

Data Analytics in Action

Mr. Tissana Tanaklang

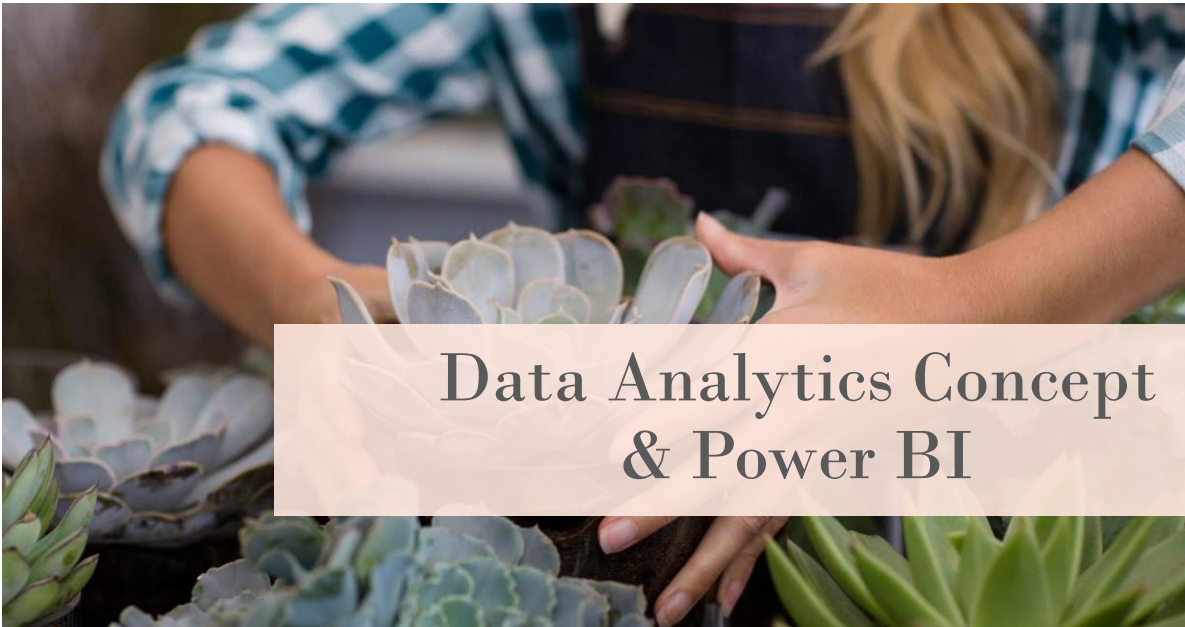
1



Agenda

- Data Analytics Concept & Power BI
- Dashboard Design Principle & Data Storytelling
- Business Dashboard Concept

2



3

What is data?

Structured

Customer				
ID	FirstName	LastName	Email	Address
1	Joe	Jones	joe@litware.com	1 Main St.
2	Samir	Nadoy	samir@northwind.com	123 Elm Pl.

Product		
ID	Name	Price
123	Hammer	2.99
162	Screwdriver	3.49
201	Wrench	4.25

Semi-structured

```
{
  "firstName": "Joe",
  "lastName": "Jones",
  "address": {
    "streetAddress": "1 Main
    St.",
    "city": "New York",
    "state": "NY",
    "postalCode": "10099"
  },
  "contact": {
    {
      "type": "home",
      "number": "555 123-
      4567"
    },
    {
      "type": "email",
      "address":
      "joe@litware.com"
    }
  ]
}
```

Unstructured

Dear Joe,

Thank you for ordering your hardware supplies from our online store (order number 1000) on 1/1/2022.

Your order has been shipped and should arrive in 3-5 business days.

Contoso Hardware

Our products are of the highest quality and used by professionals.

We have amazing screwdrivers, that are really useful for tightening and loosening screws.

We also have wrenches (or, if you prefer, spanners)...

4

How is data stored?

Delimited Text

```
FirstName, LastName, Email
Joe, Jones, joe@litware.com
Samir, Nadoy, samir@northwind.com
```

JavaScript Object Notation (JSON)

```
{
  "customers": [
    { "firstName": "Joe", "lastName": "Jones" },
    { "firstName": "Samir", "lastName": "Nadoy" }
  ]
}
```

Extensible Markup Language (XML)

```
<Customer firstName="Joe" lastName="Jones"/>
```

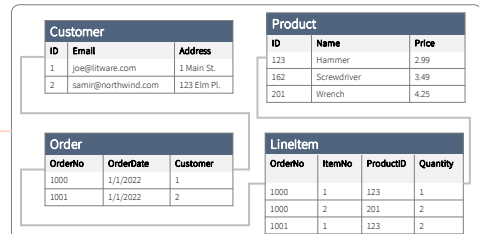
Binary Large Object (BLOB)

```
10110101101010110010...
```

Optimized formats:

- Avro, ORC, Parquet

Relational



Non-Relational

Products

Key	Value
123	"Hammer (\$2.99)"
162	"Screwdriver (\$3.49)"
201	"Wrench (\$4.25)"

Key-Value

Customers

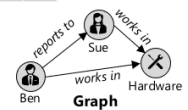
Key	Document
1	{ "name": "Joe Jones" }
2	{ "name": "Samir Nadoy" }

Document

Orders

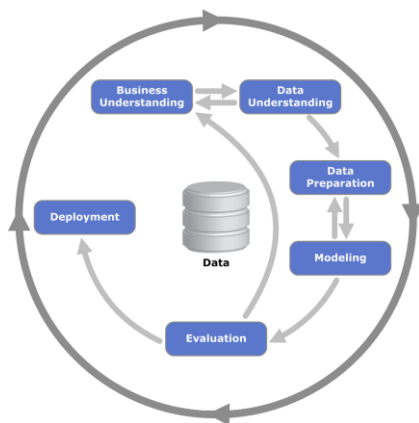
Key	Customer	Product
1000	Joe Jones	1 Main St. Hammer
1001	Samir Nadoy	123 Elm Pl. Wrench

Column Family



5

Data Analytics Lifecycle



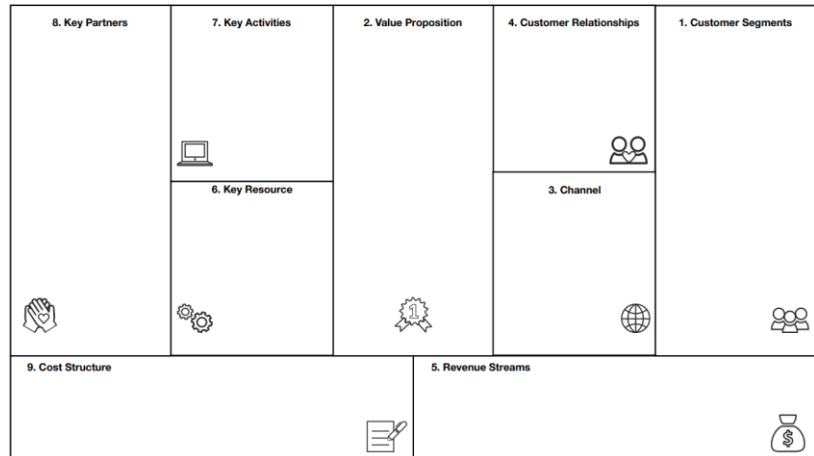
CRISP-DM (Cross-industry standard process for data mining)

https://en.wikipedia.org/wiki/Cross-industry_standard_process_for_data_mining#/media/File:CRISP-DM_Process_Diagram.png

6

Business Understanding

- Identify business pain points
- Define key business questions
- Choose key business areas of interest

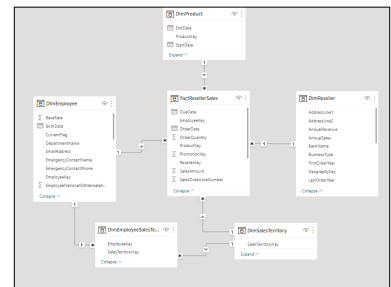


<https://www.sub-brain.com/business/business-model-canvas-sbc/>

7

Data Understanding

- Identify data sources
- Understand limitation of each source
- Understand data relationships



8

Data Preparation

- Data layout design
- Formatting data
- Validating and cleansing data
- Aggregating data

	SalesOrderNumber	SalesOrderLineNumber	OrderDate	ShipDate	ShipDate	ProductKey
1	50716891	2	6/1/2020	6/12/2020	6/12/2020	434
2	50716891	4	6/1/2020	6/12/2020	6/12/2020	232
3	5071774	1	6/1/2020	6/12/2020	6/12/2020	434
4	5071774	2	6/1/2020	6/12/2020	6/12/2020	434
5	5071775	1	6/1/2020	6/12/2020	6/12/2020	878
6	5071775	2	6/1/2020	6/12/2020	6/12/2020	893
7	5071775	3	6/1/2020	6/12/2020	6/12/2020	430
8	5071776	1	6/2/2020	6/12/2020	6/12/2020	534
9	5071777	1	6/2/2020	6/12/2020	6/12/2020	408
10	5071777	2	6/2/2020	6/12/2020	6/12/2020	434
11	5071778	1	6/2/2020	6/12/2020	6/12/2020	467
12	5071778	2	6/2/2020	6/12/2020	6/12/2020	595
13	5071778	3	6/2/2020	6/12/2020	6/12/2020	554
14	5071778	4	6/2/2020	6/12/2020	6/12/2020	497
15	5071779	1	6/2/2020	6/12/2020	6/12/2020	589
16	5071779	2	6/2/2020	6/12/2020	6/12/2020	543
17						

<https://www.sub-brain.com/business/business-model-canvas-sbc/>

9

Modeling

- explores data to learn about relationships between variables and subsequently.
- selects key variables and the most suitable models.
- develop data sets for training, testing, and production purposes.
- builds and executes models based on the work done in the model planning phase.



<https://www.geeksforgeeks.org/>

10

From data to business insights with Power BI



<https://learn.microsoft.com/>

11

Different types of analysis

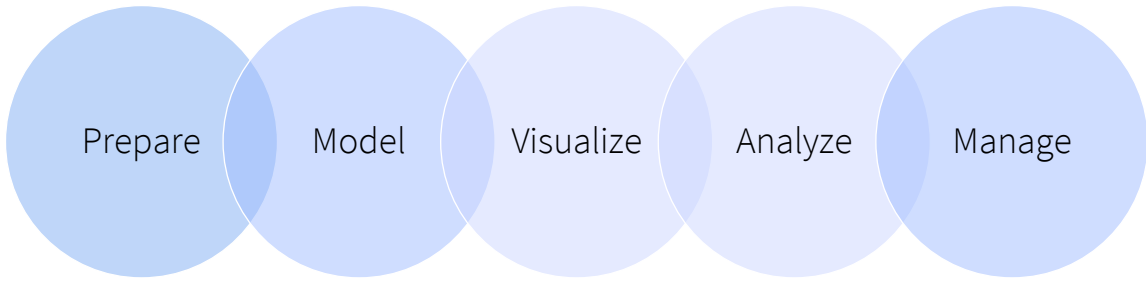
Data analysis is another form of storytelling with five categories:

- **Descriptive**: Summarize past data
- **Diagnostic**: Explain past data
- **Predictive**: Forecast future data
- **Prescriptive**: Optimize future data
- **Cognitive**: Learn from data

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12

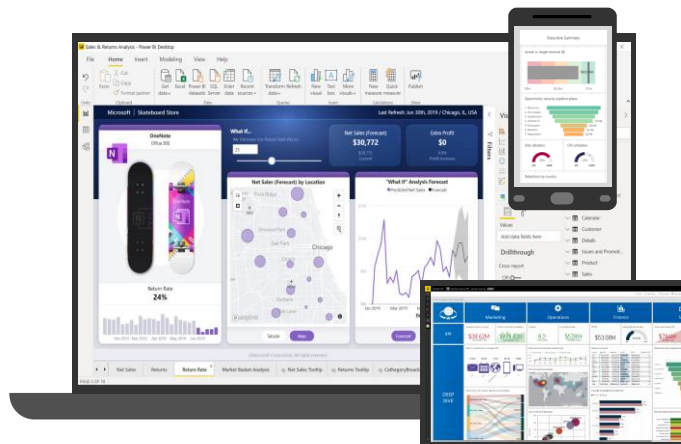
Tasks of a Data Analyst



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13

Microsoft Power BI



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14

The flow of Power BI

Data sources

Power BI Desktop

Power BI service & Mobile

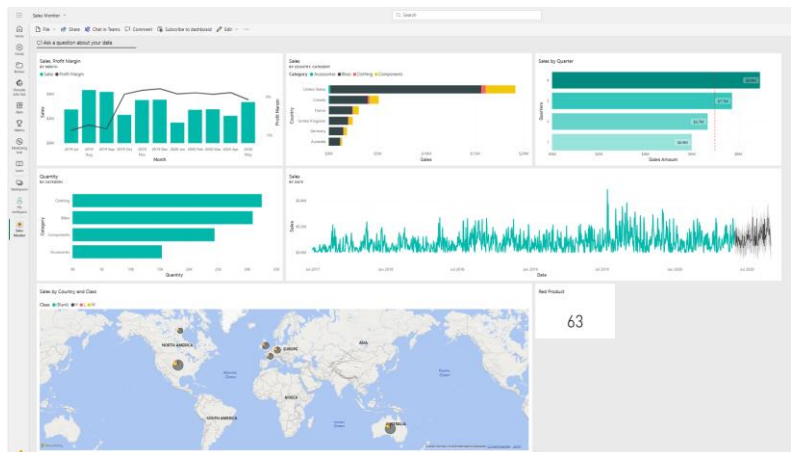


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15

Power BI service

- Single-page dashboards can be derived from reports in the service.

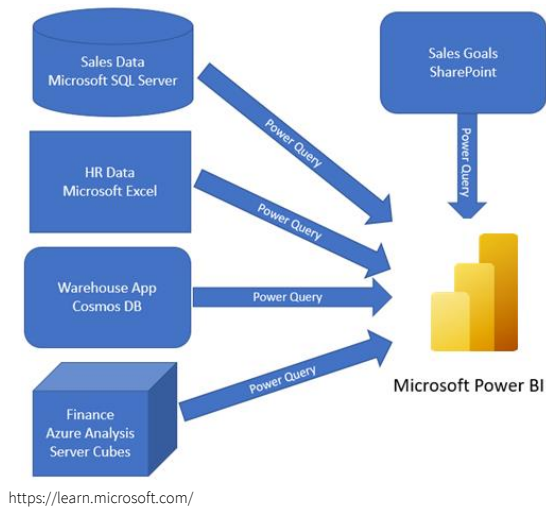


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16

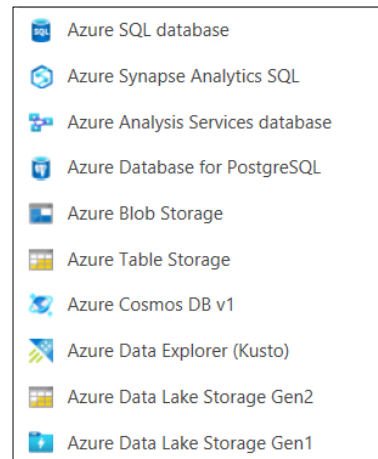
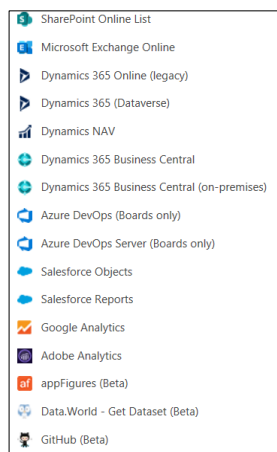
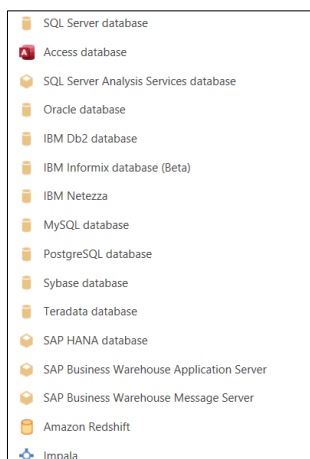
Get data in Power BI

- Combine all data into a single dataset



17

Data Source



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18

Select a storage mode

Storage mode affects

- Available transformations
- Report performance

*Not all sources support all modes *

SQL Server database

Server ⓘ

localhost

Database (optional)

AdventureWorksDW

Data Connectivity mode ⓘ

☐ Import

☒ DirectQuery

▸ Advanced options

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19

Implications of using DirectQuery

Benefits

- Frequently changing data
- Need near real-time
- Large data volumes
- Multi-dimensional data

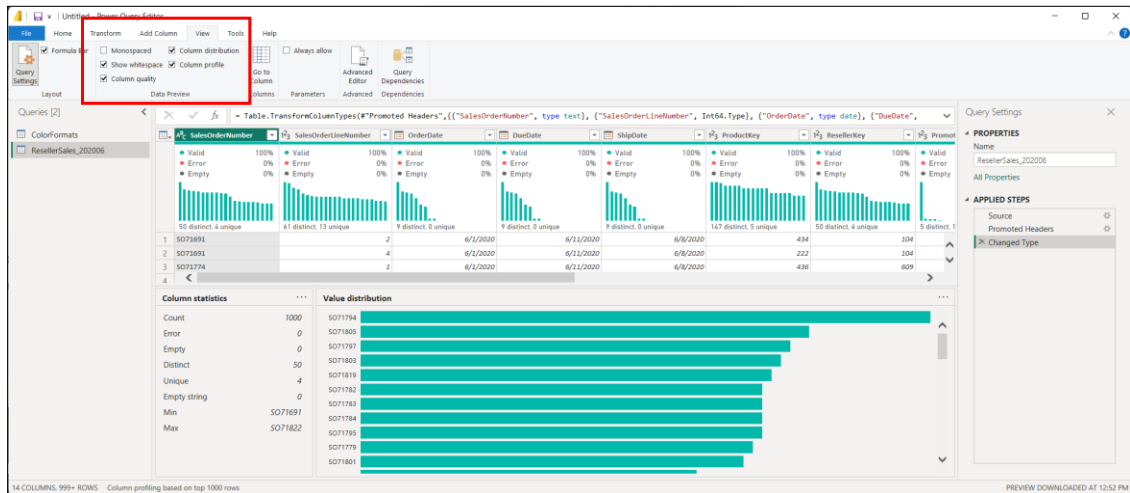
Limitations

- Dependent on data source performance
- Security between source and destination
- Limited modeling capabilities
- Limited transformation features

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20

Data profiling options in Power Query Editor

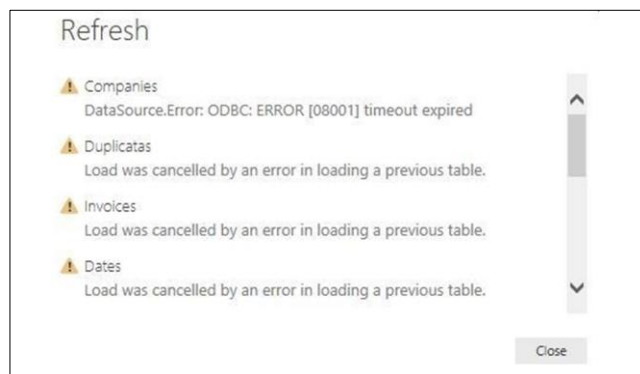


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21

Data import errors

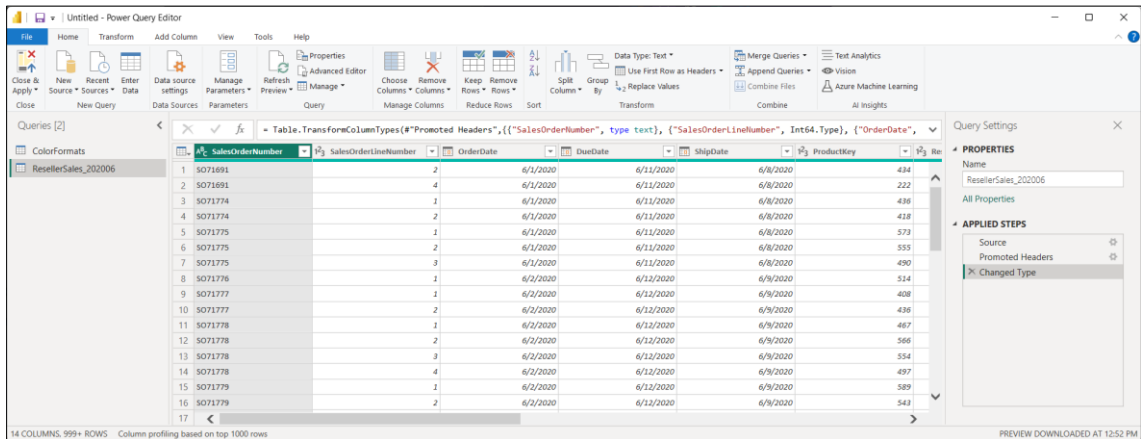
- Query Timeout
- Couldn't find data formatted as a table
- Could not find file
- Data type errors



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22

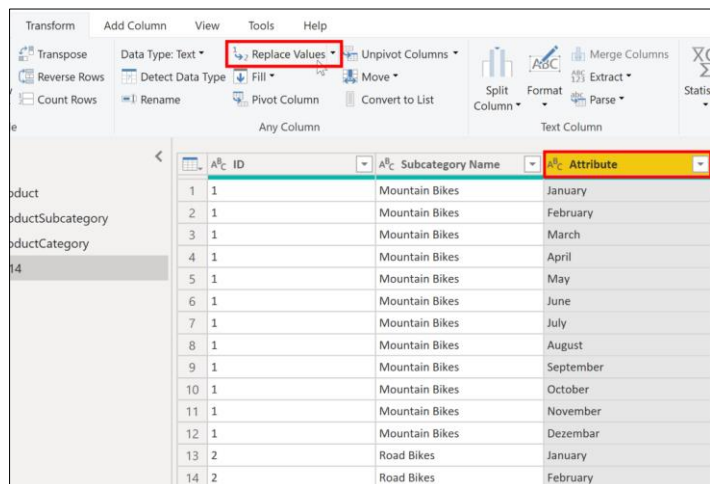
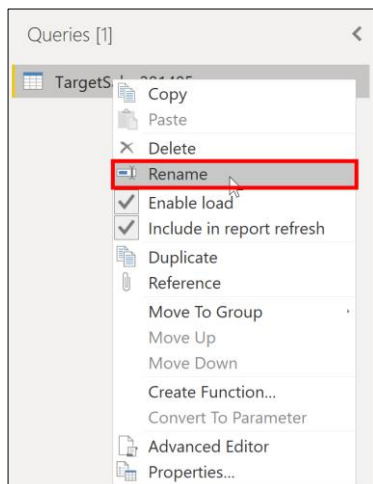
Transform data with Power Query Editor



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23

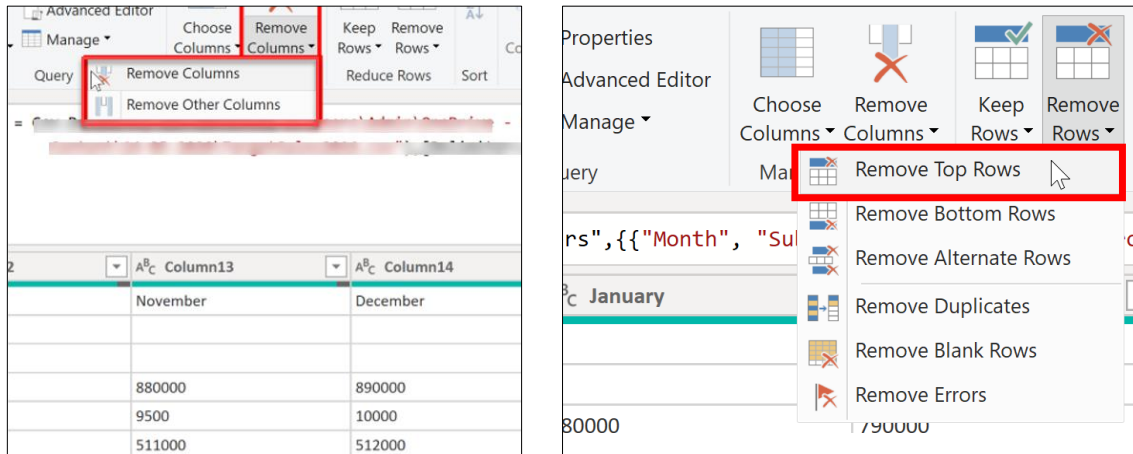
Choose user-friendly values



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24

Shaping table structure

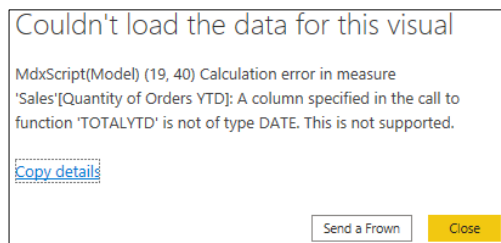


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25

Evaluate and change column data types

ABC SalesOrderNumber	ABC OrderDate	ABC TotalCost
SO43659	7/1/2017	2024.99
SO43659	7/1/2017	6074.97
SO43659	7/1/2017	2024.99
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	4079.98
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	86.52
SO43659	7/1/2017	28.84
SO43659	7/1/2017	34.2



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26

Combine multiple queries into one

Append

Concatenate rows from three or more tables into a single table.

☐ Two tables ☒ Three or more tables

Available tables

- Production Suppliers
- Sales Customers
- HR Employees

Tables to append

- Production Suppliers
- Sales Customers
- HR Employees

Add >>

OK

Merge

Select a table and matching columns to create a merged table.

Sales Orders

orderid	custid	empid	orderdate	requireddate	shipdate	shipperid	freight	shipname
10248	85	5	7/4/2014	8/2/2014	7/16/2014	3	32.38	Ship to 85-B
10249	79	6	7/5/2014	8/16/2014	7/16/2014	1	11.62	Ship to 79-C
10250	34	4	7/8/2014	8/7/2014	7/12/2014	2	65.83	Destination SQD
10251	84	3	7/8/2014	8/7/2014	7/15/2014	1	41.34	Ship to 84-A

Sales OrderDetails

orderid	productid	unitprice	qty	discount
10248	11	14.00	12	0
10248	42	9.80	10	0
10248	72	34.80	5	0
10249	14	18.60	9	0
10249	51	42.40	40	0

Join Kind

Left Outer (all from first, matching from second)

☐ Use fuzzy matching to perform the merge

Fuzzy matching options

The selection matches 830 of 830 rows from the first table.

OK Cancel

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27

Unpivot or pivot columns

Year	EmployeeID	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12
2017	61161660	-	-	-	-	-	200	400	600	400	800	800	
2017	90836195	-	-	-	-	-	100	200	300	400	400	500	
2017	112432117	-	-	-	-	-	500	1500	1000	1000	2200	1750	
2017	139397894	-	-	-	-	-	100	200	300	300	300	500	
2017	191644724	-	-	-	-	-	100	450	500	200	750	750	
2017	234474252	-	-	-	-	-	100	200	300	300	300	300	
2017	399771412	-	-	-	-	-	100	200	300	300	300	300	
2017	502097814	-	-	-	-	-	500	1500	1000	1000	2200	1750	
2017	615389812	-	-	-	-	-	100	100	100	100	200	200	
2017	716374314	-	-	-	-	-	100	200	300	100	300	500	
2017	841560125	-	-	-	-	-	100	500	400	400	1000	1000	
2017	987554265	-	-	-	-	-	100	200	300	400	400	500	
2018	61161660	200	500	1000	200	750	1250	700	1250	1750	600	1000	1750
2018	90836195	100	200	300	100	500	400	300	200	250	250	350	350
2018	112432117	650	1750	1500	750	2000	1500	1850	3200	2850	1700	3000	2000
2018	134219713	-	-	-	-	-	75	150	250	50	150	50	
2018	139397894	100	200	300	200	400	500	500	500	500	500	500	500
2018	191644724	100	500	500	200	750	400	800	1200	800	800	800	800
2018	234474252	150	175	200	225	200	225	500	500	500	500	500	500

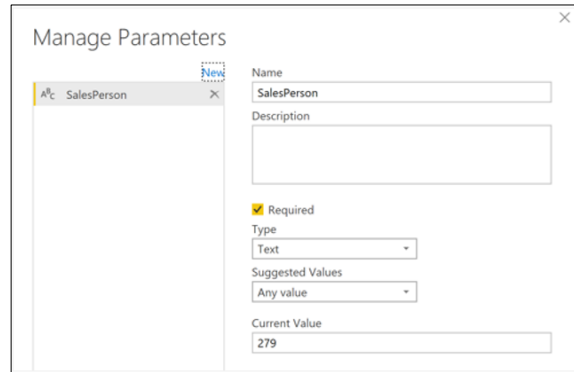
	Yr	Year	EmployeeID	Attribute	Value
1	2017	61161660	M07	200	
2	2017	61161660	M08	400	
3	2017	61161660	M09	600	
4	2017	61161660	M10	400	
5	2017	61161660	M11	800	
6	2017	61161660	M12	800	
7	2017	90836195	M07	100	
8	2017	90836195	M08	200	
9	2017	90836195	M09	300	
10	2017	90836195	M10	400	
11	2017	90836195	M11	400	
12	2017	90836195	M12	500	
13	2017	112432117	M07	650	
14	2017	112432117	M08	1500	
15	2017	112432117	M09	1000	
16	2017	112432117	M10	1000	
17	2017	112432117	M11	2200	
18	2017	112432117	M12	1750	
19	2017	139397894	M07	100	
20	2017	139397894	M08	200	
21	2017	139397894	M09	300	

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28

Performance recommendations

- Only keep necessary data
- Check data types
- Reduce cardinality
- Disable query load
- Use parameters

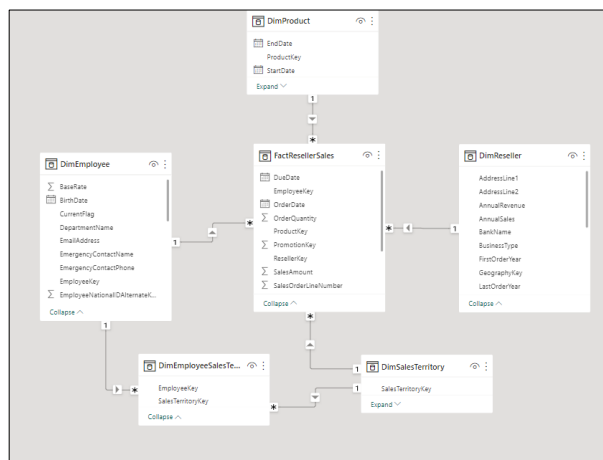


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29

Model data with Power BI Desktop

- Data types
- Star schema
- Create relationships
- Edit relationships
- Create hierarchies



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30

Relational tables

- Data is stored in tables
- Tables consists of rows and columns
- All rows have the same columns
- Each column is assigned a datatype

Customer						
ID	FirstName	MiddleName	LastName	Email	Address	City
1	Joe	David	Jones	joe@litware.com	1 Main St.	Seattle
2	Samir		Nadoy	samir@northwind.com	123 Elm Pl.	New York

Product		
ID	Name	Price
123	Hammer	2.99
162	Screwdriver	3.49
201	Wrench	4.25

Order		
OrderNo	OrderDate	Customer
1000	1/1/2022	1
1001	1/1/2022	2

Linitem			
OrderNo	ItemNo	ProductID	Quantity
1000	1	123	1
1000	2	201	2
1001	1	123	2

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31

Normalization

Sales Data				
OrderNo	OrderDate	Customer	Product	Quantity
1000	1/1/2022	Joe Jones, 1 Main St, Seattle	Hammer (\$2.99)	1
1000	1/1/2022	Joe Jones- 1 Main St, Seattle	Screwdriver (\$3.49)	2
1001	1/1/2022	Samir Nadoy, 123 Elm Pl, New York	Hammer (\$2.99)	2
...



Customer				
ID	FirstName	LastName	Address	City
1	Joe	Jones	1 Main St.	Seattle
2	Samir	Nadoy	123 Elm Pl.	New York

Product		
ID	Name	Price
123	Hammer	2.99
162	Screwdriver	3.49
201	Wrench	4.25

Order		
OrderNo	OrderDate	Customer
1000	1/1/2022	1
1001	1/1/2022	2

Linitem			
OrderNo	ItemNo	ProductID	Quantity
1000	1	123	1
1000	2	201	2
1001	1	123	2

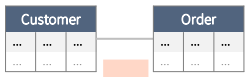
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32

Other common database objects

Views

```
CREATE VIEW Deliveries
AS
SELECT o.OrderNo, o.OrderDate,
       c.Address, c.City
FROM Order AS o JOIN Customer AS c
ON o.Customer = c.ID;
```



The diagram shows two tables, 'Customer' and 'Order', with an arrow pointing to a 'Deliveries' view. The 'Deliveries' view contains the following data:

OrderNo	OrderDate	Address	City
1000	1/1/2022	1 Main St.	Seattle
1001	1/1/2022	123 Elm Pl.	New York

Stored Procedures

```
CREATE PROCEDURE RenameProduct
    @ProductID INT,
    @NewName VARCHAR(20)
AS
UPDATE Product
SET Name = @NewName
WHERE ID = @ProductID;
...
EXEC RenameProduct 201, 'Spanner';
```

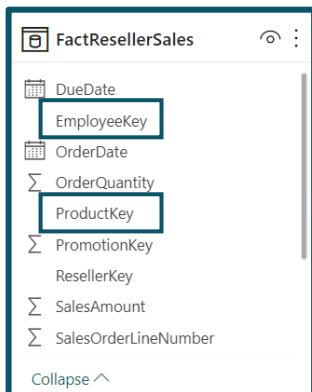
ID	Name	Price
201	Wrench Spanner	4.25

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33

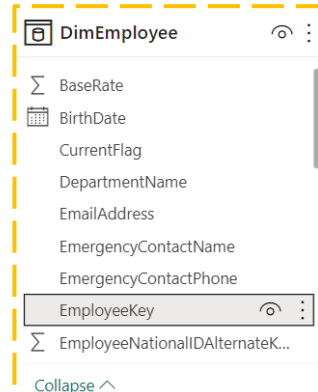
Data table types

Fact tables are activities or events.



The screenshot shows the 'FactResellerSales' table with the following columns: DueDate, EmployeeKey, OrderDate, OrderQuantity, ProductKey, PromotionKey, ResellerKey, SalesAmount, and SalesOrderLineNumber. The 'EmployeeKey' and 'ProductKey' columns are highlighted with red boxes, indicating they are foreign keys.

Dimension tables provide the details.

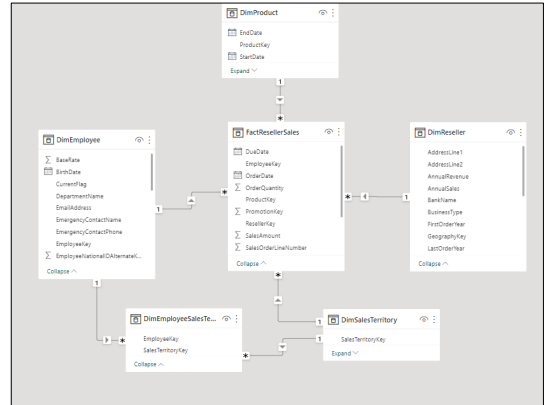
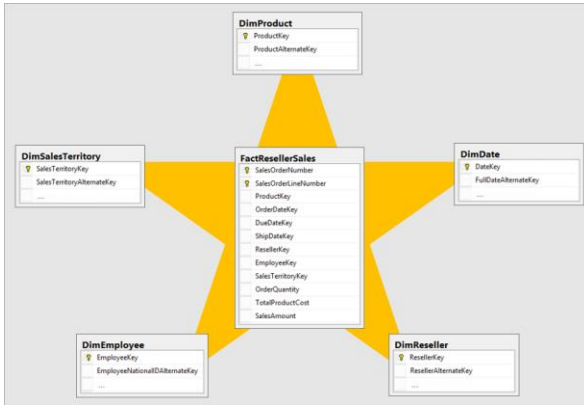


The screenshot shows the 'DimEmployee' table with the following columns: BaseRate, BirthDate, CurrentFlag, DepartmentName, EmailAddress, EmergencyContactName, EmergencyContactPhone, EmployeeKey, and EmployeeNationalIDAlternateK... The 'EmployeeKey' column is highlighted with a red box, indicating it is a primary key.

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34

Understand star schemas



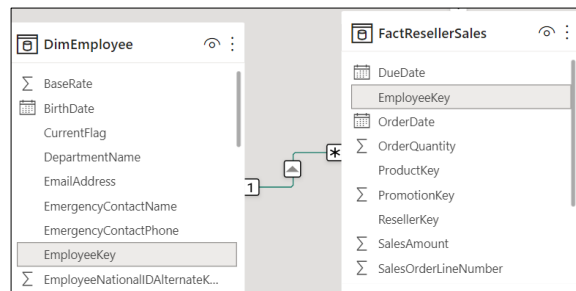
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35

Create relationships

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	DimEmployeeSalesTerritory (EmployeeKey)	DimEmployee (EmployeeKey)
<input checked="" type="checkbox"/>	DimEmployeeSalesTerritory (SalesTerritoryKey)	DimSalesTerritory (SalesTerritoryKey)
<input checked="" type="checkbox"/>	FactResellerSales (EmployeeKey)	DimEmployee (EmployeeKey)
<input checked="" type="checkbox"/>	FactResellerSales (ProductKey)	DimProduct (ProductKey)
<input checked="" type="checkbox"/>	FactResellerSales (ResellerKey)	DimReseller (ResellerKey)
<input checked="" type="checkbox"/>	FactResellerSales (SalesTerritoryKey)	DimSalesTerritory (SalesTerritoryKey)

Buttons: New..., Autodetect..., Edit..., Delete, Close



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36

Edit relationships

Edit relationship

Select tables and columns that are related.

FactResellerSales

DueDate	ShipDate	ProductKey	ResellerKey	PromotionKey	EmployeeKey	SalesAmount
Monday, September 4, 2017	Friday, September 1, 2017	235	312	1	282	282
Monday, September 4, 2017	Friday, September 1, 2017	351	312	1	282	282
Monday, September 4, 2017	Friday, September 1, 2017	348	312	1	282	282

DimEmployee

EmployeeKey	ParentEmployeeKey	EmployeeNationalIDAlternateKey	ParentEmployeeNationalIDAlternateKey
12	189	912265825	33237992
17	189	132674823	33237992
24	201	835460180	332349500

Cardinality: Many to one (*:1)

Cross filter direction: Single

☒ Make this relationship active

☐ Assume referential integrity

☐ Apply security filter in both directions

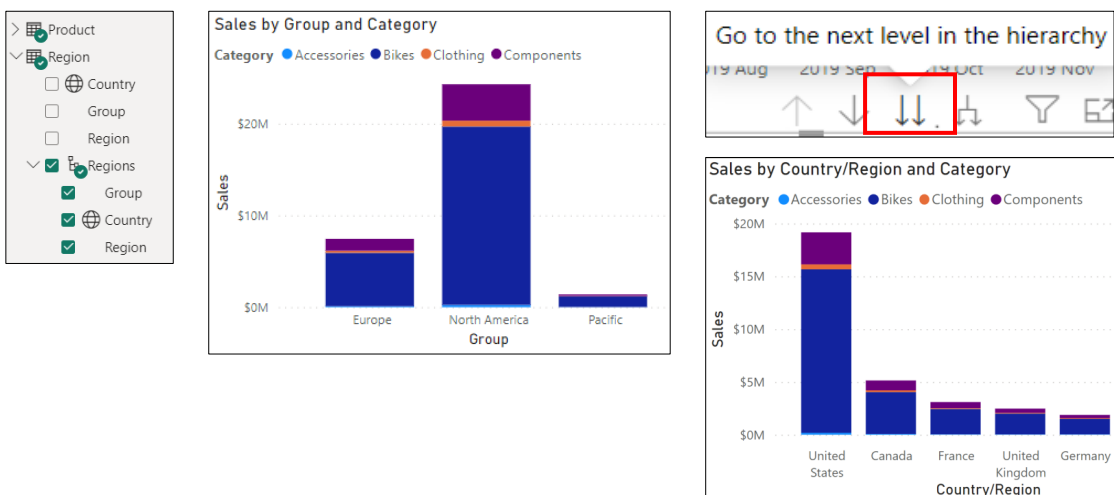
Diagram: DimEmployee (1) to FactResellerSales (*)

Cross filter direction: Single

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37

How to use hierarchies for data fields

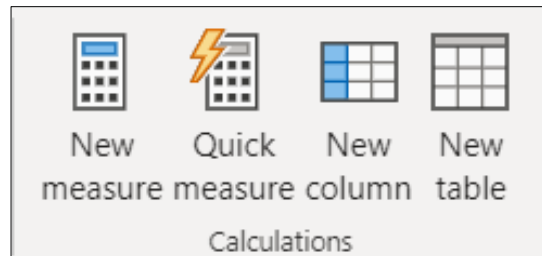


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38

What is DAX?

- Data Analysis Expressions
- Library of functions and operators
- Build formulas and expressions
- Create calculated measures, columns, and tables

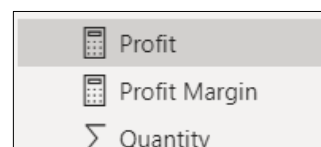
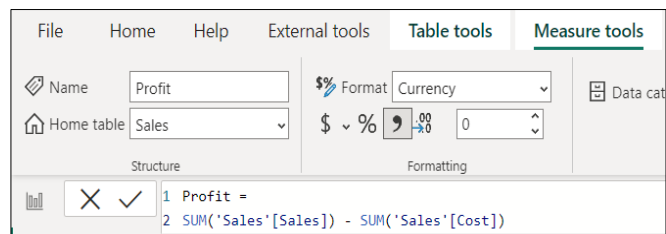


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39

Create calculated measures

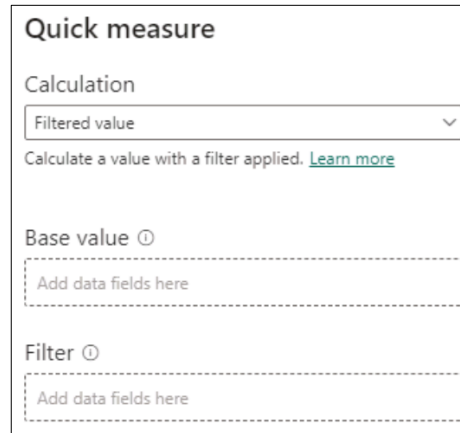
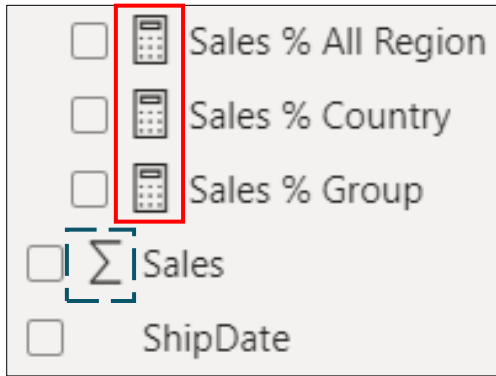
- Defined with DAX definitions
- Computed on the fly.
- Not stored in data model.
- Responsive to interactions.
- Indicated by calculator icon.



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40

Quick measures

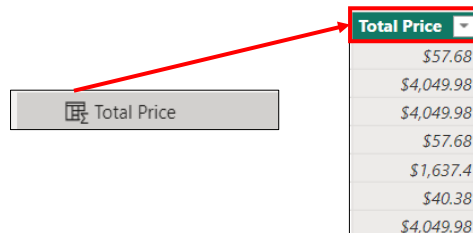
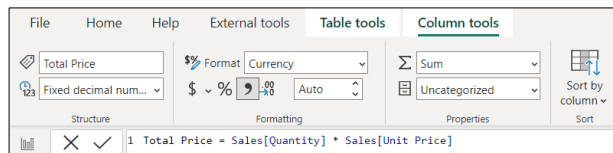


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41

Create calculated columns

- Defined using DAX expressions.
- Computed & stored in data model.
- Useful “helper/connector columns.”
- Recalculated during data refresh.
- Table and Sigma icon.

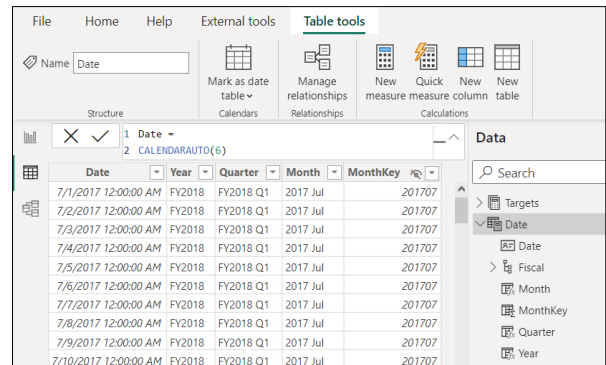


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42

Create calculated tables

- Defined using DAX expressions.
- Computed & stored in data model.
- Useful for aggregating data or creating custom tables.
- Table and calculator icon.



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43

DAX Data Types

- Whole Number (Integer)
- Decimal Number (Float)
- Currency (Currency), a fixed decimal number internally stored as an integer
- Date (DateTime)
- Boolean (TRUE/FALSE)
- Text (String)
- Binary large object (BLOB)

44

DAX operators

Operator Type	Symbol	Use	Example
Parenthesis	()	Precedence order and grouping of arguments	(5 + 2) * 3
Arithmetic	+ - * /	Addition Subtraction/negation Multiplication Division	4 + 2 5 - 3 4 * 2 4 / 2
Comparison	= <> > >= < <=	Equal to Not equal to Greater than Greater than or equal to Less than Less than or equal to	[CountryRegion] = "USA" [CountryRegion] <> "USA" [Quantity] > 0 [Quantity] >= 100 [Quantity] < 0 [Quantity] <= 100
Text concatenation	&	Concatenation of strings	"Value is " & [Amount]
Logical	&& 	AND condition between two Boolean expressions OR condition between two Boolean expressions	[CountryRegion] = "USA" && [Quantity]>0 [CountryRegion] = "USA" [Quantity] > 0

45

dax.guide

All products

Any attribute

A-Z Groups Search

FUNCTIONS

ABS

ACCRINT

ACCRINTM

ACOS

ACOSH

ACOT

ACOTH

ADDCOLUMNS

ADDMISSINGITEMS

ALL

ALLCROSSFILTERED

The DAX language

The DAX language was created specifically for the handling of data models, through the use of formulas and expressions. DAX is used in several Microsoft Products such as Microsoft Power BI, Microsoft Analysis Services and Microsoft Power Pivot for Excel. These products all share the same internal engine, called Tabular.

Functions

Browse DAX functions alphabetically from the sidebar or choose a category below:

Aggregation functions

Aggregation functions return a scalar value applying an aggregation function to a column or to an expression evaluated by iterating a table expression.

Date and Time functions

Date and time functions help creating calculations based on dates and time. Many of the functions in DAX are similar to the

Information functions

Information functions provide information about data type or filter context of the argument provided.

Logical functions

Logical functions act upon an expression to return information about the values or sets in the expression.

Relationships management functions

These functions manage and manipulate relationships between tables.

Statistical functions

Statistical aggregation functions.

Table manipulation functions

These functions manipulate and return tables.

46

Common DAX functions

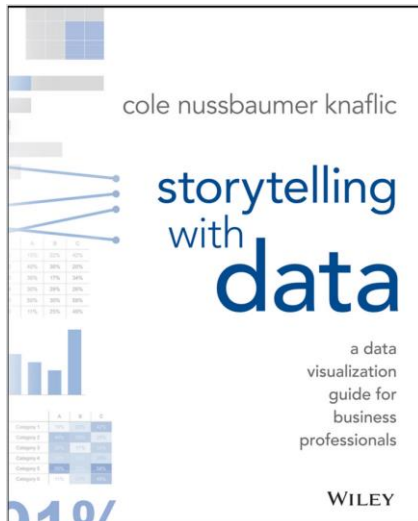
- Aggregate functions
- Logical functions
- Information functions
- Mathematical functions
- Text functions
- Conversion functions
- Date and time functions
- Relational functions

47



48

Reference Resource



49

choosing an effective visual

\$8,658,484	\$8,650,000	\$8,484	0.10%
Sales	Target	Variance	Variance Margin








- Simple text

91%

50

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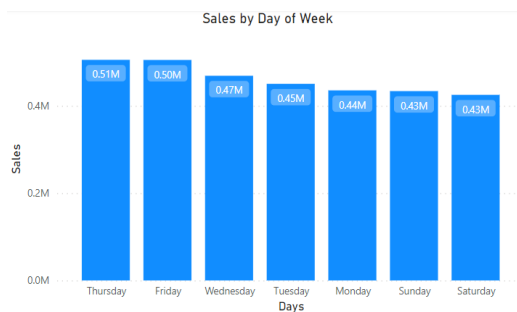
- Table

Subcategory	Color	Quantity	Sales	Profit Margin
Mountain Bikes	Black	12,371	\$14,219,696	6.13% 
Mountain Bikes	Silver	10,083	\$11,660,457	5.91% 
Road Bikes	Black	13,908	\$9,625,464	-3.36% 
Road Bikes	Red	15,310	\$12,116,381	-3.01% 
Road Bikes	Yellow	8,960	\$6,940,054	-5.25% 
Touring Bikes	Blue	6,415	\$5,593,085	-5.58% 
Touring Bikes	Yellow	4,833	\$3,913,896	-16.17% 
Total		71,880	\$64,069,033	-0.68%

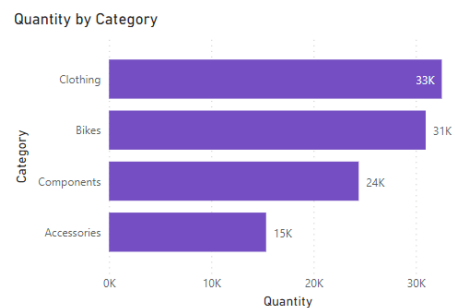
<https://learn.microsoft.com/>

51

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Vertical bar



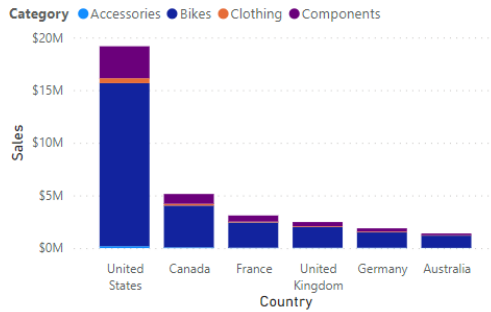
Horizontal bar

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52

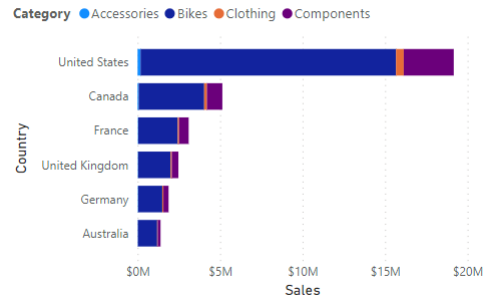
choosing an effective visual

Sales by Country and Category



Stacked vertical bar

Sales by Country and Category

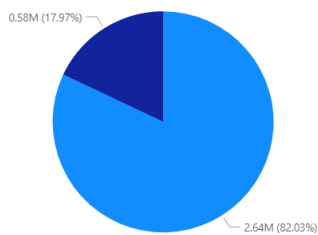


Stacked horizontal bar

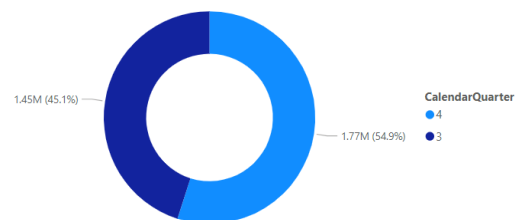
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53

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Pie



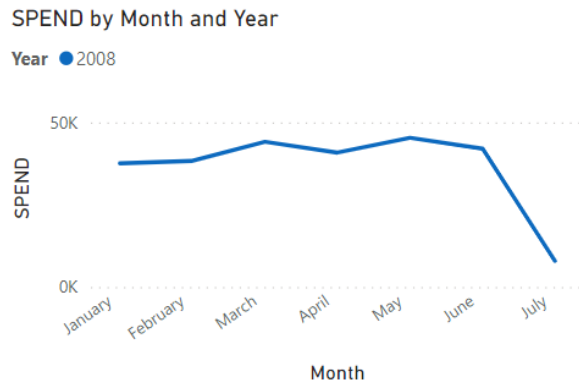
Donut

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54

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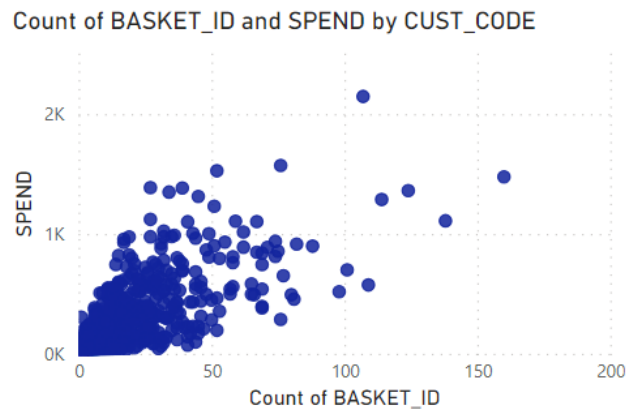
- Line



55

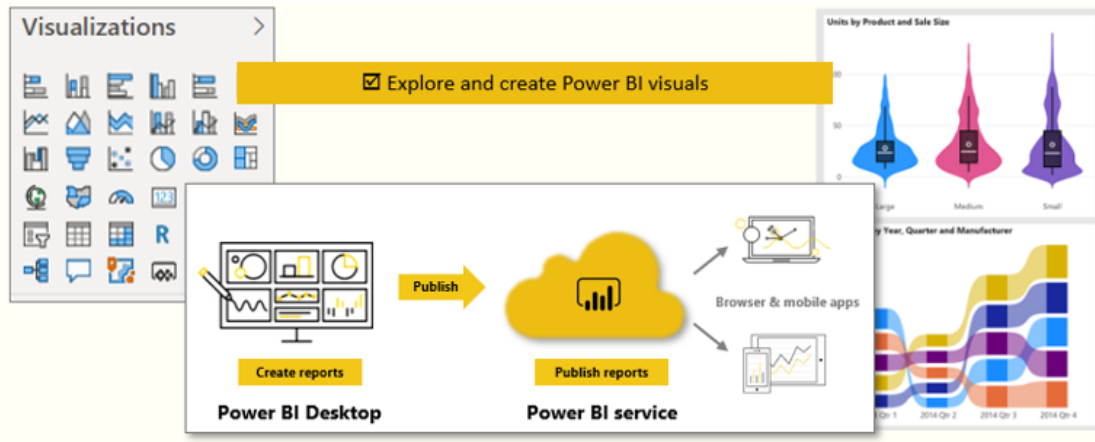
choosing an effective visual

- Scatterplot



56

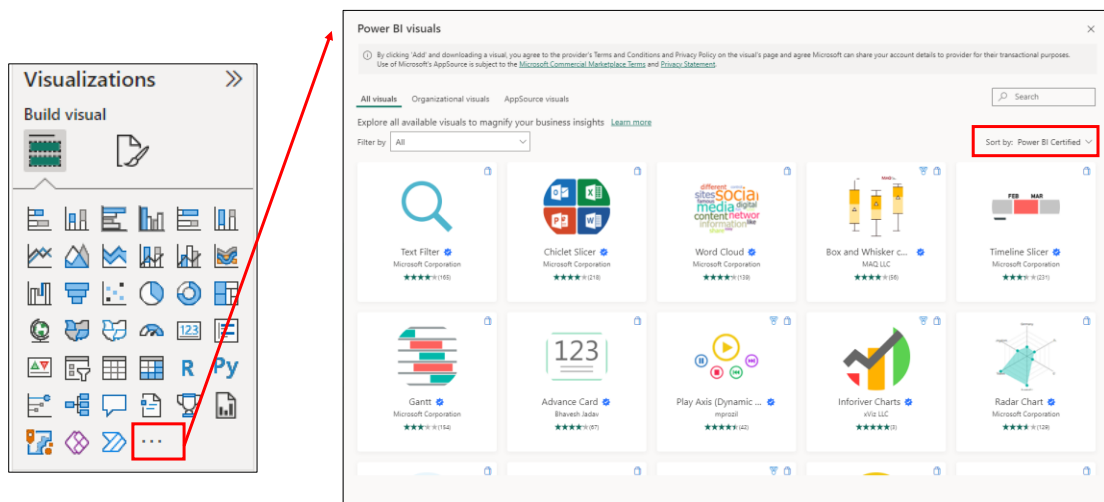
Add visualizations to Power BI reports



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57

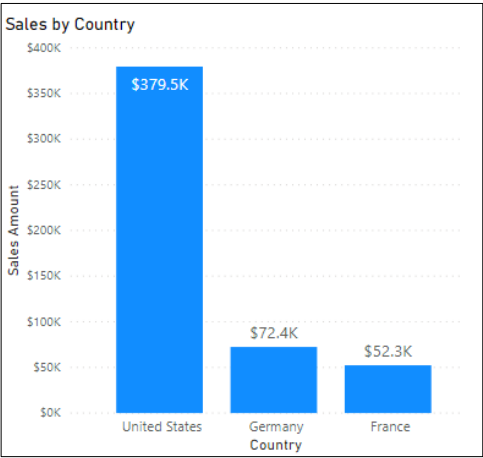
Import custom visuals from AppSource



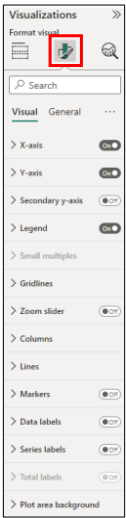
<https://learn.microsoft.com/>

58

Format and configure visualizations



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59

Configure conditional formatting

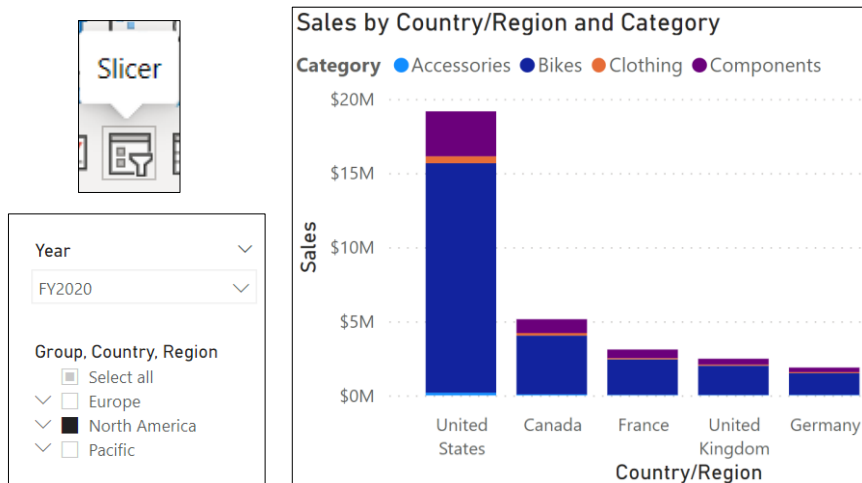
A screenshot of the "Background color - Background color" dialog box in Microsoft Excel. The dialog box has a "Format style" dropdown set to "Gradient" and an "Apply to" dropdown set to "Values only". Below these are three sections: "What field should we base this on?", "Summarization", and "How should we format empty values?". The "What field should we base this on?" section has a dropdown set to "Sum of Sales". The "Summarization" section has a dropdown set to "Sum". The "How should we format empty values?" section has a dropdown set to "As zero". There are three color pickers for "Minimum", "Center", and "Maximum" values. The "Minimum" color picker is set to "Lowest value" and the "Maximum" color picker is set to "Highest value". There are input fields for "Enter a value" for each color picker. A checkbox labeled "Add a middle color" is checked. A color bar is shown below the checkboxes. At the bottom, there is a link "Learn more about conditional formatting" and "OK" and "Cancel" buttons.

Region	Sales
Australia	\$1,391,025
Canada	\$13,875,633
Central	\$7,633,387
France	\$4,527,840
Germany	\$1,877,743
Northeast	\$6,715,354
Northwest	\$12,004,822
Southeast	\$7,638,607
Southwest	\$18,001,116
United Kingdom	\$3,883,043
Total	\$77,548,570

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60

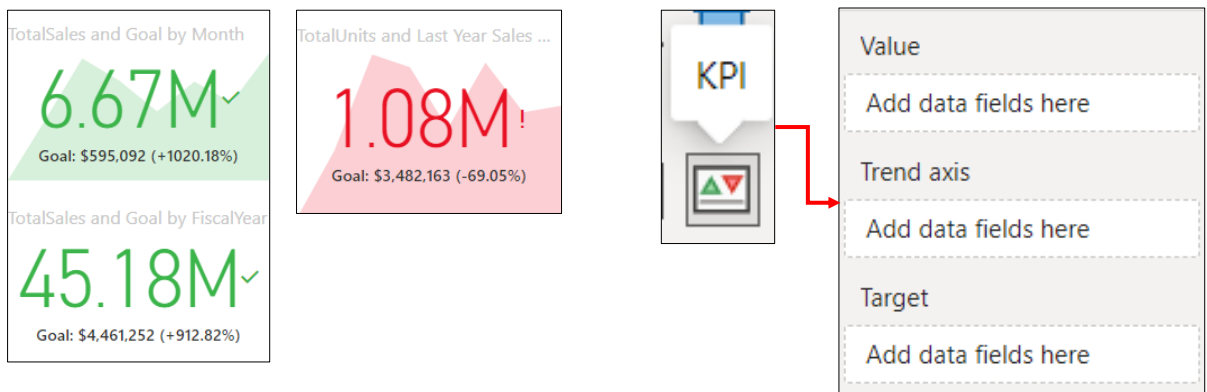
Use the Slicer visual to provide on-report filtering



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61

Key Performance Indicator visual



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62

AI Insights for data preparation in Power Query Editor

- Leverage AI analysis of text, images, and use Azure Machine Learning models.

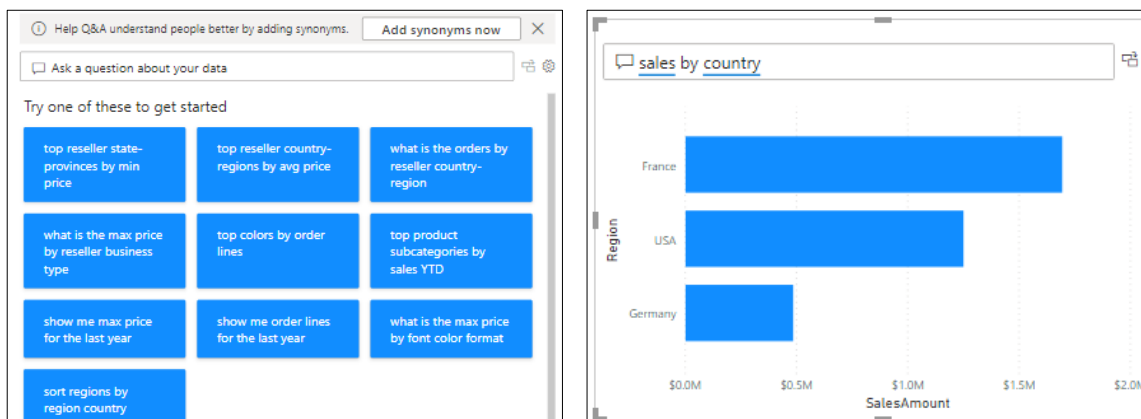


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63

AI in the Q&A feature

- Use natural language to ask questions about data and create visuals for insights.

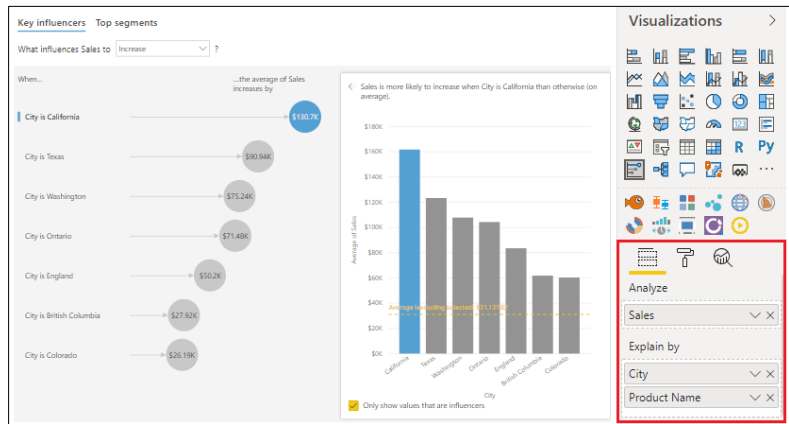


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64

Key influencers visual

- Identify factors driving variations in a chosen target metric.

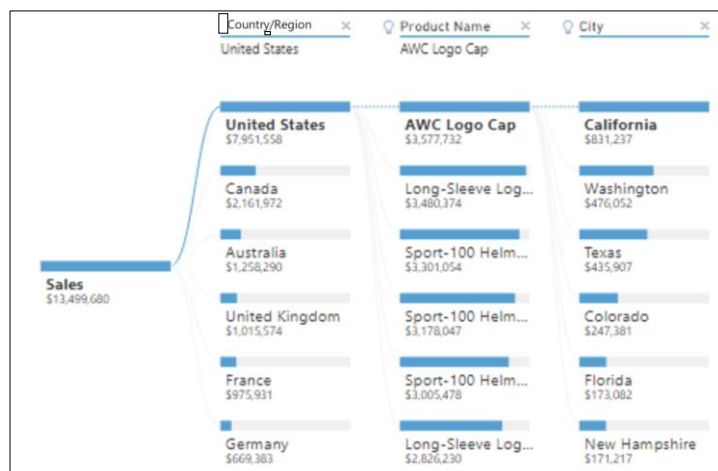


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65

Decomposition tree visual

- Visualize data hierarchies for in-depth exploration and pattern discovery.



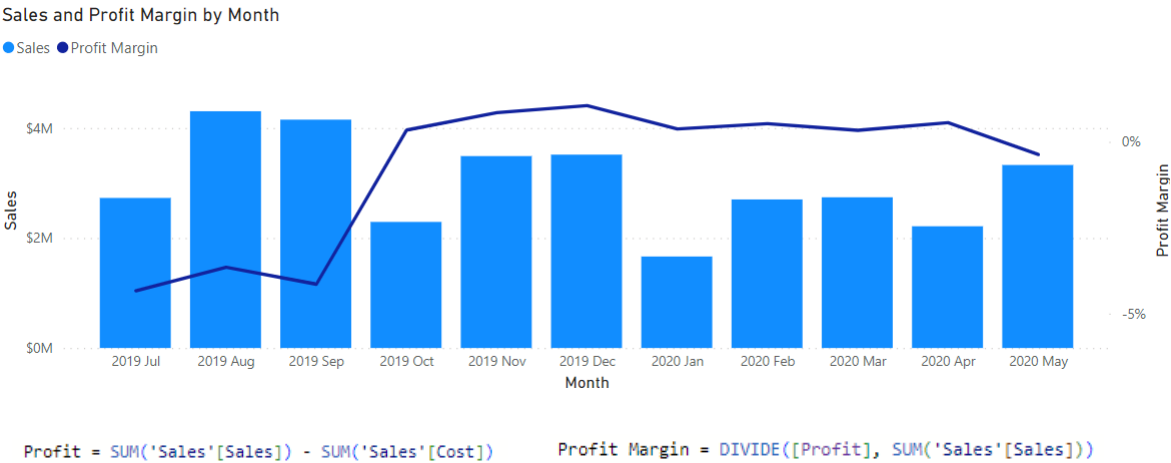
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66



67

Sales and Profit Margin



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68

Variance and Variance Margin

```
Variance =
IF(
    HASONEVALUE('Salesperson (Performance)'[Salesperson]),
    SUM(Sales[Sales]) - [Target]
)

Variance Margin =
DIVIDE([Variance], [Target])
```

Salesperson	Sales	Target	Variance	Variance Margin
Amy Alberts	\$10,288,626	\$19,450,000	(\$9,161,374)	-47.10%
Brian Welcker	\$77,548,570	\$221,700,000	(\$144,151,430)	-65.02%
David Campbell	\$12,004,822	\$19,625,000	(\$7,620,178)	-38.83%
Garrett Vargas	\$13,875,633	\$23,675,000	(\$9,799,367)	-41.39%
Jae Pak	\$8,410,883	\$13,575,000	(\$5,164,117)	-38.04%
Jillian Carson	\$7,633,387	\$13,675,000	(\$6,041,613)	-44.18%
José Saraiva	\$13,875,633	\$18,875,000	(\$4,999,367)	-26.49%
Linda Mitchell	\$25,634,503	\$40,850,000	(\$15,215,497)	-37.25%
Lynn Tsoflias	\$1,391,025	\$3,210,000	(\$1,818,975)	-56.67%
Michael Blythe	\$21,987,348	\$31,150,000	(\$9,162,652)	-29.41%
Pamela Ansman-Wolfe	\$30,005,939	\$53,850,000	(\$23,844,061)	-44.28%
Rachel Valdez	\$1,877,743	\$4,125,000	(\$2,247,257)	-54.48%
Ranjit Varkey Chudukatil	\$4,527,840	\$9,050,000	(\$4,522,160)	-49.97%
Shu Ito	\$18,001,116	\$59,850,000	(\$41,848,884)	-69.92%
Stephen Jiang	\$65,868,919	\$110,150,000	(\$44,281,081)	-40.20%
Syed Abbas	\$1,391,025	\$3,050,000	(\$1,658,975)	-54.39%
Tete Mensa-Annan	\$12,004,822	\$17,100,000	(\$5,095,178)	-29.80%
Tsvi Reiter	\$7,638,607	\$13,250,000	(\$5,611,393)	-42.35%
Total	\$77,548,570			

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69

Aggregate Price

```
Avg Price = AVERAGE(Sales[Unit Price])

Median Price = MEDIAN(Sales[Unit Price])

Max Price = MAX(Sales[Unit Price])

Min Price = MIN(Sales[Unit Price])

Orders = DISTINCTCOUNT(Sales[SalesOrderNumber])

Order Lines = COUNTROWS(Sales)
```

Year	Avg Price	Median Price	Min Price	Max Price	Orders	Order Lines
FY2018	\$748.68	\$419.46	\$4.75	\$2,146.96	739	8,459
2017 Jul	\$655.59	\$419.46	\$5.19	\$2,146.96	38	352
2017 Aug	\$758.93	\$419.46	\$4.75	\$2,146.96	75	785
2017 Sep	\$741.85	\$419.46	\$5.19	\$2,146.96	60	593
2017 Oct	\$677.45	\$419.46	\$5.19	\$2,146.96	40	499
2017 Nov	\$752.31	\$419.46	\$5.01	\$2,146.96	90	1,106
2017 Dec	\$734.58	\$419.46	\$5.01	\$2,146.96	63	803
2018 Jan	\$808.94	\$419.46	\$5.19	\$2,146.96	40	377
2018 Feb	\$896.80	\$419.46	\$5.01	\$2,146.96	79	866
2018 Mar	\$863.54	\$419.46	\$5.19	\$2,146.96	64	653
2018 Apr	\$732.25	\$419.46	\$5.19	\$2,146.96	37	494
2018 May	\$761.30	\$419.46	\$4.75	\$2,146.96	85	1,112
2018 Jun	\$552.95	\$419.46	\$4.75	\$2,146.96	68	819

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70

Sales Dashboard Example

```
Sales % All Region =
DIVIDE(
    SUM(Sales[Sales]),
    CALCULATE(
        SUM(Sales[Sales]),
        REMOVEFILTERS(Region)
    )
)
```

Group	Country	Region	Sales	Sales % All Region
Europe	France	France	\$4,527,840	5.84 %
		Total	\$4,527,840	5.84 %
	Germany	Germany	\$1,877,743	2.42 %
		Total	\$1,877,743	2.42 %
	United Kingdom	United Kingdom	\$3,883,043	5.01 %
		Total	\$3,883,043	5.01 %
	Total		\$10,288,626	13.27 %

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71

Sales Dashboard Example

```
Sales % Country =
IF(
    ISINSCOPE(Region[Region]),
    DIVIDE(
        SUM(Sales[Sales]),
        CALCULATE(
            SUM(Sales[Sales]),
            REMOVEFILTERS(Region[Region])
        )
    )
)
```

Group	Country	Region	Sales	Sales % All Region	Sales % Country
Europe	France	France	\$4,527,840	5.84 %	100.00 %
		Total	\$4,527,840	5.84 %	
	Germany	Germany	\$1,877,743	2.42 %	100.00 %
		Total	\$1,877,743	2.42 %	
	United Kingdom	United Kingdom	\$3,883,043	5.01 %	100.00 %
		Total	\$3,883,043	5.01 %	

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72

YTD measure

```
Sales YTD =
TOTALYTD(SUM(Sales[Sales]), 'Date'[Date], "6-30")
```

Sales	Sales YTD
\$16,429,043	\$16,429,043
\$489,328	\$489,328
\$1,540,072	\$2,029,400
\$1,166,332	\$3,195,733
\$844,833	\$4,040,566
\$2,325,755	\$6,366,320
\$1,703,435	\$8,069,756
\$713,230	\$8,782,985
\$1,900,794	\$10,683,780
\$1,455,280	\$12,139,060
\$883,011	\$13,022,071
\$2,269,720	\$15,291,791
\$1,137,252	\$16,429,043
\$27,979,780	\$27,979,780
\$2,411,559	\$2,411,559
\$3,615,914	\$6,027,473

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73

YoY growth measure

```
Sales YoY Growth =
VAR SalesPriorYear =
CALCULATE(
SUM(Sales[Sales]),
PARALLELPERIOD(
'Date'[Date],
-12,
MONTH
)
)
RETURN
DIVIDE(
(SUM(Sales[Sales]) - SalesPriorYear),
SalesPriorYear
)
```

Sales	Sales YTD	Sales YoY Growth
\$16,429,043	\$16,429,043	
\$489,328	\$489,328	
\$1,540,072	\$2,029,400	
\$1,166,332	\$3,195,733	
\$844,833	\$4,040,566	
\$2,325,755	\$6,366,320	
\$1,703,435	\$8,069,756	
\$713,230	\$8,782,985	
\$1,900,794	\$10,683,780	
\$1,455,280	\$12,139,060	
\$883,011	\$13,022,071	
\$2,269,720	\$15,291,791	
\$1,137,252	\$16,429,043	
\$27,979,780	\$27,979,780	70.31 %
\$2,411,559	\$2,411,559	392.83 %
\$3,615,914	\$6,027,473	134.79 %

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74

Sales Forecast

Options

Units: Months

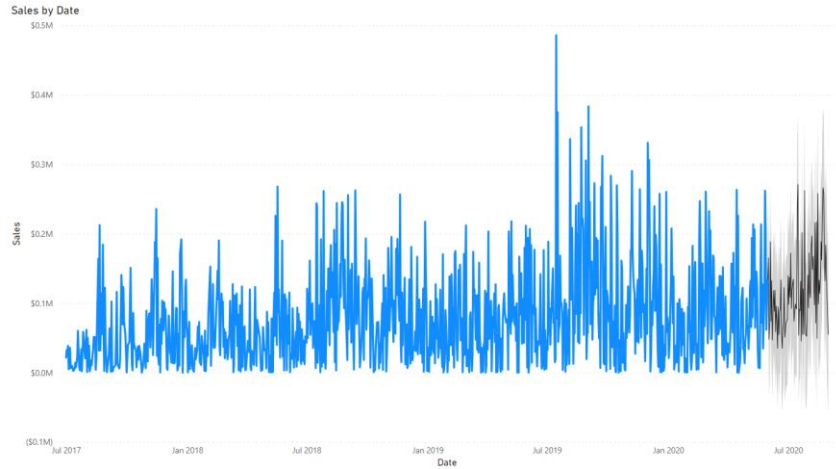
Forecast length: 1

Ignore the last: 0

Seasonality: 365 Points

Confidence interval: 80%

Apply



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75



Thank you

76