Use a Pivot Table in Excel 2007 for Data Organization

Pivot tables are an Excel feature that you should learn how to use. Instead of analyzing rows upon rows of records, a pivot table can aggregate your data and show a new perspective and few clicks. You can also move columns to rows or vice versa. The problem is people believe creating a pivot table is too difficult to learn. Grab a seat and we'll walk you through this mini tutorial using Excel 2007.

What is a Pivot Table

You might think of a pivot table as a user created summary table of your original spreadsheet. You create the table by defining which fields to view and how the data should be displayed. Based on your field selections, Excel aggregates and organizes the data so you see a different view of your data.

As example, I've uploaded a sample spreadsheet of 4000 fictitious voters, which includes the following data fields:

- Voter ID
- Party Affiliation
- □ Their precinct
- □ Age group
- □ When they last voted
- Years they've been registered
- Ballot status

pivot_table_example.xls - Microsoft Excel												
Ľ	Home	Insert P	age Layout	Formulas	Data F	Review	View	ASAP Utilities	Ad Intelli			
	From Access From Web From Text Get	From Other Sources - Co External Data	Existing nnections A	Con Prop resh II → ∞ Edit Connectio	nections perties Links ns	$A \downarrow Z \downarrow Z A$ $Z \downarrow Z A$ $Z \downarrow Sort$	Filter Sort & Filt	Clear Reapply Advanced	Text to F Columns D			
	N25	, (*	f_{x}									
	А	В	С	D	E	F	G	Н	-			
	_		_	AGE	LAST	YEARS	BALLOT	_				
1	VOTER 💌	PARTY 💌	PRECINCT	GROUP	VOTED 💌	REG 💌	STATUS	•				
2	1012	REPUBLICAN	2408	3 71 +	08/2006	51	PERM					
3	1013	REPUBLICAN	241:	71+	08/2006	50	PERM					
4	1014	DEMOCRAT	2424	171+	08/2006	50	PERM					
5	1015	DEMOCRAT	2418	3 71 +	08/2006	50	POLL					
6	1016	REPUBLICAN	241:	. 71 +	08/2006	50	PERM					
7	1017	REPUBLICAN	2419	9 71 +	08/2006	50	PERM					
8	1018	REPUBLICAN	241	71+	08/2006	48	PERM					
9	1019	REPUBLICAN	241	/ /1 +	08/2006	48	PERM					
10	1023	DEMOCRAT	2424	71+	08/2006	46	POLL					
11	1024	REPUBLICAN	241	1 /1 +	08/2006	46	PERM					
12	1025	REPUBLICAN	2410) /1 +	06/2006	40	POLL					
13	1020	DEMOCRAT	240	71 +	08/2000	40	PERIVI					
14	1027	REPUBLICAN	2403	71 -	08/2000	3						
15	1020	DEMOCRAT	2420	71 +	00/2000	40						
17	1025	REDUBLICAN	2410	71 +	08/2006	45	DERM					
18	1030	REPUBLICAN	2410	71 +	08/2006	44	DERM					
19	1031	DEMOCRAT	241) 71 +	08/2006	44	PERM					
20	1032	DEMOCRAT	2410	61-70	08/2006	44	POLL					
21	1034	DEMOCRAT	240	3 71 +	06/2006	44	PERM					

Looking at the first 20 data records, you can see the data is boring. It's enough to make you roll your eyes and fall asleep. In this format, the key question it answers is how many voters exist in all the precincts.

Using Excel pivot tables, you can organize and group the same data in ways that start to answer questions such as:

- What is the party breakdown by precinct?
- Do voters use permanent absentee ballots?
- Which precincts have the most Democrats?
- How many voter pamphlets do I need for Precinct 2416?
- Do 18-21 year olds vote?

A pivot tables allow you to group the spreadsheet or external data source by any of your data fields. The thumbnail below shows a count of voters by party by precinct.

	А		В	С	D	E	F	G	н	1	J	К		PivotTable Field List		• ×
1												[™ - 1
2														Choose fields to add to re	eport:	
4	Age Group) 🔽	INDEP	DECLINED	DEMOCRAT	GREEN	REPUBLICAN	Total						VOTER		
5	2401			23	106	2	31	162					ч.			
6	2402		6	33	128	5	55	227								
7	2403		2	17	72	4	28	123								
8	2404		3	17	94	3	34	151								
9	2405		3	31	80	2	60	176						BALLOT		
10	2406		3	24	90	2	51	170								
11	2407		3	19	72	2	22	118								
12	2408		1	24	89	1	43	158								
13	2409			32	92	2	53	179								
14	2411		1	26	76		42	145								
15	2412		1	26	83	2	38	150								
16	2413		5	26	95		63	189						Drag fields between areas	s below:	
17	2414		4	21	83	4	42	154						Y Report Filter	Column	Labels
18	2415		2	26	96	5	54	183							PARTY	-
19	2416		2	24	111	3	59	199								
20	2417		2	14	136	2	69	223								
21	2418		6	40	135		87	268								
22	2419		4	33	108	1	92	238						Row Labels	Σ Values	
23	2420		2	12	75	1	26	116						PRECINCT 🔻	Count of P	ARTY 🔻
24	2421		2	15	94		64	175								
25	2422		3	16	66		42	127								
26	2423		6	30	87		74	197								
27	2424	at2 /	Votere 🖉	21	89		62	172					•	Defer Layout Update	U	pdate

Using a pivot table, I can continue to slice the data by selecting additional fields from the **PivotTable Field List**. For example, I can take the same data and segment by voter age group.

	G4	- (0	∫x T	otal								*
	Α	В	С	D	E	F	G	Н	1	J	К	PivotTable Field List 🔹 🗙
1												
2												Choose fields to add to report:
4	Age Group	INDEP	DECLINED	DEMOCRAT	GREEN	REPUBLICAN	Total					VOTER
5	□ 2401		23	106	2	31	162					
6	21-30		1	3		1	5					
7	31-40		6	24		7	37					
8	41-50		5	29	2	10	46					
9	51-60		5	23		6	34					
10	61-70		4	16		3	23					
11	71 +		2	11		4	17					
12	□ 2402	6	33	128	5	55	227					
13	21-30		2	8	2		12					
14	31-40		(3	21	3	9	37					
15	41-50	1	. 10	38		12	61					
16	51-60	1	. 13	21		16	51					Drag fields between areas below:
17	61-70	3	2	28		13	46					🝸 Report Filter 📰 Column Labels
18	71 +	1	. 2	12		5	20					PARTY
19	□ 2403	2	17	72	4	28	123					
20	21-30		3	5			8					(2)
21	31-40	1		10	1	6	18					
22	41-50		8	21	2	6	37					Row Labels Σ Values
23	51-60	1	. 4	18	1	12	36					PRECINCT Count of PARTY
24	61-70		1	11		1	13					
25	71+		1	7		3	11					
26	= 2404	3	17	0/1	3	3/	151					

Understanding the Pivot Table Structure

In the thumbnail above, I've labeled the main areas of the pivot table.

(1) PivotTable Field List – this section in the top right displays the fields in your spreadsheet. You may check a field or drag it to a quadrant in the lower portion.

- (2) The lower right quadrants this area defines where and how the data shows on your pivot table. You can have a field show in either a column or row. You may also indicate if the data should be counted, summed, averaged, filtered and so on.
- (3) The red outlined area to the left is the result of your selections from (1) and (2). You'll see that the only difference I made in the last pivot table was to drag the AGE GROUP field underneath the PRECINCT field in the **Row Labels** quadrant.

How to Create a Pivot Table

There are several ways to build a pivot table. Excel has logic that knows the field type and will try to place it in the correct row or column if you check the box. For example, data that is numeric such as Precinct counts tends to appear to the right in columns. Data, which is textual, such as Party would appear in rows.

While you can simply check fields to display and let Excel build your pivot table, I prefer to use the "drag and drop" method. This is partly because I like to visualize my data in columns and rows. I think it may also be easier if you have fields, which can appear to be numbers like a precinct value.

- 1. Open your original spreadsheet and remove any blank rows or columns.
- 2. Make sure each column has a heading, as it will be carried over to the Field List.
- 3. Make sure your cells are properly formatted for their data type.
- 4. Highlight your data range
- 5. Click the **Insert** tab.
- 6. Select the **PivotTable** button from the **Tables** group.
- 7. Select **PivotTable** from the list.

pivot_table_example.xls - Microsoft Excel												
9	Home	Insert (1)	age Layout	Formula	s Data Rev	view \	view As	SAP Utilities	Ad Intell			
Pivot	Table Table	Picture Cli	p Shapes St	SmartArt C	Column Line Pi	ie Bar	Area S	catter Other	Hyperlin			
3	Pivo <u>t</u> Table	(2)	lustrations			Charts		Г 	Links			
1	Pivot <u>C</u> hart	-	f _x	VOTER								
	А	В	С	D	E	F	G	Н	1			
1	VOTER 💌	PARTY 💽	РСТ 🔽	AGEDG	LAST 🛛 VOTE 💽	YRS R 💌	ABST 🛛 💌	TUS				
3978	5138	DEMOCRAT	2415	41-50	06/2006	2	PERM					
3979	5139	REPUBLICAN	2415	41-50	06/2006	2	PERM					
3980	5140	DEMOCRAT	2424	61-70	08/2006	2						
3981	5141	DEMOCRAT	2420	61-70	08/2006	2	PERM					
3982	5142	NON-DECLINE	2406	41-50	06/2006	2						
3983	5143	DEMOCRAT	2414	41-50	06/2006	2	PERM					
3984	5144	DEMOCRAT	2414	41-50	08/2006	2	PERM					
3985	5145	DEMOCRAT	2418	41-50	06/2006	2	PERM					
3986	5146	DEMOCRAT	2417	71+	06/2006	2	PERM					
3987	5147	NON-DECLINE	2424	18-20	06/2006	2	PERM					
3988	5149	DEMOCRAT	2408	71+	06/2006	2	PERM					
3989	5150	DEMOCRAT	2407	31-40	06/2006	2	PERM					
3990	5151	NON-DECLINE	2422	41-50	06/2006	2						

The Create PivotTable dialog appears.

	А	В	С	D	E	F	G						
				AGE	LAST	YEARS	BALLOT						
1	VOTER 💌	PARTY 🔽	PRECINCT 💌	GROUP	VOTED 💌	REG 💌	STATUS						
3979	5139	REPUBLICAN	PERM										
3980	5140	DEMOCRAT	DEMOCRAT 2424 61-70 08/2006 2 PO										
3981	5141	Create PivotTa	ble				? × 1						
3982	5142	Choose the data	that you want to	analyze									
3983	5143	Select a tab	ole or range				h						
3984	5144	Table/F	ange: Voters!\$	A\$1:\$G\$4001			🛒 🍋						
3985	5145	C Use an ext	ernal data source				- h						
3986	5146	Choo	se Connection	1			h						
3987	5147	Connec	Crosse Connection										
3988	5149	Change where w	ou wont the Divet	Table conect to	he placed -		h						
3989	5150	Choose where yo	bu want the Pivot	rable report u) be placed		p						
3990	5151	C Existing Wo	rksheet										
3991	5152		a.										
3992	5153	Locauo	n: J										
3993	5154				ОК	Cance							
3994	5155						14						
3995	5156	DEMOCRAT	2408	21-30	06/2006	2	POLL						
3996	5157	DEMOCRAT	2416	61-70	08/2006	2	POLL						
3997	5158	DECLINED	2416	18-20	08/2006	2	POLL						
3998	5159	REPUBLICAN	2424	61-70	08/2006	2	PERM						
3999	5160	DEMOCRAT	2418	18-20	08/2006	2	PERM						
4000	5161	DEMOCRAT	2401	21-30	08/2006	2	POLL						
4001	5162	DEMOCRAT	2414	21-30	06/2006	2	POLL						

8. Double-check your **Table/Range:** value.

9. Select the radio button for **New Worksheet**.

10. Click **OK**.

A new worksheet opens with a blank pivot table. You'll see that the fields from our source spreadsheet were carried over to the **PivotTable Field List**.

	B20	-	• (•	f_{x}										×
	Α	В	С	D	E	F	G	Н	1	J	К	L	PivotTable Field List	• x
1														6 - I
2													Choose fields to add to report:	- 62
3													VOTER	
4		DivotTabla	1											
5		Protrable	1											
6	To buil	d a report,	choose											
7	fields fr	rom the Piv	/otTable											
8		Field List											BALLOT	
9														
10														
11		-												
12														
13	E B B B B											_		
14												_	-	
15												_	Drag fields between areas below:	
10												_	Y Report Filter 🛄 Column La	abels
10												_		
10												_		
20			1											
21													Row Labels Σ Values	
22														
23														
24														
25														
26												-	Defer Layout Update Upd	late
H 4	► ► She	et2 / Voter	s / 🖓 /											

11. Drag an item such as PRECINCT from the **PivotTable Field List** down to the **Row Labels** quadrant. The left side of your Excel spreadsheet should show a row for each precinct value. You should also see a checkmark appear next to PRECINCT.



12. The next step is to ask what you would like to know about each precinct. I'll drag the PARTY field from the **PivotTable Field List** to the **Column Labels** quadrant. This will provide an additional column for each party. Note that you won't see any numerical data.

	A3	▼ (• f:	e								*
	А	В	С	D	E	F	G	Н	1	J	PivotTable Field List 🔹 💌
1											
2											Choose fields to add to report:
3		Column Labels 💌									VOTER
4	Row Label	s AMERICAN INDEP	DECLINED	DEMOCRAT	GREEN	REPUBLICAN	Grand Total				PARTY
5	2401										
6	2402										
7	2403										
8	2404										
9	2405										
10	2406										
11	2407										
12	2408										
13	2409										
14	2411										
15	2412										Drag fields between areas below:
16	2413										Report Filter Column Labels
17	2414										
18	2415									_	
19	2416										
20	2417										
21	2418										Row Labels 2. Values
22	2419										PRECINCT
23	2420										
24	2421										
25	2422										Defer Laveut Lindate
14 4	≥+25 ► H Shee	et2 Voters 🖄								▶	Update Update

13. To see the count for each party, I need to drag the same field to the **Values** quadrant. In this case, Excel determines I want a Count of PARTY. I could double-click the entry and choose another **Field Setting**. Excel has also added Grand Totals.

	A3		• (• fx	Count of P	ARTY						×
	А		В	С	D	E	F	G	H I		PivotTable Field List 🔹 👻
4	Row Labels	-	AMERICAN INDEP	DECLINED	DEMOCRAT	GREEN	REPUBLICAN	Grand Total			
5	2401			23	106	2	31	162			Choose fields to add to report:
6	2402		6	33	128	5	55	227			VOTER
7	2403		2	17	72	4	28	123			PARTY
8	2404		3	17	94	3	34	151			
9	2405		3	31	80	2	60	176			
10	2406		3	24	90	2	51	170			
11	2407		3	19	72	2	22	118			
12	2408		1	24	89	1	43	158			
13	2409			32	92	2	53	179			
14	2411		1	26	76		42	145			
15	2412		1	26	83	2	38	150			
16	2413		5	26	95		63	189			
17	2414		4	21	83	4	42	154		_	
18	2415		2	26	96	5	54	183			Drag fields between areas below:
19	2416		2	24	111	3	59	199			🝸 Report Filter 🔛 Column Labels
20	2417		2	14	136	2	69	223			PARTY
21	2418		6	40	135		87	268			
22	2419		4	33	108	1	92	238			
23	2420		2	12	75	1	26	116			
24	2421		2	15	94		64	175			🔛 Row Labels Σ 🔰 ues
25	2422		3	16	66		42	127			PRECINCT Count of PARTY
26	2423		6	30	87		74	197			
27	2424			21	89		62	172			
28	Grand Total		61	550	2157	41	1191	4000			
29	Sheet?		loters 🕅				14				Defer Layout Update Update

But wait....there's more....and some of the same

As you build your pivot table, you'll probably think of additional ways to group the information. For example, you might want to know the Age Range of voters by Precinct

by Party. In this case, I would drag the AGE GROUP column from the **PivotTable Field** List down below the **PRECINCT** value in **Row Labels**.

	A3	• (• f _x	Count of P	ARTY						*
	А	В	С	D	Е	F	G	H I	-	PivotTable Field List 🔹 💌
4	Row Labels	AMERICAN INDEP	DECLINED	DEMOCRAT	GREEN	REPUBLICAN	Grand Total			1 v
5	□ 2401		23	106	2	31	162			Choose fields to add to report:
6	21-30		1	3		1	5		=	VOTER
7	31-40		6	24		7	37			PARTY
8	41-50		5	29	2	10	46			
9	51-60		5	23		6	34			
10	61-70		4	16		3	23			
11	71+		2	11		4	17			
12	■ 2402	(5 33	128	5	55	227			-
13	21-30		2	8	2		12			
14	31-40		4	21	3	9	37			
15	41-50	:	1 10	38		12	61			
16	51-60	:	1 13	21		16	51			
17	61-70	:	3 2	28		13	46			
18	71+		1 2	12		5	20			Drag fields between areas below:
19	□ 2403		2 17	72	4	28	123			🝸 Report Filter 📰 Column Labels
20	21-30		3	5			8			PARTY -
21	31-40	:	1	10	1	6	18		_	
22	41-50		8	21	2	6	37			
23	51-60	:	1 4	18	1	12	36			
24	61-70		1	11		1	13			Row abels Σ Values
25	71 +		1	7		3	11			PRECINCT Count of PARTY
26	⊒2404	1	3 17	94	3	34	151			
27	21-30			4			4			
28	31-40		4	10		6	20			
29	41-50	Notore 187	4	16	3	8	31			Defer Layout Update Update
	▶ N Sheet2	Voters Voters								

(pivot_table_step4.png)

Each age group is broken out and indented by precinct. At this stage, you might also be thinking of usability. As with a regular spreadsheet, you may manipulate the fields. For example, you might want to rename "Grand Total" to "Total" or even collapse the age values for one or more precincts. You can also hide or show rows and columns. These features work the same way as a regular spreadsheet.

One area that is different is the pivot table has its own options. You can access these options by right-clicking a cell within and selecting **PivotTable Options...** For example, you might only want Grand Totals for columns and not rows.

There are also ways to filter the data using the controls next to Row Labels or Column labels on the pivot table. You may also drag fields to the **Report Filter** quadrant.

Troubleshooting Pivot Tables

You might encounter several "gotchas" with this example file or another spreadsheet. Sometimes when you move around your pivot table the **PivotTable Field List** disappears. To get it back, click any cell with a value.

You can also move or "pivot" your data by right clicking a data field on the table and selecting the "**Move**" menu. From here, you can move a column to a row or even change the position. An example of this might be the values for "LAST VOTED" since Excel will sort by the month first. You might prefer to move the data so the election dates are in a chronological order.

I prefer not adding fields to a pivot table. I think it's easier to add the fields first to your source spreadsheet. The reason is you might get items out of sync if you move data unless you make them a calculated field.

Pivot tables may not make the election data exciting, but it can make the analysis process easier. Without these tables, you'd probably spend more time filtering, sorting and subtotaling. The other benefit is that it's easy to start over by deselecting fields or moving them to another location. Feel free to download the tutorial spreadsheet below and play with the data. This will probably be the only time you're allowed to manipulate election data.

Related Tutorial Files: Pivot table example spreadsheet