CHAPTER 1

What's New in Excel 2007?

Microsoft Office 2007 heralds the most significant changes to the Office suite for years. The user interface across the main applications has been given a new image aimed at improving usability as well as modernizing the overall look of the software. The regenerated appearance penetrates down to the documents with the introduction of new Office styles and themes and a new family of SmartArt graphics intended to give your creations an increased depth of professionalism. But the improvements are not simply aesthetic. Behind the contemporary façade lie some important enhancements that will allow you to experience more flexibility and functionality than ever before with Excel from the new XML file formats to improved analysis tools, although some critics may feel that many potential improvements have been omitted in this release.

This chapter will provide you with an overview of the most consequential modifications to Excel and will help you to settle into the new surroundings. First I will look at how Excel has been expanded both in size and in data-handling capability. I will then discuss its new image for 2007 and the features available that will allow you to produce an attractive and consistent look for your documents. Following a quick outline of the increased functionality of Excel's analysis tools, I will identify the file formats that can be used when saving work as well as the new ways you can share your worksheets with others and how Excel 2007 facilitates the management of external connections. By the time you have finished this chapter, you will know that we are not in Excel 2003 anymore!

From Excel to XXL

Microsoft has certainly pushed the limits with Excel 2007, making this version capable of handling more data more quickly than ever before. Excel users who need to store large amounts of data will be pleased to see that they can now enter over 16,000

columns and 1 million rows into a worksheet—a total of over 17 billion cells! To some this may seem cumbersome and unnecessary, but for those who analyze thousands of items or record data at small intervals this will be a welcome expansion. For example, if you are using Excel to keep a record of readings taken every minute, this will now allow almost two years of data to be stored in rows, or just over 11 days if stored by columns. If you record daily data in columns, your worksheet can now span almost 45 years!

> **NOTE** The last column is now XFD, which means that Excel 2007 may not accept some of the named ranges in workbooks created in previous versions. For example, names like DAY21 or TAX2007 can no longer be used, as these will now be cell references.

The size of the grid is not the only feature that has been augmented in Excel 2007. Excel can now support up to 4.3 billion colors (32-bit) and unlimited format types, and the number of cell references per cell is limited only by available memory. Excel 2007 also supports dual processors and multithreaded chipsets, and the amount of PC memory that it can use is limited only by the maximum allowed by Windows, thereby improving its overall performance. Table 1-1 lists some of the increases to limits that have been incorporated in Excel 2007.

Table 1-1. Excel 2007 Limits

Item	Excel 2003 Limit	Excel 2007 Limit
Columns	256	16,384
Rows	65,536	1,048,576
PC memory that Excel can use	1GB	Maximum allowed by Windows
Unique colors in a workbook	56 (indexed color)	4.3 billion (32-bit color)
Unique cell formats/cell styles	4000	64,000
Conditional formats in a cell	3	Limited by available memory
Levels of sorting in a table or range	3	64
Items in AutoFilter dropdown list	1,000	10,000
Characters that can be displayed in a cell	1,024 (255 when formatted as text)	32,768
Characters that can be printed in a cell	1,024	32,768
Cell styles in a workbook	4,096	65,536
Characters in a formula	1,024	8,192
Levels of nesting in a formula	7	64

Item	Excel 2003 Limit	Excel 2007 Limit
Arguments in a function	30	255
Items that can be found with Find All	~65,000	~1 million
Columns in a PivotTable	255	16,384
Items in a Pivot field	32,768	~1 million
Number of fields in a PivotTable	255	16,384

If you don't already use shortcut keys for navigating around your worksheet, you may find that now is a good time to start getting the hang of them. Table 1-2 lists some key combinations that could save you a lot of time scrolling around the super-sized grid.

Table 1-2. Shortcut Keys for Navigating in Excel

To Go To...	Press
Cell A1	Ctrl+Home
Column A of the current row	Home
Last used cell in a worksheet (even if it is currently blank)	Ctrl+End
First row of the data (provided there are no blank cells)	Ctrl+Up arrow
Last row of the data (provided there are no blank cells)	Ctrl+Down arrow
First column of the data (provided there are no blank cells)	Ctrl+Left arrow
Last column of the data (provided there are no blank cells)	Ctrl+Right arrow
Next worksheet	Ctrl+Page Down
Previous worksheet	Ctrl+Page Up

> **TIP** Using the Shift key along with the key combinations in Table 1-2 will select the range of cells; e.g., pressing Ctrl+Shift+Home will select all the cells from cell A1 to the active cell. To select the current region (i.e., the contiguous range of cells surrounding the active cell that contain data), press Ctrl+* (use the * in the numeric keypad or Ctrl+Shift+* on a laptop).

Table 1-3 contains some more tips for quickly selecting, inserting, deleting, hiding, and unhiding rows and columns.

Table 1-3. Shortcut Keys for Selecting, Inserting, Deleting, Hiding, and Unhiding in Excel

To Do This...	Press
Select the column or columns for the active cell or cells	Ctrl+Spacebar
Select the row or rows for the active cell or cells	Shift+Spacebar
Insert a row in a table or a cell, row, or column in a range	Ctrl++ (plus sign)
Insert a column in a table or range	Ctrl+Spacebar, then Ctrl++
Delete a row in a table or a cell, row, or column in a range	Ctrl+- (hyphen)
Delete a column in a table or range	Ctrl+Spacebar, then Ctrl+-
Hide the column or columns for the active cell or cells	Ctrl+0
Unhide the column or columns between the selected cells	Ctrl+Shift+0
Hide the row or rows for the active cell or cells	Ctrl+9
Unhide the row or rows between the selected cells	Ctrl+Shift+9

You can also use the Name box to quickly go to a cell, select a range, or copy a formula or text to a large number of cells. To go to a cell, you simply type the cell reference in the Name box and press Enter; to select the range starting from the active cell to the cell reference you have typed in the Name box, press Shift+Enter. The same process can be used to paste copied data into a range: copy the data to be pasted, select the first cell in the range, type the cell reference of the last cell in the range in the Name box, press Shift+Enter to select the range, and then press Enter again to paste the data.

> **TIP** To copy a cell down the length of a column (as far as there is data in an adjacent column), select the cell and move the mouse pointer over the bottom-right corner of the cell; when the pointer changes to the Fill Handle (black cross), double-click.

Excel Gets a Makeover

Even veteran users of Excel will probably find that they have lost their bearings when they look at Excel 2007 for the first time. The traditional menu bar and Standard and Formatting toolbars have now been rendered obsolete, replaced by what is referred to as the Ribbon, a display of larger icons that spans the top of the window where the menu bar and toolbars used to be. The big difference with the Ribbon is that it is

contextual and updates in accordance with the tasks that you are currently carrying out. The Ribbon also features in the new versions of Microsoft Word, Access, and PowerPoint.

However, the Ribbon is not the only method of accessing commands in the new version of Microsoft Office. The Quick Access toolbar, Microsoft Office Button, and access keys are all new features intended to improve usability. Excel also now benefits from the addition of a Page Layout view, allowing you to see how the printed worksheet will appear as you edit your data.

The Ribbon

Probably the most significant change to the user interface is the demise of menus and toolbars and the introduction of the Ribbon (see Figure 1-1). Running across the top of the screen, the Ribbon groups together related commands and features into different tabs and will adapt depending on the task you are completing. So, for example, if you want to insert an object you can select the Insert tab to see the range of objects that can be included in your worksheet and the related commands. If you are working with a table, the Ribbon will feature additional tabs that include the tools that are relevant to tables. Consequently, users can see at a glance the various commands that are available related to the task they are currently completing rather than having to search through an ever-increasing menu system.

Figure 1-1. On the Ribbon, each tab contains groups of related commands for the different activity areas.

The Ribbon is made up of a variety of content, including dialog boxes, galleries, and many of the familiar toolbar buttons. The contents of the Ribbon will vary for each Office application, but across applications it is composed of similar components:

- *Tabs*, placed along the top of the ribbon, which identify different activity areas. The standard tabs are Home, Insert, Page Layout, Formulas, Data, Review, and View, but additional tabs may become available for specific tasks. For example, if you have any active application add-ins, the Add-Ins tab will also be displayed. The default tab is the Home tab; to select a different tab, click on it with your mouse.
- *Groups* within each tab; for example, on the Home tab the groups include Clipboard, Font, and Alignment. These are sets of related commands used to carry out the various tasks.
- *Commands* can take the form of boxes, menus, or buttons and are arranged together within groups.

As well as the standard tabs, there are two other types of tabs that may appear on the Ribbon when they are relevant to the current task. *Contextual tabs* will appear when you work with a particular object like SmartArt, a chart, or table. For example, additional Design, Layout, and Format tabs will appear under a *Chart Tools* label when a chart is selected. These contextual tabs house further commands appropriate for working with charts. When the object is deselected, the contextual tabs will be hidden again. *Program tabs* replace the standard tabs when you are using certain authoring modes or views. For example, when you switch to Print Preview by selecting it from the Print command in the Microsoft Office Button, the standard tabs are replaced by a Print Preview tab. There is also a Developer tab, which you can opt to display by selecting the appropriate checkbox in the Personalize section of Excel Options (see the following section on the Microsoft Office Button). This contains commands for carrying out tasks like recording macros and features related to XML (see information on new file formats in the "Finishing Touches" section later in this chapter).

In some groups on the Ribbon (for example, Clipboard, Font, Alignment, and Number in Figure 1-1), you will see a small icon at the bottom-right corner of the group; this icon is known as a Dialog Box Launcher. As the name suggests, clicking this icon will open the relevant dialog box or task pane for that group of commands, allowing you to select further options.

> **TIP** To collapse the Ribbon and reveal more of the grid, double-click on any of the tabs. The tabs will still be visible and you can view the Ribbon temporarily by clicking a tab, enabling you to still select commands. To restore the Ribbon again, double-click any tab.

The Microsoft Office Button

The Microsoft Office button is a feature that you will now discover in Word, PowerPoint, and Access as well as Excel. It is a circular button positioned at the top-left corner of the screen and is used to access many of the common functions that were previously available from the File menu or the Standard toolbar, like Open, Save, Close, and Print (see Figure 1-2). Two new features that are listed are Prepare and Publish.

Prepare provides quick access to tools that may be required to check and secure finished documents, including checking a workbook for hidden metadata or for features that are not supported by earlier versions of Excel. You can also set document properties and permissions, make a document read-only, and add a digital signature within the Prepare option.

When you have finalized the settings for the finished documents, you can then use the Publish command to distribute it to other people. You can distribute a document in various ways, including through Excel Services (a web-based data exploration and reporting system for Excel workbooks), by using a document management server, or by creating a document workspace using SharePoint (see the information on new ways to share data in the "Finishing Touches" section and in Chapters 16 and 17).

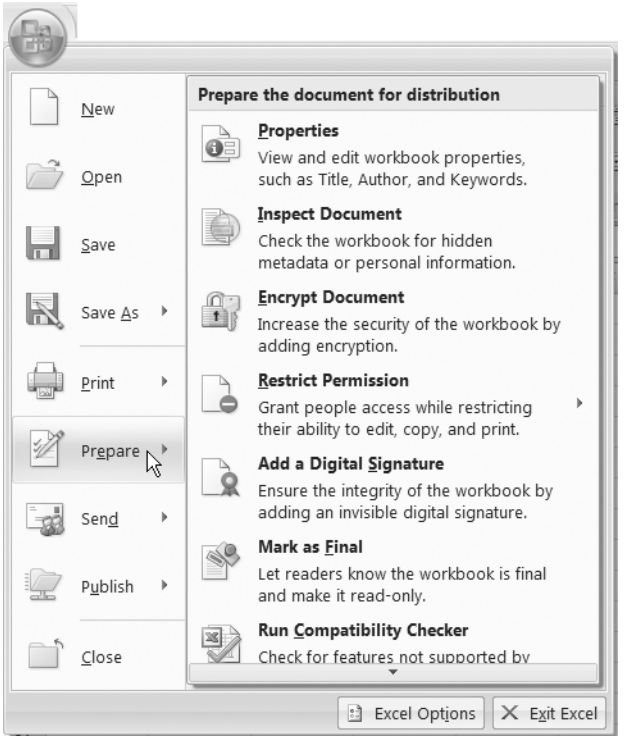

Figure 1-2. The contents of the Microsoft Office Button in Excel 2007. The Prepare option allows you to carry out a variety of tasks to check and secure finished documents.

Also in the Microsoft Office Button you will find Excel Options (see Figure 1-2), which allows you to customize many of the features within Excel (see Chapter 2 for more on this). Here you will find most of the commands that were traditionally located within the Options command of the Tools menu.

The Quick Access Toolbar

As the commands available on the Ribbon will update as you perform different tasks, Excel provides a toolbar where you can store frequently used commands regardless of the Ribbon tab being displayed. The Quick Access toolbar (see Figure 1-3) appears above the Ribbon and by default contains the Save, Undo, and Redo icons (the Undo and Redo icons will be grayed out when they are not available). You can customize the Quick Access toolbar to display commands of your choice so that your favorite commands are permanently on view (see Chapter 2).

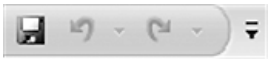

Figure 1-3. You can use the Quick Access toolbar to store frequently used commands so that they are always readily available.

Table 1-4 provides you with a quick reference guide to the new locations in Excel 2007 of some of the most popular commands from Excel 2003. Appendix A provides the location of most of the other commands.

Table 1-4. New Locations for Popular Commands

Command	Excel 2003 Location	Excel 2007 Location
New, Open, Print	File menu Standard toolbar	Microsoft Office Button
Close, Exit, Save As	File menu	Microsoft Office Button
Save	File menu Standard toolbar Quick Access toolbar	Microsoft Office Button
Page Setup Print Area, Set Print Area, Clear Print Area	File menu	Page Layout tab, Page Setup group Page Layout tab, Sheet Options group (Dialog Box Launcher)
Print Preview	File menu Standard toolbar	Microsoft Office Button, Print, Print Preview
Undo, Redo	Edit menu Standard toolbar	Quick Access toolbar
Cut, Copy, Paste	Edit menu Standard toolbar	Home tab, Clipboard group
Delete	Edit menu	Home tab, Cells group
Delete Sheet	Edit menu	Home tab, Cells group, Delete
Move or Copy Sheet	Edit menu	Home tab, Cells group, Format
Find, Replace, Go To	Edit menu	Home tab, Editing group, Find & Select
Header and Footer	View menu	Insert tab, Text group
Cells, Rows, Columns, Worksheet	Insert menu	Home tab, Cells group, Insert
Chart	Insert menu Standard toolbar	Insert tab, Charts group
Function	Insert menu	Formulas tab, Function Library group

Command	Excel 2003 Location	Excel 2007 Location
Name	Insert menu	Formulas tab, Defined Names group
Cells, Rows, Columns Sheets—Rename, Hide, Unhide, Tab Color	Format menu	Home tab, Cells group, Format
Options	Tools menu	Microsoft Office Button, Excel Options
Sort, Filter	Data menu	Home tab, Editing group, Sort & Filter Data tab, Sort & Filter group
Font, Font Size, Bold, Italic, Underline, Border, Fill Color, Font Color	Formatting toolbar	Home tab, Font group
Align Left, Align Center, Align Right, Merge and Center, Increase Indent, Decrease Indent	Formatting toolbar	Home tab, Alignment group
Currency, Percent Style, Comma Style, Increase Decimal, Decrease Decimal	Formatting toolbar	Home tab, Number group

> **TIP** If you can't find an Excel 2003 command on the Ribbon, you may be able to locate it and add it to the Quick Access toolbar using the Customize category of Excel Options in the Microsoft Office Button (see Chapter 2). If you can't find it there, use the Help facility to find out how to complete the task that you would have used the command to do.

Access Keys

Access keys allow you to access the Ribbon, Microsoft Office Button, and Quick Access toolbar using the keyboard, rather like keyboard shortcuts. To switch to command mode to use the access keys, you need to press the Alt key on the keyboard. This will reveal small boxes containing *key tips,* indicating the key you need to press in order to access a feature of the screen (see Figure 1-4). Every command on the Ribbon, Microsoft Office Button, and Quick Access toolbar has an access key. So, for example, pressing Alt and then F will access the Microsoft Office Button, with further key tips then being displayed for each of the commands within it. To use access keys to execute a command on any tab on the Ribbon, you must select the key for the appropriate tab first.

> **NOTE** Keyboard shortcuts, like Ctrl+C for Copy, have remained largely unaffected by Excel 2007.

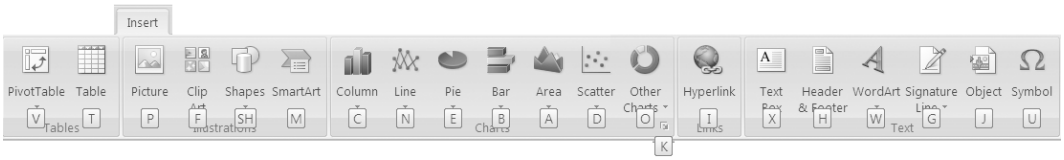

Figure 1-4. Key tips for the Insert tab. To view key tips for a tab, press the Alt key and then select the access key for the tab.

Only one layer of key tips is displayed at a time, so you must select the access key for a particular tab before the key tips for the commands on that tab are revealed. As you only see the key tips for the active tab, a particular key can relate to different commands, depending on the tab that is displayed. For example, when you turn on the access keys, the H key will access the Home tab. Once on the Home tab, pressing the H key will access the Fill Color command, but if you had selected the Insert tab, the H key would refer to the Header & Footer command. If a dialog box is open, its key tips will take precedence over key tips on the Ribbon.

When you are in command mode, you can also use the arrow keys and Tab key to move around the Ribbon (although the access keys are probably a much more efficient method) as follows:

- Use the left and right arrows to move between the tabs.
- Use the down arrow to activate a tab and then all the arrows to move through the groups and commands.
- From the tabs, use the up arrow to move to the Quick Access toolbar.
- From the Quick Access toolbar, use the left arrow to move along the toolbar and then to the Microsoft Office Button.
- Use the down arrow to access the Microsoft Office Button and use all the arrows to move around the commands.
- Use the Tab key to move through each command in each group of the active tab in turn from left to right. Once you reach the last command of the last group, the Tab key will take you through the Help button, the Microsoft Office Button, and the Quick Access toolbar. Use Shift+Tab to move backward from right to left.
- Use the Enter key to select the highlighted command.

Once you start to use the arrows to navigate around the screen, the key tips will disappear. You will need to press the Alt key twice to display the key tips again. To remove the key tips and return to text entry mode, press the Alt key again.

If you use an old keyboard shortcut that begins with Alt, like Alt+E to open the Edit menu, a message will appear to say that you are using an Office 2003 access key. If you know the key sequence you want to use, you can continue to type it or press Esc to cancel.

Enhanced ScreenTips

Another enhancement to the user interface of Excel 2007 is the augmented capabilities of the ToolTip feature. Now, when you hover your mouse over a command on the Ribbon, not only will its name be displayed but you will also be provided with additional details, such as the shortcut key for the command (where available), what the command does, and when it would typically be used. Where appropriate there may be graphics illustrating what the command does or showing a dialog box that can be opened to access further options.

This embellishing of ToolTips with feature descriptions has led to them being renamed as Enhanced ScreenTips, or Super ToolTips. The main benefit is that you can gain a quick overview about the particular command (see Figure 1-5) and what it is generally used for without having to search through reference guides or use the Help facility. If you do require further information, you can still press F1 to open the Help facility.

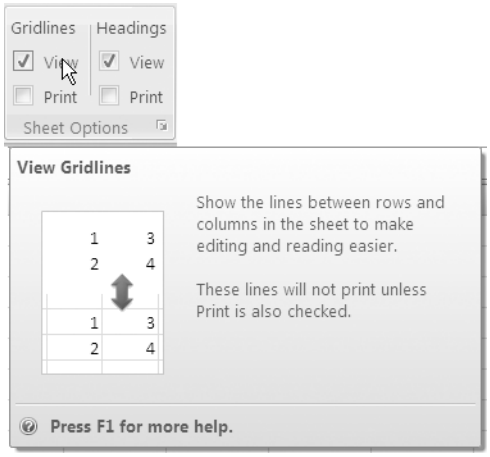

Figure 1-5. The Enhanced ScreenTip for View Gridlines. These new Super ToolTips, as they are known, provide more detail than their predecessors.

> **TIP** If you are not impressed and want to get rid of the Super ToolTips, you can change the setting by clicking the Microsoft Office Button, clicking Excel Options, and selecting the Popular category. Under "Top options for working with Excel," click the down arrow beside the ScreenTip Style box and select "Don't show feature descriptions in ScreenTips" to display the 2003-style ToolTips, or select "Don't show ScreenTips" to remove ToolTips altogether.

Page Layout View

In Excel 2007, Microsoft has added a Page Layout view to the Normal and Page Break Preview views that were already available. This allows you to see how your printouts will appear as you create and edit your worksheets. Using Page Layout view, you can carry out a range of tasks—such as inserting headers and footers, changing margins, or rearranging objects—and see exactly how these alterations will impact your printed document. Page Layout view can be accessed from the Workbook Views group on the View tab or by clicking the Page Layout View icon on the Status bar at the bottom of the screen.

> **TIP** You can now configure the Status bar to show a Zoom slider and to display various statistics about selected data like Average, Count, Sum, etc., as well as the different views. Just right-click on the Status bar and select the items that you want to be displayed.

Better-Looking Documents

In addition to revamping the user interface, Microsoft has provided Office 2007 with various new features that allow you to produce superior documents that can have a consistent look across your applications. New document themes can be applied to all your Microsoft Office documents while Excel styles can be used to format specific items like charts, tables, PivotTables, shapes, diagrams, and so forth, thus maintaining a uniform look within your workbooks. There is also a wider range of templates available with Excel 2007, and you can quickly access more through Microsoft Office Online.

The conditional formatting feature has been greatly enhanced to include a variety of methods of highlighting cells based on criteria. Excel 2007 sees the introduction of new visual features like icon sets, color scales, and data bars. SmartArt, another new graphical concept making its debut with this version, can be used to create diagrams that will convey the message behind your data in a visually appealing manner. Like styles, SmartArt is based on the document themes, ensuring that the consistent appearance of your documents is upheld.

Themes and Styles

Document themes are predefined sets of fonts, colors, lines, and fill effects that can be applied to an entire workbook and shared between different types of Office documents. You can even create custom themes by specifying your own settings for any or all of the theme components to add your own personal touch to your finished work.

Styles are based on the current theme and can be applied to Excel tables, PivotTables, charts, diagrams, and shapes. A nice touch is the Live Preview feature, which automatically shows you what your object will look like as you move your mouse over each style, helping you to choose a suitable style (see Figure 1-6).

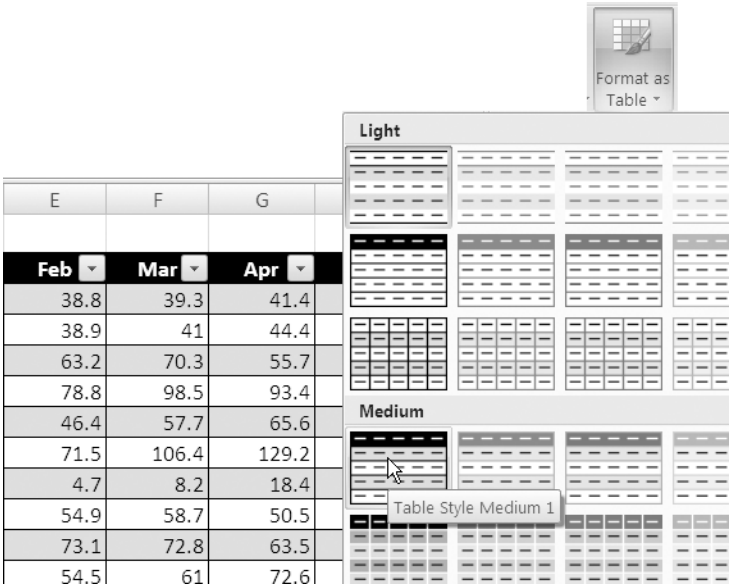

Figure 1-6. As you move the mouse pointer over a style in the gallery in Live Preview, the selected table will temporarily take on the features of that style, allowing you to preview the style.

If you decide that none of the built-in styles are suitable, you can create your own, although you cannot create your own chart style. Excel 2007 also includes predefined cell styles that can be applied to individual cells or ranges, and many of these are independent of the document theme. Again, if you want to, you can create your own custom cell styles.

More Templates

Microsoft Excel 2007 is installed with a variety of built-in templates that you can use to base your new worksheets on, covering a range of purposes from balance sheets to a blood pressure tracker. If none of these are appropriate, you can search Microsoft Office Online for a much wider selection of templates, which are divided into various categories:

- Agendas
- Budgets
- Calendars
- Expense Reports
- Forms
- Inventories
- Invoices
- Lists
- Planners
- Plans
- Purchase Orders
- Receipts
- Reports
- Schedules
- Statements
- Stationery
- Timesheets

Of course, as with themes and styles, if you are still not satisfied you can create your own templates to suit your specific type of data and analysis.

SmartArt

SmartArt (or OfficeArt as it is sometimes referred to) is another new concept being offered to Excel users with the intention of giving documents a more professional design. Basically, SmartArt provides you with a range of diagrams or captions that you can use to highlight information or convey points from your data. Suggested uses would be to create high-impact lists or to illustrate a process, cycle, hierarchy, or relationship. Available layouts include horizontal and vertical lists, organization charts, pyramids, Venn diagrams, and radial diagrams. Figure 1-7 shows some examples of the SmartArt graphics available in Microsoft Office 2007.

Once you have selected a SmartArt layout that you want to use, it is easy to add and edit text, to resize or format the graphic, and to switch to a different layout. SmartArt graphics are built on the document themes and will adopt colors and styles appropriate to your chosen theme; however, you can customize most of the elements if you want to, including shape fills, line styles, and 3D effects. The finished result is graphics that look like they have just stepped out of a designer's studio.

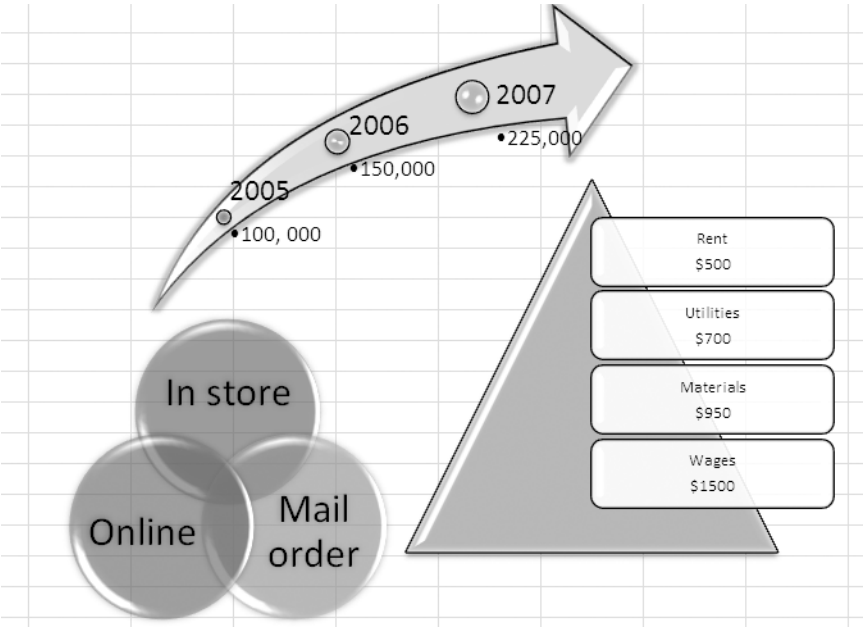

Figure 1-7. Use SmartArt graphics to add a professional touch to lists and diagrams.

Easier Analysis

Although these aesthetic enhancements are mostly welcome, you are probably wondering what the "real changes" are and how Excel 2007 will make your working life easier. Microsoft has made a variety of improvements to existing features in Excel that are intended to streamline the processes involved in some of the traditional analytical procedures and to make more complex data-management activities not as daunting for less experienced users.

Conditional Formatting (available from the Styles group on the Home tab) and Sorting and Filtering (located in the Editing group on the Home tab or the Sort & Filter group on the Data tab) are all fundamental features of Excel that have been expanded in this new version to include more functionality and to allow you to display your data in a more comprehensible manner. The feature formerly known as Lists has been given a polish and renamed as Excel Tables, and PivotTables and charts have benefited from some attention from the Microsoft developers as well. Finally, an attempt has also been made to make formula writing easier, and Online Analysis Processing (OLAP) formulas and Cube functions have been introduced to the application.

Rich Conditional Formatting

The Conditional Formatting feature has been taken to new levels with Excel 2007 with the introduction of novel tools like Color Scales, Icon Sets, and Data Bars to allow you to visualize your data in a more interpretable manner. Depending on a cell's position within a range of values, you can allocate it a different color, a particular icon, or a varying length of shaded data bar. Each of these new tools allows you to convey a certain degree of meaning along with your data from within the actual cell.

Excel 2007 also provides you with various types of common rules to make it easier to create your conditional formats. These rules are divided into Highlight Cells Rules and Top/Bottom Rules. With Highlight Cells Rules, you can select from a range of rules to highlight specific data, including rules to identify values that are greater than, less than, or equal to a set value, or indicate dates that occur within a given range. Top/Bottom Rules allow you to identify the top or bottom percentage or number of items or to indicate those cells that are above or below the average. Figure 1-8 shows the options available with these two new sets of conditional formatting rules.

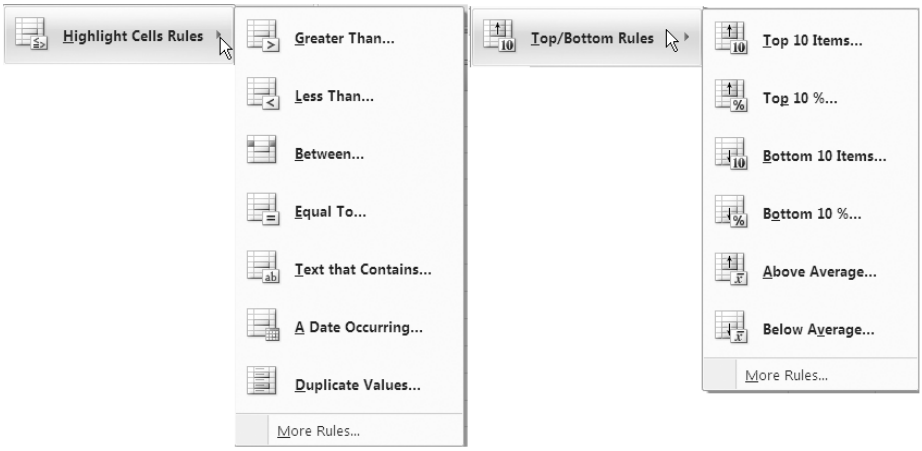

Figure 1-8. Highlight Cells Rules and Top/Bottom Rules. Use one of these predefined rules to create conditional formats or select More Rules to create a new formatting rule.

Another important advancement in conditional formatting is the removal of the restriction on the number of conditional formats that can be applied to a range of cells. Instead of only being able to identify three criteria, the number of conditional formats that can be specified is now unlimited (within the bounds of available memory). To help you keep track of these potentially numerous formatting rules, Excel 2007 provides you with the Conditional Formatting Rules Manager (which you open by clicking Manage Rules in a Conditional Formatting dropdown list) to look after the various chores that may be associated with rules, including creating, editing, and deleting rules and controlling the rule precedence.

Although a fairly comprehensive selection of built-in rules is available, conditional formats are also customizable, enabling you to define your own rules or formats. This allows you to control the technicalities, like exactly how the range is partitioned when allocating icons or colors, as well as the specific formatting features, like the color of the data bars or border and fill effects.

Excel Tables

Within Excel 2007 you can easily create, format, and expand an Excel table (or Excel List as it was known back in 2003) to organize your data in a manner more suited for analysis. Along with the name change Microsoft has improved the functionality of tables to include features like

- Headers that can be switched on and off
- Calculated columns that automatically expand to include additional rows
- An Automatic Filter button in each header cell for quick sorting and filtering
- Structured references that allow you to use column heading names and special item specifiers in formulas instead of cell references
- Total rows that can use custom formulas and text entries
- Table styles to add coordinated formatting that will update automatically as rows are added or removed

PivotTables and PivotCharts

PivotTables have long been a fundamental analysis tool in Excel, so the improvements to the design of the interface and the enhanced capabilities will probably be welcome by most Excel users (although they may not go as far as some users would have liked). Many users who have not experimented with PivotTables to any great extent may be more encouraged to do so now that the creation process has been streamlined and made more approachable. For example, checkboxes and new drop zones in the PivotTable Field List make adding and removing fields to and from a PivotTable or PivotChart report easier. Other features that will make summarizing data with PivotTables more efficient include

- The ability to undo actions taken on a PivotTable
- Plus and minus drilldown indicators that make it clear whether data can be expanded or collapsed
- Simpler sorting and filtering of PivotTable data
- The ability to apply conditional formats to cells within a PivotTable
- PivotTable styles for quickly formatting a PivotTable
- PivotCharts that are easier to create (also, chart formatting is preserved when changes are applied to a PivotChart)

- PivotChart styles that can be applied in a similar fashion to regular charts
- The ability to easily convert a PivotTable linked to an OLAP cube to formulas

Sorting and Filtering

Sorting and filtering have been enhanced with some useful features in Excel 2007 to allow you to arrange your data quickly in a meaningful way according to your current needs. You can now sort data by anything up to 64 levels, and you can also sort by cell color, font color, or cell icon as well as cell value. The actual wording of the Sort command will change depending on the data being sorted: if the cells contain text, you can choose either Sort A to Z or Sort Z to A; if you are sorting dates you can select Sort Oldest to Newest or Sort Newest to Oldest; if the data consists of numbers, the options will be Sort Smallest to Largest or Sort Largest to Smallest.

AutoFilter (or Filter as it is often now referred to) has been augmented to facilitate more complex and dynamic filtering by providing a range of Date, Number, and Text filters that will reflect your data type. For example, for numerical data, available filters include Equals, Greater Than, Above Average, Top 10, and so forth. If the column selected contains text, you can select filters such as Begins With, Ends With, and Contains. If the data you are filtering contains dates, filters like Tomorrow, This Week, Last Month, Next Quarter, This Year, and so forth can be applied, allowing dynamic filtering of dates to be carried out simply. The capabilities of AutoFilter have also been expanded; the AutoFilter list will now display up to 10,000 items, and you can also filter by multiple items within a column. Like the Sorting tool, AutoFilter accommodates the new conditional formats that can be applied to cells and allows data to be filtered by value, cell color, font color, or cell icon. A Reapply command has also been added to enable you to reapply all sort and filter conditions on a table.

Changes to Charts

Like tables and other objects, charts in Excel will have their formatting founded on the document theme. The new look for charts will also include special effects such as soft edges, shadows, beveling, and 3D effects, as illustrated in Figure 1-9. The intention is obviously to make the charts more visually appealing, though some users may feel that such embellishments will detract from the message the chart is supposed to convey. Other useful features include the ability to switch between charting the data in the rows and the data in the columns of the worksheet with one click and to save the formatting and layout of a chart as a template that can be applied to future charts.

A major change being implemented with Office 2007 is that the chart engine for Excel will also now be used for Word 2007 and PowerPoint 2007, therefore eliminating the need to use Microsoft Graph. As an Excel worksheet is now used as the chart datasheet for Word and PowerPoint, these applications can take advantage of the increased functionality provided by Excel—including the use of formulas, filtering, sorting, and the ability to link the chart to external data sources like SQL Server Analysis Services. The Excel data worksheet can be embedded in the Word document or PowerPoint presentation, or it can remain in a separate file to minimize file size.

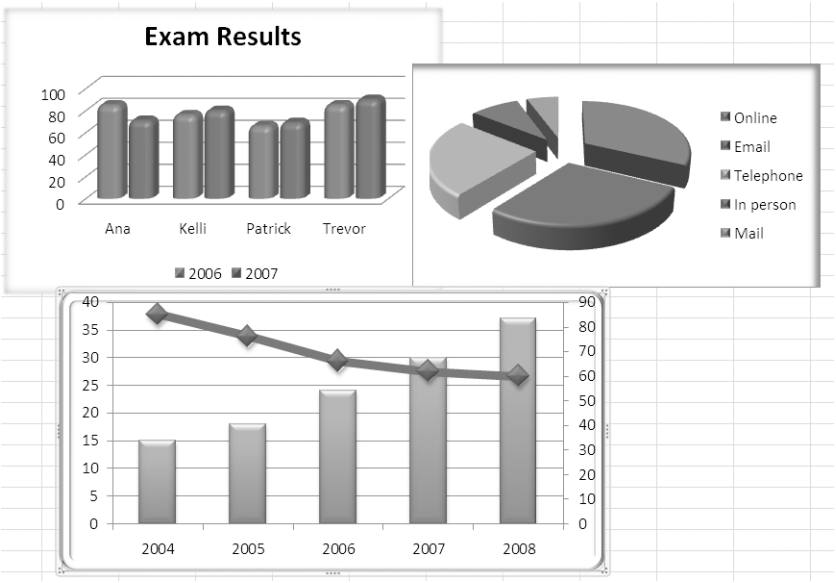

Figure 1-9. Excel 2007 lets you choose from a wide range of chart styles and apply features like glow and bevel effects to charts.

Simplified Formula Writing

Excel 2007 has attempted to expedite the task of formula writing, particularly if you need to write long and complex formulas. First, the formula bar can now be resized to accommodate long formulas without overlapping onto the worksheet and covering the headings or data. You can now include over 8,000 characters and up to 64 levels of nesting in a formula, compared to just 1,000 characters and 7 levels in Excel 2003. The number of arguments that a function can hold has also been increased from 30 to 255.

The Formulas tab on the Ribbon provides quick reference to the commands you may require when creating and auditing formulas. It also includes an easy-to-use Function Library, which displays the main function categories and lets you quickly select your required function. The familiar AutoSum button is also there and operates in a similar way as before, facilitating immediate access to a dropdown list and allowing you to select from the popular Sum, Average, Count Numbers, Max, and Min functions. If you prefer to enter a function by launching the traditional Insert Function dialog box, then you can click the Insert Function button. Finally, the Calculation Options button in the Calculation group allows you to control when formulas are calculated.

Formula AutoComplete is a new feature that will help you to remember the exact name of a function and enter the formula syntax correctly. As you begin to type in a formula, Excel will display a list of functions (and named ranges and table references where appropriate) that match what you type; once you detect the formula (or name or reference) that you want to use, you can select it using the Tab key or the mouse.

Excel will then help you to enter the right number of arguments and will suggest defined names or structured references where appropriate. A ToolTip will appear for each formula to help you to select the correct one without having to refer to the Help facility.

Defining names has long been recognized as a way of simplifying formula construction and readability. Excel 2007 provides us with the Name Manager, a new interface to accommodate the general housekeeping duties associated with creating, viewing, editing, and deleting names. Prominently positioned on the Formulas tab of the Ribbon, the Name Manager and other commands within the Defined Names group will allow you to create and update your list of defined names more efficiently than in Excel 2003. The ability to add comments to defined names has been included, enabling you to provide a description that will be displayed as a ToolTip in Formula AutoComplete. The Name box can also now be resized to display long names.

A further useful innovation in Excel 2007 is the ability to incorporate structured references (where you can reference a table or part of a table directly by name rather than cell references) in formulas. For example, to sum all the values in a table called Table1 you can enter the formula **=SUM(Table1)**; to sum all the values in the Sales column of that table, you would enter the formula **=SUM(Table1[Sales])**. Table names (and subsequently column names) will appear in Formula AutoComplete where appropriate.

> **TIP** Formulas can still be entered by typing them straight in and ignoring Formula AutoComplete. If you really dislike the feature, Formula AutoComplete can be turned off in the Formulas category of Excel Options.

More Functions

The function library within Excel has been expanded to include a set of seven new Cube functions to allow the extraction of information from SQL Server Analysis Services, and the Analysis ToolPak functions have now been integrated into the main function library (the Engineering functions category is now available as standard). Microsoft has also added the following general functions, specifically requested by users:

- *IFERROR (Logical)*: To identify formula errors rather than using IF and ISERROR
- *AVERAGEIF (Statistical)*: To conditionally average a range in a similar manner to SUMIF and COUNTIF
- *SUMIFS (Math & Trig)*: Similar to SUMIF but for multiple criteria
- *COUNTIFS (Statistical)*: Similar to COUNTIF but for multiple criteria
- *AVERAGEIFS (Statistical)*: Similar to AVERAGEIF but for multiple criteria

If you work with multidimensional databases (like SQL Server Analysis Services) in Excel 2007 you can use OLAP formulas to build complex, free-form, OLAP data-bound reports. Seven new Cube functions have been added to Excel to accommodate

the extraction of data from SQL Services Analysis Services (2000 and 2005), including any member, set, aggregated value, property, or Key Performance Indicator (KPI) from the OLAP cube. This data can then be placed anywhere within the spreadsheet and integrated with other calculations or within other formulas. These new Cube functions are

- *CUBEMEMBER*: Fetches the defined member or tuple from the cube
- *CUBEVALUE*: Fetches the aggregated value from the cube filtered by various arguments
- *CUBESET*: Fetches the defined set of members or tuples
- *CUBESETCOUNT*: Returns the number of items in a set
- *CUBERANKEDMEMBER*: Returns the *n*th ranked member from a set
- *CUBEMEMBERPROPERTY*: Returns the value of a member property from the cube
- *CUBEKPIMEMBER*: Returns a KPI property from the cube and displays the KPI name in the cell

If you have a PivotTable connected to an OLAP cube, you can convert the PivotTable to a set of formulas, where each formula will use one of the Cube functions. This will allow you to modify your work by inserting rows or columns or adding calculations, using the converted PivotTable as a starting point.

Finishing Touches

With a growing emphasis on sharing data and producing information that can be viewed and analyzed by multiple users, Excel 2007 brings with it important enhancements to much of its importing and exporting functionality. This includes streamlining the process for connecting to external sources and distributing data through Excel Services. Microsoft has also introduced some new file formats to improve the transferability of Office documents, and it is also much easier to save workbooks in alternative formats, thus increasing the transferability of information from Excel workbooks.

External Connections

The Get External Data group on the Data tab of the Ribbon renders the task of importing data from external sources much less daunting. The Existing Connections command provides you with quick access to connections in the current workbook, as well as to connection files on your computer or network. The other commands in the Get External Data group allow you to easily import data from Access, the Web, and text files, or to create new connections to other sources.

Managing external connections should be easier with Excel 2007 thanks to the Connections group on the Data tab. If you have a workbook that is connected to an external data source, for example, an Access or Oracle database or an Analysis Services cube, you can see a list of the connections in your workbook and where they are used, and change the properties of the connections. This ability to view and manage all of the connections in a workbook in a central location is a significant shift from the way connection information was stored with the object that used the connection in previous versions. This will make updating and sharing connections easier, especially with the introduction of Cube functions where the connection to a particular OLAP cube must be specified with each function.

New File Formats

Microsoft Office 2007 sees the inauguration of new file formats for Excel, Word, and PowerPoint known as XML formats. The purpose of XML file formats is to ease integration with external data sources, to reduce file size, and to improve data recovery. The default format for an Excel 2007 workbook will now be the XML-based file format (.xlsx). Other XML-based formats that will also be available for Excel 2007 are the XML-based and macro-enabled workbook format (.xlsm), the format for an Excel template (.xltx), the macro-enabled template (.xltm), and the macro-enabled add-in (.xlam).

In addition to the new XML file formats, Excel 2007 introduces a new non-XML binary file format for large or complex workbooks. This binary version of the segmented compressed file format or BIFF12 file format (.xlsb) will allow optimal performance and backward compatibility. Excel 2007 spreadsheets can also be saved as XPS (XML Paper Specification) format or exported to PDF without needing to have a PDF writer installed.

When you open an Excel file that was created in an earlier version, it will automatically open in Compatibility mode. In this mode, new or enhanced 2007 features are not available, preventing any loss of data or fidelity when the workbook is opened in an earlier version again. When the file is saved, it will be saved using the Excel 97–2003 file format (.xls) and not the new XML file format. If you want to upgrade the workbook to the current 2007 file format, you can convert it using the Convert command in the Microsoft Office Button, which will replace the original file with the new XML file. If you want to retain a copy of the original file format, you can save it to XML format, which will create a new copy of the file with the .xlsx extension.

> **TIP** Check your Excel 2007 workbooks to see if they contain any formatting or other features that are not compatible with earlier versions of Excel so that you can make any necessary changes. You can do this by running the Compatibility Checker in Compatibility mode by clicking the Microsoft Office Button, pointing to Prepare, and then clicking Run Compatibility Checker. The Compatibility Checker will run automatically if you save a workbook that is in the Excel 97–2003 file format. Updates and converters can be installed in earlier versions to allow Excel 2007 workbooks to be opened, updated, and saved without losing any of their Excel 2007–specific functionality.

New Ways to Share Data

With Excel 2007 you can distribute worksheets to others in various ways. If you need to share your worksheets with other users within your organization and have access to Excel Services (a new server technology available as part of Microsoft Office SharePoint Server 2007 that allows browser-based access to Excel spreadsheets), you can save your workbook to Excel Services using the Publish option in the Microsoft Office Button. You can then specify the worksheet data (for example, sheets or items like charts or tables) that you want others to be able to see. The other users can then use Microsoft Excel Web Access to carry out tasks like viewing, analyzing, extracting, and saving this data, or they can take a static snapshot of the data at regular intervals or when required. The main advantages that Excel Services will bring are the ability to provide controlled access to data via a browser and the ability to avoid having more than one "version of the truth" (i.e., multiple copies of a spreadsheet that are inconsistent with one another).

Excel Services is optimized for organizations where multiple users are accessing the same spreadsheets and consists of three parts: Excel Web Access, Excel Calculation Services, and Excel Web Services. Excel Web Access is used to display a spreadsheet in a browser and permits users to perform various Excel activities, including scrolling, sorting, filtering, viewing charts, and using drilldown in PivotTables. If they have the correct permissions, they can even open the workbook in Excel 2007 (if they have it installed on their own computer), enabling them to take advantage of the full functionality of Excel to analyze the data. Excel Calculation Services is the component that loads the spreadsheets, performs the calculations on them, and manages the sessions. Excel Web Services provides programmatic access, allowing you to automate the update of Excel spreadsheets and to develop custom applications that incorporate calculation.

To make a workbook available to other users from a central location, you can use the Publish command to save it to a document management server, enabling you to automate workflows and share document libraries. If you want to allow users to collaborate on a workbook while maintaining a local copy synchronized with any changes, you can save it to a Document Workspace site hosted by Windows SharePoint Services 3.0. A *Document Workspace site* is a SharePoint site that incorporates tools to help users share and update files while keeping everyone informed of changes. Other advantages of a Document Workspace site include the ability to allocate tasks and to receive email alerts when changes are made to a document or task (see Chapters 16 and 17 for more information on sharing data and Excel Services).

This chapter has given you an overview of the main enhancements that have been introduced with Microsoft Excel 2007. The remainder of this book will guide you through these and the many other useful features of this versatile application.