resort column. The Count All function counts all rows including empty and duplicate rows.

Quarter	Resort	Revenue
Q1	Bahamas Beach	\$224,881
Q1	French Riviera	\$208,565
Q1	Hawaiian Club	\$357,170
Q2	Bahamas Beach	\$237,872
Q2	French Riviera	\$242,165
Q2	Hawaiian Club	\$341,780
Q3	Bahamas Beach	\$263,422
Q3	French Riviera	\$226,125
Q3	Hawaiian Club	\$395,150
Q4	Bahamas Beach	\$245,269
Q4	French Riviera	\$158,565
Q4	Hawaiian Club	\$385,560
Count:	3	12
Count All:	12	12

If you look at the Revenue column, Count and Count All return 12. For a measure object, the Count function counts all rows.

Using the Calculation toolbar

You can also use the buttons on the Report toolbar for certain calculations.



- a. Sum
- b. Percentage
- c. Count
- d. Variance
- e. Variance percentage

Removing calculations from a table or a crosstab

To delete calculations from a table or crosstab:

1. Select the row or column where the calculation is displayed.
2. From the Data Menu, choose Calculations and then the calculation that has been applied from the submenu.
You can see which calculations have been applied to a row or column of data. On the Data menu, the icon next to the calculation is dimmed or has a check mark next to it to show it has been used. Buttons on the toolbar are dimmed to show they have been used on the selected data.

Note: The calculation commands available on the menu and toolbar depend on the data you have selected in the table or crosstab.

Making calculations on dimension and detail objects

You can use the following calculations on dimension and detail objects:


Dimension object


Detail object

- Count
- Minimum
- Maximum

Calculation examples

The following section contains several examples of making calculations using the Calculations menu.

Example Displaying total revenue and subtotals

You want to calculate and display the total revenue in a table. To do this:

1. Click in the Revenue column.
2. Click the Sum button on the Calculations toolbar.
 - The revenue sum is displayed in the footer at the end of the table.
 - The sum button on the Calculations toolbar is dimmed.



Sum



Sum button
dimmed

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
Sum:		\$3,286,524

You now decide you want to insert a break on this table to display subtotals for each resort.



Insert Break

3. Click inside the Resort column and click the Insert Break button.
The data is broken up and an empty row is inserted at the end of each resort section.
4. Click in the Revenue column.
5. Click the Sum button once to remove the existing calculation.

6. Click the Sum button again to carry out a new calculation.
 A subtotal is displayed for each resort and a total sum at the end of the table:

Resort	Quarter	Revenue
French Riviera	Q1	\$208,565
French Riviera	Q2	\$242,165
French Riviera	Q3	\$226,125
French Riviera	Q4	\$158,565
French Riviera	Sum:	\$835,420

A subtotal is displayed
 For revenue per resort

Resort	Quarter	Revenue
Bahamas Beach	Q1	\$224,881
Bahamas Beach	Q2	\$237,872
Bahamas Beach	Q3	\$263,422
Bahamas Beach	Q4	\$245,269
Bahamas Beach	Sum:	\$971,444

Resort	Quarter	Revenue
Hawaiian Club	Q1	\$357,170
Hawaiian Club	Q2	\$341,780
Hawaiian Club	Q3	\$395,150
Hawaiian Club	Q4	\$385,560
Hawaiian Club	Sum:	\$1,479,660

A total is displayed for
 revenue for all resorts

	Sum:	\$3,286,524
--	-------------	--------------------

Example Displaying average, maximum and minimum revenue

The following table has four different calculations for revenue. Notice that the Average revenue, the Maximum and Minimum revenues and the Sum are all displayed in separate rows in the order they were applied. Each figure is identified by the name of the calculation. A new column has been inserted to show the percentage for each row.

Quarter	Resort	Service Line	Revenue	Percentage
Q1	French Riviera	Accommodation	\$139,470	17.64 %
Q1	French Riviera	Food & Drinks	\$27,450	3.47 %
Q1	French Riviera	Recreation	\$41,645	5.27 %
Q1	Bahamas Beach	Accommodation	\$167,296	21.16 %
Q1	Bahamas Beach	Food & Drinks	\$26,985	3.41 %
Q1	Bahamas Beach	Recreation	\$30,600	3.87 %
Q1	Hawaiian Club	Accommodation	\$237,810	30.08 %
Q1	Hawaiian Club	Food & Drinks	\$64,160	8.12 %
Q1	Hawaiian Club	Recreation	\$55,200	6.98 %
		Average:	\$87,846	
		Maximum:	\$237,810	
		Minimum:	\$26,985	
		Sum:	\$790,616	
		Percent:		100.00 %

Example Calculating the difference in revenue between two quarters

In this example you have a crosstab that displays revenue per resort per quarter and total revenue per quarter. You want to show in the table the difference in revenue between two quarters. To do this:

1. Select Q2 with the mouse, then, holding down the Ctrl key, select Q1.

	Baham
Q1	
Q2	
Q3	
Q4	

Q2 is selected first.

	Bahama
Q1	
Q2	
Q3	
Q4	

Then Q1.



Variance Percentage

2. Click the Variance Percentage button on the calculations toolbar. The difference in revenue between Q1 and Q2 for each resort and for the total revenue of all resorts is displayed in a new cell as a percentage. The new row is labeled Q2-Q1.

The result of Q2-Q1 is displayed in a new row.

	Bahamas Beach	French Riviera	Hawaiian Club	Sum:
Q1	\$224,881.00	\$208,565.00	\$357,170.00	\$790,616.00
Q2	\$237,872.00	\$242,165.00	\$341,780.00	\$821,817.00
Q2-Q1	5.78 %	16.11 %	-4.31 %	3.95 %
Q3	\$263,422.00	\$226,125.00	\$395,150.00	\$884,697.00
Q4	\$245,269.00	\$158,565.00	\$385,560.00	\$789,394.00
Q4-Q3	-6.89 %	-29.88 %	-2.43 %	-10.77 %
Sum:	\$971,444.00	\$835,420.00	\$1,479,660.00	\$3,286,524.00

3. Now select Q4 with the mouse.
4. Holding down the Control key, select Q3. The difference in revenue between Q4 and Q3 for each resort and for the total revenue of all resorts is displayed in a new cell as a percentage. The new row is labeled Q4-Q3.

Note: You can also use the Shift key to select columns and rows. If you use the Shift key, BUSINESSOBJECTS does not take into account the order in which you selected the columns and rows and always selects cells from top to bottom and from left to right. If you carry out the calculation above using the Shift key, BUSINESSOBJECTS will calculate Q1-Q2.

Reusing a calculation elsewhere in a report

You can drag a calculation from a table or a crosstab and place it in a different position in a report. BUSINESSOBJECTS keeps the formula with the cell. To do this:

1. Click inside the cell containing the calculation.
2. Click inside the cell again and, holding down your mouse button, drag the cell to the desired position.
3. Release the mouse button.

Note: When you move a cell containing a calculation to a different part of the report, the calculation result depends on where exactly the cell is positioned as this can change the context in which the calculation is made. For more information on this point see “What are calculation contexts?” on page 345.

Example Displaying total revenue as a table title

In this report you dragged the cell containing the sum of the total revenue for all resorts out of the table and placed it at the top of the table. You inserted a cell next to the figure and typed in the text “Total revenue”. You then deleted the rows for Sum total and Maximum total at the very bottom of the table.

Resort	Service Line	Revenue
French Riviera	Accommodation	\$563,250
	Food & Drinks	\$107,400
	Recreation	\$164,770
French Riviera	Sum:	\$835,420
	Maximum:	\$563,250

Resort	Service Line	Revenue
Bahamas Beach	Accommodation	\$673,664
	Food & Drinks	\$169,680
	Recreation	\$128,100
Bahamas Beach	Sum:	\$971,444
	Maximum:	\$673,664

Resort	Service Line	Revenue
Hawaiian Club	Accommodation	\$981,210
	Food & Drinks	\$277,750
	Recreation	\$220,700
Hawaiian Club	Sum:	\$1,479,660
	Maximum:	\$981,210

All resorts	Sum:	\$3,286,524
	Maximum:	\$981,210

Total revenue

Resort	Service Line	Revenue
French Riviera	Accommodation	\$563,250
	Food & Drinks	\$107,400
	Recreation	\$164,770
French Riviera	Sum:	\$835,420
	Maximum:	\$563,250

Resort	Service Line	Revenue
Bahamas Beach	Accommodation	\$673,664
	Food & Drinks	\$169,680
	Recreation	\$128,100
Bahamas Beach	Sum:	\$971,444
	Maximum:	\$673,664

Resort	Service Line	Revenue
Hawaiian Club	Accommodation	\$981,210
	Food & Drinks	\$277,750
	Recreation	\$220,700
Hawaiian Club	Sum:	\$1,479,660
	Maximum:	\$981,210

Converting To And From Euros

The following section describes how BUSINESSOBJECTS uses built-in functions to help you quickly and accurately convert a currency to or from euros.

What is the euro?

The euro is the official currency unit of the European countries that belong to the EMU (European Monetary Union).

For each of these countries, a six-digit conversion rate between the euro and the national currency has been fixed and EMU regulations stipulate how the conversion must be carried out.

BUSINESSOBJECTS euro conversion functions adhere to these stipulations.

Displaying the euro symbol



The euro is designated by an official symbol. To display this currency symbol in BUSINESSOBJECTS, you need to have a Windows operating system that can display it or you need to install a euro font upgrade to your Windows operating system.

If your operating system cannot display the euro symbol, you can use the official ISO three-letter code, EUR, instead.

How does the conversion work?

For each currency, there is a fixed conversion rate of six significant digits. The number of digits after the decimal point depends on the number of digits before the decimal point.

Example Converting to euros: six-digit conversion rates

.....
 The conversion rate for Dutch guilders (NLG) is 2.20371, with 1 digit before the decimal and five after.

The conversion rate for Belgian francs (BEF) is 40.3399, with 2 digits before the decimal point and four after.

To convert to euros from an EMU-compliant currency, you divide the local currency amount using the six-digit conversion rate for that currency and then round the result to display the appropriate number of decimal digits.

To convert from euros to an EMU-compliant currency, you multiply the amount in euros by the six-digit conversion rate for the target currency and then round the result to display the appropriate number of decimal digits.

Conversion Errors

When you convert an EMU-compliant currency to or from euros, you use the fixed six-digit conversion rate and then round the result to the appropriate number of decimal digits. Rounded numbers are less accurate than the original numbers and the round error on a given amount may be fairly negligible or quite substantial. BUSINESSOBJECTS allows you to display round errors after you have converted amounts to and from euros to assess the importance of the difference.

Displaying currency formats in BUSINESSOBJECTS

BUSINESSOBJECTS uses the default currency defined for your operating system defined in the Windows Regional Settings in the Windows Control Panel.

You can display custom currencies in your BUSINESSOBJECTS reports in addition to the default currency provided by your operating system. For example, if your default currency is \$, all the amounts in your report will be in US dollars. If you also want to display a column with revenue in euros, you can add your own currency format in BUSINESSOBJECTS. See “Creating your own number and date formats” on page 547 for details.

Converting to euros

You can convert an amount from one of the eleven EMU currencies into euros using one easy mouse click.

To do this:

1. Select the column, row or cell that contains the data you want to convert.
2. From the Data menu, choose Euro, then Convert To Euro.
 - If BUSINESSOBJECTS recognizes the currency, it carries out the conversion and displays the result.
 - If BUSINESSOBJECTS does not recognize the currency, it displays the Select Currency dialog box.
3. Choose the currency from the list box and click OK.

The data is converted. If the source data was formatted as currency, the converted data is formatted with the euro currency formatting defined in the Conversion Rates table.

How does BusinessObjects recognize the currency of the selected data?

BUSINESSOBJECTS recognizes the currency of selected data if:

- it is formatted as currency using the standard Windows currency symbol
- and the selected currency is in the Conversion Rates list

For example, 47 DM will be recognized by BUSINESSOBJECTS as German marks.

If the data is not formatted as a currency BUSINESSOBJECTS recognizes, the Select Currency dialog box is displayed.

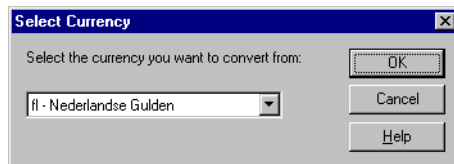
If the currency you want to convert to euros is not in the list, you can add it as described below.

Converting from euros

You can convert a figure from euros into one of the eleven EMU currencies using one easy mouse click.

To do this:

1. Select the column, row or cell that contains the data you want to convert.
2. From the Data menu, choose Euro, then Convert From Euro.
The Select Currency dialog box opens.



3. Choose the currency you want to convert the euros to and click OK.
The data is converted. If the data in euros was formatted as currency, the converted data is formatted with the currency formatting defined in the Conversion Rates table.

Displaying rounding errors

A rounding error occurs because when an amount is converted to or from euros, the result is rounded to show only the appropriate number of decimal digits. The rounding error returns the difference between the rounded number and the number before rounding.

To display round errors:

1. Select the column, row or cell that contains the converted data.
2. From the Data menu, choose Display Rounding Errors.
The rounding errors are displayed in a new column, row or cell which is inserted after the selected column, row or cell.

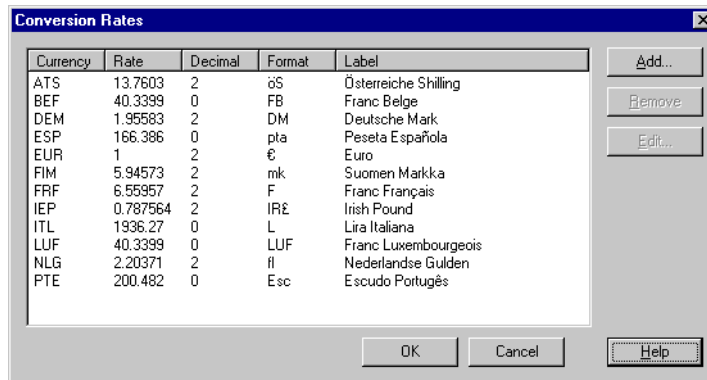
Note: The Display Rounding Errors command is only available if the selected cell contains a number that has been converted to or from euros.

Conversion rates

BUSINESSOBJECTS stores the conversion rates and other information for the EMU currencies and uses this information to carry out conversions to and from euros. You can edit this information and add other currencies to this list.

Viewing conversion rates

1. From the Data menu, choose Euro, then Display Conversion Rates.
The Conversion Rates dialog box opens.



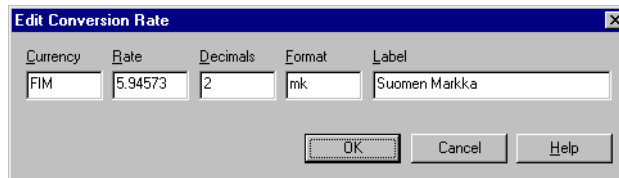
This dialog box shows the following information about each currency:

Currency	Shows the official ISO (International Standards Organization) label for the currency.
Rate	Shows the official 6-digit conversion rate between the currency and the euro.

Decimal	Shows the number of decimal digits used by each currency.
Format	Shows the symbol or abbreviation used to designate the currency.
Label	Shows the name of the currency in the local language.

Editing information about a currency

1. From the Data menu, choose Euro, then Display Conversion Rates.
2. The Conversion Rates dialog box opens.
3. Select the currency you want to edit from the list.
4. Click the Edit button.
The Edit Conversion Rate dialog box opens.

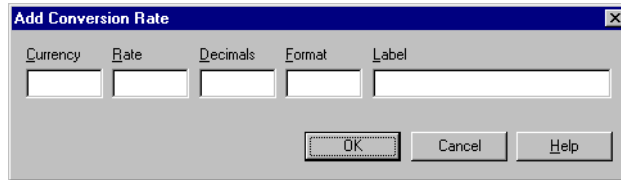


This dialog box displays the information that BUSINESSOBJECTS currently uses for the selected currency.

5. Make any necessary changes by typing in the new information over the old information in the text boxes.
6. Click OK when you have finished.
The Edit Conversion Rate dialog box closes.
The new information concerning the selected currency is now displayed in the list in the Conversion Rates dialog box.
7. Click OK to close the Conversion Rates dialog box.

Adding a new currency

1. From the Data menu, choose Euro, then Display Conversion Rates.
The Conversion Rates dialog box opens.
2. Click the Add button.
The Add Conversion Rate dialog box opens.



3. Enter the required information in each text box
You must enter information in each text box.
4. Click OK.
The Add Conversion Rate dialog box closes.
The new currency is now displayed in the list in the Conversion Rates dialog box.
5. Click OK to close the Conversion Rates dialog box.

Example Add US dollars to the euro conversion list

.....

You want to add US dollars to the list of currencies since you regularly use dollar to euro conversion in your business. You have today's dollar/euro exchange rate. Since the price of the dollar against the euro fluctuates daily, you will have to update dollar currency information regularly.

To add US dollars to the currency list:

1. From the Data menu, choose Euro, then Display Conversion Rates.
The Conversion Rates dialog box opens.
2. Click the Add button.
The Add Conversion Rate dialog box opens.
3. Enter the information in the Add Conversion Rate dialog box:
 - Enter USD in the Currency box.
 - Enter 0.9 in the Rate box
 - Enter 2 in the Decimal box.
 - Enter \$ in the Format box.
 - Enter US Dollars in the Label box.

4. Click OK.

US dollars now appears in your list and will be recognized by BUSINESSOBJECTS so that you can convert between US dollars and euros using the Convert to Euro and Convert from Euro menu commands.

Fixed and fluctuating currency rates

The conversion rates between the euro and EMU-compliant currencies are fixed. When converting euros to any other currency you must use the daily rate set by financial institutions.

Triangulation

If you want to convert from one EMU-compliant currency to another EMU-compliant currency, you cannot simply use cross rates. You have to use a procedure called triangulation. To triangulate, you convert the first currency into euros using a six-digit conversion rate and then convert the euros into the second currency using another six-digit conversion rate.

Example Triangulation: Converting between EMU-compliant currencies

In the following example, you want to convert an amount in German marks into Belgian francs. To do this, you first have to convert the German marks into euros using the six-digit conversion rate for German marks. You then round the euros to no less than **three** decimal digits. Finally you convert the euros into Belgian francs using the six-digit conversion rate for Belgian francs. You can carry out this conversion by writing a BUSINESSOBJECTS formula.

The following BUSINESSOBJECTS formula converts 100 DEM to 2063 BEF.

```
EuroConvertFrom(EuroConvertTo(100, "DEM", 3), "BEF", 0)
```


Chapter 14

Formulas, Local Variables & Functions

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Overview

This chapter gives you an introduction to using BUSINESSOBJECTS formulas, local variables and functions. It explains how to set up your own formulas and variables in BUSINESSOBJECTS reports using BUSINESSOBJECTS syntax, how to use BUSINESSOBJECTS functions, and also includes several examples of business calculations.

Chapter 15 "Calculation Contexts and Extended Syntax" on page 341 describes how to build more powerful calculations by using extended syntax to define calculation contexts. This chapter also has a calculations "Quick Reference" on page 369 that recaps some of the key BUSINESSOBJECTS terms.

Chapter 16 "Calculation Troubleshooting" on page 373 gives solutions to computation errors that may occur in BUSINESSOBJECTS when you are writing or using formulas.

Formulas

When you run a query, BUSINESSOBJECTS carries out certain calculations on the data at the query level and returns the results as variables. You can also make calculations on report data using the built-in calculations available on the calculations menu or toolbar. This section explains how you can set up your own personalized calculations on data in your reports by writing BUSINESSOBJECTS formulas.

Why use formulas?

A BUSINESSOBJECTS formula is made up of functions, variables, and operators and always begins with an “equal to” sign. The examples below show two very simple formulas:

```
=Sum<Sales Revenue>
```

```
=<Margin>/<Sales revenue>*100%
```

Formulas are used to carry out calculations locally in the report and also allow you to set conditions on filters and data display, for example.

Making local calculations

You may want to carry out personal calculations in your reports or compare database figures to figures from a spreadsheet for example. Writing a formula allows you to do this.

In addition, there are certain types of calculation that some SQL servers cannot carry out. For example, standard SQL does not allow you to use decision logic such as the IF statement.

Setting conditions

You can also use formulas in BUSINESSOBJECTS to set conditions. For example, you can set up a condition to hide sections in a report if the sales revenue falls below a certain level.

You can also set up conditional filters. For example, you only want to display outlets in a report that have generated weekly revenue above a certain sum. By setting a filter with a condition, when you refresh the report with the new weekly data, only those outlets that satisfy the condition will be displayed in the report.

You can also use conditions in BROADCAST AGENT when you are setting up reports for scheduled processing to specify under what conditions your documents should be processed.

Creating formulas

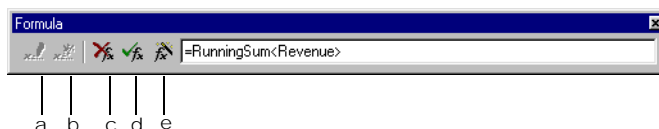
Let's look now at how you create formulas in BUSINESSOBJECTS. There are three ways of creating formulas. You can:

- type your formula directly into a cell
- type your formula in the Formula Bar
- use the Formula Editor

Displaying the Formula Bar

Once you are familiar with BUSINESSOBJECTS syntax you can type simple formulas directly into a cell or into the Formula Bar. Using the Formula Bar allows you to see more clearly what you are doing as the whole formula is displayed more easily than in a cell. If the Formula Bar is not displayed:

- From the View menu, choose Formula Bar.



- Opens the Variable Editor
- Defines the formula displayed in the Formula Bar as a variable
- Clears the Formula Bar text box of any non-validated changes you make in the Formula Bar
- Validates the formula displayed in the text box
- Opens the Formula Editor

The Formula Bar has five buttons and a text box where the formula is displayed. If you click inside any cell in a report, the contents are displayed in this text box. Depending on the type of cell you clicked in, this could be text, the name of a variable or a formula.

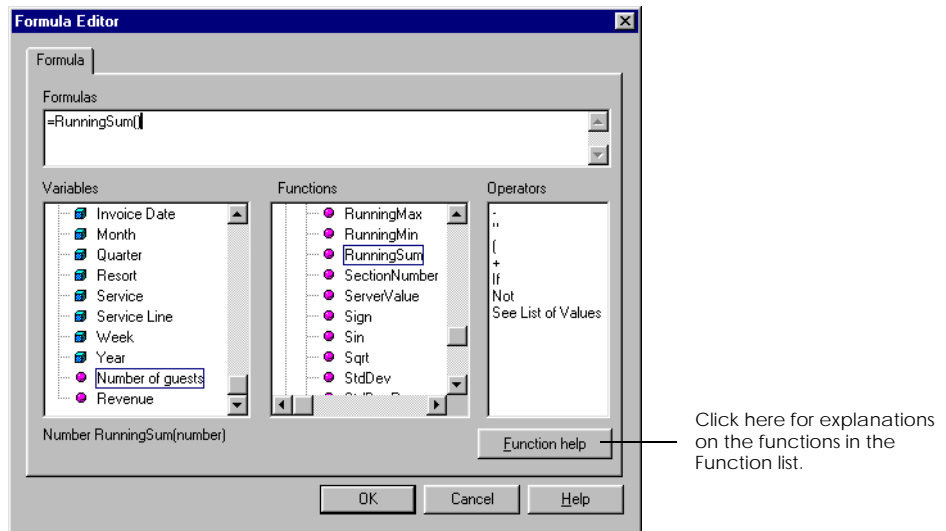
Displaying the Formula Editor

If you are not familiar with BUSINESSOBJECTS syntax or are writing more complex formulas, the best method is to use the Formula Editor.

1. Click inside the cell where you want the formula to appear.
2. Then
 - If the Formula Bar is open, click the Formula Editor button on the Formula Bar.
 - Or, from the Data menu, choose Edit Formula.
 The Formula Editor opens.

Using the Formula Editor

The Formula Editor allows you to make up your formula by choosing Variables, Functions and Operators directly from the lists.



The Formula Editor has four main parts:

Formulas box

Displays the formula. You use this box to write or edit formulas.

Variables box

Displays a list of all the variables in the document, these can be local variables or variables returned by the data provider; you can include these variables in your formula.

Functions

Displays a list of all BUSINESSOBJECTS functions.

Operators

Operators define the relationship between elements in a formula. Operators include mathematical operators such as addition (+) and division (/), relational operators such as greater than (>) and between, logical operators such as If Then Else and context operators such as ForAll, ForEach and In. The list of operators in this window is updated as you add elements to the formula so that only the operators that are compatible with the current syntax are displayed.

To understand how the Formula Editor works, let's look at an example.

Example Calculating a running total

In the table below you want to display a running total for the monthly sales revenue.

Month Name	Sales revenue
January	\$1,335,402
February	\$609,013
March	\$1,381,758
April	\$1,068,309
May	\$1,081,885
June	\$690,457
July	\$801,955
August	\$581,094
September	\$1,496,255
October	\$1,545,872
November	\$1,081,915
December	\$1,558,333
\$13,232,246	

From this.....

Month Name	Sales revenue	Running total
January	\$1,335,402	\$1,335,402
February	\$609,013	\$1,944,415
March	\$1,381,758	\$3,326,172
April	\$1,068,309	\$4,394,481
May	\$1,081,885	\$5,476,366
June	\$690,457	\$6,166,823
July	\$801,955	\$6,968,778
August	\$581,094	\$7,549,871
September	\$1,496,255	\$9,046,126
October	\$1,545,872	\$10,591,998
November	\$1,081,915	\$11,673,913
December	\$1,558,333	\$13,232,246
\$13,232,246		

To this.....

To do this:

1. Insert a new column after the Sales Revenue column and name it Running total.
2. Click inside the Running total column.
This is where you are going to insert the formula.

3. From the Data menu, choose Edit Formula.
The Formula Editor opens.
 4. Double-click the equal sign (=) sign in the Operators list.
The equal (=) sign is displayed in the Formulas box.
 5. In the Functions box, open the All functions & aggregates folder.
 6. Scroll down until the function RunningSum is displayed in the Functions box.
 7. Double-click RunningSum.
RunningSum is displayed in the Formulas box. Notice that the cursor is inside the brackets. This is where the variable will be inserted.
 8. In the Variables box, double-click Sales revenue.
Sales revenue is added to the formula. Notice the angle brackets which are automatically added to a variable by the Formula Editor.
 9. Click OK.
The Formula Editor closes and the calculation is displayed in the RunningSum column.
- The formula is stored in the Formulas folder of the Report Manager Data tab.
.....

Guidelines on the syntax to use in formulas

Whichever method you use to write formulas, always bear these guidelines in mind:

- A formula must begin with an "equal to" sign. If you remove this sign, the formula is considered as a constant or as text.
- Variables included in formulas must be surrounded by a "lower than" sign (<) and a "greater than" sign (>), e.g., <Revenue>.
- Text included in formulas must be surrounded by double-quotes ("")

Syntax errors

If there is a syntax error in a formula you have written, an error message is displayed and the part of the formula that contains the error is highlighted.

Local Variables

A local variable is a formula that is given a name. Local variables appear in the list of variables in the Report Manager Data tab and you can use them to build tables, charts etc. in the same way as you use variables returned by a data provider.

The difference is that local variables are attached to the document in which they are created and calculations are carried out at the report level. This means that local variables are only available in the document in which they were created.

Why use local variables?

As we said earlier, a variable is a formula with a name. However, variables have a certain number of advantages over formulas because they allow you to do things that you cannot do just using formulas:

- You cannot apply alerters, filters, sorts and breaks on columns or rows containing formulas, but you can on those containing variables.
- You can include variables qualified as dimensions in drill hierarchies.

Local variables are also useful from a practical point of view:

- You can re-use local variables in the same document more easily than formulas because they are named.
- Some formulas are very complex. If you create variables, you can re-use them in formulas and avoid having very long and complex formulas which can lead to making syntax errors. In addition, you don't have to re-write the formula over and over again. What's more, complex formulas are easier to decipher if they contain variables.

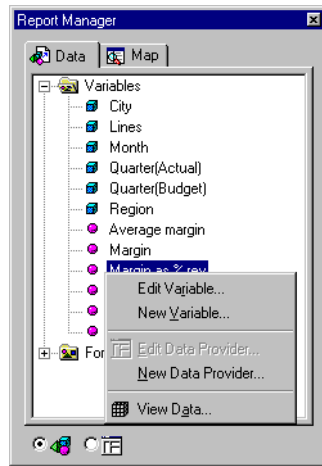
How can I recognize a local variable?

If you want to know whether a variable has been returned by a data provider or created locally in a report:

- Right-click on the variable in the list in the Data tab of the Report Manager.

In the menu that opens:

- If the menu command Edit Variable is available, the variable is a local variable and you can modify the attributes.



- If the menu command Edit Variable is not available (grayed out) the variable was returned by the data provider and cannot be edited.

Creating a local variable

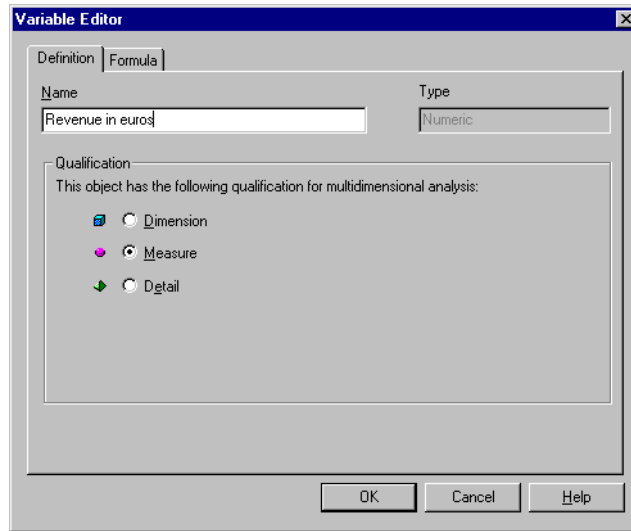
You can create local variables using the variable editor, by turning an existing formula into a variable, and by grouping values from an existing variable to create a new one.

Using the Variable Editor

You can create a local variable from scratch using the Variable Editor. To do this:

1. Right-click on the Data tab of the Report Manager and choose New Variable from the menu.
In the Variables dialog box opens.
2. Click the Formula tab.
3. Type the formula in the Formula box, or double-click the function(s), variable(s) or operator(s) you need.

- Click the Definition tab and type a name in the Name box.



- In the Qualification box, choose whether you want the local variable to be defined as a Dimension, Measure or Detail object.
- Click OK.
The new variable is displayed in the list of variables in the Report Manager data tab.

Transforming a formula into a local variable

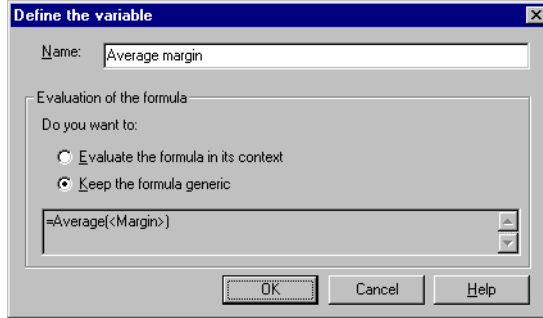
You can also transform an existing formula into a local variable. As we said earlier, variables are useful because you can apply alerters, filters, and sorts to variables but not to formulas. After setting up a formula in a report, you may decide that you'd like to highlight the top values. To do this, you can easily transform the formula you have created into a variable.

Example Highlighting above average margin

You have set up a formula to calculate average margin and now decide you want to highlight all those stores that have made above average margin. In BUSINESSOBJECTS you can highlight data in this way using alerters but you cannot apply an alerter on a column or row of data that contains a formula. However, you can use an alerter on a variable. By turning your formula into a variable you can highlight your above-average stores.

To transform a formula into a variable:

1. Select the column of data that contains the formula.
2. Choose Define As Variable from the Data menu.
3. Type in a name for the variable in the Define the Variable dialog box.



4. Set how you want the formula to be defined.

Choose....	If you want to.....
Evaluate the formula in its context	Restrict the definition of this variable to its context in the current block. If you insert this variable in another block in the report, the result of that calculation will always be based on the original context
Keep the formula generic	Allows you to define the variable so that it calculates the data dynamically, based on the context of the block where the variable is inserted

5. Click OK.

The variable is now displayed in the variables folder in the Report Manager Data tab and you can set up an alerter using the variable.

For further information on calculation contexts, see Chapter 15 "Calculation Contexts and Extended Syntax" on page 341.

.....

Creating Local Variables by Grouping Values

You can also create new variables by grouping the values of existing variables which enables you to create dynamic groups for analysis purposes. Grouping values prior to analyzing your data in drill mode can also be useful, for example, if you have a variable which has a lot of values. It allows you to create an intermediary level of detail in your analysis.

Example Group quarters to display revenue per semester

You have a report showing the sales revenue per quarter but you would like to display revenue per semester. Since you have the data for Quarter, you can do this quite easily. The Quarter variable returns four values - Q1, Q2, Q3, Q4. By grouping Q1 and Q2 into one value (H1), and Q3 and Q4 into a second value (H2) you can create a new variable, Semester, and then calculate revenue by semester. You can then add Semester to a drill hierarchy and use it in your analysis in drill mode. Here's how to do it.

Grouping values

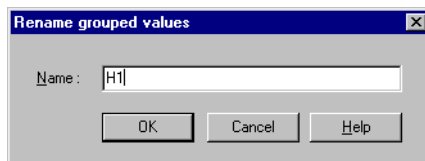
Your table displays sales revenue per quarter. You are going to create a new variable called Semester.

Quarter	Sales revenue
Q1	\$3,326,172
Q2	\$2,840,651
Q3	\$2,879,303
Q4	\$4,186,120

1. Select Q1 in the table.
2. Holding down the Ctrl key, select Q2.
3. Click the Group Values button on the Report toolbar. The Rename grouped values box opens.



Group Values

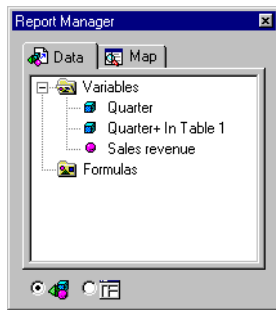


4. Type in the new name, H1, in the Rename Group box and click OK.

Q1 and Q2 are grouped together and the new name, H1, is displayed in the table.

Quarter+ In Table 1	Sales revenue
H1	\$6,166,823
Q3	\$2,879,303
Q4	\$4,186,120

A new variable is created and displayed in the list in the Report Manager. The table column header is updated with the name of the new variable, Quarter+ In Table 1.



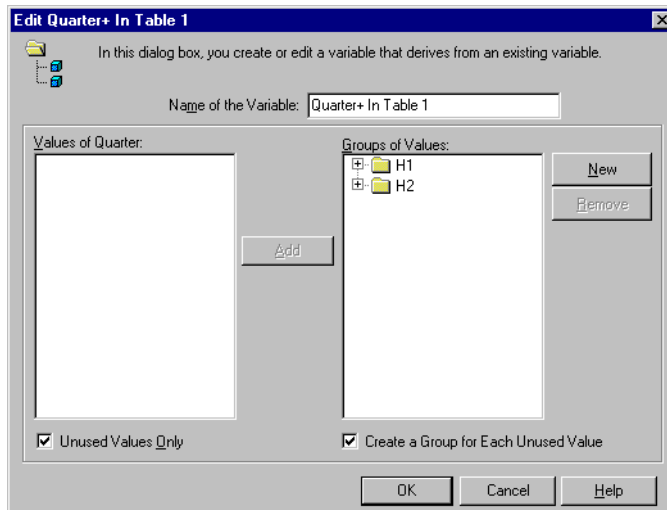
- Repeat Step 1 to Step 4 to group the values for Q3 and Q4 and name the new value H2.
Your table now looks like this.

Quarter+ In Table 1	Sales revenue
H1	\$6,166,823
H2	\$7,065,423

Since the name of the new variable is not very meaningful, you can rename it.

To rename the variable

1. Right-click on the Quarter+ In Table 1 variable in the Report Manager window.
2. Choose Edit Variable from the menu.
The Edit box opens.



3. Type in a new name, Semester, in the Name of the Variable text box and click OK.
The new name, Semester, is displayed in the Variables list and in the table.
Your table now displays sales revenue per semester.

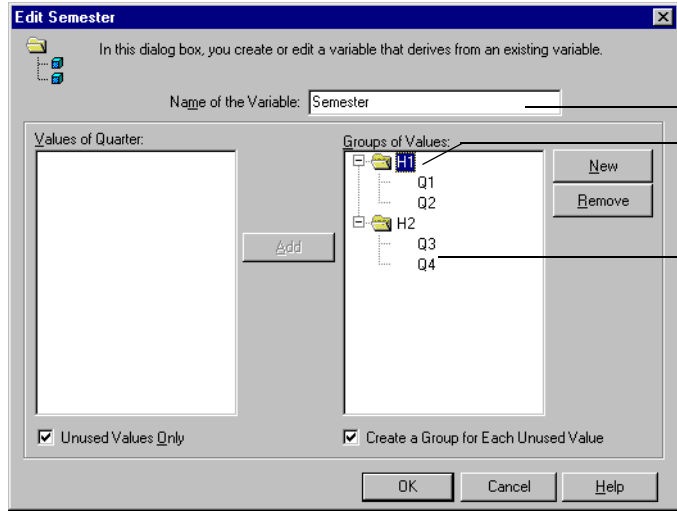


Semester	Sales revenue
H1	\$6,166,823
H2	\$7,065,423

Editing grouped values

At any time, you can edit variables created by grouping values from another variable. You can rename the variable or the values, re-arrange the values in the groups or create a new group of values.

1. Right-click on the variable in the Report Manager window.
2. Choose Edit Variable from the menu.
The Edit box opens.



You can rename the variable here.

You can rename the values here. Click on the name and type in the new one.

You can drag and drop values from one group folder to another.

3. Make the required changes and click OK.

Deleting grouped values

You can delete a variable created by grouping values from another variable.

1. From the Data menu, choose Variables.
2. In the Variables box, select the variable you want to delete.
3. Click Remove and then OK.

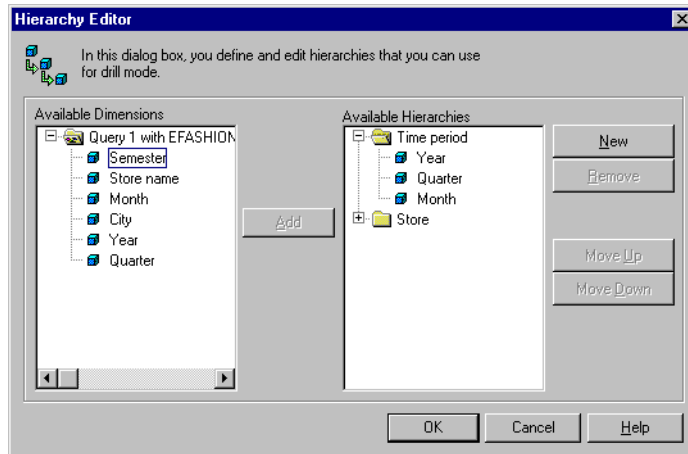
Ungrouping grouped values

You can ungroup a variable created by grouping values from another variable.

1. Select the grouped value in the table.
2. Click the Group Values button on the toolbar.

Adding grouped values to a drill hierarchy

You can add a local variable that has been qualified as a dimension to a drill hierarchy and then use it in your analysis in drill mode. You can now add Semester to the Time period hierarchy and then drill down from Year to Semester and then to Quarter.



To add Semester to the drill hierarchy:

1. From the Analysis menu, choose Hierachies.
The Hierarchy Editor opens up.
2. Add Semester to the Time period hierarchy between Year and Quarter.

Note: For more information on setting up and using drill mode, see Chapter 20 "Analyzing Data in Drill Mode" on page 463.

Managing Formulas and Local Variables

This section describes how to insert, edit and delete the local variables and formulas you have created.

Inserting local variables and formulas in a report

You can drag the variable or formula from the Data tab of the Report Manager window and drop it where you want it to appear on the report.

Editing formulas

You can edit a formula directly in the cell or in the Formula Bar or you can use the Formula Editor.

1. Click the cell that displays the result of the formula you want to edit.
2. Then:
 - Type your changes into the cell and press Enter to validate them
 - Click inside the Formula Bar, and edit the formula and click the Validate Formula button to validate the formula.
 - From the Data menu, choose Edit Formula; make your changes in the Formula Editor and click OK to validate them.The result of the formula is displayed in the cell.

Editing local variables

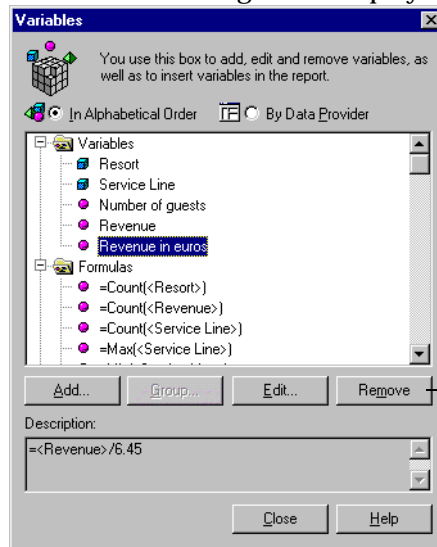
You can edit a local variable directly from the Report Manager. To do this:

1. Right-click the variable in the Data tab of the Report Manager window.
2. Choose Edit Variable from the menu.
The Variable Editor opens.
3. You can:
 - Type in a new name in the Name box.
 - Change the qualification of the variable.
 - Edit the formula on the Formula tab.
4. Click OK to validate your changes.

Deleting formulas and local variables

To delete a formula or local variable from a report:

1. From the Data menu, choose Variables.
The Variables dialog box is displayed:



The Edit and Remove buttons are not available if you choose a variable returned by the data provider.

2. Open the Variables or the Formulas folder.
3. Select the variable or formula to delete.
4. Click Remove and then click Close.

Note: You can only delete local variables, not variables returned by a data provider.

Functions

BUSINESSOBJECTS contains many built-in functions which greatly extend it's capabilities. Functions are pre-defined formulas. A function consists of the function name followed by a pair of parentheses. The parentheses can contain arguments and arguments supply functions with values on which to operate. Arguments can be objects, constants or other functions.

Some commonly used functions are available directly from the BUSINESSOBJECTS menus and toolbars. When you choose one of these functions, the necessary arguments are added automatically.

The entire set of functions is organized in nine folders in the Functions window of the Formula Editor:

The folder...	Lists.....
All	All available functions in alphabetical order.
Aggregates	Functions that return aggregate totals (e.g. the sum or average of a column of data)
Numeric Functions	Functions that operate on numerical arguments.
Character Functions	Functions that operate on character objects and text strings.
Date Functions	Functions that operate on dates.
Logical Functions	Functions that return true or false.
Document Functions	Functions that return information about a document.
Data Provider Functions	Functions that return information about a data provider.
Miscellaneous Functions	Functions that cannot be categorized into one of the seven category folders.

Using Functions

When you select a function in the list in the Functions window, a description of the syntax the function requires is displayed at the bottom of the Formula Editor window.

When you add a function to the Formula window, any necessary commas are added. The following example shows you how to use a BUSINESSOBJECTS function to rank data according to revenue generated.

Example How can I rank cities according to sales revenue?

In this example, you want to rank the cities in your table according to sales revenue generated this quarter.

City	Sales revenue
Austin	\$263,162
Chicago	\$334,297
Colorado Springs	\$189,131
Dallas	\$188,898
Houston	\$562,233
Los Angeles	\$398,860
Miami	\$174,276
New York	\$683,971
San Francisco	\$251,855
Washington	\$279,490

From this.....

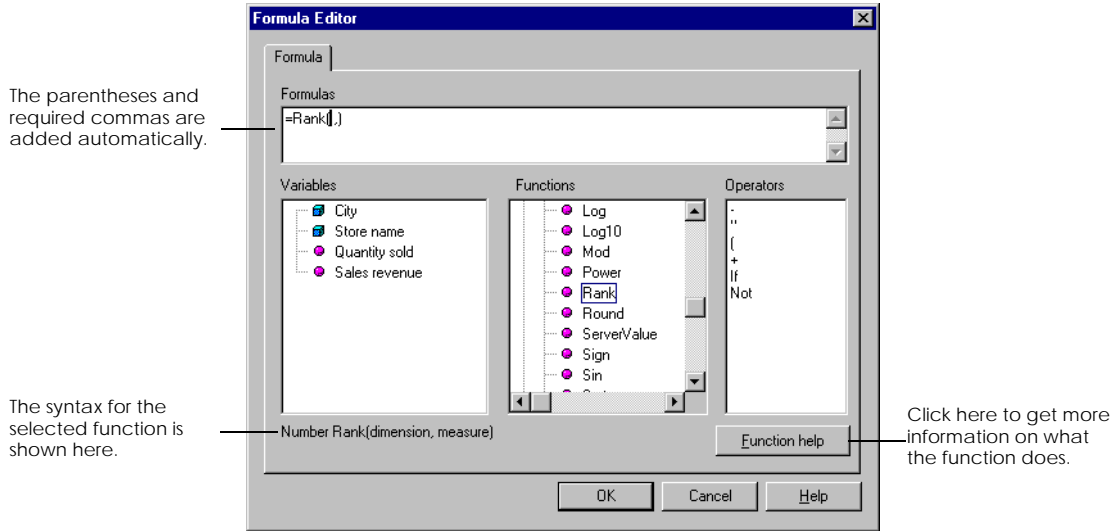
City	Sales revenue	Revenue rank
Austin	\$263,162	6
Chicago	\$334,297	4
Colorado Springs	\$189,131	8
Dallas	\$188,898	9
Houston	\$562,233	2
Los Angeles	\$398,860	3
Miami	\$174,276	10
New York	\$683,971	1
San Francisco	\$251,855	7
Washington	\$279,490	5

To this.....

Here's how to do it:

1. Add a new column to the table and name it Revenue rank.
Click in the Revenue rank column.
2. From the Data menu, choose Edit Formula.
The Formula Editor opens.
3. Open the All functions and aggregates folder and scroll down to the Rank function.

4. Double-click on Rank.



The Rank function is added to the Formula window.

To use the Rank function, you need to add a dimension variable, a comma and then a measure variable inside the parentheses. The function then ranks the dimension according to the measure.

5. In the Variables list, double-click City and then Sales revenue.
The completed syntax is displayed in the formulas window.

```
=Rank(<City> ,<Sales revenue>)
```

6. Click OK.
The cities are ranked from 1 to 10 according to sales revenue.

Tip: To quickly find a function in the Functions list, open the All functions & aggregates folder and then type the first letter of the function you want to find. BUSINESSOBJECTS highlights the first function beginning with that letter.

Using the Function Help

Before working with a function for the first time, use the Function Help to find out what the function does. To do this:

- Select the function in the Functions list and click the Function Help button.

The help page gives a description of the function, its syntax, and an example.

More Examples of Using Formulas

There are examples of using functions and writing formulas throughout this chapter and throughout this user's guide. This section has several additional examples on using the BUSINESSOBJECTS formula editor and BUSINESSOBJECTS functions to set up personal calculations.

Example Calculating a 3-week rolling average

Using a rolling average smooths out the fluctuations of a measure variable that fluctuates over time, stock prices, for example, which change daily. A rolling average is obtained by calculating the average of the current value and the specified number of previous values. In BUSINESSOBJECTS, you use the Previous() function to set up a rolling average.

This example shows you how to create the variable to calculate a three-week rolling average for sales revenue.

1. Right-click on any variable in the Report Manager Data tab and choose New Variable from the menu.
The Variable Editor opens.
2. Click the Definition tab.
3. In the Name box, type 3 weeks rolling.
4. In the Qualification section, choose Measure.
5. Click the Formula tab.
6. In the Formulas box, type the formula:

```
=(<Sales revenue>+Previous(<Sales revenue>)+Previous(Previous(<Sales revenue>)))/3.
```

This formula adds the sales revenue for the current week to the sales revenue for the two previous weeks and then divides the total by three to obtain an average for those three weeks. To create this formula, we use the BUSINESSOBJECTS Previous() function.

7. Click OK.

The new variable is added to the list in the Report Manager Data tab and you can use it in the tables and charts in your report.

Combining data in a single cell

You frequently need to combine different pieces of data returned by data providers in a single cell of a report. For example, first and last names are typically stored as separate pieces of data in the database but you often need to display a person's whole name in a single cell of a report.

There are two ways of combining pieces of data or combining text and data in a single cell in BUSINESSOBJECTS. You can either use the Concatenation() function or the & operator.

The examples below describe how to use both methods to combine character-type data, and how to combine numbers and dates with text or with other pieces of data.

Example Combining first and last names in a single cell

The BUSINESSOBJECTS Concatenation() function allows you to combine two character strings. The character string may be a piece of text or a character-type variable. The syntax for this function is:

```
Concatenation(character string, character string)
```

To display a person's first and last name in a single cell, the following syntax:

```
=Concatenation(<First Name>,<Last Name>)
```

will give the following result: JohnGardner

You would typically wish to have a space between the first and last name. To do this, you need to use the following syntax:

```
=Concatenation(<First Name> ,(Concatenation(" " ,<Last Name>)))
```

A second way to achieve the same result is to use the & operator. If you are combining several character strings and want to add spaces, using the & operator is a simpler solution than using the Concatenation() function. The syntax to achieve the same result as shown above using the & operator is:

```
=<First Name>&" "<Last Name>
```

Notice that the space we typed is surrounded by quote marks.

Example Combining text and data in a single cell

You can use the same syntax as in the example above to add a comment to data in a table cell or a master cell. The table below shows the sales figures for the top three lines for the first quarter, but quarter is not displayed in the table. By editing the master cell contents, you can add a more explanatory title for each section in the report as shown below:

Sales for Q1 in Austin

Lines	Quantity sold	Margin	Sales revenue
Sweat-T-Shirts	967	\$70,143	\$171,020
Shirt Waist	211	\$13,609	\$37,395
Sweaters	200	\$8,800	\$28,010

To obtain the result illustrated above, the formula:

```
= "Sales for Q1 in "&<City>
```

will give you the following result:

Sales for Q1 in Austin

Notice that text is surrounded by quote marks and that we typed a space at the end of the text and before the final quote marks to add a space between the text and the name of the city.

If you want to place a filter on the City section after combining text and data in the master cell, you'll notice that the Insert Filter button on the Standard toolbar is unavailable. To insert a filter:

1. Select the master cell.
2. From the Format menu, select Filters.
The Filters dialog box opens.
3. Click Add.
The Variables to filter dialog box is displayed.
4. Select City and click OK to return to the Filters dialog box.

In the Values box, select the cities you want to filter and click OK.

Example Combining text and numbers in a single cell

The Concatenation() function and & operator only allow you to combine character-type data. If you want to combine text or character-type data with numbers you must first convert the number into a character string. Otherwise, BUSINESSOBJECTS displays the error message 'Incompatible data type'. You can convert a number to a character string using the FormatNumber() function.

Revenue for week: 1

Lines	Margin	Margin as % rev	Sales revenue
Accessories	\$5,833	26.51 %	\$22,009
City Trousers	\$1,317	25.75 %	\$5,115
Leather	\$2,219	31.69 %	\$7,002

To obtain the result illustrated above, the formula:

```
= "Revenue for week: " & FormatNumber(<Week> , "0")
```

will give you the following result:

Revenue for week: 1

Example Combining text and dates in a single cell

In the same way, if you want to combine text with dates using the & operator or the Concatenation() function, you must first convert the date into a character string. Otherwise, BUSINESSOBJECTS displays the error message 'Incompatible data type'. You can convert a date into a character string using the FormatDate() function.

Invoice date: 01/01/1993

Customer	Address
McCarthy	27 Pasadena Drive, Dallas

To obtain the result illustrated above, the formula:

```
= "Invoice date: " & FormatDate(<Date> , "dd/mm/yyyy")
```

will give you the following result

Invoice date: 01/01/1993

Example Comparing yearly margin growth using the Where function

A common requirement in business is to compare data from different dates or periods so you can evaluate how key indicators such as revenue and margin have progressed. The BUSINESSOBJECTS Where function allows you to identify data with the values of another variable so that you can compare related data.

In the example below, you want to compare yearly margin. Your BUSINESSOBJECTS document contains the variables for year, margin and city. Using this data, you can write a BUSINESSOBJECTS formula to assign margin to a specific year and then calculate margin growth from one year to the next.

City	1999 margin	2000 margin	2001 margin	2000 increase	2001 increase
Austin	\$253,464	\$382,056	\$424,790	12.13 %	4.03 %
Boston	\$111,453	\$63,657	\$336,574	-9.34 %	53.34 %
Chicago	\$348,750	\$465,478	\$439,865	9.31 %	-2.04 %
Colorado Springs	\$203,701	\$294,483	\$309,966	11.23 %	1.92 %
Dallas	\$189,064	\$279,652	\$286,146	12.00 %	0.86 %
Houston	\$568,510	\$797,854	\$855,542	10.32 %	2.60 %
Los Angeles	\$444,247	\$604,780	\$619,368	9.62 %	0.87 %
Miami	\$192,479	\$266,670	\$318,132	9.54 %	6.62 %
New York	\$779,301	\$1,104,278	\$1,189,166	10.58 %	2.76 %
San Francisco	\$330,646	\$471,748	\$502,121	10.82 %	2.33 %
Washington	\$310,356	\$457,231	\$385,415	12.74 %	-6.23 %

Here's the procedure:

1. Right-click on any variable in the list of variables in the Report Manager Data tab and choose New Variable from the menu.
The Variable Editor opens.
2. Click the Definition tab.
3. In the Name box, type 1999 margin.
4. In the Qualification section, choose Measure.
5. Click the Formula tab.
6. In the Formulas box, type the formula:

```
=<Margin> Where (<Year>="1999")
```

This formula calculates the margin for the year 1999 only. Note that we use the BUSINESSOBJECTS Where operator in the formula to specify the year.

7. Click OK.
The new variable is added to the list in the Report Manager Data tab.

8. Repeat the procedure above to create one variable called 2000 margin and one called 2001 margin using the following syntax:

```
=<Margin> Where (<Year>="2000")
```

```
=<Margin> Where (<Year>="2001")
```

The new variables are added to the list in the Report Manager Data tab.

We could have simply created a formula to calculate the margin for each year. The advantage of creating a variable is that we can then re-use it more easily in other formulas. For example, you can now easily calculate the percent increase in margin between the 1999 and 2000 using the variables you have just created and display the increase in a new column in the table:

```
=(<2000 margin>-<1999 margin>)/<Margin>
```

.....

In this chapter

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Overview

This chapter is designed to help you use the powerful calculation capabilities delivered with BUSINESSOBJECTS.

Who should read this chapter

This chapter especially concerns those users whose business requires that they perform advanced calculations. The information here is also useful for any user who has experienced computation errors in their BUSINESSOBJECTS reports.

What's in this chapter

The chapter provides information on how BUSINESSOBJECTS performs calculations in reports. It describes the concepts behind the BUSINESSOBJECTS calculation engine. Most specifically, its aim is to explain the extended syntax that enables you to manipulate complex aggregations in reports.

You can find calculation troubleshooting information on error messages such as #COMPUTATION in Chapter 16 "Calculation Troubleshooting" on page 373.

Introduction to Contexts and Extended Syntax

This section introduces you to the key concepts of calculations in BUSINESSOBJECTS.

Semantically dynamic calculations

In BUSINESSOBJECTS, you create a report by building a query that retrieves data from a database. Typically, your query contains:

- *Dimensions*, which retrieve character-type data (customer names, product names, etc.), or dates (years, quarters, reservation dates, etc.).
- *Measures*, which retrieve numeric data that is the result of calculations. For example, in the BUSINESSOBJECTS demo universe, Revenue is the calculation of number of items sold multiplied by item price.

When you run the query, BUSINESSOBJECTS brings to the report the data corresponding to the dimensions and measures you selected.

In the report, measures are calculated dynamically, based on the dimensions with which they appear. Here's an example.

Example Revenue per region per year, and revenue per region

The report illustrated below contains two tables: revenue per region per year, and revenue per region.

BUSINESSOBJECTS dynamically calculates the measure, Revenue, according to the dimensions in the table. So, when the user removes the Year column, revenue per region is returned:

Region	Year	Revenue
East Coast	FY93	\$19,124
Mid West	FY93	\$128,362
Mid West	FY94	\$150,666
Mid West	FY95	\$162,566
South	FY93	\$128,330
South	FY94	\$135,580
South	FY95	\$136,989
West	FY93	\$96,380
West	FY94	\$108,210
West	FY95	\$120,050

Region	Revenue
East Coast	\$19,124
Mid West	\$441,594
South	\$400,899
West	\$324,640

What are calculation contexts?

By default, BUSINESSOBJECTS determines the result of a measure based on the dimension or dimensions in the part of the report in which the measure is inserted. These sets of dimensions are called *calculation contexts*.

Calculation contexts are dynamic in BUSINESSOBJECTS. Here's an example.

Example Calculating total revenue for two years

In the report illustrated below, the table displays revenue per city per year, with a sum on Revenue that calculates total revenue per year.

You can copy and paste, or drag and drop, the cell displaying total revenue per year from the table footer to the free-standing cell at the top. BUSINESSOBJECTS dynamically calculates total revenue for both years in the report:

Total Revenue 94 - 95	\$585,801.00
-----------------------	--------------

Section: Year

FY94

City	Revenue
Chicago	\$150,666.00
Dallas	\$135,580.00
Sum:	\$286,246.00

Section: Year

FY95

City	Revenue
Chicago	\$162,566.00
Dallas	\$136,989.00
Sum:	\$299,555.00

The result is different because the calculation contexts are different.

In the next section, you learn more about how calculation contexts work.

Understanding input and output contexts

BUSINESSOBJECTS defines an *input context* and an *output context* to determine the result of an aggregate calculation. Remember that a context is made up of one or more dimensions. The following table defines which dimensions in a report make up which context:

The...	Consists of one or more dimensions that...
Input context	Go into the calculation
Output context	Determine the result of the calculation

(BUSINESSOBJECTS also supports *reset contexts*, which are used in cumulative aggregations such as running totals. To find out about reset contexts, refer to “What about reset contexts?” on page 355).

This section explains how BUSINESSOBJECTS defines input and output contexts in different parts of a report. This information is important if you

- Want to understand the different results BUSINESSOBJECTS returns from the same formula in different parts of a report.
- Cannot obtain the results you need from the default calculation behavior.
- Need to fix errors such as #COMPUTATION.

How BusinessObjects defines input and output contexts

To understand how BUSINESSOBJECTS defines input and output contexts, you must first understand the terms *body* and *local context*. The following table provides a definition of these terms, and shows how they map to input and output contexts in a report:

The...	Consists of one or more dimensions that...	And by default is the same as the...
Body	Are present in the part of the report (e.g., a block) where the calculation is inserted	Input context.
Local context	Govern the part of the report where the calculation is inserted (e.g., a master variable in a section).	Output context.

Below you will find an illustrated example that helps you to understand the dimensions in the body and the local context - and thus the default input and output contexts - in different parts of a report.

Example A report containing aggregations in different contexts

The report illustrated on page 348 displays revenue per city per quarter in 1995. The user has placed calculations in different parts of the report:

- Total revenue at the top of the report
- Revenue in the Year section
- Revenue in the table, and
- Average revenue in the break footer.

The table below the illustration explains the default input and output contexts BUSINESSOBJECTS uses to obtain the result of each calculation.

The calculation contexts in a report

Total Revenue	\$1,186,257	a. Total revenue for the report
- Section: Year		
For FY95	\$419,605	b. Total revenue for 1995
Quarter	City	Revenue
Q1	Chicago	\$40,068
	Dallas	\$31,607
	Los Angeles	\$20,495
Q1	Average	\$30,723
Quarter	City	Revenue
Q2	Chicago	\$41,556
	Dallas	\$32,060
	Los Angeles	\$22,960
Q2	Average	\$32,192
Quarter	City	Revenue
Q3	Chicago	\$38,916
	Dallas	\$38,154
	Los Angeles	\$27,480
	San Diego	\$7,410
Q3	Average	\$27,990

	The calculation returns...	Because the body (input context) is...	And the local (output) context is...
a.	Total revenue for the report	All dimensions - including any that are not displayed in the report	The same as the body.
b.	Total revenue for 1995	Year, the section master, (the calculation is placed at the section level)	The same as the body.
c.	Revenue per city per quarter per year	Year, Quarter, City, i.e., the dimensions in the section and table	The same as the body.
d.	Average revenue per city per quarter per year	Year, Quarter, City, i.e., the dimensions in the section and table	Quarter (the calculation is placed in the footer of the break on Quarter.)

Using your understanding of input and output contexts

Once you understand input and output contexts, you are ready to benefit from *extended syntax*.

The extended syntax of an aggregate formula contains not only the basic formula, but also the dimensions that make up the aggregation's calculation contexts. Here's an example.

Example The extended syntax of an aggregate formula

The report shown here calculates running total resort revenue per country:

US

Resort	Revenue
Bahamas Beach	\$971 444
Hawaiian Club	\$1479 660
Sum:	\$2 451 104

France

Resort	Revenue
French Riviera	\$835 420
Sum:	\$3 286 524

The user obtained the running totals by applying the RunningSum function on the Revenue column. The basic formula for the calculation is

```
=RunningSum(<Revenue>)
```

The extended syntax of the formula, in which the explicit input and output contexts are shown, is

```
=RunningSum(<Revenue> In Body) In <Country>
```

where Body is the input context, and Country, the output context.

You can use your knowledge of extended syntax to:

- Understand the results BUSINESSOBJECTS returns by default (see below), and
- Change the default input and output contexts of a formula to get the results you need. For information on how to do this, refer to “Using Extended Syntax for Advanced Calculations” on page 351.

Viewing the extended syntax of a formula

BUSINESSOBJECTS provides two simple ways of viewing a formula's extended syntax, to find out the dimensions in the input and/or output context of an aggregate calculation. You can view extended syntax by

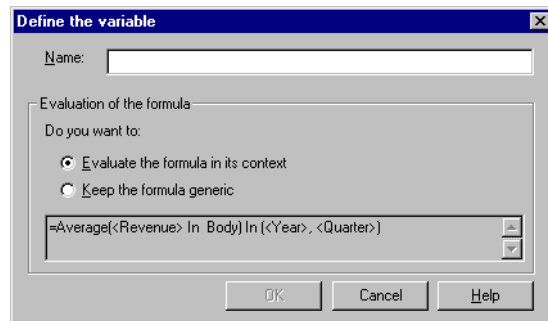
- Using the Formula Bar, or
- Using the Define As Variable command on the Data menu.

Using the Formula Bar

1. If the Formula Bar is not displayed, select the Formula Bar command on the View menu.
2. Click the cell containing the calculation.
3. Rest the cursor over the Formula Bar.
The extended syntax of the formula appears in a tooltip.

Using the Define As Variable command

1. Click the cell containing the calculation.
2. Select the Define As Variable command on the Data menu.
The Define As Variable dialog box appears.
3. Click *Evaluate the formula in its context*.
The extended syntax of the formula appears in the dialog box:



4. Click Cancel to close the dialog box.

Using Extended Syntax for Advanced Calculations

When you insert a simple aggregation in a report, for example to calculate average revenue, BUSINESSOBJECTS writes a simple formula, in this case

```
=Average(<Revenue>)
```

By default, BUSINESSOBJECTS evaluates the formula in its default context, as explained in the previous section, “Understanding input and output contexts” on page 346.

So how do you get more specific results? What if you need average revenue per city in a table containing region and city? By default, BUSINESSOBJECTS returns results based on region *and* city, i.e., both dimensions from the local context. What if you need a result based on a dimension that is available in the document but which you do not want to display in the report?

BUSINESSOBJECTS provides extended syntax so that you can specify the dimensions to use in your calculations. Here’s an example.

Example Calculating the number of cities per region

In a table containing the dimensions City and Region, if you insert a count, BUSINESSOBJECTS counts the cities one by one, using the following formula:

```
=Count(<City>)
```

By default, BUSINESSOBJECTS makes the calculation based on the dimensions in the table (Region, City). There’s only one city per city, so 1 is returned every time.

Extended syntax enables you to specify that you want BUSINESSOBJECTS to count the cities *per region*. To obtain this result, you must extend the formula:

```
=Count(<City>) In <Region>
```

Now you get the result you were looking for:

Region	City	Number of Cities
East Coast	New York City	2
East Coast	Washington D.C.	2
Mid West	Chicago	1
South	Dallas	1
West	Los Angeles	3
West	San Diego	3
West	San Francisco	3

Defining calculation contexts with extended syntax

Using extended syntax, you specify the dimensions you need for your calculation. In the example above, we specified the dimension Region in order to return the number of cities per region. When you use extended syntax to specify dimensions in this way, you define calculation contexts other than the default contexts assigned by BUSINESSOBJECTS.

BUSINESSOBJECTS lets you define your own *input* and *output* contexts. A quick reminder of the difference between them:

The...	Consists of one or more dimensions that
Input context	Go into the calculation.
Output context	Determine the result of the calculation.

Thus, in the example on page 351 (number of cities per region), we defined an output context, Region. Here's an example of a calculation with an input context defined by the user.

Example Calculating the minimum revenue per city for each region

You display Region, City and Revenue in a table. When you remove City from the table, BUSINESSOBJECTS automatically calculates revenue per region, because Region is now the only dimension in the body.

The only way to display minimum revenue per city for each region is to define an input context, because the local context does not contain the City dimension. BUSINESSOBJECTS allows you to do this, because even though you have removed City from the report display, it is still available in the document.

The formula and the result are as follows:

=Min(<Revenue> In (<Region>,<City>))

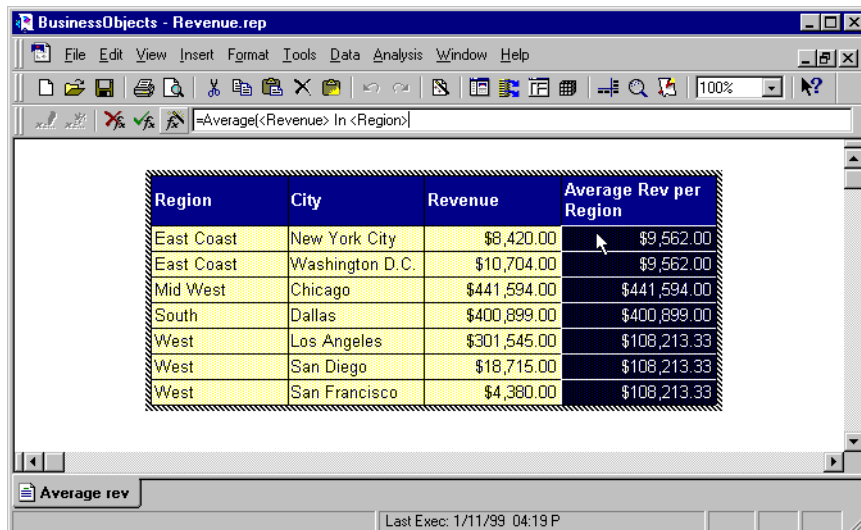
Region	Revenue		Region	Min Rev per City
East Coast	\$19,124.00	→	East Coast	\$8,420.00
Mid West	\$441,594.00		Mid West	\$441,594.00
South	\$400,899.00		South	\$400,899.00
West	\$324,640.00		West	\$4,380.00

How to define input and output contexts

Let's start with the basics. When you insert an aggregation such as Sum, BUSINESSOBJECTS writes a simple formula, for example

```
=Sum(<Revenue>)
```

To define contexts, you have to edit formulas, so the first thing to do is to display the Formula Bar. To do this, select the Formula Bar command on the View menu. Now, when you click a cell in a report, its formula appears in the Formula Bar:



Syntax for input and output contexts

To define contexts, you add arguments to a formula. The syntax for input and output contexts is as follows:

```
=AggregateFunction(<measure> In <input context>) In <output context>
```

Let's dissect a formula to understand this more clearly.

Example A formula containing input and output contexts

The following formula returns the minimum revenue per city per region:

```
=Min(<Revenue> In (<Region>,<City>)) In <Region>
```

The input context consists of Region and City, while the output context is Region.

To add an input and output context to a formula

This procedure shows you step-by-step how to add an input and/or output context to a simple calculation you have already inserted. The procedure is based on the example on page 352, “Calculating the minimum revenue per city for each region”.

1. If the Formula Bar is not displayed, select the Formula Bar command on the View menu.
2. Click inside the cell containing the calculation you want to change, in this case a column containing the Revenue measure.

The formula appears in the Formula Bar, for example

```
=Min(<Revenue>)
```

3. If you’re adding input context, click to the left of the closing parenthesis. For an output context, click to the right of the closing parenthesis.
4. Type a space, type In, then type another space.
5. Type the name of the dimension you want to specify as the context.

6. Type < > on either side of the dimension, for example

```
<City>
```

7. If you need to add dimensions to the context, separate each one with a comma, and place the list of dimension in parentheses, like this:

```
(<Region> , <City> , <Year> )
```

8. Press Enter to validate the formula.



Formula Editor

Tip: You can also use the Formula Editor to add contexts to a formula. The advantage is that you can double-click variables to add them to the formula, instead of having to type them.

To display the Formula Editor, click the Formula Editor button on the left of the Formula Bar.

What about reset contexts?

You use a reset context in a *cumulative* aggregation, such as running total revenue per quarter. The reset context consists of one or more dimensions which reset the value of the calculation to zero each time a dimension value changes. This is best explained with an example.

Example Calculating running total revenue per country

You want to calculate running total revenue per country per year, and naturally you want the calculation to be reset for each country. In other words, when the value of Country changes, you want the calculation to begin at 0.

To obtain this result, you display Country, Year and Revenue in a table, and apply a break on Country. You then add the cumulative aggregation

```
=RunningSum(<Revenue>;<Country>)
```

in which Country is specified as the reset context. Here's what you get:

Country	Year	Revenue	Running Total
France	FY93	\$295,940	\$295,940
	FY94	\$280,310	\$576,250
	FY95	\$259,170	\$835,420
France			\$835,420
US	FY93	\$767,614	\$767,614
	FY94	\$826,930	\$1,594,544
	FY95	\$856,560	\$2,451,104
US			\$2,451,104

How to define reset contexts

You define a reset context by specifying one or more dimensions in the cumulative formula. The syntax is

```
=RunningAggregateFunction(<measure>;<dimension>)
```

giving, for example

```
=Sum(<Revenue>;<Year>;<Region>)
```

To define a reset context:

1. If the Formula Bar is not displayed, select the Formula Bar command on the View menu.
2. Click inside the cell containing the calculation you want to change. The formula appears in the Formula Bar.
3. Type a parenthesis before the function name.
4. Type a semi-colon (;) after the measure.
5. Type the name of the dimension you want to use as the reset context, e.g.,

```
<Year>
```

6. Add other dimensions if necessary; separate each with a comma and place the list in parentheses.

A reset context with more than one dimension looks like this:

```
;<Year>,<Region>
```

7. Type a closing parenthesis at the end of the formula, then press Enter.

Using reset contexts in crosstabs

A crosstab displays data in rows and columns, as opposed to a table which displays data in columns only. Measures are typically placed in the body of a crosstab, i.e., at the intersection of rows and columns. The crosstab illustrated here shows revenue per region in 1994 and 1995:

	FY94	FY95
Mid West	\$150,666.00	\$162,566.00
South	\$135,580.00	\$136,989.00
West	\$108,210.00	\$120,050.00

Now, to calculate running total revenue, you insert a break on Year, then change Revenue to

```
=RunningSum(<Revenue>)
```

Here's the result:

	FY94	FY94	FY95	FY95
Mid West	\$150,666.00	\$150,666.00	\$162,566.00	\$313,232.00
South	\$135,580.00	\$448,812.00	\$136,989.00	\$585,801.00
West	\$108,210.00	\$694,011.00	\$120,050.00	\$814,061.00

Notice that the running totals are calculated for both Year *and* Region. In other words, the figures are added from left to right, and from top to bottom.

To reset the running sum for either Year or Region, you add a reset context to the formula. The formula to reset the running sum to 0 for each year is

```
=RunningSum(<Revenue>; <Year>)
```

and the result is as shown:

	FY94	FY94	FY95	FY95
Mid West	\$150,666.00	\$150,666.00	\$162,566.00	\$162,566.00
South	\$135,580.00	\$286,246.00	\$136,989.00	\$299,555.00
West	\$108,210.00	\$394,456.00	\$120,050.00	\$419,605.00

Note: Users of previous versions of BUSINESSOBJECTS may have used the keywords Col and Row to define reset contexts in crosstabs. These keywords are no longer necessary. You can use them, but they have no added value. For example

```
=RunningSum(<Revenue>; Col <Year>)
```

and

```
=RunningSum(<Revenue>; <Year>)
```

return the same result.

Syntax for combining reset, input and output contexts

When input and output contexts are specified, the syntax for reset contexts is as follows:

```
=RunningAggregateFunction(<measure> In <input context>;<reset  
context>) In <output context>
```

Modifying contexts with the operators ForEach and ForAll

When you define a context, you specify the dimension(s) it must contain. The syntax requires that you use the In operator to introduce the context:

```
=Min(<Revenue> In (<Region>,<City>) In <Region>
```

In is the default operator for defining a context. However, you can modify the context you're defining by replacing In by ForEach or ForAll. The following table provides a definition of ForEach and ForAll:

Operator	Definition
ForEach	Adds dimensions to the input or output context.
ForAll	Removes dimensions to the input or output context.

The following example illustrates how ForEach and ForAll work.

Example Using ForEach and ForAll

A table containing Region, City and Revenue returns the revenue per city per region.

The Year dimension is also available in the document. You want to display maximum revenue per city per year, but you don't want to add Year to the table. No problem, you *add* Year to the local context by using ForEach:

```
=Max(<Revenue> ForEach <Year>)
```

Region	City	Revenue
East Coast	New York City	\$8,420
East Coast	Washington D.C.	\$10,704
Mid West	Chicago	\$441,594
South	Dallas	\$400,899
West	Los Angeles	\$301,545
West	San Diego	\$18,715
West	San Francisco	\$4,380



Region	City	Revenue	Max Rev per Year
East Coast	New York City	\$8,420.00	\$8,420.00
East Coast	Washington D.C.	\$10,704.00	\$10,704.00
Mid West	Chicago	\$441,594.00	\$162,566.00
South	Dallas	\$400,899.00	\$136,989.00
West	Los Angeles	\$301,545.00	\$108,210.00
West	San Diego	\$18,715.00	\$18,715.00
West	San Francisco	\$4,380.00	\$4,380.00

Finally, you want to display maximum revenue per region, but want City to remain in the table. In other words, you have to *remove* City from the local context without physically removing the City column. You achieve this by using ForAll.

Here's the formula and the result:

```
=Max(<Revenue>) ForAll <City>
```

Region	City	Revenue	Max Rev per Region
East Coast	New York City	\$8,420.00	\$10,704.00
East Coast	Washington D.C.	\$10,704.00	\$10,704.00
Mid West	Chicago	\$441,594.00	\$441,594.00
South	Dallas	\$400,899.00	\$400,899.00
West	Los Angeles	\$301,545.00	\$301,545.00
West	San Diego	\$18,715.00	\$301,545.00
West	San Francisco	\$4,380.00	\$301,545.00

Getting the same result: ForAll <City> vs. In <Region>

In the previous example, we calculated maximum revenue per region by using ForAll to remove City from the local context. You could obtain the same result by making Region the output context.

Here's how this works. The local context is City and Region. Unless you specify otherwise, BUSINESSOBJECTS returns maximum revenue per city per region. You want maximum revenue per region. To calculate this, you must "tell" the formula to "ignore" City, either by

- Removing City from the local context, or
- Defining an output context, Region.

So, these two formulas,

```
=Max(<Revenue>) ForAll <City>
```

```
=Max(<Revenue>) In <Region>
```

where the local context is Region and City, obtain the same result.

Now try ForEach <City> vs. In (<Region>,<City>)

In the example entitled "Calculating the minimum revenue per city for each region" on page 352, we used

```
=Min(<Revenue> In (<Region>,<City>))
```

to calculate minimum revenue per city in a table containing only Region and Revenue. The default result is input context is Region, but we added City to it.

You could obtain the same result by adding City with the ForEach operator, the formula being

```
=Min(<Revenue> ForEach <City>)
```


Using the Rank function and extended syntax

The Rank function allows you to rank the values of a dimension based on a measure. The syntax is:

```
=Rank(dimension ,measure)
```

The first table below shows revenue per quarter per country. Quarters are ranked according to revenue by inserting the following formula in the Rank column:

```
=Rank(<Quarter> ,<Revenue>)
```

But what if you put a break or a section on country? The result is that the quarters are ranked for each country separately, as shown in the second table.

Country	Quarter	Revenue	Rank
France	Q1	\$208,565	3
France	Q2	\$242,165	2
France	Q3	\$226,125	1
France	Q4	\$158,565	4
US	Q1	\$582,051	3
US	Q2	\$579,652	2
US	Q3	\$658,572	1
US	Q4	\$630,829	4

Country	Quarter	Revenue	Rank
France	Q1	\$208,565	3
	Q2	\$242,165	1
	Q3	\$226,125	2
	Q4	\$158,565	4
France			

Country	Quarter	Revenue	Rank
US	Q1	\$582,051	3
	Q2	\$579,652	4
	Q3	\$658,572	1
	Q4	\$630,829	2
US			

This is because, by default, BUSINESSOBJECTS includes country in the calculation context. Since there are two values for Country, BUSINESSOBJECTS makes a calculation for each value.

You can modify the calculation context by using the ForAll context operator. This tells BUSINESSOBJECTS to ignore the break (or section) on Country. The syntax is:

```
=Rank(<Quarter> ,<Revenue>) ForAll <Country>
```

The result is:

Country	Quarter	Revenue	Rank
France	Q1	\$208,565	3
	Q2	\$242,165	2
	Q3	\$226,125	1
	Q4	\$158,565	4
France			

Country	Quarter	Revenue	Rank
US	Q1	\$582,051	3
	Q2	\$579,652	2
	Q3	\$658,572	1
	Q4	\$630,829	4
US			

BUSINESSOBJECTS now calculates the rank according to revenue generated per quarter and for all values of the Country dimension.

What if you now want to rank all eight quarters in the block according to revenue generated?

To do this, you have to remove the Country break from the rank calculation context, but keep it in the revenue calculation context. The best way to achieve this is to create a new variable to calculate the revenue and then include this in the formula inserted in the Rank column.

Here's how to do it:

1. Create a new measure variable using the following syntax:

```
=<Revenue> ForEach <Country>
```

This variable calculates the revenue for each country.

2. Name the variable Revenue ForEach Country.

3. Insert the following formula in the rank column:

```
=Rank(<Quarter> ,<Revenue ForEach Country>) ForAll <Country>
```

The result is:

Country	Quarter	Revenue	Rank
France	Q1	\$208,565	7
	Q2	\$242,165	5
	Q3	\$226,125	6
	Q4	\$158,565	8
France			

Country	Quarter	Revenue	Rank
US	Q1	\$582,051	3
	Q2	\$579,652	4
	Q3	\$658,572	1
	Q4	\$630,829	2
US			

Using the Rank function in crosstabs

In the following example, you have a crosstab that displays revenue per quarter per resort. You have inserted a column to display rank after each Resort column and inserted the following syntax:

```
=Rank(<Quarter> ,<Revenue>)
```

The result is:

	Bahamas Beach	Rank	French Riviera	Rank	Hawaiian Club	Rank
Q1	\$224,881	3	\$208,565	3	\$357,170	3
Q2	\$237,872	2	\$242,165	2	\$341,780	2
Q3	\$263,422	1	\$226,125	1	\$395,150	1
Q4	\$245,269	4	\$158,565	4	\$385,560	4

The problem is that the rank is the same for all quarters in all resorts.

What you want to do is rank the quarters for each resort in the crosstab. To do this, you have to specify that you want to calculate rank for each resort in the output context. The syntax is:

```
=Rank(<Quarter> ,<Revenue>) ForEach <Resort>
```

And the result is:

	Bahamas Beach	Rank	French Riviera	Rank	Hawaiian Club	Rank
Q1	\$224,881	4	\$208,565	3	\$357,170	3
Q2	\$237,872	3	\$242,165	1	\$341,780	4
Q3	\$263,422	1	\$226,125	2	\$395,150	1
Q4	\$245,269	2	\$158,565	4	\$385,560	2

Defining contexts with keywords

Calculation contexts consist of one or more dimensions. In the examples so far, we've defined contexts by writing the names of dimensions inside the formula.

BUSINESSOBJECTS provides keywords that enable you to define contexts without listing the specific dimensions you need. A keyword corresponds to the dimension or dimensions in a specific part of the report. Keywords can define all types of context in extended syntax- input, output or reset.

Keywords offer you the following advantages:

Advantage	Description
Simplified formula definition	It's often quicker to add one keyword to a formula than to write a list of dimensions.
Reduced risk of syntax errors	The syntax for keywords is simple: you just add the keyword to the formula. Thus, you avoid missing parentheses, misspelled dimensions, etc.
Guaranteed dynamic results	If you add or remove dimensions from the report, perform drag-and-drop or slice-and-dice, you don't have to rewrite formulas containing keywords.

This section provides:

- Definitions of the keywords you can use
- An example of how to use a keyword in a formula
- A step-by-step procedure for writing formulas with keywords
- Information on how BUSINESSOBJECTS assigns keywords to formulas, and
- An explanation of how report filters behave when you use keywords.

Keywords: definitions and example

The four keywords you can use in formulas are Report, Block, Body and CurrentPage. Each keyword corresponds to the dimension or dimensions in a specific part of the report. The definitions in the following table indicate

- In which part of a report you can use each keyword, and
- The dimensions the keywords correspond to.

Keyword	Can be used in formulas...	And corresponds to...
Body	Inside a block	The dimensions in the block.
	Outside a block	The dimensions in the current section.
Block	Inside a block	The dimensions in the current section.
Report	Anywhere in the report	All the dimensions in the document.
CurrentPage	Inside the current page	The dimensions in the current page.

To illustrate how keywords can be used, here's an example.

Example Calculating a grand total by using the Report keyword

You want to display the grand total revenue across all dimensions in a report. This calculation does not require extended syntax if the formula is placed in a cell at the very top of the report, because in this case the default output context contains all the dimensions in the report. But you want to display the information elsewhere, for example inside a table footer.

To obtain this result, you could define an output context by listing all the dimensions in the report. A much simpler solution is to use the Report keyword in the following formula:

```
=Sum(<Revenue>) In Report
```

Wherever you display this formula in the report, you obtain the grand total.

Tip: A formula in which the Report keyword is used to define the output context always returns a single value.

How to define a context using a keyword

Here's the step-by-step procedure for using a keyword to define a context:

1. If the Formula Bar is not displayed, select the Formula Bar command on the View menu.
2. Click the cell in which you want to place the formula, then write the basic formula, e.g.,
`=Sum(<Revenue>)`
in the Formula Bar.
3. If you're adding input context, click to the left of the closing parenthesis. For an output context, click to the right of the closing parenthesis.
4. Type a space, type In, then type another space.
5. Type the keyword (Block, Body, Report, or CurrentPage), then press Enter.

How BusinessObjects uses keywords

You use keywords in extended syntax when you need to define contexts in aggregate formulas. BUSINESSOBJECTS defines contexts in all aggregate formulas, however simple, and often uses keywords to do so. Here's an example to illustrate this behavior.

Example The formula BusinessObjects writes for a simple calculation

You create a master/detail report that shows revenue per resort per year. You insert a sum on Revenue. This is a simple calculation requiring no extended syntax.

BUSINESSOBJECTS, however, writes a full formula in which input and output contexts are specified. The formula is

```
=Sum(<Revenue> In Body) In (<Year>)
```

where Body corresponds to Resort (the dimension in the table containing the calculation, i.e., the local context), and Year is the output context.

You can view the full formula by clicking the cell containing the sum, then resting the mouse pointer over the Formula Bar. The formula appears in a tooltip.

You can also view the full formula by using the Define As Variable command on the Data menu.

Benefits

In simple aggregations such as the one in the example above, you rarely need to understand the extended syntax BUSINESSOBJECTS uses. But what if you don't understand the numbers BUSINESSOBJECTS displays in a report? What if you're having a hard time fixing an error such as #COMPUTATION?

In these cases, you can use the extended syntax BUSINESSOBJECTS provides to

- Understand the computation behind the report display, then
- Edit your formula to get the result you want. The formula displayed in the tooltip is a base for you to work from.

Filters and keywords

Question: if your report contains filters, are these taken into account when you apply aggregate calculations using keywords?

Answer: yes. The results you obtain will always be filtered. You can, however, force BUSINESSOBJECTS to ignore filters.

How to force BusinessObjects to ignore filters

Let's say you have a master/detail report and a filter on the master variable. You want to calculate a grand total using the Report keyword. Problem: you don't want to compute the filter but you don't want to delete it either.

Solution: use the NoFilter function! The syntax is

```
=NoFilter(formula)
```

an example being

```
=NoFilter(Sum(<Revenue>) In Report)
```

Tip: Why not try comparing filtered and non-filtered information? Insert a cell with the regular formula, then use NoFilter to get the real grand total.

Quick Reference

This guide contains a lot of theory and terminology, which is not always easy to remember. This section provides at-a-glance information to jog your memory when you just can't remember the difference between, for example, ForEach and ForAll...

The information below is organized by category:

- Basic terms such as document, microcube, aggregation, etc.
- Calculation contexts (local, body, input, output and reset)
- Context operators (In, ForEach, ForAll)
- Keywords (Report, Block, Body, CurrentPage).

Frequently used terms

A selection of useful terms often used in this context.

Term	Definition
Aggregation	A calculation that returns totals, percentages, etc. in which any of the following functions are used: Average, Count, Max, Min, StdDev, StdDevP, Sum, Var, VarP.
Cumulative aggregation	A calculation that returns running totals, percentages, etc. in which any of the following functions are used: RunningAverage, RunningCount, RunningMax, RunningMin, RunningSum.
Dimension	Qualification of an object, variable or formula that returns text (names, IDs, etc.) or dates. In a report, dimensions make up calculation contexts.
Document	A BUSINESSOBJECTS file (extension .rep).
Extended syntax	The syntax of a formula for an aggregation, in which the input and output contexts for the aggregation are displayed. You can use extended syntax to define your own input and output contexts You have to use extended syntax to define reset contexts.

Term	Definition
Formula	The definition of the content of a cell. Can contain functions, operators, variables and text.
Measure	<p>Qualification of an object, variable or formula that returns numeric data, such as revenue.</p> <p>The result of a measure is by default determined by the dimensions in the context in which the measure is placed in a report.</p>
Microcube	<p>Set of data returned by a query.</p> <p>Because documents can contain data from different sources in BUSINESSOBJECTS, any given document can contain multiple microcubes.</p>
Report	<p>Pages in a document where data is displayed. A document can contain many reports; each report has a tab at the bottom of the application window.</p> <p>A report can display only a subset of data from the document. You can use any dimension - displayed or not - as input or output for a calculation.</p>
Variable	<p>A named formula.</p> <p>BUSINESSOBJECTS always stores query results as variables.</p>

Calculation contexts

A calculation context consists of one or more dimensions that determine the input and output of aggregate calculations. Important: In BusinessObjects 5.1.x, the SQL

Context	Definition
Local	Dimension or dimensions that govern the part of the report where the calculation is inserted (e.g., a master variable in a section).
Body	Dimension or dimensions that are present in the part of the report (e.g., a block) where the calculation is inserted.
Input	One or more dimensions that go into an aggregate calculation. By default, the input context for a calculation is the defined by the dimension(s) in the body. You can define your own input context using extended syntax.
Output	One or more dimensions that determine the result of an aggregate calculation. By default, the output context is defined by the dimension(s) in the local context. You can define your own output context using extended syntax.
Reset	One or more dimensions that reset a cumulative aggregation such as running total to 0 when the value of the dimension(s) changes. You specify reset contexts using extended syntax.

Important: In BusinessObjects 5.1.x, the SQL for contexts is generated differently to previous versions. Therefore, if you run a query that was built in a previous version to 5.0.x, you receive #SYNTAX, #COMPUTATION and #ERROR messages in the upgrading report.

Context operators

In the formula for an aggregation using extended syntax, an operator introduces the input and/or output context.

Operator	Definition
In	The default operator. Includes the specified dimension(s) in the context.
ForEach	Modifies a context by including the specified dimension(s).
ForAll	Modifies a context by excluding the specified dimension(s).

Keywords

In extended syntax, a keyword stands for the dimension(s) in a specific part of a report. The keyword enables you to define contexts in aggregate formulas by using one word rather than listing the dimensions in the context.

Keyword	Definition	
Block	Corresponds to the dimensions in the current section. Can only be used in a formula placed inside a block.	
Body	When the formula is placed...	Corresponds to...
	Outside a block	The dimensions in the current section.
	Inside a block	The dimensions in the block.
Report	Anywhere in the report	All the dimensions in the document.
CurrentPage	Inside the current page	The dimensions in the current page.

Chapter 16 Calculation Troubleshooting

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Overview

This chapter describes and offers solutions for computation errors that may occur in BUSINESSOBJECTS. A computation error always starts with # and appears the cells where your business data should be.

The bulk of the information in this chapter focuses on the most common errors, i.e., #COMPUTATION and #MULTIVALUE. For the full list of errors covered here, please refer to the table of contents or the index.

Tip: If you need help with #COMPUTATION and #MULTIVALUE errors in your reports, you are strongly advised to first read Chapter 15 "Calculation Contexts and Extended Syntax" on page 341.

#COMPUTATION

This section provides descriptions, examples and solutions for the following errors in BUSINESSOBJECTS:

- #COMPUTATION in cumulative aggregations such as running average revenue per city
- #COMPUTATION in non-aggregate formulas, for example using IF THEN ELSE statements.

#COMPUTATION in cumulative aggregations

The expression “cumulative aggregations” refers to any aggregation containing a running aggregate function such as RunningMax or RunningAverage. In reports, cumulative aggregations let you answer questions such as “What’s the running percentage of revenue per city for each year?”.

Note: The information presented here requires that you understand BUSINESSOBJECTS extended syntax, which is described in “Using Extended Syntax for Advanced Calculations” on page 351.

Description of #COMPUTATION in a cumulative aggregation

#COMPUTATION can occur in cumulative formulas where a reset context is defined. A reset context consists of a dimension, and resets a running calculation to zero when the value of the dimension changes. To read up on reset contexts, refer to “What about reset contexts?” on page 355.

#COMPUTATION occurs in cumulative aggregations for the following reason:

The reset context is not included in the output context.

Here’s an example.

Example #COMPUTATION resulting from a running sum with a reset context

You've displayed running totals per country per year, and reset the calculation per country. The formula is as follows:

```
=RunningSum(<Revenue>;<Country>)
```

You now set a break on Year, because you want to display the running total for each year. You copy the formula from the running total column and paste it in the break footer. #COMPUTATION appears:

Country	Year	Running Total
France	FY93	\$295,940.00
US		\$767,614.00
	FY93	#COMPUTATION

Country	Year	Running Total
France	FY94	\$576,250.00
US		\$1,594,544.00
	FY94	#COMPUTATION

Country	Year	Running Total
France	FY95	\$835,420.00
US		\$2,451,104.00
	FY95	#COMPUTATION

Why? Because the reset context in the formula you pasted is Country, but you placed the formula in the footer of the break on Year. Thus, the reset context (Country) is not in the output context (Year).

To fix this error, you need to display the Formula Bar and change the reset context from Country to Year. The winning formula is:

```
=RunningSum(<Revenue>;<Year>)
```

Alternatively, you could set the break on Country, but you would obtain a different result.

Solution for #COMPUTATION in a cumulative aggregation

To avoid #COMPUTATION in a cumulative aggregation, the reset context must be included in the output context. In other words, the dimension or dimensions after the semi-colon (;) in the formula must also be listed after the operator (In, ForEach or ForAll) on the right of the formula.

Reminder: If no output context is defined in the formula, the calculation is made using the local context. To brush up on this concept, refer to “Understanding input and output contexts” on page 346.

To fix your formula:

1. Display the Formula Bar (Formula Bar command, View menu), then click the cell containing the formula.
2. Check that the dimension in the reset context is also specified in the output context. The following table will help you determine this:

When the reset context is Region and...	Then...
Only the output context is defined, e.g., =RunningSum(<Revenue> ;<Region>) In (<Region> ,<City>))	Region must also be specified in the output context.
Only the input context is defined, e.g., =RunningSum(<Revenue> In (<Region> ,<City>) ;<Region>)	Region must be present in the local context.
Neither the input nor output contexts are defined, e.g., =RunningSum(<Revenue> ;<Region>)	Region must be present in the local context.
Both the input and the output contexts are defined, e.g., =RunningSum(<Revenue> In (<Region> ,<City>) ;<Region>) In (<City> ;<Region>)	Region must also be specified in the output context.

3. Edit the formula in the Formula Bar, then press Enter.

#COMPUTATION in non-aggregate formulas

#COMPUTATION can occur in formulas that do not contain aggregate or running aggregate functions.

Description of #COMPUTATION in a non-aggregate formula

In non-aggregate formulas, #COMPUTATION occurs because the output context is not included in the input context. Here's an example.

Example #COMPUTATION caused by a conditional formula in a break footer

You can use an IF THEN formula to set a condition for displaying data in a report. The following formula

```
= If (<Year>="FY95" ) Then <Revenue>
```

displays the measure, Revenue, only when 1995 is also displayed.

In the report illustrated here, the formula is inserted in a break footer, and this causes #COMPUTATION:

Resort	Year	Revenue
Bahamas Beach	FY93	287,929.00
	FY94	307,400.00
	FY95	376,115.00
Bahamas Beach		#COMPUTATION

Resort	Year	Revenue
French Riviera	FY93	295,940.00
	FY94	280,310.00
	FY95	259,170.00
French Riviera		#COMPUTATION

Resort	Year	Revenue
Hawaiian Club	FY93	479,685.00
	FY94	519,530.00
	FY95	480,445.00
Hawaiian Club		#COMPUTATION

Why? The input context required to display revenue for 1995 is Year, whereas the output context of the break footer is Resort. To fix this error, you add Year to the output context using the ForEach operator:

```
=(If (<Year>="FY95" ) Then <Revenue>) ForEach <Year>
```

Finally, you add Max (or Min) to return the single value you need:

```
=Max((If (<Year>="FY95" ) Then <Revenue>) ForEach <Year>)
```

BUSINESSOBJECTS now displays Revenue for 1995 in the break footer.

Solution for #COMPUTATION in a non-aggregate formula

You must:

1. Edit the formula so that the output context is included in the input context, as described in the example above.
2. Add Max or Min to the beginning of the formula, followed by an opening parenthesis.
3. Add a closing parenthesis at the end of the formula, then press Enter.

#MULTIVALUE

This section provides descriptions, examples and solutions for #MULTIVALUE in BUSINESSOBJECTS:

- #MULTIVALUE in aggregations such as maximum revenue per year
- #MULTIVALUE in break headers and footers
- #MULTIVALUE in a cell at the section level.

#MULTIVALUE in aggregations

The expression “aggregations” refers to any calculation containing an aggregate function such as Sum, Count, Min, Max etc. In reports, aggregations let you answer questions such as “What is the minimum revenue per city for each region?”.

This section provides a description of why #MULTIVALUE occurs in aggregations, with an example, and offers a solution.

Note: The information presented here requires that you understand BUSINESSOBJECTS extended syntax, which is described in “Using Extended Syntax for Advanced Calculations” on page 351.

Description of #MULTIVALUE in an aggregation

#MULTIVALUE occurs in aggregations because

The output context is not included in the local context.

Here's an example.

Example #MULTIVALUE in an aggregation

Check out the following table:

Region	City	
East Coast	New York City	#MULTIVALUE
East Coast	Washington D.C.	#MULTIVALUE
Mid West	Chicago	#MULTIVALUE
South	Dallas	#MULTIVALUE
West	Los Angeles	#MULTIVALUE
West	San Diego	#MULTIVALUE
West	San Francisco	#MULTIVALUE

The desired result in the right-hand column is revenue for a dimension that is not present in the table, e.g., Year. The formula

```
=<Revenue> In <Year>
```

returns #MULTIVALUE because Year is specified as the output context but it is not present in the local context, i.e., the table.

Note: The formula in this example does not begin with an aggregate function (Min, Max, etc.). If you omit the function in this way, BUSINESSOBJECTS calculates a sum by default. However, if the user had specified Sum or another aggregate function in the formula above, e.g.,

```
=Sum(<Revenue>) In <Year>
```

BUSINESSOBJECTS would have returned #COMPUTATION.

If the Year dimension is available in the document, you can, using extended syntax, calculate revenue per year without displaying Year in the table. To do this, you must define a formula with an input and an output context, like this:

```
=Sum(<Revenue> In (<Region>,<City>,<Year>) In <Year>)
```

Solution for #MULTIVALUE in an aggregation

To avoid #MULTIVALUE in an aggregation, the output context must be included in the local context. In other words, the dimension(s) specified on the right of the formula after In or ForEach must be present. To fix your formula:

1. Display the Formula Bar (Formula Bar command, View menu), then click the cell containing the formula.
2. Check the following questions:
 - Does the output context contain dimensions that are not in the block or section in which the formula is inserted? For example, if the following formula appears in a block that does not contain Year, you'll get a #MULTIVALUE:
`=Min(<Revenue>) In(<Year>)`
 - Does the output context contain more dimensions than the local context?
 - For example
`=Min(<Revenue>) In(<Region>,<City>)`
 - returns #MULTIVALUE in a table containing only one of these dimensions.
3. Edit the formula in the Formula Bar, then press Enter.

#MULTIVALUE in break headers and footers

#MULTIVALUE can occur when you insert a variable in a break header or footer in a table or crosstab.

Description of #MULTIVALUE in a break header or footer

A break splits up the values of a variable and thus enables you to make calculations.

A break footer is a cell at the bottom of each value of the break. Users typically display text or calculations such as running totals in break footers.

#MULTIVALUE occurs in a break header or footer:

If You...	Then You...	And...
Set a break on a variable	Insert a second variable in the break footer	These two variables have a 1:1 relationship, as is the case with Customer and Age.

Here's an example.

Example #MULTIVALUE in a break footer

The table below shows the running total revenue for two customers. When you insert Age in the break footer, BUSINESSOBJECTS returns #MULTIVALUE:

Customer	Resort	Revenue
Arai	Bahamas Beach	\$8,036.00
#MULTIVALUE		\$8,036.00

Customer	Resort	Revenue
Baker	Bahamas Beach	\$141,584.00
	French Riviera	\$141,300.00
	Hawaiian Club	\$158,710.00
#MULTIVALUE		\$449,630.00

This error occurs because variables with a 1:1 relationship, i.e., Customer and Age, are inserted at the same break level. By default, a break is based on one variable only.

Solution for #MULTIVALUE in a break header or footer

You fix this problem by including the variable from the header or footer in the break definition. Here's how to do it:

1. Click inside the table or crosstab containing the break, then select the Breaks command on the Format menu.
The Breaks dialog box appears.
2. Click the icon of the break concerned, then click Edit.
A dialog box listing all the variables in the report appears.
3. Click the check box next to the variable you want to display in the break footer (Age in the example on page 385), then click OK.
4. Click OK in the Breaks dialog box.
BUSINESSOBJECTS displays the variable in the break footer. Here's proof!

Customer	Resort	Revenue
Arai	Bahamas Beach	\$8,036.00
18		\$8,036.00

Customer	Resort	Revenue
Baker	Bahamas Beach	\$141,584.00
	French Riviera	\$141,300.00
	Hawaiian Club	\$158,710.00
64		\$449,630.00

#MULTIVALUE in a cell at the section level

Description

A report section displays data in a master cell and in a block or blocks. If you use two variables at the section level, #MULTIVALUE can occur. Here's an example.

Example #MULTIVALUE in a section containing Name and Address

You want to display customer names and addresses in a section, and the customers' and revenue details in a table. You build a table containing Customer, Address, Invoice Date and Revenue, then drag Customer out of the block to create a section.

The next step is to drag Address out of the block, and drop it next to Customer. Here's what you get:

Goldschmidt	#MULTIVALUE
Invoice Date	Revenue
7/5/95	\$1,140.00
7/15/95	\$2,280.00
7/20/95	\$3,990.00
10/5/95	\$3,325.00
10/10/95	\$3,990.00
10/15/95	\$3,990.00

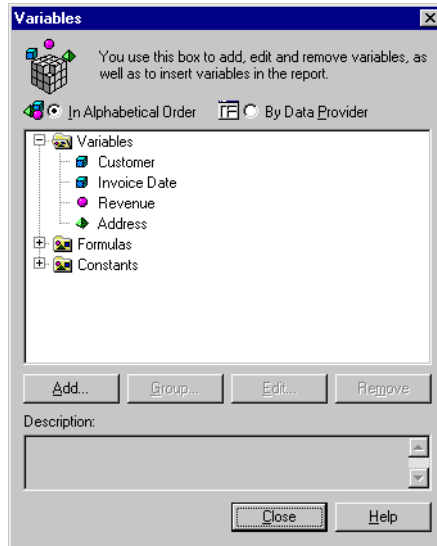
Why? Because by default, there is only one master variable per section. When you place a second variable at the section level, BUSINESSOBJECTS thinks "ah, multiple values occur here" so returns #MULTIVALUE.

Solution #1 for #MULTIVALUE at the section level

The way round this problem is to turn the variable that returns the error into a measure. Here's how to do it:

1. Click the cell containing the #MULTIVALUE error.
2. Select the Variables command on the Data menu.

The Variables dialog box appears:



3. In the dialog box, click the variable that returns the error.

4. The next step depends on the type of variable you just clicked:

The Edit button is grayed.	The Edit button is available.
<p>It means that the variable you need to turn into a measure comes from a query on a universe. You cannot edit variables that come from queries on universes, so you have to create a new variable instead.</p>	<p>No problem, you can turn the variable into a measure.</p>
<ul style="list-style-type: none"> • Click Add. The Variable Editor appears. • In the Definition tab, type a name for the new variable. • In the Qualification box, click Measure. • Click the Formula tab. • In the Variables box, double-click the name of the variable that returned the error. For example if you're creating a new variable to replace Address, double-click Address in the Variables box. • Click OK. 	<ul style="list-style-type: none"> • Click Edit. The Variable Editor appears. • In the Qualification box, click Measure, then click OK.

5. In the Variables dialog box, click Replace.
You replace the erroneous variable with the one you have just either created or modified. The data appears instead of the error.

Solution #2 for #MULTIVALUE at the section level

You can also fix #MULTIVALUE at the section level by applying the Min or Max function, which forces BUSINESSOBJECTS to display only one value. This solution works great for master variables with a 1:1 relationship, such as Customer and

Address (unless your customers have more than one address). If the variable returning #MULTIVALUE contains more than two values, you will only be able to display the first and last of these by applying Min or Max.

1. Click the master cell displaying #MULTIVALUE.
2. In the Formula Bar, type Min or Max after =, then add parentheses, like this:

```
=Min(<Address>)
```

3. Press Enter.

#####

Description

Simply means that the cell is not wide enough to display the data it contains in full.

Solution

Double-click the cell's right border. BUSINESSOBJECTS widens the cell to autofit the data.

#ALERTER

Description

This error occurs when an alerter contains a missing variable. For example, if the definition of the alerter contains the Revenue variable, #ALERTER appears if Revenue does not exist in the report.

The definition of the alerter itself may also be the cause of this error. For example, if you try to compare a measure with a dimension (Revenue greater than Country), #ALERTER is returned.

Solution

You can:

- Obtain the missing data by adding the corresponding object to the query (Edit Data Provider command, Data menu)
- Edit the alerter so that its definition contains only available data (Alerters command, Format menu)

- Deactivate the alerter (Alerters command, Format menu, then uncheck the alerter in the dialog box).
- Check that the definition of the alerter does not contain a comparison such as that of a measure with a dimension.

Tip: To use the Alerters command on the Format menu, first click any cell containing data.

#DICT.ERROR

Description

In BUSINESSOBJECTS, you can format a report by applying a template. You do this by choosing Report, and then Apply Template from the Format menu. The Apply Template dialog box appears.

A template contains a set of variables, also referred to as the variable dictionary. The report you wish to format also contains a variable dictionary. When you apply a template, unless you click the Options button in the Apply Template dialog box, in order to specify the correspondence between the two variable dictionaries, BUSINESSOBJECTS automatically replaces the variables in the template with the variables in the report. In some cases, BUSINESSOBJECTS cannot match the variable dictionaries and returns #DICT.ERROR.

Solution

There is a simple way to fix this problem:

1. Click the cell containing #DICT.ERROR, then select the Variables command on the Data menu.
The Variables dialog box appears.
2. Click the variable or formula that you want to display in the selected cell.
3. Click Replace.
The Variables dialog box closes, and the variable or formula appears in the report.

How to avoid #DICT.ERROR from the start

If the template you select has many more variables than the report you are working on, you may well end up with #DICT.ERROR. To avoid the problem:

1. From the Format menu, choose Report, then Apply Template.
The Apply Template dialog box appears.
2. Click the template you want to apply, then click Options.
The Template Options dialog box appears.
3. Uncheck *Replace Variables Automatically*, then click Define.
The Replace Variables dialog box appears.
4. In the Report Variables box, click a variable, then click a corresponding variable in the Template Variables box, making sure that the two variables are of the same type (dimension, measure or detail).
5. Click Replace, then repeat the previous step until you have replaced all variables from the template with variables from the report.
6. Click OK in the Replace Templates dialog box.
You return to the Template Options dialog box.
7. Ensure that *Delete Undefined Template Variables* is checked, then click OK.
8. Click OK in the Apply Template dialog box.
BUSINESSOBJECTS applies the template to the report.

#DIV/0

Description

Occurs when a formula performs a division by 0. For example, the formula

=<Revenue>/<Quantity Sold>

returns 20 if Revenue is 100 and Quantity Sold is 5. But if Quantity Sold is 0, then the result is #DIV/0.

Solution

Using an IF THEN ELSE statement, you can set up a value or text, e.g., “No Sale”, which will appear when a division by zero occurs. To do this:

1. Switch on the Formula Bar command on the View menu.
2. Click inside the cell where #DIV/0 appears.
3. Write the following formula in the Formula Bar:

```
=If IsError (<VariableName>) Then “No Sale” Else (<VariableName>)
```

4. Press the Enter key.

Tip: You can use an IF THEN ELSE statement such as the one in the above procedure to return default values for errors other than #DIV/0.

#ERROR

Description

This error occurs when the definition of a formula or a variable within a formula is incorrect. For example, the formula that returns percentages based on a measure, such as

```
=<Nb Customers>/Sum(<Nb Customers>)
```

returns #ERROR if the measure, in this case Nb Customers, itself contains an error.

Solution

You need to break down the formula into its component parts in order to find which part contains the error. Here’s how:

1. Insert a new cell in the report (Cell command, Insert menu).
2. Select the cell containing the error, then select Copy on the Edit menu.
3. Select the new cell, then select Paste on the Edit menu.
The formula containing the error appears in the new cell.
4. Click the new cell, then in the Formula Bar, select one part of the formula.

5. Copy and paste the selection into the cell where the error first occurred, then press Enter.
6. Repeat this step until you find the part of the formula that contains the error.
7. Fix the error, then paste the whole corrected formula back into the cell where the error first occurred.

#IERR

Occurs in complex “formulas within formulas”. The three common causes are:

- Formulas combining measures and dimensions, where a dimension is missing from the calculation context
- Aggregations containing multiple formulas
- Formulas with complex WHERE clauses.

Tip: When you make calculations by combining formulas, #IERR may occur because the formulas within the formulas contain errors. If none of the solutions in this section get rid of #IERR, try breaking down the formula into its component parts, and test each one. This procedure is described under “#ERROR” on page 393.

#IERR in a formula combining measures and dimensions

Description

BUSINESSOBJECTS supports aggregate formulas that contain both dimensions and measures. For example, the following formula displays revenue for customers called Prince:

```
=If(<Customer>="Prince") Then <Revenue>
```

BUSINESSOBJECTS qualifies any formula containing a measure (e.g., Revenue) as a measure. This qualification requires that all dimensions are present in the calculation context - the local context if none is specified. #IERR may occur when a dimension required to compute the formula is missing from the context.

Tip: For information on calculation contexts, refer to Chapter 15 "Calculation Contexts and Extended Syntax" on page 341.

Solution

You add the missing dimension to the context using the ForEach operator, and apply the Sum function. So, if

```
=If(<Customer>="Prince") Then <Revenue>
```

returns #IERR, the formula you need is as follows:

```
=Sum((If(<Customer>="Prince") Then <Revenue>) ForEach  
<Customer>)
```

#IERR in an aggregation containing a complex formula

Description

An aggregation such as Min, Max etc., used on a formula that already contains a formula, may produce #IERR.

Solution

The trick is to turn the formula within the formula into a variable, then rewrite the whole formula using the new variable.

Remember that a variable is a formula with a name. So, once you have made your variable, to include it in your formula, all you have to do is write its name, rather than a complex formula within a formula. Here's an example.

Example Solving #IERR by turning part of a formula into a variable

You want to know the week your top ten customers placed their first order. In a table containing the list of customers, you add a column and insert the following formula:

```
=Min(Week(<Order Date>))
```

If #IERR occurs, the first thing to do, using the Variables command on the Data menu, is to create a variable called WeekOrderDate from the formula

```
=Week(<Order Date>)
```

Then, rewrite the original formula using the new variable, as follows:

```
=Min(<WeekOrderDate>)
```

Please note that the original formula may work. The purpose of this example is to show how to fix #IERR should it occur in similar formulas.

#IERR in a formula using WHERE

Description

The WHERE operator lets you specify values of a dimension to include in a calculation. For example

```
=(<Revenue>*2) WHERE (<Customer>="Prince")
```

shows revenue at 200% for customers named Prince. #IERR can occur in WHERE clauses that contain complex formulas.

Solution

The trick is to turn conditions specified after WHERE into variables. Then, you can rewrite the whole formula, using the variables instead of the original formulas in the WHERE clause.

This is the same solution as for #IERR in an aggregation containing a complex formula. Refer to “Solving #IERR by turning part of a formula into a variable” on page 396 for more information.

#OVERFLOW

Description

The calculation returns a number that is too big for BUSINESSOBJECTS to compute. The maximum is $17e \pm 308$, or 15 digits.

Solution

Check the maximum value of the function used in the formula. For example, the maximum value for the Fact function is 709.

The BUSINESSOBJECTS online help on functions includes maximum values where appropriate.

#SYNTAX

Description

#SYNTAX occurs when a variable used in a formula no longer exists in the document. For example, the formula

```
=<Product Price> * <Quantity Sold>
```

returns #SYNTAX if the user deletes either object from the query.

The missing variable can correspond to

- An object returned by a query, or
- A local variable that you have defined in the report.

Solution

The way you fix this problem depends on the data available in the report:

If the variable you need is...	Then...
Available as an object in the universe you are using	Edit the query (Edit Data Provider command, Data menu), add the object you need, then click Run.
A local variable that you have defined in the report	Create it in the Formula Editor (Variables command, Data menu, Add button).

#UNKNOWN

Description

Occurs when the object corresponding to a variable displayed in the report has been removed from the query.

In BUSINESSOBJECTS, when you remove an object from a query, the corresponding variable is automatically removed from the report - sometimes. More specifically:

If the variable is displayed in...	Then BUSINESSOBJECTS...
<ul style="list-style-type: none"> • A table or simple crosstab • A master cell 	Removes it from the report.
<ul style="list-style-type: none"> • A free-standing cell • A break header or footer 	Returns #UNKNOWN.

Note: If the missing variable is used in a formula, BUSINESSOBJECTS returns #SYNTAX.

Solution

You have to add the missing object to the query. Here's how to do it:


1. Select the Edit Data Provider command on the Data menu. If the List of Data Providers dialog box appears, click the query you want to edit, then click OK. The Query Panel appears.
2. Double-click the missing object in the Classes and Objects box. The object appears in the Result Objects box.
3. Click Run.
BUSINESSOBJECTS replaces #UNKNOWN with the variable corresponding to the object you added.

Tip: If you do not want to add the missing data to your report, simply clear the cell containing the error. Select the cell, then press the Del key on your keyboard. To delete the cell, select the Delete command on the Edit menu.

Tips and Tricks

This section provides tips for writing formulas and avoiding #COMPUTATION, #MULTIVALUE and other errors.

Tip		Here's how to do it:
1.	All formulas must begin with = If you forget =, BUSINESSOBJECTS displays the formula as text!	Type = before your formula!
2.	The extended syntax of a formula shows you the contexts BUSINESSOBJECTS applies by default. There are two easy ways to see the extended syntax of a formula.	<ol style="list-style-type: none"> 1. Click the cell containing the formula. 2. Rest your cursor over the Formula Bar. The extended formula appears in a tooltip. <p>- or -</p> <ol style="list-style-type: none"> 1. Click the cell containing the formula. 2. Select the Define as Variable command on the Data menu. 3. Click <i>Evaluate the formula in its context</i>. The extended formula appears in the dialog box.
3.	If you remove a dimension from a table, a calculation that needs that dimension can return an error. To avoid this, you can hide the dimension: it won't appear in the report, but it will be included in the calculation.	<ol style="list-style-type: none"> 1. Click the table containing the dimension you want to hide. 2. Click the Table command on the Format menu. 3. In the Pivot tab, click the dimension. 4. Click Hide, then click OK.
4.	The best way to fix #MULTIVALUE is to include the variable returning the error in the current break.	Use the Breaks command on the Format menu. For more information, refer to "Solution for #MULTIVALUE in a break header or footer" on page 386

Tip		Here's how to do it:
5.	If you get #MULTIVALUE when you insert a variable in a column header of a table, try fixing it by applying a sort.	<ol style="list-style-type: none"> 1. Click the cell containing #MULTIVALUE. 2. Select the Sort command on the Insert menu.
6.	When you create or edit a formula in the Formula Bar or the Formula Editor, you press enter to validate the formula. If there's a syntax error, BUSINESSOBJECTS tell you so and highlights the anomaly in the formula itself. This helps you fix the specific problem.	<ul style="list-style-type: none"> • If a variable name is highlighted in full, add parentheses and check the spelling. • If one end of a variable name is highlighted, add a parenthesis.
7.	You can edit formulas directly in the report, without using the Formula Bar or the Formula Editor.	<ol style="list-style-type: none"> 1. Double-click the cell containing the formula you want to edit. 2. Edit the formula in the cell, then press Enter when you're done.
8.	You can display the Formula Editor from the Formula Bar.	<ul style="list-style-type: none"> • Click this button: 
9.	You can view and edit all the formulas displayed in a report by switching to Structure view.	<ul style="list-style-type: none"> • Select the Structure command on the View menu.
10.	BUSINESSOBJECTS lists all the formulas you create in a document in the Data tab of the Report Manager.	To open Report Manager, choose Report Manager from the View menu. Click the Data tab and expand the Formulas folder.
11.	BUSINESSOBJECTS also lists formulas in the Variables dialog box. In this dialog box, you can view, edit or insert any formula you have created.	<ol style="list-style-type: none"> 1. Select the Variables command on the Data menu. 2. Double-click the Formulas folder. 3. To edit a formula, select it then click Edit. 4. To insert a formula, select it then click Insert or Replace.



BUSINESS OBJECTS®



Part IV

Working with Charts

www.businessobjects.com/services/infocenter

Chapter 17 Creating Charts

In this chapter

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 - Switching between chart types 412
- ❑ **Organizing Chart Data 413**
 - Matrix charts 413
 - Reorganizing chart data 415
 - Removing or hiding data 417
- ❑

Overview

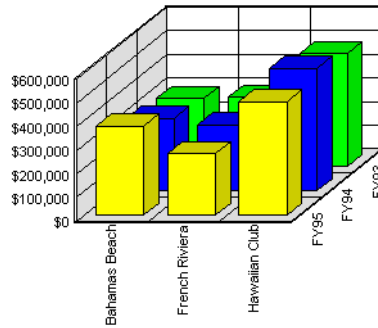
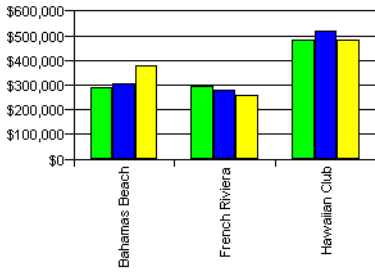
Charts are the graphic equivalent of tables and crosstabs. BUSINESSOBJECTS has a very powerful and easy-to-use charting feature which enables you to produce sophisticated and visually appealing charts to display a simple summary of your data or to represent complex relationships in it.

- The first chapter of this part describes how to display data in charts in BUSINESSOBJECTS reports and how to organize the way the data is displayed on the chart.
- The second chapter describes the different elements (legends, titles, gridlines) you can add to your charts and how you can format them to obtain professional looking charts.

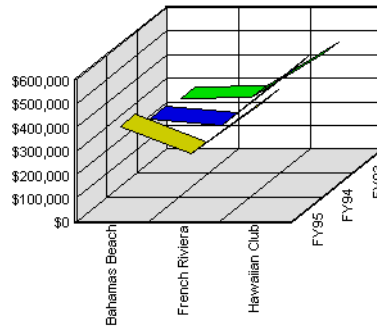
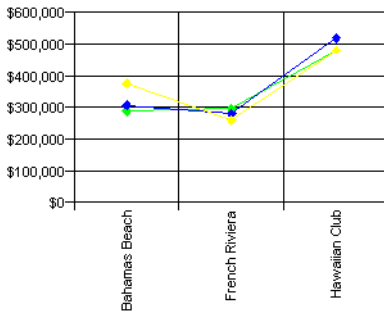
Chart Types

BUSINESSOBJECTS has five basic chart types, some with a 2-D and some with a 3-D view.

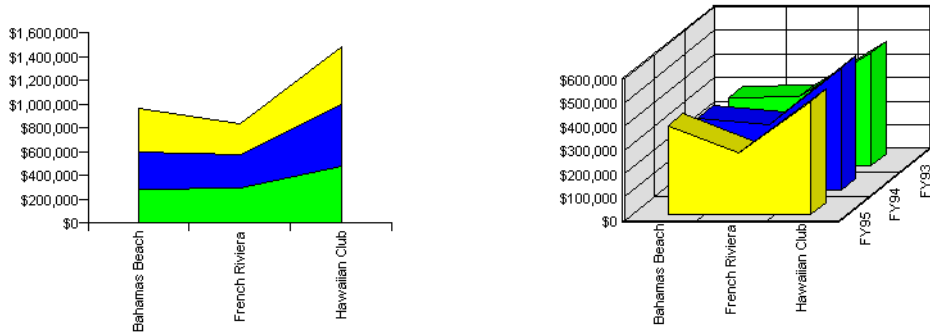
2-D and 3-D Column



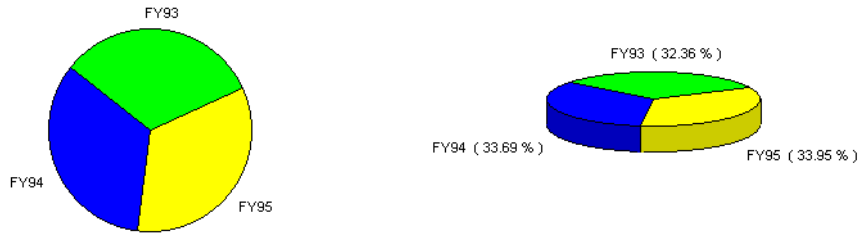
2-D and 3-D Line



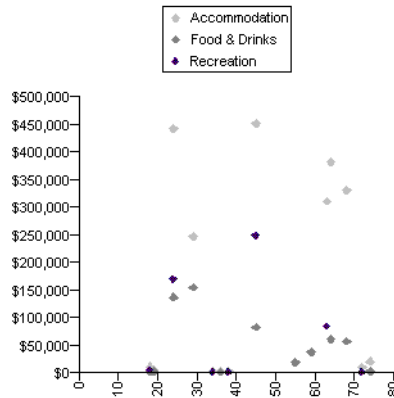
2-D and 3-D Area



2-D and 3-D Pie



XY Scatter chart



Creating a Chart

There are several ways of creating a chart to display your data. You can:

- Use the Insert Chart wizard.
- Turn an existing table or crosstab into a chart.
- Copy & paste an existing table or crosstab and then turn it into chart.

To create a chart you need to use at least one measure object and one dimension or detail object.

Using the Insert Chart wizard



Insert Chart

You can use the Insert Chart Wizard to insert a chart in a report using existing data from the document. To do this:

1. Click the Insert Chart button on the Report toolbar, or from the Insert menu, choose Chart.
The cursor changes to the insert chart icon.
2. Click in a blank part of the report and holding down the left mouse button, draw a box around the area where you want to display the chart.

Tip: The size of the box you draw determines the size of the area in which the chart will be displayed.

When you release your mouse button, the New Chart wizard appears.

3. Click the first option, *Use existing data from the document*, then click Begin.
4. Hold down the Ctrl key and select the variables you want to display in the chart. Click Next.
5. Choose the type of chart you want to display from the list and then choose a chart style. Click Finish.
The chart is displayed in the report.

Note: If you check Generate a Default Chart, BUSINESSOBJECTS automatically creates the default chart best suited to the number of variables you have selected in the list. If you check this option, the Chart Autoformat screen is not shown. Just click Finish to generate the chart.

Turning a table or crosstab into a chart

If the data you want to display in your chart is already displayed in a table or crosstab in your report you can change it automatically into a chart. To do this:



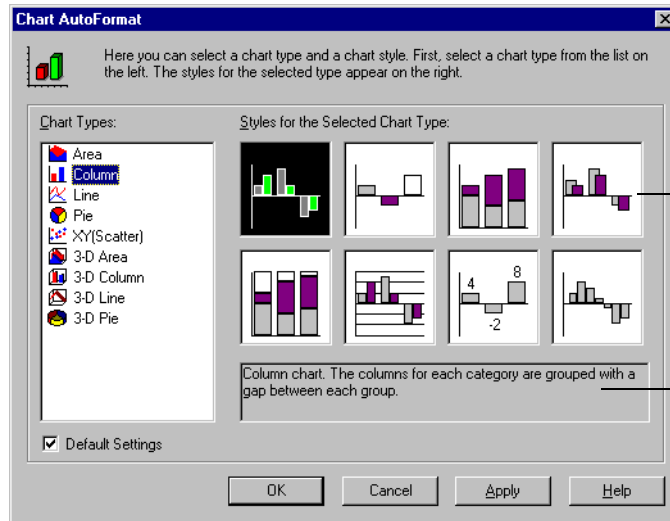
Chart Types toolbar

1. Select the chart.
2. Click the down arrow next to Chart Types button on the Report toolbar.
3. Choose the chart type from the menu.

- or -

1. Right-click on the table or crosstab.
2. Choose Turn to Chart from the popup menu
For each type of chart, there are several predefined styles. Each style provides a variation on the basic chart type as illustrated below.

Choose the type of chart from this list.



Choose from one of the pre-defined styles for the selected chart type.

When you click on a chart style, a short description of what the style consists of is displayed.

3. Choose the type of chart you want to display from the list and then choose a chart style.
4. Click Apply to test the settings or OK to close the Chart Autoformat dialog box and save the settings.

Tip: If you want to display the data from a table in a chart and keep the table:

- Copy the table or crosstab and paste it in a new location and then turn it to a chart.
-
-

Turning a chart into a table or crosstab

You can also turn data displayed in a chart into a table or crosstab.

1. Right-click on the chart.
2. Choose Turn to Table or Turn to Crosstab from the popup menu.
Turn to Table is displayed for a 2-D chart and Turn to Crosstab for a 3-D chart.

The data from the chart is displayed in a table or crosstab.

Using the best chart type for your data

When you turn a table or crosstab to a chart, BUSINESSOBJECTS will propose a default chart type based on the type of block -- table or crosstab -- and the number of variables in the block. This may not necessarily be the best chart type for your business data and you may need to experiment with other chart types to find the best presentation for *your* data.

Switching between chart types

If you decide that you want to display your data as a pie chart rather than a column chart you can easily switch from one type of chart to another.

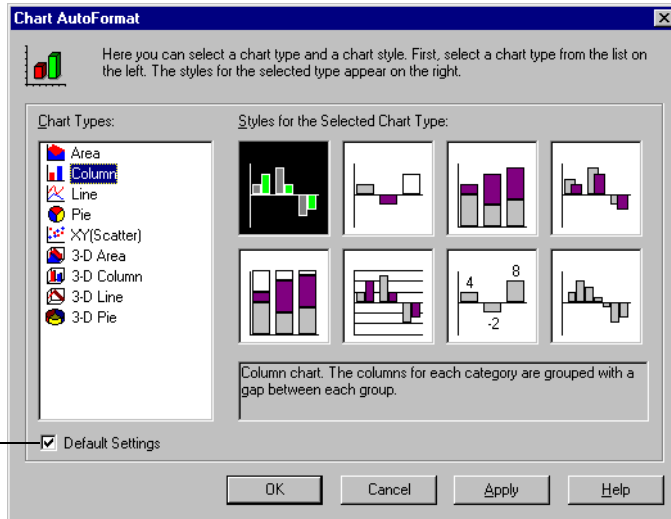
There are two ways to change chart type. The first method allows you to change from one chart to another. The second method additionally allows you to apply a predefined chart style to the chosen chart type.

To change chart type only

1. Select the chart.
2. Click the down arrow next to Chart Types button on the Report toolbar.
3. Choose the new chart type from the menu.
The data in the chart is displayed using the new chart type.

To change chart type and style

1. Right-click on the chart and choose Chart Autoformat from the popup menu.
The Chart AutoFormat dialog box appears:



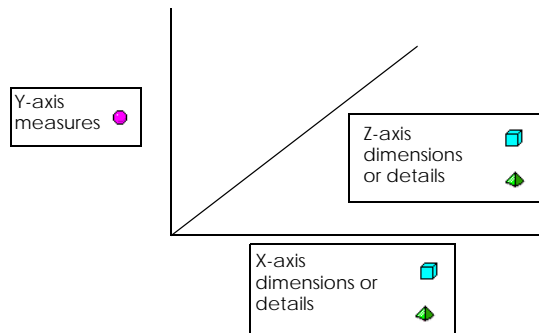
If you check this box, the default formatting for the selected chart style is applied to your chart and any custom formatting you have applied is lost.

2. Choose a chart type from the list and then a style for that chart type.
3. Click OK.
The new chart type is displayed in the report.

Organizing Chart Data

In all types of chart except pie charts, data is plotted on axes. Charts have two or three axes. Measure objects are always plotted on the Y-axis and dimension or detail objects are plotted on the X-axis or the Z-axis.

You can re-organize how the data is displayed in charts by using the Pivot tab on the Format Chart dialog box. You can move data from one axis to another, re-distribute data among the axes, add or remove data, temporarily hide data from your chart and, if you have more than one variable on an axis, you can change the order in which the variable is displayed on the axis.



Matrix charts

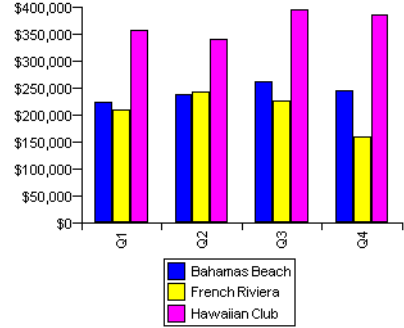
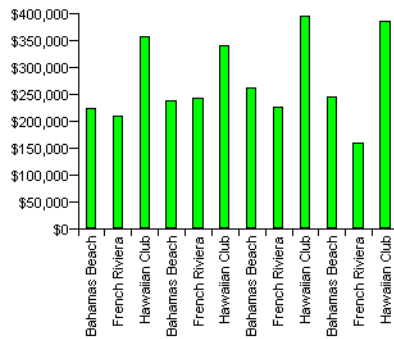
When you turn a table to a chart, the data is distributed over two axes. Matrix charts have at least one variable on each of the three axes of a chart. When you turn a crosstab to a chart, the data is automatically distributed over three axes. The example below shows how you get a different look to a column chart by re-distributing the data over three axes.

Example Re-organizing data on chart axes in 2-D charts

The charts on the next page both represent revenue per quarter for three resorts. In both charts, Revenue, the measure variable is placed on the Y-axis.

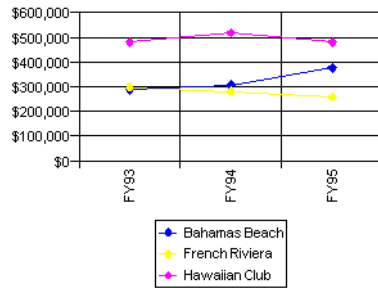
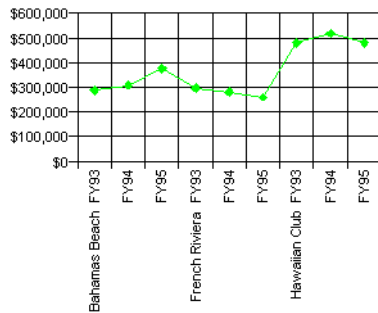
In the first chart, the other two variables, Resort and Quarter, are both placed on the X-axis. This gives a column chart where all the columns have the same color since they all show Revenue.

In the second chart, the variables have been re-arranged and Resort has been placed on the Z-axis. The columns are now grouped by quarters and Resort is represented by a different color column. This type of chart is called a matrix chart.



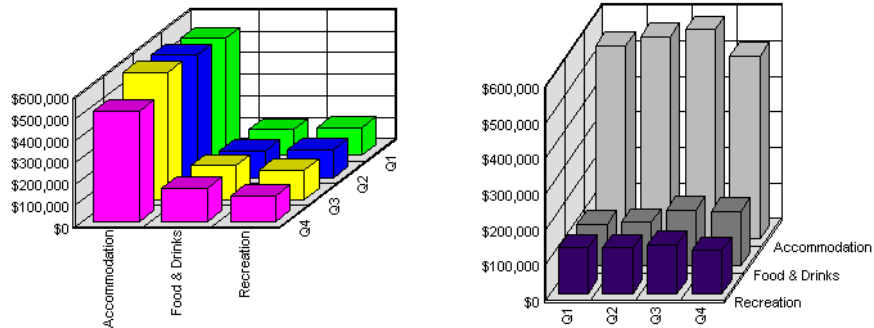
Example Showing multiple lines on a line chart

The two charts below both display data for one measure, Revenue, and two dimensions, Resort and Financial Year. In the first illustration below the two dimensions were both placed by default on the X-axis. By moving Resort to the Z-axis, as shown in the second illustration, you can show multiple lines on the same chart and see the revenue plotted for each resort.



Example Re-organizing data on chart axes in 3-D charts

In the illustration below, the first chart shows the Quarter variable plotted on the Z-axis and the Service Line variable on the X-axis. In the second chart these two variables have been swapped by dragging Quarter into the X-axis folder on the Pivot tab of the Chart Format dialog and dragging Service Line into the Z-axis folder. Quarter is now plotted on the X-axis and Service Line on the Z-axis.

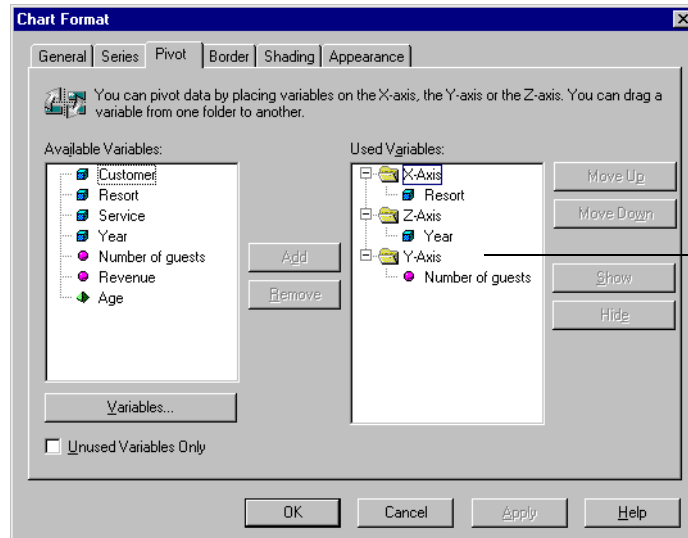


Reorganizing chart data

To reorganize the data in a chart:

1. Right-click on the chart.
2. Choose Format Chart from the popup menu.
The Chart Format dialog box appears.

3. Click the Pivot tab.



In 2-D charts, the variables are shown in the X-axis and Y-axis folders. Numeric data is always shown in the Y-axis folder. In matrix charts, there is at least one variable in each of the three folders.

The Pivot tab shows a representation of the data in the chart:

- The Available Variables box lists the variables you can display in the chart.
- The Used Variables box contains three folders. These folders show the variables that are already displayed on the X-axis, the Y-axis and the Z-axis.

4. Make the required changes and click Apply or OK.

Moving Data

To move data from one axis to another:

- Drag the variable from its current axis folder and drop it in the new one.

To change the order in which data appears on chart axes:

1. In the Used Variables box, select the variable you want to move.
2. Click Move Up or Move Down.

Removing or hiding data

You can hide a variable so that the data is temporarily not displayed on the chart. You can also remove the variable permanently from the chart.

1. In the Used Variables box, select the variable you want to remove or hide. To remove or hide more than one variable at the same time, hold down the Ctrl key and select the variables.
2. Click the Remove button or the Hide button. Hidden variables are grayed in the Used Variables box. Removed variables are no longer displayed.
 - To display a previously hidden variable, click it in the Used Variables list, then click Show.
 - To add a variable from the Available Variables list, click it, then click Add. The variable appears in the folder you selected.

Note: You can also re-organize chart data using slice-and-dice mode. See Chapter 21 "Using Slice and Dice Mode" on page 499.

Chapter 18 Formatting Charts

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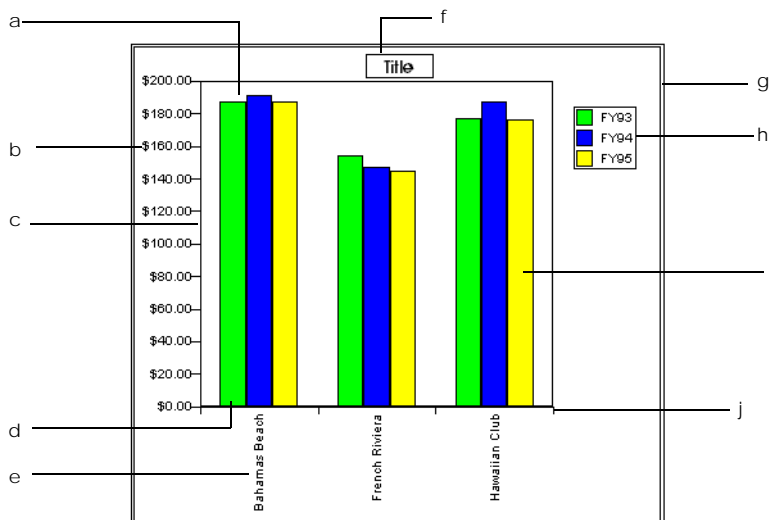
-

Overview

The elements that make up a chart can be formatted in different ways. Some elements are common to all types of chart and some appear in certain types of chart only.

What makes up a chart?

The illustration below shows the elements of a chart and what you can do to format them.



- Change the color, border and shade of the **plot area**.
- Apply text, number and date formats to the **Y-axis labels**.
- Change the scale and style of the **Y-axis**, where numeric data is plotted.
- Change the style of the **X-axis**.
- Apply text and date formats to the **X-axis labels**.
- Display and format a **title**.
- Change the color, border and shade of the **chart block**.
- Display and format a **legend key**.
- Change the color, border and shade of the **data series**.
- Display/hide **tick marks** on the X-axis; change their style and color.

Selecting chart elements

You set the formatting attributes for chart elements on the Format dialog box. There are different ways in which you can open this dialog box. You can:

- Right-click on the chart element and choose Format [chart element] from the popup menu.
This command is dynamic: it refers to the chart element that you selected. For example, if you right-click on the chart axis, the menu command is Format Axis Label.
- Double-click the chart element that you want to format.
- Select a chart element, such as the slice of a pie chart, then choose the [chart element] command on the Format menu.

A dialog box is displayed. The dialog box, like the menu command, is dynamic: its name and tabs depend on the chart element that you first selected.

General Formatting

This section describes general formatting options.

Choosing elements to display

You can display and hide axes, walls, a legend or a title on your chart.

To do this:

1. Right-click on the chart and choose Format Chart from the menu. The Chart Format dialog box opens.
2. Click the General tab.
3. Set the required options as described below:

Type in a name for the chart

Places the selected chart on a new page.

Repeats the selected chart on every page of the report

Set the elements you want to display on the chart.

Some elements are only available for certain types of chart.

Where possible, starts a new page for charts that would otherwise be split by a page break.

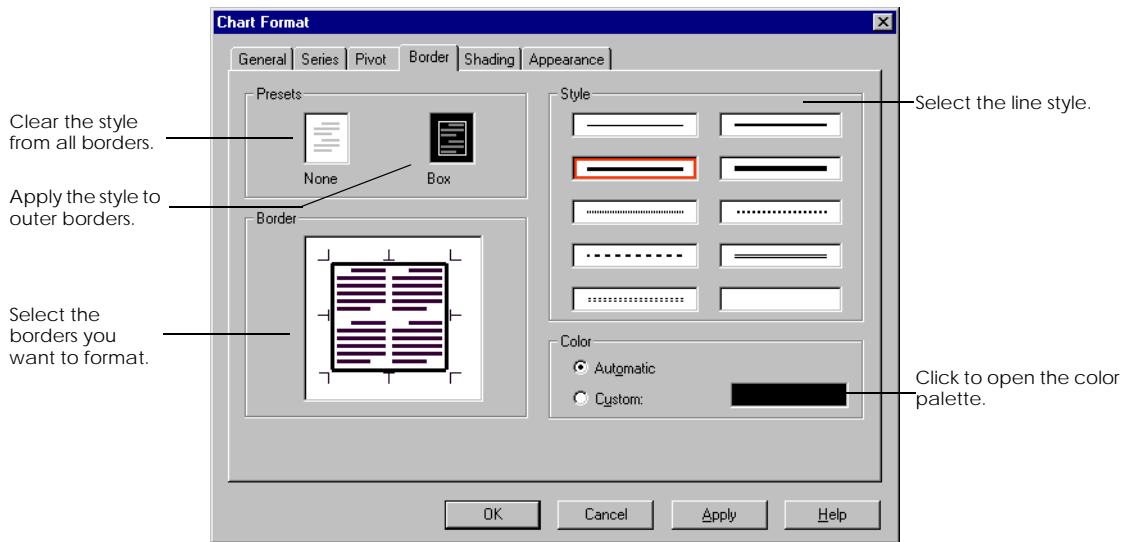
4. Click OK to save the settings and close the dialog box.

Formatting the chart block

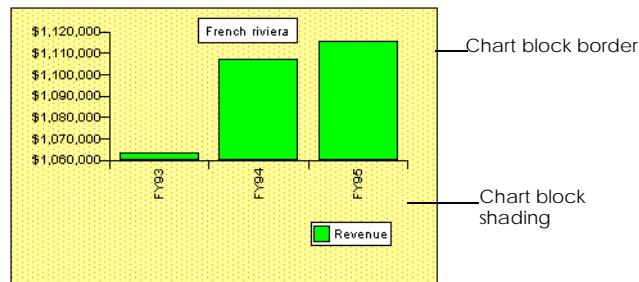
The chart block is the term used to describe all the elements that make up a chart and the area in which they are contained. It includes the plot area, the title, the legend and the data series labels. You can resize the chart block and apply a border and shading to it.

To do this:

1. Right-click on the chart and choose Format Chart from the menu. The Chart Format dialog box opens.
2. Click the Border tab to set and format a border. Set the required options as illustrated below:



3. Click OK to save the settings and close the dialog box.



- Click the Shading tab to set and format the color you want to apply to the chart block.
Set the required options as illustrated below:

Click None if you do not want to apply shading. This makes the background transparent.

Choose the pattern or shade from the list.

If you choose Clear, you apply the Background color only.

If you choose Solid, you apply the Foreground color only.

The other settings mix the two colors.

Click here to select a color you want to the foreground.

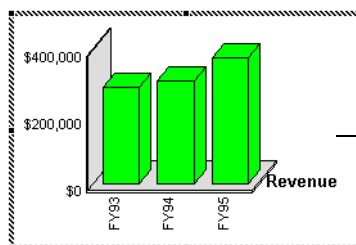
Click here to select the color you want to apply to the background.

This box displays a preview of the shading that will be applied to the section.

Resizing the chart block

Once you see your chart actually displayed you may need to resize it. You can resize charts using your mouse.

- Hold down the Alt key and click inside the chart.
A border with handles appears around the chart.



A handle appears on each border and corner of a selected chart.

- Rest the mouse pointer over a handle. When the pointer changes to a double-headed arrow, click the handle and hold down your mouse button.

3. Drag the handle until the chart's height or width reaches the required size. Note that if you drag a handle on a corner of the chart, you can adjust the height and width simultaneously.
4. Release the mouse button, then repeat the previous steps, if necessary, to make further adjustments.

Keeping the plot area proportionate to chart size

When you enlarge the size of the chart block, the plot area of the chart is not automatically enlarged.

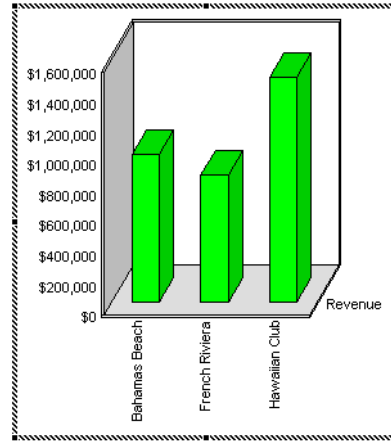
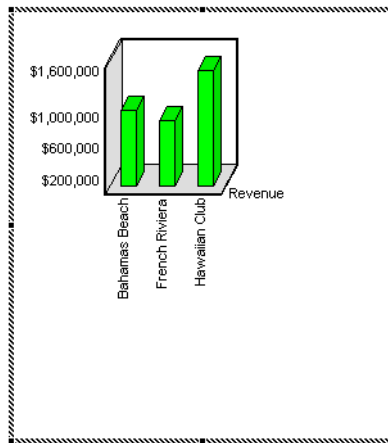
When you reduce the size of the chart block, however, BUSINESSOBJECTS reduces the chart's plot area proportionately.

To keep the plot area proportionate to the chart's size when you enlarge the chart block:

1. Enlarge the chart.
2. Right-click on the chart and choose Format Chart from the popup menu. The Chart Format dialog box appears.
3. Click the General tab.
4. On the General tab check *Adjust Plot Area to Chart Size* and click OK. BUSINESSOBJECTS resizes the plot area in proportion to the size of the chart.

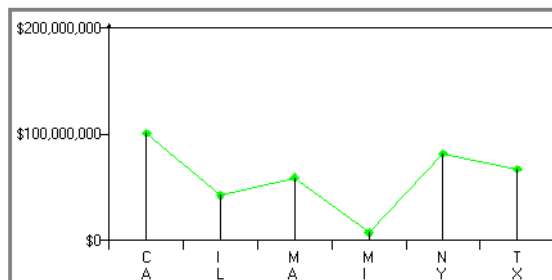
Example Adjusting the plot area to the chart size - before and after

In the first illustration the chart has been enlarged. In the second illustration the option *Adjust Plot Area to Chart Size* has been checked and the graph is enlarged to fit inside the enlarged area.



Formatting the plot area

The plot area is the area where the data series and the axes are displayed as illustrated:



The plot area is contained within the chart block. You can apply color and shade and put a border around it.

To format the plot area

1. Right-click inside the plot area without clicking any other chart element.

2. Choose Format Plot Area from the pop-up menu.

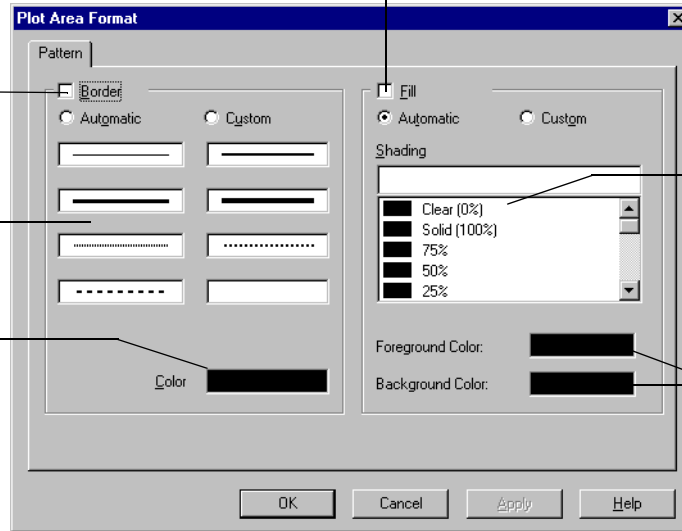
The Plot Area Format dialog box appears. It contains the Pattern tab only:

Deselect Fill if you do not want to apply shading or color.

Deselect Border if you do not want to apply borders.

Select the border style to apply.

Select the border color to apply.



Select the pattern or shade you want. Note that Clear applies the Background color, whereas Solid applies the Foreground color. The other settings show both colors and the pattern or shade you select.

Click here to select a color to apply to the shade.

3. Select the formats that you want to apply and click Apply or OK.

Formatting the Data Series

Data series map the data in a chart. In a pie chart, a data series is a slice of the pie. In a line chart, it is a line, in a column chart, a column, and so on.

To format the data series

1. Right-click on the data series.
2. Choose Data Series from the pop-up menu.
The Data Series Format dialog box opens.

For...	You can format....
Column, Area, Pie, 3-D Line	Border, color, shading
2-D Line, XY Scatter	Line style, marker style

3. Make the required changes and click Apply or OK.

Deselect Line if you want to display no lines, but only markers.

Select the line style to apply.

Select the line color to apply.

Deselect Marker if you want to display no markers, but only lines.

Select the marker style to apply.

Data Series Format dialog box for 2-D Line and XY Scatter charts

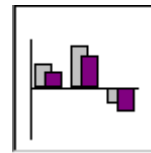
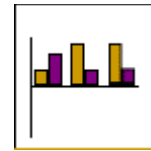
Chart Specific Formatting

The following section describes formatting that you can only use on certain types of chart.

Column charts

You can enhance the appearance of your column charts by setting how the columns are placed on the chart.

- You can define the amount of space you want to have between each set of columns.
- You can overlap columns in the same set.
- You can choose to show or hide any negative values you have in your data.



To change these settings:

1. Right-click on the chart and choose **Format Chart** from the menu. The **Chart Format** dialog box is displayed.
2. Click the **Series** tab.
3. In the **Groups and Data series** section, select the group you want to format.
4. In the **Group Type** section, click the column chart icon.
 - Type a value between 0 and 500 in the **Gap Width** box.or
 - Type a value in the **Overlap** box.
5. Check the **Show Negative Values** checkbox if you want to display negative values on your column chart.
6. Click **Apply** to see how the changes look on the chart.
7. When you are satisfied with the result, click **OK** to close the dialog box and make the changes.

Area charts

There are certain elements that you can add to line and area charts to highlight certain aspects of your data.

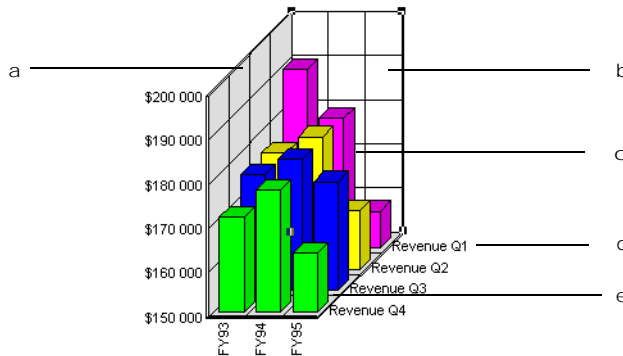
Drop lines	Lines extending from a point in the chart down to the X-axis.
Up-down bars	Bars that extend from the highest value of one data series to the lowest value of another data series. You can only display up-down bars in charts that display data for two measures.
High low lines	Lines going from the highest to the lowest value for numeric data. You can only display high-low lines and up-down bars in charts that display data for two measures

To add these options:

1. Right-click on the chart and choose Format Chart from the menu.
2. Click the Series tab in the dialog box that appears.
3. In the Groups and Data series box, click the line or area chart icon.
4. Check the options you want to display on your chart:
 - High-Low Lines, Drop Lines and/or Up-Down Bars for line charts.
 - Drop Lines for area charts.
5. Click Apply to see how the changes look on the chart.
6. When you are happy with the result, click OK to close the dialog box and make the changes.

3-D charts

The illustration below shows the elements specific to a 3-D chart and what you can do to format them:



- a. Change the color, border and shade of the **side wall**.
- b. Change the color, border and shade of the **back wall**.
- c. Adjust the 3-D view
- d. Display the **Z-axis**, and format its axis labels.
- e. Change the color, border and shade of the **floor**.

Formatting chart walls

In some 3-D charts, you can display and format three walls: the back wall, side wall and floor.

To display walls:

See “Choosing elements to display” on page 423.

To format walls:

1. Right-click on the wall you want to format.
2. Choose Format Wall from the pop-up menu.

The Wall Format dialog box appears. It contains the Pattern tab only. For information on how to apply formats using this dialog box, refer to page 428.

Formatting the 3-D view

A chart's 3-D view consists of its elevation, rotation and ratio. With some chart types, you can also adjust the chart's depth and thickness. When you create a 3-D chart you may need to experiment with these settings to get the best possible view. To set these options:

1. Right-click on the chart and choose Format Chart from the menu.
2. Click the Series tab.
3. Click the 3-D view button.
4. Make the settings described below and click OK or Apply.

Defining the 3-D view of a chart

1. In the Elevation box, set a value either by clicking Up or Down, or by typing a value between -90 and 90.
Elevation is measured in degrees.
2. In the Rotation box, set a value either by clicking Up or Down, or by typing a value between 0 and 360.
Rotation is measured in degrees. The value you set rotates the chart horizontally.
3. In the Height % of Base box, type a value between 5 and 500. The value corresponds to the ratio between the height and width of the chart. For example, 200% means that the chart will be twice as high as it is wide (from left to right).
4. If you want the chart to cover the plot area, click AutoScale.
The AutoScale option is not available for pie charts.

Note: For pie charts, the angle you set in the Rotation box is the angle at which the first slice of the pie begins (an angle between 0 and 360, clockwise from the top).

Defining the depth and thickness of a 3-D chart.

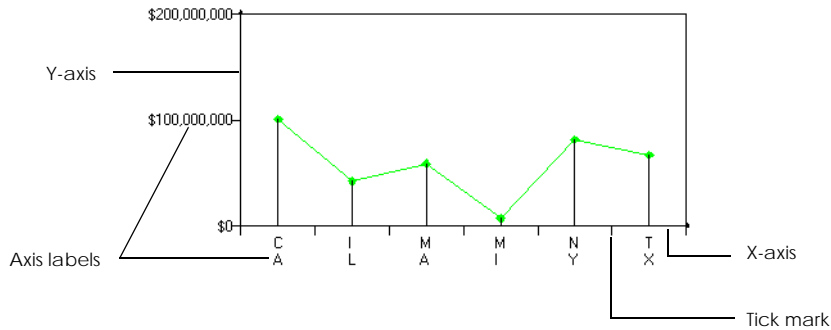
1. In the Chart Depth box, type a value between 20 and 2000.
The value you type determines the depth of the chart floor. The higher the value, the deeper the floor.

2. In the Gap Width box, type a value between 0 and 500.
This value determines the distance in depth between the data series displayed in the chart.

Note: You cannot use this feature in pie charts.

Formatting Chart Axes and Axis Labels

The horizontal and vertical axes of a chart are called the X-axis and the Y-axis respectively.



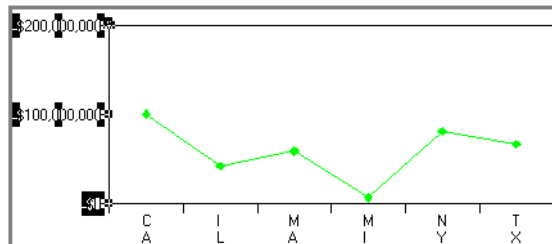
Matrix charts contain a third axis, the Z-axis.

You can work on chart axes and axis labels in the following ways:

- Format the text, numbers or dates of the axis labels.
- Change the orientation of the axis labels (horizontally, vertically, etc.).
- Apply different axis styles and colors.
- Display tick marks, and change their style.
- Change the scale of the Y-axis.

Axis labels

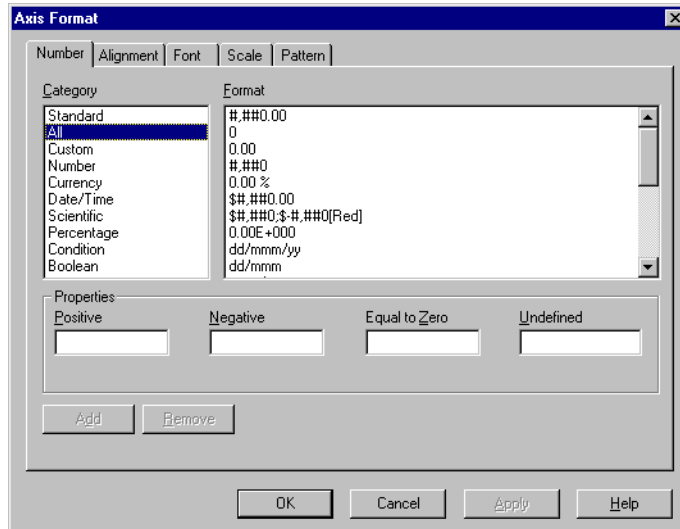
1. Right-click on the axis you want to work on.
The illustration below shows a chart with the Y-axis selected.



2. Choose Format Axis Label from the pop-up menu.

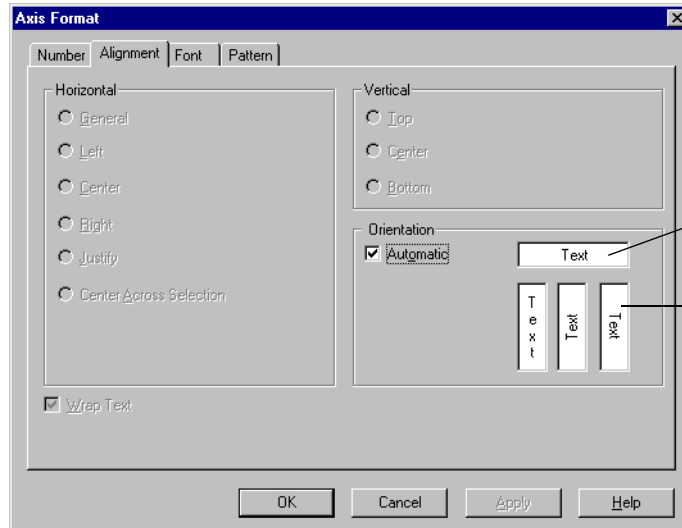
The Axis Format dialog box opens.

- If you selected the Y-axis, the dialog box contains five tabs, as shown below.
- If you selected the X-axis or the Z-axis, the dialog box does not contain the Scale tab, as this tab is used to change the scale of the Y-axis only.



- Use the **Number** tab to edit number and date formats on the axis labels.

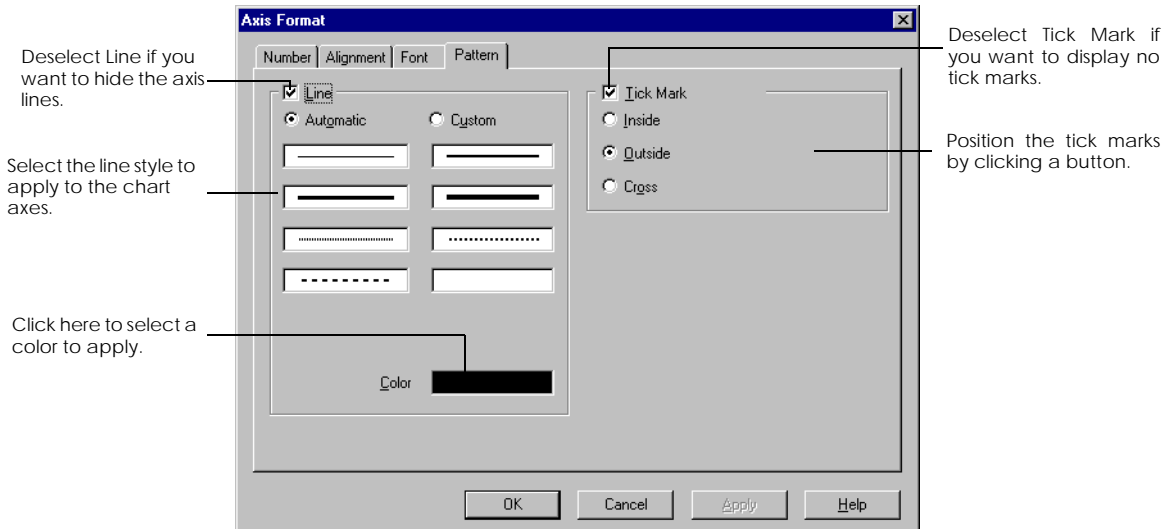
- Use the **Alignment** tab to change the orientation of the axis labels:



This is the default orientation.

Select an orientation, then click Apply.

- Use the **Font** tab to apply different text formats to the axis labels.
- Use the **Pattern** tab to display and edit tick marks. You can also change the axes' line style and color:



Deselect Line if you want to hide the axis lines.

Select the line style to apply to the chart axes.

Click here to select a color to apply.

Deselect Tick Mark if you want to display no tick marks.

Position the tick marks by clicking a button.

- Use the **Scale** tab to change the scale of the Y-axis. See below.

Axis scale

The scale of a chart determines the minimum and maximum values on the chart's Y-axis, where numeric data such as Revenue is plotted. The scale also includes the intervals between the values on the axis. You can change the scale to broaden or narrow the range of values displayed.

To define the scale of a chart

1. Click the axis label of the Y-axis.
This can be the primary or the secondary axis.
2. Click the Axis Labels command on the Format menu.
3. Click the Scale tab in the dialog box that appears.
4. In the Value (Y) Axis Scale box, click the following options:

Minimum, to display the lowest value as the minimum value on the Y-axis. To specify a different value, type the minimum value in the box.

Maximum, to display the highest value as the maximum value on the Y-axis. To specify a different value, type the maximum value in the box.

Major Unit, to set an automatic interval between the values on the Y-axis. To specify the interval you want, type a value in the box.

5. In the Scale box, click **Decimal** for a scale in decimal numbers, or **Logarithmic** for a scale to the power of 10, based on the range of data plotted in the chart.
6. Click **Apply** or **OK**.

Logarithmic scale

Negative or null values are not displayed in logarithmic charts. The value of the Major Unit option must be to the power of 10. If you enter a value to a different power, it will be rounded up to the nearest power of 10.

A logarithmic scale enables you to display very low values, or values that cover a broad range.

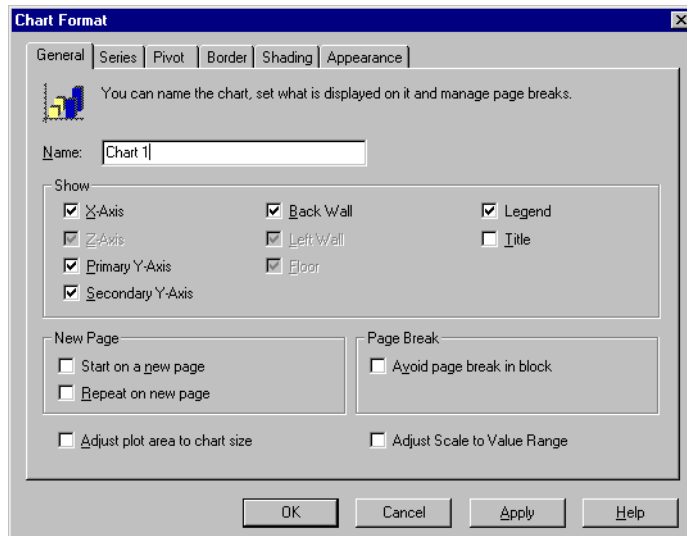
If you enter decimal values for the chart's scale and then click **Logarithmic**, remember to edit the values accordingly.

Scaling charts in Master/Detail reports

In a Master/Detail report a chart is displayed for each value of the master in a separate section. Since the range of values may be different in each section, you can, if necessary, use different scaling on for each chart so that the values on the chart are better displayed.

To do this:

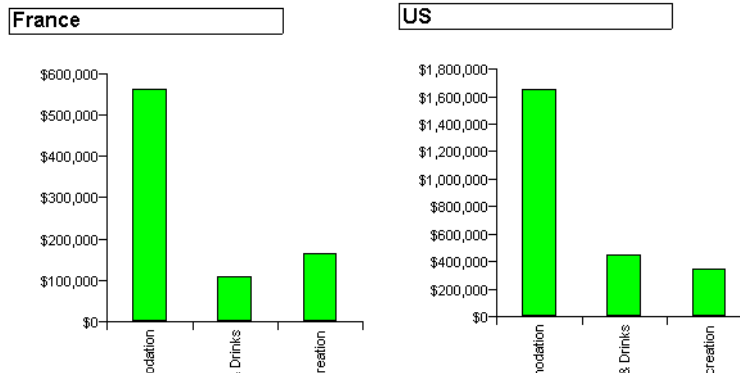
1. Right-click on one of the charts in the Master/Detail report.
2. Choose Format Chart from the menu.
3. Click the General tab.



4. Check the Adjust Scale to Value Range option.

Example Adjusting scaling in a master/detail report

This report shows revenue per service line for each country. The range of values is quite different for France and the US and with Adjust Scale to Value Range turned on, the range of values displayed on the Y-axis is different for the two charts.



Helping Users to Read your Chart

There are a number of items you can add to your charts to make them easier for your audience to read and interpret, for example you can add a chart title or a legend. These are described in the following section.

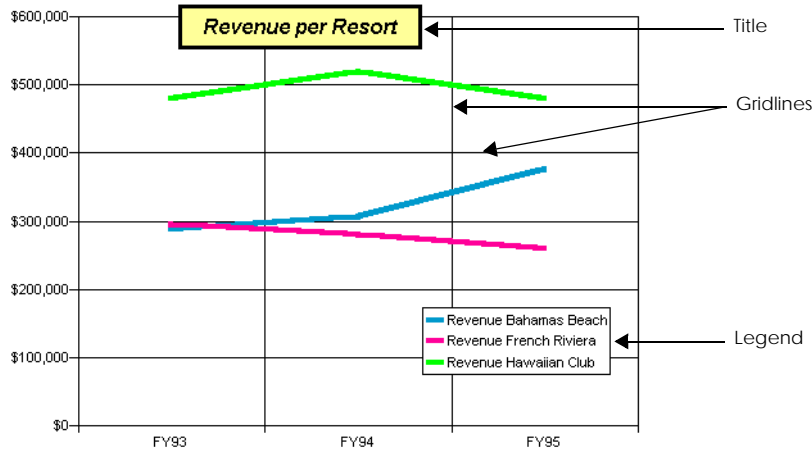


Chart title

A chart title is a cell in which text is displayed. You can edit and format the text, as well as move the title and format the cell.

Adding a chart title

1. Right-click anywhere inside the chart.
2. Choose Insert Title from the pop-up menu.
3. Double-click the chart title.
The default title is highlighted
4. Type in the name and press the return key.

Positioning the chart title

- Click inside the chart title and drag it with your mouse to the required position.

Formatting the chart title

1. Right-click inside the chart title.
2. Choose Format Title from the pop-up menu.
The Title Format dialog box appears. It has four tabs: Number, Alignment, Font and Pattern.
3. Make the required settings and click OK.

Resizing the chart title

If the text in the chart title does not fit in the title cell, you can resize it.

1. Select the title.
A hatched border with handles appear around it.
2. Use the handles to re-size the cell.

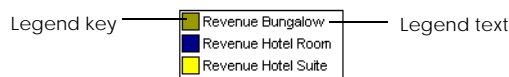
Note: If you drag the title cell's border beyond a chart boundary, BUSINESSOBJECTS automatically enlarges the chart accordingly.

Deleting the chart title

- Right-click on the chart title and choose Delete from the popup menu.

Chart Legend

The chart legend explains what the data in the chart represents. It is a rectangular box, containing the names of the variables (the legend text) and their corresponding color, shade and border (the legend key):



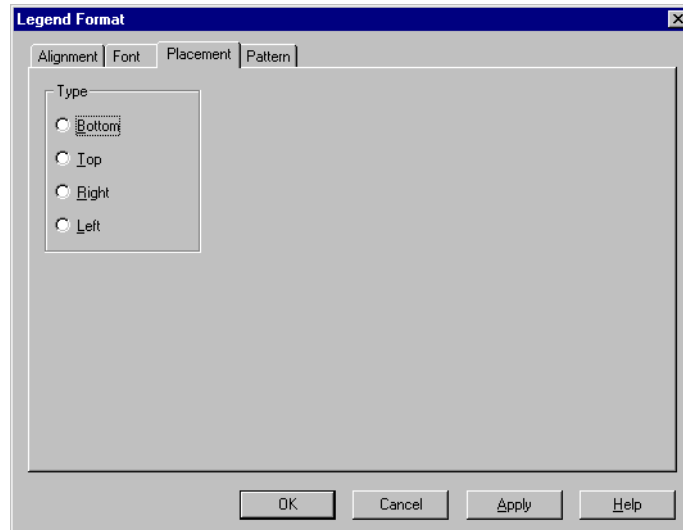
Displaying a chart legend

- Click the Legend button on the Report toolbar.
- or
1. Right-click on the chart.
 2. Choose Insert Legend from the pop-up menu.

Format and moving the legend

You can format the legend by changing its border, color and shade. You can also move the legend to a different place in the chart. To do so:

1. Select the border of the legend.
2. Choose Legend from the Format menu.
The Legend Format dialog box appears:



3. In the Placement tab, click a radio button to reposition the legend in the chart.
4. In the Pattern tab, select the border style and color, and the pattern and color.
5. Change the alignment and font of the legend text in the Alignment and Font tabs.
6. Click OK or Apply.
The legend appears in its new position, with its new formats.

Tip: You can also move the chart legend by clicking it and dragging it.

Formatting the legend key

You can change the border, shade and color of the legend key. The formats that you apply are immediately visible in the chart's data series. For example, if you change the color of a square in the legend from yellow to red, the corresponding data in the chart is also changed to red.

1. Right-click the legend key.
2. Choose Legend Key from the pop-up menu.

The Legend Key Format dialog box appears. It contains the Pattern tab only.

Formatting the legend text

You can format the legend text by changing its font attributes (e.g., font, font size), and by realigning it. The formats that you apply only appear in the legend text, not in the text of the chart's axis labels.

1. Right-click the legend text and choose Format Legend Text from the menu.
The Legend Text Format dialog box appears. It has an Alignment and a Font tab.
2. Make the required settings and click Apply or OK.
The new formats appear in the legend text.

Resizing the legend

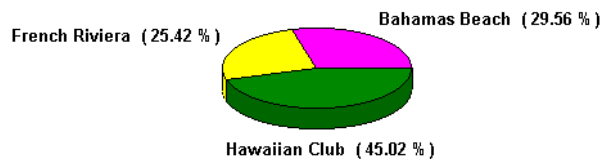
1. Select the Legend.
A hatched border with handles appear around it.
2. Use the handles to re-size the legend box.

Deleting the legend

- Right-click on the legend and choose Delete from the pop-up menu.

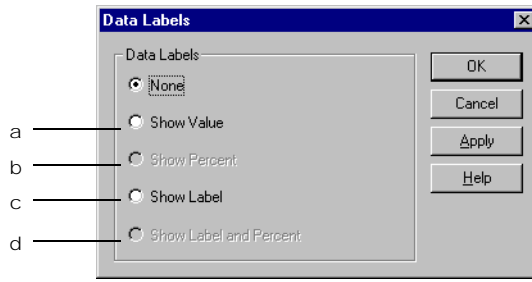
Data labels

Data labels appear next to a chart's data series, for example next to each slice of a pie chart. They indicate the exact values or percentages of the data series. In the pie chart illustrated below, the data labels show revenue share per resort:



Displaying data labels

1. Right-click the data series (e.g., a slice of a pie chart).
2. Choose Insert Data Labels from the pop-up menu.
The Data Labels dialog box appears:



- a. Displays the exact value, e.g. \$10,235.
- b. Displays the percentage of each data series.
- c. Displays the “name” of the data series, e.g. Revenue.
- d. Displays the “name” and the percentage of each data series.

3. Select the data label type you want and click Apply or OK.

Formatting data labels

You can apply specific number and text formats to data labels, as well as realign them. You can also change data labels, or remove them.

1. Right-click on the data label.
2. Choose Format Data Labels from the pop-up menu.

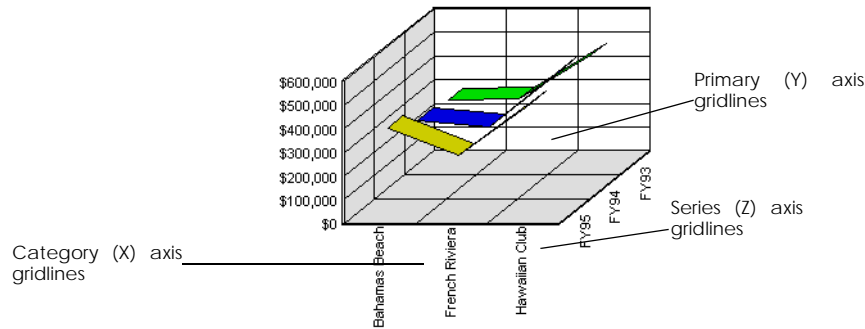
The Data Labels Format dialog box appears. It contains three tabs: Number, Alignment, and Font.

Changing or removing data labels

1. Right-click on the data label.
2. Choose Insert Data Labels from the pop-up menu.
The Insert Data Labels dialog box appears.
3. To remove the data labels, click “None”.
4. Otherwise, click the type of data label that you want to display and Click Apply or OK.

Gridlines

Gridlines help you to see a chart's values more easily. They begin at the chart's axes and extend across its wall(s).

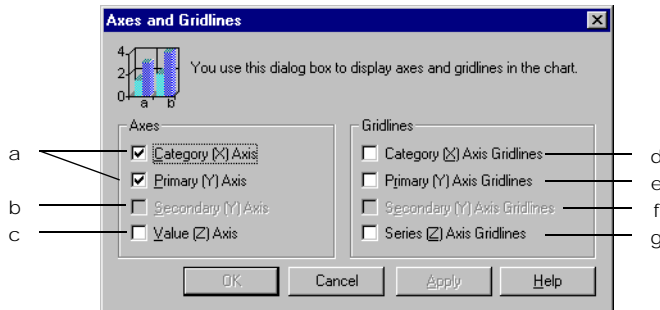


Note: You cannot display axes and gridlines in pie charts.

Displaying gridlines

1. Right-click anywhere in the chart.
2. Choose Display Axes/Gridlines from the pop-up menu.
The Axes and Gridlines dialog box appears.

3. Set the required options and click Apply or OK.



- a. These options are checked by default. Click a check box to hide an axis.
- b. Only available if you have created a group and associated a secondary axis to it.
- c. This option is checked by default in 3-D matrix charts (illustrated on page 432). Click the check box to hide the Z-axis.
- d. Displays gridlines that extend vertically from the X-axis.
- e. Displays gridlines that extend horizontally from the Y-axis.
- f. Refer to (b), above.
- g. Only available in 3-D matrix charts, this option displays gridlines that extend horizontally from the Z-axis, across the chart's floor.

Formatting gridlines

You can format gridlines by changing their color and line style.

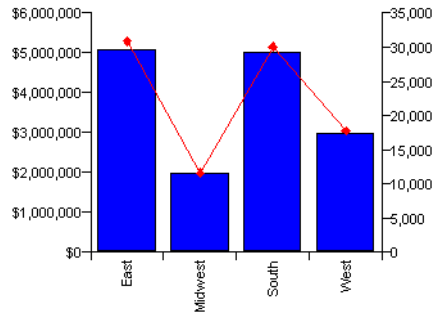
1. Right-click on the axis or gridline.
2. Choose Format Axis Label from the menu.
3. In the Axis Label Format dialog box that appears, click the Pattern tab.

For information on how to use this tab, refer to page 437.

You can only format one axis and its associated gridlines at a time. For example, if you click an X-axis gridline, the formats you select in the Axis Label Format dialog box are applied to the X-axis and its gridlines only.

Using Different Chart Types on one Chart

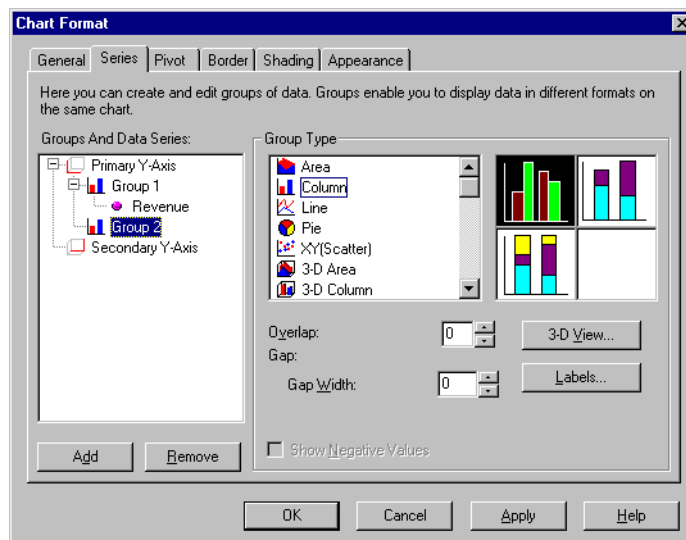
A useful feature of BUSINESSOBJECTS charts is that you can display data in more than one way on the same chart. For example, you can display some data in a line and other data in columns in the same chart as shown below. This allows you to make a distinctive visual comparison between data.



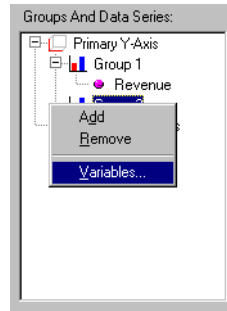
Using groups on charts

In order to use different chart types, BUSINESSOBJECTS uses the notion of groups. You add the variables you want to display on the chart to the different groups and then assign different chart types to different groups. To do this:

1. Right-click on the chart and choose Format Chart from the menu. The Chart Format dialog box opens.



2. Click on the Series tab.
By default, a chart has only one group.
3. Click the Add button to add a new group.
A new group is added.
4. Right-click on the Groups and Data Series box and choose Variables from the menu.



5. Click or create the variable you want to add, then click Insert.
The new variable appears in the group folder. To view the variables now in the group, click the + sign.

Tip: If the variable you want to use in the group is already displayed in the Series tab, you can drag it to the new group.

6. Select the new group and choose a chart type and subtype.
7. Click OK to close the dialog box and see the result on your chart.

Choosing the type of chart

When you choose a chart type for a group certain charts have subtypes from which you can choose. Also bear in mind the types of charts you want to combine as some combinations give better results than others. The table below gives you some recommendations.

The Group Type offers only one possibility if you selected a scatter chart or a pie chart. If you selected an area, column or line chart, 2-D or 3-D, you can now choose between a standard chart, a stacked chart or a 100% stacked chart.

Chart Type	Available Subtypes
Area/line/ column	Standard, stacked chart or 100% stacked area, line or column chart respectively
Scatter	Standard scatter
Pie	Standard pie

The following table shows the chart combinations that give the best results.

Group 1 chart type	Group 2 chart type
Column	Line
Column	Area
3-D Column	3-D Line
3-D Column	3-D Area
Scatter	Scatter
Pie	Not possible

Using a secondary Y-axis

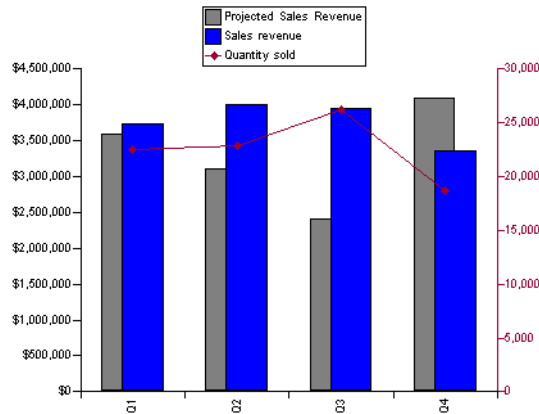
If you have two measures on a chart you can use a secondary Y-axis. This allows you to display different values on each of the axes and different scales which can make your chart more readable.

The primary axis is displayed on the left, the secondary axis on the right.

You can display all the groups in a chart on the primary axis or all on the secondary axis. However, you will often obtain the best result by placing one group on the primary axis and one group on the secondary axis.

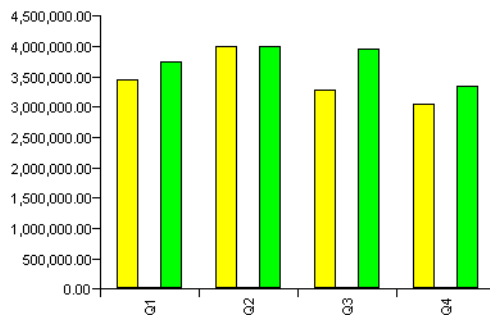
Example Comparing revenue and quantity sold in a chart

In this chart, a clear and effective visual comparison is made by showing the difference in a column chart between projected and actual revenue and then using a line chart to compare quantity sold.



To create this type of chart:

The original chart is set up using the Insert Chart wizard. The chart has four variables: Quarter, Projected Sales Revenue, Sales revenue and Quantity sold. You choose a simple column style from the wizard.



Each measure is represented by a different colored column. However, in reality, revenue is calculated in dollars and quantity sold in number of units. The values displayed by default on the Y-axis represent dollars so you cannot even see the Quantity sold column on the chart.

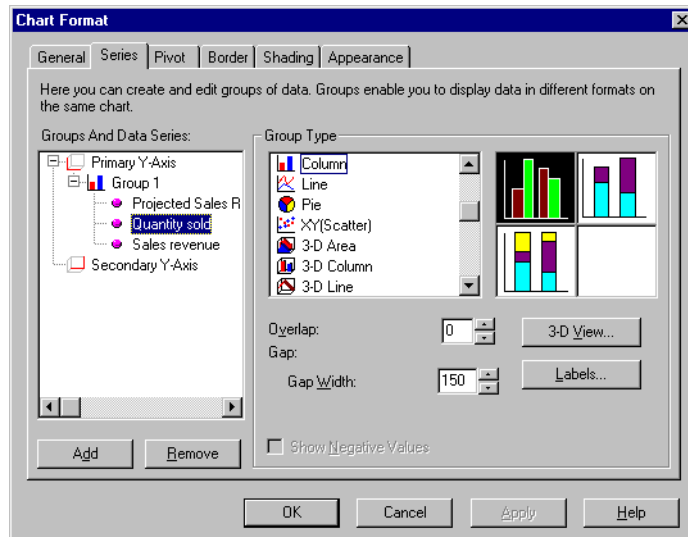
This chart can be improved in two ways:

- by using a different chart type for quantity sold and for revenue

- by displaying data on two axes, one axis with values in dollars and the other with number of units.

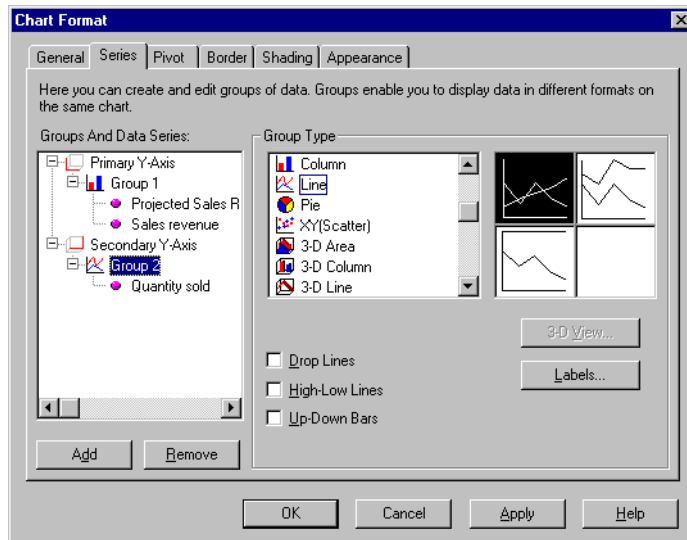
To do this:

1. Right-click on the chart and choose Format Chart from the menu.
2. Click on the Series tab of the Chart Format dialog box.
3. In the Groups and Data Series section, open the Group 1 list. You see that, by default, all the measures have been placed in the same group and are on the same axis.

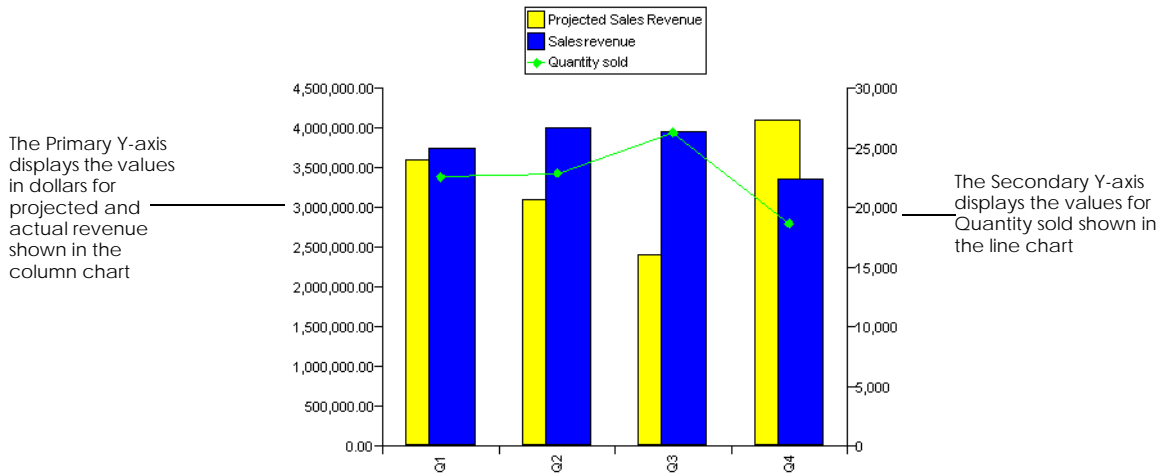


4. Drag the Quantity sold variable from Primary Y-axis to the Secondary Y-axis. A new group is created on the Secondary Y-axis.

- Select Group 2 and choose Line from the Group Type list. Notice that the icon next to the Group 2 list is a line chart icon.



- Click OK to close the dialog box and see the result.



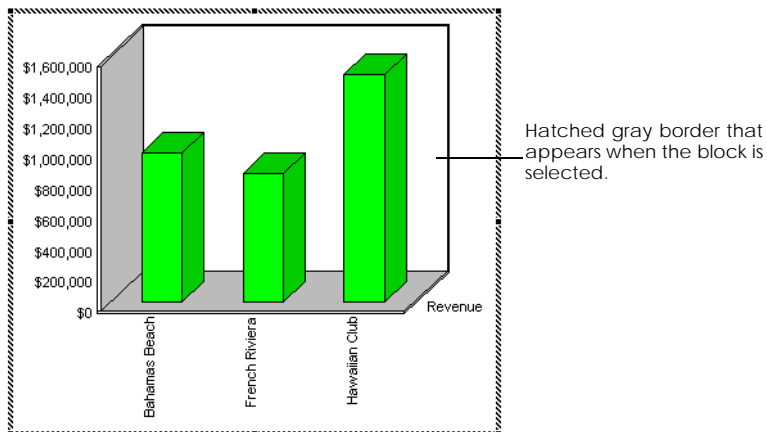
You now have Revenue and Quantity sold displayed on different types of chart. You see more clearly the difference between actual and projected revenue and the accompanying progression in quantity of units sold. You can further enhance your chart by setting an overlap for the two columns and by formatting the Primary-Y axis labels to display the dollar symbol.

.....

Deleting Charts

To select a chart

1. If part of the chart is selected, click a blank space outside it.
2. Hold down your Alt key and click once inside the chart.
A hatched gray border appears around the chart:

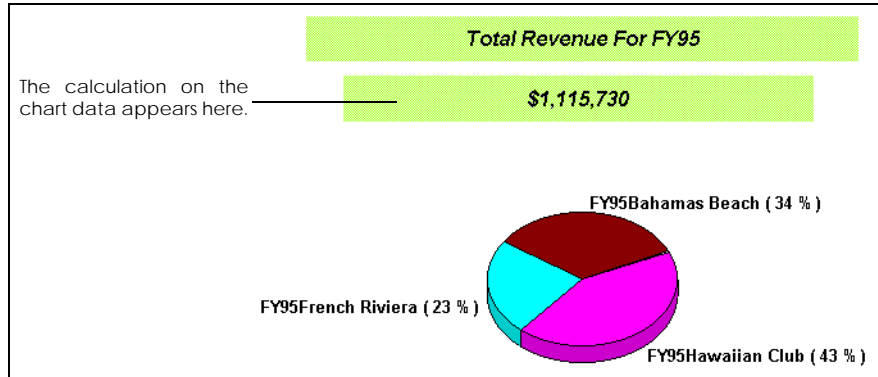


To select two or more charts

1. Click a blank space in the report.
2. Drag the mouse until you have covered part of each chart you want to select.
3. Release the mouse button.
A hatched gray border appears around each selected chart.

Displaying a Calculation on Data in Charts

In the report illustrated below, the share of revenue per resort in FY95 is shown in a pie chart. The calculation on the data in the chart, total revenue for the year, is shown in a cell above the chart:



You can display a calculation on data in a chart in the following way:

1. Insert a cell in the section where you want the calculation to appear.
2. Type an “equal to” sign (=).
3. If you are using a variable to make the calculation, type:
 - a “less than” sign (<)
 - the name of the variable
 - a “greater than” sign (>).
 For example, to display the Revenue variable in the cell, type =<Revenue>.
4. If you are using a formula to make the calculation, type it after the = sign.
5. Press the Enter key to view the result of the calculation.

Tip: You can also drag a calculation from a table or a crosstab and drop it in the section where the chart appears.



Part V

Analyzing Data

www.businessobjects.com/services/infocenter

Chapter 19 Analysis Overview

In this chapter

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- ❑ **On-report Analysis 460**
- ❑ **BusinessObjects Drill Mode 461**
- ❑ **BusinessMiner 461**
- ❑ **OLAP Servers 461**
- ❑ **Slice and Dice Mode 462**
- ❑

Analyzing Data in BusinessObjects

With BUSINESSOBJECTS, you analyze data by looking at it on different levels of detail and from different viewpoints. Through your analysis, you gain new information and thereby answer questions.

You need go no further than the BUSINESSOBJECTS interface to address all your multidimensional analysis needs:

- BUSINESSOBJECTS on-report analysis allows you to work directly on your data in your report using drag and drop and or with simple mouse clicks.
- EXPLORER, an optional component in BUSINESSOBJECTS, enables you to carry out multidimensional analysis in Drill mode.
- BUSINESSMINER, another optional component, allows you to analyze data using data mining technology.
- OLAP servers are databases that store summarized data, ready for business analysis
- BUSINESSOBJECTS Slice and Dice mode allows you to organize data for analysis in the slice and dice panel.

On-report Analysis

Part III of this User's Guide describes how BUSINESSOBJECTS on-report analysis allows you to analyze your data directly on your report using easy mouse clicks and drag and drop or with a simple mouse click.

You can drag and drop data on your report to get a different viewpoint for your analysis. You can add data from the Report Manager to create tables and sections, you can replace, swap and re-organize data on the report. BUSINESSOBJECTS redoes the calculations in your report immediately so that you can see at once how different combinations of factors affect your performance.

Dynamic on-report grouping allows you to create groups for comparative analysis and you can quickly insert common business calculations or easily create your own formulas and variables for analysis.

You can sort, filter and rank your data using a simple mouse click to focus your analysis on a slice of data.

BusinessObjects Drill Mode

BUSINESSOBJECTS drill mode allows you to analyze data from different angles and on different levels of detail. Typically, you start off by looking at the high level data and when you spot an unusually low or high value, or an unexpected value, you can analyze it by displaying related data on a more detailed level. This allows you to see how different factors of your business, seasonal, geographical, product line affect your revenue.

You can analyze data in Drill mode if you have the EXPLORER module.

BusinessMiner

Using BUSINESSOBJECTS, you can view different aspects of your data to see how different factors affect your business.

BUSINESSMINER enables you to discover the *hidden* patterns and relationships in your data. Using powerful statistical methods, it can quickly and automatically find patterns in customer behavior, for example. This can help you identify the characteristics of customers likely to default on payments or help you improve customer retention by targeting services according to the customer profiles you have identified.

BUSINESSMINER is an optional product. Once you install BUSINESSMINER, you can open it directly from BUSINESSOBJECTS and continue working on the data you have in your BUSINESSOBJECTS report.

For more information on BUSINESSMINER, refer to the *BusinessMiner User's Guide*

OLAP Servers

If you work with an OLAP server, you can view and select the data you want when creating a report. OLAP servers are databases that store summarized data, ready for business analysis.

For more information on OLAP servers, refer to the *OLAP Access Pack* documentation for the server at your site.

Slice and Dice Mode

Chapter 21 "Using Slice and Dice Mode" on page 499 describes how you can use the slice and dice panel to add, delete and swap data round, to analyze your data from a different viewpoint.

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Overview

This chapter describes how to use BUSINESSOBJECTS drill mode.

What is drill mode?

Drill mode is a BUSINESSOBJECTS analysis mode that allows you to break down data and view it from different angles and on different levels of detail to discover what is the driving factor behind a good or bad result.

Example Why is revenue better in this resort than in the others?

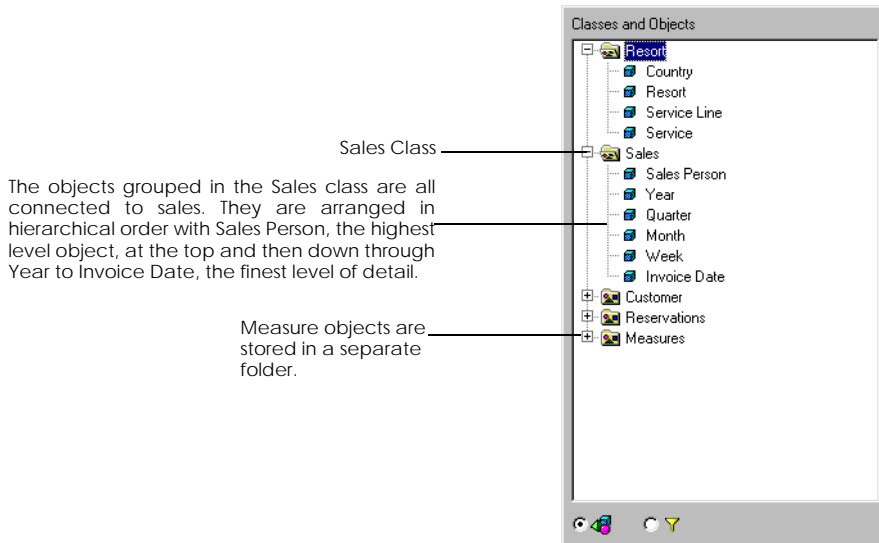
You see that revenue is much higher in the Hawaiian Club resort than in the others. To find the reason for this, you need to look at all the factors that affect revenue.

Resort	Revenue
Bahamas Beach	971,444
French Riviera	835,420
Hawaiian Club	1,479,660

If you displayed all the factors that could be useful for analysis in a table or chart, it could be difficult to read. Drill mode allows you to include data for analysis behind the scenes of your report and display only the top level data. You can then go down one level at a time and display more detailed information. This allows you to see how different aspects of your business affect your revenue step by step. This behind-the-scenes data is set up by the person who creates the report.

How does drill mode work?

When you make a query on a BUSINESSOBJECTS universe, the objects you can include are grouped in folders and organized in a specific order.



The person who creates the BUSINESSOBJECTS Universe classes objects and organizes them in a hierarchy, with the most general object in the class at the top and the most detailed at the bottom.

Objects are grouped in this way to make it easy for you to find what you are looking for. They are classified inside the groups so that if you want to make a high level report you know you need to include objects at the top of the list in your query and if you want a more detailed report than you choose objects from further down the list.

Hierarchies

Objects are also organized in this way for drilling. When you analyze data in drill mode, you use hierarchies. The Universe classes are the default hierarchies you use for drilling but the Universe designer can also set up custom hierarchies. You can also create and edit hierarchies in your reports.

Drill hierarchies only contain dimension objects. In drill mode, you drill down on dimensions, for example from Year to Quarter to Month. At each level, measures, such as Revenue or Profit Margin, are recalculated.

The classic themes on which a designer or advanced user creates hierarchies are geography, time and product. In the demo universe, Island Resorts Marketing, there are four hierarchies:

- Resort (Country, Resort, Service Line, Service).
- Sales (Year, Quarter, Month, Week, Invoice Date).
- Customer (Country of Origin, Region, City, Customer).
- Reservations (Reservation Year, Reservation Quarter, Reservation Month, Reservation Week, Reservation Date).

When you set up a report for drilling, you include high level objects to display in your table or chart but include more detailed objects in your scope of analysis. BUSINESSOBJECTS retrieves these objects from the database and stores them behind the scenes in your report so that they are there when you need them.

Before you can analyze data in drill mode, you have to set up this behind-the-scenes the data.

For information on how to set up data for analysis in drill mode see “Defining scope of analysis” on page 67.

Using Drill Mode

Before you can analyze data in drill mode, your report must contain data which has been set up for analysis.

Switching to drill mode


You open drill mode from a BUSINESSOBJECTS report. To do this:

1. Select the table, crosstab or chart that you want to analyze in drill mode.
You can only analyze one block at a time.
2. Click the Drill button on the Standard toolbar or choose Drill from the Analysis menu.



Drill

If no part of any table, chart or crosstab was selected before you clicked the drill button, the cursor becomes a magnifying glass with a question mark next to it.

 _____ This cursor appears if you do not select a block before switching to drill mode.

If this happens click inside the table, chart or crosstab you want to analyze.

When you go into drill mode, by default:

- A new report is created which contains a copy of the selected table, crosstab or chart. The report tab displays the drill icon to show you are in drill mode. The original report remains intact.
- A sum is added on measure objects.
- If you are working on a master/detail report the Drill toolbar is displayed.

Note: You can change these default options. See page 497 for more details.

You are now ready to drill on the data in the report.

Drilling down

When you drill down, you display the next level of detail in a hierarchy.

To drill down

1. Rest the cursor over the data.

The cursor changes to a magnifying glass with a plus sign in it. The plus sign indicates that you can drill down on this value.

A tooltip shows you the next dimension in the hierarchy:

Resort	Revenue
Bahamas Beach	971,444.00
French Riviera	836,420.00
Hawaiian Club	578,560.00
Sum:	3,286,524.00

The tooltip over Resort shows Service Line, which is the next dimension in the hierarchy. This means that by double-clicking a Resort value, you will display values for Service Line.

2. Double-click the value.

The data for the next dimension appears in the table and the selected value is appears in the Drill toolbar.



The selected value, Hawaiian Club now appears in the Drill toolbar

Service Line	Revenue
Accommodation	981,210.00
Food & Drinks	277,750.00
Recreation	220,700.00
Sum:	1,479,660.00

The table now displays the revenue for Service Line services for Hawaiian Club only.

Continuing to drill down

Each time you drill down the value drilled on is moved to the Drill toolbar and the data in the table is filtered according to the values displayed in the Drill toolbar.



Service	Revenue
Fast Food	38,850.00
Poolside Bar	35,200.00
Restaurant	203,700.00
Sum:	277,750.00

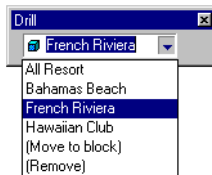
Here the table now displays the revenue for all services in the Food & Drinks category for Hawaiian Club only.

You can drill down as long as there are objects in the hierarchy. When you reach the last level in a hierarchy, the normal cursor is displayed. This indicates you are at the bottom of a hierarchy. If tooltips are turned on, a tooltip displays the message *Right-click to explore*.

Displaying different values in the Drill toolbar

The block is filtered to only show data for the values currently displayed in the Drill toolbar. You can change the values in the toolbar to look at data for a different value.

1. Click the down arrow.



2. Choose a value from the drop-down list.
The data for the chosen value is displayed in the table.



Service Line	Revenue
Accommodation	563,250.00
Food & Drinks	107,400.00
Recreation	164,770.00
Sum:	835,420.00

The revenue column is updated to show Revenue for French Riviera.

Tip: You can also click in the box and type in the first letter of the next value you want to display (making sure you type a capital letter if necessary). When you press Enter, the value is displayed and the table or chart is updated.

Drilling up

Drilling up is the opposite of drilling down. When you drill up, you go back up through the hierarchy to display data on less detailed levels.

To drill up from one dimension to the next

1. Place the cursor over a value.
2. Right-click on the value you want to drill up on and choose Drill Up from the pop-up menu.
The data for the next level up is displayed.
If you have drilled down to the bottom of a hierarchy the magnifying glass cursor is no longer displayed. If tooltips are turned on a tooltip displays the message *Right-click to explore*.

Undoing drill actions

You can undo up to ten drill actions which can be useful if you lose track of your analysis. To do this:

- Choose Undo from the Edit menu.

Drilling by

When you drill down and up you move through the levels of the same hierarchy. However, if you cannot find the answer to a question by analyzing data in its current hierarchy, you can move to another hierarchy to analyze other data that belongs to a different hierarchy.

Example Move from analyzing Resort to Sales

.....
Your report displays data for Resort, which belongs to the Resort hierarchy. The report also contains Year, which belongs to the Sales hierarchy, but the data for Year is not currently displayed. If you drill across from Resort to Year, you can then drill down on the next dimension in the Sales hierarchy. You can also drill across to other hierarchies, or back to the hierarchy you were originally working in. Drilling across opens up new paths that you can follow when analyzing data.
.....

Before you can drill across, your report must contain dimensions from more than one hierarchy. If this is not the case, you can:

- Retrieve data for dimensions from more than one hierarchy by expanding your scope of analysis, or
- Create new hierarchies inside the report.

See later in this chapter for information on how to do this.

To drill down to another hierarchy

1. Right-click a value and choose Drill By from the menu.

The list of dimensions that you can drill to appears on a sub-menu:

Service Line	Revenue
Accommodation	563250
Food & Drinks	107400
Recreatic	70

Drill Down	
Drill Up	
Drill By	▶
Drill Through...	
Scope of Analysis...	
Set as Drill Filter	
Insert	▶
Replace	▶
Delete	
Rotate Table	
Turn to Chart	
Snapshot	

Service
Year
Quarter
Month
Country of origin
More...

In this example, you selected Food & Drink from the Service Line column of the table. The first dimension in the list, Service, is the next dimension down in the current hierarchy, the Resort hierarchy.

The next three dimensions belong to the Sales hierarchy.

The next dimension belongs to the Customer hierarchy.

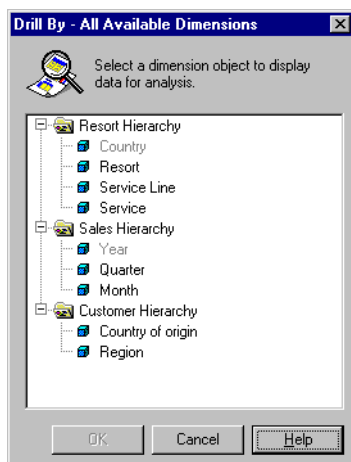
More opens up a list of all the available dimensions.

2. Choose a dimension from the list.

Drill By - More

The list in the Drill By sub-menu displays five dimensions only by default. To display the full list of dimensions:

1. Right-click a value and choose Drill By then More from the menu.
The Drill By - All Available Dimensions dialog box opens.



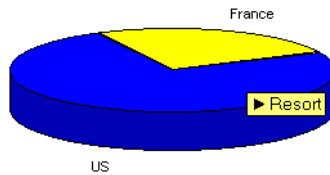
2. Choose a dimension from the list and click OK.
The dimensions displayed in gray are already used in the current analysis.

Note: You can change the setting in the Drill By menu to display more items. See “Setting Options for Working in Drill Mode” on page 497 for more information.

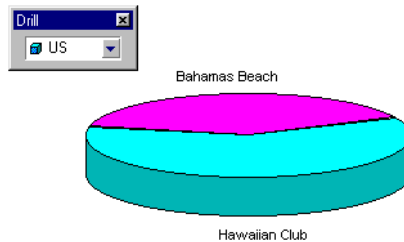
Drilling on Charts

You can also drill on chart blocks in the same way you drill on tables and crosstabs.

1. Place the cursor over a part of the chart.
A tooltip appears to indicate the next dimension down in the hierarchy and the cursor turns to a magnifying glass.



2. Double-click.
The chart is updated and the value you drilled on is displayed in the Drill toolbar.



Drilling on Multiple Hierarchies

If your block contains more than one hierarchy, you can simultaneously drill down from one dimension to the next in all the hierarchies in the block. To do this, you have to drill down on a measure object.

In the table illustrated below, Resort belongs to the Resort hierarchy and Year to the Sales hierarchy. If you rest the cursor over the Resort column, you see that the next level down is Service. If you rest the cursor over the Year column, you see that the next level down is Quarter. You could drill down on one hierarchy and then the other or you could drill down on both at the same time by drilling on the Revenue column.

Resort	Year	Revenue
Bahamas Beach	FY93	287,929.00
Bahamas Beach	FY94	307,400.00
Bahamas Beach	FY95	376,115.00
French Riviera	FY93	295,940.00
French Riviera	FY94	280,310.00
French Riviera	FY95	259,170.00
Hawaiian Club	FY93	479,685.00
Hawaiian Club	FY94	519,530.00
Hawaiian Club	FY95	480,445.00
		3,286,524.00

To do this:

1. Rest the cursor over the Revenue column.

A tooltip shows you can drill down on both Service and Quarter.

Resort	Year	Revenue
Bahamas Beach	FY93	287,929.00
Bahamas Beach	FY94	307,400.00
Bahamas Beach	FY95	376,115.00
French Riviera	FY93	295,940.00
French Riviera	FY94	280,310.00
French Riviera	FY95	259,170.00
Hawaiian Club	FY93	479,685.00
Hawaiian Club	FY94	519,530.00
Hawaiian Club	FY95	480,440.00
		3,286,524.00

▶ Service Line/Quarter

The tooltip shows you can drill down on two hierarchies, Service Line and Quarter.

2. Double-click on the Revenue column in the cell that displays revenue for Hawaiian Club in FY94.

This is the highest value in the column.

Resort and Year are moved to the Drill toolbar. The values in the Drill toolbar are Hawaiian Club and FY94. Service Line and Quarter appear in the table and the revenue column is updated.

Service Line	Quarter	Revenue
Accommodation	Q1	83,970.00
Accommodation	Q2	79,050.00
Accommodation	Q3	90,270.00
Accommodation	Q4	91,890.00
Food & Drinks	Q1	24,780.00
Food & Drinks	Q2	22,870.00
Food & Drinks	Q3	26,040.00
Food & Drinks	Q4	26,260.00
Recreation	Q1	17,200.00
Recreation	Q2	17,200.00
Recreation	Q3	20,600.00
Recreation	Q4	19,400.00
		519,530.00



To drill up on multiple hierarchies

To drill up on all dimensions:

- Right-click on a measure object value and choose Drill Up from the pop-up menu.

Getting a Different View of your Data

As you work, you can change the data to analyze by inserting, removing or replacing dimensions and measures in the block.

You can only replace data with data that is of the same type. You can replace measures with measures and dimensions with dimensions.

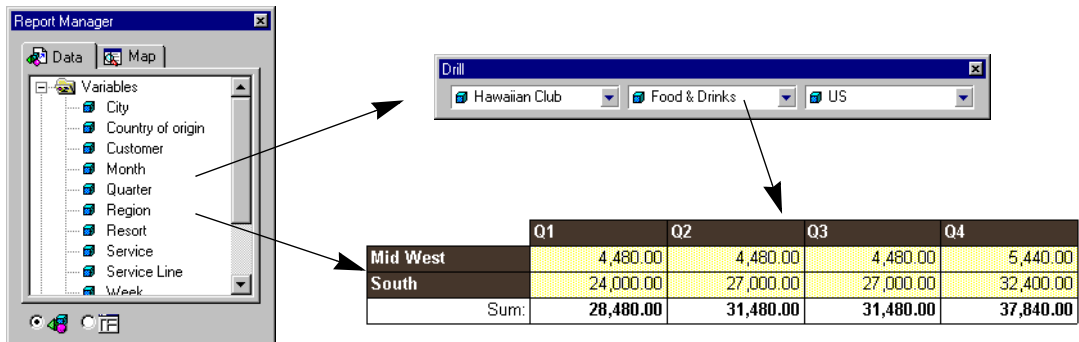
To...	Right-click.....	From the menu choose.....	Then choose....
Insert a variable	<ul style="list-style-type: none"> in a table, on the cell below or to the right of where you want to insert the variable in a chart, on the data series (or its data label, or its legend key) next to which you are going to insert the variable 	Insert	the variable you want to insert
Replace a variable	on the data you want to replace	Replace	the variable you want to use from the list
Delete a variable	the data you want to delete	Delete	

Note: If the Insert and Replace commands are not available when you click on data, this means there is no compatible variable with which to replace the selection.

Changing the data in tables as you drill

As you work on tables or crosstabs in drill mode, you can move data around from the Report Manager to the Drill toolbar or to and from your table or crosstab. You can add, replace remove data as required to get a different viewpoint for your analysis.

- You can move variables from the Report Manager window to the Drill toolbar or to a table or crosstab in the report.
- You can move variables from the Drill toolbar to a table or crosstab in the report.



Note: You cannot drag and drop variables onto charts.

The following tables summarize how you can move data around between the Report Manager, Drill toolbar and tables and crosstabs.

Report Manager to Drill toolbar

You can drag a variable from the list in the Report Manager and drop it in the Drill toolbar.

To..	Click.....	Drag.....	Drop when....
Insert a variable	the icon of the variable you want to move	the variable to where you want to insert it	the Drill toolbar shows the Insert highlighting the status bar displays <i>Drop to insert</i>

To..	Click.....	Drag.....	Drop when....
Replace a variable	the icon of one of the variables	the variable over the variable you want to replace	the Drill toolbar shows the Replace highlighting the status bar displays <i>Drop to replace contents</i>

Data tab or Drill toolbar to table or crosstab

You can also drag a variable from the Drill toolbar or Report Manager to the table or crosstab you are working on.

To...	Click.....	Drag....	Drop when.....
Insert a variable	the icon of the variable you want to insert	the variable to where you want to insert it	the table or Drill toolbar is shows the Insert highlighting the status bar displays <i>Drop to insert</i>
Replace a variable	the icon of one of the variables	the variable over the variable you want to replace	the table or Drill toolbar is shows the Replace highlighting the status bar displays <i>Drop to replace contents</i>

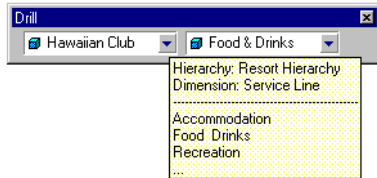
Using the Drill toolbar

You use the Drill toolbar to filter the data displayed in the block you are analyzing.

If you hold your cursor over one of the boxes a tooltip appears showing you:

- Which hierarchy the chosen value belongs to.
- The name of the dimension.
- A list of the top three values available for that dimension.

Three dots after the list of values indicates that more values are available than those shown in the tooltip list. You can display a value from the list by typing in the first letter on the keyboard.



Removing an object from the Drill toolbar

1. Click the arrow next to the object name.
2. Choose (Remove) from the list.
The cell disappears from the drill toolbar, and the data for the variable is no longer displayed.

Moving an object from the Drill toolbar to the block

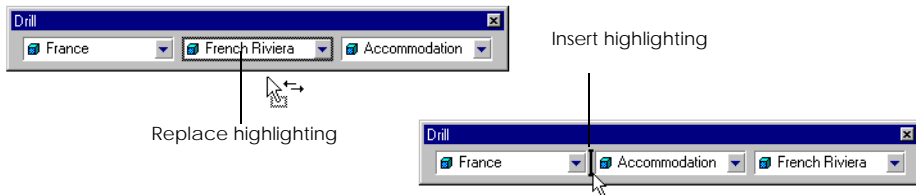
1. Click the arrow next to the object name.
2. Choose (Move to block) from the list.
The cell disappears from the Drill toolbar and a column of data is added to the table.

Re-organizing the Drill Toolbar

You can re-organize the order in which variables are displayed in the Drill toolbar.

To..	Click.....	Drag.....	Drop when....
Move a variable	the icon of the variable you want to move	the variable to where you want to insert it	the Drill toolbar shows the Insert highlighting the status bar displays <i>Drop to insert</i>

To..	Click.....	Drag.....	Drop when....
Swap two variables	the icon of one of the variables	the variable over the variable you want to swap it with	the mouse cursor becomes a swap icon the status bar displays <i>Drop to swap</i>



Tip: You can drag the drill toolbar from its docked position under the other toolbars and place it where it is convenient for you in your workspace.

Analyzing Measures in Drill Mode

Measures display numeric data that is the result of calculations. For example, Profit Margin is a measure that is the result of Revenue - Cost.

A report can contain two different types of measure objects:

- those created by the Universe designer and which are retrieved by a query (or measures retrieved by other data providers)
- measures created locally in the report

You can analyze measures in drill mode only if you have created them locally, based on data in the document that you are working on.

Note: For information on creating measure objects locally, see Chapter 14 "Formulas, Local Variables & Functions" on page 313.

In drill mode, you can expand a measure in order to view its component parts in the report and analyze numeric data.

Collapsing a measure is the opposite of expanding it. Instead of viewing the measure's component parts, you display its aggregated values once more.

Example **Analyzing profit margin**

.....

The data for Customer, Service and Margin are displayed in a report. Margin is a local variable with the following syntax: Product Price - Product Cost.

When you expand Margin, the data for Product Price and Product Cost appear in the report. When you collapse the expanded measure, only the data for Margin is shown.

.....

To expand a measure

To expand a measure while working in drill mode:

1. Right-click the cell or chart element that displays the measure you want to expand.
2. Choose Expand from the menu.
The measure's component parts are displayed in the block.

To collapse a measure

To collapse a measure while working in drill mode:

1. Right-click the cell or chart element that displays the measure you want to collapse.
2. Choose Collapse from the menu.
The data for the measure's component parts disappears.

Note: If the Expand and Collapse commands are not available when you click on a measure, it means the variable was not created locally in the report and therefore cannot be analyzed.

Making Copies of Reports While You Work

To keep track of the different stages of your analysis you can make copies of your work as you go along. Each copy you make of the report appears in a new tab inside the document.

To make a copy of a report:

- Click the Take Snapshot button on the Report toolbar.



Take Snapshot

A copy of the report appears in a new tab inside your document. The name that appears in the tab is *Report Name(n+1)*. For example, if the report you copied is named Sales, the new report is named Sales (1).

Note: The filters displayed in the Drill toolbar when the snapshot was taken are turned into global report filters.

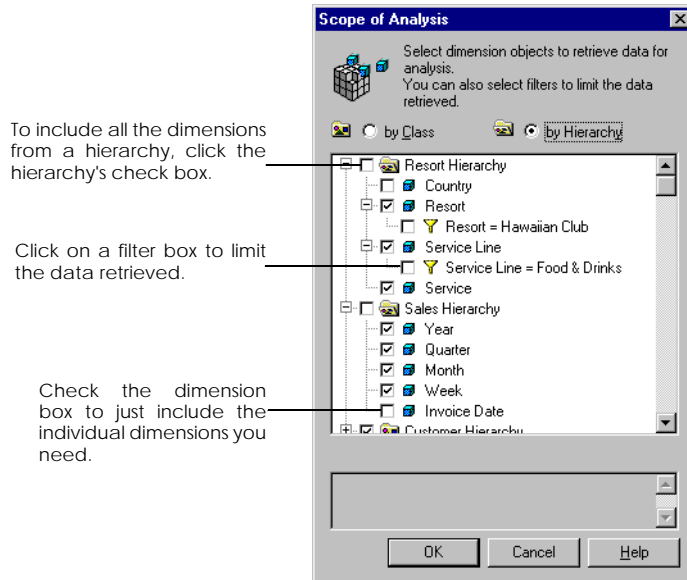
Extending Analysis

You may realize that a dimension you need for your analysis is not available in your report. As you drill, you can bring in data that was not originally included in the analysis either by extending the scope of analysis in the Scope of Analysis window or by editing your query to bring in more data from the database.

Expanding scope of analysis

You can bring in more data by editing the Scope of analysis. To do this:

1. Right-click on the block you are analyzing.
2. Choose Scope of Analysis from the pop-up menu.
The Scope of Analysis dialog box appears.



3. Choose the dimensions to include in your scope of analysis and click OK.
The dimensions are now displayed in the list in the Report Manager window.

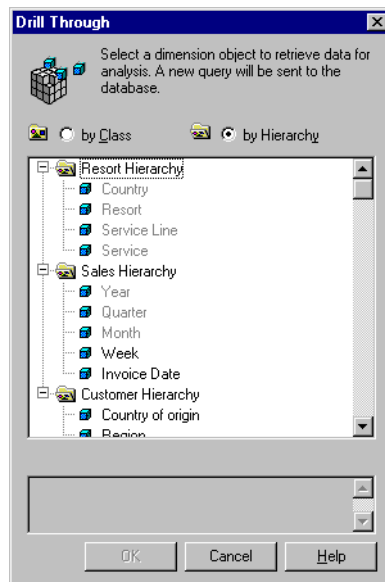
Note: BUSINESSOBJECTS shows you which values are currently displayed in the Drill toolbar by placing a filter icon next to them.

Drilling through to the database to bring in new data

If the lowest level of detail you need is not currently available in the report, you can drill through to the database directly from drill mode and get the data you need. You do not have to edit the query in the Query Panel.

Here's how to do it:

1. Right-click on the column or row where you want the new data to be displayed.
2. Choose Drill Through from the menu.
The Drill Through dialog box is displayed.



The dimensions that are currently available in the report are grayed out.

All those that belong to drill hierarchies but are not currently available in the report are displayed in black.

3. Choose a dimension and click OK.
The dimension is retrieved from the database and displayed in the block you are analyzing.

Note: You can only choose one dimension at a time.

Bringing in new data using filters

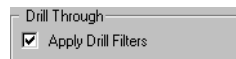
You can use the filters applied in drill mode as query conditions when you bring in new data from the database. The example below illustrates how this works.

Example Focus analysis on one high-profit resort using drill filters as query conditions

You are interested in analyzing the excellent revenue results in the US. You have drilled down on country and see that the resort Hawaiian Club has generated the best revenue. You now want to concentrate on this one resort and find out some information on the country of origin of the customers for that resort, data that is not currently available in your report.

To do this you first need to turn the drill filters option on:

1. From the Tools menu choose Options.
The Options dialog box opens up.
2. Click the Drill tab.



3. Check the Apply Drill Filters box in the Drill Through section.

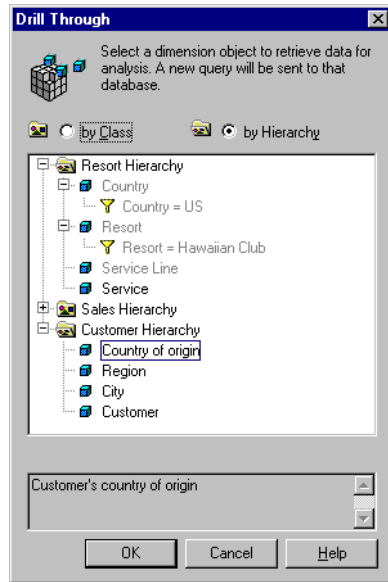
You can now retrieve the new data from the database. Your drill mode report currently looks like this:

 A screenshot of a "Drill" window. At the top, there is a dropdown menu showing "US". Below it is a table with two columns: "Resort" and "Revenue". The table contains three rows: "Bahamas Beach" with revenue "971,444.00", "Hawaiian Club" with revenue "1,479,660.00", and a "Sum:" row with revenue "2,451,104.00".

Resort	Revenue
Bahamas Beach	971,444.00
Hawaiian Club	1,479,660.00
Sum:	2,451,104.00

You drilled down on Country and the table displays revenue for US resorts only.

1. Right-click on Hawaiian Club in the Resort column and choose Drill Through from the menu.
The Drill Through dialog box opens.



The dimensions already available in the report are grayed out. The Country dimension has a filter to display data only for the US and the Resort dimension a filter to display data only for Hawaiian Club. These filters will be used as query conditions and only data concerning the US resort Hawaiian Club will be retrieved from the database.

2. Choose Country of Origin from the Customer hierarchy and click OK. The data is retrieved from the database and Country of Origin is displayed in the table. Resort is moved to the Drill toolbar.

	Revenue
All Country	
US	
(Move to block)	
(Remove)	
Germany	479,640
Japan	454,800
US	545,220
Sum:	1,479,660

Notice that France is no longer available in the Country list and Hawaiian Club is the only name in the resort list. The table now only displays data for Hawaiian Club.

Drilling Using Custom Hierarchies

You may find that the default order in which dimension objects are arranged in hierarchies is not optimal for your analysis needs, or that you need to drill on a hierarchy that has objects from different classes.

You can edit a hierarchy by changing the order of the dimensions it contains, by adding dimensions to it, and removing dimensions from it. You can also rename a hierarchy, and even delete it.

You can also create your own hierarchies using dimensions available in the report or by using user objects. There are two types of custom hierarchies:

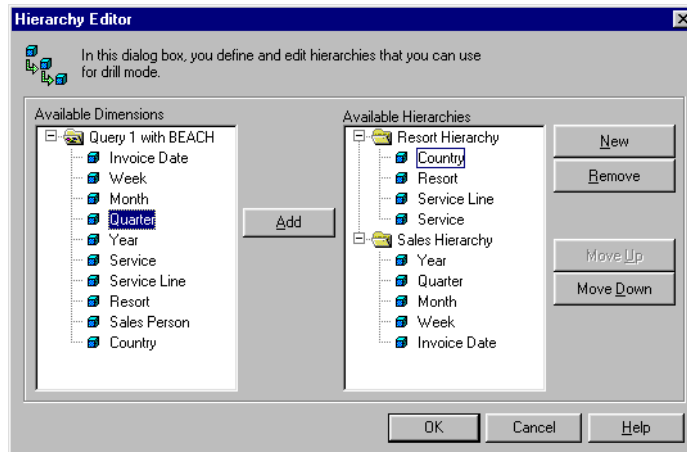
- Pre-defined custom hierarchies that are set up by the universe designer and which can be re-used in other documents.
- Hierarchies you create yourself and which are only saved in the document you created them in.

Editing hierarchies

The changes you make to a hierarchy that was created by a universe designer affect your work in drill mode only. For example, if you delete a hierarchy, you can no longer use it in drill mode. However, the hierarchy remains unchanged in the universe so you can still use the hierarchy to define scope of analysis when building a query on the universe. The universe designer is the only person who can edit or delete hierarchies at the universe level.

To edit a hierarchy for drill mode

1. Click the Hierarchies command on the Analysis menu.
The Hierarchy Editor opens.



2. In the Available Hierarchies box, click the + sign to view the contents of the hierarchy folder.
3. In the Available Dimensions box, click the + sign to the left of the folder to view the list of dimensions.
4. Make the required changes and click OK to close the Hierarchy Editor.

To add a dimension to an existing hierarchy

- Click the dimension you want to add to the hierarchy, then click Add.

The dimension you clicked appears in the hierarchy's folder in the Available Hierarchies box.

If the Hierarchy Editor does not list the dimension that you want to add to your hierarchy, you may have to expand your scope of analysis. See “Expanding scope of analysis” on page 485.

Note: You cannot combine dimensions from different data providers in a single hierarchy.

To change the order of the dimensions in a hierarchy

1. Click the dimension you want to move up or down in its hierarchy.
2. Click Move Up or Move Down to change the dimension's position in the hierarchy.

To rename a hierarchy

1. Click the hierarchy you want to rename.
2. Click a second time on the hierarchy's name, then type the new name.

To remove a dimension from a hierarchy

- Click the dimension you want to delete, then click Remove.

To delete a hierarchy

- Click the hierarchy you want to delete, then click Remove.

Creating hierarchies

You can create your own custom hierarchies from any dimensions available in the report. The dimensions you include in a hierarchy can be local variables, derived variables, or dimensions returned by data providers.

Note: You can also use a date-type user object as the basis for a time hierarchy. For information on user objects see “Creating User Objects” on page 80.

To create a custom hierarchy

1. Click the Hierarchies command on the Analysis menu.
The Hierarchy Editor opens.
2. In the Hierarchy Editor, click New.
3. Type the name of the new hierarchy, then click outside the name box.
4. In the Available Dimensions box, click the first dimension for the new hierarchy, then click Add.
The dimension you clicked appears in the new hierarchy's folder in the Available Hierarchies box.
5. Add the other dimensions you want to include and then click OK.

If the Hierarchy Editor does not list the dimensions that you want to include in the hierarchy, you may have to expand your scope of analysis. See “Expanding scope of analysis” on page 485.

Note: You cannot combine dimensions from different data providers in a single hierarchy.

Qualifying Data For Hierarchies

BUSINESSOBJECTS qualifies data as dimensions, measures or details.

Hierarchies only contain dimensions so if you want to include an object in a hierarchy for analysis in drill mode, you must qualify it as a dimension.

In preparation for drill mode, you may need to change the qualification of user objects, variables or formulas that you have created in your report. For example, you want to include a variable in a hierarchy, but cannot because the variable is qualified as a detail. In this case, you must qualify the variable as a dimension before you can include it in the hierarchy.

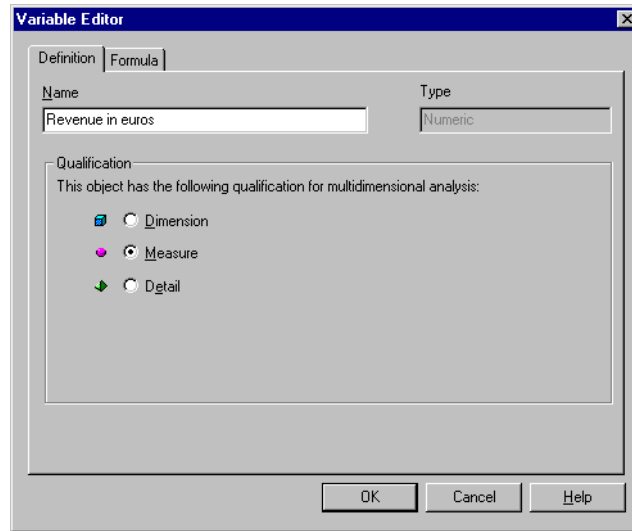
You can change the qualification of data returned by stored procedures, free-hand SQL scripts, and personal data files. You can also change the qualification of user objects, local variables and formulas.

Note: You cannot change the qualification of data returned by a query on a universe.

Re-qualifying local variables and formulas

1. Select one of the following report elements which displays the formula or local variable you want to qualify:
 - A cell in a table or a crosstab.
 - In a chart, the data series, a data label or the legend.
 - A free-form cell.
2. Click the Variables command on the Data menu.
The Variables dialog box opens.
3. Select the local variable or formula from the list.
Local variables are stored in the Variables folder and formulas are stored in the Formulas folder.

4. Click Edit.



5. In the Definition tab of the Variable Editor, click an option button to change the qualification, then click OK.
6. Click Close in the Variables dialog box.

Re-qualifying variables

1. Click the View Data command on the Data menu.
The Data Manager dialog box opens.
2. In the Data Providers box of the Data Manager, click the icon that represents the column of data whose qualification you want to change.
3. Click the Definition tab.
The name, type, qualification and values for the column are displayed.
4. In the Qualification box, click an option button to change the column's qualification.
5. Click OK.

Re-qualifying user objects

1. Click the Universes command on the Tools menu.
The Universes dialog box opens.
2. Select the universe that contains the user object, then click User Objects.
3. Click Edit.
4. In the Qualification box of the Definition tab, click an option button to change the qualification, then click OK.
5. Click OK in the User Objects dialog box.

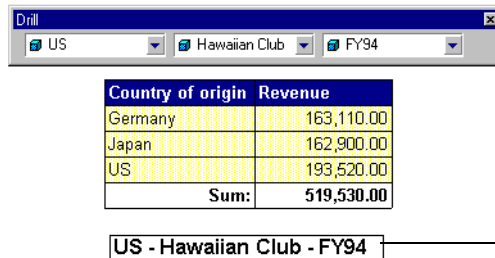
Printing from Drill Mode

You can print out a table, crosstab or chart from drill mode to have a printed record of the results of your analysis. Before printing you can insert the contents of the Drill toolbar as a title to your report to keep track of the filters applied.

Inserting Drill toolbar contents as a title

1. From the Insert menu, choose Special Field/Drill Filters.
The cursor turns into the insert cell cursor.
2. Holding down the left mouse button, draw a box on your drill mode report page in the position where you would like to display the title.
3. Release the mouse button.
A cell is inserted that contains a list of the values currently displayed in the Drill toolbar.

You can edit the size and formatting of the cell just as you would edit any cell in a report.



The dimensions displayed in the drill toolbar are inserted as a title. This table shows the revenue results for the US resort Hawaiian Club for 1994.

Printing a report from drill mode

1. Make sure the report you want to print is active.
2. From the File menu, choose Print.

Note: For more information on setting up reports for printing, see the *InfoView User's Guide*.

Setting Options for Working in Drill Mode

There are a number of options you can set to manage how you work in drill mode. You can:

- Control the number of items that appear on the popup sub-menus.
- View the number of values for each dimension that appears on the popup menu.
- Systematically create a new report when you switch to drill mode, or be prompted to choose whether or not to create a new report.
- Control the cursor and the tooltip that appear in drill mode.
- Automatically display the totals or percentages of numeric data (measures).
- Choose to display a message before closing drill mode.
- Set drill filters as query conditions when you drill through to retrieve more data from the database.

To set options for drill mode:

1. From the Tools menu, choose Options.
The Options dialog box opens.
2. Click the Drill tab:



3. Set the required options and click OK.

Chapter 21

Using Slice and Dice Mode

In this chapter

- **Working in Slice-and-Dice Mode 500**
 - Working with Master/Detail Reports in Slice-and-Dice Mode 502
 - Positioning Data Horizontally in Slice-and-Dice Mode 512
 - Working with Crosstabs and 3-D Matrix Charts 513
 - Displaying and Removing Data in Slice-and-Dice Mode 518
 - Deleting, Renaming and Resetting Blocks in Slice-and-Dice Mode 519
 - Transforming Blocks in Slice-and-Dice Mode 519
 - Applying Further Modifications in Slice-and-Dice Mode 520

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Working in Slice-and-Dice Mode

Slice-and-dice mode enables you to switch the position of data in a report. You can, for example, move data from columns to rows. The result would be a crosstab, where numeric data such as revenue appears at the intersection of rows and columns.

You can also use slice-and-dice mode to:

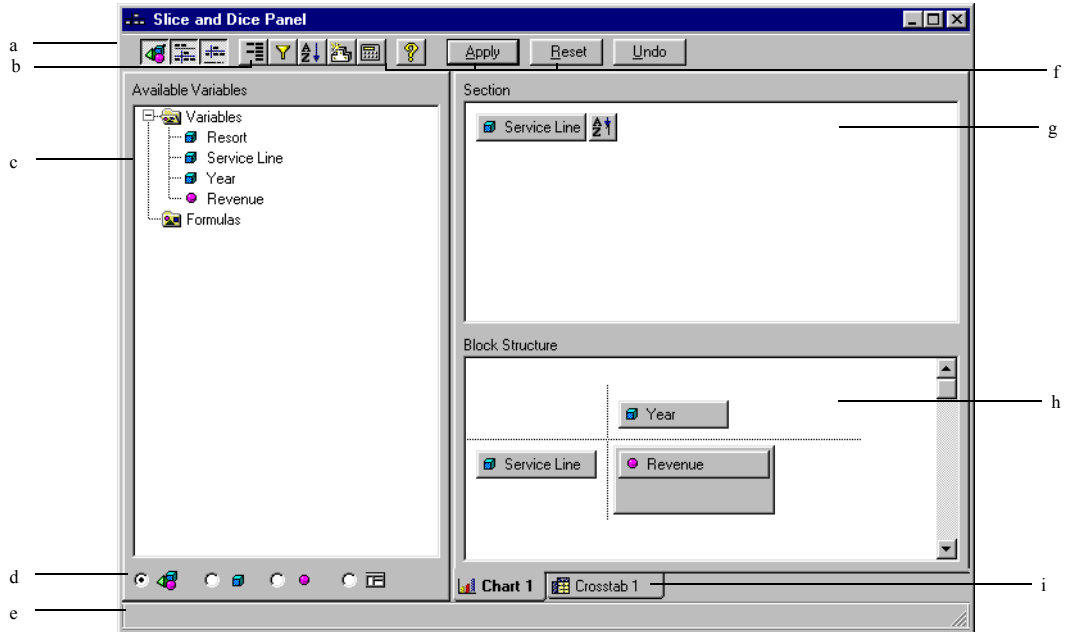
- Work with master/detail reports
- Display and remove data
- Rename, reset and delete blocks
- Turn tables and crosstabs into charts, and vice versa
- Apply, edit and delete breaks, filters, sorts, rankings and calculations.

Slice-and-dice mode is enabled by the Slice and Dice Panel, a pop-up window that provides a graphical representation of the report you are working on. You carry out tasks by dragging and dropping icons that represent the data you can use.



Slice and Dice

To display the Slice and Dice Panel, select the Slice and Dice command on the Analysis menu, or click Slice and Dice on the Standard toolbar. A detailed illustration of the Slice and Dice Panel is provided on page 501.



The Slice and Dice Panel

- Show or hide the different boxes of the Slice and Dice Panel.
- Apply breaks, filters, sorts, rankings and calculations.
- Lists the variables that you can display in the report.
- Let you view all variables, dimensions only, measures only, or all variables by data provider.
- Provides information on the tasks you perform.
- Let you accept or to cancel the operations you have performed. Click Apply to accept, Reset to accept and recalculate the report, and Undo to cancel.
Note that clicking the Reset button removes all formatting you have applied throughout the report. See also (i.)
- Shows the master(s) in master/detail reports.
- Shows the variables in the active table, chart or crosstab.
- Shows the name and type (table, chart or crosstab) of each block in the report.
You can rename, transform, reset or delete a block by clicking its tab with the right mouse button, then clicking a command on the pop-up menu that appears.

Working with Master/Detail Reports in Slice-and-Dice Mode

Master/detail reports display data in sections. Each section contains a “master” piece of data, for example a resort, or a year. The rest of the data in the section relates to the master.

The following illustration shows a master/detail report, and its corresponding representation in the Slice and Dice Panel:

The Available Variables box presents the variables and formulas you can display in the report.

The Section box shows the master, which in this report is Quarter.

The Block Structure box shows the data that appears in the table.

Section: Quarter	
Q1	
Resort	Revenue
Bahamas Beach	224,881.00
French Riviera	208,565.00
Hawaiian Club	357,170.00
Q2	
Resort	Revenue
Bahamas Beach	237,8
French Riviera	242,1
Hawaiian Club	341,7
Q3	
Resort	Revenue
Bahamas Beach	263,4
French Riviera	226,1
Hawaiian Club	395,1
Q4	
Resort	Revenue
Bahamas Beach	245,2
French Riviera	158,5
Hawaiian Club	385,5

Slice and Dice Panel

Available Variables:

- Variables
 - Month
 - Quarter
 - Resort
 - Service
 - Service Line
 - Number of guests
 - Revenue
- Formulas

Section:

- Quarter

Block Structure:

- Resort
- Revenue

Table 1

A master/detail report, and its representation in the Slice and Dice Panel

The Slice and Dice Panel makes it easy to work with master/detail reports. You can:

- Build a master/detail report.
- Re-organize a master/detail report by replacing the master or by building a master/master detail report.
- Undo a master/detail report by removing the master.
- Deactivate sections of master/detail reports.

The following sections describe how to perform these tasks.

To structure an existing report as a master/detail report

To structure an existing report as a master/detail report in slice-and-dice mode, you drop the icon of the master in the Section box. You can:

- Use data that is already displayed in the report.
To do this, drag an icon from the Block Structure box, drop it in the Section box, then click Apply.
- Use data that is not yet displayed in the report.
To do this, drag an icon from the Available Variables box, drop it in the Section box, then click Apply.

You can perform this task in drill mode. To do so, switch to drill mode and select the data you want to use as master. Click your right-mouse button and from the pop-up menu that appears, select the Set as Master command.

Reorganizing a master/detail report

You can re-organize a master/detail report by:

- Using a different master. For example, if the master is Year, you can replace it with Resort.
- Building a master/master/detail report. This structure enables you to view data on two levels of detail. The illustration below shows one section of a master/master/detail report. For FY93, the report displays revenue for each resort per quarter:

FY93	
Q1	
Resort	Revenue
Bahamas Beach	67,085.00
French Riviera	76,270.00
Hawaiian Club	113,505.00
Q2	
Resort	Revenue
Bahamas Beach	75,600.00
French Riviera	85,560.00
Hawaiian Club	111,330.00
Q3	
Resort	Revenue
Bahamas Beach	78,788.00
French Riviera	81,085.00
Hawaiian Club	129,120.00
Q4	
Resort	Revenue
Bahamas Beach	66,456.00
French Riviera	53,025.00
Hawaiian Club	125,730.00

One section of a master/master/detail report

To use a different master

You can replace the master with data that is already displayed in the report, or with data that is not yet displayed. Here is the procedure:

1. Open a master/detail report.
2. Select the icon of the master in the Section box, then press the Delete key. The icon disappears from the Section box.
3. To use data that is already displayed in the report, drag an icon from the Block Structure box, and drop it in the Section box.
4. To use data that is not yet displayed, drag an icon from the Available Variables box, and drop it in the Section box.
5. Click Apply to display the report with its new master.

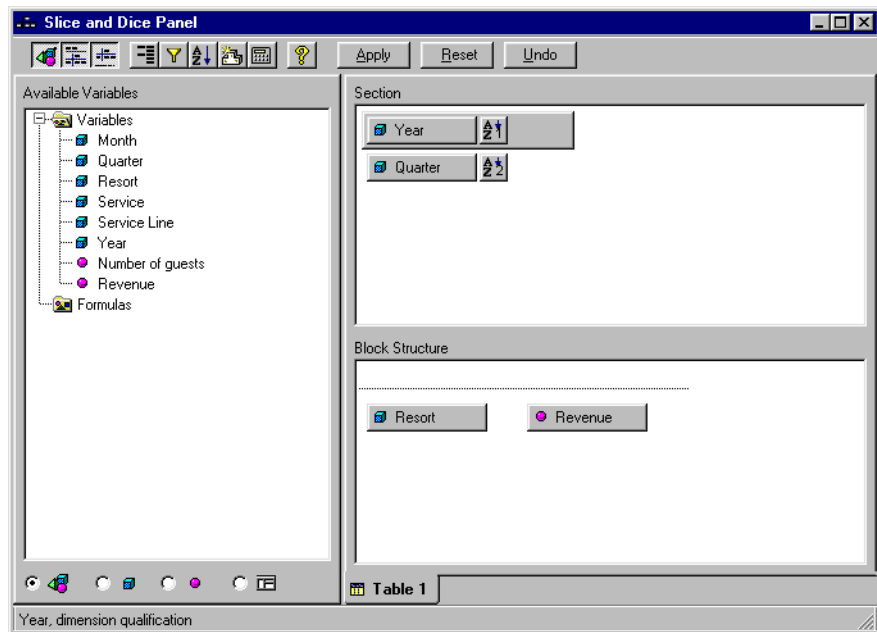
You can **swap** the master with data that is displayed in the report. To do so, hold down your Shift key, then drag the master until it is located above the icon with which you want to swap it, in the Block Structure box. Release your mouse button, then click Apply.

To build a master/master detail report

A master/master detail report contains two masters, as its name suggests. This means that in the Slice and Dice Panel, there must be two icons in the Section box.

You are most likely to build a master/master/detail report from an existing master/detail report. Here is the procedure:

1. Open a master/detail report, then open the Slice and Dice Panel.
2. Drag an icon to the Section box.
You can drag an icon from the Available Variables box, or from the Block Structure box.
3. Drop the icon until it is located just below the existing master, then release your mouse button.



4. Click Apply to display the master/master detail report.

To undo a master/detail report

Undoing a master/detail report means removing the master. In the Slice and Dice Panel, this means that you remove the master from the Section box. You can:

- Place the master in a block in the report. In this case, the data that was displayed as master is still displayed in the report.

To do this, drag the master from the Section box to the Block Structure box.

- Remove the master from the report.

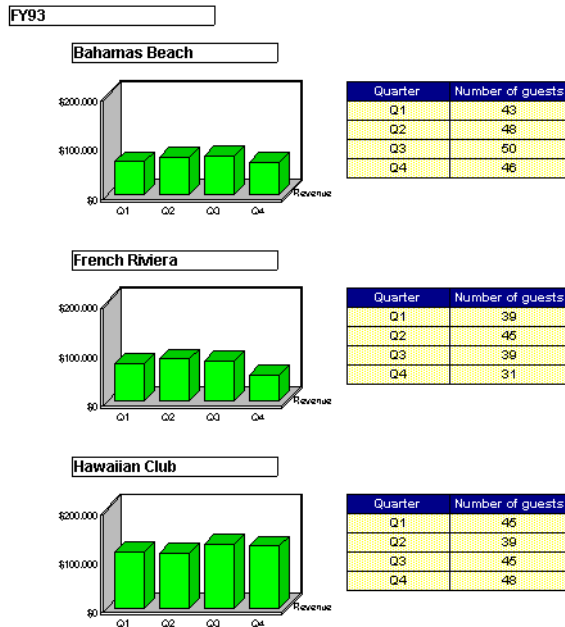
To do this, select the master in the Section box, then press the Delete key.

Now, click Apply.

Deactivating sections of master/detail reports

Deactivating sections of a master/detail report enables you to recalculate the report without removing data from it. This feature is particularly useful in reports which contain multiple blocks, as the following example describes.

The section of the report illustrated below displays revenue and number of guests per quarter for FY93. Revenue per quarter is shown in the chart on the left, while the table on the right shows number of guests per quarter:

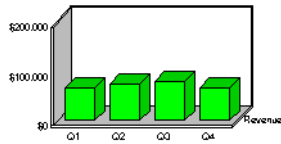


You want to obtain the number of guests per quarter for all resorts, rather than the number of guests per resort, as shown in this illustration:

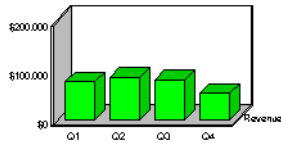
FY93

Quarter	Number of guests
Q1	127
Q2	132
Q3	134
Q4	125

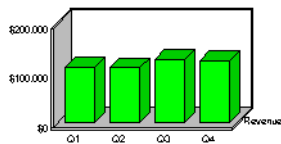
Bahamas Beach



French Riviera



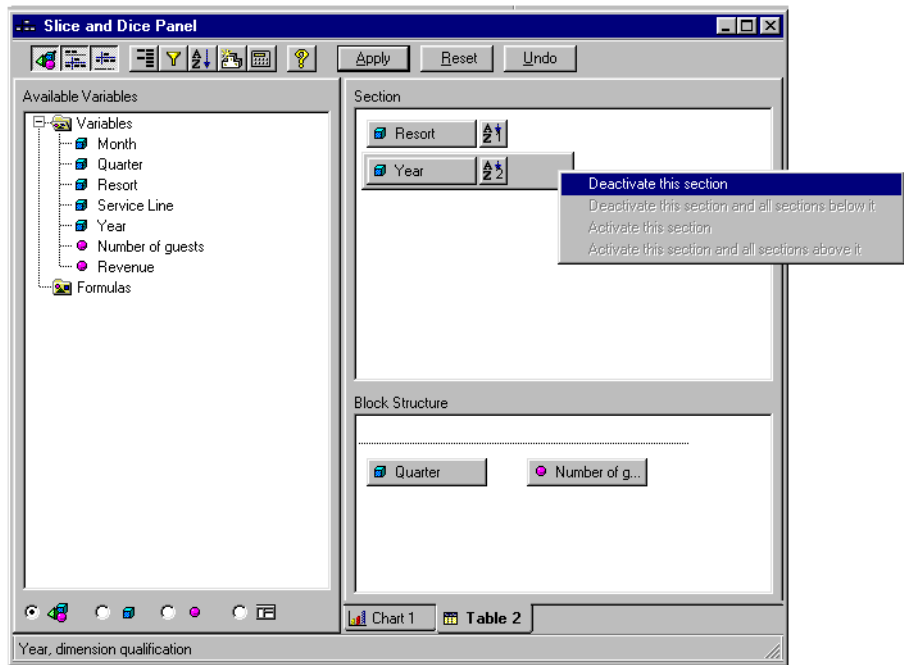
Hawaiian Club



You obtain this result by deactivating the Resort section for the table. The Slice and Dice Panel enables you to perform this task with simple mouse clicks. BUSINESSOBJECTS dynamically recalculates the number of guests for all resorts, while the data in the charts remains unchanged.

To deactivate a section of a master/detail report

1. Open a master/detail report, then open the Slice and Dice Panel.
2. Click the tab of the block (table, chart or crosstab) that you want to recalculate.
3. In the Section box, with your right-mouse button click the master of the section that you want to deactivate.
A pop-up menu appears.
4. Click *Deactivate this section*:



5. Click **Apply**.
The block appears in the section above the section that you deactivated.

To reactivate a section of a master/detail report

Once you have deactivated a section of a master/detail report, you can reactivate it in the following way:

1. Open the master/detail report, then open the Slice and Dice Panel.
2. Click the tab of the block (table, chart or crosstab) that you want to recalculate.
3. In the Section box, with your right-mouse button click the master that you now want to activate
4. On the pop-up menu that appears, click *Activate this section*.
5. Click Apply.

You can also perform this task by selecting and dragging the block back to its original section. To do this, hold down your Alt key and click inside the block. Position the cursor on the block's border. When the cursor changes to a cross, as shown in the margin, click the border. Hold down your mouse and drag the block to its original section. When you release the mouse button, BUSINESSOBJECTS dynamically recalculates the data in the block.



To deactivate or activate two or more sections at the same time

In master/master/detail reports, which by definition contain two or more sections, you can deactivate two or more sections at the same time:

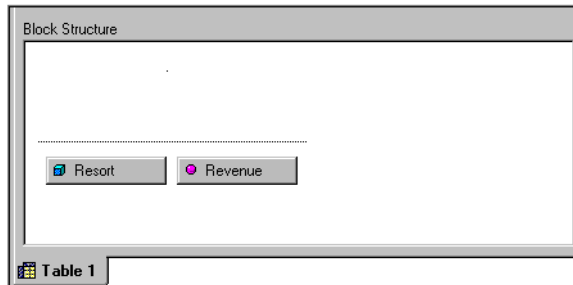
1. Open the master/detail report, then open the Slice and Dice Panel.
2. Click the tab of the block (table, chart or crosstab) that you want to recalculate.
3. In the Section box, with your right-mouse button click the master of the uppermost section that you want to deactivate.
4. On the pop-up menu, click *Deactivate this section and all sections below it*.
5. Click Apply.
The report is recalculated.

To reactivate the sections:

6. Click the master of the lowest section with your right-mouse button (Quarter, in the example above).
7. Click *Activate this section and all sections above it*, then click Apply.

Positioning Data Horizontally in Slice-and-Dice Mode

All reports display data horizontally. In tables and crosstabs, data appears in columns, and in charts, data is plotted on the X-axis that runs from left to right. In the Slice and Dice Panel, the data that appears horizontally in a table, crosstab or chart is shown in the Block Structure box. It is represented by the icons that appear in a horizontal line, as illustrated here:



You can use the Slice and Dice Panel to move variables horizontally, using drag-and-drop. You can also swap two variables.

To drag a variable horizontally to a new position

Select an icon, hold down your mouse button and drag the icon horizontally, left or right, to its new position. As you move the mouse, the cursor changes, as shown in the margin. Release your mouse button to drop the icon at its new position. Click Apply to display the data in its new position in the report.



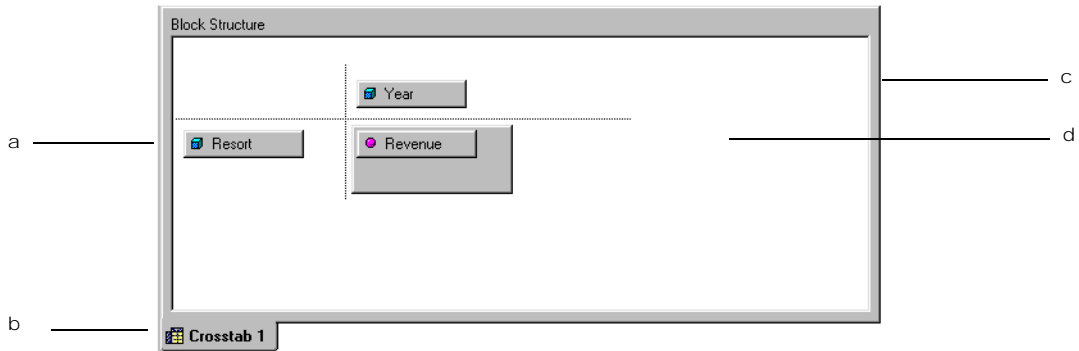
To swap two variables horizontally

To swap two variables horizontally, hold down the Shift key and select one of the icons you want to swap. The cursor changes to show that you are carrying out a “swap” operation, as shown in the margin. Drag the icon horizontally until it is above the other icon you want to swap, then release your mouse button. Click Apply to display the swapped data in the report.



Working with Crosstabs and 3-D Matrix Charts

Working with crosstabs and 3-D matrix charts is made simple by the Slice and Dice Panel. The structure of a crosstab or 3-D matrix chart is clearly shown in the Block Structure box:

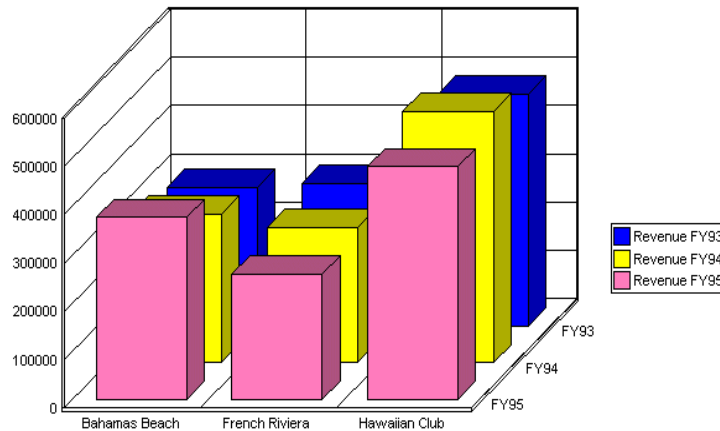


- The icon here represents the data that appears in columns in crosstabs, or on the X-axis of charts.
- The symbol for a crosstab in the Slice and Dice Panel. There is a different symbol for charts.
- The icon here represents the data that appears in rows in a crosstab or on the Z-axis in 3-D matrix charts.
- The icon here represents the numeric data that appears at the intersection of rows and columns in crosstabs (i.e., in the body), and data that is plotted on the Y-axis of 3-D matrix charts.

The following illustrations show the crosstab and the 3-D chart. The following illustrations show the crosstab and the 3-D matrix chart that correspond to the representation in the Block Structure box, above.

	FY93	FY94	FY95
Bahamas Beach	287 929,00	307 400,00	376 115,00
French Riviera	295 940,00	280 310,00	259 170,00
Hawaiian Club	479 685,00	519 530,00	480 445,00

The crosstab



The 3-D matrix chart

In slice-and-dice mode you can perform the following tasks with crosstabs and 3-D matrix charts:

- Build a crosstab or 3-D matrix chart from a table or 2-D chart, respectively.
- Reduce a crosstab or 3-D matrix chart to a table or 2-D chart, respectively.
- Reposition data that appears in rows or on the Z-axis.
- Move data between rows and columns (in crosstabs), and between the Z-axis to the X-axis (in 3-D matrix charts.)
- Turn crosstabs into 3-D matrix charts and vice versa.

The following sections describe how to perform these tasks, with the exception of turning crosstabs into 3-D matrix charts and vice versa. This task is described in “Transforming Blocks in Slice-and-Dice Mode” on page 519.

To build a crosstab or a 3-D matrix chart from a table or 2-D chart

You can:

- Use data that is already displayed in the report. To do this, you take an icon from the Block Structure box or the Section box.
- Use data that is not yet displayed. In this case, you take an icon from the Available Variables box.

Here is the procedure:

1. Click inside a table or 2-D chart, then open the Slice and Dice Panel.
2. Select the icon of the data that you want to use to build the crosstab or matrix chart.
3. Drag the icon until it is positioned above the icon that is furthest to the right in the Block Structure box, then release your mouse button.
The icon appears above and to the right of the other icons in the Block Structure box, as illustrated on page 513.
4. Click Apply to make the crosstab or matrix chart appear.

To reduce a crosstab or 3-D matrix chart to a table or 2-D chart

When you reduce a crosstab or a 3-D matrix chart into a table or 2-D chart, you take data out of the crosstab or matrix chart. You can:

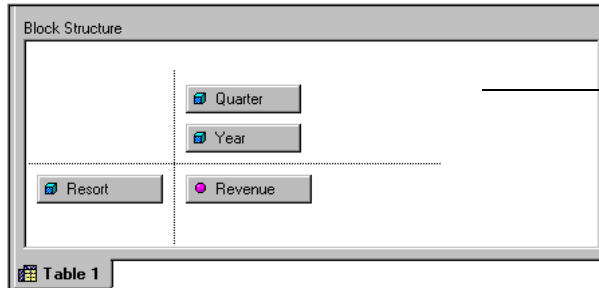
- Remove data from the report.
- Display the data in the 2-D chart or table.

Here is the procedure:

1. Click inside a crosstab or 3-D matrix chart, then open the Slice and Dice Panel.
2. Select the icon of the variable whose data appears in rows (if you are working with a crosstab), or on the Z-axis (if you are working with a chart.) This icon is located in the upper right-hand corner of the Block Structure box.
3. If you want to remove the data from the report, press the Delete key.
If you want to display the data in the table or 2-D chart, drag it down and to the left, until it is at the same level as the other icons. Then, release your mouse button.
4. Click Apply to make the table or 2-D chart appear.

To reposition data vertically

You can place more than one variable in rows in crosstabs and on the Z-axis of 3-D matrix charts. You can reposition these variables, as illustrated here:



In this example, the data for Quarter and Year would appear in rows in a crosstab, or on the Z-axis of a 3-D matrix chart. You can move Year up, or Quarter, down.

To move a variable up or down

Select an icon, hold down your mouse button and drag the icon vertically, up or down, to its new position. As you move the mouse, the cursor changes, as shown in the margin. Release your mouse button to drop the icon at its new position, then click Apply.



To swap two variables vertically

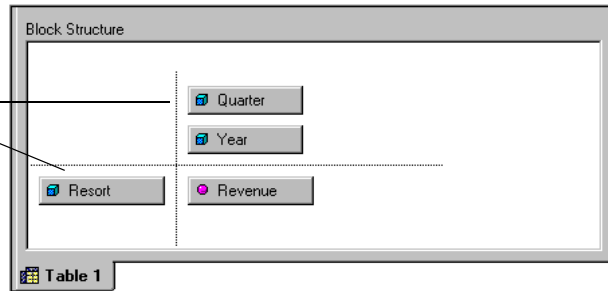
To swap two variables vertically, hold down the Shift key and select one of the icons you want to swap. The cursor changes to show that you are carrying out a “swap” operation, as shown in the margin. Drag the icon vertically until it is above the other icon you want to swap, then release your mouse button. Click Apply.



To move data between columns and rows in crosstabs

Crosstabs display data in columns and in rows. This means you can change crosstabs by swapping data between columns and rows. You can do this in the Slice and Dice Panel, by moving icons from and to the upper right-hand corner of the Block Structure box:

In this example, the data for Quarter and Year appears in rows in the crosstab. You can move either variable to a column in the crosstab, by dragging Quarter or Year next to Resort.



To move data from rows to columns

Select an icon in the upper right-hand corner of the Block Structure box, hold down your mouse button and drag it to the bottom left-hand corner of the box. As you move the mouse, the cursor changes, as shown in the margin. Release your mouse button and click Apply.



To swap two variables between columns and rows

Hold down the Shift key and select one of the icons you want to swap. Drag the icon until it is above the other icon you want to swap. The cursor changes to show that you are carrying out a “swap” operation, as shown in the margin. Release your mouse button and click Apply.



To move data between the X- and Z-axis in 3-D matrix charts

This task is equivalent to moving data between columns and rows in crosstabs. Follow the procedures described in the preceding paragraphs. For “column” read “X-axis” and for “row” read “Z-axis”.

Displaying and Removing Data in Slice-and-Dice Mode

The Slice and Dice Panel shows the data that is displayed in a report. It also shows any unused data that you can display. More precisely:

- The icons that you can see in the Section box, and in the Block Structure box, show the data that is already displayed in the report.
- The icons in the Available Variables box show all the data you can use, whether or not it is already displayed.

Using the drag-and-drop technique, you can display unused data in the report, and you can remove data that is already displayed. Once removed, the data remains available for later use.

To display data in the report

1. In the Available Variables box, drag an icon to the Section box to display it as a master, or double-click it to display it in the block.
2. Click Apply to display the data in the report.

To remove data from the report

1. Select an icon in the Section box or the Block Structure box.
2. Drag the icon to the Available Variables box, and release the mouse button. Alternatively, press the Delete key.
3. Click Apply to remove the data from the report.

Deleting, Renaming and Resetting Blocks in Slice-and-Dice Mode

You can delete, rename and reset blocks in slice-and-dice mode. To do so:

1. Click the tab of the block you want to work on. To select multiple blocks, hold down the Ctrl key then click each one.
2. Click your right-mouse button.
A pop-up menu appears.
3. Click the command that corresponds to the task you want to perform.
 - If you select the Rename command, you must type the new name in the dialog box that appears, then click OK.
 - The Rename command is not available for multiple tabs.
4. Click Apply.

Tip: You can reset one or more blocks using the procedure described above. To reset the whole report, click the Reset button on the Slice and Dice Panel toolbar. Resetting a block or a report removes any formatting you have applied.

Transforming Blocks in Slice-and-Dice Mode

In slice-and-dice mode, you can turn tables and crosstabs into charts, and vice versa. To do so:

1. Open the Slice and Dice Panel, then click the tab of the block you want to transform.
2. Click your right-mouse button, then select a command:

Command	Action
Turn to Chart	Turns the selected table or crosstab to a chart.
Turn to Table	Turns the selected chart to a table.
Turn to Crosstab	Turns the selected matrix chart to a crosstab.

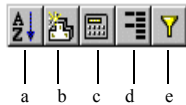
3. Click Apply.

Applying Further Modifications in Slice-and-Dice Mode

You can use the Slice and Dice Panel to apply the following features on data that is displayed in a report:

- Sorts, which control the order in which the data appears.
- Ranking, which enable you to view top and bottom values of selected data.
- Calculations.
- Breaks, which break up blocks of data.
- Filters, which enable you to view only the data that you need.

There is a button for each feature in the Slice and Dice Panel toolbar:



- a. Sorts
- b. Ranking
- c. Calculations
- d. Breaks
- e. Filters

None of the above are specific to slice-and-dice mode, as they are all core features of the User module. However, the Slice and Dice Panel's graphical interface provides a user-friendly way to apply them. Moreover, it is useful to be able to perform slice-and-dice operations, then apply one or more of the features to the report. For example, if you build a master/detail report that displays revenue by resort, you can quickly calculate the total revenue per resort.

In the sections that follow, you learn how to use the Slice and Dice Panel to apply sorts, ranking, calculations, breaks and filters on report data. References to more information on the features are provided in their respective sections.

Using sorts to control data order



Apply Sort

To apply a sort on data in the report, select an icon in the Section box or the Block Structure box, then click Apply Sort. A sort icon appears next to or below the icon you selected. Click Apply to display the data in order in the report.

You can also:

- Invert the sort, i.e., from ascending order to descending order, or vice versa. To do this, double-click its icon.
- Remove the sort. To do this, select its icon then press the Delete key.



For further information on sorts and how to apply them on report data, refer to “Ordering Data” on page 266.

Using ranking to view only top and bottom values of data



Apply Ranking

To apply ranking on data in the report, select an icon in the Section box or the Block Structure box. Then, click Apply Ranking. A ranking icon appears next to or below the icon you selected.

Double-click the ranking icon. The Select Top/Bottom *Variable Name* dialog box appears, where you define the ranking you wish to apply. Click OK, then, in the Slice and Dice Panel, click Apply. The report appears with the ranking you applied.

You can also:

- Redefine the ranking by double-clicking its icon in the Slice and Dice Panel, then modify its attributes in the Select Top/Bottom *Variable Name* dialog box.
- Remove the ranking. To do this, select its icon then press the Delete key.



For further information on ranking and how to apply them, refer to “Using Ranking to View the Top and Bottom Values” on page 273.

Making calculations on data



Insert Calculation

To make a calculation on data in the report, select an icon in the Section box or the Block Structure box, then click Insert Calculation. A calculation icon appears next to or below the icon you selected.

To select the calculation you want to make, double-click the calculation icon. The Calculation on dialog box appears.

Select the function(s) you wish to apply, then click OK. Click Apply to make the calculation(s) appear in the report.



For information on how to apply calculations without using slice-and-dice mode, refer to Chapter 13 "Breaking Up Tables and Displaying Calculations" on page 285.

Applying breaks

You can apply a break on data that is displayed in tables or crosstabs. You cannot apply a break on a master, or on data that is displayed in a chart.



Apply Break

To apply a break, select an icon in the Block Structure box, then click Apply Break. A break icon appears next to or below the icon you selected. click Apply. The report appears with the break you applied.

You can also:

- Redefine a break by double-clicking its icon. In the dialog box that appears, you can select different attributes for the break.
- Remove a break. To do this, select its icon, then press the Delete key.



For further information on breaks and how to apply them, refer to Chapter 13 "Breaking Up Tables and Displaying Calculations" on page 285.

Using filters to view only the data you need



Apply Filter

To apply a filter on data in the report, select an icon in the Section box or the Block Structure box. Then, click Apply Filter. A filter icon appears next to or below the icon you selected.

Double-click the filter icon. The Filter On dialog box appears, where you define the filter you wish to apply. Click OK, then, in the Slice and Dice Panel, click Apply. The report appears with the filter you applied.

You can also:

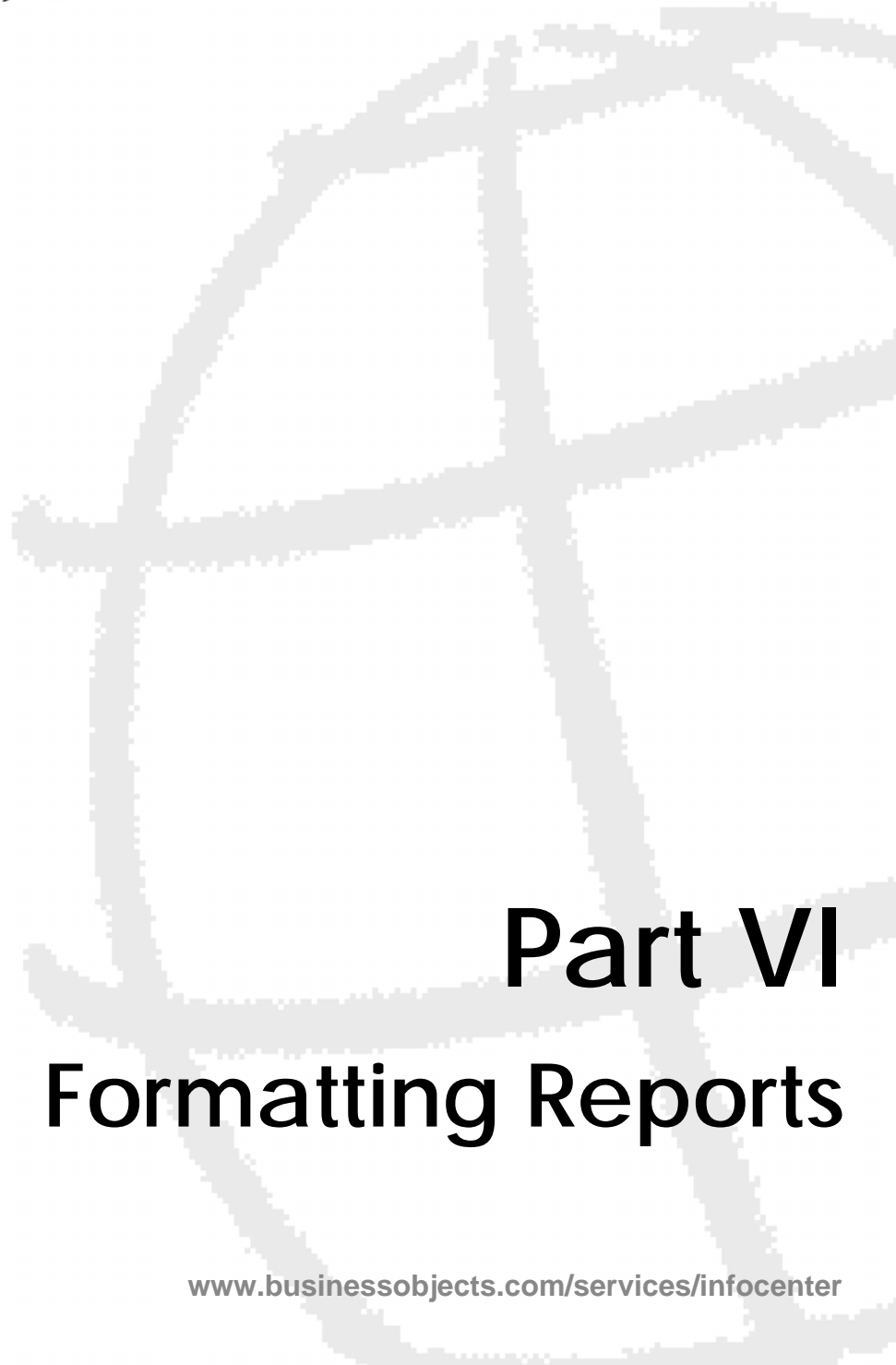
- Redefine the filter by double-clicking its icon in the Slice and Dice Panel, then modify its attributes in the Filter on dialog box.
- Remove the filter. To do this, select its icon then press the Delete key.



For further information on filters and how to apply them, refer to "Limiting the Data Displayed" on page 258.



BUSINESS OBJECTS®



Part VI

Formatting Reports

Chapter 22

Formatting Tables, Cells and Sections

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Overview

This chapter describes how to format sections in a report and how to format the cells, rows and columns that make up tables and crosstabs.

Formatting Sections

You can format the sections in a report by applying shading to the background.

What are sections?

There are two types of section in a BUSINESSOBJECTS report.

Main Section

If you have not created any sections, the main section is the only section in the report and when you apply shading, the whole report (except margins) will be shaded in the same color.

Sections in a Master/Detail report

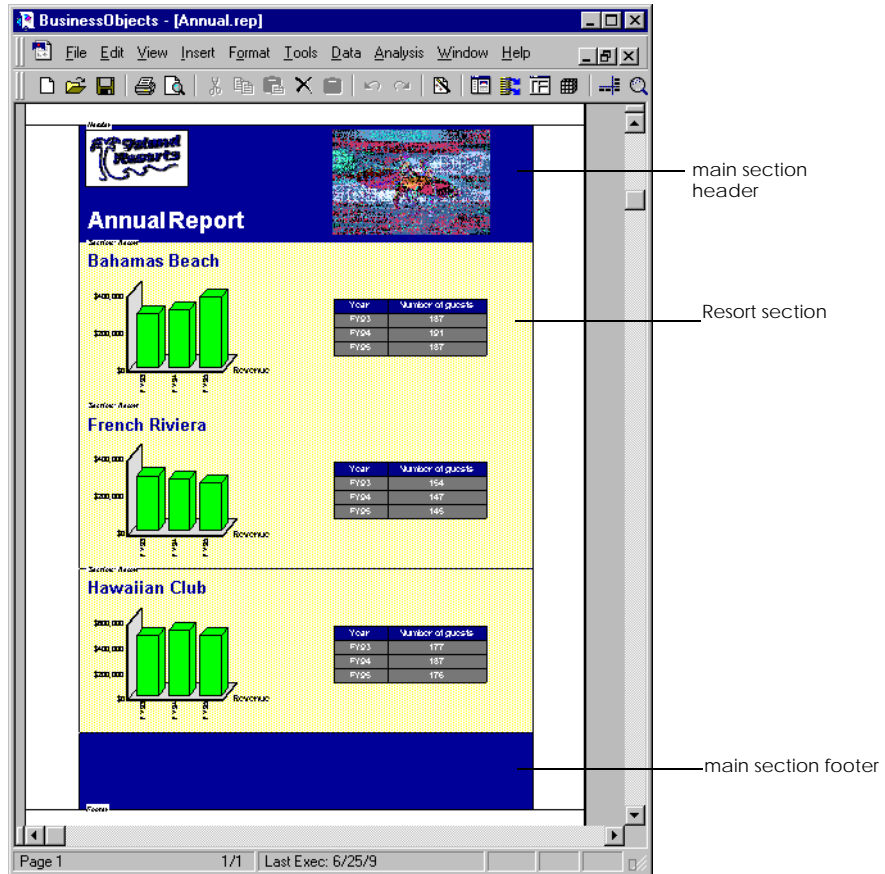
If you have set up a report with sections, you can apply a different type of shading to each section in the report. This can allow you to easily distinguish between the different sections.

The sections you have created are contained in the main section and a main section header is displayed at the beginning of the report and a main section footer at the end of the report.

You can hide the main section header or the main section footer or both of them if you wish.

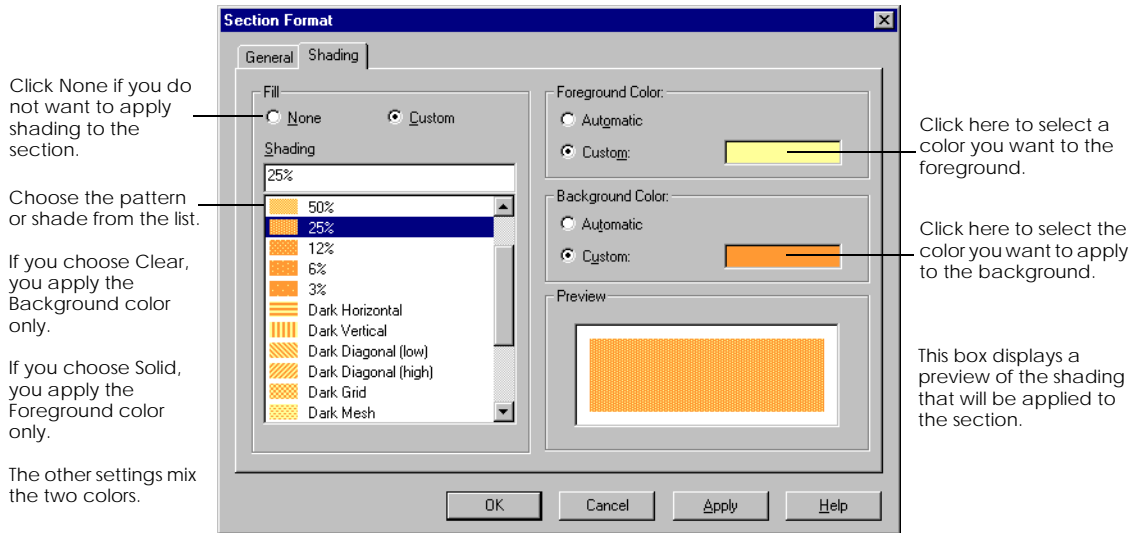
Example Using shading to distinguish between sections

In the illustration below, the report contains two sections: the main section and a Resort section. The Resort section has three values, Bahamas Beach, French Riviera and Hawaiian Club. The main section is shaded blue and the Resort section yellow which allows you to clearly see where the sections begin and end. As you can see from the illustration, the Resort section is contained within the main section.



Formatting sections

1. Right-click in the section you want to format.
2. Chose Format Section from the menu.
3. Click on the Shading tab:

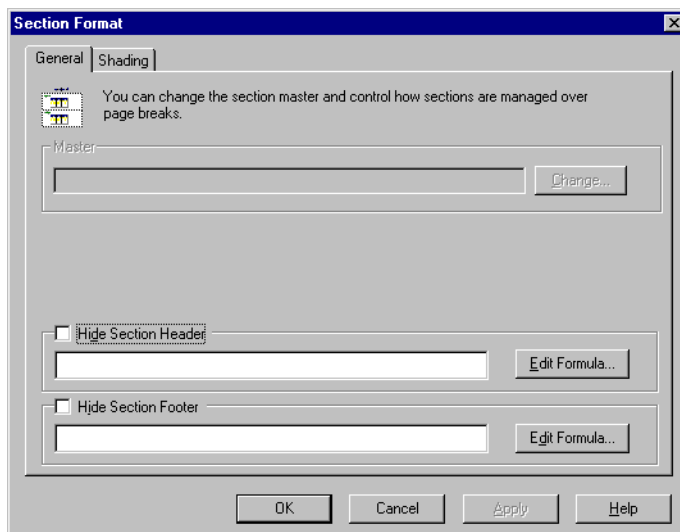


4. Make the settings as required and click OK.

To hide the main section header of footer

1. Right-click in the main section header or footer area.
2. Choose Format section from the menu.

3. Click on the General tab.



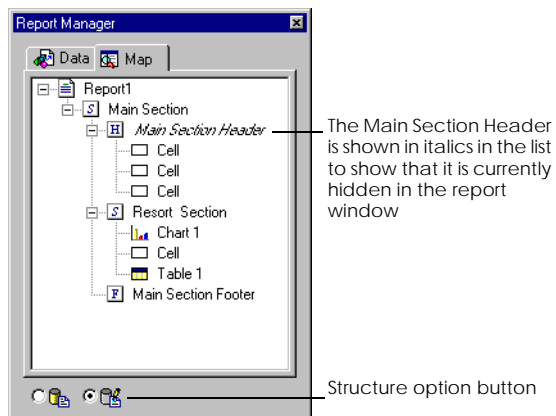
4. Check the Hide Section Footer or Hide Section Header check box.
A section header or footer that is hidden is shown in italics in the Report Manager Map list.

Note: For more information on hiding and displaying report components, see “Hiding and Displaying Report Components” on page 569.

To display the section footer or header again

1. Click the Map tab on the Report Manager.
If Report Manager is not open, choose Report Manager from the View menu.

2. Click the Structure option button.



3. Right-click on main Section in the list in the Map window and choose Format Section from the menu.
The Section Format dialog box opens.
4. Click on the General tab.
5. Uncheck the Hide Section Header or Hide Section footer check box and click OK.

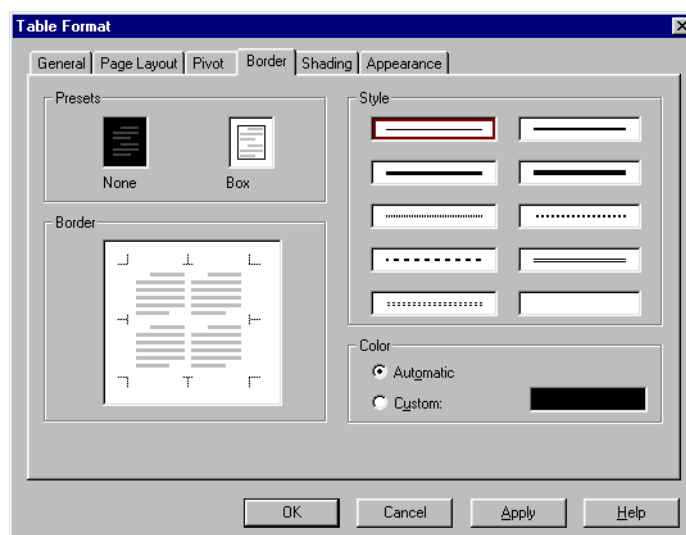
Formatting Tables

Tables and crosstabs are made up of headers and footers, columns and rows, and cells. All these elements together make up the block. The cell is the most basic element of a table or crosstab. Rows and columns are made up of groups of cells. When you format tables and crosstabs, you can work on the formatting cell by cell or on the block formatting.

Formatting blocks

You can format a block by applying shading and borders. The following procedure shows how to do this for a table. The procedure is the same for a crosstab or a chart block:

1. Right-click on the table and choose Format Table from the menu. The Table Format dialog box opens.
2. Click the Border tab:



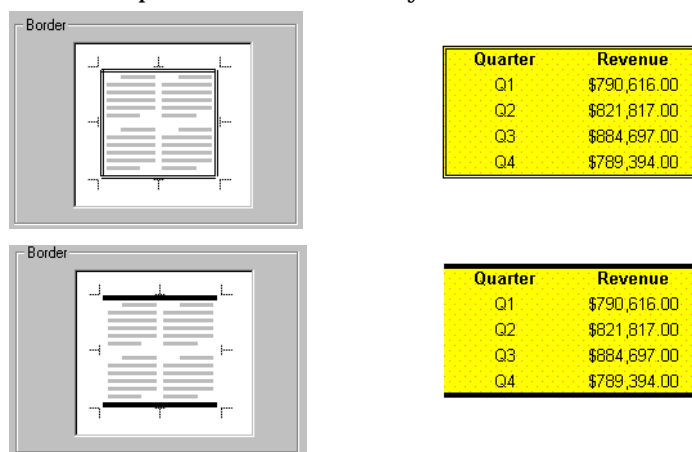
3. Choose a line style from the Style section.
4. To change the border color, click the box next to Custom, then select a color from the color palette that opens. Click OK to close the palette.

5. Set which sides of the block you want to format. You can:
 - Click one or more borders in the Borders box, or
 - Click Box to put a border on all four sides of the table.
6. Click Apply.
7. Click on the Shading tab and make the required settings.
The options available on the Shading tab are described on page 528.

- Click OK to close the dialog box.

Example Applying shading and borders to tables

In the examples below, the table has been shaded yellow. In the first table, all four sides have a double-line border. In the second table, a thick border has been applied to the top and bottom sides only.



Example Correctly formatting crosstab corners

When you apply shading to a section and then insert a crosstab, the corner cells of the crosstab are sometimes incorrectly shaded or formatted as shown in the example below. In this example, you want the top left-hand corner be shaded as the section shading.

	Q1	Q2	Q3	Q4
France	\$208,565	\$242,165	\$226,125	\$158,565
US	\$582,051	\$579,652	\$658,572	\$630,829

There are two things you have to check. You have to make sure that the cell shading *and* the crosstab shading are set to transparent.

To do this:

- Right-click on the top left-hand cell and choose Format Cell from the menu. The Cell Format dialog box opens.

2. Click on the Shading tab.
3. On the Shading tab, click the None option button in the Fill section.



This means the cell is now transparent and the section shading can show through. If this has not solved the problem, repeat the procedure above but this time, choose Format Crosstab from the menu.

.....

Resizing Columns, Rows and Cells

You can resize cells, rows and columns.

Resizing using the mouse

To change the width:

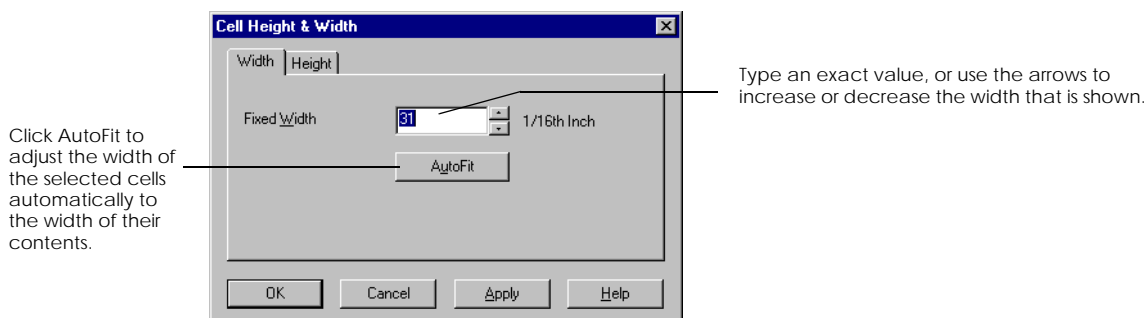
1. Click the right border of the selection.
2. Holding down the left mouse button, drag the border until the selection reaches the width you want.

To change the height of the selection:

1. Click the top border of the selection
2. Holding down the left mouse button, drag the border until the selection reaches the width height you want.

Resizing using a menu command

1. Select the cells, columns or rows you want to resize.
2. Select the Cell Height and Width command from the Format menu.
The Cell Height and Width dialog box appears:



3. Set the required width on the Width tab.
4. Click the Height tab and set the required height.
5. Click OK.
The dialog box closes and the selection is resized, according to the settings you entered.

Showing Headers and Footers

You can choose whether you want to display headers or footers or not on a table and specify how rows and columns are managed. For crosstabs, the header rows are always displayed but you can choose to display or hide the footer row and columns and also choose to display additional information in the header.

To set these options:

1. Right-click on the table or crosstab.
2. Choose Format Table (or Crosstab) from the menu.
3. Click on the General tab.

The options you can set are described below.

Tables

The screenshot shows the **Table Format** dialog box with the **General** tab selected. The **Name** field contains "Revenue per country". The **Orientation** section has **Down** selected. The **Columns** section shows **Columns** set to 1 and **Spacing** set to 0.

Annotations:

- Displays a header and footer on the table (points to **Show Header** and **Show Footer** checkboxes).
- Displays a table in multiple columns or rows. (points to the **Columns** and **Spacing** fields).
- The options available here depend on what table orientation is set. (points to the **Orientation** section).
- Orientation sets the type of table displayed. (points to the **Down** and **Across** radio buttons).
- Down displays the data in columns with the header in the top row. (points to the **Down** radio button).
- Across displays the data in rows with the header down the left-hand side. (points to the **Across** radio button).

Displaying tables in a multi-column layout

You can set up a multi-column or multi-row page layout to fit more information on a page. The example below shows how this works:

Customer	Service	Customer	Service	Customer	Service
Arai	Hotel Room	Kamata	Restaurant	Oneda	Poolside Bar
Arai	Restaurant	Kamimura	Bungalow	Reinman	Hotel Suite
Baker	Hotel Suite	Kamimura	Excursion	Reinman	Sports
Baker	Poolside Bar	Larson	Bungalow	Schiller	Activities
Brendt	Hotel Room	Larson	Excursion	Schiller	Hotel Room
Brendt	Restaurant	Makino	Bungalow	Schultz	Restaurant
Diemers	Activities	Makino	Excursion	Swenson	Hotel Suite
Diemers	Hotel Room	McCarthy	Hotel Room	Swenson	Poolside Bar
Dunstein	Bungalow	McCarthy	Restaurant	Titzman	Hotel Suite
Dunstein	Fast Food	Mukumoto	Restaurant	Titzman	Sports
Goldschmidt	Restaurant	Okumura	Hotel Suite	Travis	Bungalow
Kamata	Hotel Room	Okumura	Poolside Bar	Travis	Excursion
		Oneda	Hotel Suite	Weimar	Bungalow

In this example, you have a long two column table. By setting the page to display a three column layout, you use the page space more efficiently. You can also set how much space you want to have between each set of columns or rows.



You can only see the results of this setting in page layout view.

Displaying duplicate rows in a table

The Avoid Duplicate Rows Aggregation option allows you to display all rows of a report instead of aggregating to avoid displaying rows with the same set of dimensions.

This is demonstrated in the example below:

Quarter	Resort	Revenue
Q1	Bahamas Beach	224,881
Q1	French Riviera	208,565
Q1	Hawaiian Club	357,170
Q2	Bahamas Beach	237,872
Q2	French Riviera	242,165
Q2	Hawaiian Club	341,780
Q3	Bahamas Beach	263,422
Q3	French Riviera	226,125
Q3	Hawaiian Club	395,150
Q4	Bahamas Beach	245,269
Q4	French Riviera	158,565
Q4	Hawaiian Club	385,560

Quarter	Revenue
Q1	790,616
Q2	821,817
Q3	884,697
Q4	789,394

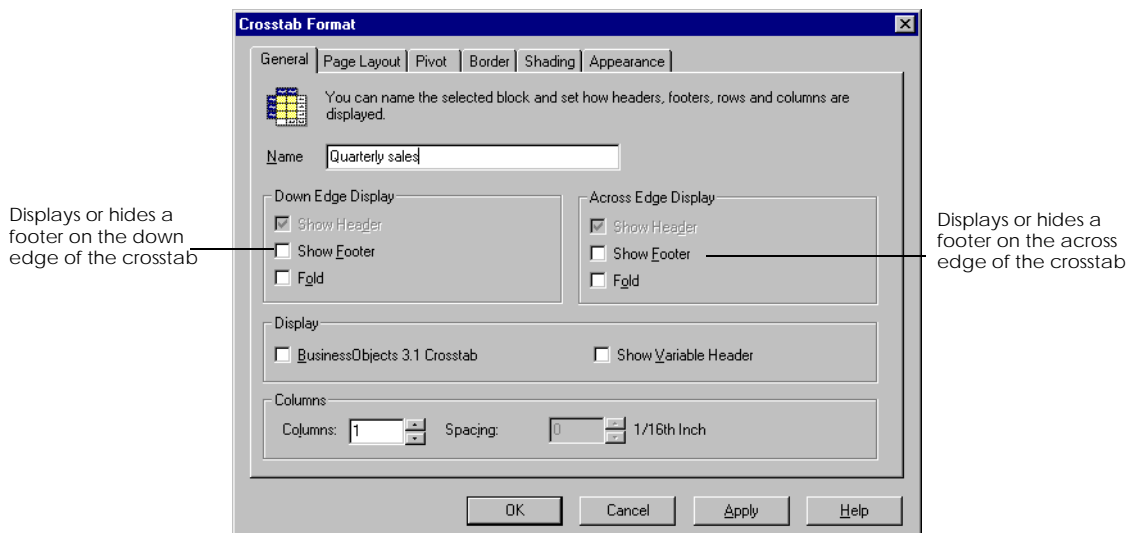
Quarter	Revenue
Q1	224,881
Q1	208,565
Q1	357,170
Q2	237,872
Q2	242,165
Q2	341,780
Q3	263,422
Q3	226,125
Q3	395,150
Q4	245,269
Q4	158,565
Q4	385,560

The first table shows the revenue per resort per quarter. Since each resort per quarter is unique, there is no difference whether duplicate row aggregation is used or not.

In the second table, the Resort column has been removed. The revenue column now shows a sum of all resorts for each quarter. Since there are only four quarters, there are only four rows in the table.

The third table shows the effect of using the Avoid Duplicate Rows Aggregation option on the second table. Here the original number of rows is retained, even though the table shows duplicate rows based on the dimension shown (Quarter).

Crosstabs



Showing additional header information

When you display data in a crosstab, the headers show the values of the variables placed in the header row and column. If you check the option Show Variable Header, you can display the name of the variable as well as the values and also show what the figures in the body cells refer to. This gives additional information to help interpret the data in the crosstab.

Here is an example of how this works:

Here the values only are shown in the headers and the figures only in the body cells

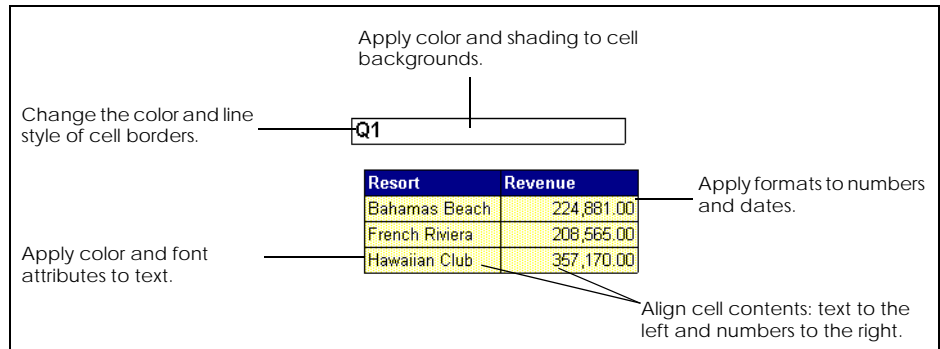
	Q1	Q2	Q3	Q4
Bahamas Beach	224,881	237,872	263,422	245,269
French Riviera	208,565	242,165	226,125	158,565
Hawaiian Club	357,170	341,780	395,150	385,560

The same crosstab with the Show Variable Header option on

Quarter	Q1	Q2	Q3	Q4
Resort	Revenue	Revenue	Revenue	Revenue
Bahamas Beach	224,881	237,872	263,422	245,269
French Riviera	208,565	242,165	226,125	158,565
Hawaiian Club	357,170	341,780	395,150	385,560

Formatting Cells

This section describes how to format cells. The illustration below shows what you can do to format cells and their contents:



Before you can format cells, you must first select them.

Selecting the body without the header

The body is made up of the cells where data is displayed in a table or a crosstab. The body does not include the title cells that appear at the top of columns and to the left of rows.

By selecting the body, you can format all the cells it contains at the same time, for example by applying border styles or backgrounds.

To select the body in a table

1. Place the cursor on the table's left-hand border, but not at the top of the table where the title cells appear.
2. When the cursor turns into a black arrow pointing towards the table, click once.

A hatched gray border appears around the table, and the body is highlighted to show that it is selected:

Year	Number of guests
FY93	187
FY94	191
FY95	187

A table, with the body selected

To select the body in a crosstab

1. Click once inside the crosstab's body.
2. If the body contains two or more variables, hold down your Shift key and click each one.

A hatched gray border appears around the crosstab, and the body is highlighted to show that it is selected:

	Bahamas Beach	French Riviera	Hawaiian Club
FY93	187	154	177
FY94	191	147	187
FY95	187	145	176

A crosstab, with the body selected

Using the formatting toolbar

The quickest and easiest way to apply common formats is to use the toolbar buttons.

To display the Formatting and Borders toolbars:

1. From the View menu, choose Toolbars.
The Toolbars dialog box opens.
2. Check the Formatting and Border toolbar check boxes, then click OK.

The toolbars are displayed. The buttons you can use to format cells are illustrated in the sections that follow.

Repeating cell formats

When you have spent time formatting a cell, you can quickly apply the same formats to other cells. To do this:

1. Select the cells you want to format.
2. From the Edit menu, choose Repeat Format.

Tip: You can also use the keyboard shortcut Ctrl+Shift+Y

Copying cell formats

You can copy and paste the formatting only of a cell. To do this:



Paste Format

1. Select the cell from which you want to copy the formatting.
2. Click Copy button on the Standard toolbar.
3. Select the cell to which you want to paste the formatting.
4. Choose the Paste Format Only button on the Standard toolbar.
The formatting is copied but the contents remain unchanged.

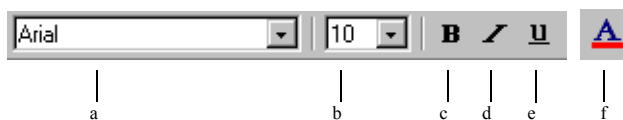
Tip: You can also use the keyboard shortcut Ctrl+Shift+V to paste the formatting only.

Formatting text

You can format text in cells in the following ways:

- Change the font and font size.
- Apply color.
- Apply bold, italics and underline.

You can apply some of these text formatting features using buttons on the Formatting toolbar:

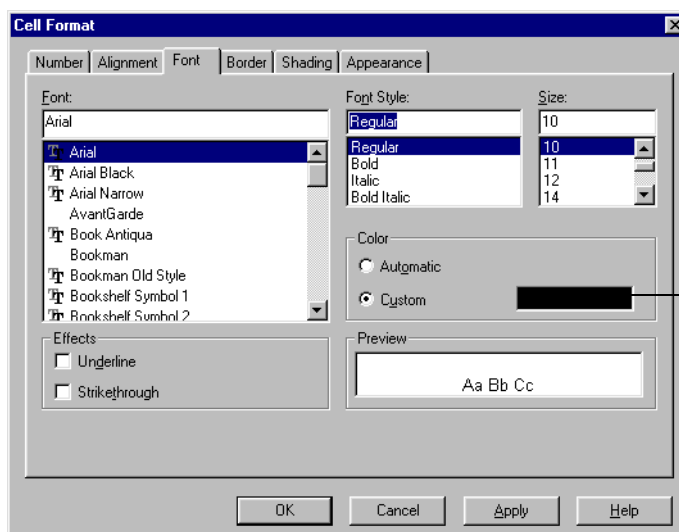


- a. Font
- b. Font size
- c. Bold
- d. Italics
- e. Underline
- f. Text color

1. Select the cell(s), row(s) or column(s) that contain the text you want to format.
2. Use the toolbar buttons to apply the required formatting.

You can also use the Cell Format dialog box to format text. Here is the procedure:

1. Select the cell(s), row(s) or column(s) that contain the text that you want to format.
2. Choose the Cell command from the Format menu, or the Format Cell command from the pop-up menu that appears when you click your right-mouse button.
The Cell Format dialog box appears.
3. Click the Font tab to display the text formatting features:



Click here to open the color palette.

4. Choose the text formats you want, then click Apply or OK.
The formats are applied to the selection.

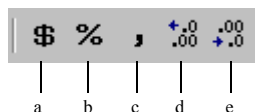
Formatting numbers and dates

This section describes how to apply formats supplied by BUSINESSOBJECTS to numbers and dates, and how to create your own formats.

Using the toolbar buttons

The formatting toolbar has several buttons you can use to quickly apply certain formats to numbers. You can use these buttons to format numbers in cells or on charts.

1. Make sure the Formatting toolbar is open.
2. Select the number you want to format and click the required button.
 - a. Formats the number with the default currency style
 - b. Formats the number with the default percent style
 - c. Formats the number with the default million style
 - d. Adds a decimal place
 - e. Removes a decimal place

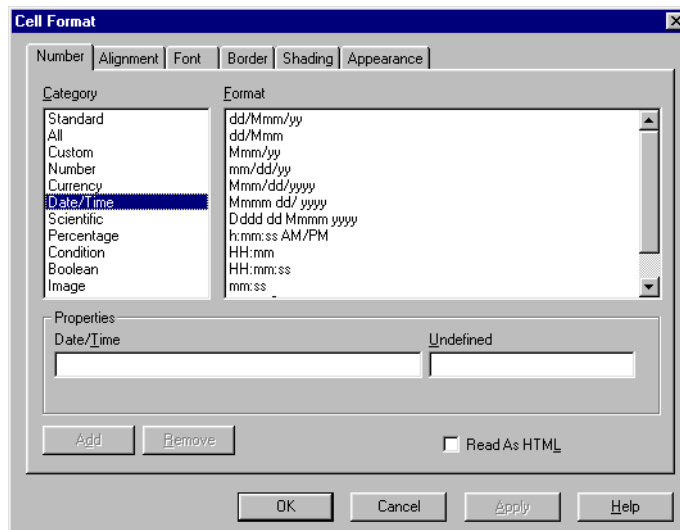


Note: The default currency, million and percent styles are taken from the regional settings properties in the Windows Control Panel.

To format numbers and dates

1. Select the cell(s), row(s) or column(s) that contain the numbers or dates that you want to format.
2. Select the Cell command from the Format menu or the Format Cell command from the pop-up menu that appears when you click your right-mouse button. The Cell Format dialog box appears.

3. Click the Number tab:



4. Click a category in the Category list to display its corresponding formats:

- All All formats.
- Custom Formats that you have created yourself.
- Number Formats for decimal values.
- Currency Formats for currency values.
- Date/Time Date and time formats.
- Scientific Formats to display values to the n th power.
- Percentage Percentage formats.
- Condition Mr., Mrs., Miss.
- Boolean True, False.
- Image Bitmap/TIFF

5. Click a format in the Format list.

An example of the effect the format has on numbers is shown below the Positive field. Examples also appear below the other fields (Negative, Equal to Zero and Undefined) if the format has been defined for negative numbers, zero and empty cells, respectively.

6. Click Apply or OK.

The new formats are applied to the selection.

Creating your own number and date formats

You can create your own number and date formats, based on standard formats. To illustrate the procedure that you must follow to create your own format, the steps described in this section are based on an example.

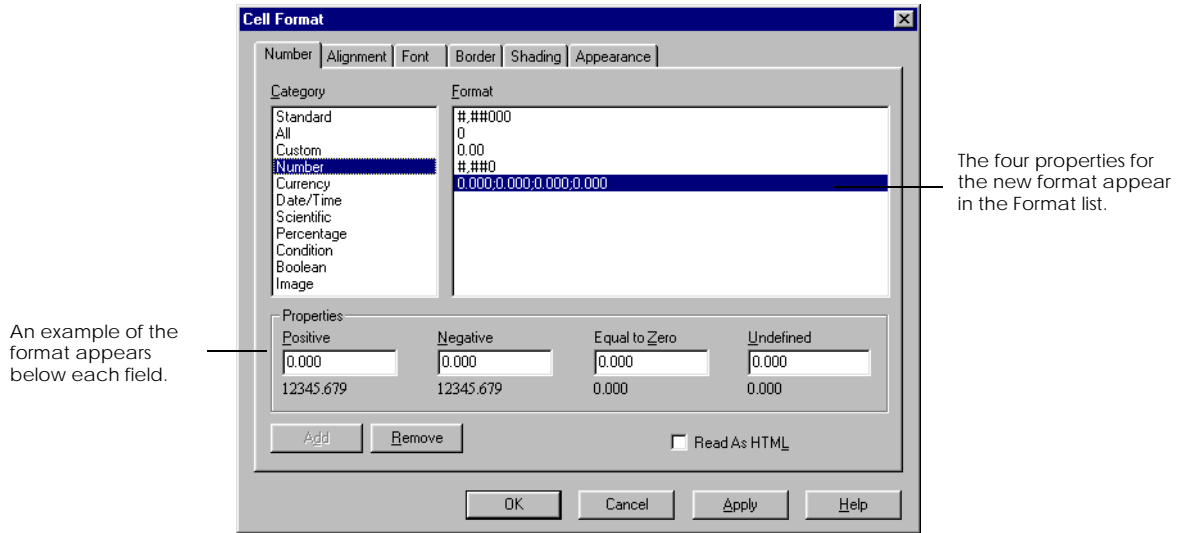
Example **Creating a number format with three decimal places**

The format can be applied to positive and negative values, as well as to zero values and empty cells.

1. In the Number tab of the Cell Format dialog box, click the Number category from the Category list.
The corresponding number formats appear in the Format list.
2. Click the number format with two decimal points (0.00).
The effect that this format has on positive values appears below the Positive field.
3. Click inside the Positive field, then add a zero in third decimal place.
You have now created a format that will display positive values with three decimal places. If you do not wish to enter formats in the remaining fields (Negative, Equal to Zero and Undefined), go to step 6
4. Click inside the Negative field, then enter the format (0.000).
Negative values will now be displayed with three decimal points.
5. Enter 0.000 in the Equal to Zero and Undefined fields.
These fields correspond to null values (zero) and empty cells, respectively. In cells that contain null values, “0.000” will be displayed. The format is also applied to empty cells.

6. Click Add.

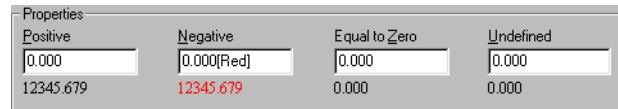
The new format appears in the Format list, under the Number category and the Custom category.



7. Click Apply or OK.

The new number format is available for use.

You can apply a color to number formats that you create. For example, if you want negative values to appear in red, type [Red] after the number format in the Negative field.



To delete number and date formats that you have created

You can delete number and date formats that you or other users have created.

1. In the Number tab of the Cell Format dialog box, click the Category where you created the format you want to delete.
2. Select the format(s) that you wish to delete.
3. Click Remove, then click OK.

Using hyperlinks in BusinessObjects reports

You can easily add hyperlinks such as email addresses and web site addresses to your reports. BUSINESSOBJECTS automatically recognizes certain keywords or symbols included in the address, adds any extra syntax behind the scenes and formats the address as a hyperlink. Hyperlinks you add to a BUSINESSOBJECTS report are retained when you save the report in PDF or in HTML format.

BUSINESSOBJECTS automatically recognizes the keywords, syntax and symbols in the table below and turns them into hyperlinks:

Keyword or syntax	Automatically recognized and formatted as....
HTTP <i>or</i> www	HyperText Transfer Protocol
MAILTO <i>or</i> @	Electronic Mail
FILE	Host-specific Files
<a href	specified in the HTML code
FTP	File Transfer Protocol
NEWS	Usenet news
TELNET	Telnet Protocol for Interactive Sessions
GOPHER	Gopher and Gopher+ Protocols
WAIS	Wide Area Information Servers Protocol
PROSPERO	Prospero Directory Service
NNTP	Usenet news using NNTP access

How are hyperlinks formatted?

If you have Microsoft Internet Explorer installed, hyperlinks in BUSINESSOBJECTS reports are formatted according to the settings you have made in Internet Explorer. If Internet Explorer is not installed on your computer, unused hyperlinks are formatted in blue and underlined.

Adding a hyperlink

You can type an address directly into a cell or retrieve it through a query if your universe Designer has included hyperlinks in a universe.

1. Select the cell where you want the hyperlink to appear.
2. Type in the address using one of the supported keywords or symbols in the table above and press return.
BUSINESSOBJECTS automatically detects the hyperlink and formats accordingly.

Tip: Selecting and resizing cells containing hyperlinks can be a little tricky because every time you click on the cell, the hyperlink is activated. Make the cell containing the hyperlink longer than the actual text inside it so that you can select the cell after the address without activating the hyperlink.

Example

Adding a link to a web site in a report

Complementary information on the data in your report is available on a company web site. Including a link to this site from your report allows your report readers to go directly to the source of further information. To add a web site address to your report:

1. Insert a new free-standing cell in your report.
It's a good idea to make the cell fairly large to allow some space in the cell after the address. This allows you to easily select the cell without activating the hyperlink.
2. Select the cell and type in the address: www.businessobjects.com.
3. Press return.
BUSINESSOBJECTS automatically recognizes the key string [www](http://www.businessobjects.com) as part of a web address and formats the string in blue underline. If you move your mouse over the address, the cursor changes to the hand icon to show it is a hyperlink.
4. Click on the link.
If you have Internet access, the BUSINESSOBJECTS web site will open in your Internet browser.

www.businessobjects.com



<http://www.businessobjects.com>

BUSINESSOBJECTS also recognizes <a href syntax which allows you to define exactly what will be visible in the hyperlink and to define relative paths to files.

In the example syntax below, the hyperlink will take you directly to the Tips & Tricks page on the Business Objects web site but you only see “BusinessObjects Tips & Tricks” displayed in your report:

```
<a href="http://www.businessobjects.com/services/infocenter//tips/start/starthome.htm">BusinessObjects Tips & Tricks</a>
```

If you hold your mouse cursor over the address, a tooltip appears displaying the web address syntax:



Editing a hyperlink

You can edit a cell containing a hyperlink either directly in the cell or using the Formula Bar.

Using the Formula Bar:

1. Make sure the Formula Bar is open.
2. Select the cell containing the hyperlink you want to edit.
The full hyperlink syntax is displayed in the Formula Bar window.



3. Make the required changes in the Formula Bar window and press the return key.
The hyperlink is updated.

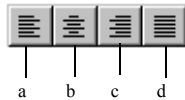
Editing directly in the cell:

1. Double-click on the cell containing the hyperlink you want to edit.
The hyperlink becomes editable.
2. Make the required changes and click out of the cell or press the enter key.
The hyperlink is updated.

Aligning cell contents

Aligning contents means positioning the data in a cell relative to the borders of the cell. For example, you can align data against the left border of its cell.

You can use buttons on the Formatting toolbar to align cell contents:

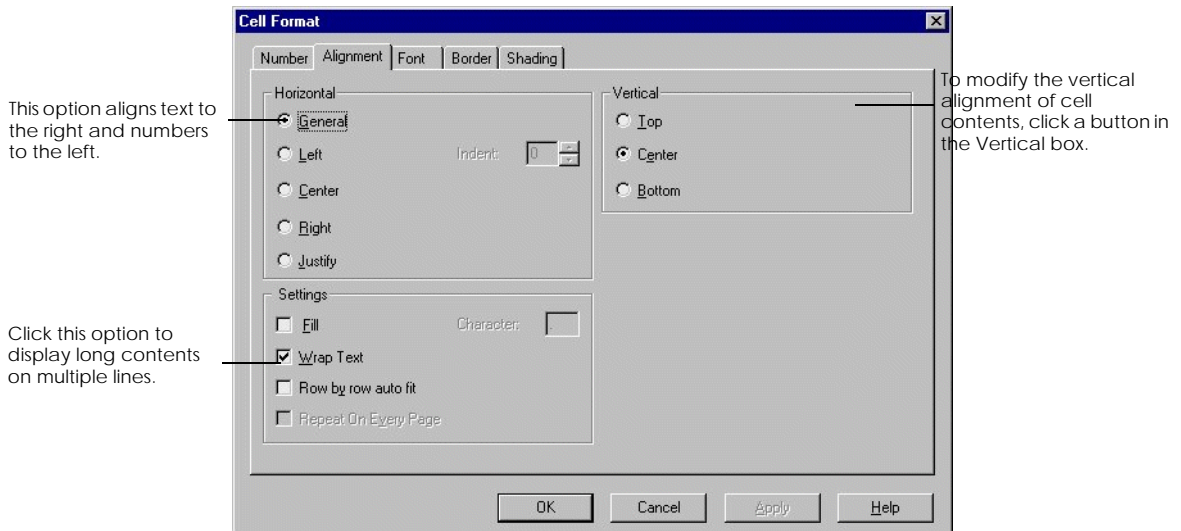


- a. Left align
- b. Center
- c. Right align
- d. Justify

1. Select the cell(s), row(s) or column(s) whose contents you want to align.
2. Click one of the alignment buttons.

You can also use the alignment features in the Cell Format dialog box. To do so:

1. Select the cell(s), row(s) or column(s) whose contents you want to align.
2. Right-click the cell, row or column and choose Format from the pop-up menu. The Cell Format dialog box appears.
3. Click the Alignment tab to display the alignment features:



4. Select the features that you wish to apply to the selection, then click OK.

Certain types of table or crosstab typically used in financial reports have a characteristic layout as shown in the illustration below.

Fill character at the end of the text.

	Q1	Q2	Q3	Q4
Quantity sold.....	\$3,742,989	\$4,006,718	\$3,953,395	\$3,356,041
Sales revenue.....	22,537	22,846	26,263	18,650
Margin.....	\$1,384,424	\$1,647,660	\$1,344,435	\$1,290,564
Margin per unit.....	\$61	\$72	\$51	\$69
Margin as % rev.....	36.99 %	41.12 %	34.01 %	38.45 %

Indented cell contents.

Indenting cell content

You can set a space between the left cell border and the text or numbers in the cell to give the appearance of an indented list in your table.

1. On the Alignment tab, click Left to align the cell contents on the left of the cell.
2. Set a value in the Indents box.
A value of 1 is equal to one space. You cannot enter negative values.

You can also use the buttons on the Formatting toolbar:



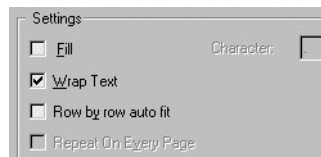
Align left/Align right

1. Click inside the cell.
2. Click the Left Align button on the Formatting toolbar.
3. Use the buttons to increase and decrease the amount of indent.

Fill and character settings

You can fill in the space between the end of the text in a cell and the cell border with a selected character.

1. On the Alignment tab, check the Fill checkbox in the Settings section.



2. Type in the character you want to use.

Merging cell contents

When you have inserted a break on a row or column, you have several columns or rows displaying the same value. You can remove these duplicate values, merge the empty cells and center the value over the rows or columns it describes.



Center Values
Across Break

To do this:

1. Click in the column or row where you have inserted a break.
2. Click the Center Values Across Break button on the Formatting toolbar.

Note: For information on inserting and managing breaks see Chapter 13 "Breaking Up Tables and Displaying Calculations" on page 285.

Wrapping cell contents

When you have a long label in a header row or column, you can display the text on more than one line.

In the example below, the Number of guests label is much longer than any of the figures displayed under it and this column is taking up unnecessary space in the table. By wrapping the cell contents and then resizing the column, you can get round this problem.

Resort	Revenue	Number of guests
Bahamas Beach	971,444	565
French Riviera	835,420	446
Hawaiian Club	1,479,660	540
Sum:	3,286,524.00	

Resort	Revenue	Number of guests
Bahamas Beach	971,444	565
French Riviera	835,420	446
Hawaiian Club	1,479,660	540
Sum:	3,286,524.00	

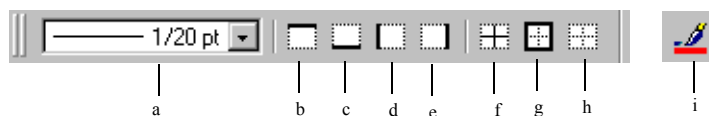
To do this:

1. Right-click on the Number of guests cell and choose Format Cell from the menu.
The Cell Format dialog box opens.
2. Click the Alignment tab.
3. In the Settings section, check the Wrap Text check box.

Tip: If you have column labels on two or more lines, choose Bottom in the Vertical section of the Alignment tab to align all labels along the last line of the text. To automatically align rows of wrapped text, choose Row by row autofit. The size of the highest cell in the row is taken as default. Note: If you manually adjust the size of the row this feature is overwritten.

Formatting cell borders

You can format cell borders by applying line styles and colors. The buttons on the Borders toolbar make it easy to format cell borders:



- a. Enables you to select the line style to apply.
- b. Applies the style to the upper border.
- c. Applies the style to the lower border.
- d. Applies the style to the left border.
- e. Applies the style to the right border.
- f. Applies the style to the inner borders.
- g. Applies the style to the outer borders.
- h. Removes the style from all borders.
- i. Selects the color to apply.

To display the Borders toolbar:



Borders Toolbar

- Right-click on any other toolbar and choose Borders from the menu.
- or
- If the Formatting toolbar is already displayed, click the arrow next to the Borders button.

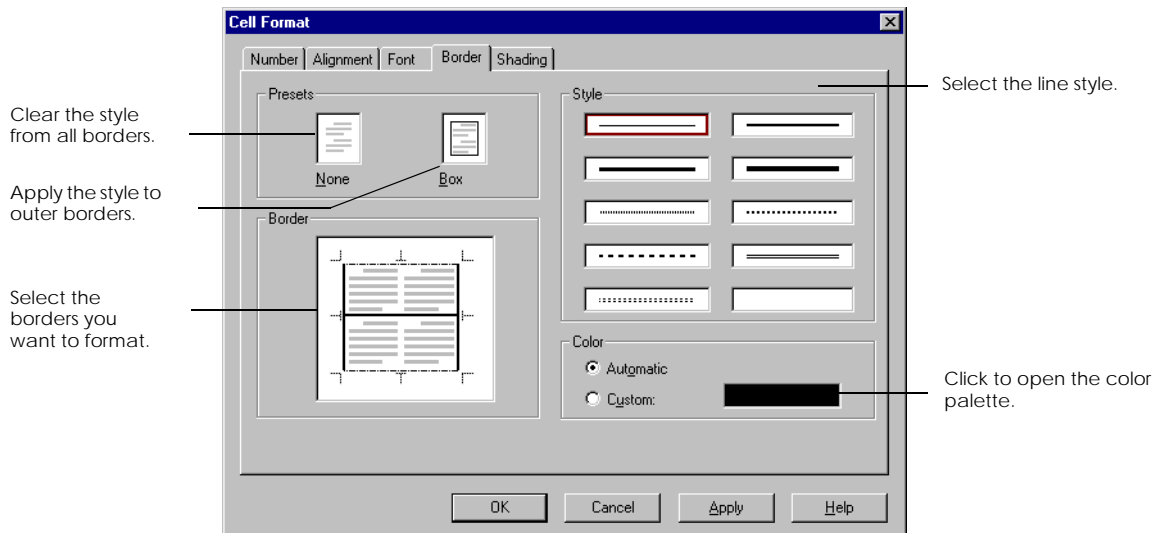
To format borders

1. Select the cell(s), row(s) or column(s) whose borders you want to format.
2. Choose a line style and a color to apply.
3. Click the border buttons to add the required borders to the cell.

You can also use the Cell Format dialog box to apply lines and colors to cell borders. To do so:

1. Select the cell(s), row(s) or column(s) that you want to format.
2. Select the Cell command from the Format menu, or the Format Cell command from the pop-up menu that appears when you click your right-mouse button. The Cell Format dialog box appears.

3. Click the Border tab to display the border formatting features:



4. Choose a line style from the Style section.

5. To change the border color, click the box next to Custom, then select a color from the color palette that opens. Click OK to close the palette.

6. Select the border(s) you want to format. You can select them individually, or, to select the outer borders, click Box.

7. Click Apply or OK.

The border line styles and color are applied to the borders you selected.

Formatting cell backgrounds

You can format the background of cells in the following ways:

- Change the color.
- Apply a pattern.
- Combine a color and a pattern.

To format cell backgrounds:

1. Select the cell(s), row(s) or column(s) that you want to format.
2. Choose Cell from the Format menu or
 - Right-click the cell, row or column and choose Format Cell from the menu
 The Cell Format dialog box appears.
3. Click the Shading tab:

Click None if you do not want to apply shading to the cell. This makes the cell transparent.

Choose the pattern or shade from the list.

If you choose Clear, you apply the Background color only.

If you choose Solid, you apply the Foreground color only.

The other settings mix the two colors.

Click here to select a color you want to the foreground.

Click here to select the color you want to apply to the background.

This box displays a preview of the shading that will be applied to the section.

4. Make the required settings, then click Apply or OK. The shading and color attributes are applied.

Chapter 23 Formatting Page Layout

In this chapter

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- ❑ **Positioning Report Components 561**
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 - Aligning blocks and cells 563
 - Displaying delimiters 564
 - Manually positioning components using the grid 564
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Overview

This section describes how to lay out the different report components on a page to obtain a clear, professional look to your reports. It deals with how to:

- Position blocks (tables, crosstabs and charts) and cells relative to one another.
- Align blocks with one another.
- Set conditions to hide and display blocks so that you can have different page layouts on different pages.
- Use page backgrounds.

Positioning Report Components

This section describes how to position and align the different components that make up your report.

Relative positioning

Relative positioning means positioning a selected block in relation to markers such as page margins or other blocks. If these markers change in size or position the block is re-positioned accordingly. The example below demonstrates why relative positioning is important.

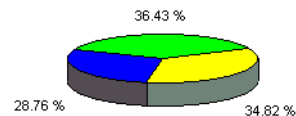
Example Why is relative positioning important?

You have a table and a chart positioned on a report page. The table is five lines long. You refresh your report to update it with new data and your table is now 10 lines long. If you do not set the position of the chart in relation to the actual position of the table, the new table will overlap the chart as shown in the first illustration below.

Country of origin	Age group	Number of guests
Germany	18-30	136
Germany	30-60	137
Germany	Over 60	197
Japan	18-30	151
Japan	30-60	146
Japan	Over 60	202
US	18-30	164
US	30-60	169
US	Over 60	249



Country of origin	Age group	Number of guests
Germany	18-30	136
Germany	30-60	137
Germany	Over 60	197
Japan	18-30	151
Japan	30-60	146
Japan	Over 60	202
US	18-30	164
US	30-60	169
US	Over 60	249

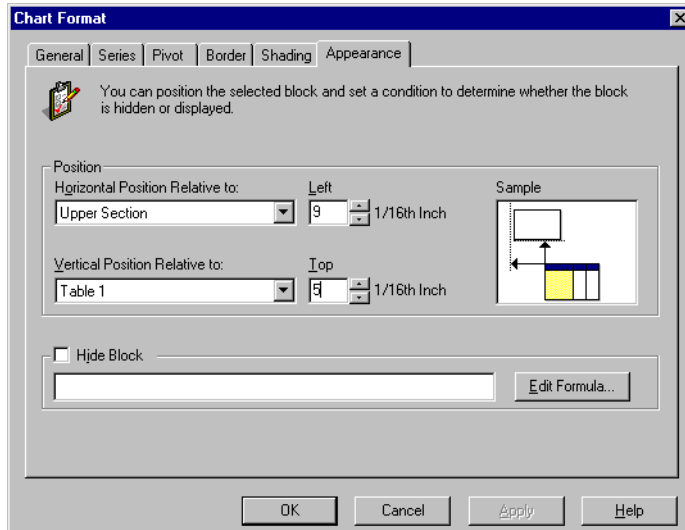


If you set the position of the chart in relation to the actual position of the table, when the table expands, the chart is positioned accordingly so that it is always under the table with the space that has been set.

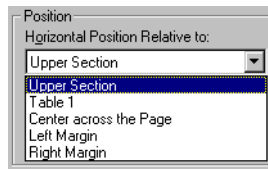
Using relative positioning is particularly important if you are setting conditions to determine whether a table or chart, for example, is displayed or not. If you do not position components in relation to one another you could end up with overlapping components or with big gaps between them.

To position a block in relation to another report component

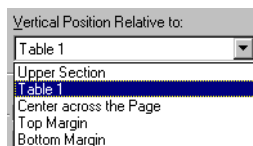
1. Right-click on the block or cell and choose **Format (block)** from the menu. The Format dialog box opens.
2. Click the **Appearance** tab:



3. In the **Horizontal Position Relative To** box, choose the marker you want to use to position the block or cell horizontally.

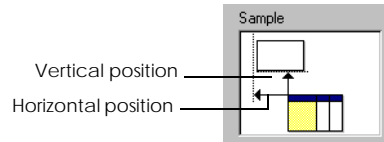


4. Enter a number (positive or negative) in the **Left** field to set how much space you want to have between the marker and the selected block.
5. In the **Vertical Position Relative To** box, choose the marker you want to use to position the block or cell vertically.



- Enter a value (positive or negative) in the Top field to set how much space you want to have between the marker and the selected block.

The Sample box demonstrates the way the components are positioned.



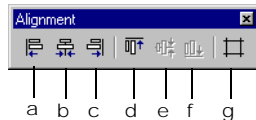
The space between the marker and the selected block is always calculated from the upper left corner of the block.

- Click Apply or OK to display the cells or blocks in their new position.

Note: When a report contains only the main section, the Upper section is the top margin of the page. When a report contains sections, the Upper Section is the top of the section in which a block is currently positioned.

Aligning blocks and cells

You can align report components with one other in the following ways using the Alignment toolbar:



- Aligns the left edges
- Centers horizontally
- Aligns the right edges
- Aligns the top edges
- Centers vertically
- Aligns the bottom edges
- Snap to Grid - Forces components to stick to gridlines

- Make sure the alignment toolbar is displayed.
- Select the first component.
For example, if you want to align a cell with a table, you must first select the table.
- Hold down the Ctrl key and select the component you want to align with the first.
- Click the option you want to use, then click OK.
The report components you selected are aligned.

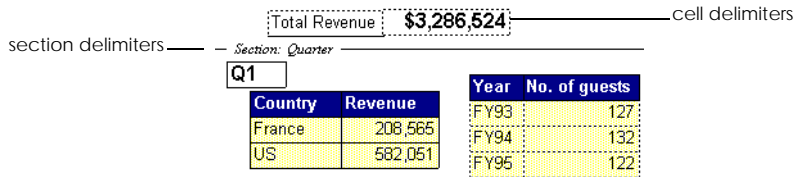
Displaying delimiters

When you are working on your page layout and aligning components, it may be useful to turn on the delimiters. Delimiters are non-printing dotted lines. There are three types of delimiters that you can turn on and off:

- cell delimiters shows the outline of a cell
- margin delimiters shows the size of page margins; you can only turn margin delimiters on if you are in Page Layout view
- section delimiters shows where a section begins and ends

To turn cell and section delimiters on:

- From the View menu, choose Cell Delimiters or Section Delimiters.



To turn margin delimiters on:

1. From the View menu, choose Page Layout.
2. If the margins are not displayed, choose Page Margins from the View menu.

Manually positioning components using the grid

You can manually drag report components and place them as required on the report page. To help place components accurately you can turn on a page grid.

To display the grid:

- From the View menu, choose Grid.

You can use the grid to automatically align the selection as you drag it. To do this:

- Click the Snap to Grid button on the Alignment toolbar



When you drop a component in a new location, it will automatically be aligned with the nearest line on the grid.

To position a component:

1. Select the block(s) or cell(s) you want to position.
2. Then:
 - Hold the cursor over the hatched border of the block. When the cursor changes to the Move arrow, hold down your mouse and drag.
 - Click inside the cell, hold down your mouse and drag.
3. Drag the block or cell to the new position and release the mouse button.



Move arrow

Note: In master/detail reports, you can drag a block between sections. When you do this, the data in the block is re-calculated. You can also move blocks between sections using the Report Manager.

Using Report Manager to Structure Report Layout

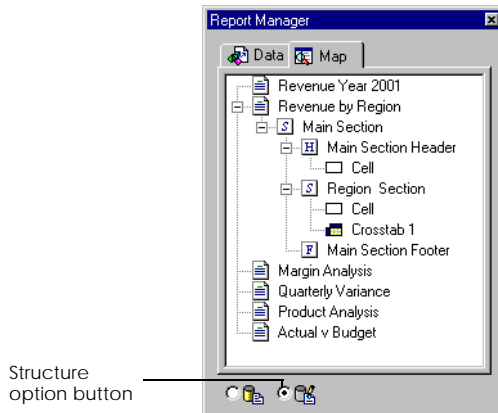
You can use the Map tab of the Report Manager to work on the structure, layout and formatting of your report. In particular, the Map tab in structure view allows you to manage reports which contain hidden cells, sections and blocks.

To display Report Manager in structure view



Report Manager

1. If the Report Manager is not already open, click the Report Manager button on the Standard toolbar.
2. Click the Map tab.
3. Click the Structure option button.



Structure option button

The Map tab displays a list of all the components in the currently selected report arranged in the order they appear in the report. The Report name is at the top, followed by the Main Section Header and then the Sections with the cells, charts, crosstabs and tables in each section.

Each report component is represented by an icon. When you click on an icon in the Report Manager window, the corresponding component is displayed in the report window.

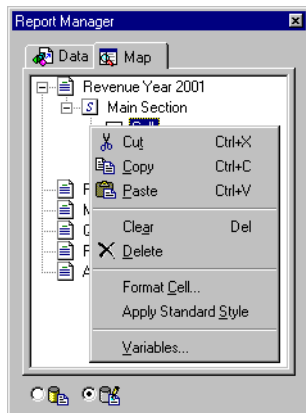
Organizing the report in Report Manager

You can use the Report Manager to organize the tables, cells and charts in your report.

Copying report components

You can copy and paste a component from one section of your report to another. When you paste a component in a new location, the original formatting is retained. For example, if you copy a pie chart from one part of your report to another in the Map window, the chart will retain all the colors, legends, title and other formatting. To do this:

1. Right-click on the icon of the component you want to copy.
2. Choose Copy from the menu.



3. Right-click again and choose Paste from the menu.

This is a quick and easy way of copying a component and then working on it in the report window.

Moving report components

You can also drag a component from a position in the list and drop it in the new position. To do this:

1. Click on the icon of the component you want to move.
2. Click on the icon again and, holding down your mouse button, drag the icon to the new position in the list.

3. Release your mouse button.
The icon is displayed in the new position in the list and the component is displayed in the new position in the report window.

Formatting components in Report Manager

You can also work on the formatting of the components in your report from the Report Manager Map tab. You can format tables, crosstabs, charts, cells and sections as well as work on the format of filters, sorts and breaks. To do this:

- Right-click on the component icon in the Map list and choose the relevant option from the menu.

Naming components in Report Manager

You name tables, crosstabs, cells and charts. These names appear in the Report Manager Map list in structure mode. Naming components makes it easier for you and others to find your way to the different parts of the report. With one click, you can go directly to the part of the report you are interested in. More importantly, however, naming components is a good idea if you are hiding report components on certain pages. To do this:

1. Make sure you are in structure view in the Report Manager Map tab.
2. Click once on a component name and then click again.
The name is highlighted
3. Type in your new name.
4. Press Enter or click out of the name.

Tip: You can also name components in the *FormatBlock* dialog boxes either on the General tab or on the Appearance tab.

Hiding and Displaying Report Components

BUSINESSOBJECTS allows you to create and format report components (tables, crosstabs, charts, cells and sections) and then choose which components you want to display on a given page or in a given set of circumstances. This is sometimes called conditional formatting.

Conditional formatting allows you to easily set up reports which display different information and different formatting on different pages. For example, you can create a different page layout for your odd and even pages or use a different table format for customer payment records depending on whether the customer is up-to-date or not on payments.

You can hide and display report components in two ways:

- either by simply checking a box to temporarily hide a report component
- or by setting up a condition to determine when the report component is hidden or displayed.

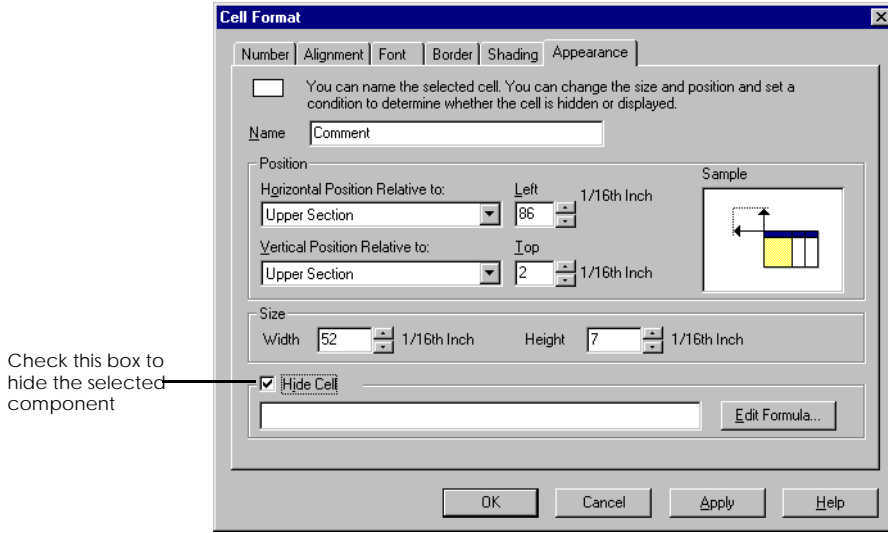
This section describes how to hide and display report components using both methods and gives a number of illustrated examples.

Showing and hiding report components

You can temporarily hide a report component from the report page. This may be useful, for example, if you want to hide a cell containing a comment before you print out a report. To hide a report component:

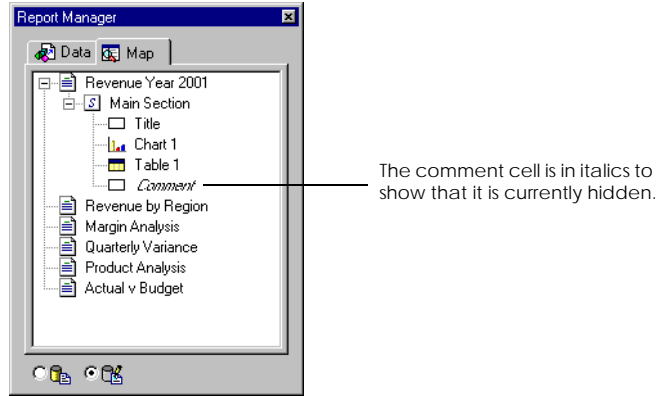
1. Right-click on the report component.
2. Choose Format (Cell, Section, Table, Crosstab, Chart, depending on the type of report component) from the menu.
The Format dialog appears.
3. The next step depends on the type of component you want to hide:
 - if you selected a section, click the General tab

- if you selected a table, crosstab, cell or chart, click the Appearance tab



4. Check the Hide box and click OK.

The component is removed from the report page and the component name is displayed in italics in the Map list.



To display the report component

Since the report component is no longer displayed on the report page, you use the list in the Report Manager Map tab to display the component again. To do this:

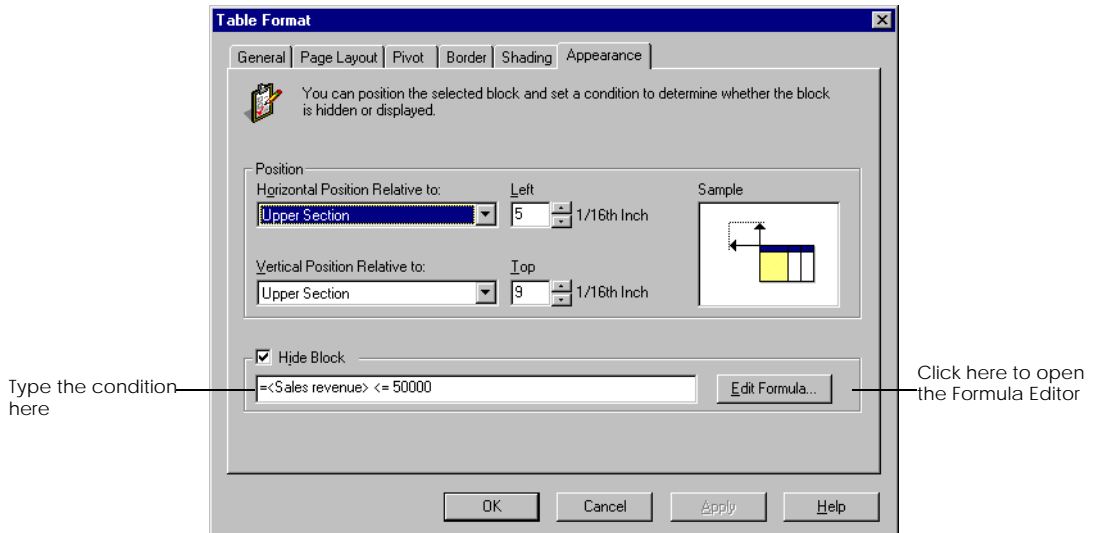
1. Right-click on the component name in the Report Manager window.
2. Choose Format (Cell, Section, Table, Crosstab, Chart, depending on the type of report component) from the menu.
3. Click the Appearance or General tab.
4. Uncheck the Hide box and click OK.

Setting a condition to hide a component

You can also use the BUSINESSOBJECTS Formula Editor to set a condition to determine when a report component is hidden or displayed. To do this:

1. Right-click on the report component.
2. Choose Format (Cell, Section, Table, Crosstab, Chart, depending on the type of report component) from the menu.
The Format dialog appears.
3. The next step depends on the type of component you want to hide:
 - if you selected a section, click the General tab
 - if you selected a table, crosstab, cell or chart, click the Appearance tab.
4. Check the Hide box.
5. You can then:
 - Either click the Edit Formula button to open the Formula Editor to write your formula.

- Or type in your formula directly in the formula box.



6. Click OK to apply the condition.

The components which satisfy the condition set will be hidden.

A hidden component is removed from the report page and the component name is displayed in italics in the Map list in the Report Manager window.

Note: For details on the syntax to use for writing formulas see Chapter 14 "Formulas, Local Variables & Functions" on page 313.

Example Displaying different table formats for European and US currencies

You produce a weekly report of the sales revenue generated per product line per city in the eFashion retail group. The report has a section for each city and you have created a variable, Currency Region, by grouping your cities into Europe and US. You want to produce a report displaying sales revenue in US dollars and in euros for your three European cities, and sales revenue in US dollars only for your US cities.

To do this, you create two different table formats as shown below:

Brussels

Lines	Sales revenue US dollars	Sales revenue euros
Accessories	\$6,581.70	Eur 5,923.53
City Skirts	\$705.40	Eur 634.86
City Trousers	\$4,909.20	Eur 4,418.28
Dresses	\$29,357.00	Eur 26,421.30
Jackets	\$696.00	Eur 626.40
Leather	\$1,773.10	Eur 1,595.79
Overcoats	\$1,614.00	Eur 1,452.60
Shirt Waist	\$51,327.50	Eur 46,194.75
Sweaters	\$4,877.10	Eur 4,389.39
Sweat-T-Shirts	\$54,971.20	Eur 49,474.08
Trousers	\$906.50	Eur 815.85
Total	\$157,718.70	Eur 141,946.83

European cities

Austin

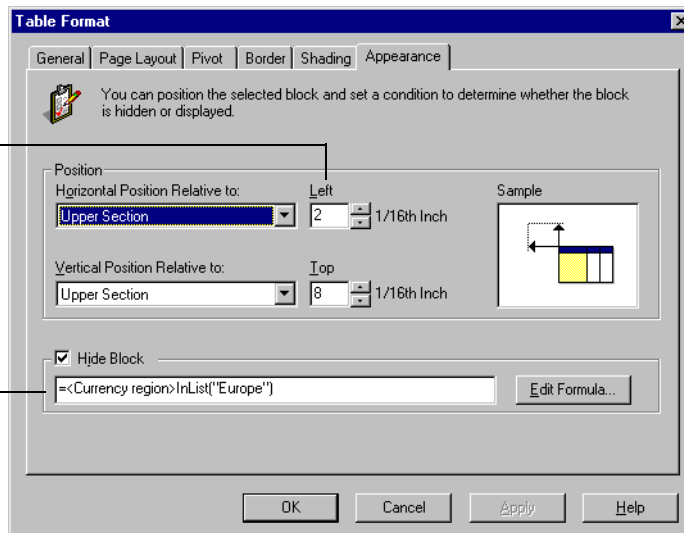
Lines	Sales revenue
Accessories	\$437,018.90
City Skirts	\$6,097.70
City Trousers	\$13,734.00
Dresses	\$83,598.00
Jackets	\$21,364.10
Leather	\$3,341.30
Outerwear	\$97,805.40
Overcoats	\$20,122.30
Shirt Waist	\$82,840.10
Sweaters	\$51,819.00
Sweat-T-Shirts	\$170,275.80
Trousers	\$15,054.10
Total	\$1,003,070.70

US cities

- One table, named Dollars, has sales revenue in US dollars only. You set a condition to hide this table for all cities in Europe. The syntax is:

=<Currency region>InList("Europe")

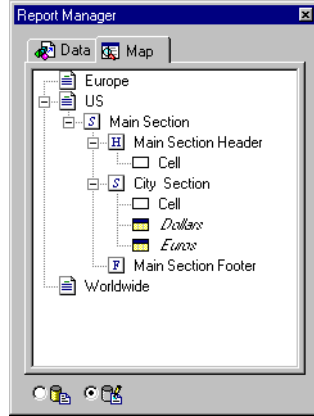
Make sure you set the table position in relation to the left edge of the report.



The condition tells BUSINESSOBJECTS to hide this table if the city belongs to the group Europe.

- The other table, named Euros, displays sales revenue in US dollars and in euros. You set a condition to hide this table for all US cities. The syntax is:

```
=<Currency region>InList("US").
```



Both tables are shown in italics in the Report Map list because both are hidden in certain sections of the report.

When you set up two table formats with conditions specifying when each one is to be hidden, it's important to position both tables in relation to the left edge of the report page. When one table is hidden, the other will be re-positioned accordingly. For more details on relative positioning, see "Relative positioning" on page 561.

Example Setting up a different page layout for odd and even pages

In this example, you are setting up a report that will be printed and bound and you want to create a different layout for the odd and even pages. You want:

- odd page numbers to appear in the top right-hand corner of the page and display the document name in the page footer
- even page numbers to appear in the top left-hand corner of the page.

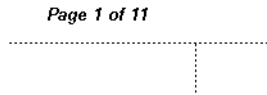
Here's how to do it:

Layout for odd numbered pages

You're going to place the page numbers in the page header area and the document title in the page footer area.

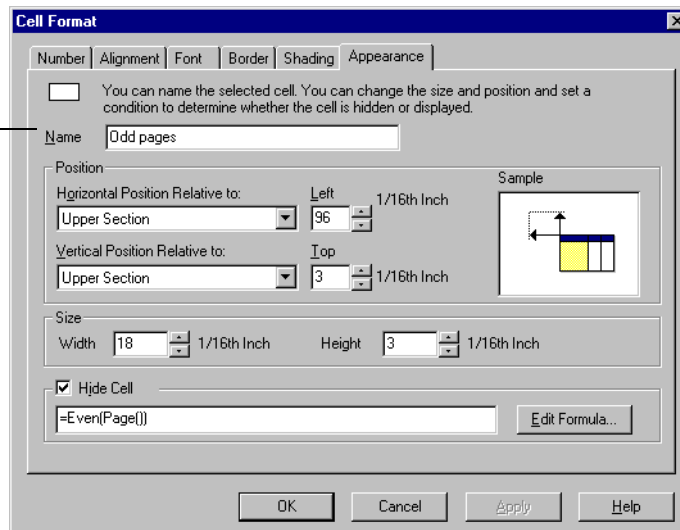
1. Make sure you are in page layout view and that page 1 of your document is displayed on screen.

2. Add a special field containing the page number in the right-hand side of the page header area.



3. Right-click on the page number cell and choose Format Cell from the menu. The Format Cell dialog box is displayed.
4. Click the Appearance tab.

Type a name for the cell here. The name helps you to identify the cell in the Report Map list



5. Check the Hide Cell checkbox and type the following formula in the Hide Cell text box.

=Even (Page ())

You can use this formula to hide all components that you do not want to be shown on even pages in your report.

6. Click OK to close the Cell Format dialog box.
7. Following the same procedure, add the document title to the page footer and set a condition to hide it on even-numbered pages.

Layout for even numbered pages

To set up the even numbered pages:

1. Add a special field containing the page number in the left-hand side of the page header area.
2. Right-click on the page number cell and choose Format Cell from the menu. The Format Cell dialog box is displayed.
3. Click the Appearance tab
4. Check the Hide Cell checkbox and type the following formula in the Hide Cell text box.

```
=Odd(Page())
```

You can use this formula to hide all components that you do not want to be shown on odd pages in your report.

5. Click OK to close the Cell Format dialog box.
This cell will be hidden on all odd-numbered pages.

If you page through your document, you will see that the odd page numbers appear at the top right-hand side of the odd pages only and the even page numbers appear at the top left-hand side of the page. The document title appears on the odd pages only.

Hiding an empty section in a report

When you create or refresh a master/detail report, you may have empty sections, as shown in the example below:

[Empty Master Cell]	The year section contains an empty master cell.						
Australia							
<table border="1"> <thead> <tr> <th>Resort</th> <th>Year</th> <th>Revenue</th> </tr> </thead> <tbody> <tr> <td>Australian Reef</td> <td></td> <td></td> </tr> </tbody> </table>	Resort	Year	Revenue	Australian Reef			There is no data for revenue in Australia and the US for the unidentified year.
Resort	Year	Revenue					
Australian Reef							
US							
<table border="1"> <thead> <tr> <th>Resort</th> <th>Year</th> <th>Revenue</th> </tr> </thead> <tbody> <tr> <td>Royal Caribbean</td> <td></td> <td></td> </tr> </tbody> </table>	Resort	Year	Revenue	Royal Caribbean			
Resort	Year	Revenue					
Royal Caribbean							

This may happen for two reasons:

- the section master cell is empty because you have data in the data provider that has not been organized into one of the section values. BUSINESSOBJECTS designates sections with no value in the master cell as #EMPTY.
- you have a section that contains no data because there is no data currently available for that section.

You can set a condition to hide these empty sections in a report. You can hide the master cell only, the section only or both master cell and section.

To do this:

1. Click on the Report Manager Map tab and choose Navigation view.
2. In the Report Manager list, right-click on the empty master cell or the empty section and choose Format Section from the menu.
The Section Format dialog box opens.
3. Click the General tab.
4. Check the Hide Section Header check box and type the following formula in the formula box:

```
=IsNull(<variable>)
```

where <variable> is the variable for which you have no data.

To hide the empty year master cell in the example above, the formula is:

```
=IsNull(<Year>)
```

5. Click OK.
The empty cell or section is hidden on the report page and displayed in italics in the Report Manager list in the Map tab.

Working with Page Backgrounds

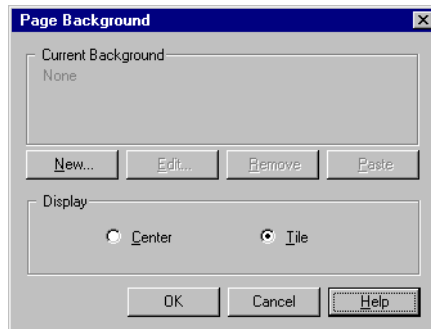
You can enhance the look of a report by inserting a page background. A page background is simply a picture displayed behind the report data and other pictures.

To insert a page background

You can insert an existing picture as a page background, or call a graphics application to create a new picture:

1. Click the Page Layout button on the report toolbar.
2. Click the tab of the report in which you want to insert the page background.
3. From the Format menu, choose Page and then Background from the sub-menu.

The Page Background dialog box appears:



4. Click New.
The Insert Object dialog box appears.
5. Click Create from File.
6. Type in the path of the file you want to insert in the File text box or click Browse to locate the file.
7. Check the Link checkbox if you want to link the file.
If you leave this box unchecked the image is embedded in the report.
8. Click OK to close the close the Insert Object dialog box.
9. Click a Display option in the Page Background dialog box, then click OK.
 - *Center* displays the background in the center of the page.

- *Tile* displays the background as multiple tiles.

Tip: You can also copy a picture to the clipboard, then click Paste in the Page Background dialog box.

To edit the current page background

You can edit a page background in the graphics application in which it was originally created.

1. Make sure you are in Page Layout view. If not, choose Page Layout from the View menu.
2. From the Format menu, choose Page and then Background from the sub-menu.
The Page Background dialog box appears.
3. Click Edit.
The current page background appears in its native graphics application, i.e., the application in which it was created.
4. Make the required changes to the page background, then quit the graphics application.
5. In the Page Background dialog box, change the Display option if you wish:
 - *Center* displays the background in the center of the page.
 - *Tile* displays the background as multiple tiles.
6. Click OK.
The edited page background appears in the report.

To remove the current page background.

- Click Remove on the Page Background dialog box, then click OK.

The Page Background dialog box closes, and the page background no longer appears in the report.

Chapter 24 Formatting Report Layout

In this chapter

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- ❑ **Multi-page Reports 583**
 - Setting what is to appear on each page 583
 - Managing page breaks 584
 - Running headers and footers in tables 586
- ❑ **Page Setup 589**
 - Setting margins 589
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 - Resizing headers, footers and margins 591
- ❑ **Using Page Numbers, Times and Dates 592**
 - Inserting numbers, time and date 592
 - Changing how the date and time is displayed 594
- ❑ **Inserting Document Information 595**
- ❑ **Using Outline View 597**
- ❑

Overview

This chapter describes how to set up your report layout. It deals with how to set margins, headers and footers and how you can control exactly what appears on each page of the report and how to set up and manage multi-page reports.

It also deals with how to handle tables which extend over several pages using running headers and footers for calculations over page breaks.

Finally, it deals with how you can enhance your report by adding document and tracking information such as author, page numbers, date and time and how you can prepare a report for viewing.

Multi-page Reports

When your report contains several pages, there are a number of options in **BUSINESSOBJECTS** to manage the page layout over multiple pages so that your report reads fluently and coherently and you obtain good printed copy.

Setting what is to appear on each page

You can control how sections, tables and crosstabs, cells and charts appear on each page of a report. For example, in a report divided into sections, you may want to start a new page at the beginning of each new section. Or, you may wish to display a specific chart on every page of your report.

To display a block on every page of a report

1. Right-click on the block.
2. Choose **FormatBlock** from the menu.

For a..	Click this tab.....	And check this box...
cell	Alignment	Repeat on Every Page
table	Page Layout	Repeat Block on Every Page
crosstab	Page Layout	Repeat Block on Every Page
chart	General	Repeat on New Page

To display one section or block per page

1. Right-click on the block or in the section.
2. Choose **FormatBlock** or **Format Section** from the menu.

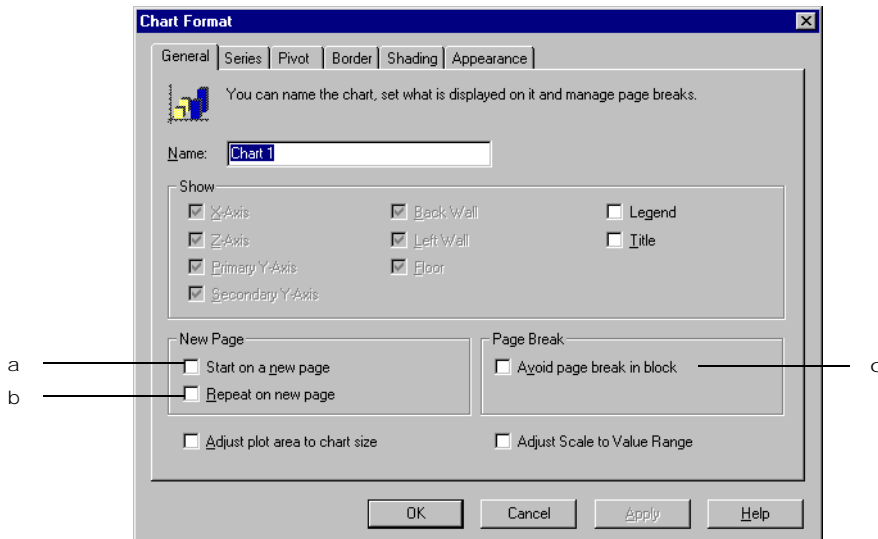
For a..	Click this tab.....	And check this box...
section	Alignment	Start on a New Page
table	Page Layout	Start on a New Page
crosstab	Page Layout	Start on a New Page
chart	General	Start on a New Page

Managing page breaks

When tables and charts extend over more than one page you need to make sure that they are split coherently and that the elements that help your readers to understand the tables and charts correctly, such as title headers on tables, are added to every new page. You may also want to include page sub-totals and previous page recaps for calculations to make it easier for your readers to follow tables of data over several pages.

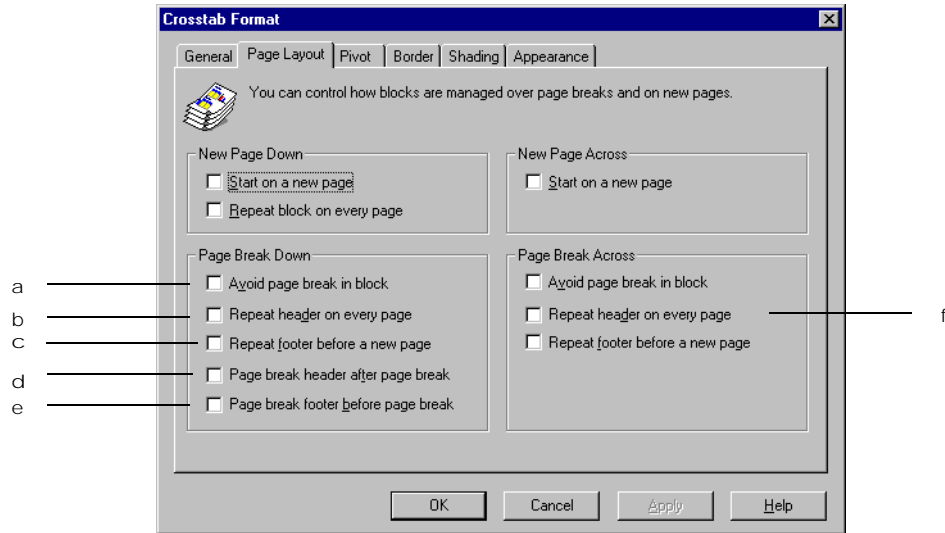
The page break options are set on the format dialog boxes. To open the format dialog for a table, crosstab or chart:

1. Right-click on the block.
2. Choose *FormatBlock* from the menu.
The Format dialog box that opens depends on the type of block selected.
3. For crosstabs and tables, choose the Page Layout tab.
See page 585 for an illustration of the Page Layout tab.
For charts, choose the General tab.



- a. Places the selected chart on a new page.
- b. Repeats the selected chart on every page of the report.
- c. Where possible, starts a new page for charts that would otherwise be split by a page break.

The page layout tab below shows the page break options you can set for crosstabs. The options for tables are exactly the same. The only difference is that you can manage page breaks along the across edge as well as the down edge for crosstabs.



- a. Where possible, starts a new page for blocks that would otherwise be split by a page break.
- b. When a table/crosstab goes over more than one page, the title header is repeated at the top of the table/crosstab on every new page.
- c. Before a table/crosstab goes over onto a new page, a footer is displayed at the bottom of the table.
- d. When a table/crosstab goes over more than one page, a page break header is displayed at the top of the table/crosstab on the new page. You can insert a formula in this header to allow you to display a recap amount from the previous page, for example.
- e. Before a table/crosstab goes over onto a new page, a page break footer is displayed. You can insert a formula in this footer to allow you to display a running total for example.
- f. Page break options for the across edge of a crosstab.

Running headers and footers in tables

When a table extends over more than one page you may want to recap on certain calculated amounts to make the table easier to follow. You do this by inserting conditional headers and footers in your table and then inserting the text and the formula for the information you want to display into these header and footer cells. These headers and footers are only displayed if there is a page break in your table. The example below shows how this works for a multi-page bank statement.

Example How can I display page totals and recap amounts in a multi-page report?

The example below shows a two-page bank statement. To help the bank's client follow this two-page statement, the account status after the list of credits and debits is displayed at the bottom of the first page. This sum is then repeated at the top of the second page before the list of debits and credits continues. These two sums are only displayed if a page break occurs.

Page 1/2			
Date	Identifier	Debit	Credit
Starting Account Amount			\$22,000
01/01/98	XXXXXX	\$250	
02/01/98	XXXXXX	\$300	
04/01/98	XXXXXX		\$10,000
06/01/98	XXXXXX	\$677	
07/01/98	XXXXXX	\$90	
Account Status			\$30,683

Page break footer. This line is only displayed before a page break in the table.

Page 2/2			
Date	Identifier	Debit	Credit
Recap from previous page			\$30,683
01/01/98	XXXXXX		\$165
09/01/98	XXXXXX	\$89	
10/01/98	XXXXXX	\$900	
11/01/98	XXXXXX	\$1,200	
12/01/98	XXXXXX	\$200	
Final Account Status			\$28,459

Page break occurs here.

Page break header. This line is only displayed after a page break in the table.

Table footer. Displayed at the end of the table.

To set up a report with running headers and footers

First, you have to turn the option on. To do this:

1. Right-click on the table.
2. Choose Format Table from the menu.
The Format Table dialog box opens.
3. Choose the Page Layout tab.
4. Check *Page break header after page break* and *Page break footer before page break*.
5. Click OK to close the dialog box.

Next, type in the formula:



Page Layout

1. Click the page layout button on the Report toolbar.
You can only see page break headers and footers when you are in page layout mode and when the table goes over to the next page.
2. Click the structure button on the Report toolbar, click the header/footer cell and type in the formula.
3. Press the enter key.
The result of the formula is displayed in the cell.
4. Click in an adjacent cell and type in a text to describe what the amount represents.

To add columns and rows to a running header or footer

By default, a page break header or footer has one column or row but you can add as many columns or rows as you need for the information you want to display. The size of the table is adjusted so that all the page break header and footer columns and rows fit onto the page.

1. Make sure you are in page layout view.
2. Select the page break header or footer in the table.
3. Use the Structure toolbar to insert the required columns and rows.



4. Insert the required formulas in the page break header and footer.

Running header and footer examples

Here are some examples of formulas used in page break headers and footers where the measure object to calculate is <Revenue>.

To calculate and display...	Type the following formula...
A subtotal for the current page	=Sum(<Revenue>)
A running total, that is the sum of all the data displayed in the table up to and including the current page	=RunningSum(<Revenue>)
A recap amount from the previous page, that is the sum of all the data in the table up to and including the previous page	=RunningSum(<Revenue>)-Sum(<Revenue>)
The percentage of data displayed in the current page against all data displayed in the table	=Sum(<Revenue>)In CurrentPage/ Sum(<Revenue>)In Block

Note: For information on writing formulas, see Chapter 14 "Formulas, Local Variables & Functions" on page 313. You can also use Input, Output and Reset contexts as well as the keyword arguments ForEach and ForAll in the page break header and footer cells. For information on using this extended syntax see Chapter 15 "Calculation Contexts and Extended Syntax" on page 341.

Formatting page break headers and footers

You can change the font, number, color and other attributes for the text and numbers displayed in the page break header and footer cells. See "Formatting Cells" on page 540 for information on how to do this.

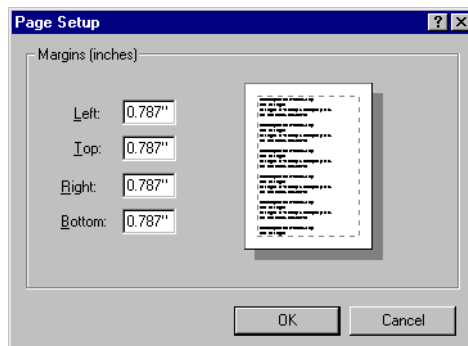
Page Setup

This section describes how to set up report page margins and how to use and format page headers and page footers.

Setting margins

When setting margins, remember that the minimum margins you can set are determined by the printer you are using. You may be tempted to reduce the margins as much as possible to fit everything on the printed page. Bear in mind, however, that reports are often bound or stored in binders and you need to allow an adequate margin for this

1. From the File menu, choose Page Setup.
2. The Page Setup dialog box opens.
3. Click the Margins button to open the Margins dialog box.



4. Type in sizes for the Left, Right, Top and Bottom margins.

Using headers and footers

The Header and Footer areas of the page are usually reserved to display information that you want to repeat on every page of your document. Information such as page numbers, author name and creation date are typically placed in header and footer sections.

Inserting a cell in a page header or footer

If you want to display information (text, pictures, variables) in a header or footer, you must first insert a cell. Here is how to do it:



Page Layout

1. Make sure you are in Page Layout view. If you are not, click the Page Layout button on the Report toolbar.
You can only see the header and footer sections in Page Layout View
2. Click inside the header or footer, then choose Cell from the Insert menu.
The cursor changes to the Insert Cell cursor.
3. Click where you want your cell to appear and, holding down your mouse button, draw a cell.

Year	Service Line	Revenue
FY93	Accommodation	7320

When you release the mouse button, a cell appears in the area you have drawn. When a new cell is inserted it has a flashing cursor inside it so that you can immediately type in text.

4. Type your text or formula in the cell and press Enter.
You can now format the cell as you wish.

Applying shading to a header or footer

You can apply different color shades and patterns to a header or footer. Here is how to do it:

1. Ensure that the Page Layout command on the View menu is switched on.
2. Click inside the header or footer, then select the Page Header or Page Footer command on the Format menu.
The Page Header Format dialog box or the Page Footer dialog box appears.
Each dialog box contains the Shading tab only.
3. Select the fill, foreground color and background color you want, then click OK or Apply.

Resizing headers, footers and margins

You can reduce or increase the height of headers and footers, and the width of margins, simply by dragging the mouse:

1. Ensure that the Page Layout command on the View menu is switched on.
2. Position the pointer over the element you want to resize.
3. When the pointer changes to the resize cursor, press and hold down the left mouse button.
4. Drag the mouse until the header, footer or margin reaches the size you require, then release the mouse button.



Resize cursor

Using Page Numbers, Times and Dates

BUSINESSOBJECTS has pre-defined page number, date and time functions that you can insert in your reports directly from the Insert menu. These functions are automatically updated.

Inserting numbers, time and date

To insert a page number or a date at the top of the page (in the page header) or at the bottom of the page (in the page footer):

1. From the View menu, choose Page Layout.
The page number commands are only available when you are in Page Layout view.
The margins are displayed on your report. If the margin lines are not displayed, choose Page Margins from the View menu.
2. From the Insert menu, choose Special Field then Page Numbers or Date and Time and then an option from the submenu.

Page Numbers	
Page #	Displays the word Page followed by the current page number
Page # of #	Displays the current page number and then the total number of pages in the report
Date and Time	
Current	Displays the current date and time (automatically updated each time a report is opened)
Save Date	Displays the date on which the report was last saved (automatically updated)
Print Date	Displays the date on which the report was last printed (automatically updated)
Last Refresh Date	Displays the date on which the data in the report was last refreshed with the most up-to-date data from the database (automatically updated)



Insert Cell cursor

The mouse cursor turns to the Insert Cell cursor

3. Click once in the area of the report where you want your page numbers to appear.
A cell displaying the page number is inserted.

Formatting the cell

When you insert a cell it has the default formatting. To change the formatting, you use the same procedure you use for formatting any other type of cell.

1. Right-click on the page number.
2. Choose Format Cell from the menu.
The Cell Format dialog box opens.
3. Change the formatting as required and then click OK to close the dialog box.

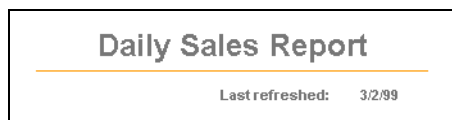
Example

How do I know when the data in my report was last updated?

In many companies, it is essential to know the exact date or time at which the data in the report was updated. In BUSINESSOBJECTS, you can display the last refresh date in a special field which is automatically updated every time you refresh your report and see at a glance when the data was last updated.

To do this:

1. Add a caption cell at the top of your report and type “Last refreshed” in it, for example.
2. From the Insert menu, choose Special Field, then Date or Time, then Last Refresh Date.
The cursor changes to the Insert Cell cursor.
3. Click once next to the Last Refreshed caption.



The date on which the report was last updated is inserted in the report. This date is updated each time you refresh the report.

Changing how the date and time is displayed

When you choose the insert date and time option from the menu, the date is inserted by default. To re-format the cell to display the time or to format the date display differently:

1. Right-click the cell and choose Format Cell from the pop-up menu.
2. Click the Numbers tab on the Cell Format dialog box
3. Choose Date and Time in the Category list.
The display options are shown in the Formats box.
4. Click on a format in the Formats box.
An example of how the date or time will appear is shown in the Properties box.

Tip: If you get a cell which displays ####, it means that the text is too long to be fully displayed in the cell size. To fix the problem, click on the cell and re-size it until the text is correctly displayed.

Inserting the date and the time

If you want to insert both the date and time, insert two cells using the Insert/Special Field/Date and Time command and re-format one to display the time.

Inserting Document Information

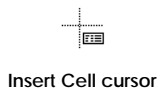
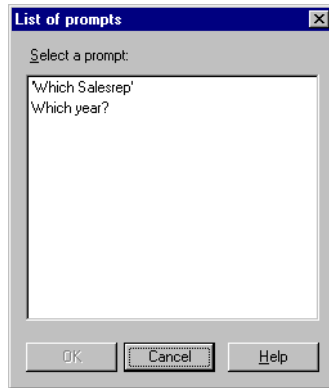
For tracking purposes it may be useful to display information about the query you used to retrieve the data displayed in the report, the filters you have placed on the report and the drill filters you have used in drill mode. You can do this automatically using the Insert Special Field option. The following options are available:

Choose Insert Special Field...	To display....
Query prompt	Inserts the option you chose from the prompt dialog box when you ran the query. If you only chose to retrieve the sales figures for Northern Europe in FY95 for example, Northern Europe FY95 is inserted in the cell.
Global Filters	Inserts the name of the filters you have applied to the whole report. These are the filters placed in the Global folder in the Filters dialog box.
Drill Filters	Inserts the name of the filters currently displayed in the drill toolbar.

Example Inserting a query prompt in a report

In this example, when you ran a query you were prompted to choose which data you wanted to retrieve from the database. You had to choose the name of the sales representative and the year you wanted the data for. You now want to insert this information into your report to keep track of the data you have retrieved. Here's how to do it:

1. From the Insert menu, choose Special Field and then Query Prompt. The List of Prompts box opens if there is more than one choice.



2. Choose the prompt *Which Salesrep?* and click OK. The insert cell cursor is displayed.
3. Click once where you want the query prompt to be displayed. The name of the sales representative is displayed in a new cell.
4. Repeat Step 1 to Step 3 to insert the year you chose when you ran the query. You now have the name of the sales representative, Galager, and the year, FY96, displayed in your report.

Sales rep: **Galager**

Year: **FY95**

Country	Sales Person	Revenue
France	Galagers	77,535
US	Galagers	186,366
Sum:		263,901.00

This information is updated if you run the query again and choose a different sales representative or year.

Using Outline View

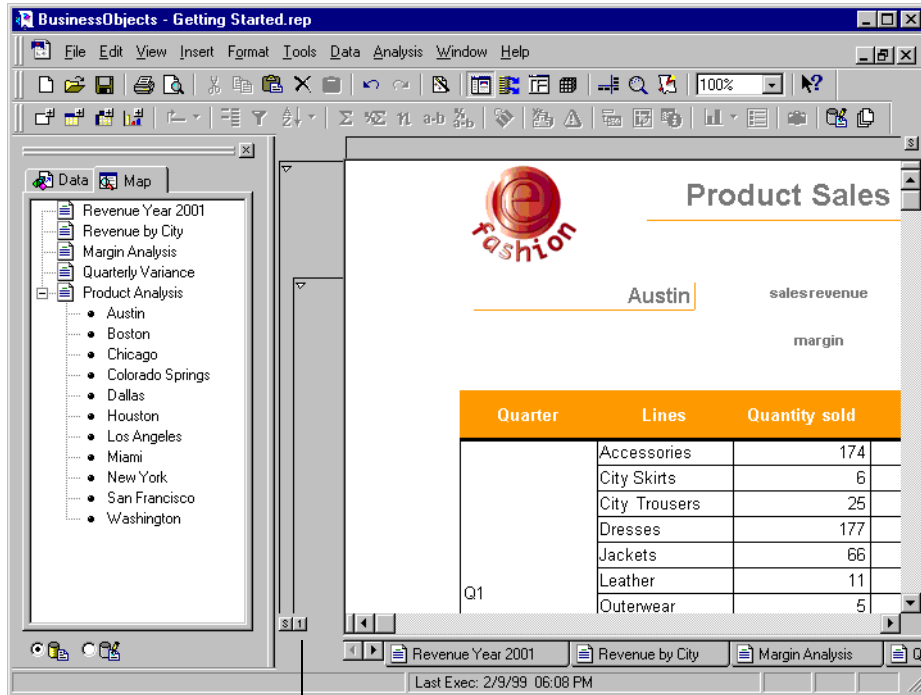
When you have a report in sections with a lot of information in each section, a convenient way of presenting the report is to use outline view. Outline view folds up the sections in the report to display only the high level information that you've included at the top of each section. People viewing your reports can then open up the sections they are interested in to get more details.

To turn on outline view:

- From the View menu, choose Outline.

A bar with arrows is displayed at the left side of the report window.

The number of buttons displayed at the bottom of the outline bar depends on the number of sections you have in the report. In the report illustrated below, there is a main section and a City section.

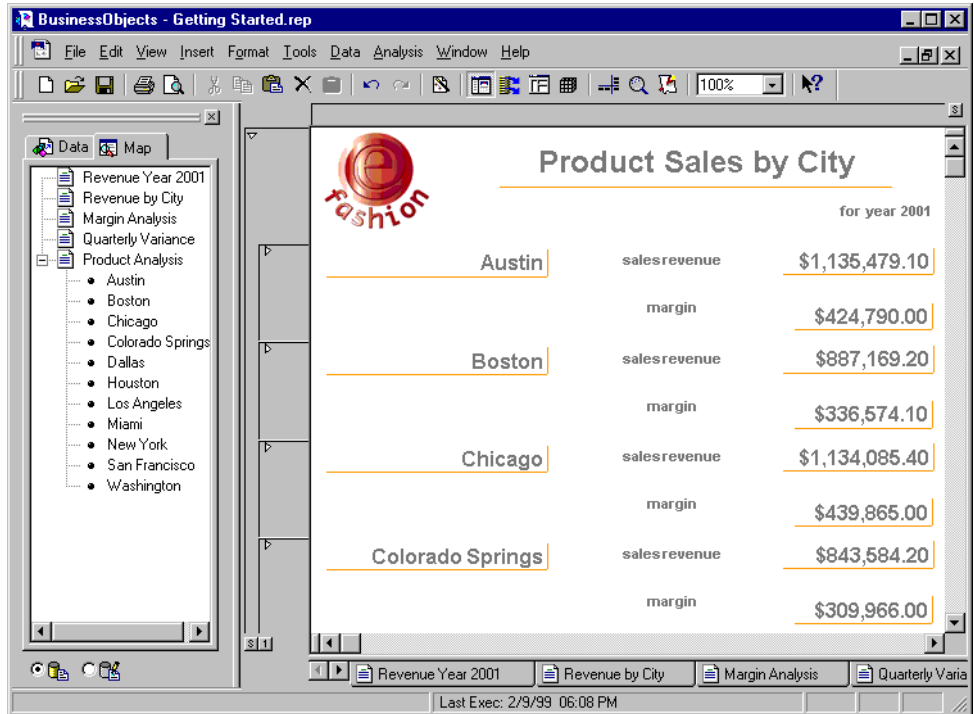


Click here to fold or unfold all sections.

If you click the S button, the main section is folded to display only the title and logo. If you click the 1 button, all section 1 City sections are folded to display only the section title, the name of the city and the section totals.

To view a report in outline view:

1. Click on the Report Manager Map tab.
This gives you a list of the sections in the report.



2. Click on the section you want to view in the Report Manager Map list.
The high level information for this section is displayed in the Report window.
3. Click on the arrow next to the section name in the Outline bar.
The selected section opens up and you can view the details for that section.

Chapter 25

Templates and Standard Report Styles

In this chapter

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Overview

This chapter describes how to set up templates and how to customize the standard report styles used to create standard reports.

Using templates saves you time if you regularly use the same structure and formatting for your reports. You make the settings once and then re-use them in all your reports.

Customizing standard report styles allows you to change the default shading, fonts, and other formatting that BUSINESSOBJECTS uses by default each time you create a standard report or insert a new table, cell, break or other component in an existing report.

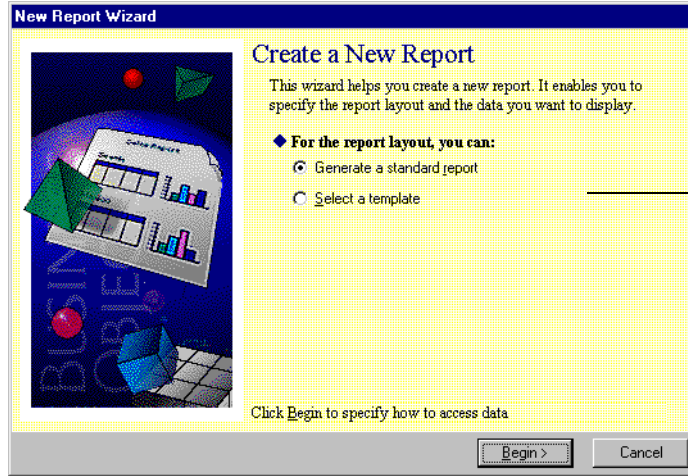
Who should read this chapter

Most of the information in this chapter concerns those users in your company who are designing templates and styles. If you are not designing templates and styles, all you need to know is how to:

- apply a template to your report
- use a template when you create a new document
- apply standard report styles to a report

What Are Templates And Standard Report Styles?

When you create a new document in BUSINESSOBJECTS, you choose the type of report layout your data will be displayed in. You can either generate a standard report or choose from a set of templates.



Choose the report layout here.

What is a standard report?

When you install BUSINESSOBJECTS and create your first standard report, your data is displayed in a table with a report title and has the default application formatting as illustrated below:

Free-standing cell _____

Report Title

Quarter	Sales revenue
Q1	\$3,326,172
Q2	\$2,840,651
Q3	\$2,879,303
Q4	\$4,186,120
Sum:	\$13,232,246

Table header

Table body

Table footer

The table header is dark blue, the body cells are pale yellow with text and numbers in Arial size 10 font and black borders. The table footer has a white background and free-standing cells have a black border.

Whenever you insert a new table, crosstab or free-standing cell in a report, this default formatting is used.

But what if your company always uses a green header row and different type of borders? Or you want to use a different font? Or you want to have a particular format every time you insert a break in a table or crosstab. Using the Standard Report Styles editor, you can customize and save these attributes so that every time you create a new standard report, or insert a new component in a report, you will have your own colors, fonts, number styles and so on.

The settings that define the styles used to create a standard report are contained in a file called default.ret. This file is stored in the BUSINESSOBJECTS template folder.

Since the settings used to create a standard report are contained in one file, you can customize these settings once and then distribute this file to all users in the company. Every time a user creates a standard report, the corporate formatting will be used.

Note: A standard report does not contain information on page setup such as margin sizes and page orientation. If you want to include this information when you create a new report, use a template. See “Making sure a template contains the correct standard styles” on page 613 for more information.

What is a template?

A standard report does not contain information on page setup or include custom elements such as graphics. A BUSINESSOBJECTS template allows you to do this. A template is a special kind of BUSINESSOBJECTS document that contains pre-defined styles and structure that you use as a foundation to create reports.

BUSINESSOBJECTS comes with several templates for you to use and you can also create your own.

Your own templates enable you to apply the same customized styles and structure to your reports. For example, if you always display your company's logo in the header of your reports, you can place the logo in the header of a template, then use the template when creating or formatting reports.

Templates contain a report structure and styles. You can either use a template when you create a report or you can apply a template to an existing report.

Structure

The structure of a report defines how the data is presented. Your data can be presented in a crosstab, a column chart, or it can have a master/detail structure for example. When you use a template, the data is displayed in the structure defined in the template using the formatting defined in the template.

Styles

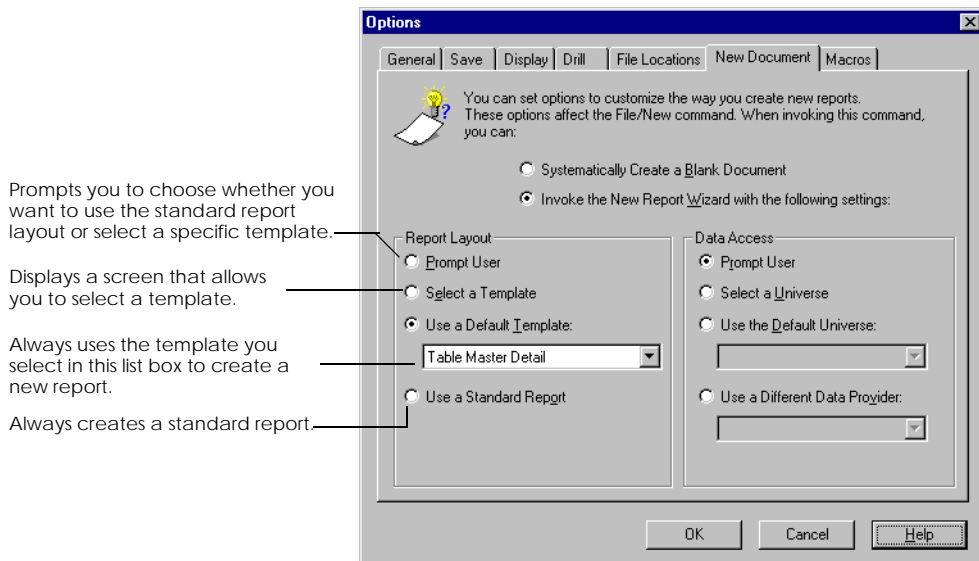
The styles contained in a template define the report page background and the style of the headers and footers.

Setting a default report layout

You can set default options for the layout you want to use when you create new reports with the New Report wizard. This allows you to always use the same template or to always create a standard report.

To do this:

1. From the Tools, choose Options.
The Options dialog box opens.
2. Click the New Document tab.
3. Set the required option in the Report Layout section.



Tip: If you have set a default universe and template, you can create documents without using the New Report Wizard. When you click the New button or choose New from the File menu, the Query Panel appears. The Classes and Objects list

presents the classes and objects of the default universe. When you build the query, the data appears in the layout provided by the default template you set.

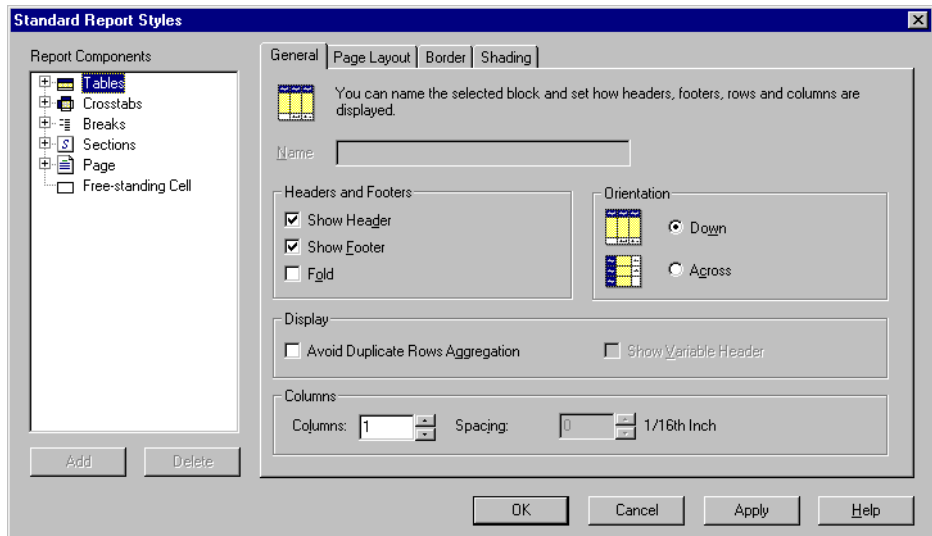
Customizing Standard Report Styles

You customize standard report styles in the Standard Report Styles dialog box. You can open the Standard Report Styles dialog box with or without a BUSINESSOBJECTS document open.

To open the Standard Report Styles dialog box:

- From the Tools menu, choose Standard Report Styles.

The Standard Report Styles dialog box opens:



The Standard Report Styles dialog box has two parts:

- Report Components

The Report Components box on the left-hand side of the dialog box displays a list of the components that make up a report. This includes tables, crosstabs and cells as well as section and page components and breaks. Each component in the list is given a name and is identified by an icon.

- Settings tabs

When you click on an icon in the list the tabs on the right-hand side of the dialog box display the formatting options that can be set for the selected component. These are the same tabs used on the format dialog boxes.

Some icons in the list have a plus sign next to them. Click on the plus sign to expand the list.

What you can change depends on the type of report component.

The following buttons are available on the Standard Report Styles dialog box:

Click...	To...
Add	Add a break or section level.
Delete	Remove a break or section level from the list.
OK	Save the changes you have made and close the dialog box. The changes are saved in the default.ret file.
Cancel	Close the dialog box without saving any changes you have made.
Apply	Apply the changes you have made to the active report. This button is not displayed if you do not have a document open.
Help	Open the on-line Help for a quick explanation of the dialog box options.

Note: You cannot set chart attributes in the Standard Report Styles dialog box.

Editing settings

To edit settings in the Standard Report Styles window:

1. Select the item you want to modify in the Report Component list.
The tabs display the formatting options available for the selected item.
2. Make the required settings on the tabs.
3. Click OK to save the changes and close the dialog box.

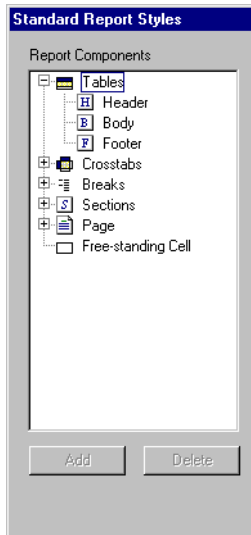
Editing settings and applying to an open report

If you have a document open and want to apply the changes you have made in the Standard Report Styles window immediately to the active report:

- When you have made the required changes in the Standard Styles dialog box, click the Apply button and then the OK button.

Tables

You can edit the default formatting and page layout options for tables.



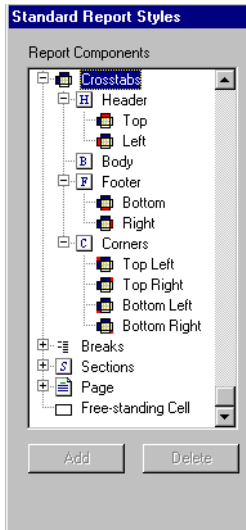
To edit general settings for tables, select the table icon in the list. General settings include whether to display headers and footers, table orientation and how page breaks are handled.

To edit the settings for the different elements that make up a table, click on the plus sign next to the table icon.

You can set different formatting for header, body and footer columns and rows.

Crosstabs

You can edit the default formatting and page layout options for crosstabs.



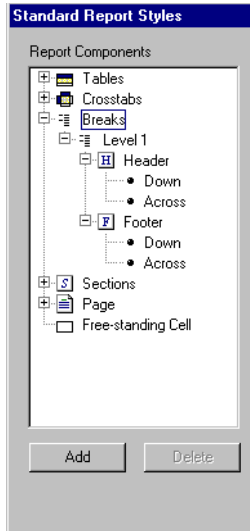
Select the crosstab icon to edit general settings for crosstabs. General settings include whether to display headers and footers and how page breaks are handled.

To edit the settings for the different elements that make up a crosstab, click on the plus sign next to the crosstab icon.

You can set styles for headers and footers, for the body cells of the crosstab and for the four corners of a crosstab.

Breaks

You can edit the settings for breaks you insert in tables and crosstabs. You can define up to nine different break levels with different attributes set for each level.



Click on the Breaks icon to edit settings that will apply to all breaks in the report.

Click on the Level n icon to edit settings that will apply to all level n breaks in the report.

Open the Level n folder and click on Down or Across to edit settings that apply only to the selected item.

Adding and deleting break levels

When you add a new break level, BUSINESSOBJECTS inserts the new level below the level selected when you click the Add button. The newly inserted break level has the same style settings as the break level under which it is inserted.

To add a break level:

1. Select the Break level under which you want to add a break.
2. Click the Add button.
A new break level is added to the list.

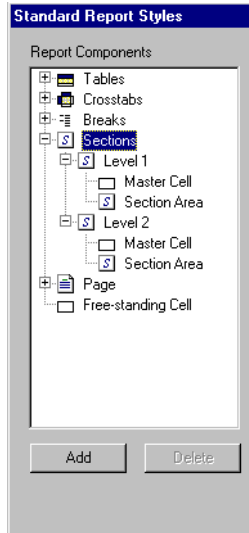
To delete a break level:

1. Select the break level you want to delete in the list.
2. Click the Delete button.

Sections

You can set different attributes for up to nine different sections in a report.

You can set attributes for the cells that are displayed at the top of each section and that contain the master value and for the background shading of the section.



Click on the Section icon to edit settings that apply to all the section levels in your report.

To edit settings for a particular section, click on the Level n icon and make the required changes.

To edit the settings for the different elements that make up a section, click on the plus sign next to the Level n icon to open up the section list.

Click on Master Cell to edit settings for the master cell.

Click on Section Area to edit the background shading for the selected section.

Adding and deleting sections

When you add a new section level, BUSINESSOBJECTS inserts the new level below the level selected when you click the Add button. The newly inserted section level has the same style settings as the section level under which it is inserted.

To add a section:

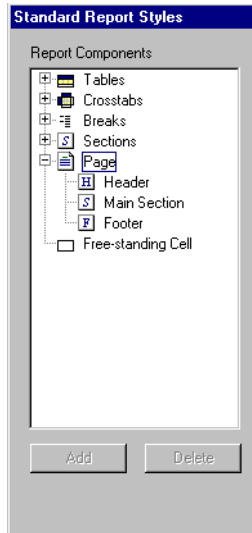
1. Select the Section level under which you want to add a section.
2. Click the Add button.
A new section is added to the list.

To delete a section:

1. Select the section you want to delete in the list.
2. Click the Delete button.

Pages

You can edit the background shading for the report page. You can either set the same shading for the whole page or set the shading for the page header, page body and page footer separately.



Select the Page icon to set the same shading for all three page elements.

To edit the settings for the different elements that make up a page, click on the plus sign next to the page icon.

You can set different shading for the page header, the main section (the page body) and the page footer.

Free-standing cells

Click on the cell icon to edit settings for free-standing cells.

Applying standard report styles

You can create a new standard report using your custom standard report style settings or you can apply your custom styles to existing reports.

You can apply your custom standard report styles to the whole report or to a selected item.

Applying standard report styles to the report

- From the Format menu, choose Report and then Apply Standard Style.

Applying standard report styles to a selected component

You may want to only apply a standard report style to a selected table, crosstab or cell, for example. When you apply a standard report style to a selected component, only the formatting attributes are applied. The pagination and break settings are ignored so that your report layout is not disorganized.

1. Make sure the Report Manager window is open.
2. Click on the Map tab.
3. Click the Structure option button.
A list of all the components in the report is displayed.
4. Right-click on the component you want to apply the standard report style to.
5. Choose Apply Standard Style from the menu.

Tip: For a section or cell, you can right-click on the component you want to apply the standard report style to and choose Apply Standard Style from the menu.

Making sure everyone uses the same standard report styles

Any changes you make to the standard report style settings are saved in the default.ret file. This allows you to customize the standard report styles once using your corporate formatting and then distribute the default.ret file to all users in a company via the repository. To do this:

1. Edit and save the standard report styles on your computer.
2. Make sure all users in the company are using the same default.ret file. There are several ways of doing this:
 - send the default.ret file to all users and have them copy it into their BUSINESSOBJECTS template folder
 - change the template folder location to point to the folder containing the customized default.ret file; you can also do this during installation
 - use a master/ shared installation

A word about the default.ret file

If BUSINESSOBJECTS cannot find the default.ret file, it will re-create one using the default application settings and the standard report created may not reflect any changes you have made.

Make sure the default.ret is in the Template folder in the BUSINESSOBJECTS folder. If you have changed the default location of your templates in your BUSINESSOBJECTS options, make sure the default.ret file is in this folder.

Making sure a template contains the correct standard styles

To make sure that the standard styles you want to use are saved in a template, apply these styles to a report before saving it as a template:

1. Make all your required formatting settings in the Standard Report Styles window and save.
2. Create a Standard report using these settings or apply the new standard styles to an existing report.
3. Set up the report page layout, margins, and add any other elements you want to include in the template.

4. Save this report as a template in the folder where your BUSINESSOBJECTS templates are saved.
You can now use this template to create new reports.

Note: The standard report styles saved with this template are the ones set at the time of creating the template. This means that if, at a later date, you change settings in the Standard Report Styles window, the styles saved in the template will not be the same.

Using Templates

You can use a template in the following situations:

- When creating a report.

The New Report Wizard includes a dialog box that enables you to view and select the template you want to use. The styles and structure of the template are applied to the new report.

- When formatting an existing report.

When you apply a template you can choose to apply the template styles only, or to apply the styles and the structure.

If you choose to apply the styles and the structure, you can also manually replace certain variables in the template with certain variables from the report.

Note: Universe Designers can apply formats (Alignment, Font, Border, Shading) to objects when creating universes. These formats are used even if you use a template with different formats. If you are designing templates, we recommend you talk to the person designing universes in the company to make sure you are using the same formats.

Creating a template

Set up the report you want to use as a template with all the required formatting, margin settings etc.

1. Make sure the report that you want to use as a template is active.
2. Choose Save As from the File menu.
The Save Document As dialog box appears.
3. Click the *Save as type* box, then click *BusinessObjects Templates (*.ret)*.
4. Select the folder in which you want to save the template.
If you want the template to be available in the New Report Wizard, you must save it in the Template folder in the BUSINESSOBJECTS folder.
5. Type the name of the template in the File Name box, then click OK.
Templates are saved as .ret files.

Changing the default template folder

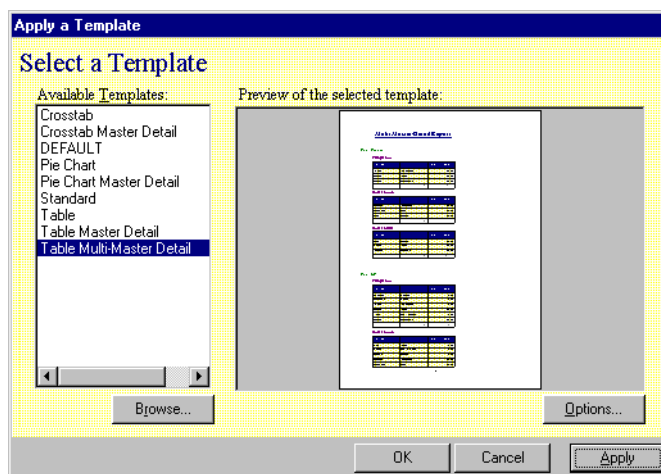
To set a default folder other than Template in which to save your templates

1. From the Tools menu choose Options.
2. Click on the File Location tab.
3. Click User Templates.
4. Click the Browse button to select the folder you want to use.

Applying a Template

You can quickly format an existing report by applying a template.

1. Display the report you want to format.
2. From the Format menu, choose Report then Apply Template.
The Apply a Template dialog box appears:



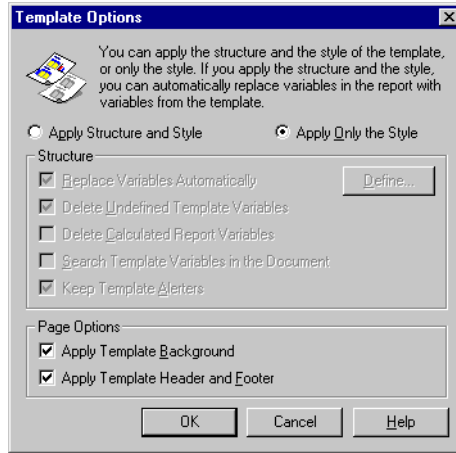
3. Select a template from the Available Templates list.

Note: If the template you want to use is located in a folder other than the one set in the File Locations tab on the Options dialog box, click Browse. A dialog box appears, and enables you to select the folder where the template is located.

4. The next step depends on what you want to do:

If you want to...	Click...	Then...
Apply the template styles and structure to the report	OK.	BUSINESSOBJECTS applies the template to the report.
Choose what to apply from the template to the report	Options.	The Template Options dialog box opens.

5. In the Template Options dialog box, click *Apply Only the Style* if you want to apply the page background and header/footer contained in the template. Only the options in the Page Options section are now available:



6. If you do not want to apply the background or header/footer, deselect *Apply Template Background* and *Apply Template Header and Footer*, respectively.
7. Click *Apply Structure and Style* if you want to apply the template's style and its structure (blocks, sections) to the report.
This option:
 - Activates the options in the Structure box.
 - Enables you to replace variables in the template with variables from the report. For information on how to do this, refer to “Replacing variables in a template with variables from a report” on page 619.
8. Click OK, then click Apply or OK in the Apply a Template dialog box.

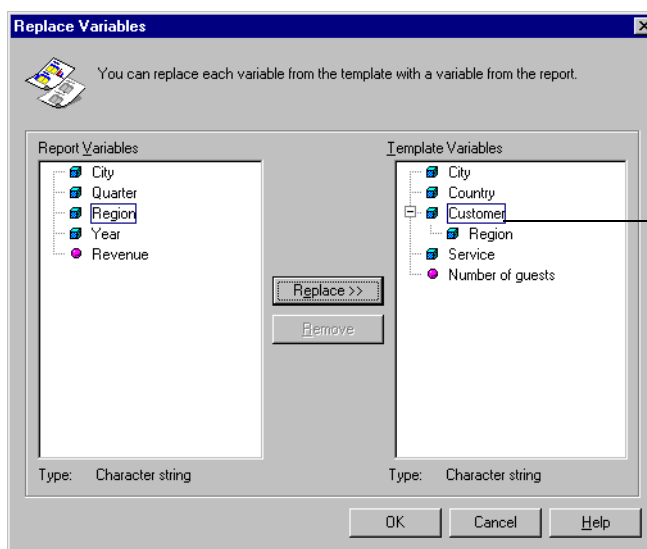
Note: You cannot apply templates created using BUSINESSOBJECTS 4.1 to reports created using BUSINESSOBJECTS 5.x and vice versa.

Replacing variables in a template with variables from a report

When you apply a template, by default BUSINESSOBJECTS chooses how to place the variables in the report into the template structure.

You can also choose manually how you want to map variables in the report to variables in the template structure. To do so:

1. From an open a report, choose **Apply Template** from the **Format** menu.
The **Apply a Template** dialog box appears.
2. Click the **Options**
The **Template Options** dialog box appears.
3. Click **Apply Structure and Style**.
The options in the **Structure** box are now active.
4. Uncheck **Replace Variables Automatically**, then click **Define**.
The **Replace Variables** dialog box appears.
5. In the **Report Variables** box, click the report variable you want to map to the template variable.
6. In the **Template Variables** box, click the template variable to be replaced by the report variable, then click **Replace**.
The variable from the report appears in the **Template Variables** box:



Here, the user has replaced **Customer** with **Region**. **Region** will appear in the report where **Customer** appears in the template.

7. Repeat step 6 to replace other variables, then click OK.
To undo a replacement, click the variable in the Template Variables box, then click Remove.
8. In the Template Options dialog box, click OK.
You return to the Apply a Template dialog box.
9. Click Apply or OK.
BUSINESSOBJECTS applies the template to the report.

Chapter 26

Including Graphics and Other Data Objects

In this chapter

- ❑ **Overview 620**
- ❑ **Using Data and Pictures from Other Applications 621**
 - Inserting Data and Pictures from Other Applications 621
 - Editing Inserted OLE 2 Objects 624
- ❑ **Using Pictures in Reports 626**
 - Inserting a Picture in a Cell 626
- ❑

Overview

BUSINESSOBJECTS is open to working with data from and in other applications. This means that you can bring in data and pictures from other Windows applications, and display these in BUSINESSOBJECTS reports. You can also transfer data from BUSINESSOBJECTS reports to other applications, such as Microsoft Excel.

BUSINESSOBJECTS supports Microsoft Object Linking and Embedding version 2 (OLE 2). This feature creates objects from files that come from other applications that also support OLE 2. An OLE 2 object can be a word processing file, a spreadsheet, a picture, and so on.

You can *embed* an OLE 2 object in a BUSINESSOBJECTS report, which means that the object physically resides in the report. You can also *link* OLE 2 objects, which means that the data or picture remains in its native application and is displayed in BUSINESSOBJECTS thanks to a dynamic link. Finally, you can link or embed BUSINESSOBJECTS reports in other applications that support OLE 2.

BUSINESSOBJECTS also supports the Microsoft Dynamic Data Exchange (DDE) feature. This feature enables you to use data from BUSINESSOBJECTS reports in other applications. DDE ensures that the data in the remote application is dynamically updated when the data in the host application, i.e., BUSINESSOBJECTS, changes.

Note: You can also exchange data from BUSINESSOBJECTS with other applications by exporting data to different file formats. For example, you can export the results of a query to dBASE or Microsoft Excel format. To find out about exporting data to different file formats see Chapter 8 "Exporting Data From BusinessObjects" on page 175.

Using Data and Pictures from Other Applications

You can use data and pictures from other applications in BUSINESSOBJECTS. The data and pictures you can use are *objects* that you or other users created in remote applications. For example, a Microsoft Word document is an object that you can insert in a BUSINESSOBJECTS report.

Inserting Data and Pictures from Other Applications

Object Linking and Embedding (OLE 2), developed by Microsoft Corporation, enables you to share data and pictures between Windows applications. BUSINESSOBJECTS supports OLE 2, which means that you can insert OLE 2 objects inside BUSINESSOBJECTS reports, and use BUSINESSOBJECTS reports as OLE 2 objects in other applications.

When you link or embed an object in a BUSINESSOBJECTS report, you display an object from a remote application. The differences between linking and embedding are as follows:

- When you create a link, the object does not physically reside in the BUSINESSOBJECTS report. It is represented there, but, thanks to the link, it remains in its native application. The link between the object's native application and BUSINESSOBJECTS updates the object's representation in the BUSINESSOBJECTS report. For example, if you insert a picture with a link, then modify the picture in its native application, you also modify the picture in BUSINESSOBJECTS.
- When you embed an object, it physically resides in BUSINESSOBJECTS.

To insert an object in a report, you must first select a cell. If you do not select a cell, BUSINESSOBJECTS prompts you to insert a cell in the active section and displays the object in the cell.

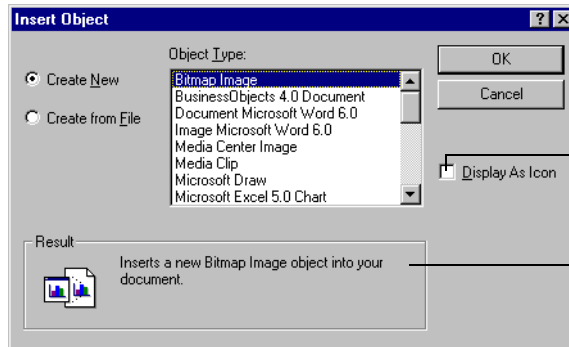
You insert objects in reports by using the Object command on the Insert menu. When you select this command, the Insert Object dialog box appears. This dialog box enables you to:

- Select the file that corresponds to the object that you want to insert.
- Start a remote application, for example Microsoft Word, in which you can create an object to insert.

The following sections describe these ways of inserting objects.

To create a new object to insert

1. Click the cell where you want the object to appear, then select the Object command from the Insert menu.
2. In the Insert Object dialog box that appears, click the Create New option button.
3. Click the type of object you want to create from the Object type list, as shown:



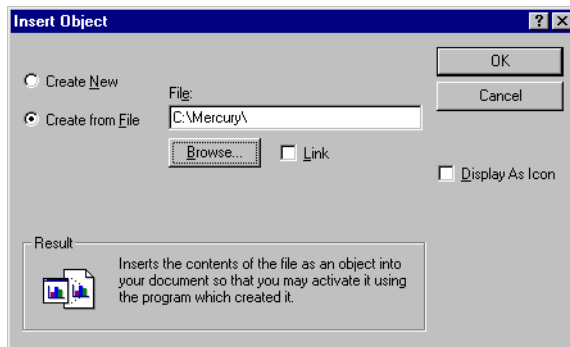
Click Display Icon to display the object as an icon in the report. You open the object by double-clicking its icon.

Information on the object type you select appears here.

4. Click OK.
Depending on the type of object you want to create, one of two things now occurs:
 - If the application you use to create the object supports OLE 2, the application now appears in the cell you selected. The application's name replaces BUSINESSOBJECTS in the title bar, and the application's menus appear.
 - If the application does not support OLE 2, it opens on top of the BUSINESSOBJECTS window.
5. Create the object in the remote application.
6. To return to BUSINESSOBJECTS:
 - If the remote application supports OLE 2, you simply have to click outside it.
 - If the application does not support OLE 2, select the Exit command. The object appears in the cell you selected.

To insert an existing object

1. Select the cell where you want the object to appear, then select the Object command from the Insert menu.
2. In the Insert Object dialog box that appears, click the Create from File option button.



3. To locate the file (object) you want to insert, type a path in the File text box, or click Browse to select the file.
4. Click Link if you want to link the object. If you do not click Link, you embed the object in the report.
5. Click OK to close the dialog box.
The object appears in the cell you selected.

Notes: If you do not select a cell before selecting the Object command on the Insert menu, BUSINESSOBJECTS invites you to create a new cell in which the object will appear.

You should avoid saving reports that contain OLE 2 objects as PDF documents as you may encounter problems viewing the OLE 2 objects.

If you encounter problems viewing OLE 2 objects in reports that have been shared, this may be because they have been shared via Enterprise Server products installed on UNIX. You should contact your WEBINTELLIGENCE or BROADCAST AGENT administrator.

To insert a logo or other image in a report and save the report as a PDF document or share it via Enterprise Server products installed on UNIX, you should save the image as a bitmap (.bmp). You can do this in Microsoft Paint or a similar application.

Editing Inserted OLE 2 Objects

Once you have inserted an object in a BUSINESSOBJECTS report, you can edit the object. You can:

- Edit the object itself by calling the application in which it was created. You can then work on the object's file, then save it. The new version of the object is displayed in BUSINESSOBJECTS.
- Edit the link between BUSINESSOBJECTS and the object's source file. This is the case for objects that you insert with a link, rather than objects that you embed. You must edit the link if, for example, the object's file is moved to a different location. If you do not, the link is lost and the object is no longer displayed in the report.

These two ways of editing objects are described in the following section.

Editing an inserted object

OLE 2 enables you to edit an object “in place”. This means that you can edit the object without leaving BUSINESSOBJECTS. This feature is only available if the application in which the object was created supports OLE 2.

If in-place editing is not available, you can open the object in its native application. You can then edit the object, save its file, and return to BUSINESSOBJECTS, where the edited object is displayed.

To edit an object in place

When you edit an object in place, the commands and toolbars you need to edit the object appear in BUSINESSOBJECTS. The application name in the title bar changes from BUSINESSOBJECTS to the name of the remote application.

To edit an object in place, you can:

- Double-click the object in the report.
- Click the object, then select the Object>Edit command from the Edit menu or the Edit Object command from the popup menu.

A hatched border appears around the object. When you have finished editing the object, click anywhere outside the object's borders to return to the BUSINESSOBJECTS interface, and save the active document.

To edit an object in its native application

If the object's application does not support in-place editing, you must open the application when you want to edit the object. To do so:

- Double-click the object.
- Click the object, then select the Object>Open command from the Edit menu, or the Open Object command from the popup menu.

The object appears in its native application. To return to BUSINESSOBJECTS when you have finished editing the object, save the file and exit the application. The edited object appears in the report.

Using Pictures in Reports

You can display pictures in BUSINESSOBJECTS reports. You can display a picture in a cell, or use a picture as a page background on every page of the report.

The pictures that you use can be static files, or they can be objects enabled by OLE 2 (Object Linking and Embedding).

Inserting a Picture in a Cell

This section describes how to insert static pictures in report cells. Examples of inserting static pictures in cells include using a logo in a title cell at the top of a report, or a picture of a product that features in a report.

To insert a static picture in a cell:

1. If you want to insert the picture in a new cell, click in a blank part of the report. Select the Picture command on the Insert menu, then click in a blank part of the report once again. Hold down your mouse button, then drag the mouse to draw the cell in which the picture will appear.
If you want to insert the picture in an existing cell, click inside it, then select the Picture command on the Insert menu.
The Open dialog box appears.
2. Select the picture's file, then click Open.
The picture appears in the cell.

You can also insert a picture by double-clicking inside a cell and typing the picture's path and file name (e.g., `c:\pictures\picture.bmp`). Then, click inside the cell and select the Cell command on the Format menu. In the Number tab of the Cell Format dialog box, select the Image category and Bitmap or TIFF format. When you click OK or Apply, the picture appears in the cell.



Part VII

Appendix

Appendix A

Launching BusinessObjects with the Run Command

In this appendix

- **Overview 630**
- **Using the Run Command 630**
 - Run Command Options 631
 - Specifying BOUSER, BOPASS and Other Variables 632

Overview

This appendix explains how to run BUSINESSOBJECTS by using the Run command on Windows. You can use the Run command as an alternative way of double-clicking the BUSINESSOBJECTS icon. You can also specify command line options such as your user name, password and other options.

Using the Run Command

The following procedure describes how to launch BUSINESSOBJECTS by using the Run command. The options you can include in the Run command are listed and explained in “Run Command Options” below.

1. Click the Start button, then click the Run command.
The Run dialog box appears.
2. In the Open text box, enter the path to the BUSINESSOBJECTS executable file (Busobj.exe). By default, this file is located in the BusinessObjects folder. You can click Browse to specify the path, rather than type it.
3. Click OK.
The User Identification dialog box appears.
4. Enter the user name and password that your BUSINESSOBJECTS supervisor provided, then click OK.
The BUSINESSOBJECTS application is now launched.

Run Command Options

You can use Run command options to log in to BUSINESSOBJECTS with your user name and password. The table below describes the options that you can use.

Option	Description
-user [user name]	The user name assigned to you by your supervisor. User names that include spaces must be written in double quotes, e.g., "user name".
-pass [password]	The password assigned to you by your supervisor. This option is mandatory if you enter the -user option. Passwords that include spaces must be written in double quotes, e.g., "my password".
-online or -offline	By default, the last connection mode of the specified user, or "online" the first time you launch BUSINESSOBJECTS. Offline mode disconnects you from the repository and therefore disables remote connections during your work session.
rename.rep	The name of the document that you wish to work with on launching BUSINESSOBJECTS. You must include the path to this file, for example: c:\BusinessObjects\userdocs\sales.rep
-keyfile [keyfile name]	If you are working with multiple repositories, specifies the repository you want to work with.
-nologo	Runs BUSINESSOBJECTS without showing the logo screen.
-vars myfile.txt	Name of a text file in which variables are specified. You can specify BOUSER and BOPASS, which manage your access to BUSINESSOBJECTS. You can also declare your own variables in the file. For more information on these variables, refer to "Specifying BOUSER, BOPASS and Other Variables" below.

Tip: In the file you declare after the -vars option, you can also specify the variables such as DBUSER, DBPASSWORD and DBDSN. (The names of such variables depend on the database at your site). These variables can be used to define a restriction on an object, for example. For further information on these variables, refer to "BUSINESSOBJECTS Variables" in the *Database Guide* included in your BUSINESSOBJECTS package.

Specifying BOUSER, BOPASS and Other Variables

You can use the BOUSER and BOPASS variables to manage your access to BUSINESSOBJECTS. You can specify the values of these variables in the Run command, or in a file that you call from the Run command. Other variables can be declared in this file.

BOUSER and BOPASS

When the BUSINESSOBJECTS supervisor creates users, he or she assigns each one a user name and password. The user's name and password are stored on the repository. When you log in to BUSINESSOBJECTS in online mode, which is the default working mode, BUSINESSOBJECTS connects to the repository and reads your security information. Your user name and password are then written to either the objects.lsi file or the objects.ssi file, located in either the ShData folder or the LocData folder.

Once you have launched BUSINESSOBJECTS in online mode, you can use the BOUSER and BOPASS variables in the Run command. You can:

- Declare the value of the variables after `-user` and `-pass`.
For example, if your supervisor assigned you the user name JOHN and the password SMITH, you can write the following command:

```
c:\BusinessObjects\Busobj.exe -user JOHN -pass SMITH
```

- Declare the variables and their values in a text file in the BusinessObjects folder. Then, in the Run command, you specify the file name after the `-vars` option.

For example, if your supervisor assigned you the user name JOHN and the password SMITH, you create a .txt file (myfile.txt) in which you specify:
BOUSER=JOHN
BOPASS=SMITH

You can now use the following Run command:

```
c:\BusinessObjects\Busobj.exe -vars myfile.txt
```

Note: User names and passwords that contain spaces must be written in double quotes, e.g., "user name". You must use upper-case characters when specifying the variables that manage security, as in the example above.

Other variables you can specify in a file

In the .txt file that you declare after the -vars option, you can specify other variables that you work with in BUSINESSOBJECTS. For example, if you have created a variable that displays a prompt when a query is run, you can specify this variable's value in the .txt file. The syntax is as follows:

```
VARIABLENAME=VALUE
```

Specifying prompt values in a file

When you open a report from the command line and specify the value of a prompt, BUSINESSOBJECTS treats the prompt as a global variable. If you then close the report, re-open it from the user interface and refresh it, the Values button on the prompt dialog box is grayed out. This is because BUSINESSOBJECTS still treats the prompt as a global variable, but is no longer able to locate its value(s) because the report was not opened from the command line.

To enable the Values button again, rename the prompt. BUSINESSOBJECTS now treats the prompt as a local variable and is able to associate a list of values with it.

Appendix B

BusinessObjects and Visual Basic for Applications

In this appendix

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 - What is an add-in? 638
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 - Running Visual Basic Editor 644

Overview

You can customize BUSINESSOBJECTS 5.x using the Microsoft Visual Basic for Applications programming language. BUSINESSOBJECTS 5.x has a Visual Basic Editor that you can use to develop macros, add-ins and VBA data providers. The Visual Basic Editor is the standard Microsoft VBA editor that you may already be familiar with if you use Microsoft Office products.

This chapter describes how to use macros and add-ins in BUSINESSOBJECTS. For information on building VBA data providers, see “Using Visual Basic for Applications Procedures” on page 142.

What is a macro?

A macro is a series of commands and functions that are stored in a Visual Basic for Applications module and can be run whenever you need to perform the task. If you perform a task repeatedly, you can automate the task with a macro. You create macros using the Visual Basic Editor.

What is an add-in?

Add-ins are programs that add optional commands and features to BUSINESSOBJECTS. Add-ins are usually created by those responsible in your company for adding customized features to BUSINESSOBJECTS. All you probably need to do is install and uninstall add-ins that are sent to you.

Before you can use an add-in, you must install it on your computer and then load it in BUSINESSOBJECTS. Add-ins (*.rea files) are installed by default in the UserDocs folder in the BUSINESSOBJECTS folder. Loading an add-in makes the feature available in BUSINESSOBJECTS and adds any associated commands to the appropriate menus.

Unloading an add-in removes its features and commands from BUSINESSOBJECTS, but the add-in program remains on your computer so you can easily load it again.

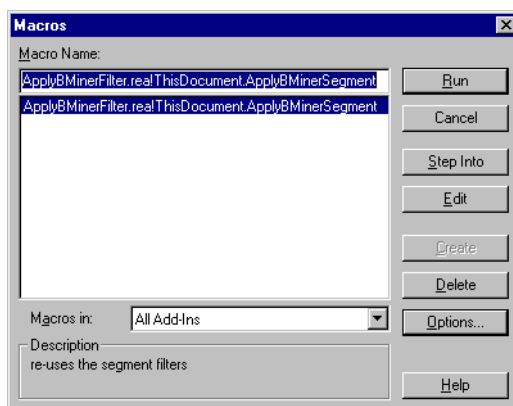
You can use your own Visual Basic for Applications programs as custom add-ins. For information about making a Visual Basic for Applications program an add-in, see the *BUSINESSOBJECTS SDK Reference Guide*.

Using Macros

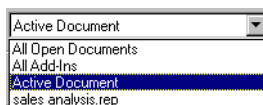
Macros are created and stored inside BUSINESSOBJECTS documents (.rep files) or BUSINESSOBJECTS add-ins (.rea files). You can run macros either from the Macros dialog box or from the Visual Basic toolbar if macros have been assigned to the macro buttons.

Running a macro

1. From the Tools menu, choose Macro and then Macros or click the Macros button on the Visual Basic toolbar.
The Macros dialog box opens.



2. From the Macros in: list box, choose the documents where the macros are stored. You can display the macros available in the active document, all macros in all open documents, macros in a selected open document or macros in add-ins.



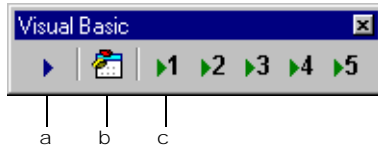
The macros stored in the selected document(s) are displayed in the Macro Name list.

3. Select the name of the macro you want to use and click Run.

Using the Visual Basic toolbar

To open the Visual Basic toolbar:

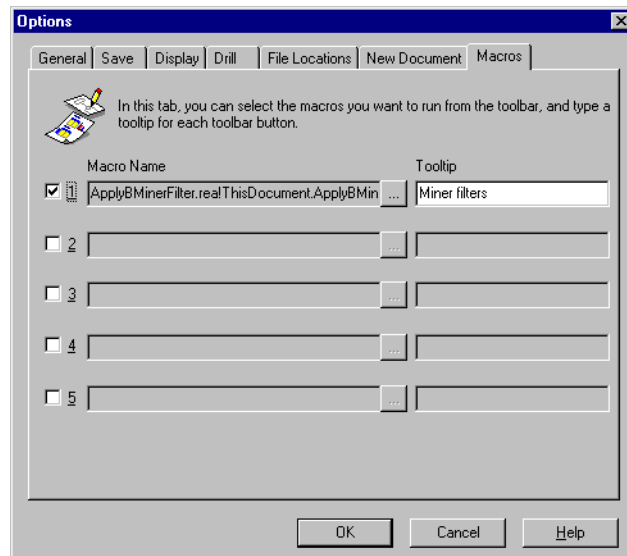
- Right-click on any other open toolbar and choose Visual Basic from the menu.



- Opens the macros dialog box
- Opens the Visual Basic Editor
- Buttons 1-5 run the macros that have been assigned to them

Associating a macro to a toolbar button

1. From the Tools menu, choose Options.
The Options dialog box opens.
2. Click the Macro tab.



3. Click check box 1 to activate the first button on the Visual Basic toolbar.

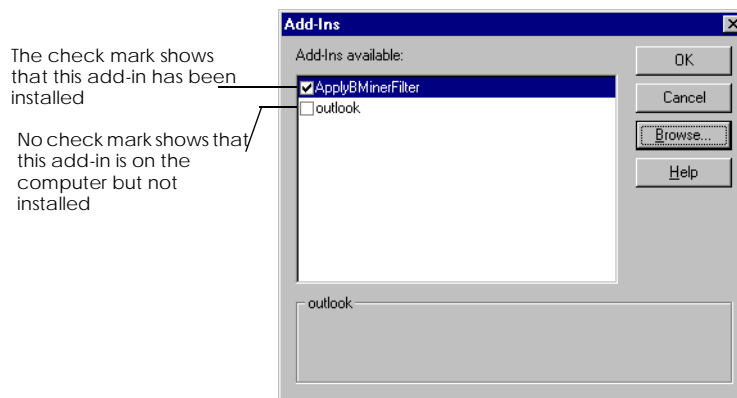
4. Click the button to the right of the Macro Name box.
The Macros dialog box opens.
5. Click on the macro you want to use from the list and click the Select button.
The name the macro is displayed in the Macro Name box.
6. In the Tooltip box, type the tooltip that you want to use for the macro.
The tooltip appears when you rest the cursor over the button on the Visual Basic toolbar.

Using Add-Ins

BUSINESSOBJECTS add-ins are Visual Basic for Applications programs that add optional commands and features to BUSINESSOBJECTS. You can distribute add-ins you have created to other users and retrieve and use add-ins that others have created.

Installing an add-in

1. From the Tools menu, choose Add-Ins.
The Add-Ins dialog box opens.



2. Click the Browse button to locate and open the add-ins on your computer.
The Add-Ins Available box displays the list of available add-ins. There are two types of add-ins that you may see in this dialog box: those that are available and those that have been installed. You cannot use an add-in until it has been installed.
3. Click the check box next to the name of the add-in and click OK.
The add-in is installed and can now be used.

Note: When a user installs an add-in, it is only installed for that user. If that user logs on under a different name, the add-in will not be available.

Using an add-in

You can run an installed add-in from the Macros dialog box, or you can associate it with a button on the Visual Basic toolbar.

Uninstalling an add-in

1. Click the check box next to the add-in name in the Add-Ins dialog box to remove the check mark
2. Click OK.
The add-in features and commands are removed from BUSINESSOBJECTS, but the add-in program remains on your computer so you can easily load it again if you want to use it.

Exchanging add-ins with other users

You can send and retrieve add-ins (.rea files) in the same way you can send and retrieve BUSINESSOBJECTS documents.

Using the Visual Basic Editor

You can open the Visual Basic Editor directly from BUSINESSOBJECTS to create macros and programs to use in BUSINESSOBJECTS. This development environment has its own set of online Help files.

Running Visual Basic Editor



Visual Basic Editor

To open the Visual Basic Editor:

- Click the Visual Basic Editor button on the Visual Basic toolbar.

The Visual Basic development environment opens up.

Programming in Visual Basic requires knowledge of the programming environment and this is covered in the *BUSINESSOBJECTS SDK Reference Guide*.

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