



Crystal Reports 2008 Official Guide (Business Objects Press)

By Neil Fitzgerald

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CRYSTAL REPORTS® 2008
OFFICIAL GUIDE

Whether you're a DBA, data warehousing or business intelligence professional, reporting specialist, or developer, this book has the answers you need. Through hands-on examples, you'll systematically master Crystal Reports and Xcelsius 2008's most powerful features for creating, distributing, and delivering content. One step at a time, long-time Crystal Reports insiders take you from the basics through advanced content creation and delivery using Xcelsius, Crystal Reports Server, crystalreports.com, and the offline Crystal Reports Viewer. Every significant enhancement introduced in Crystal Reports 2008 is covered, including its new visualization options and more robust Web services capabilities. The book concludes by showing how to use Crystal Reports' powerful .NET and Java SDKs to customize and extend enterprise reporting in virtually unlimited ways.

- Learn hands-on, through step-by-step examples and exercises—and discover tips and tricks proven in real-world enterprise environments
 - Master new Crystal Reports 2008 features, including interactive report viewing, Xcelsius dashboarding, Flex, and Flash integration, Report Designer improvements, report bursting, and more
 - Publish professional-quality reports against virtually any data source, including relational and OLAP databases, Universes, SAP, PeopleSoft, JavaBeans, .NET/COM objects, XML, and more
 - Discover advanced visualization techniques using Xcelsius, charts, and maps
 - Learn methods for distributing reports and integrating content into other applications
 - Learn about the latest reporting addition to the Business Objects family—Xcelsius and begin creating dynamic and interactive dashboards

NEIL FITZGERALD has spent several years working at Business Objects and with one of Business Objects' largest providers of custom BI and enterprise reporting solutions.

BOB COATES currently works as a Sales Consultant for Business Objects, an SAP company, where he has been employed for more than eleven years.

RYAN GOODMAN is the founder of Centigon Solutions, Inc., and remains one of the top Xcelsius experts and evangelists in the world.

MICHAEL VOLOSHKO is a senior presales consultant for the financial services team at Business Objects.

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- Bonus chapters, tips, tricks, and links to great reporting resources

CATEGORY: Database

COVERS: Crystal Reports 2008, Crystal Reports Server 2008, Crystal Reports Viewer, crystalreports.com, Xcelsius 2008

USER LEVEL: Beginning—Intermediate

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INTRODUCTION

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Introduction to Information Delivery

Organizations of all sizes today find themselves increasingly awash in data, yet hungering for information to help them meet their business objectives. These corporations, from Main Street and Wall Street alike, have spent large amounts of time and money over the past 10 or so years implementing systems to help collect data on and streamline their operations. From monolithic Enterprise Resource Planning (ERP) systems (SAP, PeopleSoft, Oracle Financials, and so on) through Customer Relationship Management (CRM) systems (Siebel, Rightnow.com, Salesforce.com, and so on) to Custom Data Warehousing projects, these firms are now looking for ways to extract value from the collective body of data to help them run their businesses more productively and competitively. These firms are looking for a strategic information delivery or business intelligence solution to help them become more productive and ultimately compete more effectively. The products covered in this book are geared toward meeting that challenge.

The information delivery products and solutions presented in this book are often categorized under the *Business Intelligence (BI)* banner. BI is the industry of value-added information delivery based on structured data sources—essentially providing meaningful, business-driven value and information to business end users by connecting them to data with appropriate tools and products. Figure I.1 highlights the conceptual divide of information delivery solutions into the structured and unstructured world. Although evidence suggests an eventual blurring of the boundaries between these discrete industries over time, the Business Objects products covered in this book most aptly fit under the BI banner.

Figure I.1

The information delivery industry divides broadly into structured and unstructured information management.

Industry analysts in the information delivery area regularly highlight the impressive adoption rates of BI products in the past few years as testimony to their value. The dynamic double-digit percentage growth rates for industry leaders such as Business Objects are especially impressive when the difficult macroeconomic operating environment of recent years is taken into account. Ironically, many suggest, this same poor economic environment has largely driven the increased worldwide demand for BI functionality as firms work to increase their productivity and competitiveness by leveraging existing investments—and doing more with less. The next section covers the BI industry driver along with a few others.

Spectrum of Business Objects Product Usage

BI products such as those distributed by Business Objects (Crystal Reports, Crystal Reports Server, BusinessObjects Enterprise, Crystal Xcelsius, and Web Intelligence) are deployed and used in about as many different ways as there are product implementations—and there are millions. However, as you examine a broad swath of BI clients and their implementations, you can find definite themes to their deployments.

Taking a step back, distinctive drivers to worldwide BI product adoption become evident. The following sections discuss a few of the most common.

Custom Information Delivery Applications

Despite the increasing functionality of turnkey software and web applications available today, corporations of all sizes still regularly look to custom-developed applications to provide them with unique competitive advantage and to meet their proprietary business requirements. These applications run the gamut in size from small business applications through large departmental applications to enterprise intranet and extranet applications. The key component of these custom projects is the integration of BI functionality, such as formatted reporting, ad hoc query, dashboarding, self-service web reporting, and/or analytic capabilities, within an internally developed application. Table I.1 highlights some typical examples of custom applications using the Business Objects suite of products to help deliver custom applications.

Table I.1 Sample Custom Information Delivery Applications

Application	Application Audience	Product Usage
Small retail chain's internal Java-based sales metrics application	Approximately 20 sales employees and managers	Using Crystal Reports Java Engine, the developer provides the sales team with Web access to on-demand metrics reports built into the intranet application.
Large portfolio	10,000+ high value customers of firm	Using Crystal Xcelsius and Crystal Reports Server, the management firm's developer provides access to the scalable client extranet application reporting infrastructure and facilitates those customers getting online web access to their portfolio reports.
Asset management firm's report batch of institution scheduling application	50,000+ clients	Using the Business Objects reporting server and scheduling engine, the developer's application dynamically creates tens of thousands of customized reports daily and automatically emails them to the appropriate clients in PDF and XLS formats.

A key strength of the Business Objects suite of products is that it lends itself readily to integration into custom applications. From the inclusion of basic formatted reports within Java/J2EE or .NET applications through the inclusion of rich ad hoc query and self-service reporting functionality in proprietary information product applications to provision of large-scale enterprise BI analytics, scheduling, and security functionality in a globally deployed application, the Business Objects suite of products can meet your requirements. Table I.2 provides a jump-point for those looking for each type of application integration covered in this book.

Table I.2 Custom Application Chapters Overview

Development Environment	Required Functionality	Part or Chapters
Java/J2EE	Prebuilt reports included in custom Java application	Part IV, Chapter 18
.NET	Prebuilt reports included in custom .NET application	Part IV, Chapter 19

Enterprise BI Initiatives

With the proliferation of BI tools and the acceleration of product adoption around the globe, there has been

concurrent pressure for the involved companies to standardize on a single set of products and tools—effectively a BI infrastructure or platform. The main arguments for such standardization include the following:

- Reduced total cost of product ownership
- Creation of enterprise centers of excellence
- Reduced vendor relationships
- Movement toward a BI infrastructure/platform

As BI products have matured from different areas of historical strength and their marketplace acceptance has grown, end user organizations have found themselves with disparate and incompatible BI tools and products across or even within the same departments in their organization. To eliminate the costliness of managing such a broad set of tools, many firms are now moving to adopt a single BI platform such as BusinessObjects Enterprise (or Crystal Reports Server for smaller businesses).

The infrastructure of BusinessObjects Enterprise provides a single architecture to manage all the content and tools required to serve an organization's structured information delivery requirements. Figure I.2 shows an end user map of a typical organization. To be productive, each type of end user in a company requires different types of tools. There are clear organizational benefits to a common infrastructure or centrally managed center of excellence, such as BusinessObjects Enterprise, which can meet the various end user and IT requirements.

Figure I.2

Organizational end user requirements map from Business Objects.

Details of the breakdown of this book are included later in this Introduction, but to jumpstart your learning on this type of BI application, Table I.3 can point you to the sections and chapters of particular relevance.

Table I.3 Enterprise Business Intelligence Chapter Overview

Enterprise Business Intelligence Focus	Chapter
Out-of-the-box product using Crystal Reports Server for small- and medium-sized businesses	Part IV, Chapter 17
Using crystalreports.com to distribute reporting content	Part IV, Chapter 17

Spectrum of BI Tool Users

Across the usage profiles of the thousands of BI scenarios/implementations, there generally exists a consistency in the types of people who become involved. Figure I.3 provides a relatively high level yet accurate graphic that shows a typical distribution of the people involved in BI implementations.

Figure I.3

Average BI implementation user distribution.

Each of the three communities outlined in the pyramid plays a key role in the ongoing success and operation of any BI implementation. The content creators and system administrators play perhaps the most important role in ensuring the short- and long-term success of any deployment because their work sets up the system content and tools from which the other users derive benefit. The information analysts generally come from across an organization's typical functions and are highly demanding users who require rich and highly functional interactive tools to facilitate their jobs as analysts. The last group is by far the largest group and

includes employees, partners, customers, and suppliers who rely on the BI implementation to provide timely, secure, and reliable information or corporate truths. This group tends to span the entire corporate ladder from foot soldiers right up to the executive suite—all of whom have the same requirement of simple information provision to enable them to complete their regular day-to-day assignments successfully.

Figure I.4 provides a schematic highlighting the distinction between the different content creation tools and the content delivery tools—BusinessObjects Enterprise, Crystal Reports Server, or Java/.NET reporting engines. This book breaks down into two sections covering these two themes: content creation (Chapters 1–16) and content delivery in all of its possible forms (Chapters 17–21) using some of the Business Objects suite of products.

Figure I.4

Content creation and content delivery schematic.

Content Creators (Information Designers)

Content creators provide the foundation to any BI implementation. This group uses content creation tools such as Crystal Reports, Crystal Xcelsius, Web Intelligence, Desktop Intelligence (formerly BusinessObjects), Excel, and so on. These users—primarily composed of IT folks but sometimes complemented with technically savvy business users—create the report content, dashboards, OLAP cubes, and reporting metadata that facilitates system usage and benefits derived from the other system users. Because these tasks are of paramount importance in an enterprise suite deployment, the entire first half of the book is dedicated to providing these folks with a comprehensive tutorial and reference on content creation using Crystal Reports and Crystal Xcelsius.

After content exists, it is ready for distribution through an infrastructure such as BusinessObjects Enterprise, the new Crystal Reports Server product, or a custom application. Finally, the content requires management. Another small but critical group of BI system users—the BI administrators—need to ensure that the system is deployed and tuned correctly to ensure optimal performance for the business end users.

Information Analysts

Although not the primary group in number, the information analysts in a BI deployment are those who are primarily responsible for the extraction of new business insights and actionable recommendations derived from the BI implementation. Using such analytic tools as Web Intelligence, Crystal Xcelsius, and Excel, these users spend their time interrogating, massaging, and slicing and dicing the data provided in the various back-end systems until they glean nuggets of business relevance. These users tend to come from a wide variety of functional areas in a company, including operations, finance, sales, HR, and marketing and all work with the provided BI tools to extract new information out of the existing corporate data set. Chapters 20 and 21 provide detailed information on using Crystal Xcelsius, and <http://www.usingcrystal.com> provides information on Web Intelligence and Microsoft Live Office plug-ins.

Information Consumers

This group of users composes the clear majority of those involved with a BI implementation. They are also the most diverse group and come from every rung on the corporate ladder. Executives who view corporate performance dashboards fit into this category, as would truck drivers who receive their daily mileage and shipping reports online through a wireless device. The common characteristic of members of this group is that their interactions with the BI system are not indicative of their primary jobs. Unlike the content creators and information analysts, information consumers have jobs outside of the BI implementation, and the key

measure of success for them is that the BI system helps facilitate their variety of assignments. Chapter 17 provides an introduction to the out-of-the-box Crystal Reports Server interfaces.

The Product Family from Business Objects

As Figure I.4 showed, the product family distributed by Business Objects is broken into two major segments: content creation and content delivery. This book is roughly split in two, with each section covering one of the topics in great detail. The primary products in the family covered in these sections are Crystal Reports (first section) and Crystal Reports Server, the Crystal Reports SDKs, and Crystal Xcelsius (second section). The content creation section of the book introduces Crystal Reports version 2008—the world standard for professional formatted reporting across the largest spectrum of data sources. The Crystal Reports Application Designer benefits from more than 15 years of development and provides an unparalleled combination of powerful functionality and report-design flexibility.

The content delivery half of the book covers the following Crystal Products and SDKs:

- **Crystal Reports Server**—New since version XI, Crystal Reports Server provides all the functionality of BusinessObjects Enterprise but is limited to a single multi-CPU server and is aggressively priced for small- and medium-sized businesses. This solution is a very attractive option for deploying BI and reporting solutions.
- **Crystal Xcelsius**—Xcelsius 2008 is a dynamic and customizable data visualization tool that enables users of different skill levels to create insightful and engaging dashboards from any data source with point-and-click ease. Xcelsius 2008 offers a comprehensive set of new features and integrations with Crystal Reports 2008, making it easy to put the power of dashboards into the hands of business users.
- **Crystal Vision**—New to version XI release 2, Crystal Vision provides a combination of the functionality of Crystal Reports Server with the newly acquired Crystal Xcelsius dashboarding functionality.
- **Crystal Reports Engine for .NET Applications**—The only third-party tool distributed with Visual Studio .NET, this reporting component enables .NET developers to quickly embed limited but powerful reporting functionality into their .NET applications.
- **Crystal Reports Engine for Java Applications**—Embedded in Borland's JBuilder and other Java IDEs, this reporting component enables Java developers to quickly embed limited but powerful reporting functionality into their Java applications.

What Is in This Book

This book is broken down into several sections to address the varied and evolving requirements of the different users in a BI deployment.

The entire first half of the book (Parts I through III) focuses exclusively on content creation with Crystal Reports. Through hands-on step-by-step examples and detailed descriptions of key product functionality, you learn to leverage the powerful report creation capabilities of Crystal Reports v2008. Some profiles of people who find these sections of particular relevance:

- New and mature Crystal Reports designers
- Professional Crystal Reports designers upgrading to 2008
- Existing and new OLAP Intelligence, Web Intelligence, and Desktop Intelligence (formerly Business Objects) designers and analysts
- Existing and new BusinessObjects Enterprise (formerly Crystal Enterprise) administrators
- New Crystal Reports Server administrators

The second section of the book (Part IV) focuses on the distribution or delivery of the valuable content created in the first half and additional insights into advanced content creation with Crystal Xcelsius. An introduction to Crystal Reports Server, crystalreports.com, and the offline Crystal Reports Viewer complements a comprehensive introduction to Crystal Xcelsius. This extends with an introduction to the .NET and Java SDKs around Crystal Reports. Some profiles of people who find these sections of high value:

- New Crystal Reports Server administrators
- New or existing Crystal Reports Server users
- .NET-based application developers
- Java/J2EE-based application developers
- Application developers looking to integrate report design or modification into their applications

Part I: Crystal Reports Design

Part I should familiarize you with the foundations of Crystal Reports and get you up and running as quickly as possible. It is critical for someone who is new to Crystal Reports and includes the fundamental report design concepts that even experienced users can use for the rest of their Crystal Reports-writing career. This section also provides powerful exercises and real-world usage tips and tricks with which even seasoned reporting experts can become more productive.

Part II: Formatting Crystal Reports

Part II focuses on some of the more subtle nuances of Crystal Report design: effective report formatting and data visualization through charting and mapping. Improper formatting and incorrect use of visualization techniques can make reports confusing and not user friendly. This section also provides powerful exercises and real-world usage tips and tricks, enabling mature reporting experts to become more productive.

Part III: Advanced Crystal Reports Design

Part III presents a host of advanced Crystal Reports design concepts that involve features such as subreports, cross-tabs, report templates, and alerts. This part also touches on advanced data access methods such as JavaBeans, XML objects, SAP, and PeopleSoft systems. The section also provides powerful exercises and real-world usage tips and tricks, enabling mature reporting experts to become more effective in their report design work.

Part IV: Report Distribution and Advanced Report Design with Crystal Xcelsius

Part IV focuses on the different methods of distribution of the Crystal Reports content created in the first three sections. These methods include Crystal Reports Server, crystalreports.com, the .NET and Java SDKs, and the offline Crystal Reports Viewer. This section provides a comprehensive introduction to advanced visualizations and dashboard creation with Crystal Xcelsius.

Equipment Used for This Book

You can find various supporting material that will assist you in the completion of the exercises in this book, as well as supplemental documentation on related topics. You should have access to a computer that has at least a 450MHz Pentium II or equivalent processor, 128MB of RAM, and Windows 2000, Windows 2003, or Windows XP Professional.

Web Resources

You can find all the source code and report samples for the examples in the book, as well as links to great external content, at <http://www.usingcrystal.com>. You'll find report samples to download and code for you to leverage in your report design and sharing efforts. Also, a great deal of additional product-related information on the Business Objects suite of products including Crystal Reports, Web Intelligence, OLAP Intelligence, Desktop Intelligence, Crystal Reports Server, and BusinessObjects Enterprise can be found at <http://www.businessobjects.com>.

Intended Audience

This book was written to appeal to the full range of Crystal Reports, Crystal Reports Server, and Crystal Xcelsius users. You'll find this book useful if you've never used the Business Objects suite of products before, if you are a mature Crystal Reports user looking for some new productivity tips, or if you want to explore some of the new features found in version 2008 and their related SDKs.

You don't have to be an expert, but you should have a basic understanding of the following concepts:

- Database systems such as Microsoft SQL Server, Oracle, Sybase, and Informix
- Operating system functions in Windows 2003/XP/Vista
- General Internet/intranet-based concepts such as HTML, DHTML, ActiveX, and Java

Parts I through III build on each other, so skipping around those parts isn't the best approach unless you have some familiarity with Crystal Reports 2008. Even if you are familiar with Crystal Reports, many new features have been introduced in recent versions, so you are encouraged to read the entire first three sections of the book so that you don't miss anything. Part IV focuses on the different methods of content delivery, so you can approach each part independently without loss of context.

Requirements for This Book

All reports are based on sample data available from the businessobjects.com website, so you have access to the same data used in this book. You'll need to install Crystal Reports to get the most out of the examples included in each chapter in the first half of the book.

Conventions Used in This Book

Several conventions are used within this book to help you get more out of the text. Look for special fonts or text styles and icons that emphasize special information.

- Objects such as fields or formulas normally appear on separate lines from the rest of the text. However, there are special situations in which some formulas or fields appear directly in the paragraph for explanation purposes. These types of objects appear in a special font like this: `Some Special Code`. Formula examples appear on the Sams Publishing website as well.
- In some cases, I might refer to your computer as a *machine* or *server*. This is always in reference to the physical computer on which you have installed Crystal Reports.
- You'll always be able to recognize menu selections and command sequences because they're implemented like this:
- Use the File, Open command.
- New terms appear in *italic* when they are defined.
- Text that you are asked to type appears in **boldface**.

- URLs for websites are presented like this: <http://www.businessobjects.com>.

Note - Notes help you understand principles or provide amplifying information. In many cases, a Note emphasizes some piece of critical information that you need. All of us like to know special bits of information that make our job easier, more fun, or faster to perform.

Tip - Tips help you get the job done faster and more safely. In many cases, the information found in a Tip comes from experience rather than through experimentation or documentation.

Sidebar - Sidebars spend more time on a particular subject that could be considered a tangent but will help you be a better Business Objects product user as a result.

Real World sections provide some practical and productivity-enhancing usage insights derived from the author's real-world experience designing and deploying hundreds of Crystal Reports.

Troubleshooting sections provide some quick chapter summary notes and examples that are useful reminders on the product operations.

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