

# Taking a First Look at Excel's Reporting Tools

This chapter provides you with an overview of Excel's reporting features. It shows you the principal types of Excel reports and how you can use them to satisfy many of the business requirements you may face. It covers some of the benefits of using Excel reports, including real-time access, simplified report updates, and reduced cost of ownership.

In this first chapter, I try to give you a snapshot overview of PivotTable and PivotChart reports, Spreadsheet reports, parameter queries (how you can map parameters to stored procedure variables), and web queries, along with a quick look at some of the new features available in Excel 2007.

Keep in mind that this chapter just helps you get started with the basics. As you work your way through the other chapters, you have the opportunity to dive into these topics in a lot more detail. So let's begin!

## Why Use Excel for Reports?

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Companies produce reports from enterprise software systems using numerous methods. A report might be generated from the native enterprise software program or from a standalone report development software program such as Business Objects (formerly Crystal Reports). In other scenarios, the report data may be extracted to a delimited file that is loaded into a program such as Excel or Access. The number of enterprise software applications, the amount and level of internal expertise, and the degree of organizational leadership are just a few factors that can determine how reports are managed within a company.

**NOTE** You might be asking yourself, “What is an enterprise software system, anyway?” Some popular enterprise software systems include SAP, PeopleSoft, Siebel, and Baan. These systems are used in all types of organizations to run the business more efficiently and effectively. Hospitals use medical information systems to track a patient’s vital data and health care history. Companies such as Amazon.com or Barnes & Noble use warehouse management systems to reduce the time and labor expenses for shipping products to customers. The company I work for produces enterprise software for magazine and book publishers. More than 35 modules are available to perform business functions from advertising, billing, inventory, circulation, and payroll to conference management, web access, and customer relationship management.

Although report development tools are often bundled with enterprise software applications, many organizations use a separate report development software application for creating and running reports. So why would an organization spend additional funds to purchase reporting software if it is already included as part of its enterprise software system? Learning and supporting the report development tools included with an enterprise software application can be both difficult and expensive. Furthermore, many organizations have numerous enterprise applications, so that work and cost can be magnified several times. Enhanced performance and standardization to a single system are major benefits for organizations seeking to reduce costs and maintain their report development skills. Instead of paying six employees to develop and manage reports using the report development tools in a few enterprise software applications, it may take only two employees to develop and manage equivalent reports for the same enterprise systems using a single report development software program.

Initially, information technology (IT) professionals and business managers unfamiliar with Excel’s reporting capabilities are often skeptical about using Excel to produce reports from an enterprise system. However, even the most skeptical of IT decision-makers are generally convinced once they

- See Excel’s powerful reporting tools in action.
- Receive superb feedback from report users.
- Understand how much less software licensing fee, support costs, and maintenance is involved with Microsoft Excel compared to other software reporting packages.

Here are some of the top considerations for using Excel reports over competing report development software programs:

- **Excel reports can retrieve data from an enterprise software application’s OLTP database in real time.** Many systems require reports to be run by first launching the application and then requesting it. If the report is exported to Excel, a second step is likely involved for actually importing and formatting the data. (Many software systems build interfaces to Excel.) In comparison, by using native Excel reporting functionality, you can accomplish all of this in a fraction of the time. With hardly more than a mouse click, data can be fetched

directly from one or more databases to update an Excel report with the most up-to-date information.

- **Sorts, breaks, and totals can easily be applied, modified, and removed.** With only limited training, even a novice Excel user can add or remove subtotals, apply complex sorts, and insert page breaks or lines between various report groups. It can take days or weeks of training to be able to understand and perform this same type of task with competing report development software programs and enterprise reporting tools.
- **Some Excel report types, such as PivotTable reports, are very dynamic and powerful.** One report can replace dozens of traditional columnar reports. A PivotTable report can contain many more fields than what is actually displayed in a single view of the report. Inserting and removing fields, changing field locations, and applying filters are easily and readily performed.
- **Excel reports are cost effective.** Running and modifying reports from an enterprise software application or report development software program usually requires that the application be installed. This can add a considerable burden to support, training, and software licensing costs. In contrast, most computers already have Excel installed and users are often familiar with the basics of how this program works.
- **Report development time is often much faster than with competing reporting software applications.** Enterprise reporting tools and report development software programs can be very intricate and complex. Organizations regularly hire report programmers or consultants to help develop many of their reports. In contrast, learning and using Excel report development tools is simple. Reports can frequently be developed more quickly, and at a lesser cost, than competing report development software programs and enterprise reporting tools.
- **Excel reports are integrated with related Microsoft products.** The integration among the various Office programs becomes more seamless and feature-rich with each new release of Microsoft Office, allowing you to develop ever more powerful and innovative reporting solutions.

## PivotTable Reports

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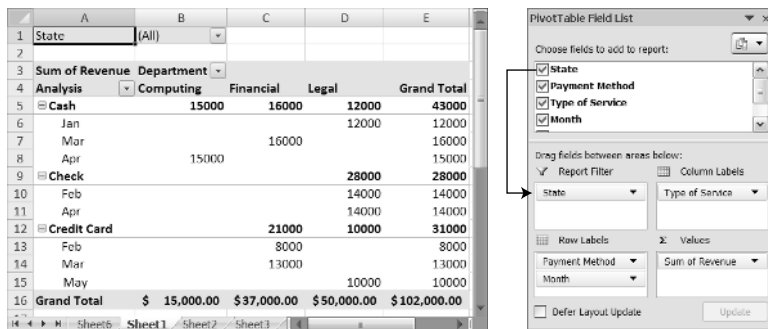
With PivotTable reports, you can interactively create and build cross-tabular reports from a list of available fields. These fields can be derived from another worksheet tab, an SQL or Oracle database, a text file, an OLAP cube, or some other external data source. After the PivotTable shape is created, users can move fields to different locations in the report, change the type of aggregation (for example, calculate an average amount instead of a total amount), apply filters to determine which items in a report field are displayed, and apply complex sorts based on aggregated values or other field items in the report.

Using PivotTable technology, report users can do the following:

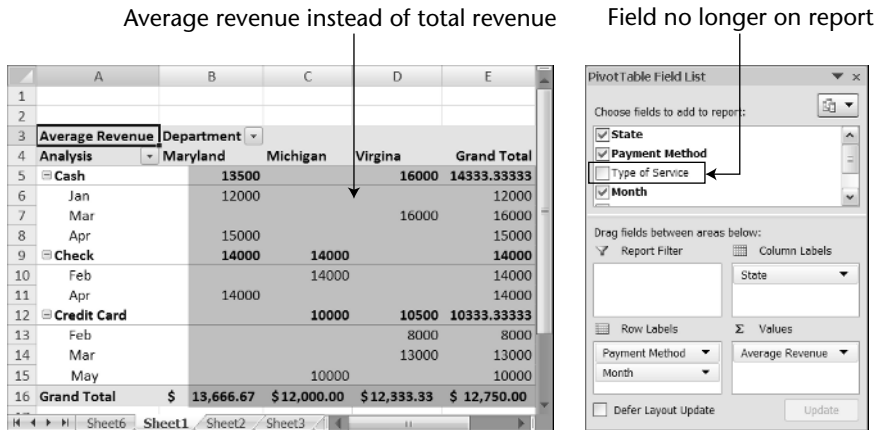
- Produce a number of different views and reports by simply dragging fields from a field list to different locations in the PivotTable.
- Apply simple or advanced filters to determine which items should be displayed in a field.
- Conditionally add icons, data bars, color scales, and other formats to highlight critical report information.
- Aggregate numeric fields in a variety of ways.
- Group and sort data, toggle subtotals, and apply report format styles.
- Access and refresh data from external data sources using nothing more than a simple click of the mouse.
- Drill down on numeric data to reveal the underlying dataset detail.
- Use basic and advanced sorting tools to sort date, text, and numeric data in a variety of different ways.

With a PivotTable, you can drag fields from within the PivotTable Field List dialog box to different areas in the report. Using this technology, you can dynamically shape and format reports using the simple but powerful functions of Excel. Adding or removing a field, changing a filter, or modifying a sort order is easy. If you're not happy with the current report view, you can drag fields on or off the PivotTable, modify filter settings, and change how numerical data is aggregated to completely transform the look, meaning, and shape of the report.

The PivotTable in Figure 1-1 shows Total Revenue by Month within Payment Method and Type of Service. Notice that State is a field at the top of the PivotTable. With just a few clicks and moves of the mouse, the report can instantly be changed to instead show Average Revenue by Month and State (see Figure 1-2).



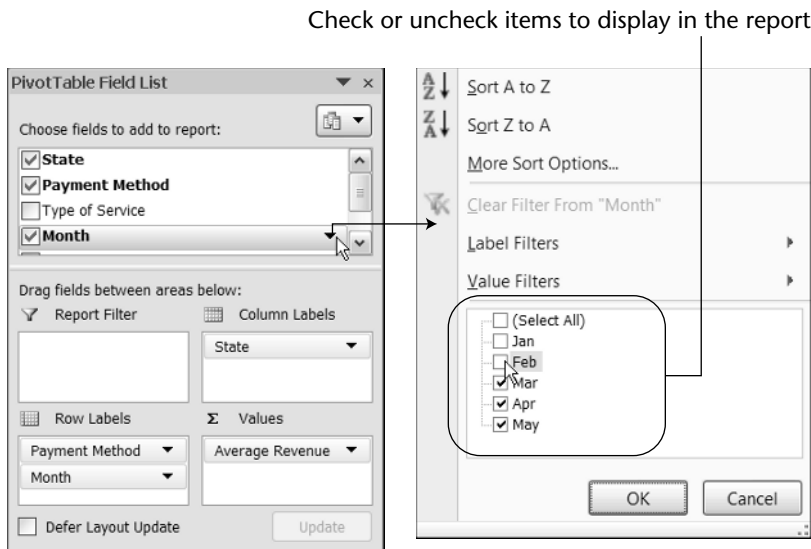
**Figure 1-1:** A PivotTable report is developed by simply dragging fields from the top of the PivotTable Field List dialog box to one of the areas in the bottom half of the dialog box.



**Figure 1-2:** Now the report shows Average Revenue instead of Total Revenue, and State is now in the Column Labels area.

**TIP** You can create PivotTable reports that have numerous fields which do not necessarily have to be dragged to a report location (notice that Type of Service in Figure 1-2 no longer appears in the report). Using this type of approach, a PivotTable report can replace several regular reports, because fields can simply be dragged to locations in the report when they are needed.

Perhaps you might want to display data for a few of the months. To do so, just click the drop-down arrow on Month to deselect the values Jan and Feb, as shown in Figure 1-3.

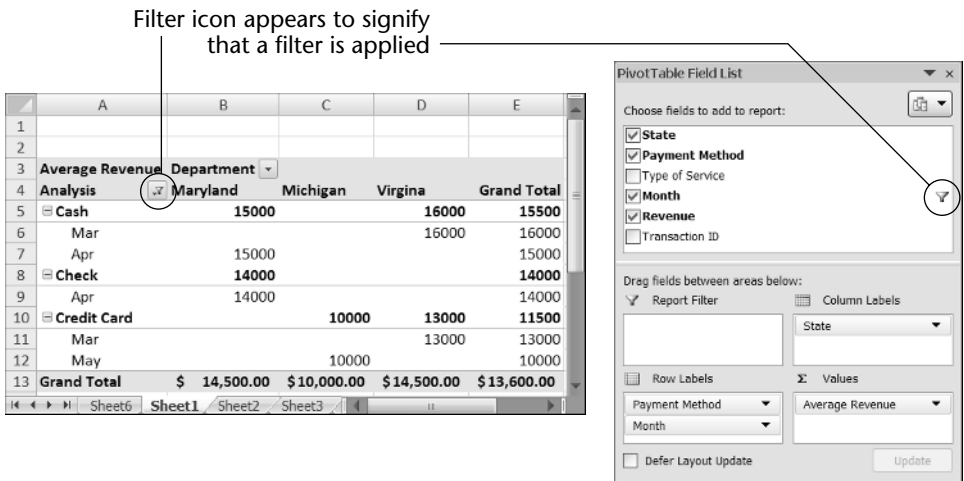


**Figure 1-3:** Clicking a drop-down arrow for a field shows a list of items that can be displayed (checked) or not displayed (unchecked).

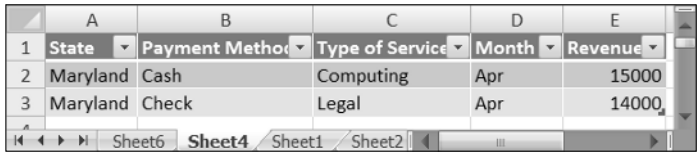
After the filter is applied, the report is automatically resized to show only Mar, Apr, and May, as shown in Figure 1-4.

One of the most powerful utilities of PivotTable reports is the capability to drill down on the summarized report data to the underlying detail. In Figure 1-4, double-clicking any cell value in the range B5:E13 creates a new worksheet with the dataset that makes up that cell. Figure 1-5 shows the underlying data for cell B13.

**CROSS-REFERENCE** Be sure to read Chapters 2 and 3 to learn more about the basics of PivotTable reports, and then turn to Chapter 10 for a more complete analysis of PivotTable functionality, Chapter 11 for PivotTable formatting information, and Chapter 12 for PivotTable data management.



**Figure 1-4:** PivotTable reports are automatically resized once a filter is applied. Additionally, helpful filter icons let report users know which fields are being filtered.



**Figure 1-5:** The supporting dataset that makes up cell B13 in Figure 1-4.

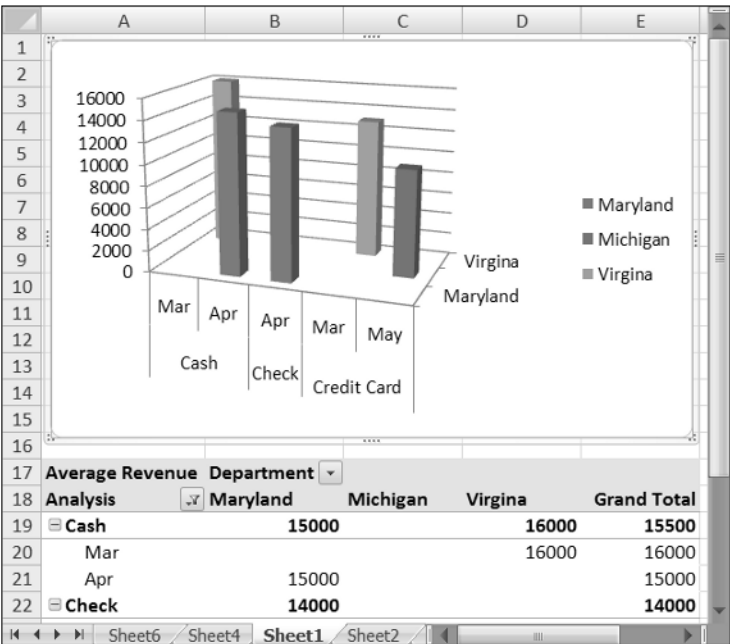
## PivotChart Reports

PivotCharts enable you to visually view and analyze trends in data by linking to a PivotTable report. This link provides you with all the capabilities of a PivotTable report while also providing similar design and features in the graphical PivotChart that can be displayed on a different worksheet or right alongside the PivotTable report. Using a PivotChart, you see the data represented in a chart format, rather than summarized numerically, as is the case for a PivotTable report.

PivotCharts have much the same functionality as PivotTables and are organized in almost the same way. Using PivotChart technology, report users can do the following:

- Produce a number of different types of charts by simply dragging fields from a field list to different locations in the PivotChart.
- Apply simple or advanced filters to determine which items should be displayed in a field.
- Graphically represent numerical aggregations in many different ways using a variety of chart types.
- Use filters to control which items are charted.
- Link to a PivotTable report on the same worksheet or a different worksheet.

Figure 1-6 shows a sample PivotChart report linked to a PivotTable.



**Figure 1-6:** PivotCharts can be displayed alongside a PivotTable report (shown here) or on their own worksheet tab.

Several types of charts are available with PivotCharts. You can choose from a simple two-dimensional bar, column, or pie chart, to a more complex three-dimensional area, bubble, or radar chart. There are also numerous functions for controlling how the data is displayed for each data element in the series.

**CROSS-REFERENCE** To find out the details of creating and using PivotCharts, see Chapter 13.

## Spreadsheet Reports

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Instead of the cross-tabular format of PivotTable reports, Spreadsheet reports organize data into a columnar format. You can use this type of report to extract non-numeric data, such as customer address data or a list of product titles. You can also use this data to extract a mix of alphanumeric and numeric data, such as order line details or product inventory counts. And, as with PivotTable reports, the external data is easily loaded into the report, requiring only a simple click of the mouse button to refresh.

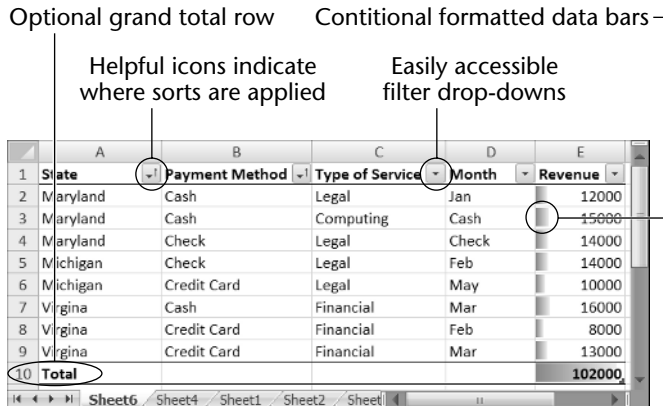
As with most columnar reporting packages, you can apply sorts, filters, breaks, and totals. Unlike other traditional report development software, however, Spreadsheet reports enable you to use all the powerful tools and functions built into Excel. In addition, Spreadsheet reports

- Give you clear-cut functions for applying sorts, breaks, and totals.
- Provide simple and advanced filtering tools to determine which items should be displayed.
- Include a robust suite of tools for applying conditional formatting, including data bars, icon sets, and graded color scales.
- Update report data automatically at predefined intervals or when the report is opened.

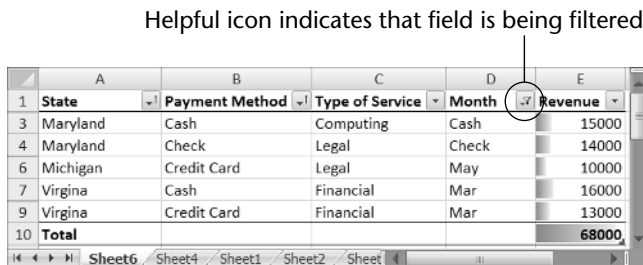
Figure 1-7 shows how a Spreadsheet report might extract and format data from an external database system. Notice that this report contains the same data as the PivotTable reports in the previous section of this chapter. It is, however, in a more columnar format. Don't be fooled by the simplicity of the report layout. It offers many powerful features for calculated fields, applying conditional field formats, and refreshing data at predefined intervals. Additionally, once the data is in the report, you are able to leverage the robust suite of Excel tools and functions to manipulate and analyze the report data.

All that's required to apply a filter is to click the drop-down arrow next to a field. Additionally, once a filter is applied, a helpful icon appears next to the field to indicate that the field is being filtered, as shown in Figure 1-8.





**Figure 1-7:** Spreadsheet reports display data in a columnar format.



**Figure 1-8:** Filter icons appear next to fields that have a filter applied to them.

**CROSS-REFERENCE** To find out the details of creating and using Spreadsheet reports, read Chapters 14–16. Chapter 14 covers building and using Spreadsheet reports, Chapter 15 covers reporting solutions (a group of linked Spreadsheet reports designed to deliver a more robust report solution), and Chapter 16 covers Spreadsheet report formatting.

## Parameter Queries

Filters can be applied before or after the data is imported into the report. However, filtering data on a client machine running Excel is much slower than filtering data on a powerful server with substantial memory and processing resources. There are also numerous other reasons to filter data prior to loading it into the report (see Chapters 11 and 14); thus the data is typically filtered prior to loading it into Excel. This filtering is usually performed by specifying a constraint in the underlying SQL query. However, unless the user can enter a different value each time the report is run, the constraint is static and cannot be specified by the report user.

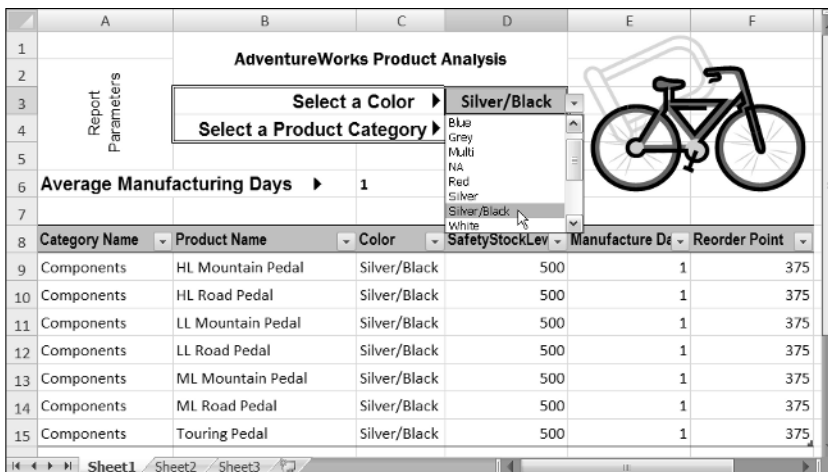
Static constraints might filter data to a particular product line, region, company division, or period of time (for example, the last 30 days). However, if the report user has to define the product line, region, company division, or period of time before the report is run, the underlying SQL query must be modified. Because most report users do not have the technical skills or the security privileges to modify an SQL query, another solution is required. Parameter queries can fill this gap.

Parameter queries act as dynamic constraints, allowing the user to specify a value (or values) each time the report is run. Instead of importing a huge dataset into Excel, parameter queries apply a filter to return only a subset of the records from the data source. With a smaller dataset, the report can run much quicker because it uses fewer server resources. It also consumes less memory and disk space on the computer running the report, enhancing report manipulation performance and computer processing speed. Using parameter queries, you can

- Limit the amount of data that is displayed in a report before the data is imported into the report.
- Integrate the parameters with SQL stored procedure arguments and/or SQL queries to restrict the type and amount of data that is returned.
- Automatically re-query the data source when a parameter value is changed.

Figure 1-9 shows how a parameter query can be used in conjunction with a Spreadsheet report to restrict the report data to a specific type of service. When the Color or the Product Category is changed from the drop-down boxes in cells D3 or D4, the Spreadsheet report automatically queries that data source and refreshes the report.

**CROSS-REFERENCE** To find out the details of creating and using parameter queries, see Chapter 15.



| Category Name | Product Name      | Color        | SafetyStockLevel | Manufacture Date | Reorder Point |
|---------------|-------------------|--------------|------------------|------------------|---------------|
| Components    | HL Mountain Pedal | Silver/Black | 500              | 1                | 375           |
| Components    | HL Road Pedal     | Silver/Black | 500              | 1                | 375           |
| Components    | LL Mountain Pedal | Silver/Black | 500              | 1                | 375           |
| Components    | LL Road Pedal     | Silver/Black | 500              | 1                | 375           |
| Components    | ML Mountain Pedal | Silver/Black | 500              | 1                | 375           |
| Components    | ML Road Pedal     | Silver/Black | 500              | 1                | 375           |
| Components    | Touring Pedal     | Silver/Black | 500              | 1                | 375           |

**Figure 1-9:** Parameter queries can automatically refresh the report as different values are selected.

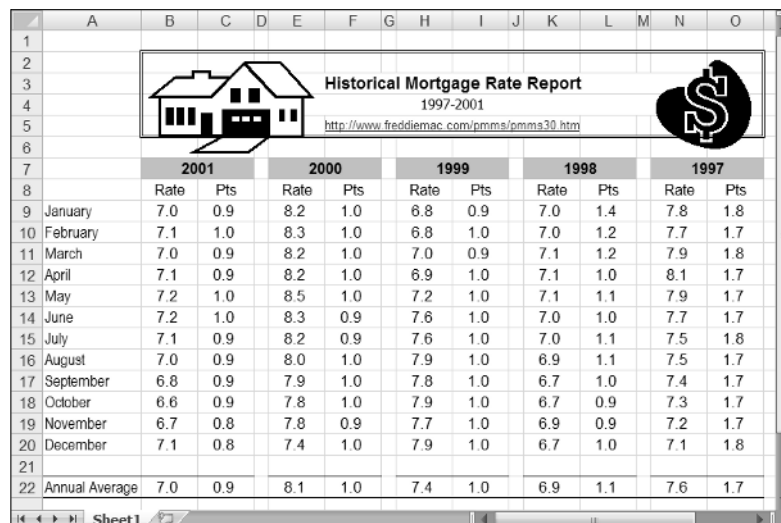
## Web Queries

The web query feature is another exciting and novel reporting tool included as part of Microsoft Excel. Imagine getting the latest currency exchange rates or mortgage interest rates imported directly from the web into your Spreadsheet report. It's as easy as navigating to the web page within Excel and selecting the table (or tables) that you want to import. By simply clicking the report and selecting the Refresh function, you can automatically refresh the report at predefined intervals.

Using this technology, you can

- Import data from the Internet and Intranet web sites.
- Integrate parameters to pull only the data for a specified query.
- Update report data automatically at predefined intervals or when the report is opened.

Figure 1-10 shows how a web query pulls the Historical Mortgage Rate Report information from the Freddie Mac web site. Note that this report uses the <http://www.freddiemac.com/pmms/pmms30.htm> link at the Freddie Mac web site.



|                | 2001 |     | 2000 |     | 1999 |     | 1998 |     | 1997 |     |
|----------------|------|-----|------|-----|------|-----|------|-----|------|-----|
|                | Rate | Pts | Rate | Pts | Rate | Pts | Rate | Pts | Rate | Pts |
| January        | 7.0  | 0.9 | 8.2  | 1.0 | 6.8  | 0.9 | 7.0  | 1.4 | 7.8  | 1.8 |
| February       | 7.1  | 1.0 | 8.3  | 1.0 | 6.8  | 1.0 | 7.0  | 1.2 | 7.7  | 1.7 |
| March          | 7.0  | 0.9 | 8.2  | 1.0 | 7.0  | 0.9 | 7.1  | 1.2 | 7.9  | 1.8 |
| April          | 7.1  | 0.9 | 8.2  | 1.0 | 6.9  | 1.0 | 7.1  | 1.0 | 8.1  | 1.7 |
| May            | 7.2  | 1.0 | 8.5  | 1.0 | 7.2  | 1.0 | 7.1  | 1.1 | 7.9  | 1.7 |
| June           | 7.2  | 1.0 | 8.3  | 0.9 | 7.6  | 1.0 | 7.0  | 1.0 | 7.7  | 1.7 |
| July           | 7.1  | 0.9 | 8.2  | 0.9 | 7.6  | 1.0 | 7.0  | 1.1 | 7.5  | 1.8 |
| August         | 7.0  | 0.9 | 8.0  | 1.0 | 7.9  | 1.0 | 6.9  | 1.1 | 7.5  | 1.7 |
| September      | 6.8  | 0.9 | 7.9  | 1.0 | 7.8  | 1.0 | 6.7  | 1.0 | 7.4  | 1.7 |
| October        | 6.6  | 0.9 | 7.8  | 1.0 | 7.9  | 1.0 | 6.7  | 0.9 | 7.3  | 1.7 |
| November       | 6.7  | 0.8 | 7.8  | 0.9 | 7.7  | 1.0 | 6.9  | 0.9 | 7.2  | 1.7 |
| December       | 7.1  | 0.8 | 7.4  | 1.0 | 7.9  | 1.0 | 6.7  | 1.0 | 7.1  | 1.8 |
| Annual Average | 7.0  | 0.9 | 8.1  | 1.0 | 7.4  | 1.0 | 6.9  | 1.1 | 7.6  | 1.7 |

**Figure 1-10:** Web queries can access data from Intranet and Internet web sites.

## **Chapter Review**

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This chapter provided an introduction to some of the principal types of Excel reports and highlighted some of the innovative tools and features included with each report type. It highlighted some of the features available in the numerous types of Excel reporting tools, including PivotTable reports, PivotChart reports, Spreadsheet reports, parameter queries, and web queries.

The next two chapters provide a more comprehensive look at PivotTable reports. In Chapter 2, I provide a conceptual overview on how PivotTable reports work and how the data is summarized. In Chapter 3, I provide a more detailed review of the PivotTable components and describe the purpose and use of each area in the PivotTable report.