# **EXCEL APPLICATIONS**11 Steps for Advanced Users

Sergey Vaselenko

# EXCEL APPLICATIONS 11 Steps for Advanced Users

Written by Sergey Vaselenko

This e-book shows how to create feature-rich multi-user Excel applications with no SQL or VBA use. You may repeat the steps and create a lot of applications for your team yourself.

## Introduction

Microsoft Excel is an amazing product.

It brings freedom to business users as allows getting data from anywhere and consume the data in any way.

If you like Microsoft Excel, you definitely have to try the SaveToDB add-in for Microsoft Excel.

The add-in allows database and VBA professionals to create complex corporate applications using Excel.

Moreover, the add-in allows business users to create Excel applications with no SQL or VBA use.

In this book, we will create an application and learn 11 steps that you may repeat for your applications:

- 1. Publish tables to a database
- 2. Configure query parameters
- 3. Configure formats and table views
- 4. Configure validation lists
- 5. Add cursors and form fields
- 6. Configure detail tables, windows, and task panes
- 7. Configure context and action menus
- 8. Add image URLs
- 9. Configure LastModified and UserName fields
- 10. Integrate with other applications
- 11. Manage permissions

You have to download and install the SaveToDB add-in at <u>www.savetodb.com</u>, version 7.2 or higher.

All features described in this book are available in the free SaveToDB Express edition.

You may download the initial workbook, the final application, and required SQL codes at

https://www.savetodb.com/download.php?file=11-steps-for-advanced-users.zip

This book contains an example database for Microsoft SQL Server.

You may also use Oracle Database, IBM DB2, MySQL, and other supported databases. The steps remain the same.

Best regards, Sergey Vaselenko March 20, 2017

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# Chapter 1. Initial Workbook

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6		1/31/2017	-87,000.00	My Bank			Pay	/roll							
7		1/31/2017	-13,000.00	My Bank	Income	Taxes	Тах	es							
8		1/31/2017	-29,580.00	My Bank	Salary T	axes	Тах	es							
9		2/10/2017	300,000.00	My Bank	Rose, In	C	Rev	/enue							
10		2/10/2017	100,000.00	My Bank	Carnatio	on, Inc	Rev	/enue							
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We will create an Excel application based on the following simple workbook of payments:

Suppose, we have a team that uses this workbook: Alex as a leader, Nick, and Lora.

In common case, such workbooks are located in shared folders or corporate portals.

Simultaneous editing of such workbooks is not easy.

Also, every user periodically wants to add personal worksheets or formulas and do not share them with others.

We will solve all these issues placing data tables to a database.

Moreover, you may do this yourself. SQL or VBA knowledge is not required.

Our application requires a database. Also, you must have enough permissions to create and edit tables.

You may say to your IT guys the following:

- 1. I need a schema in a database.
- 2. My team will create tables in this schema.
- 3. I want to manage permissions on our tables.
- 4. My team members: Nick, Lora, and I am, Alex.
- 5. Create two tables, EventHandlers and TableFormats, using the attached SQL codes.

It is an easy task for your IT staff. Just send this chapter to him or her.

Further, we will use the dbo69 schema in the Test2 database and user names like Alex, Nick, and Lora.

You may skip the comments below and continue to the next chapter.

#### **SQL Scripts**

The following script creates logins and users in the master database:

```
USE master

GO

CREATE LOGIN Alex WITH PASSWORD = '1234567890' MUST_CHANGE, CHECK_EXPIRATION=ON;

CREATE LOGIN Nick WITH PASSWORD = '1234567890' MUST_CHANGE, CHECK_EXPIRATION=ON;

CREATE LOGIN Lora WITH PASSWORD = '1234567890' MUST_CHANGE, CHECK_EXPIRATION=ON;

GO

CREATE USER Alex FOR LOGIN Alex;

CREATE USER Nick FOR LOGIN Nick;

CREATE USER Lora FOR LOGIN Lora;

GO
```

The following script creates users in the **Test2** database:

```
USE Test2
GO
CREATE USER Alex FOR LOGIN Alex WITH DEFAULT_SCHEMA=dbo69;
CREATE USER Nick FOR LOGIN Nick WITH DEFAULT_SCHEMA=dbo69;
CREATE USER Lora FOR LOGIN Lora WITH DEFAULT_SCHEMA=dbo69;
GO
```

This is the important code that gives permissions to create tables in a database:

GRANT CREATE TABLE ON DATABASE::Test2 TO Alex GRANT CREATE TABLE ON DATABASE::Test2 TO Nick GRANT CREATE TABLE ON DATABASE::Test2 TO Lora GO

The following code creates and configures a role for our team, and grants permissions to Alex:

```
CREATE ROLE Alex_Team;
GO
ALTER ROLE Alex_Team ADD MEMBER Nick;
ALTER ROLE Alex_Team ADD MEMBER Lora;
GO
GRANT CONTROL ON ROLE::Alex_Team TO Alex;
GRANT CONTROL ON USER::Nick TO Alex;
GRANT CONTROL ON USER::Lora TO Alex;
GO
```

The following code creates a schema and sets the schema permissions:

```
CREATE SCHEMA dbo69;
GO
GRANT CONTROL ON SCHEMA::dbo69 TO Alex
GO
GRANT SELECT, INSERT, UPDATE, DELETE, EXECUTE, VIEW DEFINITION ON SCHEMA::dbo69 TO
Alex_Team
GO
```

#### **EventHandlers and TableFormats**

The following two tables stores the SaveToDB add-in configuration.

You must have these tables in a database to implement certain of features.

Please replace dbo69 in the following code (9 places) to your actual schema:

```
CREATE TABLE dbo69.EventHandlers (
      ID int IDENTITY(1,1) NOT NULL
    , TABLE SCHEMA nvarchar(128) NOT NULL
    , TABLE NAME nvarchar(128) NOT NULL
    , COLUMN_NAME nvarchar(128) NULL
    , EVENT NAME varchar(50) NOT NULL
    , HANDLER_SCHEMA nvarchar(128) NULL
    , HANDLER NAME nvarchar(128) NULL
    , HANDLER_TYPE nvarchar(128) NULL
    , HANDLER CODE nvarchar(MAX) NULL
    , TARGET WORKSHEET nvarchar(128) NULL
    , MENU ORDER int NULL
    , EDIT PARAMETERS bit NULL
    , IS_ACTIVE bit NULL DEFAULT((1))
    , CONSTRAINT PK_EventHandlers_dbo69 PRIMARY KEY (ID)
);
GO
CREATE TABLE dbo69.TableFormats (
      ID int IDENTITY(1,1) NOT NULL
    , TABLE_SCHEMA nvarchar(128) NOT NULL
    , TABLE_NAME nvarchar(128) NOT NULL
    , TABLE_EXCEL_FORMAT_XML xml NULL
    , CONSTRAINT PK_TableFormat_dbo69 PRIMARY KEY (ID)
    , CONSTRAINT IX TableFormats Schema Name dbo69 UNIQUE (TABLE NAME, TABLE SCHEMA)
);
GO
INSERT INTO dbo69.EventHandlers (TABLE SCHEMA, TABLE NAME, COLUMN NAME, EVENT NAME,
HANDLER_SCHEMA, HANDLER_NAME, HANDLER_TYPE, HANDLER_CODE) VALUES ('dbo69',
'EventHandlers', 'EVENT_NAME', 'ValidationList', NULL, NULL, 'VALUES',
'Actions, Change, ContextMenu, DoubleClick, SelectionChange, ConvertFormulas, DoNotConvertForm
ulas, DoNotSelect, DoNotSave, DoNotChange, ProtectRows, Formula, FormulaValue, ValidationList, S
electionList');
INSERT INTO dbo69.EventHandlers (TABLE SCHEMA, TABLE NAME, COLUMN NAME, EVENT NAME,
HANDLER_SCHEMA, HANDLER_NAME, HANDLER_TYPE, HANDLER_CODE) VALUES ('dbo69',
'EventHandlers', 'HANDLER TYPE', 'ValidationList', NULL, NULL, 'VALUES',
'TABLE, VIEW, PROCEDURE, FUNCTION, CODE, HTTP, TEXT, MACRO, CMD, VALUES, RANGE, REFRESH, MENUSEPARAT
OR');
GO
```

Chapter 3. Publish Wizard

In this chapter, we will publish our table to a database.

This action is required once for every table that you want to have in a database.

#### **Excel Tables**

The tables must be an "Excel tables", not regular ranges.

To convert a range table to an Excel table, select a cell in a table, and click **Insert**, **Table**.

E «	o- ¢-	÷	
File	Home	Insert	F
Ş	<b>.</b> ?		
PivotTable	e Recommen PivotTab	nded Table les	
	Tables		
Create Ta	ble	?	)

Excel suggests an entire region. Correct it if needed. Check **My table has headers** and click **OK**.

Create Table	?	$\times$
Where is the data for you	ur table?	
=\$B\$3:\$G\$24		Ť
✓ <u>M</u> y table has hea	ders	
ОК	Car	icel

Then locate the table left top cell at cell C3 (Chapter 6 contains details). Now we have the table like this:

<b>.</b> 5			payments-workbook.xlsx - Excel									$\times$
File	Home Inse	ert Page Lay	out Form	ulas Data	Vie	w SaveTol	DB Q Tell	me			R	Share
Paste	Calibri BJU Calibri		= = = = = = = = = = = =   ≫ + Alignment	General ▼ \$ ▼ % €.0 .00 .00 →.0	• [	Format as T Cell Styles •	I Formatting + Table + ,	Ens Ce E For	ert 👻 lete 👻 rmat 👻	∑ - ↓ - ¢ -	Az▼ →	•
A B	C	D	E	F	Call I	G	H		s	Lui	J	
1 2 3	Date 🔻	Sum 💌	Account 🔻	Company	<b>*</b>	Item 🔻	Comment	Ŧ				
4	1/10/2017	200,000.00	My Bank	Rose, Inc	F	Revenue						
5	1/10/2017	-50,000.00	My Bank	Land, Inc	E	Expenses						
6	1/31/2017	-87,000.00	My Bank		F	Payroll						
7	1/31/2017	-13,000.00	My Bank	Income Taxes	1	Taxes						
8	1/31/2017	-29,580.00	My Bank	Salary Taxes	1	Taxes						
9	2/10/2017	300,000.00	My Bank	Rose, Inc	F	Revenue						
10	2/10/2017	100,000.00	My Bank	Carnation, Inc	; F	Revenue						
11	2/10/2017	-50,000.00	My Bank	Water, Inc	E	Expenses						-
	Sheet1	$\oplus$				: •						•
Ready 🔛						B			-		+ 1	00%

#### Starting Publish Wizard

Now select a cell in the table and run **Publish Wizard**.

(		- ° - ∓		payments-	workbool	k.xlsx - E	xcel		Table T	T	_		×
F	ile	Home Ins	ert Page Lag	yout Forn	nulas	Data	View	SaveToDB	Design	Q Te	ll me	۶	🗘 Share
Sa	ve Re	Active Que	ery: d Query List	Table V	View:	<b>•</b>	Wizar	ds Options	Help				
1	A	3 C	D	E		F	ی۔ جزا	Pivot Data Con Publish Wizard	nection Wizard		1	J	
3		Date •	Sum v 200,000.00	Account V My Bank	Compa Rose, I	ny nc	5 *	Data Merge Wi Change Conne	zard ction Wizard				
5 6 7	-	1/10/2017 1/31/2017 1/31/2017	-50,000.00 -87,000.00 -13,000.00	My Bank My Bank My Bank	Land, Income	nc e Taxes	-	SaveToDB Fram Configuration \	nework Installer Workbook Gene	rator			
8 9 10	-	1/31/2017 2/10/2017 2/10/2017	-29,580.00 300,000.00	My Bank My Bank My Bank	Salary Rose, I Carnati	Taxes nc		Table Format Window Wizard	Vizard d	•			
11	 ∢►	2/10/2017 Sheet1	-50,000.00 (+)	My Bank	Water,	Inc		Pivot Wizard Workbook Tem	plates and Exar	nples 🕨			•
Rea	ady 🚦	L 					_			-		+	100%

#### You see wizard step descriptions:

🔋 Publish Wizard	?	×
Publish Wizard Steps		
Read the steps and click Next		
Publish Wizard Steps: 1. Select a provider. 2. Connect to a database. 3. Design a destination table. 4. Define a destination table name. 5. Verify and execute the publish script. 6. Verify script results. 7. Create a new Excel table connected to the new database table. After publishing you may save table data changes back to a database using the S Your colleagues may connect to the new database table using Data Connection V	Save but	ton.
This is the fastest and simplest way to get the real multi-user work with Microsoft F	Excel.	
Help Cancel Back Next	Fini	ish

Read and click **Next**.

#### **Selecting Provider**

In the next step, we select a database provider:

🔋 Publish Wizard		? ×
Select Provider		
Select an appropriat	e provider to	connect to a data source
Server	Туре	Description
SQL Server/SQL Azure	OLEDB	Microsoft OLE DB Provider for SQL Server
SQL Server/SQL Azure	OLEDB	SQL Server Native Client 11.0
SQL Server/SQL Azure	ODBC	SQL Server
SQL Server/SQL Azure	ODBC	SQL Server Native Client 11.0
Oracle Database	.NET	Oracle Data Provider for .NET
IBM DB2	.NET	IBM DB2 .NET Data Provider 10.5.0
IBM DB2	ODBC	IBM DB2 ODBC Driver
MySQL	.NET	MySQL Data Provider
MySQL	ODBC	MySQL ODBC 5.3 ANSI Driver
MySQL	ODBC	MySQL ODBC 5.3 Unicode Driver
NuoDB	.NET	NuoDB Data Provider
PostgreSQL	.NET	Npgsql Data Provider
SQL Server Compact	.NET	Microsoft SQL Server Compact Data Provider 4.0
SQLite	.NET	SQLite Data Provider
SQLite	ODBC	SQLite3 ODBC Driver
SQLite	ODBC DSN	SQLite3 Datasource
This provider is preferable	e to connect t	o Microsoft SQL Server and Windows Azure SQL Database.
		~
Help		Cancel Back Next Finish

You may publish tables to any supported database like SQL Server, Oracle, MySQL, and others.

Select the first provider for SQL Server.

#### **Connecting to Database**

In the next step, you have to specify a server, a database, and logon credentials received from your IT guy.

🔋 Publish Wizard		? ×
Connect to Database		
Enter the information require	ed to connect to a database	
1. Server name:	.\SQLEXPRESS ~	
2. Logon credentials		
O Use Windows Auth	entication	Examples
Use the following use	ser name and password	
User name:	Alex	
Password:		
3. ( Database:	Test2	
O File:		Browse
	Properties Test Co	nnection
Help	Cancel Back Next	Finish

Usually, at the first connection, you have to change the password:

🞋 Change Password		?	$\times$
Your password is expired You must enter another pa	assword before you can log on.		
Login:	Alex		
New password:	1		
Confirm password:			
	OK Cancel	He	lp

Fill the new password twice and click **OK**.

Then click **Next** in the connection form.

#### **Table Design**

The add-in suggests a database table st	ructure based on actual	data in the published table.
---	-------------------------	------------------------------

🔋 Publish Wizard				?	×						
Design Destination Database Table											
	column names and	types		1	1						
Excel Column Name	Excel Type	DB Column I	Name	DB Data Type	e PK						
	integer (0)	ID		int (4)	$\checkmark$						
Date	date	Date		datetime (8)							
Sum	integer (1)	Sum		int (4)							
Account	string (7)	Account		nvarchar(255)							
Company	string (16)	Company		nvarchar(255)							
ltem	string (8)	ltem		nvarchar(255)							
Comment		Comment		int (4)							
	Ad	d	Up D	own	Delete						
Help	Can	cel B	ack N	lext	Finish						

In this example, we need to change the int type of the Sum column to float, and the int type of the Comment column to nvarchar(255) as shown on the next page.

The add-in suggests the correct types for target databases and actual column types in the drop-down list.

Also, tables must have the primary key column or columns that uniquely identify table rows.

In most cases, you may add a column like ID of the integer type.

The add-in does this automatically if it does not find a column with unique values.

You may define primary key columns checking the **PK** column.

Also, you may add, delete, rename, and reorder columns.

It is a good idea to have column names without spaces. You may use capitalized word parts like CompanyName.

🔋 Publish Wizard				?	×
Design Destination Da	atabase Table				
Enter destination table of	olumn names and	types			
Excel Column Name	Excel Type	DB Column Name	DB Data	Туре	PK
	integer (0)	ID	int (4)		$\checkmark$
Date	date	Date	datetime	(8)	
Sum	integer (1)	Sum	float (8)		
Account	string (7)	Account	nvarchar	(255)	
Company	string (16)	Company	nvarchar	(255)	
ltem	string (8)	ltem	nvarchar	(255)	
Comment		Comment	nvarchar	(255)	
L					
	Ado	d Up	Down	Delet	te
Help	Cano	Back	Next	Finis	h

#### Table Schema and Name

In this step, you specify a table schema and name:

🔋 Publish Wiz	zard	?	×
Define Table	e's Schema and Name		
Enter a destir	nation table schema and name		
Table Schema:	dbo69 ~		
Table Name:	Payments ~		
Help	Cancel Back Next	Fin	ish

#### **Executing Script**

The add-in generates an SQL script to create a table and to insert the existing data:



You may edit the script if you need.

For example, you may delete INSERT rows if you need to create an empty table.

Also, you may create multiple tables changing table names only.

You may change column data types if you do not find it in the drop-down list in the previous step.

Click **Execute** when you are ready.

#### **Finish Steps**

The add-in shows execution results on the next screen.

Publish Wizard	?	×
Verify Script Results		
Verify the script results and click Finish to insert a new data table		
Table [dbo69].[Payments] has been created		^
		~
Help Cancel Back Next	Finis	h

You may repeat steps if you need. Just click **Back**.

You may click **Cancel** if you do not need to insert a new connected table into the workbook.

#### Now click **Finish**.

The add-in inserts a connected table to a new worksheet and shows a message about your success:



#### Editable Table

We see the following screen as a **Publish Wizard** result:

l		ج ج	¢- ∓		F	ayments-workboo	ok.xl	sx - Excel		Ē	₽	—		×
F	ile	н	ome Inse	ert Page Lay	out Form	ulas Data	Vie	ew SaveTo	oDB	Q Tell me			Я	Share
Sa Tak	ve ve	Reload	Active Que dbo69.Pay	ry: ments Query List Query List	Table V	iew:	Wiz	ards Options		Help Help				^
	А	С	D	E	F	G		Н		1		J	К	
1														
2											_			
3		ID 💌	Date 💌	Sum 💌	Account 💌	Company	-	Item	- (	Comment 🔄	_			
4		1	1/10/2017	200,000.00	My Bank	Rose, Inc		Revenue			_			
5		2	1/10/2017	-50,000.00	My Bank	Land, Inc		Expenses						
6		3	1/31/2017	-87,000.00	My Bank			Payroll						
7		4	1/31/2017	-13,000.00	My Bank	Income Taxes		Taxes						
8		5	1/31/2017	-29,580.00	My Bank	Salary Taxes		Taxes						
9		6	2/10/2017	300,000.00	My Bank	Rose, Inc		Revenue						
10		7	2/10/2017	100,000.00	My Bank	Carnation, Inc		Revenue						
11		8	2/10/2017	-50,000.00	My Bank	Water, Inc		Expenses						
	•	•	Sheet1	Sheet6	÷	·		: •						
Rea	dy	•								■ — –		-	+	100%

First of all, you see that the **Save** button is enabled.

You may change data, add and delete rows. When you are ready to save changes to a database, just click **Save**.

If you do not want to save changes, just click the **Reload** button.

Note that you may use the **Undo** command (Ctrl-Z). The add-in does not disable it, unlike macros.

You may save and close the workbook, and then open it and save the data changes to a database later.

This is useful when you work outside of the corporate network.

You see that the add-in inserts a new table on a new worksheet named as Sheet6.

You should know that the add-in creates "very hidden" worksheets that contain configuration data.

You may unhide the add-in sheets using SaveToDB Options, Developer Options, Show SaveToDB Data Sheets.

You may see the connected table name in the Active Query field.

In our example, let's do the following: rename the Sheet6 to **payments**, remove the source Sheet1, format the table, and save the workbook as a new workbook as **payments.xlsx**.

As a result, we have a new workbook with a table connected to a database.

In this chapter, we connect to the created **Payments** table from a new workbook under Nick's credentials.

#### **Connecting to Database**

Let's create a new workbook and save it as payments-nick.xlsx.

Then let's run the Data Connect Wizard.

日					payments-nick.xlsx - Excel 🗖								×
File	Ho	me Ins	ert Page	Layout	Formulas	Data	View	SaveToDB	♀ Tell me			ጸ	Share
Save	Reload	Active Que	ery: d Query List	•	Table View:		Wizar	ds Options Help	) (inset				<u>,</u>
	A	В	C	D	E	F		Pivot Data Connection v	tion Wizard		K		L
1							5	Publish Wizard					_
3							Ę	Data Merge Wizard	I				
4							×	Change Connectio	n Wizard				
5								SaveToDB Framew	ork Installer				_
6 7								Configuration Wor	kbook Generat	or			
8								Table Format Wiza	rd				
9								Window Wizard		) F			
10								Form Wizard		•			_
11		-					ţ,	Pivot Wizard		•			
	E.	Sheet1	$\oplus$				×	Workbook Templa	tes and Exampl	es ▶			Þ
Ready											1	-+ -	100%

The wizard contains the same connection steps as described <u>above</u>.

🔋 Data Connection	Wizard					?	×
Select Provider							
Select an appropriat	e provid	der to	connect to a da	ta source			
	T		Desertation				
SQL Server/SQL Azure	OLED	B	Description	DB Provider for S	SQL Server		
SQL Server/SQL Azure	OLED	R	SQL Server Na	tive Client 11.0	DQL Derver		
SQL Server/SQL Azure	ODBC		SQL Server	tive client 11.0			
SQL Server/SQL Azure	ODBC		SQL Server Na	tive Client 11.0			
Oracle Database	NET		Oracle Data Pr	wider for NET			
IBM DB2	NET		IBM DB2 NET	Data Provider 1	050		
IBM DB2	ODBC		IBM DB2 ODB	Driver	0.0.0		
MySOI	NET		MySQL Data P	o Dilver			
MySQL	ODBC			E 2 ANCI Driver			
MUSQL	ODBC		MUSQL ODBC	5.5 ANSI Driver			
MySQL NuoDD	NET		NU-DD D-t- D	5.5 Unicode Din	/er		
NUODB	.NET		NuoDB Data P	rovider			
PostgreSQL	.NET		Npgsql Data Pr	ovider		_	
SQL Server Compact	.NET		Microsoft SQL	Server Compact	Data Provider 4.	0	
SQLite	.NET		SQLite Data Pr	ovider			
SQLite	ODBC		SQLite3 ODBC	Driver			
SQLite	ODBC	DSN	SQLite3 Dataso	ource			
Text Data							
Web Data	.NET		Gartle Web Dat	ta Provider			
							~
Help			Cancel	Back	Next	Finis	ih –
Data Connection Connect to Databate Enter the information	Wizard I <b>se</b> n require	ed to c	connect to a dat	abase		?	×
1. Server name:		.\SQ	LEXPRESS		~		
2 Longe and articl	_						
2. Logon credential	5					-	
O Use Window	ws Auth	entica	ition			Example	<u>:5</u>
Use the foll	owing u	iser na	ame and passw	ord			
User	name:	Nick					
Pas	sword:						
3. ( Database:		Test	2		~		
O File:							
0.11						Brows	se
						Brows	se
			Prop	erties	Test Co	Brows	se

#### Selecting Database Object

Let's connect to the **dbo69.Payments** table. You may use search. Uncheck **Enable Query List on the ribbon**.

🥫 Data Connection Wizard		? ×
Select Object		
Select Query List and the object t	o connect	
Select Query List:	Inable	SaveToDB in this workbook
All tables, views and procedures	<ul> <li>Enable</li> </ul>	Query List on the ribbon
Select the query object:		
Schema	✓ Name	Туре 🗸
dbo69	EventHandlers	base table
dbo69	Payments	base table
dbo69	TableFormats	base table
Help SQL	Cancel Back	Next Finish
🔋 Data Connection Wizard		? ×
Select Object		
Select Query List and the object t	o connect	
Salact Query List:		SaveToDB in this workbook
All tables, views and procedures	✓ Enable	Query List on the ribbon
Select the query object:	pay	
Schema	Name	Type
dbo69	Payments	base table

#### **Selecting Table Fields**

In this step, you may check the fields to select and the fields to use as filters. We will learn this in the next chapter.

	Query Parameters - dbo69.Payments												
Sele	Select columns to place them to the Ribbon and to filter the data												
	Parameter	DataType	Value			W							
	ID	int			-								
$\checkmark$	Date	datetime			-								
$\checkmark$	Sum	float			-								
$\checkmark$	Account	nvarchar(255)			-								
$\checkmark$	Company	nvarchar(255)			-								
$\square$	ltem	nvarchar(255)			-								
$\square$	Comment	nvarchar(255)			-								
	Help			ОК	Cance	ł							

Now you may click **OK** and insert the table at cell B3.

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1	L														
3		ID 🔻	Date 🛛	Sum 💌	Account 💌	Company	💌 Item 🛛 💌	Comme	nt 💌						
4		1	1/10/201	7 200000	My Bank	Rose, Inc	Revenue								
5		2	1/10/201	7 -50000	My Bank	Land, Inc	Expenses								ш
6		3	1/31/201	7 -87000	My Bank		Payroll								
7		4	1/31/201	7 -13000	My Bank	Income Taxes	Taxes								
8		5	1/31/201	7 -29580	My Bank	Salary Taxes	Taxes								
9		6	2/10/201	7 300000	My Bank	Rose, Inc	Revenue								
10		7	2/10/201	7 100000	My Bank	Carnation, Inc	Revenue								
11		8	2/10/201	7 -50000	My Bank	Water, Inc	Expenses								-
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We have an editable table in Nick's workbook. Alex and Nick can work now in their personal workbooks.

The table has an ugly format, unlike Alex's table. We will solve this in Chapter 7.

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6	- <mark>"</mark> iy	Configu	re Quer	y Parameters		Bank	Lanu, II	IC		Pavr	oll									
7	4	1/31	/2017	-13,000.00	My	Bank	Income	Taxes	-	Taxe	25	$\square$								
8	5	1/31	/2017	-29,580.00	My	Bank	Salary 1	Faxes		Гахе	s									
9	6	2/10	/2017	300,000.00	My	Bank	Rose, I	nc		Reve	enue									
10	7	2/10	/2017	100,000.00	My	Bank	Carnati	on, Inc		Reve	enue									
11	8	2/10	/2017	-50,000.00	My	Bank	Water,	Inc		Expe	enses									r I
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Let's return to Alex's workbook and run Reload, Configure Query Parameters:

Check the check boxes in the **W** (WHERE) column for the Account, Company, and Item columns:

Query Parameters - dbo69.Payments ?														
Sele	Select columns to place them to the Ribbon and to filter the data													
	Parameter	DataType	Value			W								
$\square$	ID	int			-									
$\square$	Date	datetime			-									
	Sum	float			-	· 🗆								
	Account	nvarchar(255)			-	· 🗹								
	Company	nvarchar(255)			-	· 🗹								
	ltem	nvarchar(255)			-	· 🗹								
	Comment	nvarchar(255)			-									
	Help			ОК	Cano	el								

The SaveToDB add-in places the selected columns to the ribbon. So, you may filter data:

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A 1	C	D	E		F		Null Not Null Expenses		H		I		J	K	
3 4	ID - 1	Date 1/10/2017	Sum            7         200,000.00	Acco My	<mark>ount</mark> ▼ Bank	Co Ro	Payroll Revenue		n 💌	Cor	nment	Ŧ			
5 6	2	1/10/2017	7 -50,000.00 7 -87,000.00	My My	Bank Bank	Lar	Taxes	Pay	enses roll						
7 8 9	4	1/31/201 1/31/201 2/10/201	7 -13,000.00 7 -29,580.00 7 300.000.00	My My My	Bank Bank Bank	Sal	come Taxes lary Taxes se Inc	Tax Tax	es es						
10 11	7	2/10/2017 2/10/2017	7 100,000.00 7 -50,000.00	My My	Bank Bank Bank	Ca Wa	rnation, Inc ater, Inc	Rev	venue venue						T
Ready	•	payme	nts (+)					•	: •	]			-	+	100%

Let's choose the Revenue item:

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Save	Reload	Active Que dbo69.Pag	ery: yments d Query List	Ţ	Account: Company Item:	y: Revenue	* * *	Table Vie	.w:	<b>*</b>	Wizard	s Options	Help	
Table	Data	5 (	Query List	G	Q	uery Parameters	- G	Tabl	e View	/S Tai	Op	tions	Help	~
A	C	D	E		F	G		Н		- I		J	K	
1 2 3	ID 💌	Date	Sum 💌	Acc	ount 🔽	Company	✓ Item	1	Con	nment	Ŧ			
4	1	1/10/201	7 200,000.00	My	Bank I	Rose, Inc	Rev	enue						
5	6	2/10/201	7 300,000.00	My	Bank I	Rose, Inc	Rev	enue						
6	7	2/10/201	7 100,000.00	My	Bank (	Carnation, Inc	Rev	enue						
7	13	3/10/201	7 300,000.00	My	Bank I	Rose, Inc	Rev	enue						
8	14	3/10/201	7 200,000.00	My	Bank (	Carnation, Inc	Rev	enue						
9	15	3/10/201	7 100,000.00	My	Bank (	Cornflower, Cor	rp Rev	enue						
10														
11														-
4	Þ	payme	ents (+)					: •						
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This feature allows working without auto-filters and loading fewer data.

# Chapter 6. Table Views

Users often apply different filters to the loaded data, hide and unhide columns, sort in various ways, etc.

The SaveToDB add-in may help to save such user views and even share them with colleagues.

Let's remove all WHERE filters and click the **Save Table View** button in the **Table Views** group:

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Save Table I	Reload	Active Que dbo69.Pay	ry: ments Query List Query List	-	Account Compar Item:	t:	* * *	Table Vi	iew:	vs G	Wizards Op	Options	Help Help	*
A	С	D	E		F	G		Н	Sav	ve Table Vi	ew		К	
1									Sav	e the activ	e table vi	ew.		
3	ID 👻	Date	Sum	Acco	unt 🔽	Company	✓ Iten	n	✓ Co	mment	-			
4	1	1/10/2017	200,000.00	My B	Bank	Rose, Inc	Rev	enue						
5	2	1/10/2017	-50,000.00	My B	Bank	Land, Inc	Expe	enses						
6	3	1/31/2017	-87,000.00	My B	Bank		Payı	roll						
7	4	1/31/2017	-13,000.00	My B	Bank	Income Taxes	Taxe	es						
8	5	1/31/2017	-29,580.00	My B	Bank	Salary Taxes	Taxe	es						
9	6	2/10/2017	300,000.00	My B	Bank	Rose, Inc	Rev	enue						
10	7	2/10/2017	100,000.00	My B	Bank	Carnation, Inc	Rev	enue						
11	8	2/10/2017	-50,000.00	My B	Bank	Water, Inc	Expe	enses						-
4	•	payme	nts 🕂											Þ
Ready												-	+	100%

Type All Payments and click Save.

Save Table View	?	$\times$
Enter a name of the ta	ble view:	
All Payments		~
Save	Can	cel

We see the name of the current view, All Payments, in the **Table View** field.

Type **>0** in cell E2.

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A 1	С	D	E		F	G	_	Н		T		J	K	
2	ID - I	)ate	>0	Acc	ount 💌	Company	▼ Iten	n 🔻	Co	mment	~			
4	1	1/10/2013	7 200,000.00	My	Bank	Rose, Inc	Rev	enue						
9	6	2/10/201	7 300,000.00	My	Bank	Rose, Inc	Rev	enue						
10	7	2/10/2013	7 100,000.00	My	Bank	Carnation, Inc	Rev	enue						
16	13	3/10/2013	7 300,000.00	My	Bank	Rose, Inc	Rev	enue						
17	14	3/10/2017	7 200,000.00	My	Bank	Carnation, Inc	Rev	enue						
18	15	3/10/2017	7 100,000.00	My	Bank	Cornflower, Cor	rp Rev	enue						
25														
26														-
	•	payme	nts 🕂					: •						►
Ready	6 of 21	records fou	nd 🔝					E	∄		-	-	+	100%

The add-in applies the filter to the Sum column.

This is a reason why it is better to insert tables at cell B3.

Users may use row 2 (as a row over the table) as auto-filters. Also, they may place formulas in row 1.

Let's continue and save the view as **Incomes** (click the **Save Table View** button again):

Save T	able View	?	$\times$
Enter a	a name of the ta	able view:	
Incom	ies		~
	Save	Can	cel

#### Type **<0** in cell E2.

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5		2	10.01.2017	<u>sum</u> - -50 000.00	My	ount ≚ Bank	Land	ipany Linc	F	em xne	enses	CO	mment ≚						
6		3	31.01.2017	-87 000.00	My	Bank	Carro	,	P	ayr	oll			1					
7		4	31.01.2017	-13 000.00	My	Bank	Inco	me Taxes	т	axe	s			1					
8		5	31.01.2017	-29 580.00	My	Bank	Salar	ry Taxes	Т	axe	s			]					
11		8	10.02.2017	-50 000.00	My	Bank	Wate	er, Inc	E	хре	enses								
12		9	10.02.2017	-100 000.00	My	Bank	Land	l, Inc	E	хре	enses								
13		10	28.02.2017	-87 000.00	My I	Bank			P	ayr	oll								
14		11	28.02.2017	-13 000.00	My	Bank	Inco	me Taxes	Т	axe	s								-
	4	F	payme	nts (+)														Þ	
Rea	dy	15 of	21 records fo	und 🔠								]		-		-	+	100 9	6

The add-in applies the new filter to the Sum column.

Save the view as **Expenses**.

Save Table View	?	$\times$
Enter a name of th	e table view:	
Expenses		~
Save	Cance	:I

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1 2 3 4 9 10 16	ID • 1 6 7 13	Date 1/10, 2/10, 2/10, 3/10, 2/10	2017 /2017 /2017 /2017 /2017 /2017	Sum 7 200,000.00 300,000.00 100,000.00 300,000.00	Acco My I My I My I	Bank Bank Bank Bank Bank	Con Ros Ros Carr Ros	mpany se, Inc se, Inc nation, Inc se, Inc	F F F	eve eve eve	enue enue enue enue		omme	ent						_
17 18 25 26	14	3/10, 3/10,	/2017	200,000.00	My	Bank Bank	Cor	nation, Inc nflower, Co	rp R	eve	enue									
Ready	6 of 2	21 record	s foun	d 🛅							∎ :		E	Ē	]		-	+	1009	%

Remove the filter in cell E2 and apply the **Incomes** view in the **Table View** list:

As we may expect, the add-in applies the saved filter to the Sum column.

You may use the auto-filter row and table views for any Excel table.

Moreover, you may save views for pivot tables also.

I am sure you will like these features.

# Chapter 7. Table Format Wizard

We have formatted the table in the previous steps in the payments.xlsx workbook.

If a user connects to a database from a new workbook like Nick in Chapter 4, he has Excel defaults.

We can fix this publishing table formats and table views to a database using **Table Format Wizard**.

#### **Saving Formats**

#### Start Table Format Wizard:

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Fil	e H	ome Ins	ert Page Lay	out	Form	ulas Data	View	Save	ГоDB	Σī	fell me		Ŗ	) + Share
Save	Reload	Active Que dbo69.Pay	ery: yments d Query List	v	Accoun Compai Item:	t:	* * *	Table V All Pa	/iew: yments		Wizards	Options •	Help	
Tabl	e Data 🛛	<u>a</u> (	Query List	G.	C	Query Parameters	G.	Ta	ble Viev	vs 📑	Data Conne	ection Wiza	ard	
	4 C	D	E		F	G		Н			Pivot Data (	Connectio	n Wizard	
1											Publish Wiz	ard		
2			_							·••	Data Morga	Wizzed		
3	D 🔻	Date	Sum 💌	Acco	ount 💌	Company	▼ liten	n	Cor	n 🖘	Data Werge	vvizaru		
4	1	1/10/201	/ 200,000.00	My E	Bank	Rose, Inc	Rev	enue		_ 14	Change Co	nnection V	Vizard	
5	2	1/10/201	7 -50,000.00	My B	Bank	Land, Inc	Exp	enses			SaveToDB F	ramework	Installer	
6	3	1/31/201	7 -87,000.00	My B	Bank		Payı	roll		-	Configurati	on Workh	ook Gener	ator
7	4	1/31/201	7 -13,000.00	My B	Bank	Income Taxes	Taxe	es		41	conngaraa		Jok Gener	
8	5	1/31/201	7 -29,580.00	My B	Bank	Salary Taxes	Taxe	es			Table Form	at Wizard		
9	6	2/10/201	7 300,000.00	My B	Bank	Rose, Inc	Rev	enue			Window Wi	zard		۰.
10	7	2/10/201	7 100,000.00	My B	Bank	Carnation, Inc	: Rev	enue		N	Form Wizar	d		
11	8	2/10/201	7 -50,000.00	My B	Bank	Water, Inc	Exp	enses						
		10.01/10.0	inte A	- ·				:	4	4	Pivot Wizar	d		
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In the wizard, select a table and click the **Save in Database** button:

III Table Form	at Wizard						?	Х
Sheet	Object dbo69.Payments	Saved in WB	Saved in DB	Database Test2	Server			
Save in	Workbook	Restore from \	Workbook	Clear in Work	book	Clear Tabl	e Forma	t
Save in	Database	Restore from I	Database	Clear in Data	base	Apply Defa	ult Form	at
Help						ОК	Can	cel

The wizard saves the table format and changes its state:

Table Form	at Wizard						?	×
Sheet payments	Object dbo69.Payments	Saved in WB Yes	Saved in DB Yes	Database Test2	Server	SS		
Save in \	Norkbook	Restore from V	Vorkbook	Clear in Work	book	Clear Tab	ole Format	
Save in	Database	Restore from [	Database	Clear in Data	base	Apply Defa	ault Forma	t
Help						ОК	Canc	el

Now, users will get the same formats, views, and formulas of the tables when they connect to a database. Use the wizard to republish new views later.

### **Restoring Formats**

Users may use the **Restore from Database** button to reload the updated formats and views.

For example, let's switch to Nick's workbook and run Table Format Wizard.

Nick may see that dbo69.Payments table has a format in a database:

III Table Form	at Wizard						?	×
Sheet	Object dbo69.Payments	Saved in WB	Saved in DB Yes	Database Test2	Server			
Save in	Workbook	Restore from V	Vorkbook	Clear in Work	book	Clear Table	Format	
Save in	Database	Restore from [	Database	Clear in Datab	base /	Apply Defau	lt Forma	t
Help						ОК	Canc	el

Select the desired table and click the **Restore from Database** button. Then close the wizard.

Now, the table in Nick's workbook has the same format and table views as in Alex's workbook:

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Save Table	Reload Data	Active Que dbo69.Pay	ery: yments I Query List Query List	Table	View: ayments	¥	Wiza	rds Options	H	elp elp					~
A	С	D	E	Incor Expe	mes			Н			I		J	K	▲
1	<u>.</u>			Expe	1303							_			
3	ID 💌	Date	Sum 💌	Account	Comp	any	Ψ.	tem	▼ C(	ommen	t	-			
4	1	1/10/201	7 200,000.00	My Bank	Rose,	Inc	F	Revenue							
5	2	1/10/201	7 -50,000.00	My Bank	Land,	Inc	E	Expenses							
6	3	1/31/201	7 -87,000.00	My Bank			F	Payroll							
7	4	1/31/201	7 -13,000.00	My Bank	Incom	e Taxes	; 1	Faxes							
8	5	1/31/201	7 -29,580.00	My Bank	Salary	Taxes	٦	Taxes							
9	6	2/10/201	7 300,000.00	My Bank	Rose,	Inc	F	Revenue							
10	7	2/10/201	7 100,000.00	My Bank	Carna	tion, Inc	c I	Revenue							
11	8	2/10/201	7 -50,000.00	My Bank	Water	, Inc	6	Expenses							-
	•	Sheet1	÷					:				1			•
Ready										Ξ			-	+	100%

Once again, you may use this wizard to save and restore formats, formulas, and table views.

This feature allows sharing best features when every team member uses personal workbooks.

The Table Format Wizard saves formats in the TableFormats table in a database.

We have created this table using the SQL code provided in the <u>Configuring Database</u> chapter.

# Chapter 8. Validation Lists

In this chapter, we will create validation lists for Account, Company, and Item columns.

Moreover, we will configure this feature in a database, and the add-in will apply validation rules automatically.

#### **EventHandlers**

Configuring validation lists requires the **EventHandlers** table in a database.

We have created this table using the SQL code provided in the <u>Configuring Database</u> chapter.

Let's add a worksheet, named as handlers, run Data Connection Wizard and connect to the EventHandlers table:

Configure Query Wizard				?	$\times$
Select Object Select Query List and the object to con	nec	ct			
Select Query List: All tables, views and procedures		~	<ul> <li>Enable SaveToDB in t</li> <li>Enable Query List on</li> </ul>	this workbook <b>the ribbon</b>	
Select the query object:					
Schema	$\sim$	Name		Туре	$\sim$
dbo69		EventHar	ndlers	base table	
dbo69		Payments		base table	
dbo69		TableForm	nats	base table	
Help SQL Ca	ano	cel	Back Next	Finish	1

Uncheck Enable Query List on the ribbon. Click Finish, and insert the table at cell B3.

We have to see the following table:

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Fil	e	Home	Insert	Page Layout	For	mulas	Data	Vie	w	SaveTo	DB	Qт	ell me				<b>Р</b>	Sha	ire
Save Table	e Relo	ad Acti	ive Query: 069.EventHand Reload Query Ouery Lis	llers - List	Table	View:	•	Wiz	ards Option	ptions	Help								~
	A C		D	E			F			G				н			1		
1																			
2																			
3	ID 🗖	TABLE	SCHEMA	TABLE_NA	ME 💌	COLUMN	NAM		EVEN		IE 💌	HAN	DLER_	SCHEM	A 🔻	HAN	DLER_I	NAI	
4		_																	
5	_																	_	
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The add-in highlights fields that require values. Let's format the worksheet and table to make them beautiful.

#### **Static Validation Lists**

Add the following configuration and click the **Save** button:

ID 🔻	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	EVENT_NAME	HANDLER_SCHEMA	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE
1	L dbo69	Payments	Account	ValidationList	dbo69	Accounts	VALUES	MyBank
1	2 dbo69	Payments	Item	ValidationList	dbo69	Items	VALUES	Revenue, Expenses, Payroll, Taxes

This table has two parts, "tables" and "handlers":

TABLE_SCHEMA	TABLE_NAME 💌	COLUMN_NAME	EVENT_NAME 🔻
dbo69	Payments	Account	ValidationList
dbo69	Payments	Item	ValidationList

HANDLER_SCHEMA	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE
dbo69	Accounts	VALUES	MyBank
dbo69	Items	VALUES	Revenue, Expenses, Payroll, Taxes

In the table part, we have specified the configured table, its columns and the event name as ValidationList.

In the handler part, we have defined how to handle events. In this case, we have configured the **VALUES** type and specified static values in the **HANDLER\_CODE** field.

Further, I will use the short format like this, without the SCHEMA fields that contain the dbo69 value:

TABLE_NAM 🔻	COLUMN	EVENT_NAME	HANDLER 👻	HAND 🕆	HANDLER_CODE
Payments	Account	ValidationList	Accounts	VALUES	My Bank
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes

Now, the **handlers** worksheet should look like this:

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Let's switch to the payments worksheet and click Reload, Reload Data and Configuration:

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8		5	1/31/2017	-29,580.00	My Bank	Salary Taxes	Тах	es					
9		6	2/10/2017	300,000.00	My Bank	Rose, Inc	Rev	enue					
10		7	2/10/2017	100,000.00	My Bank	Carnation, Inc	c Rev	enue					
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6	3	1/31/2017	-87,000.00	My Bank			Rev	enue						
7	4	1/31/2017	-13,000.00	My Bank	Inc	ome Taxes	Pay	roll						
8	5	1/31/2017	-29,580.00	My Bank	Sal	ary Taxes	Tax	5						
9	6	2/10/2017	300,000.00	My Bank	Ros	se, Inc	Rev	enue						
10	7	2/10/2017	100,000.00	My Bank	Car	rnation, Inc	Rev	enue						
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The add-in creates validation lists using the specified values:

#### List Editor

The add-in activates **List Editor** that allows selecting values from lists in a comfortable way, including search.

List Editor		*	×
Search	🚽 🛛 Segoe UI	-	Ŧ
Revenue			
Expenses			
Payroll			
Taxes			

You may turn on/off the List Editor using the Options, Show List Editor Task Pane option.

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6	3	1/31/2	2017	-87,000.00	My	Bank			Pa	yre	oll								
7	4	1/31/2	2017	-13,000.00	My	Bank	Inco	ome Taxes	Ta	xe	s								
8	5	1/31/2	2017	-29,580.00	My	Bank	Sala	ary Taxes	Ta	xe	s								
9	6	2/10/2	2017	300,000.00	My	Bank	Ros	e, Inc	Re	ve	enue								
10	7	2/10/2	2017	100,000.00	My	Bank	Carr	nation, Inc	Re	ve	nue								
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#### **Dynamic Validation Lists**

Let's create a validation list for the Company column. We must have the possibility to change values easily.

Create an Excel table with companies at a new worksheet starting cell C3:

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Run <u>Publish Wizard</u> as described above. At the design tab, we have the following structure:

🔋 Publish Wizard			?	$\times$
Design Destination Da	atabase Table	hypes		
Excel Column Name	Excel Type	DB Column Name	DB Data Type	PK
	integer (0)		int (4)	
Company	string (16)	Company	nvarchar(255)	
	Ado	d Up D	Jown Delet	e
Help	Cano	el Back 1	Vext Finis	h

The table contains one column that is used as a primary key column. It's ok. Click **Next** and execute next steps.

Publish table as dbo69.Companies table.

As a Publish Wizard result, we have the editable **dbo69.Companies** table of companies at a new sheet:

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Let's remove the initial Sheet1 worksheet, rename the Sheet2 to **companies**, and format the table:

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1 2 3 4 5 6 7 8 9 10 11	Company Carnation, Inc Cornflower, Cor Corporate Tax Income Taxes Land, Inc Rose, Inc Salary Taxes Water, Inc	P											
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Switch to the **handlers** sheet, select a cell in row 5, and click the **Copy and Insert Rows** button.

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6 7 8 9 10 11				1									
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This action will create a copy of the selected line. So, you may easily change only different values.

Add a validation list configuration for the Company field like this:

TABLE_NAM 👻	COLUMN	EVENT_NAME	HANDLER 💌	HAND 🝸	HANDLER_CODE
Payments	Account	ValidationList	Accounts	VALUES	My Bank
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes
Payments	Company	ValidationList	Companies	TABLE	Company

Complete table:

ID 🔻	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	EVENT_NAME	HANDLER_SCHEMA 💌	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE
1	dbo69	Payments	Account	ValidationList	dbo69	Accounts	VALUES	MyBank
2	dbo69	Payments	Item	ValidationList	dbo69	Items	VALUES	Revenue,Expenses,Payroll,Taxes
3	dbo69	Payments	Company	ValidationList	dbo69	Companies	TABLE	Company

As a result, the add-in will create a validation list for the Company column using the **Company** field of the **dbo69.Companies** table.

Switch to the payments worksheet and click Reload, Reload Data and Configuration to refresh the list:

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4		1	1/10/201	7 200,000.00	My	Bank	Rose, Inc	R	even	ue						
5		2	1/10/201	7 -50,000.00	My	Bank	Land, Inc	E	xpen	ses						
6		3	1/31/201	7 -87,000.00	My	Bank		P	ayrol	I						
7		4	1/31/201	7 -13,000.00	My	Bank	Income Taxes	-	xes							
8		5	1/31/201	7 -29,580.00	My	Bank	Carnation, Inc		xes							
9		6	2/10/201	7 300,000.00	My	Bank	Corporate Tax		ven	ue						
10		7	2/10/201	7 100,000.00	My	Bank	Income Taxes		ven	ue						
11		8	2/10/201	7 -50,000.00	My	Bank	Rose, Inc		pen	ses						-
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You have to know that the add-in places connected tables of validation list source values like dbo69.Companies to a hidden worksheet and configures validation lists using a range formulas.

Setting validation lists this way has great benefits.

You configure it in the EventHandlers table, and the add-in creates validation lists automatically.

Just use Reload, Reload Data and Configuration to reload validation list values.

Let's select the **Payments** worksheet and click **Wizards**, Form Wizard, Add Cursor:

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4	1	1/10/2017	200,000.00	My Bank	Ros	se, Inc		Rev	enue		×	Change Cor	nection V	Vizard	
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6	3	1/31/2017	-87,000.00	My Bank				Payr	oll			Configuratio	on Workh	ook Genera	ator
7	4	1/31/2017	-13,000.00	My Bank	Inc	ome Taxes	5	Taxe	25					Jok Gener	
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The add-in highlights the active table row:

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4		1	1/10/201	7 200,000.00	My	Bank	Rose, Inc	Rev	enue						
5		2	1/10/201	.7 -50,000.00	My	Bank	Land, Inc	Exp	enses						
6		3	1/31/201	.7 -87,000.00	My	Bank		Pay	roll						
7		4	1/31/201	7 -13,000.00	My	Bank	Income Taxes	Тах	es						
8		5	1/31/201	7 -29,580.00	My	Bank	Salary Taxes	Тах	es						
9		6	2/10/201	7 300,000.00	My	Bank	Rose, Inc	Rev	enue						
10		7	2/10/201	7 100,000.00	My	Bank	Carnation, Inc	Rev	enue						
11		8	2/10/201	7 -50,000.00	My	Bank	Water, Inc	Exp	enses						-
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6	3	1/31/20	17	-87,000.00	My I	Bank			P	ayr	oll					Sum		-13,000.0	0	
7	4	1/31/20	17	-13,000.00	My I	Bank	Inco	me Taxes	Т	axe	25					Account	1	My Bank		
8	5	1/31/20	17	-29,580.00	My I	Bank	Sala	ry Taxes	Т	axe	25					Compar	Ŋ	Income Ta	axe	
9	6	2/10/20	17 3	300,000.00	My I	Bank	Rose	e, Inc	R	leve	enue					Item		Taxes		
10	7	2/10/20	17 :	100,000.00	My I	Bank	Carn	nation, Inc	R	leve	enue					Comme	nt			
11	8	2/10/20	17	-50,000.00	My I	Bank	Wat	er, Inc	E	хре	enses									Ŧ
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Let's run the same wizard, click Add Form Fields and select cell K4:

The add-in inserts form fields and updates them when you select another row.

Moreover, you may use such fields to edit table row values.

# Chapter 11. Master-Details

Let's select the **companies** sheet and add form fields at cell E4.

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Then let's move cell F4, the Company field, to C1 and remove column E. Now cell C1 contains the active company.

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1 2 3 4 5 6 7 8 9 10 11	Cornflow Company Carnatior Cornflow Corporate Income T Land, Inc Rose, Inc Salary Tay Water, In	er, Corp a, Inc er, Corp axes axes kes c									·				
	•	paymen	ts con	npanies	handlers	+		: (						►	
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Now, select cell E3 (outside of the active table) and connect to the **dbo69.Payments** table.

In the connection wizard, check at least the field used as a filter (Company) in the WHERE column:

Query Parameters - dbo69.Payments ?											
Sele	ect columns to	place them to the F	Ribbon and to filter the data								
	Parameter	DataType	Value			w					
	ID	int			-						
$\checkmark$	Date	datetime			-						
$\checkmark$	Sum	float			-						
$\square$	Account	nvarchar(255)			-						
$\square$	Company	nvarchar(255)			-						
$\square$	ltem	nvarchar(255)			-						
$\square$	Comment	nvarchar(255)			•						
	Help		0	К	Cance	el					

and insert the table at cell E3:

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4	Carnatio	on, Inc		1	1/10/	2017	200,	,000.00	My Bank	R	Rose, Inc		Rev	enue			-	
5	Cornflo	wer, Cor	р	2	1/10/	2017	-50,	,000.00	My Bank	L	and, Inc		Exp	enses				
6	Corpora	ate Tax		3	1/31/	2017	-87,	,000.00	My Bank				Pay	roll				
7	Income	Taxes		4	1/31/	2017	-13,	,000.00	My Bank	Ir	ncome Taxe	s	Тах	es				
8	Land, In	C		5	1/31/	2017	-29,	,580.00	My Bank	S	alary Taxes		Тах	es				
9	Rose, In	ic		6	2/10/	2017	300,	,000.00	My Bank	R	lose, Inc		Rev	enue	_			
10	Salary T	axes		7	2/10/	2017	100,	,000.00	My Bank	C	Carnation, In	IC	Rev	enue				
11	Water,	Inc		8	2/10/	2017	-50,	,000.00	My Bank	V	Vater, Inc		Exp	enses				-
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We see that the **dbo69.Payments** table has ribbon parameters including **Company**.

Also, we see the selected company in cell C1 that may be used as a parameter. Let's link them.

Select cell C1 and click the **Define Name** button in the **Defined Names** group on the **Formulas** tab:



Specify the name as the parameter name, **Company**, and select the sheet name, **companies**, in the **Scope** field:

New Name	2	?	$\times$
<u>N</u> ame:	Company		
<u>S</u> cope:	companies 🗸 🗸		
C <u>o</u> mment:		-	~
			$\sim$
<u>R</u> efers to:	= companies!\$C\$1		Ť
	ОК	C	ancel
			/

Click OK. Then select a row in the Company table, and voilà!

₽	<b>€</b> • ∂					payr	ments.xlsx	- Exce	el.					Table T.		ক			>	<
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Save Table	Reload	Active Q dbo69.C (a) Relo	uery: ompani ad Quer Query I	es y List List	*	Table	e View:		• •	Wizards Opti	Optior ons	ns	Help Help							~
<b>A</b>		С	D	F	G		н			1		J	J			к		L		
1 2 3 4 5 6 7 8 9 10	Carnatic Compan Carnatic Cornflov Corpora Income Land, In Rose, In Salary T	on, Inc on, Inc wer, Cor te Tax Taxes c c	<b>p</b>	ID <b>*</b> 7 14	Date 2/10/ 3/10/	× 2017 2017	Sum 100,000 200,000	▼ 1 00.0 1 00.0	Acc My My	Bank Bank Bank	Com Carn Carn	pany atior atior	n, Inc	F F F	tem Rever Rever	vue nue	Comm	ient	¥	
11	Water, I	nc																		-
4	•	paym	ents	com	panies	har	ndlers	9	Ð		:	•							Þ	
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Save Table	Reload	Active dbo69	Query Paym load Qu	/: nents Query <b>Jery L</b> i	' List		Acco Com Item:	pany: Quei	Carnation	n, Inc	* * *	Table	View:	ws	•	Wizards • Opti	Opti ons	ons	Help Help	~
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1 2 3 4 5 6 7 8 9 10 11	Comparison Carnatic Cornflo Corpora Income Land, In Rose, In Salary T Water,	on, Inc on, Inc wer, C ate Tax Taxes ic ac axes Inc	orp		ID ▼ 7 14	Date 2/10/ 3/10/	¥ 2017 2017	Sum 100 200	,000.00 ),000.00	Accoun My Ban My Ban	t ▼ k k	Com Carn Carn	pany ation, I ation, I	▼ nc nc	Ite Rev Rev	m venue venue	- C	òomn	nent	
11	water,						L.			<u>.</u>										<b>▼</b>
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When you select the detail table, you may see its parameters at the ribbon:

Both tables are editable.

Here is a list of events that implement master-details:

- 1. A user selects another row in a master table.
- 2. The add-in updates form fields (cell C1 with Company).
- 3. The add-in changes parameters of the detail tables using named cell values (cell C1 as Company).
- 4. The add-in reloads the details with new parameter values.

You may build more complex forms using the same technique.

For example, the Northwind example contains the following tables with master-detail relations:

- 1. Customer first char index (A-Z)
- 2. Customers
- 3. Customer orders
- 4. Orders

We may use another technique to show details in windows and task panes using the SelectionChange handlers.

#### **Detail Windows**

Let's select the handlers worksheet and add the SelectionChange handler:

TABLE_NAM 👻	COLUMN -	EVENT_NAME	HANDLER 🔻	HAND 🔻	HANDLER_CODE
Payments	Account	ValidationList	Accounts	VALUES	My Bank
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes
Payments	Company	ValidationList	Companies	TABLE	Company
Payments		SelectionChange	Payments	TABLE	

#### Complete table:

ID	TABLE_SCHEMA 🔻	TABLE_NAME	COLUMN_NAME	EVENT_NAME	HANDLER_SCHEMA	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE	TARGET_WORKSHEET
	1 dbo69	Payments	Account	ValidationList	dbo69	Accounts	VALUES	My Bank	
	2 dbo69	Payments	Item	ValidationList	dbo69	Items	VALUES	Revenue, Expenses, Payroll, Taxes	
	3 dbo69	Payments	Company	ValidationList	dbo69	Companies	TABLE	Company	
	4 dbo69	Payments		SelectionChange	dbo69	Payments	TABLE		

Switch to the payments worksheet and click Reload, Reload Data and Configuration to reload the configuration.

Then select another row in the Payments table. You will see the window with row details:

dbo	69.	Payments					
ID		Date	Sum	Account	Company	ltem	Comment
	6	2/10/2017	300000	My Bank	Rose, Inc	Revenue	
SELE	СТ	* FROM [dl	bo69].[Pay	ments] WHEF	RE [ID] = 6 AND	[Date] =	20170210 00;

You may select another row. The window will stay on top and show related information.

#### \_Transpose

You may transpose row to columns in the output window. Just add the **\_Transpose** word in **TARGET\_WORSHEET**:

TABLE_NAM 🔻	COLUMN	EVENT_NAME	HANDLER 🔻	HAND -	HANDLER_CODE	
Payments	Account	ValidationList	Accounts	VALUES	My Bank	
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes	
Payments	Company	ValidationList	Companies	TABLE	Company	
Payments		SelectionChange	Payments	TABLE		_Transpose

Switch to the payments worksheet and click Reload, Reload Data and Configuration. A new window looks like

dbo69.Payments	– 🗆 X
Field	Value
ID	6
Date	2/10/2017
Sum	300000
Account	My Bank
Company	Rose, Inc
ltem	Revenue
Comment	
SELECT * FROM [dbo6	9].[Payments] WHEF;

#### **Task Panes**

Use of detail windows is a good solution when you need windows that are always visible.

If you need context windows, you may use task panes. Just add the **\_TaskPane** word in **TARGET\_WORSHEET**:

TABLE_NAM 🗵	COLUMN_ 👻	EVENT_NAME	HANDLER 🔻	HAND 🔻	HANDLER_CODE	TARGET_WORKSHEET
Payments	Account	ValidationList	Accounts	VALUES	My Bank	
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes	
Payments	Company	ValidationList	Companies	TABLE	Company	
Payments		SelectionChange	Payments	TABLE		_TaskPane _Transpose

A new task pane window will look like

dbo69.Payments 🔹 🗙									
Field	Value								
ID	6								
Date	2/10/2017								
Sum	300,000.00								
Account	My Bank								
Company	Rose, Inc								
Item	Revenue								
Comment									

You may customize column formats using the context menu.

Also, you may dock task panes and turn them on/off using the **SaveToDB**, **Options**, **Show Task Panes** option.

# Chapter 13. Context Menus

Detail windows and task panes discussed above are shown in the SelectionChange event.

We may add such queries and much more to the context menu.

Let's add the following configuration to the **EventHandlers** table (two lines at the bottom):

TABLE_NAM 👻	COLUMN 🔽	EVENT_NAME	HANDLER 🔻	HAND 🔻	HANDLER_CODE					
Payments	Account	ValidationList	Accounts	VALUES	My Bank					
Payments	Item	ValidationList	Items	VALUES	Revenue, Expenses, Payroll, Taxes					
Payments	Company	ValidationList	Companies	TABLE	Company					
Payments		SelectionChange	Payments	TABLE		_TaskPane _Transpose				
Payments	Company	ContextMenu	Payments	TABLE	+Date,+Sum,Account,@Company,	Item,Comment				
Payments	Item	ContextMenu	Payments	TABLE	+Date,+Sum,Account,Company,@Item,Comment					

Contrary to the SelectionChange handler, we have specified columns. So, context menus are shown for columns.

Also, we have directly specified select columns in the **HANDLER\_CODE**. The plus sign defines the sort order.

@Company and @Item fields are used in the WHERE clause to filter output data using current row values.

Let's select the payments sheet, click Reload, Reload Data and Configuration, and right click on a company cell:

B					payme	nts.xlsx - Exce	:			Table T	i	• •		×
File	н	ome Inse	ert Page Lay	out	Form	ulas Data		View	SaveToDB	Design	Q	) Tell me	<u>A</u>	. Share
Save Table	Reload	Active Que dbo69.Pay	ry: ments I Query List Query List	-	Accoun Compar Item:	t: ny: Query Paramete	rs	* * *	Table View:	ews 5	Wizar	ds Options	Help Help	^
A	C	D	E		F	G	Cal	ibri –	H	ا م ف م	J	K	L	
2							B		Δ - Δ -	A ⊅ * 7	6 7 00			
3	D 🗵	Date	Sum	Acco	ount 💌	Company								
4	1	1/10/2017	7 200,000.00	My I	Bank	Rose, Inc		SaveT	oDB Drill-Dow	/n ⊧		dho69 Davn	ents	1
5	2	1/10/2017	-50,000.00	My I	Bank	Land, Inc					H	aboostrayii		17
6	3	1/31/2017	-87,000.00	My I	Bank		đ	Cu <u>t</u>				Sum	200,000.0	00
7	4	1/31/2017	-13,000.00	My I	Bank	Income Taxe	Ē	<u>С</u> ору			4	Account	My Bank	
8	5	1/31/2017	-29,580.00	My I	Bank	Salary Taxes	ĥ	Paste	Options:		4	Company	Rose, Inc	:
9	6	2/10/2017	300,000.00	My I	Bank	Rose, Inc						ltem	Revenue	E I
10	7	2/10/2017	100,000.00	My I	Bank	Carnation, I					4	Comment		
11	8	2/10/2017	-50,000.00	My I	Bank	Water, Inc		Paste	<u>S</u> pecial					-
4	•	payme	nts compar	nies	hand	ers 🤅 🤆	Ĵ	Smart	<u>L</u> ookup					Þ
Ready	•						è	<u>R</u> efres	h			-	+	100%

When we click on the **dbo69.Payments** item, the add-in shows the window like this:

dbo69.Pay	/ments									
Date	Sum	Account	Company	ltem	Comment					
1/10/2017	200000	My Bank	Rose, Inc	Revenue						
2/10/2017	300000	My Bank	Rose, Inc	Revenue						
3/10/2017	300000	My Bank	Rose, Inc	Revenue						
SELECT [Date], [Sum], [Account], [Company], [Item], [Comment] FROI										

You see rows for Rose, Inc. You may click on the status line to check the generated SQL:

Query Command of dbo69.Payments	$\times$	
SELECT [Date], [Sum], [Account], [Company], [Item], [Comment] FROM [dbo69].[Payments] WHERE [Company] = N'Rose, Inc' ORDER BY [Date], [Sum]		
ОК	]	

Let's right click on any Revenue item cell and click on the **dbo69.Payments** item. We will see item payments.

dbo69.Pay	/ments				o x							
Date	Sum	Account	Company	ltem	Comment							
1/10/2017	200000	My Bank	Rose, Inc	Revenue								
2/10/2017	100000	My Bank	Camation, Inc	Revenue								
2/10/2017	300000	My Bank	Rose, Inc	Revenue								
3/10/2017	100000	My Bank	Comflower, Corp	Revenue								
3/10/2017	200000	My Bank	Camation, Inc	Revenue								
3/10/2017	300000	My Bank	Rose, Inc	Revenue								
SELECT [Date], [Sum], [Account], [Company], [Item], [Comment] FROM [db(;;;												

As we learned above, the **SelectionChange** and **ContextMenu** handlers are nearly the same.

They get parameters from the columns of the active row. They differ by the **EVENT\_NAME** configuration.

However, the **ContextMenu** handlers support additional configuration parameters like **MENU\_ORDER** and **EDIT\_PARAMETERS** and allow using much more handler types in the **HANDLER\_TYPE** field.

You may configure executing stored procedures, SQL codes, macros, CMD commands, opening URLs.

Use the **MenuSeparator** type to separate menu items.

# Chapter 14. Actions Menus

The action menus are located at the ribbon and have nearly the same features as context menus.

However, users may execute actions when the active cell is outside of the table. So, they may have no context.

Let's add an URL to the Actions menu for the EventHandlers table. Add the line shown at the bottom:

TABLE_NAM 🔽	COLUMN_ 🗸	EVENT_NAME	HANDLER 🔻	HAND 🔻	HANDLER_CODE	TARGET_WORKSHEET 💌
Payments	Account	ValidationList	Accounts	VALUES	My Bank	
Payments	Item	ValidationList	Items	VALUES	Revenue,Expenses,Payroll,Taxes	
Payments	Company	ValidationList	Companies	TABLE	Company	
Payments		SelectionChange	Payments	TABLE		_TaskPane _Transpose
Payments	Company	ContextMenu	Payments	TABLE	+Date,+Sum,Account,@Company	,Item,Comment
Payments	Item	ContextMenu	Payments	TABLE	+Date,+Sum,Account,Company,@	Item,Comment
EventHandlers		Actions	Instruction	нттр	https://www.savetodb.com/save	todb/configuring-event-

#### Complete table:

ID 🔻	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME 🔻	EVENT_NAME	HANDLER_SCHEMA	HANDLER_NAME	HANDLER_TYPE V	HANDLER_CODE	TARGET_WORKSHEET	MENU_ORDER V
1	L dbo69	Payments	Account	ValidationList	dbo69	Accounts	VALUES	My Bank		
2	2 dbo69	Payments	Item	ValidationList	dbo69	Items	VALUES	Revenue, Expenses, Payroll, Taxes		
3	dbo69	Payments	Company	ValidationList	dbo69	Companies	TABLE	Company		
4	1 dbo69	Payments		SelectionChange	dbo69	Payments	TABLE		_TaskPane _Transpose	
5	dbo69	Payments	Company	ContextMenu	dbo69	Payments	TABLE	+Date,+Sum,Account,@Company,	Item,Comment	
(	dbo69	Payments	Item	ContextMenu	dbo69	Payments	TABLE	+Date,+Sum,Account,Company,@	Item,Comment	
-	7 dbo69	EventHandlers		Actions	dbo69	Instruction	HTTP	https://www.savetodb.com/save	todb/configuring-event-h	andlers.htm

Reload data and configuration. You will see the Actions menu with the Instruction link.

₽		<i>∂</i> =				payments.xl	sx - Ex	cel		Ŧ			×
File	H	lome	Insert	Page Layout	Formu	as Data	View	SaveToDB	♀ Tell me	2		R	Share
Save	Reloa	d Actions	Active Qu dbo69.Ev B Reloa	ery: entHandlers d Query List <b>uery List</b>		Table View:	5	Wizards Option	ns Help Help				~
A	С		D	E		F		G		н		1	<b>▲</b>
1 2													
3	D 🔻	TABLE_S	SCHEMA 🔽	TABLE_NAM	E 👻 CO	LUMN_NAM	E - E	VENT_NAME	HANDLER	SCHEMA	▼ HA	NDLER_	NAI
4	1	dbo69		Payments	Ac	count	N	/alidationList	dbo69		Acc	counts	
5	2	dbo69		Payments	Ite	m	١	alidationList	dbo69		Ite	ms	
6	3	dbo69		Payments	Co	mpany	١	/alidationList	dbo69		Cor	mpanie	5
7	4	dbo69		Payments			S	electionChange	dbo69		Pay	yments	
8	5	dbo69		Payments	Co	mpany	C	ontextMenu	dbo69		Pay	yments	
9	6	dbo69		Payments	Ite	m	C	ontextMenu	dbo69		Pay	yments	
10	7	dbo69		EventHandle	ers		A	ctions	dbo69		Ins	truction	
11													-
	•	pa	yments	companies	handle	ers 🕂		: •					
Ready										-	-	-+	100%

The Actions menu is a good place for documentation links and common tasks related to a table, not to a row.

# Chapter 15. Image URLs

You may add URLs and image URLs to your tables. This does not require any configuration.

The add-in automatically loads and shows images in task panes. You may dock task panes like this:

⊟	<b>€</b> - €			payments.xls	x - Excel				Table T	Ē	<b>和</b> -			×
File	e Hom	ne Insert	Page Layout	Formulas	Data	View	SaveTo	DB	Design	Q	Tell me		Я	Share
Save Table	Reload Data S	Active Query:	r ery List y List ⊡	Table View:	vs s	Wizards •	Options •	Help						^
1		D					E			Imad	ie URI	L	-	×
2 3 U 4 ht 5 ht 7 8 9 10 11	RL ttps://ww ttps://ww ttps://ww	w.savetodb. w.savetodb. w.savetodb.	Image UR com/_https://st com/_https://st com/_https://st images	L atic.savetodb atic.savetodb atic.savetodb	.com/ima .com/ima .com/ima	ages/ebo ages/ebo	ooks/10-s ooks/10-s ooks/11-s	steps- steps-	fc fc fc		XCEL PPLICA Disteps for data M	FIONS base develo	ey Voselenk	
Ready	<b>1</b>						E	Ħ					+ 1	00%

Also, the add-in adds the **Open URL** context menu if a row contains URLs.

H	<u>/</u> =	Quick Analysis		payments.xls>	- Excel				Table T	Ŧ	-		×
File		S <u>o</u> rt Filter	⊧ ⊧t	Formulas	Data	View	SaveToD	рв	Design	Q Tell	me	<b>А</b>	Share
Save Table D	<b>t</b> ⊃	Ta <u>b</u> le XML Insert Co <u>m</u> ment	► ► □	Table View:		Wizards •	Options •	Help					~
1 2		<u>F</u> ormat Cells Pic <u>k</u> From Drop-down List Hyperl <u>i</u> nk					E		_ Ir	nage l	JRL	Ŧ	×
3 UR 4 htt 5 htt 6 htt 7 8 9 10 11	Cali B	Open URL www.savetoub.com/ mttp bri $\cdot$ 11 $\cdot$ A $\star$ $\star$ $\cdot$ $I \equiv \Delta \cdot A \cdot \odot$ companies image	▶ 5./ 96 0.00 0.00	https://www https://static ✓	savetodb. .savetodb. .com/ima	com/10-s	teps-for-da ges/ebooks poks/11-s	itabas	e-develope teps-for-da	rs.htm tabase-dev	or database der	enderers	
Ready		in companies inage								_	-	<b>+</b> 1	00%

In this chapter, we will add columns that show times and user names of the latest updates.

This helps team members to understand who and when changed data.

You may use the following solution in a friendly environment. Otherwise, you have to use database triggers.

#### **Creating New Columns**

Let's select the companies worksheet, the Companies table, and launch Publish Wizard.

Follow the steps. At the design tab, add the following columns:

🔋 Publish Wizard				?	×							
Design Destination D	Design Destination Database Table Enter destination table column names and types											
Excel Column Name	Excel Type	DB Column Name	DB Da	ata Type	РК							
_RowNum	integer (0) row number		int (4)									
Company	string (16)	Company	nvarch	ar(255)								
		LastModified	datetin	datetime (8)								
		UserName	nvarch	ar(50)								
	Ad	d Up	Down	Dele	te							
Help	Can	cel Back	Next	Finis	ah							

You may change column names and data types in your solutions.

Specify the same table name at the following step and execute the SQL script to recreate the table.

🔋 Publish Wi	zard	?	×
Define Tabl	e's Schema and Name		
Enter a destin	nation table schema and name		
Table Schema:	dbo69 ~		
Table Name:	Companies ~		
Table dbo69.Co	mpanies exists in the database and will be dropped before the ex	(port!	
Help	Cancel Back Next	Fi	nish

Do not click **Finish** to skip the creating a new table in the workbook. Click **Cancel** at this step.

Verify Script Results	
Verify the script results and click Finish to insert a new data table	
Table [dbo69].[Companies] has been dropped	^
Processed 8 total records	
Help Cancel Back Mext F	inish

Let's reload data and configuration on the existing worksheet. You will see new fields in the **Companies** table:

H	5- ೆ	∋ - ∓			p	aymer	nts.xls	x - Excel					ħ	_			×
File	Hon	ne Ins	ert	Page Layout	Formulas	Da	ıta	View	Save	ToDB	Ωт	ell me				R s∣	hare
Save	Reload	Active Que	ery: I Query	y List	Table View:	¥.	Ţ	Wizards	Option	s Hel	P						
		c	Juery L	D	E E	F	H	Opt	ions		p		к		L		Â
1 2 3 4	Carnatic Compan Carnatic	on, Inc y on, Inc	Last	Modified 🔽	UserName 💌		ID 🔹	7 Date	· ▼ 0/2017	Sum 100,0	× 000.00	Acco My E	ount -	Comp Carnat	a <b>ny</b> tion, In	⊂	
5	Cornflo	wer, Corp					1	4 3/10	)/2017	200,0	00.00	My E	Bank	Carnat	tion, In	с	
6 7 8 9	Corpora Income Land, Inc Rose, In	te Tax Taxes c c															
10	Salary Ta	axes				-											
11	Water, I	nc															-
-	•	payme	nts	companies	images	hand	dlers	(+	) : [	•						►	
Ready	•													-	+	100	%

#### **Event Handlers**

Let's add the following handlers for the Companies table in the **EventHandlers** table:

TABLE_NAM 👻	COLUMN 🔻	EVENT_NAME	HANDLER 💌	HAND 🝸	HANDLER_CODE
Companies	LastModified	FormulaValue			=NOW()
Companies	UserName	FormulaValue			=UserName()
Companies	LastModified	DoNotChange			
Companies	UserName	DoNotChange			

Complete table:

ID 🔻	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	EVENT_NAME	HANDLER_SCHEMA	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE
8	dbo69	Companies	LastModified	FormulaValue				=NOW()
9	dbo69	Companies	UserName	FormulaValue				=UserName()
10	dbo69	Companies	LastModified	DoNotChange				
11	dbo69	Companies	UserName	DoNotChange				

The FormulaValue handlers update cell values on row changes using the specified formulas.

=NOW() is an Excel formula. You may use this technique for other formulas too.

=UserName() is a SaveToDB add-in formula. You may use =DomainUserName() also.

The **DoNotChange** handlers prevent changes in the LastModified and UserName columns.

Let's switch to the **companies** worksheet and change a couple of cells.

₽	5-0-	Ŧ		payments.xls	ж-Е	xcel				Table T.	চ	3 —		×
File	Home	Inse	rt Page Layout	Formulas	Da	ita	View	Save	ToDB	Desig	jn ⊋	Tell me		$egin{smallmatrix} \label{eq:phase} \mathcal{A} & Share \ \end{pmatrix}$
Save	Reload	e Quer 9.Con eload	y: npanies v Query List	Table View:	<u>.</u>	Ŧ	Wizards	Option	s Hel	p				
	C	Q	D	F	F	H	Opt	ions	Hel	p	к		1	
1 2	Cornflower, (	Corp			1		Data		C		A			
3	Company Carnation In			Osername	-	1	<sup>•</sup> Date 5 3/10	/2017	100 c	00.00	Account My Bank	Cornf	any lower (	orn
5	Cornflower, (	Corp	3/14/2017	Alex	1		5 5/10	12011	100,0	00.00	Wry Durik	Conn	iower, v	
6	Corporate Ta	x			1									
7	Income Taxes	5			]									
8	Land, Inc													
9	Rose, Inc													
10	Salary Taxes													
11	Water, Inc			L										-
	• pa	ymer	ts companies	images	han	dlers	(+	) : [	4					Þ
Ready	<b>1</b>									Ξ	── ─		+	100%

As you may see, the add-in updates the values in the LastModified and UserName columns.

This technique is very simple. You may add this feature to your tables quickly.

However, note that such columns may be updated with any values directly in a database using SQL.

You may load data from external data sources and save the data into your tables.

You may load data from databases, web pages, and text files using the add-in, or from other sources using Excel or other tools like PowerQuery.

#### **External Data Sources**

Let's create a worksheet like integration and run Data Connection Wizard.

You may connect to any supported data source including text files and web data.

Let's select the **Web Data** provider.

Data Connection	Wizard	? ×
Select Provider		
Select an appropriat	e provider to	connect to a data source
Server	Туре	Description
SQL Server/SQL Azure	OLEDB	Microsoft OLE DB Provider for SQL Server
SQL Server/SQL Azure	OLEDB	SQL Server Native Client 11.0
SQL Server/SQL Azure	ODBC	SQL Server
SQL Server/SQL Azure	ODBC	SQL Server Native Client 11.0
Oracle Database	.NET	Oracle Data Provider for .NET
IBM DB2	.NET	IBM DB2 .NET Data Provider 10.5.0
IBM DB2	ODBC	IBM DB2 ODBC Driver
MySQL	.NET	MySQL Data Provider
MySQL	ODBC	MySQL ODBC 5.3 ANSI Driver
MySQL	ODBC	MySQL ODBC 5.3 Unicode Driver
NuoDB	.NET	NuoDB Data Provider
PostgreSQL	.NET	Npgsql Data Provider
SQL Server Compact	.NET	Microsoft SQL Server Compact Data Provider 4.0
SQLite	.NET	SQLite Data Provider
SQLite	ODBC	SQLite3 ODBC Driver
SQLite	ODBC DSN	SQLite3 Datasource
Text Data	.NET	Gartle Text Data Provider
Web Data	.NET	Gartle Web Data Provider
This provider is used to c Supported types: html. xn	onnect to we nl, json and cs	b pages and web services including OData web services.
		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
Help		Cancel Back Next Finish

At the following step, let's paste the test **URL** to load data from a JSON data source:

🔋 Data Connectio	on Wizard ?	×
Connect to Web	b Data Source	
Enter the informat	tion required to connect to a web data source	
URL:	https://static.savetodb.com/examples/companies.json	~
Service URL:	https://static.savetodb.com/examples/companies.json/	~
OAuth Provider:	~	
Scope:		~
Accept:	Auto ~	~
	Test Connect	ion
Help	Cancel Back Next	Finish

You may test the following URLs:

- https://static.savetodb.com/examples/companies.json
- https://static.savetodb.com/examples/companies.xml
- https://static.savetodb.com/examples/companies.html
- https://static.savetodb.com/examples/companies.csv

The SaveToDB add-in automatically parses the pages and retrieves the meaningful data.

You may also customize the parsers. Refer to the documentation.

Let's insert the new connected table at cell B3. You may refresh the data anytime.

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Save Table I	Reload	uery: ad Query List Query List		Table View:	▼ N/S I⊋	Wizards • Opt	Options •	Help Help					~
M14		Ŧ	: >	<ul> <li>✓ f<sub>x</sub></li> </ul>									~
A 1 2 3 4 5 6 7 8	C name Carnation, Inc Cornflower, Cor Corporate Tax Income Taxes Land, Inc	• • •	E	F	G	H		I	J	К	L		M -
•	comp	oanies im	ages	integration	handler	: ÷							•
Ready											-	+	100%

#### Data Merge Wizard

The external data source contains the **name** column. Our **dbo69.Companies** table contains the **Company** column. Let's add the target **Company** column using the formula like =[@name] and run **Data Merge Wizard**.

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File	Home Inse	ert Page Layout	Formulas	Data	View	SaveToDB	Design	© Tel	l me	R	. Share
Save	Reload	ery: V I Query List	Table View:		Wizards	Options H	lelp				
Table	Data 🖬 🤇	Query List 🕞	Table Viev	VS F	D	ata Connectio	n Wizard		к		~
1	<u> </u>	5	-		– 🛃 Pi	ivot Data Conn	ection Wizard		K		
2			_		S P	ublish Wizard					
3	name 💌	Company 🗸			S D	ata Merge Wiz	ard				
4	Carnation, Inc	Carnation, Inc			≿∎ C	hange Connec	tion Wizard				
5	Cornflower, Corp	Cornflower, Corp	•		🔳 Sa	aveToDB Fram	ework Installer				
6	Corporate Tax	Corporate Tax	-			onfiguration W	/orkbook Gene	rator			
7	Income Taxes	Income Taxes	-								
8	Land, Inc	Land, Inc	-			able Format W	Izard				
9	Rose, Inc	Rose, Inc	4		- W	/indow Wizard		►			
10	Salary Taxes	Salary Taxes	-		E Fo	orm Wizard		►			
11	Water, Inc	Water, Inc			- 🛃 Pi	ivot Wizard		×			-
•	compa	nies images	integration	handler	rs 🔊 🕷	/orkbook Temp	plates and Exan	nples 🕨	_		Þ
Ready								-		-+ 1	00 %

Follow wizard steps and select the target **dbo69.Companies** table at the following step:

🧻 Data Merge Wizard		? ×
Select Table		
Select a table to merge data		
Schema	Name	Туре
dbo69	Companies	base table
dbo69	EventHandlers	base table
dbo69	Payments	base table
dbo69	TableFormats	base table
Help	ancel Back Next	Finish

You may see the generated SQL code used to update the underlying table in a merge mode. Click **Execute**.

🔋 Data Merge Wizard	?	×
Verify and Execute Script		
Verify the script and click Execute		
<pre>INSERT INTO [dbo69].[Companies] ([Company]) SELECT s.[Company] INSERT INTO [dbo69].[Companies] ([Company]) SELECT s.[Company] GO</pre>	] FROM ] FROM ] FROM ] FROM ] FROM ] FROM	
<	-	>
	Execut	e
Help Cancel Back Next:	Finish	l -

At this step, you see the execution result. The add-in has updated data. Click **Finish** to exit the wizard.

🔋 Data Merge Wizard				?	×
Verify Script Results					
Verify the script results					
Processed 8 total recor	ds				^
					~
Help	Cancel	Back	Next	Finis	sh

#### Save by Merge

The add-in saves the merge configuration. So, later you may use the **Save by Merge** item to have the same results.

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<b>D</b> 2	Save			: G	Table V	/iews 5	i Opt	tions	Help					<b>^</b>
To:	Filter Changed	Rows	►	D	E	F	G	H			J	K		L
SQL	View Save Char	ige SQL												
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# Chapter 18. Permission Management

Managing permissions is an important part in multi-user environment.

Your IT staff manages permissions at the server and database levels. This is their tasks.

As a business user, you may manage permissions related to your applications.

And, the best news, you may do this for SQL Server in Excel using the SaveToDB add-in application.

This application is a good example, also, of what you and your developers may do with the SaveToDB add-in.

#### **SQL Server Management Application**

Create the **permissions** worksheet and run **Data Connection Wizard**. Connect to your database.

At the following step, select SQL Server Management in the Select Query List field,

leave Enable Query List on the ribbon checked, and select Logins.

🧻 Data Connection Wizard			?	×
Select Object				
Select Query List and the object to	connect			
Select Query List:		Enable SaveToDB in	this workbook	
SQL Server Management	$\sim$	Enable Query List on	the ribbon	
All tables, views and procedures SQL Server Management				
Schema 🗸	Name		Туре	$\sim$
management	Database Permis	ssions	code	
management	Logins		code	
management	Object Permissio	ins	code	
management	Principal Permiss	sions	code	
management	Roles		code	
management	Users		code	
Help SQL	Cancel	Back Next	Finish	ı

Click **Finish** and insert a new table at cell B3.

#### Logins

This table allows managing logins, passwords, and usernames. Just change the data and click **Save**.

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1 2 3 4 5 6 7 8 9 10 11	login Alex			<b>•</b>	passwo	ord 💌	usemam Alex	le	*	]						•
•	ж	. ima	ges	integrati	on	permissions	hand	e (	9 : ◄						Þ	
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Usually, business users see the personal login only and cannot change any value.

The Actions menu contains useful actions and helpful links for database administrators.

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4 5 6 7	Alex	A_	Create User Create User Drop User Help	r for Login r from External Pro	ovider	<u>ex</u>		d						
8 9 10 11	6	82 482 482 482 482	Transact-S( Transact-S( Transact-S(	QL Reference - Pe QL Reference - CR OL Reference - AL	rmissions REATE LOGIN TER LOGIN									*
<b>↓</b> Ready	<ul> <li></li> <li></li> <li></li> </ul>	80 80 80	Transact-So Transact-So	QL Reference - DR QL Reference - CR	ROP LOGIN REATE USER	handle	(+		E		-	-	+	100%

#### **Query List**

The ribbon **Query List** allows changing query objects using a single worksheet for multiple tasks:

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Save Save Ta A A 1 2 3 4 5 6 7 8 9	Reload Action	Active Logir Data Login E Obje Prince Roles	e Query: Is base Permissions ns ct Permissions ipal Permissions ;	Table	e View: I I I I I I I I I I I I I I I I I I I		Wizards ( Optic	Diptions ons H	Help Help		J	K	
11													-
•	→   i	images	integration	permissions	handle	(+	) : •						Þ
Ready	<b>H</b>						ł			-	-	+	100%

#### Users

The Users table shows users that you may manage. Usually, business users have no permissions to change.

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Save Ta	Reload Act	ions	tive Que ers Reload	ry: Query List Juery List	Ta	able View: 	vs I	Wizards Options	ons Help				^
A		С		D	E	F	G	Н	1	J	K	L	
1 2 3 4 5 6 7 8 9 10 11	username Alex Lora Nick		<b>•</b>										
•	·	images	inte	gration	permissio	hand	dle (1	) : •					
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#### Roles

This table allows checking and changing user membership in roles. Just set 1 or clear the value in the desired cell.

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	Α	C	:		D		F		G		н	1		J		K		L		
1 2 3 4 5		<b>type</b> database_ sql_user	role	✓ na A	ame lex_Team lex	Ŧ	Alex_Team	<b>~</b>												
6		sql_user		Lo	ora		~													
7		sql_user		N	lick		<ul> <li>Image: A set of the /li></ul>													
8 9 10																				
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#### **Principal Permissions**

This table allows changing principal permissions. Set the **HasAny** value to 1 to see the actual permissions only.

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A	С		D	E		F	G	H	1	J K	L		M
1 2 3 4 5 6 7 8 9	principal_type sql_user sql_user sql_user	2 v p A A A	rincipal 💌 .lex .lex .lex	name Alex_Tean Lora Nick	type databas sql_use sql_use	₹ se_role er	has_any	• • • • • • • • • • • • • • • • • • •		ALTER	CONTRO GRANT GRANT GRANT	<b>v</b>	
10 11	→ ima	ages	integratio	on <b>pern</b>	nissions	hand	le (+)	:	4				•
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#### Database Permissions

Only database administrators may change permissions. Business users must have **CREATE TABLE** permissions.

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A	С		D		E	F	G	н	T.	J	K	L	М	Ν		0			Р	
1 2						_		_	_		_	_	_							
3	principal_type	▼ pri	ncipal 🔄 💌	CONN	ECT 🔻	<b>.</b>	Υ.	Υ.	<b>-</b>	Υ.	<b>-</b>	Υ.	-	Υ.	CREAT	TE TABLI	Υ.	CREA	TE VIE\	<u>v</u> –
4	database_role	Ale	ex_Team																	
5	database_role	pu	blic																	$- \square$
6	sql_user	Ale	2X	GRAN	Т										GRAN	Т				_
7	sql_user	gue	est																	
8	sql_user	Lor	ra	GRAN	Т										GRAN	Т				
9	sql_user	Nic	ck	GRAN	Т										GRAN	Т				
10																				
11																				-
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#### **Object Permissions**

This is a working table for business users. We learn it below. Set **HasAny** to 1 to see the actual permissions only.

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A 🔊	С	D	E	F	G	J	К	L	M	N	
1											
2		_								_	
3	principal_type	👻 principal 👻	schema 💌	name 💌	type 💌	SELECT -	INSERT -	UPDATE -	DELETE	EXECUT	
4	database_role	Alex_Team	dbo69		schema	GRANT	GRANT	GRANT	GRANT	GRANT	
5	database_role	Alex_Team	dbo69	Companies	table	GRANT s	GRANT s	GRANT s	GRANT s	GRANT	1
6	database_role	Alex_Team	dbo69	EventHandlers	table	GRANT s	GRANT s	GRANT s	GRANT s	GRANT	1
7	database_role	Alex_Team	dbo69	Payments	table	GRANT s	GRANT s	GRANT s	GRANT s	GRANT	1
8	database_role	Alex_Team	dbo69	TableFormats	table	GRANT s	GRANT s	GRANT s	GRANT s	GRANT	1
9	sql_user	Alex	dbo69		schema						
10	sql_user	Alex	dbo69	Companies	table						
11	sql_user	Alex	dbo69	EventHandlers	table						Ţ
•	→   inte	gration <b>per</b>	nissions	handlers	÷	: •			1	Þ	]
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The table contains actual permissions for our application:

principal_type 💌	principal 💌	schema 💌	name 🔹	type 💌	SELECT 💌	INSERT 👻	UPDATE 👻	DELETE 👻	EXECUTE 🔻	VIEW DEFINITION	CONTROL 💌
database_role	Alex_Team	dbo69		schema	GRANT	GRANT	GRANT	GRANT	GRANT	GRANT	
database_role	Alex_Team	dbo69	Companies	table	GRANT s	GRANT s					
database_role	Alex_Team	dbo69	EventHandlers	table	GRANT s	GRANT s					
database_role	Alex_Team	dbo69	Payments	table	GRANT s	GRANT s					
database_role	Alex_Team	dbo69	TableFormats	table	GRANT s	GRANT s					
sql_user	Alex	dbo69		schema							GRANT+
sql_user	Alex	dbo69	Companies	table							GRANT+ s
sql_user	Alex	dbo69	EventHandlers	table							GRANT+ s
sql_user	Alex	dbo69	Payments	table							GRANT+ s
sql_user	Alex	dbo69	TableFormats	table							GRANT+ s
sql_user	Lora	dbo69		schema	GRANT r	GRANT r					
sql_user	Lora	dbo69	Companies	table	GRANT sr	GRANT sr					
sql_user	Lora	dbo69	EventHandlers	table	GRANT sr	GRANT sr					
sql_user	Lora	dbo69	Payments	table	GRANT sr	GRANT sr					
sql_user	Lora	dbo69	TableFormats	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69		schema	GRANT r	GRANT r					
sql_user	Nick	dbo69	Companies	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69	EventHandlers	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69	Payments	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69	TableFormats	table	GRANT sr	GRANT sr					

Suffix legend: s – by parent schema, r – by parent role, sr – by parent schema and role, + - WITH GRANT OPTION

We see the following data under Alex's credentials:

- The database contains the Alex\_Team role and users: Alex, Lora, and Nick.
- The database contains the dbo69 schema and tables: Companies, EventHandlers, Payments, TableFormats.
- Alex has the CONTROL permission WITH GRANT OPTION on the dbo69 schema and schema tables.
- Alex\_Team and its members have read and write permissions on the dbo69 schema and schema tables.

You may change permissions using first letters: **G** – GRANT, **D** – DENY, **R** – REVOKE

In the following example, Alex denies the INSERT permission for the EventHandlers table directly, and the UPDATE and DELETE permission indirectly, using the role level.

principal_type 💌	principal 💌	schema 💌	name 💌	type 💌	SELECT 💌	INSERT 💌	UPDATE 🔻	DELETE	EXECUTE 💌	VIEW DEFINITION	CONTROL 🔽
database_role	Alex_Team	dbo69		schema	GRANT	GRANT	GRANT	GRANT	GRANT	GRANT	
database_role	Alex_Team	dbo69	Companies	table	GRANT s	GRANT s					
database_role	Alex_Team	dbo69	EventHandlers	table	GRANT s	GRANT s	DENY	DENY	GRANT s	GRANT s	
database_role	Alex_Team	dbo69	Payments	table	GRANT s	GRANT s					
database_role	Alex_Team	dbo69	TableFormats	table	GRANT s	GRANT s					
sql_user	Alex	dbo69		schema							GRANT+
sql_user	Alex	dbo69	Companies	table							GRANT+ s
sql_user	Alex	dbo69	EventHandlers	table							GRANT+ s
sql_user	Alex	dbo69	Payments	table							GRANT+ s
sql_user	Alex	dbo69	TableFormats	table							GRANT+ s
sql_user	Lora	dbo69		schema	GRANT r	GRANT r					
sql_user	Lora	dbo69	Companies	table	GRANT sr	GRANT sr					
sql_user	Lora	dbo69	EventHandlers	table	GRANT sr	DENY	DENY r	DENY r	GRANT sr	GRANT sr	
sql_user	Lora	dbo69	Payments	table	GRANT sr	GRANT sr					
sql_user	Lora	dbo69	TableFormats	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69		schema	GRANT r	GRANT r					
sql_user	Nick	dbo69	Companies	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69	EventHandlers	table	GRANT sr	DENY	DENY r	DENY r	GRANT sr	GRANT sr	
sql_user	Nick	dbo69	Payments	table	GRANT sr	GRANT sr					
sql_user	Nick	dbo69	TableFormats	table	GRANT sr	GRANT sr					

In any case, if you have this task, you will find this app user-friendly and learn required actions quickly.

Do not afraid and go ahead.

# Conclusion

We have created an Excel application with cool professional features and learned steps that you may repeat:

- 1. Publish tables to a database
- 2. Configure query parameters
- 3. Configure formats and table views
- 4. Configure validation lists
- 5. Add cursors and form fields
- 6. Configure detail tables, windows, and task panes
- 7. Configure context and action menus
- 8. Add image URLs
- 9. Configure LastModified and UserName fields
- 10. Integrate with other applications
- 11. Manage permissions

You may do these steps with no SQL and VBA. We have configured the application using wizards and handlers:

ID .	TABLE_SCHEMA 🔻	TABLE_NAME	COLUMN_NAME 🔻	EVENT_NAME	HANDLER_SCHEMA 💌	HANDLER_NAME	HANDLER_TYPE	HANDLER_CODE	TARGET_WORKSHEET	
	1 dbo69	Payments	Account	ValidationList	dbo69	Accounts	VALUES	My Bank		
	2 dbo69	Payments	Item	ValidationList	dbo69	Items	VALUES	Revenue, Expenses, Payroll, Taxes		
	3 dbo69	Payments	Company	ValidationList	dbo69	Companies	TABLE	Company		
	4 dbo69	Payments		SelectionChange	dbo69	Payments	TABLE		_TaskPane _Transpose	
	5 dbo69	Payments	Company	ContextMenu	dbo69	Payments	TABLE	+Date,+Sum,Account,@Company,I	tem,Comment	
	6 dbo69	Payments	Item	ContextMenu	dbo69	Payments	TABLE	+Date,+Sum,Account,Company,@Item,Comment		
	7 dbo69	EventHandlers		Actions	dbo69	Instruction	нттр	https://www.savetodb.com/savet	odb/configuring-event-ha	
	8 dbo69	Companies	LastModified	FormulaValue				=NOW()		
	9 dbo69	Companies	UserName	FormulaValue				=UserName()		
1	0 dbo69	Companies	LastModified	DoNotChange						
1	1 dbo69	Companies	UserName	DoNotChange						

Of course, database and VBA developers may do much more. You may recommend them my e-books:

- Excel Applications. 10 Steps for Database Developers
- Excel Applications. 10 Steps for VBA Developers

Hope you will like the SaveToDB add-in as I am and will use the SaveToDB tab every day.

⊟ •৲• ৫• ∓							F		×				
File	Hon	ne	Insert	Page Layout	Formulas	Data	View	SaveTo	DB	♀ Tell me		R	. Share
Save	Reload	Activ	ve Query: Reload Que	ry List	Table View:	•	Wizards	Options •	file Help				
Table D	)ata 🕞		Query	List 5	Table Vi	ews 🖓	Opt	ions	Help				~

You may download the SaveToDB add-in at <u>www.savetodb.com</u> and use the SaveToDB Express edition for free.

I would appreciate your feedback. Feel free to contact me at <u>11-steps@savetodb.com</u>.

Cool applications for you and your team!

Sergey Vaselenko

# About the Author



My name is Sergey Vaselenko.

I am from Russia, Moscow.

My passion is creating software.

I am a founder and CEO of Gartle Technology Corporation and a leading developer of the SaveToDB add-in.

You are welcome to contact me at www.facebook.com/sergey.vaselenko www.linkedin.com/in/vaselenko/