

Getting Excel Data into Access

The business world is split between Access users and Excel users. Access users tend to be the database guys and the techie application builders. Everybody else uses Excel. If you work in corporate America, you are probably conversant in the language of Excel. You can send even the most seasoned of senior vice presidents a spreadsheet-style report and trust she will know what to do with it. Send that same VP an Access file and ask her to run a crosstab query, and you've relegated your career to the cubicle farm.

Simply put, Excel has few equals when it comes to performing large numbers of calculations based on other cells and then presenting that information in a widely acceptable and familiar format. However, as a relational database application, Access is a powerful tool that gives the user the ability to integrate disparate data sources to perform analysis and reporting that would be cumbersome or even impossible to do in Excel. Integrating both applications brings the best of each to bear on a plethora of business analyses. Yet few professionals in corporate America and elsewhere have the experience necessary to accomplish this.

Our goal is to introduce the power of Microsoft Access to Excel users of all skill levels. We want to show you how integrating Access and Excel can improve and expand your abilities in data analysis and reporting beyond what is possible by simply using Excel. In so doing, you will become an indispensable team member with a very rare set of skills.

This chapter explores the first steps in integrating these two Microsoft Office applications for data analysis. The first section describes the relevant differences between Access and Excel for the Access uninitiated. The remaining sections include a hands-on exercise on getting Excel data into Access and is followed by tips and tricks about how to optimize your new database's performance.

Differences Between Access and Excel

Before you dive in to bringing Excel data into Access, take a closer look at each application. Specifically, you need a better understanding of just what the utility is of each application and how they are different. You'll start by examining different categories of spreadsheets in Excel.

Different Types of Excel Spreadsheets

Not all spreadsheets are created equal. Intuitively, you probably already know this. Before importing Excel data into Access, however, you should familiarize yourself with the different types of worksheets.

At the risk of oversimplification, Excel worksheets (not applications) come in three fundamental forms: the Excel report, the Excel flat data file, and the Excel indexed list. Only the last two types are compatible with Access. To ensure your Excel data is in the proper format to be used in Access, you must understand these three types of spreadsheets.

The Excel Worksheet in Report Format

The Excel report is a means of formatting and displaying data, often for managers or other users. A good Excel report makes judicious use of empty space for formatting, summarizes data where appropriate, and clearly marks data fields. In Excel, the spreadsheet can be used both for data storage and for data reporting. A spreadsheet in report format may make a good report, but it does not make a good Access table. The Access table is a repository of data. Other Access objects, like queries, forms, and reports, need to refer to data in these tables to generate useful summaries and reports.

Take, for example, the spreadsheet in Figure 1-1. This worksheet makes for a pretty good report, but it's not in a format that can be imported into Access.

For starters, the geographical region information does not have its own column. Region information is found in the Treatment Type column. If you want to import an Excel worksheet into Access, the worksheet must be in a row by column format. This means every data field must have its own unique column.

	A	B	C	D	E	F
1	TREATMENT TYPE	TREATMENT TECHNOLOGY		4 WEEK INTERVAL	8 WEEK INTERVAL	12 WEEK INTERVAL
2	SOUTH REGION					
3	Earwig eradication					
4		Bugkiller formula EW134	\$	84.50	\$	112.75 \$ 150.50
5		Green treatment	\$	104.50	\$	132.75 \$ 170.50
6		Vacuum	\$	124.50	\$	152.75 \$ 190.50
7	Termite treatment					
8		Bugkiller formula TT56	\$	124.50	\$	152.75 \$ 190.50
9		Green treatment	\$	164.50	\$	192.75 \$ 230.50
10		Vacuum	\$	180.75	\$	209.00 \$ 246.75
11	RolleyPolley Roundup					
12		Bugkiller formula RPR45	\$	84.50	\$	112.75 \$ 150.50
13		Green treatment	\$	104.50	\$	132.75 \$ 170.50
14		Vacuum	\$	124.50	\$	152.75 \$ 190.50
15	NORTH REGION					
16	Earwig eradication					
17		Bugkiller formula EW134	\$	92.00	\$	120.25 \$ 158.00
18		Green treatment	\$	112.00	\$	140.25 \$ 178.00
19		Vacuum	\$	132.00	\$	160.25 \$ 198.00
20	Termite treatment					
21		Bugkiller formula TT56	\$	7.50	\$	7.50 \$ 7.50
22		Green treatment	\$	132.00	\$	160.25 \$ 198.00
23		Vacuum	\$	172.00	\$	200.25 \$ 238.00
24		Vacuum	\$	188.25	\$	7.50 \$ 7.50

Figure 1-1: An Excel spreadsheet in report format

The worksheet in Figure 1-1 also has blank columns and cells in the data. Column C is blank. Additionally, there are blank cells in every row of the report. For proper importing into Access, the data must be *contiguous*, meaning in one solid block with no extraneous rows or columns.

There are columns that house more than one type of information. This issue is a bit more subtle, but look more closely at columns D, E, and F. Each column is telling us something about price *and* something about service term (notice the column labels contain information on service term). A good data source for importing to Access will have columns that contain one unique type of data. For example, in a proper table, these three columns would be replaced with two columns — one for service price and one for service term.

The Excel Worksheet in Flat File Format

Flat files are data repositories organized by row and column. Each row corresponds to a set of data elements called a *record*. Each column is called a *field*. A field corresponds to a unique data element in a record. Figure 1-2 contains the same data as the report in Figure 1-1 in the flat file format.

Notice that every data field has a column and every column corresponds to one and only one data element. Furthermore, there is no extra spacing and each row, or record, corresponds to a unique set of information. However, notice that there is no single field that uniquely identifies a record. In fact, in many of these records, you would have to specify four separate fields before you could uniquely identify the record (Region, Treatment Type, Treatment Technology, Service Interval)!

	A	B	C	D	E
1	REGION	TREATMENT TYPE	TREATMENT TECHNOLOGY	SERVICE INTERVAL	PRICE
2	SOUTH	Earwig eradication	Bugkiller formula EW134	4	\$84.50
3	SOUTH	Earwig eradication	Bugkiller formula EW134	8	\$112.75
4	SOUTH	Earwig eradication	Bugkiller formula EW134	12	\$150.50
5	SOUTH	Earwig eradication	Green treatment	4	\$104.50
6	SOUTH	Earwig eradication	Green treatment	8	\$132.75
7	SOUTH	Earwig eradication	Green treatment	12	\$170.50
8	SOUTH	Earwig eradication	Slow suffocation	4	\$124.50
9	SOUTH	Earwig eradication	Slow suffocation	8	\$152.75
10	SOUTH	Earwig eradication	Slow suffocation	12	\$190.50
11	SOUTH	Termite treatment	Bugkiller formula TT56	4	\$84.50
12	SOUTH	Termite treatment	Bugkiller formula TT57	8	\$112.75
13	SOUTH	Termite treatment	Bugkiller formula TT58	12	\$150.50
14	SOUTH	Termite treatment	Green treatment	4	\$104.50
15	SOUTH	Termite treatment	Green treatment	8	\$132.75
16	SOUTH	Termite treatment	Green treatment	12	\$170.50
17	SOUTH	Termite treatment	Flame thrower	4	\$124.50
18	SOUTH	Termite treatment	Flame thrower	8	\$152.75
19	SOUTH	Termite treatment	Flame thrower	12	\$190.50
20	SOUTH	RolleyPolley Roundup	Bugkiller formula RPR45	4	\$124.50
21	SOUTH	RolleyPolley Roundup	Bugkiller formula RPR45	8	\$152.75
22	SOUTH	RolleyPolley Roundup	Bugkiller formula RPR45	12	\$190.50
23	SOUTH	RolleyPolley Roundup	Green treatment	4	\$164.50
24	SOUTH	RolleyPolley Roundup	Green treatment	8	\$192.75

Figure 1-2: An Excel worksheet in flat file format

As convenient as flat files can be, they aren't the most efficient way to store data in Access. Flat files come with their own set of drawbacks:

- Flat files often contain redundant data (that is, data that is duplicated multiple times). This naturally makes for unnecessarily large datasets.
- Flat files often contain irrelevant data columns. These columns are typically holdovers from another process that no one wants to delete.
- Flat files often contain blank or empty data elements. Because flat files are typically a mish mash of many subjects in one data table, it is not uncommon to have holes in the data.

TIP Chapter 2 discusses some of the drawbacks of flat files in the section "Understanding the Concept of Relational Databases."

The Excel Worksheet in Indexed List Format

The indexed list is the type of spreadsheet most compatible with importing into Access. Excel users who employ VLOOKUP or HLOOKUP functions are already implicitly aware of the indexed list concept. The reference list used in

these functions must always be an indexed list. An indexed list shares properties with the flat file format in that it is contiguous and organized by row and column. It is different in two very important ways, however. First, the indexed list contains information about one and only one subject. Second, an indexed list has one column with non-repeating data that uniquely identifies each record. Take a look at our data in an indexed list format in Figure 1-3.

The indexed list shown here is all about one subject: product pricing. The field called Product Number uniquely identifies each service offering and service interval combination. Notice how information about the Region, Treatment Type, and Treatment Technology no longer exists in this table. That is because the Product Number field is now used as an index to represent these elements. In a properly designed database structure, the Region, Treatment Type, and Treatment Technology might be stored in their own separate indexed lists with the subjects focused on things such as Service Descriptions and Region Hierarchy.

Don't worry if these concepts don't sink in at first glance. As you move through Chapter 2 and start working with some data in Access, you will intuitively grasp these concepts. As you will learn in Chapter 2, indexed lists will make database design more elegant and your analysis less prone to errors.

	A	B	C
1	PRODUCT NUMBER	SERVICE INTERVAL	PRICE
2	1064	8	\$132.75
3	1085	12	\$150.50
4	1085	4	\$164.50
5	1135	12	\$246.75
6	1165	4	\$124.50
7	1213	12	\$170.50
8	1218	8	\$152.75
9	1261	4	\$124.50
10	1287	4	\$180.75
11	1303	12	\$170.50
12	1320	8	\$192.75
13	1329	4	\$104.50
14	1351	8	\$152.75
15	1414	12	\$230.50
16	1453	12	\$190.50
17	1493	4	\$84.50
18	1607	4	\$84.50
19	1685	8	\$132.75
20	1689	8	\$209.00
21	1709	4	\$104.50
22	1808	12	\$190.50
23	1854	12	\$150.50

Figure 1-3: An Excel worksheet in indexed list format

The Access Table

Now that you have reviewed what type of Excel data format is compatible with Access, let's take a brief look at where the Excel data will be going — the Access table. Access contains many objects that are very useful in manipulating and presenting data. The table is where the data is stored. Queries, forms, reports, and other Access objects ultimately reference data in an Access table.

The Table in the Datasheet View

In the sample files for this book, you will find a sample Access database. Open this database. When the database is open, go up to the application ribbon, select the Create tab, and then click the Table command button. A new table similar to the one illustrated in Figure 1-4 is activated in Datasheet view.

You will notice how similar the table is to a blank Excel spreadsheet. Both are organized by row and column. As with an Excel flat file and indexed list, each row corresponds to a record of data and each column corresponds to a field or a unique data element within the record.

As you can imagine, one way to create a table in Access is to start entering data in the Datasheet view. You can enter new data fields by entering data in the cells and pressing the Tab key. Enter a new record by pressing Enter. This method of entry will work if you need to get very small Excel lists into Access. However, there are much more efficient and powerful methods such as importing and linking, which you will explore later in this chapter.

The Table in the Design View

At the far left end of the Access ribbon, you will see the View icon. Click the View icon and select Design from the drop down menu. After being prompted to save and name the table, you will see the Design view (see Figure 1-5).

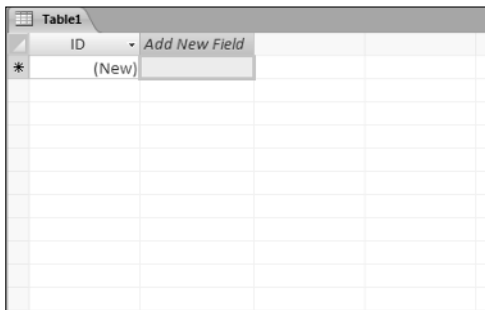


Figure 1-4: The Access table in the Datasheet view

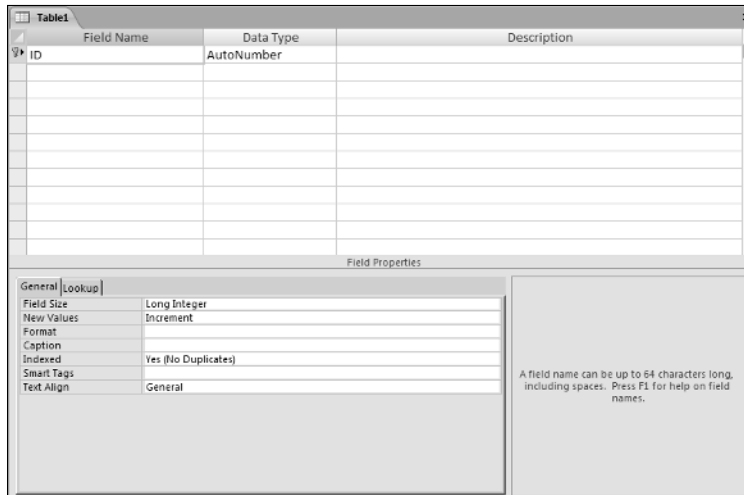


Figure 1-5: The Access table in the Design view

Here you can change the properties of the fields in the table: the field name, the data type (which characterizes what kind of information exists in the field), and a description (where you can manually enter a more descriptive word or phrase about the field).

Different Types of Data

Ten data types can be defined in Access. You will probably use just a few of them. However, this section includes a brief description of all the types in case you are relatively new to Access. The 10 data types are: Text, Memo, Number, Date/Time, Currency, AutoNumber, Yes/No, OLE Object, Hyperlink, and Attachment.

- **Text:** Text is the most common data type you will use in Access. Technically, any combination of letters, numbers, and characters is text — even spaces! Keep in mind that any number stored as text cannot be used in a calculation. Examples of numbers commonly stored as the Text data type are customer numbers, product SKUs, or serial numbers. Obviously, you would never perform any calculations on these types of numbers. The Text data type is limited to a maximum of 255 characters.
- **Memo:** The Memo field allows you to store text data that exceeds the 255-character limit of the text field.
- **Number:** The Number field is a numeric data type that is actually several data types under one heading. Use this data type with fields that might be summed or otherwise modified through arithmetic operations.

After selecting the Number data type in the Design view of the table, go to the Field Size field at the top of the Field Properties menu. Selecting this menu will give you the following choices: Byte, Integer, Long Integer, Single, Double, Replication ID, and Decimal. The most common field sizes of the Number data type are Long Integer and Double. Long Integer should be selected if the numbers are whole numbers (no decimals). Double should be selected if decimal numbers need to be stored in that field.

- **Date/Time:** The Date/Time data type is used to record the exact time or date that certain events occurred. The posting date of a transaction and the exact time a service call was placed are perfect examples of fields where the Date/Time data type is most useful.
- **Currency:** The Double field size of the Number data type can also be used for currency fields, but the Currency data type is ideal to store all data that represents amounts of money.
- **AutoNumber:** This data type is a Long Integer that is automatically created for each new record added to a table, so you will never enter data into this field. The AutoNumber can be one mechanism by which you can uniquely identify each individual record in a table, but it is best practice to use a unique record identifier that already exists in your data set.
- **Yes/No:** There are situations where the data that needs to be represented is in a simple Yes/No format. Although you could use the Text data type for creating a True/False field, it is much more intuitive to use Access's native data type for this purpose.
- **OLE Object:** This data type is not encountered very often in data analysis. It is used when the field must store a binary file, such as a picture or sound file.
- **Hyperlink:** When you need to store an address to a web site, this is the preferred data type.
- **Attachment:** You can use attachments to store several files, and even different types of files, in a single field. The Attachment field is new for Access 2007 and stores data files more efficiently than using other fields like the OLE Object field.

Different data types and field sizes can get overwhelming, but don't worry. When you import your data from Excel, Access will choose a default type for you. Most of the time, the default type is correct. If it's not, however, you have the opportunity to change it when importing or when your data is already in Access.

Table and Field Naming Conventions

There are important conventions and limitations when it comes to naming your Access database tables and fields within those tables. The maximum length of a field name is 64 characters. Although you should give your fields descriptive names to clarify what the field represents, try using considerably less than the 64-character limit. In addition, your field name cannot include a period (.), an exclamation point (!), an accent grave (`), or brackets ([]).

TIP It's good practice not to put any spaces in field or table names. When constructing queries or referring to tables in VBA code, spaces in the field names can lead to problems. If you need to indicate a space in your field name, use the underscore character (_).

Bringing Your Excel Data into Access

From the prior section, you know that your Excel data must be in flat file or indexed list format to be compatible with Access. Once you have your Excel data in the correct form, you can start bringing that data into Access. This section introduces the many ways of getting Excel data into Access.

Importing a Worksheet into a New Table

Open Microsoft Access and select the Blank Database icon as demonstrated in Figure 1-6. On the right, you see an input box used to name your new database.



Figure 1-6: Menu for creating a new database

NOTE By default, all new databases are automatically created in the My Documents directory (in Vista, the default directory is the Documents directory). You can select a different location for your database by clicking the folder icon next to the input box containing the name of the database.

When you click the Create button, you will have an empty database. At this point, start by bringing in employee data. The employee data you need comes from Human Resources. They export it from their HR system into an Excel file and make some manual adjustments to it each month. You can take a look at the data in the Excel file EmployeeMaster (see Figure 1-7).

TIP The ExcelMaster.xlsx file can be found within the sample files for this book installed under C:\Integration.

The data looks to be in indexed list format with Employee Number uniquely identifying each record. Now let's import our worksheet to a new Access table with the Access Import Spreadsheet Wizard. To begin importing an Excel spreadsheet, simply click the External Data tab and then click the Excel icon above the import section. If you are familiar with earlier versions of Access, you will remember that this functionality was buried several layers deep within the File menu.

Now browse for the file you want to import and then select the option Import the source data into a new table in the current database. Figure 1-8 shows you what the wizard should look like now.

	A	B	C	D	E	F	
	Employee_Number	Last_Name	First_Name	Employee_Status	Hire_Date	Last_Date_Worked	Job_Title
1	104	WIBB	MAURICE	A	4/11/1994		SERVICE
3	1044	BLECKMAN	PHILLIP	A	6/24/1992		SERVICE
4	1050	VALLOFURTE	LOUIS	I	11/20/1996	10/8/2004	SERVICE
5	1054	STEMPFL	JOHN	A	7/5/1977		SERVICE
6	106	CESTENGIAY	LUC	A	4/15/1996		SERVICE
7	113	TRIDIL	ROCH	A	10/24/1988		SERVICE
8	1130	RIID	RUSSELL	A	2/27/1986		SERVICE
9	1135	FERNEM	ROBERT	A	10/9/1990		TEAMLEA
10	1156	RACHERDS	PATRICK	A	8/24/1987		SERVICE
11	1245	HERPIR	JAMES	A	10/10/1994		SERVICE
12	1336	RACHTIR	CHARLES	A	3/24/1986		SERVICE
13	1344	ZAMMIRMAN	CHAD	A	1/5/1998		SERVICE
14	1416	CERMACHEIL	KEVIN	A	9/12/1990		SERVICE
15	142	CETE	GUY	A	10/26/1998		SERVICE
16	1435	HIGHIS	MICHAEL	A	7/20/1992		SERVICE
17	145	ERSINEILT	MIKE	A	9/28/1998		SERVICE
18	1462	GIFFYI	SHAWN	I	4/20/1998	1/26/2005	SERVICE
19	1464	GRANTHEM	PETER	A	7/5/1988		TEAMLEA
20	1465	PRZISLEWSKI	BRIAN	A	8/30/1994		SERVICE
21	1536	GLUISEN	JOSEPH	A	5/7/1986		SERVICE
22	1544	TERRIS	ANGELO	I	5/26/1998	6/15/2004	SERVICE
23	1564	BEWIN	BRANDON	I	1/21/1998	2/20/2004	SERVICE
24	160006	BEICHERO	SHANE	I	7/27/2003	7/9/2004	SERVICE

Figure 1-7: Employee data in Excel

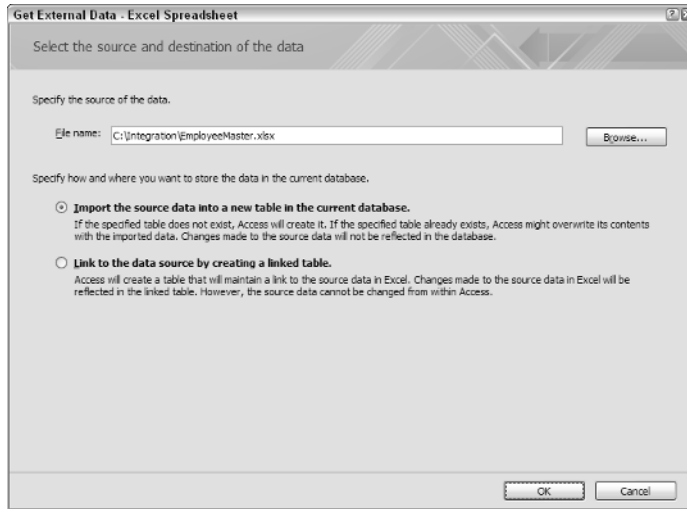


Figure 1-8: Select the data source and select the import option.

Click the OK button to activate the Import Spreadsheet Wizard shown in Figure 1-9. The first box in the Import Spreadsheet Wizard allows you to specify the worksheet or range you want to import. If your workbook has more than one worksheet, all worksheets will be listed here. In this case, there is only one worksheet. Select the target worksheet and click the Next button.

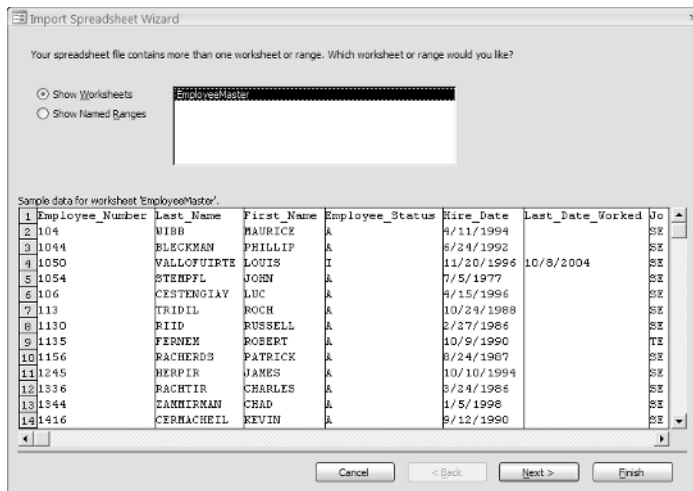


Figure 1-9: Identify the worksheet or range you want to import.

The next screen allows you to select whether the source data has headings at the tops of the columns (see Figure 1-10). As you can see, you simply check the check box if your source data has headings. Click the Next button to move on.

The next screen allows you to specify the data type for each field (see Figure 1-11). This setting allows you to tell Access whether the given field is a number, text, currency, date, or so on. The idea is to select each field and check to make sure the data type for that field is correct. In addition, you can specify whether any given field is to be indexed. When you index a field, Access creates a kind of organizational mapping of the field allowing for faster querying and grouping.

The best way to illustrate indexing is by an analogy. Imagine you had a file cabinet with 10,000 folders, each dedicated to a specific customer. Now imagine these files were in random order. To access the customer name Schnogg's Accounting Service, you would have to pore through every customer file until you found it. Now imagine finding the file if your customer folders were organized (or *indexed*) alphabetically.

When you sort or filter on a non-indexed field, Access will search every record until the correct record is found. Indexing a field in Access is conceptually identical to alphabetizing the file system. Indexing a field makes Access create an organizational scheme for that field such that it can be found much more rapidly.

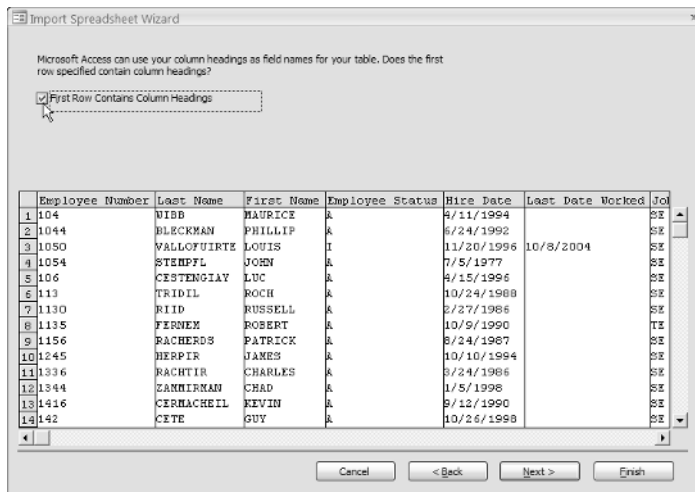


Figure 1-10: Specify whether your data source comes with headings.

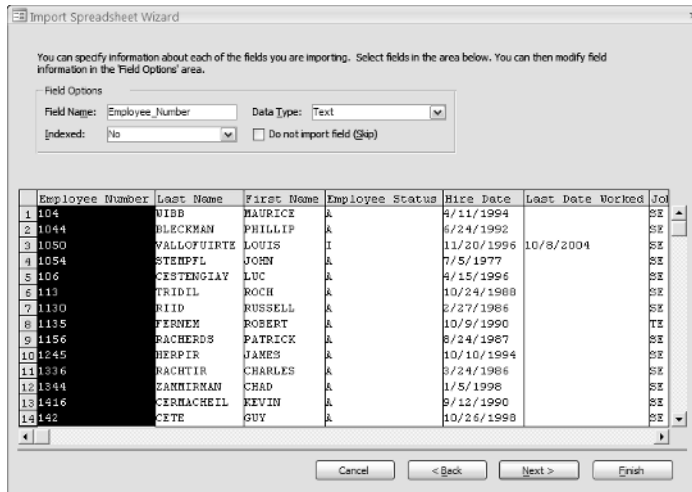


Figure 1-11: Apply data types and indexing to your fields

TIP You may wonder why you would not index all your fields. Wouldn't that make your queries run faster? The answer is an emphatic *no!* Indexing is a good idea on fields you expect to filter or join to another table. Indexing is not a good idea for fields you expect to perform calculations on. You should also be aware that while indexing can improve the performance for some types of analysis, other types could actually be slowed by using indexed fields. The relevance and importance of indexing fields will become clearer as we discuss different Access query types in Chapter 2.

The next screen allows you to select the primary key (see Figure 1-12). A primary key is a data field that uniquely identifies each record in a data set. Each table in a properly designed relational database should contain information about one entity, and each record should be uniquely identified by one field. That one field is called the primary key. In this example, the Employee_Number field contains unique numbers; one for each unique employee represented.

Sometimes the Excel data you import will be in flat file format and will not have one field that uniquely identifies each record. In these cases, the Import Spreadsheet Wizard will default to assigning an Autonumber primary key for you.

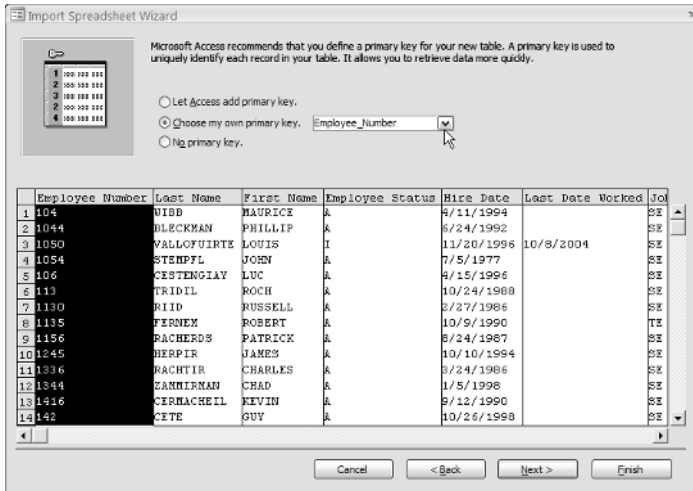


Figure 1-12: Define which field will be your primary key.

A WORD ON CREATING COMPOUND KEYS

Sometimes a flat file will have two or more fields that together uniquely identify a record. In these cases you will need to create what is called a **compound key**. Take the table shown here in Figure 1-13, for example. This table contains both an invoice number and a product number. There are duplicate values for each field when looked at separately. A sales rep may have sold multiple products to a customer on the same invoice. By combining the invoice and product number, however, you can create a compound primary key that is truly unique for each record.

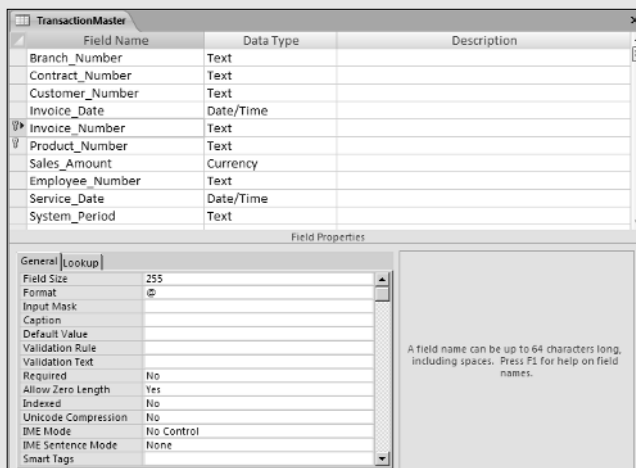


Figure 1-13: You will often require a key on two fields to make a unique value.

If you need a compound key, import your data without specifying a key in the Import Spreadsheet Wizard. Then when your table is created, view your table in the Design view. When in Design view, select the fields that together make up your compound key, right-click, and select the primary key icon from the drop-down menu. Close the table and save your changes.

The last screen of the Import Spreadsheet Wizard asks to you name your new table (see Figure 1-14). By default, the name of your new table is the name of your imported worksheet, but you can change the name to suit your needs. At this point, you can click the Finish button to start the import.

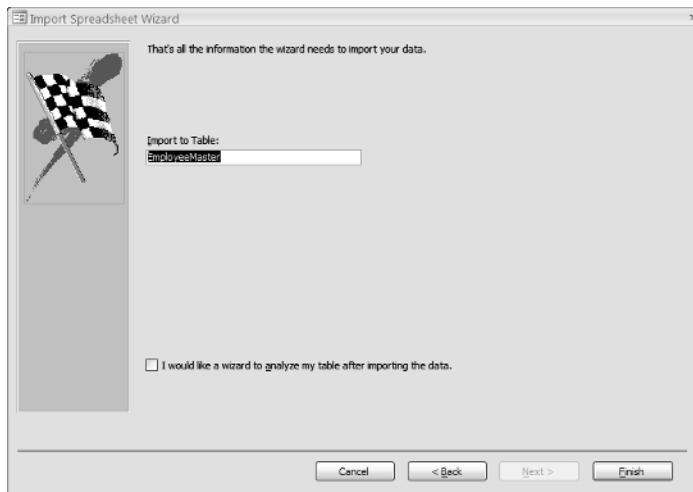


Figure 1-14: Name your imported table and click the Finish button.

NOTE It's important to note that naming your import table the same name as an existing table in your database causes Access to give you a warning that you are about to overwrite your existing table. Be careful that you do not inadvertently overwrite an existing table with a careless table name choice.

After your data has been imported, you see a dialog box that asks whether you want to save your import steps (see Figure 1-15). This is a new feature in Access 2007, allowing you to save time when the same dataset must be routinely imported. As you can see in Figure 1-15, clicking the Save import steps check box allows you to save your import steps as a named task that can be used whenever you need. To recall a saved import task, simply click the Saved Imports command button under the External Data tab in the Access ribbon.

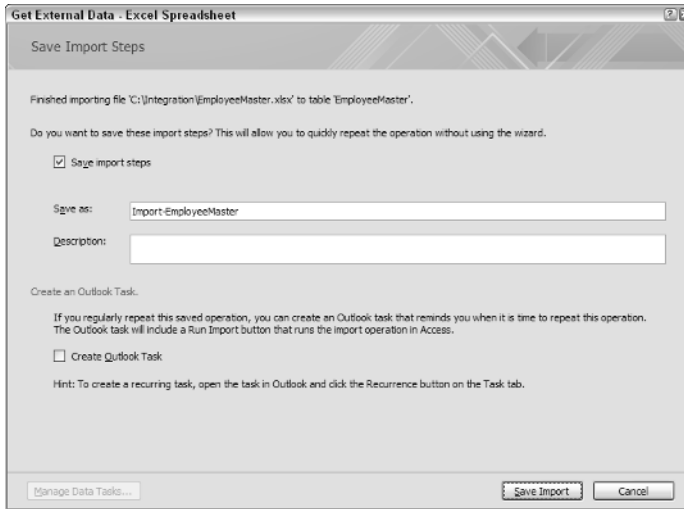


Figure 1-15: You now have the option of saving your import steps.

TIP Another quick way to create a new table in Access from Excel is to drag and drop between the two applications. Open Access and Excel and arrange the windows so you can see both applications. Now simply highlight the selected Excel range you want to import and drag it into Access. You've immediately created an Access table.

Be aware that this action actually moves the data from Excel to Access. The data will no longer be in Excel! To copy the data instead of moving it, hold down the Ctrl key on your keyboard while you drag from Excel to Access.

Linking an Excel Worksheet to Access

Sometimes the Excel data you want to incorporate into Access is going to change frequently. Perhaps the Excel data you need is owned by someone else and is updated daily. Does it make sense to import that data into a new Access table every time it changes? What if you do not know when it changes, yet it is critical to have the most up-to-date information for your analysis? In these situations it makes more sense to get your Excel data by linking a worksheet.

Linking data is different from importing data in that Access references the linked data in its original location. Importing data brings a local copy of the information into the Access database. Any changes made to the local copy in

Access do not affect the original spreadsheet. Likewise, any changes made to the original spreadsheet after importing are not reflected in the Access table.

Conversely, a linked Excel sheet exists in real time. Changes made to the sheet in the original Excel file are reflected in Access upon refresh. However, you cannot make changes to the Excel data through Access. Linking is a one-way street of data flow.

As with the prior example, start by selecting the External Data tab and then select the Import Excel icon. In the Get External Data dialog box, browse for the Location_Master.xlsx file. This time, select the option Link to the data source by creating a linked table (see Figure 1-16). Click the OK button to continue.

This launches the Link Spreadsheet Wizard shown in Figure 1-17. You will notice it looks nearly identical to the Import Spreadsheet Wizard. As with the Import Spreadsheet Wizard, the idea is to go through each screen of the wizard, answering the questions posed and clicking the Next button. The last step in the wizard gives you the option to name your linked table. Again, the default name is the worksheet name or named range. Click the Finish button to apply the link.

NOTE When linking to a data source, you can't specify data types, indexing, or primary keys. Therefore, you can't see those selections in the Link Spreadsheet Wizard.

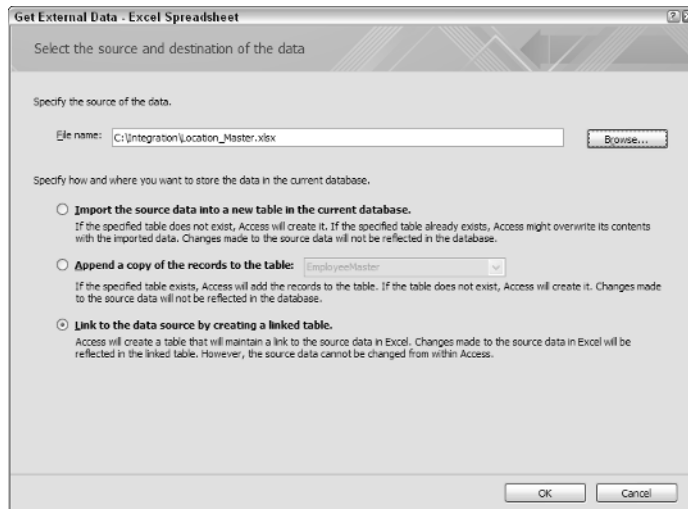


Figure 1-16: To link to a data source, select the Link option.

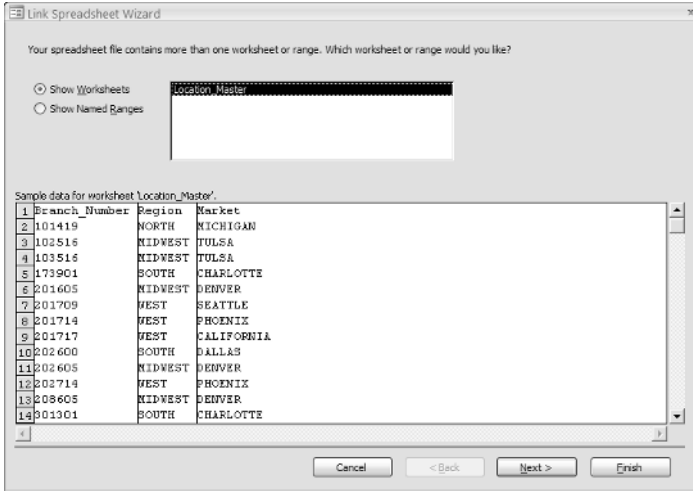


Figure 1-17: The steps in this wizard are nearly identical to those of the Import Spreadsheet Wizard.

Figure 1-18 illustrates the difference in the icons between imported tables and linked tables. Notice that tables linked to an Excel data source have an Excel icon.

Earlier you learned that a linked Excel table incorporates changes from the Excel file to Access but does not allow changes from Access back to Excel. To test this, open the linked table in Access by double-clicking the linked Excel table icon. Next, try to change the data by replacing branch number 101313 with 999999. When you try to enter the first 9, you hear an alert. Look in the bottom-left corner of the screen, and you will see the warning “This Recordset is not updateable” (see Figure 1-19).

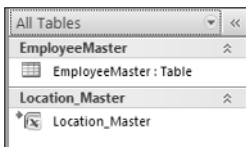


Figure 1-18: A linked table has a different-looking icon than an imported table.

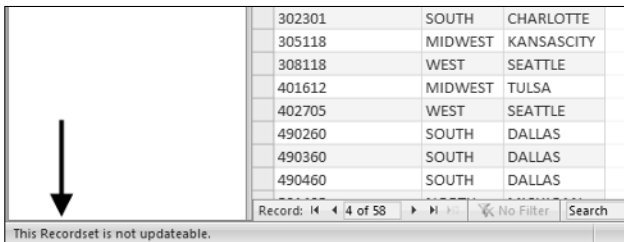


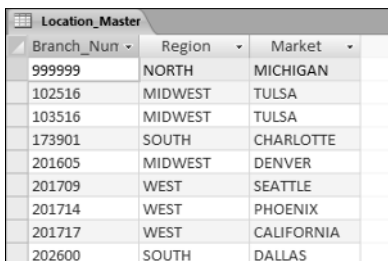
Figure 1-19: You cannot update a linked Excel table through the Access interface.

Now that you've proven that you cannot update the Excel spreadsheet through Access, test whether Access sees changes made to the source data. Close the Location_Master table in Access by clicking the X in the upper-right corner of the table window. Open Excel, locate the Location_Master worksheet and open it. Now try the same exercise of changing branch 101419 to 999999. Save and close the Excel file. Now open up the Access linked table Location_Master to verify that our change carried through (see Figure 1-20).

NOTE You may be wondering why anyone would link to an Excel file when they can't change the data in Access. Well, the primary utility of a linked table is to get the latest data from a source that changes often without having to import the data repeatedly. Imagine you have an Excel file updated nightly. If you were to use that file in your Access queries or reports, linking to that source would allow you to get the latest changes without importing the data every day.

If the structure of the data source for your linked table changes, you will have to refresh your link in order to get those structural changes. For example, if you were to add a column to the Location_Master Excel file, you would not be able to see that change in Access until you refresh the link to the Location_Master Excel file. To do so, use the Linked Table Manager. The linked table manager can be found under the Database Tools tab in the Access ribbon.

When you click the Linked Table Manager button, the dialog box shown in Figure 1-21 activates, displaying all the linked tables in the current database. In this case, you'll see one linked table: the Location_Master table. Select the check box beside the linked table and click the OK button. Your data has been successfully refreshed!



Branch_Num	Region	Market
999999	NORTH	MICHIGAN
102516	MIDWEST	TULSA
103516	MIDWEST	TULSA
173901	SOUTH	CHARLOTTE
201605	MIDWEST	DENVER
201709	WEST	SEATTLE
201714	WEST	PHOENIX
201717	WEST	CALIFORNIA
202600	SOUTH	DALLAS

Figure 1-20: Updates to the linked Excel table carry through to Access.

IMPORTING OR LINKING TO NON-EXCEL DATA

You may want to import and analyze non-Excel data and then send it to Excel after analysis in Access. One of the most common data types for import is text-delimited data. Delimited text is simply text where the individual fields in a record are separated by a specific character like a tab, comma, or space.

Fortunately, Access recognizes delimited text and even allows you to choose the specific character that separates fields. To get delimited text into Access, simply choose Text file from the External Data ribbon and walk through the same process you would when importing or linking to an Excel file.

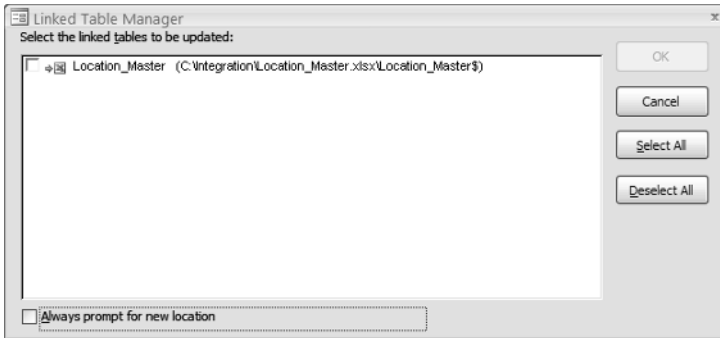


Figure 1-21: View of the Linked Table Manager

Appending an Excel Worksheet to an Existing Table

The last topic on importing Excel data to Access is how to use the Append function in the Get External Data dialog box. When you append data to a table, you essentially add records to the end of the table. This is useful when you have a process where records for a specific table are added over time (for example, if new employees come into an organization and need to be added to the EmployeeMaster table).

Select the External Data tab and click the import Excel icon. Browse for the file that contains the records you want to add. In the Get External Data dialog box, select the option Append a copy of the records to the table and specify the table to which you would like to append your new records. In Figure 1-22, you can see that new employee records from an Excel file called NewEmployees are appended to the EmployeeMaster table.

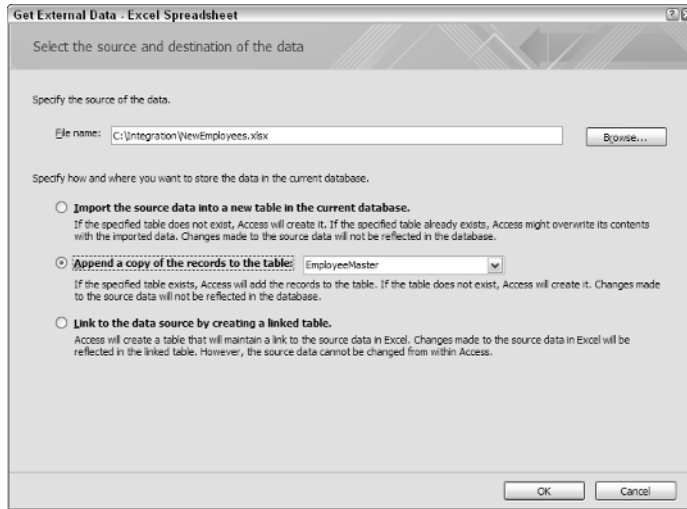


Figure 1-22: Append data by choosing the append options in the Get External Data dialog box.

Clicking the OK button activates the Import Spreadsheet Wizard. As with importing and linking data, the idea is to go through each screen of the wizard, answering the questions posed and clicking the Next button. When you get to the last screen, click the Finish button to trigger the append action.

Potential Errors When Using the Append Import Wizard

It's important to note that you may encounter some potential errors when appending data. Unfortunately, Access is not very clear when it does not like some portion of the append process. The most likely consequence of an append error is simply not being able to get your data into Access. The wizard spits out an error and does not let you continue with the import. Let's review some of the most common error messages, the underlying problem, and what is required to fix it.

- **Type Conversion Failure:** This error occurs when the data type of a value in the records you are trying to append does not match the data type of the field to which you are appending. For example, suppose you originally imported a transaction file and changed the default data type of the Invoice Number field to Number. Now suppose that invoice numbers in your organization start coming in as alphanumeric (such as INV20231). When you append additional data to your transaction table, you will receive an error because you are trying to put a text field into a field designated for numbers.

- **Key violations:** Key violations occur when you try to append a field with duplicate values to a field designated as a primary key. A primary key is a data field that uniquely defines a record in a data set. In other words, a primary key cannot have duplicates. Access will not let you append a field that has duplicate data to a field designated as a primary key.
- **Lock violation:** If the table you are trying to append to is open, Access will not allow you to append the new records until you close the table. Make sure the table you are appending to is closed before starting the Append Import Wizard.

USING COMPACT AND REPAIR

Access has a size limit of about 2 GB. When an Access database gets close to this limit, performance will degrade rapidly. Additionally, the risk of database corruption increases as well. Properly designed Access Database applications should rarely approach this size limit. I have used Access databases that perform tons of query operations on several million record transaction tables and have rarely approached this limit. The most common cause of approaching this size limit is from not doing proper maintenance to the database.

When you delete a large table of data in Access, you may think you are automatically reducing the size of the Access file. In fact, you are not. Access does not automatically release the storage space associated with a deleted table. Let's say you import a million row transaction table to your Access database only to realize that you forgot to import several relevant fields. Conscious of the size limits in Access, you delete the table and import another table with all the appropriate fields. Even though you have deleted the first table, Access still has not released the space and your file size has doubled. Another cause of this database bloat occurs when performing a series of action queries, making numerous intermediate tables for a final analysis. Even if those intermediate tables are deleted, Access is still allocating space for them.

The solution to this problem is to routinely compact and repair your database. Press the Office File icon and select Manage, Compact and Repair Database (see Figure 1-23).

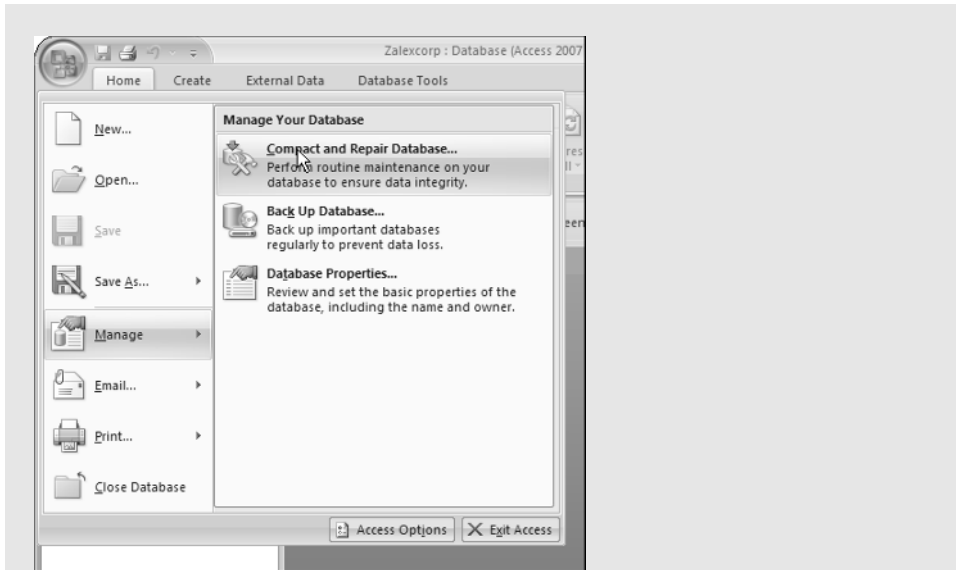


Figure 1-23: Using the Compact and Repair Database Utility in Access

How often you perform this operation really depends on how frequently you add and then delete tables from your database. The best practice is to compact and repair your Access database at least every time you open or close it. This action can be automated for you by selecting the file icon and then selecting the Access Options button at the bottom of the menu. This opens the Access Options dialog box. By selecting the Current Database menu item from the list on the left and checking the Compact on Close check box, you will ensure your database is compacted and repaired at least every time you close the application.

Summary

Getting your Excel data into Access is the first step in leveraging the powerful utilities and functionality of Access. Outside of manually entering data into your Access tables, there are three basic ways of getting Excel data into your Access processes: importing, linking, and appending.

Importing data allows you to create a table in Access that you can control and use to run queries, build reports, and perform any other Access-related task. Linking data creates a connection to your Excel file, allowing you to instantly see any changes made to your source file without having to take further action. The primary utility of a linked table is to get the latest data from a source that changes often, without having to import the data repeatedly. Appending data allows you to add records to the end of the table. This is useful when you have a process where the records for a specific table are added over time. Now that you understand the different ways of getting your data into Access, you can effectively use whichever one best suits your needs in a given situation.