Contents at a Glance

Introduction .........................................................1
1 Pivot Table Fundamentals .................................11
2 Creating a Basic Pivot Table .................................21
3 Customizing a Pivot Table .................................45
4 Controlling the Way You View Your Pivot Data ..........83
5 Performing Calculations Within Your Pivot Tables ........117
6 Using Pivot Charts and Other Visualizations .............141
7 Analyzing Disparate Data Sources with Pivot Tables .........167
8 Sharing Pivot Tables with Others ............................189
9 Working with and Analyzing OLAP Data ...................201
10 Enhancing Your Pivot Table Reports with Macros ...........215
11 Using VBA to Create Pivot Tables ..........................231
12 Common Pivot Table Issues and Questions .................291
A Finding Pivot Table Commands on the Ribbon ............315
# Table of Contents

**Introduction** ................................................. 1
What You Will Learn from This Book ................................................. 1
What Is New in Excel 2007's Pivot Tables ................................................. 2
Skills Required to Use This Book ................................................. 2
Case Study: Life Before Pivot Tables ................................................. 2
The Invention of the Pivot Table ................................................. 5
Case Study: Life After Pivot Tables ................................................. 7
Sample Files Used in This Book ................................................. 9
Conventions Used in This Book ................................................. 9
  Referring to Ribbon Commands ................................................. 9
  Special Elements ................................................. 10

## 1 Pivot Table Fundamentals ................................................. 11
What Is a Pivot Table? ................................................. 11
Why Should You Use a Pivot Table? ................................................. 12
When Should You Use a Pivot Table? ................................................. 13
The Anatomy of a Pivot Table ................................................. 14
  Values Area ................................................. 14
  Row Area ................................................. 15
  Column Area ................................................. 15
  Report Filter Area ................................................. 16
Pivot Tables Behind the Scenes ................................................. 16
Limitations of Pivot Table Reports ................................................. 17
  A Word About Compatibility ................................................. 18
Next Steps ................................................. 19

## 2 Creating a Basic Pivot Table ................................................. 21
Preparing Your Data for Pivot Table Reporting ................................................. 21
  Ensure Your Data Is in a Tabular Layout ................................................. 22
  Avoid Storing Data in Section Headings ................................................. 22
  Avoid Repeating Groups as Columns ................................................. 23
  Eliminate Gaps and Blank Cells in Your Data Source ................................................. 23
  Apply Appropriate Type Formatting to Your Fields ................................................. 24
  Summary of Good Data Source Design ................................................. 24
Case Study: Cleaning Up Data for Pivot Table Analysis ................................................. 25
Creating a Basic Pivot Table ................................................. 26
  Adding Fields to the Report ................................................. 29
  Adding Layers to Your Pivot Table ................................................. 32
  Rearranging Your Pivot Table ................................................. 32
  Creating a Report Filter ................................................. 33
Case Study: Analyzing Activity by Market ................................................. 35
# Pivot Table Data Crunching for Microsoft Office Excel 2007

## 3 Customizing a Pivot Table

- Making Common Cosmetic Changes ............................................. 46
  - Applying a Table Style to Restore Gridlines .......................... 47
  - Changing the Number Format to Add Thousands Separators ....... 47
  - Replacing Blanks with Zeros ............................................. 49
  - Changing a Field Name ..................................................... 51
- Making Layout Changes ....................................................... 52
  - Using the New Compact Layout ........................................... 52
  - Using the Outline Form Layout .......................................... 54
  - Using the Traditional Tabular Layout .................................. 54
- Case Study: Converting a Pivot Table to Values .......................... 56
  - Controlling Blank Lines, Grand Totals, Subtotals, and Other Settings .... 59
- Customizing the Pivot Table Appearance with Styles and Themes .................. 61
  - Customizing a Style ..................................................... 62
  - Choosing a Default Style for Future Pivot Tables .................... 64
  - Modifying Styles with Document Themes ............................... 64
- Changing Summary Calculations ............................................... 65
  - Understanding Why One Blank Cell Causes a Count ................... 65
  - Using Functions Other Than Count or Sum .............................. 66
- Adding and Removing Subtotals ............................................... 68
  - Suppress Subtotals When You Have Many Row Fields ................ 68
  - Adding Multiple Subtotals for One Field .............................. 69
- Using Running Total Options .................................................. 70
  - Display Change from Year to Year with Difference From ............ 71
  - Compare One Year to a Prior Year with % Difference From ........ 72
  - Track YTD Numbers with Running Total In ............................. 72
  - Determine How Much Each Line of Business Contributes to the Total .... 72
  - Create Seasonality Reports .............................................. 73
  - Measure Percentage for Two Fields with % of Total .................. 73
  - Compare One Line to Another Line Using % Of ....................... 75
  - Track Relative Importance with the Index Option .................... 75
- Keeping Up with Changes in Your Data Source ............................. 39
  - Changes Have Been Made to Your Existing Data Source ............... 40
  - Your Data Source's Range Has Been Expanded with the Addition of Rows or Columns .................. 40
- Sharing the Pivot Cache ..................................................... 41
  - Side Effects of Sharing a Pivot Cache ................................ 41
- Saving Time with New Pivot Table Tools .................................... 42
  - Deferring Layout Updates ................................................ 42
  - Starting Over with One Click ............................................ 42
  - Relocating Your Pivot Table ............................................. 43
- Next Steps ........................................................................... 44

## 2 Making Layout Changes

- Using the Traditional Tabular Layout .................................... 54
- Using the Outline Form Layout .......................................... 54
- Using the New Compact Layout ........................................... 52
- Changing a Field Name ..................................................... 51
- Replacing Blanks with Zeros ............................................. 49
- Changing the Number Format to Add Thousands Separators ....... 47
- Applying a Table Style to Restore Gridlines .......................... 47
- Changing Common Cosmetic Changes ..................................... 46
Contents

Case Study: Producing Revenue by Line of Business Report ...............................77
Next Steps ..............................................................................................................81

4 Controlling the Way You View Your Pivot Data .................................................83
   Grouping Pivot Fields .......................................................................................83
   Grouping Date Fields ......................................................................................84
   Including Years When Grouping by Months ...................................................86
   Grouping Date Fields by Week ......................................................................86
   Grouping Two Date Fields in One Report .......................................................88
   Case Study: Creating an Order Lead-Time Report .........................................88
   Grouping Numeric Fields ..............................................................................89
   Case Study: Grouping Text Fields ................................................................90
   Ungrouping .................................................................................................92
   Looking at the PivotTable Field List ..............................................................93
   Docking and Undocking the PivotTable Field List .........................................93
   Rearranging the PivotTable Field List ...........................................................93
   Using the Areas Section Drop-Downs ............................................................94
   Using the Fields Drop-Down .........................................................................94
   Sorting in a Pivot Table ..................................................................................96
   Sorting Using the Sort Icons on the Options Ribbon .....................................96
   Sorting Using the Field List Hidden Drop-Down ..........................................98
   Understanding the Effect of Layout Changes on AutoSort .........................100
   Using a Manual Sort Sequence ..................................................................100
   Using a Custom List for Sorting ..................................................................101
   Filtering the Pivot Table ..............................................................................102
   Adding Fields to the Report Filter Area .........................................................103
   Choosing One Item from a Report Filter .......................................................104
   Choosing Multiple Items from a Report Filter .............................................104
   Quickly Selecting or Clearing All Items from a Filter ..................................106
   Using the Field List Filters ..........................................................................106
   Using Label Filters ......................................................................................108
   Using Date Filters .......................................................................................109
   Using Value Filters ......................................................................................111
   Case Study: Creating a Top 10 Report .........................................................113
Next Steps ............................................................................................................116

5 Performing Calculations Within Your Pivot Tables .........................................117
   Introducing Calculated Fields and Calculated Items ......................................117
   Method 1: Manually Add the Calculated Field to Your Data Source ............118
   Method 2: Use a Formula Outside Your Pivot Table to Create the Calculated Field ..........................................................118
   Method 3: Insert a Calculated Field Directly into Your Pivot Table ...............119
   Creating Your First Calculated Field ............................................................121
   Case Study: Summarizing Next Year’s Forecast ..........................................124
Creating Your First Calculated Item ...................................................... 129
Understanding Rules and Shortcomings of Pivot Table Calculations .......... 133
  Remembering the Order of Operator Precedence .................................. 134
  Using Cell References and Named Ranges ........................................... 135
  Using Worksheet Functions ................................................................... 135
  Using Constants .................................................................................. 135
  Referencing Totals ............................................................................... 135
  Rules Specific to Calculated Fields ....................................................... 135
  Rules Specific to Calculated Items ....................................................... 136
Managing and Maintaining Your Pivot Table Calculations .......................... 137
  Editing and Deleting Your Pivot Table Calculations ................................. 137
  Changing the Solve Order of Your Calculated Items ............................... 138
  Documenting Your Formulas ................................................................ 139
Next Steps .............................................................................................. 140

6 Using Pivot Charts and Other Visualizations ................................. 141
What Is a Pivot Chart…Really? ................................................................. 141
Creating Your First Pivot Chart ............................................................... 142
Keeping Pivot Chart Rules in Mind .......................................................... 145
  Changes in the Underlying Pivot Table Affect Your Pivot Chart ............ 145
  The Placement of Data Fields in Your Pivot Table May Not Be Best Suited for Your Pivot Chart .................................................. 145
  A Few Formatting Limitations Still Exist in Excel 2007 ......................... 146
Case Study: Creating a Report Showing Invoice Frequency and Revenue
  Distribution by Product ......................................................................... 148
Examining Alternatives to Using Pivot Charts ........................................ 153
  Method 1: Turn Your Pivot Table into Hard Values ................................. 153
  Method 2: Delete the Underlying Pivot Table ......................................... 154
  Method 3: Distribute a Picture of the Pivot Chart .................................. 154
  Method 4: Use Cells Linked Back to the Pivot Table as the Source Data for Your Chart .................................................. 154
Using Conditional Formatting with Pivot Tables .................................... 157
Next Steps .............................................................................................. 166

7 Analyzing Disparate Data Sources with Pivot Tables ...................... 167
Using Multiple Consolidation Ranges ..................................................... 168
Analyzing the Anatomy of a Multiple Consolidation Range Pivot Table .... 174
  The Row Field .................................................................................. 174
  The Column Field ............................................................................. 174
  The Value Field ................................................................................ 175
  The Page Fields ................................................................................. 175
  Redefining Your Pivot Table ................................................................... 176
Case Study: Consolidating and Analyzing Datasets ................................. 176
Building a Pivot Table Using External Data Sources ................................ 179
  Building a Pivot Table with Microsoft Access Data ................................ 180
Building a Pivot Table with SQL Server Data .......................................................... 183
Next Steps ......................................................... 187

8 Sharing Pivot Tables with Others ................................................................. 189
Sharing a Pivot Table with Other Versions of Office ............................................ 189
  Features Unavailable in Excel 2003 Pivot Tables ............................................. 190
  Excel 2007 Compatibility Mode ................................................................. 190
  No Downgrade Path Available from Version 12 Pivot Tables ............................... 190
  Strategies for Sharing Pivot Tables ............................................................ 190
Saving Pivot Tables to the Web .......................................................................... 191
Publishing Pivot Tables to Excel Services .............................................................. 193
  Requirements to Render Spreadsheets with Excel Services ................................. 194
  Preparing Your Spreadsheet for Excel Services ................................................ 194
  Publishing Your Spreadsheet to Excel Services ............................................... 194
  What the End User Sees in Excel Services ...................................................... 196
  What You Cannot Do with Excel Services ...................................................... 197
  Viewing the Pivot Table in the Browser .......................................................... 199
Next Steps ......................................................... 199

9 Working with and Analyzing OLAP Data ...................................................... 201
What Is OLAP? ................................................................................................. 201
Connecting to an OLAP Cube ............................................................................ 202
Understanding the Structure of an OLAP Cube .................................................. 205
Understanding Limitations of OLAP Pivot Tables .............................................. 207
Creating Offline Cubes ...................................................................................... 207
Breaking Out of the Pivot Table Mold with Cube Functions ................................. 211
Next Steps ......................................................... 213

10 Enhancing Your Pivot Table Reports with Macros ........................................ 215
Why Use Macros with Your Pivot Table Reports? ................................................ 215
Recording Your First Macro ............................................................................. 216
Creating a User Interface with Form Controls ................................................... 218
Altering a Recorded Macro to Add Functionality .............................................. 220
Case Study: Synchronizing Two Pivot Tables with One Combo Box ....................... 225
Next Steps ......................................................... 229

11 Using VBA to Create Pivot Tables ............................................................... 231
Introducing VBA ............................................................................................... 231
  Enabling VBA in Your Copy of Excel ........................................................... 231
  Enabling the Developer Ribbon ...................................................................... 232
  Visual Basic Editor ......................................................................................... 232
  Visual Basic Tools ......................................................................................... 233
  The Macro Recorder ...................................................................................... 234
Pivot Table Data Crunching for Microsoft Office Excel 2007

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding Object-Oriented Code</td>
<td>234</td>
</tr>
<tr>
<td>Learning Tricks of the Trade</td>
<td>234</td>
</tr>
<tr>
<td>Writing Code to Handle Any Size Data Range</td>
<td>235</td>
</tr>
<tr>
<td>Using Super-Variables: Object Variables</td>
<td>236</td>
</tr>
<tr>
<td>Understanding Versions</td>
<td>236</td>
</tr>
<tr>
<td>New in Excel 2007</td>
<td>237</td>
</tr>
<tr>
<td>Building a Pivot Table in Excel VBA</td>
<td>239</td>
</tr>
<tr>
<td>Getting a Sum Instead of a Count</td>
<td>241</td>
</tr>
<tr>
<td>Learning Why You Cannot Move or Change Part of a Pivot Report</td>
<td>243</td>
</tr>
<tr>
<td>Determining Size of a Finished Pivot Table</td>
<td>244</td>
</tr>
<tr>
<td>Creating a Report Showing Revenue by Product</td>
<td>246</td>
</tr>
<tr>
<td>Eliminating Blank Cells in the Values Area</td>
<td>248</td>
</tr>
<tr>
<td>Ensuring Table Layout Is Utilized</td>
<td>248</td>
</tr>
<tr>
<td>Controlling the Sort Order with AutoSort</td>
<td>248</td>
</tr>
<tr>
<td>Changing Default Number Format</td>
<td>248</td>
</tr>
<tr>
<td>Suppressing Subtotals for Multiple Row Fields</td>
<td>249</td>
</tr>
<tr>
<td>Suppressing Grand Total for Rows</td>
<td>250</td>
</tr>
<tr>
<td>Handling Additional Annoyances When Creating Your Final Report</td>
<td>250</td>
</tr>
<tr>
<td>Creating a New Workbook to Hold the Report</td>
<td>250</td>
</tr>
<tr>
<td>Creating a Summary on a Blank Report Worksheet</td>
<td>251</td>
</tr>
<tr>
<td>Filling the Outline View</td>
<td>252</td>
</tr>
<tr>
<td>Handling Final Formatting</td>
<td>252</td>
</tr>
<tr>
<td>Adding Subtotals</td>
<td>253</td>
</tr>
<tr>
<td>Putting It All Together</td>
<td>254</td>
</tr>
<tr>
<td>Addressing Issues with Two or More Data Fields</td>
<td>257</td>
</tr>
<tr>
<td>Calculated Data Fields</td>
<td>258</td>
</tr>
<tr>
<td>Calculated Items</td>
<td>260</td>
</tr>
<tr>
<td>Summarizing Date Fields with Grouping</td>
<td>263</td>
</tr>
<tr>
<td>Group by Week</td>
<td>265</td>
</tr>
<tr>
<td>Using Advanced Pivot Table Techniques</td>
<td>267</td>
</tr>
<tr>
<td>Using AutoShow to Produce Executive Overviews</td>
<td>267</td>
</tr>
<tr>
<td>Using ShowDetail to Filter a Recordset</td>
<td>270</td>
</tr>
<tr>
<td>Creating Reports for Each Region or Model</td>
<td>272</td>
</tr>
<tr>
<td>Manually Filtering Two or More Items in a PivotField</td>
<td>275</td>
</tr>
<tr>
<td>Controlling the Sort Order Manually</td>
<td>276</td>
</tr>
<tr>
<td>Using Sum, Average, Count, Min, Max, and More</td>
<td>276</td>
</tr>
<tr>
<td>Creating Report Percentages</td>
<td>277</td>
</tr>
<tr>
<td>Percentage of Total</td>
<td>277</td>
</tr>
<tr>
<td>Percentage Growth from Previous Month</td>
<td>278</td>
</tr>
<tr>
<td>Percentage of a Specific Item</td>
<td>278</td>
</tr>
<tr>
<td>Running Total</td>
<td>278</td>
</tr>
<tr>
<td>Using New Pivot Table Features in Excel 2007</td>
<td>279</td>
</tr>
<tr>
<td>Using the New Filters</td>
<td>279</td>
</tr>
</tbody>
</table>
_12 Common Pivot Table Issues and Questions_ ........................................... 291

Troubleshooting Common Pivot Table Issues ........................................... 291
   I keep getting the error “The PivotTable field name is not valid.” ............... 291
   When I refreshed my pivot table, my data disappeared. ........................... 291
   My pivot table always uses Count instead of Sum. ................................ 292
   My pivot table constantly adjusts the columns in my workbook to autofit
      the headings. .............................................................................. 292
   The Defer Layout Update option locked me out of other functionality such as
      sorting, filtering, and grouping. ..................................................... 293
   Older versions of Excel do not open my pivot table properly. ....................... 293
   When I try to group a field, I get an error message. ................................ 294
   My pivot table shows the same data item twice. .................................... 294
   Deleted data items still show up in the filter area. .................................... 295
   I refreshed my pivot table, and now my calculated fields are displayed as error values. ... 296

Common Pivot Table Questions ................................................................. 297
   How do I make my pivot table refresh automatically? .............................. 297
   How do I refresh all pivot tables in a workbook at the same time? ............... 297
   How can I sort data items in a unique order that is not ascending or descending? 298
   How do I turn my pivot table into hard data? ....................................... 298
   Is there an easy way to fill the empty cells left by row fields? .................... 299
   Is there an easy way to fill the empty cells left by row fields in many columns? 300
   Why does my pivot chart exclude months for certain data items? ............... 303
   How do I add a rank number field to my pivot table? ............................. 305
   How do I hide calculation errors in my pivot table? ............................... 307
   How can I reduce the size of my pivot table reports? ............................. 308
   How can I easily create a separate pivot table for each market? ................ 309
   How do I avoid the need to constantly redefine my pivot table’s data range? ... 310

A Finding Pivot Table Commands on the Ribbon .................................... 315
   Inserting a Pivot Table .................................................................... 315
   Finding Commands from the Legacy PivotTable Toolbar ........................ 316

Index ................................................................................................. 321
About the Authors

Bill Jelen is Mr. Excel! He is principal behind the leading Excel website, MrExcel.com. He honed his pivot table wizardry during a 12-year tenure as a financial analyst for a fast growing public computer firm. Armed with only a spreadsheet, he learned how to turn thousands of rows of transactional data into meaningful summaries in record time. He is an accomplished author of books on Excel and is a regular guest on “Call For Help” on TechTV Canada. As an Excel consultant, he has written Excel VBA solutions for hundreds of clients around the English-speaking world. His website hosts over 12 million page views annually.

Michael Alexander is a Microsoft Certified Application Developer (MCAD) with over 14 years experience developing business solutions with Microsoft Office, VBA, and .Net. He currently lives in Frisco, Texas, where he works as a senior program manager for a top technology firm. In his spare time, he runs a free tutorial site, www.datapigtechnologies.com, where he shares basic Access and Excel tips with intermediate users.

Dedication

Bill Jelen:
To Zeke Jelen

Mike Alexander:
To my lovely wife, Mary, who will open this book just long enough to read this dedication
Acknowledgments

Bill Jelen:

Thank you to Pito Salas, who invented Lotus Improv, the first desktop product to offer functionality similar to pivot tables. Thanks to Dan Bricklin, Bob Frankston, and Mitch Kapor for being pioneers in the spreadsheet world. Thanks to Dave Gainer and the entire Excel team at Microsoft for bringing pivot tables along to what they are today. Juan Pablo González provided great technical review. Thanks to Mary Ellen, Josh, and Zeke Jelen for tolerating me while I was writing six books simultaneously. My sister, Barb Jelen, provides excellent back office support at MrExcel.com; there is a good chance that she packed and shipped this book to you. Lora White keeps things moving and produces our Podcasts. Thanks to Jerry Kohl at Leegin and everyone who ever asked me for a report back at Telxon, and our clients at MrExcel Consulting; you all contributed to my expertise with pivot tables. Thanks to William Brown at Waterside; Loretta Yates, Andy Beaster, Chuck Hutchinson, and Kevin Howard at Que Publishing. Thanks to Mike Alexander for being a great coauthor.

Mike Alexander:

Thank you to Bill Jelen for the opportunity to help write this book. It’s hard to find anyone who has more passion and drive for what he does than Bill Jelen. Thank you to Juan Pablo González for keeping Bill and me honest and sparking some great ideas. Many thanks to Loretta Yates and the many professionals at Que Publishing for all the support during the writing process. A special thank you to Mary for putting up with all my crazy projects this year.
We Want to Hear from You!

As the reader of this book, you are our most important critic and commentator. We value your opinion and want to know what we’re doing right, what we could do better, what areas you’d like to see us publish in, and any other words of wisdom you’re willing to pass our way.

As an associate publisher for Que Publishing, I welcome your comments. You can email or write me directly to let me know what you did or didn’t like about this book—as well as what we can do to make our books better.

Please note that I cannot help you with technical problems related to the topic of this book. We do have a User Services group, however, where I will forward specific technical questions related to the book.

When you write, please be sure to include this book’s title and author as well as your name, email address, and phone number. I will carefully review your comments and share them with the author and editors who worked on the book.

Email: feedback@quepublishing.com
Mail: Greg Wiegand
Associate Publisher
Que Publishing
800 East 96th Street
Indianapolis, IN 46240 USA

Reader Services

Visit our website and register this book at www.quepublishing.com/register for convenient access to any updates, downloads, or errata that might be available for this book.