

# POWER BI

## FOR THE BUSY PROFESSIONAL

By Michael Olafusi



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[www.urbizedge.com](http://www.urbizedge.com)

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Book written and formatted by [mike@urbizedge.com](mailto:mike@urbizedge.com)

## Preface

I started my data analysis career with Comviva - Airtel Africa creating daily, weekly, monthly and ad-hoc reports for the entire operations in the CRBT product unit across Africa. The company operated across ten countries in Africa then and I was creating between 11 and 30 reports daily. The company had just moved to Africa after Bharti Airtel acquired Zain Africa operations, so everything started from scratch - my colleagues and I had to build everything from scratch.

Power BI is the tool I wish we had then. I would have been able to automate all our reports with ability to drill down and drill through, allowed each country operations manager see only what is within their region/country while the big bosses overseeing the entire continent can see everything. I would not have needed to work on public holidays that were local to us since the other country guys needed their reports and were not on holidays.

Most importantly, I would have been able to build more insightful reports and ones focused on providing business intelligence, I would have had more time to do more strategic revenue improving activities rather than slaving away at recurrent reports making. And the management would always have all the data and reports they needed in a very interactive and real-time way.

This book is to give you what I lacked then; it is my own way of making it easy for you to learn and immediately start using Power BI without having to take a leave off work or risk migraines. I have used very easy to follow illustrations with a hands-on approach to ensure that it would be fun and easy for you. You are already a busy professional, this book is to fit perfectly into your life and not disrupt it.

And about me? I am a four-time Microsoft Most Valuable Professional (MVP) and the only one in my area of award in Africa. Helping people and companies make the most of their data is what I do full-time. I have also written books and created online courses that have been used by over 18,000 people across the world. You can connect with me on LinkedIn: <https://www.linkedin.com/in/olafusimichael/>

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## Comprehensive Introduction To Power BI And The Value Proposition

Power BI is Microsoft's self-service Business Intelligence solution and is the most popular self-service BI solution in Nigeria. Many companies in Nigeria are beginning to realise the huge importance of having flexible and robust BI reports and a lot of them are turning to Power BI due to the local presence of Microsoft and the low entry fee of Power BI compared to the other self-service BI solutions.

As a business professional, what do you need to know about Power BI and its potential value to your organization? Well, that is what we are going to discuss in the next few paragraphs.

Before the advent of self-service BI solutions, companies used to have a data warehouse or IT team who manage the company-wide data using Microsoft SQL servers, Oracle database servers or MySQL database servers (there are others but these are the most popular ones). These tech-savvy team model the company data and provide portals for the other teams/departments in the company to download data they need for their reports. Sometimes, they create reports too for the business managers to consume but these reports are often static and not robust enough for day-to-day business needs. Hence, the need for a second group of people -- analysts. They could be sales analysts, operations analysts, customer service analysts, marketing analysts or data analysts. This set of people create the highly important day-to-day reports that management use to keep the business running smoothly and for strategic planning. These reports are mostly made with Microsoft Excel because of its ease of use and managers' preference for it. And again, before now, this was good enough.

However, since the advent of self-service BI, Excel is now obviously no longer good enough for reporting all the business operations. Excel is still extremely important and useful but not great at providing real-time robust dashboards/reports that can be consumed on the go by managers (without having to lug around a laptop and Excel). Managers are increasingly looking for reporting tools that provide them real-time access to their business data reports and accessible from their iPads, tablets and smartphones even in the middle of the night or while on a vacation in a remote island/village. And that is the very thing, with many other valuable features, that self-service BI solutions like Power BI provide.

With Excel, you have to create the reports repeatedly and email them out. I used to work as a business analyst and MIS analyst for Comviva on an Airtel Africa CRBT project. I often say I worked for Airtel Africa as Comviva was a sister company to Airtel, both were owned by the Bharti Group. I used to create at least 11 daily reports -- one for each of the 10 countries we were operating in in Africa and one pan-Africa report to the Airtel HQ in Kenya. Then every Friday, I create a weekly report and presentation. Been very good in Excel, I created a template to automate the reports and reduce my daily repetitive tasks. Yet two things could not be automated away

and gave the management concern -- they only get the reports when I email them out and they always have to view it on their laptops. How were these a problem? On Saturday and Sunday, they are blind. They don't see what has happened all throughout the weekend till I send out reports on Monday. Then, whenever they are in a meeting or on a flight, they have to wait till they can open their PC, download the reports and interact with it before they can fully know what's in it.

Now, with Power BI, those problems are no more. I can design the reports once and set it to update automatically each day, so I don't have to daily recreate the reports. Then the managers can view the reports any day, especially on Saturday and Sunday, and see the updated (real-time) analysis. Lastly, they don't have to be on their PC. They can access the reports on their smartphones, tablets and any internet connected device that has a good browser.

And those aren't just the only benefits. You get drill-down capabilities, enhanced visualizations, KPI trigger alerts and many more benefits that managers won't want to turn a blind eye to. Below is the extract of the slides I use to present the benefits of Power BI to managers. You can also view one of my openly available Power BI dashboards that I often use to show the power of Power BI: [here](#) (<https://app.powerbi.com/view?r=eyJrljoiZDQ5MDZjOGItMmE4Yi00N2UzLWJlMjUtYmRiZGYxNDk0NDQ5IiwidCI6IjgwZTlhM2Y3LTZhNTQtNDQ2OS05NTlhLWQ2MWFhNTM4Y2M4ZilsImMiOjh9>) and [here](#) (<https://app.powerbi.com/view?r=eyJrljoiN2RjZWNIzjYtOGlyYy00MWE0LWIxNzgtMDlmYmM1ZGNjOTFkIiwidCI6IjgwZTlhM2Y3LTZhNTQtNDQ2OS05NTlhLWQ2MWFhNTM4Y2M4ZiIsImMiOjh9>).

Enjoy!

Note: The quote and architecture slides are from [Brandon George's presentation](#) (<https://www.crmug.com/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=5011d1ea-f570-6560-6a95-6a8799f3e895&forceDialog=1>).

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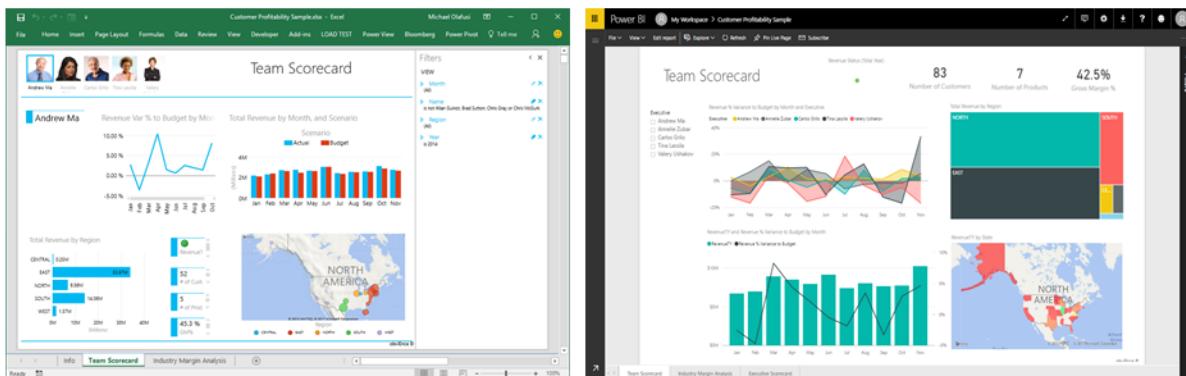
# Power BI for Managers

## The Value Proposition



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## What Is Power BI?



Do more with your data. Integrates seamlessly with Excel. Create more insightful reports that can be automatically refreshed. Allows setting up of threshold points that when reached you will get an email and/or phone notification

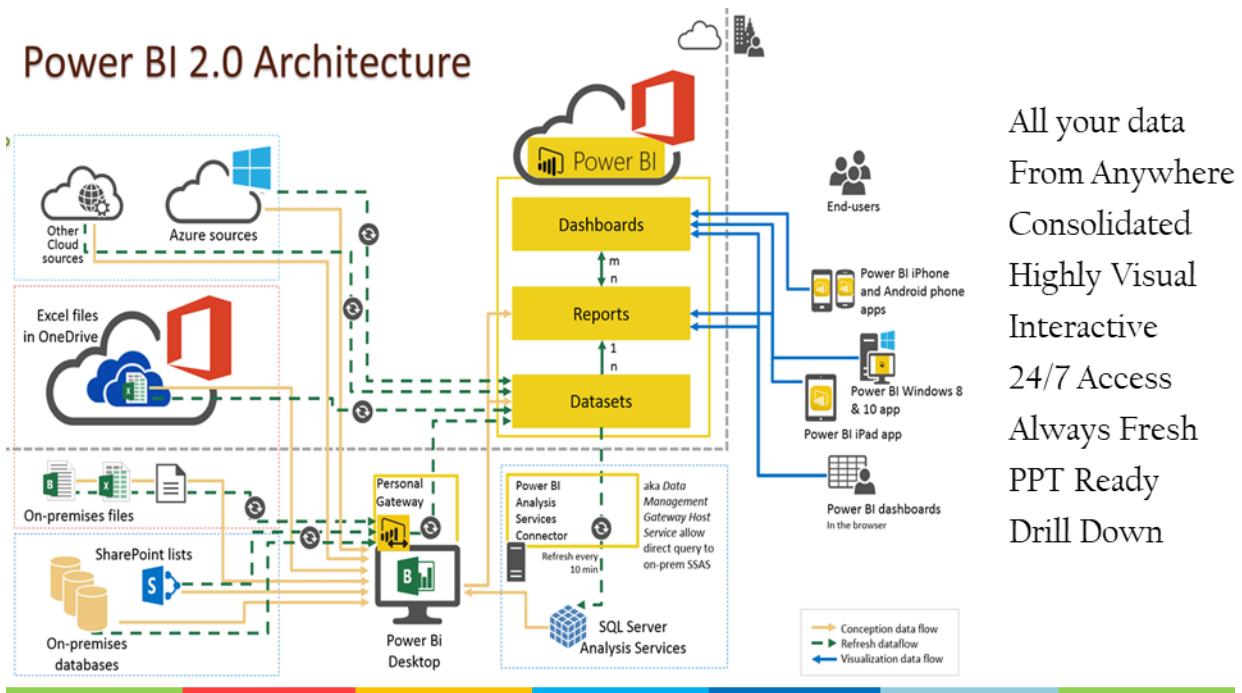
“

The things that give an organization a strong competitive edge are: 1)what it knows, 2)how it uses what it knows and 3) how fast it knows things.

”

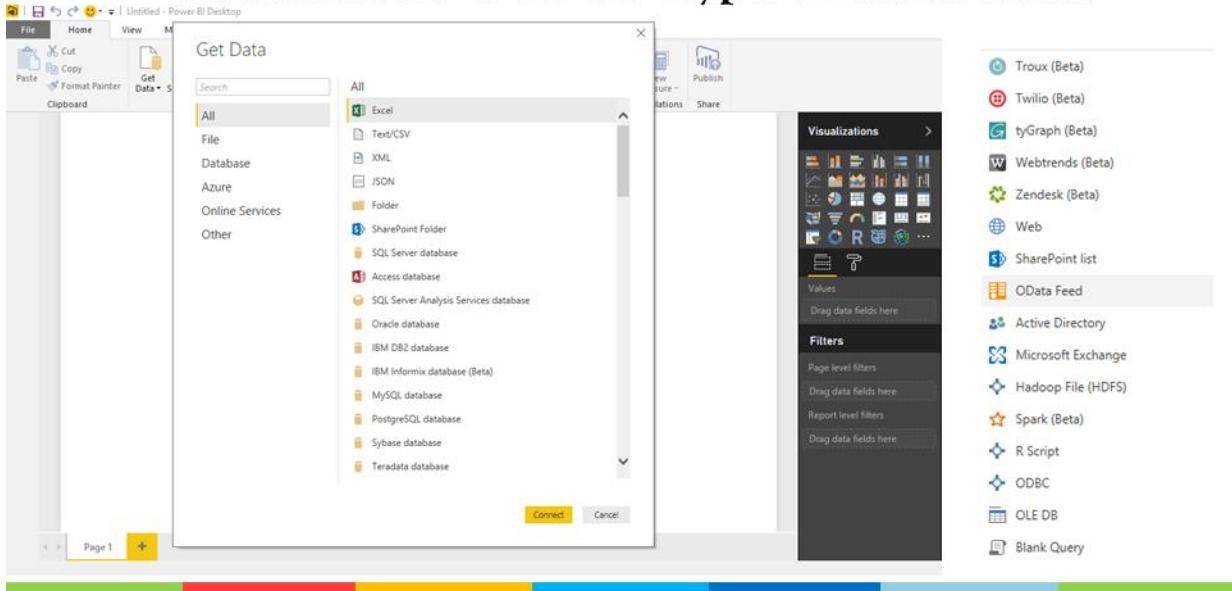
- Larry Prusak (1996)

## Power BI 2.0 Architecture



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## Connects To Over 80 Types Data Sources



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## Live Examples: Report in Excel

The screenshot displays two Excel spreadsheets side-by-side. The left spreadsheet, titled 'Sales-Datasite - Excel', contains raw sales data with columns for S/N, Date, Branch, Pizza Sold, Price, Quantity, Time, and Time Range. The right spreadsheet, also titled 'Sales-Datasite - Excel', shows a PivotTable analysis with rows for Date, Branch, and Time Range, and columns for Sum of Quantity and Count of Pizza Sold. A green box highlights the value '601' in the PivotTable, which corresponds to the data in the raw sales sheet. The PivotTable Fields pane on the right lists the available fields: S/N, Date, Branch, Pizza Sold, Price, Quantity, Time, and Time Range.

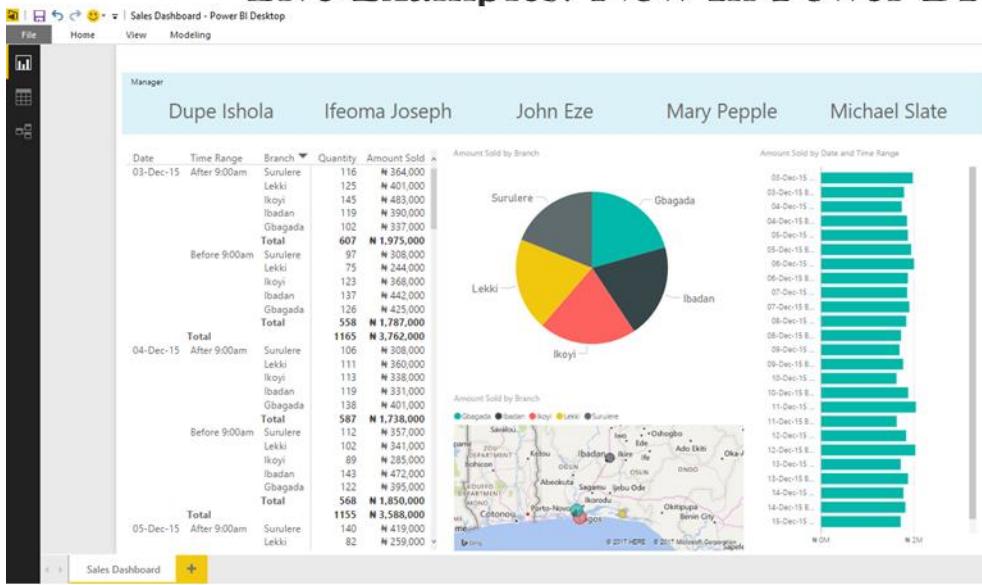
The raw data, extracted into Excel

Common Practice: Throw in a Pivot Table,  
one or two slicers and some formulas.

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## Live Examples: Now In Power BI

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Visually engaging reports that give you visibility to all insights in your data. Also allows you to drill-down – from big picture to what's behind it.

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## Live Examples: Report Sharing in Excel

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Name	Date modified	Type	Size
Sales Report - latest update.xlsx	3/13/2017 10:35 AM	Microsoft Excel W...	9 KB
Sales Report - updated - updated - updated.xlsx	3/13/2017 10:35 AM	Microsoft Excel W...	9 KB
Sales Report - updated - updated again.xlsx	3/13/2017 10:35 AM	Microsoft Excel W...	9 KB
Sales Report - updated.xlsx	3/13/2017 10:35 AM	Microsoft Excel W...	9 KB
Sales Report.xlsx	3/13/2017 10:35 AM	Microsoft Excel W...	9 KB



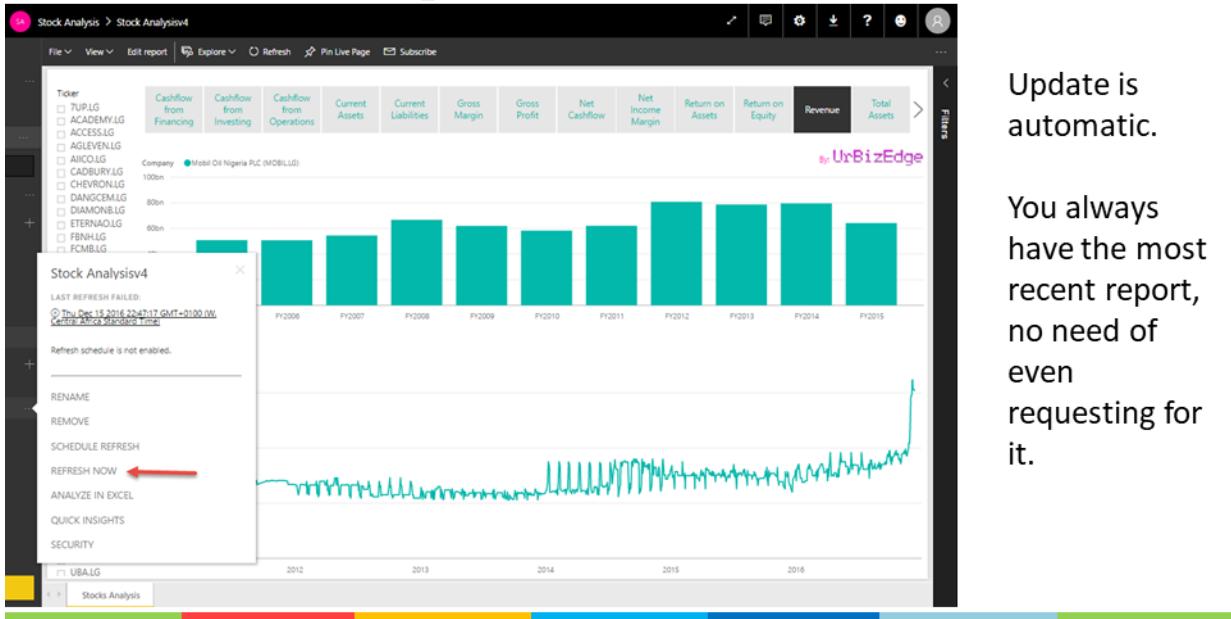
John:

I am sick of your fragmented reports, I have 5 sales reports from you in one day and all titled as updated. WHICH IS THE VALID ONE TO USE?

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# Live Examples: In Power BI, No Problem

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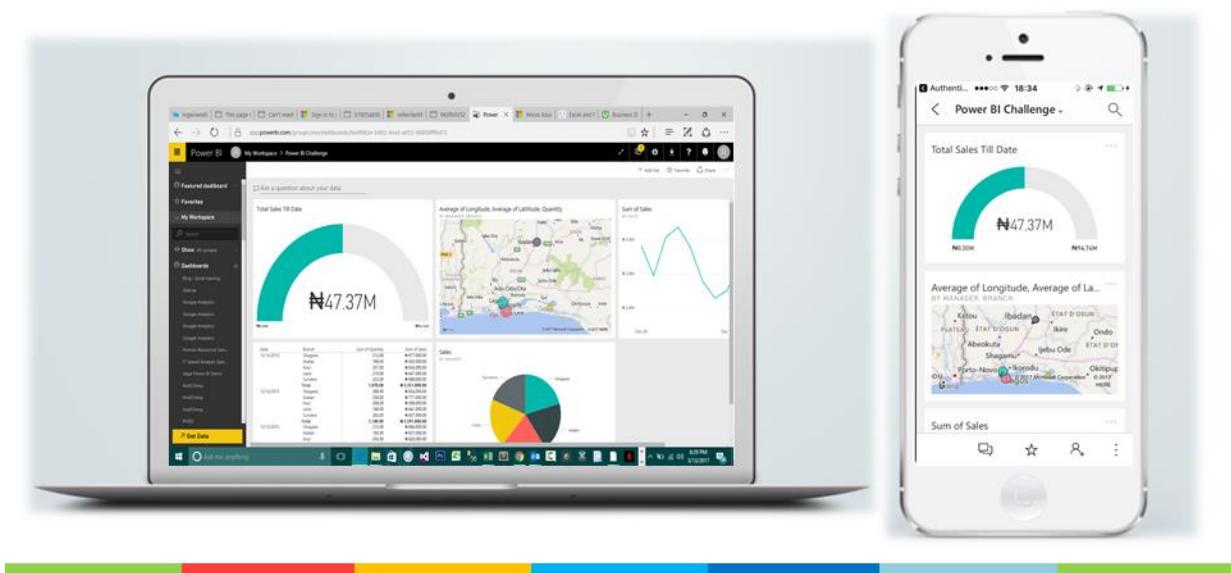
Update is automatic.

You always have the most recent report, no need of even requesting for it.

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# Access Your Reports On Any Of Your Devices

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# Set Email and Phone Notifications For KPIs

The screenshot shows a Power BI interface with several dashboards visible on the left and center. On the right, a 'Manage alerts' dialog is open for a 'Total Sales Till Date' alert. The dialog includes fields for 'Alert title' (Alert for Total Sales Till Date), 'Set alerts rule for' (Total Sales), 'Condition' (Above), 'Threshold' (0), and 'Maximum notification frequency' (At most every 24 hours). It also includes options for 'Send me email, too' and 'Use Microsoft Flow to trigger additional actions'. A preview of the alert message is shown at the bottom.

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# Export Reports To PowerPoint Presentation

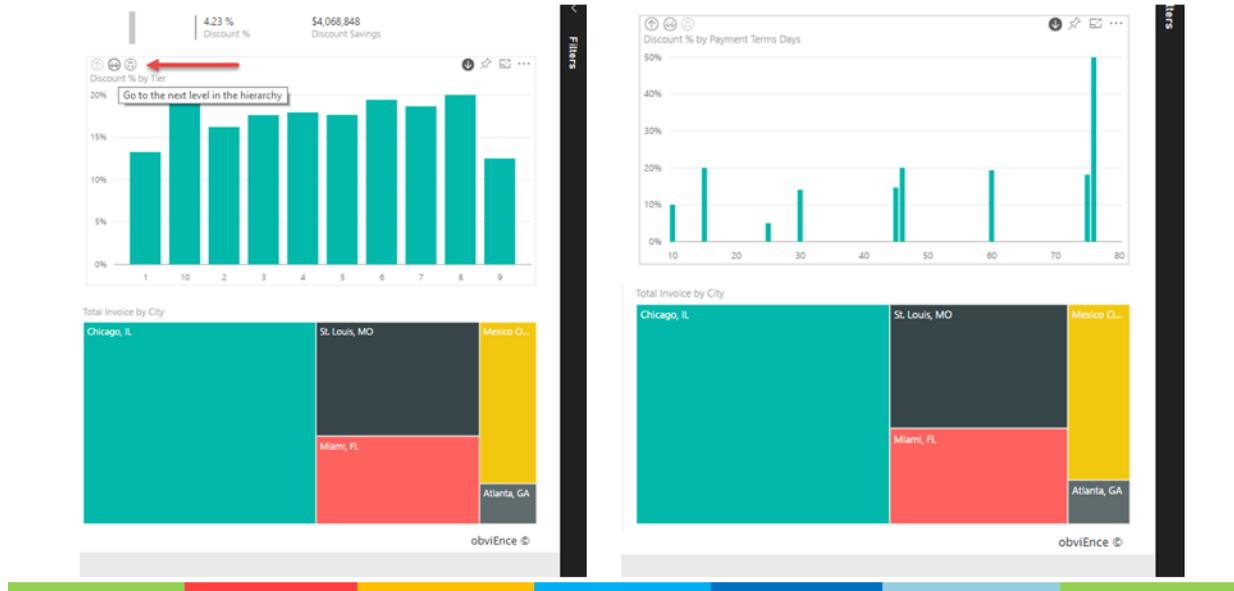
The screenshot shows a Power BI report titled 'December Training' with various financial KPIs like Net Income Margin and Return on Assets. On the left, the 'Reports' section is expanded. In the top navigation bar, the 'File' menu is open, showing options like 'Save as', 'Print', 'Publish to web', and 'Export to PowerPoint (Preview)'. A red arrow points to the 'Export to PowerPoint (Preview)' option. The main area displays a bar chart for Net Income Margin from FY2005 to FY2015 and a line chart for Return on Assets over the same period.

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## Drill-Down Capabilities

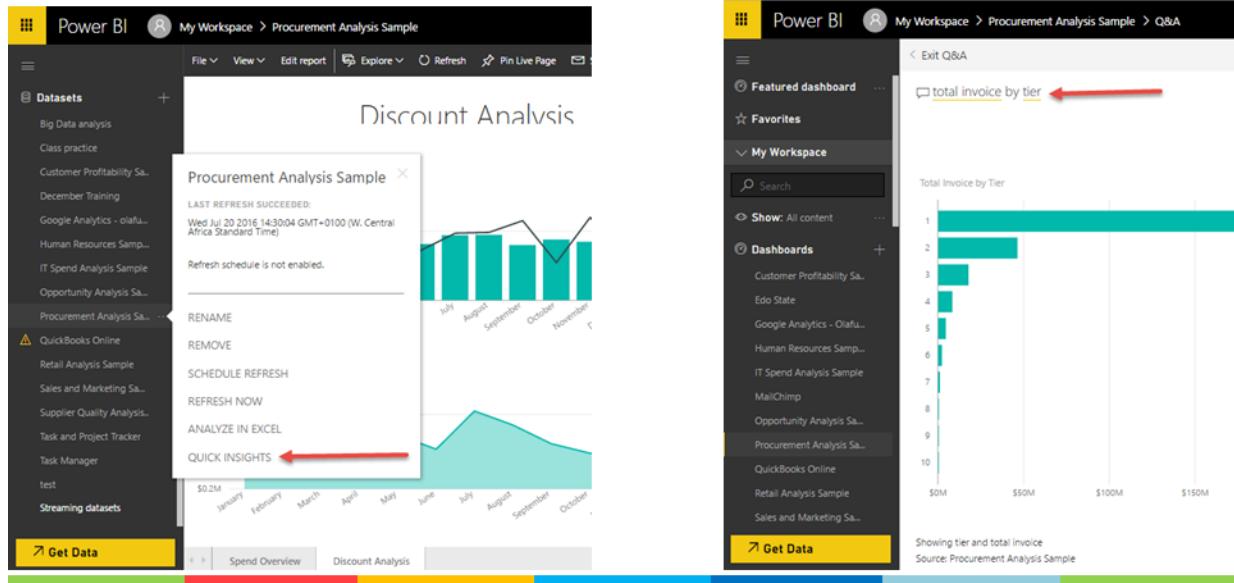
13



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## AI To Generate Insights On a Button Click

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# Doing More With Your Data

## PAST: What Happened?

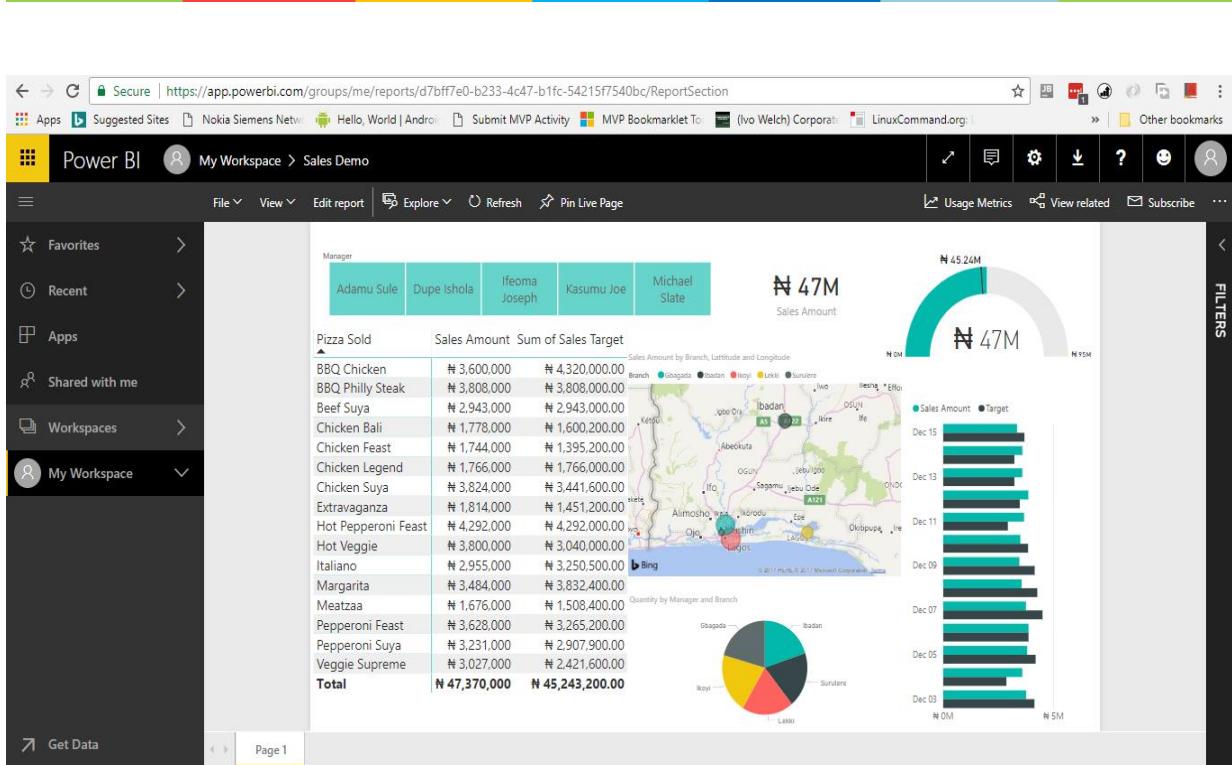
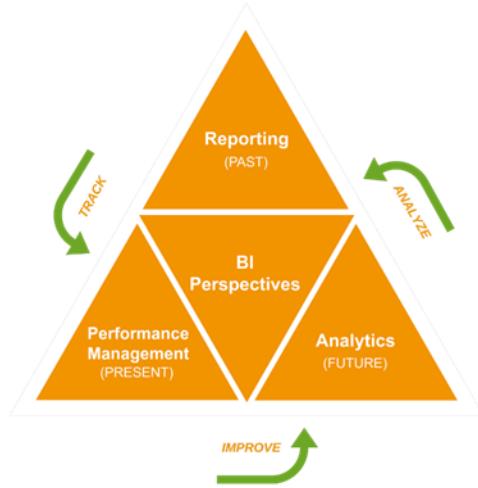
- Reactive reporting
- Common among most companies

## PRESENT: What is Happening?

- KPI's and ROI Concepts
- Streaming analytics

## FUTURE: What will Happen?

- Predict based on trends and external data
- Understand impact and what-if analysis



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## Engage Us Today

### Register for Training

We have the only Microsoft Excel MVP in Africa and have held training for people from Vodacom, Airtel, IBM, SABMiller, Nestle & Lafarge.



### Custom Programs

We can build you programs to fix your unique business and data analysis issues.



### Outsource Your Data Analysis

Don't have the internal resources or want an expert to show the insights in your business data. We are who you need.



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20, Kofoworola street, Off Lagoon Hospital,  
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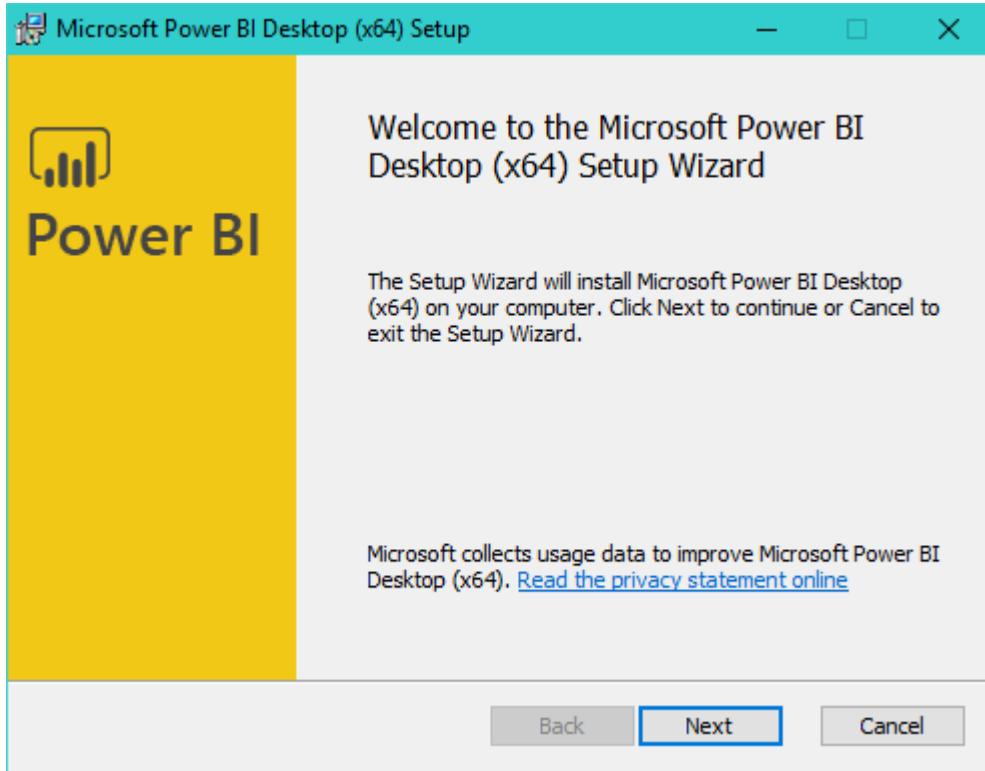
+234-808-938-2423; +1-941-312-2149

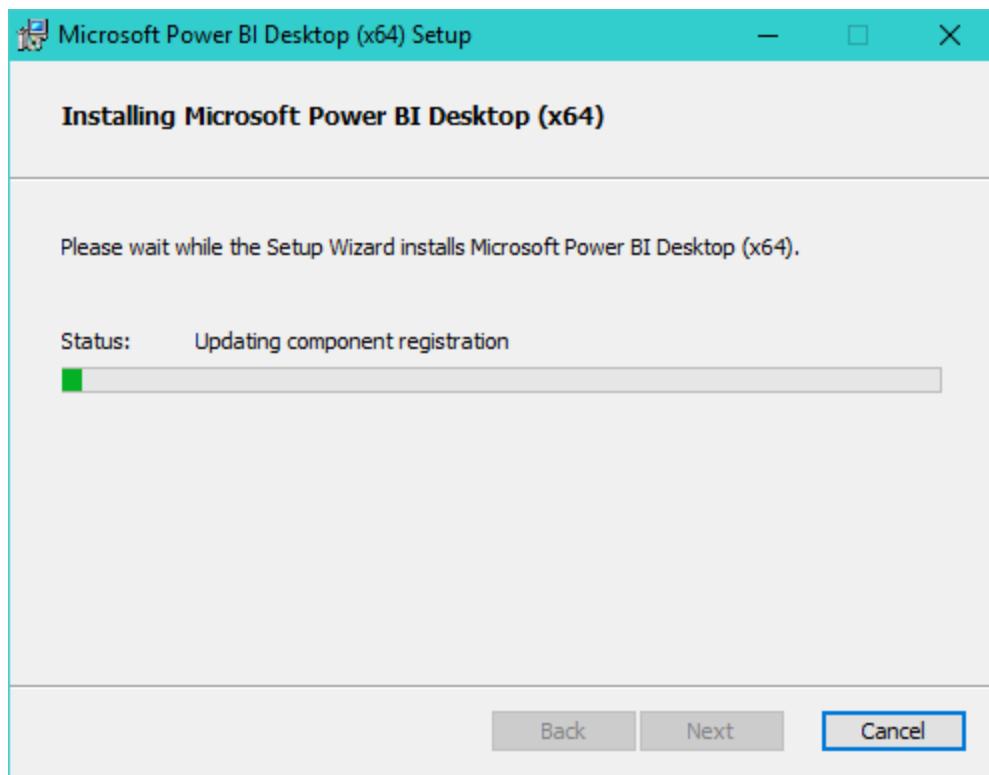
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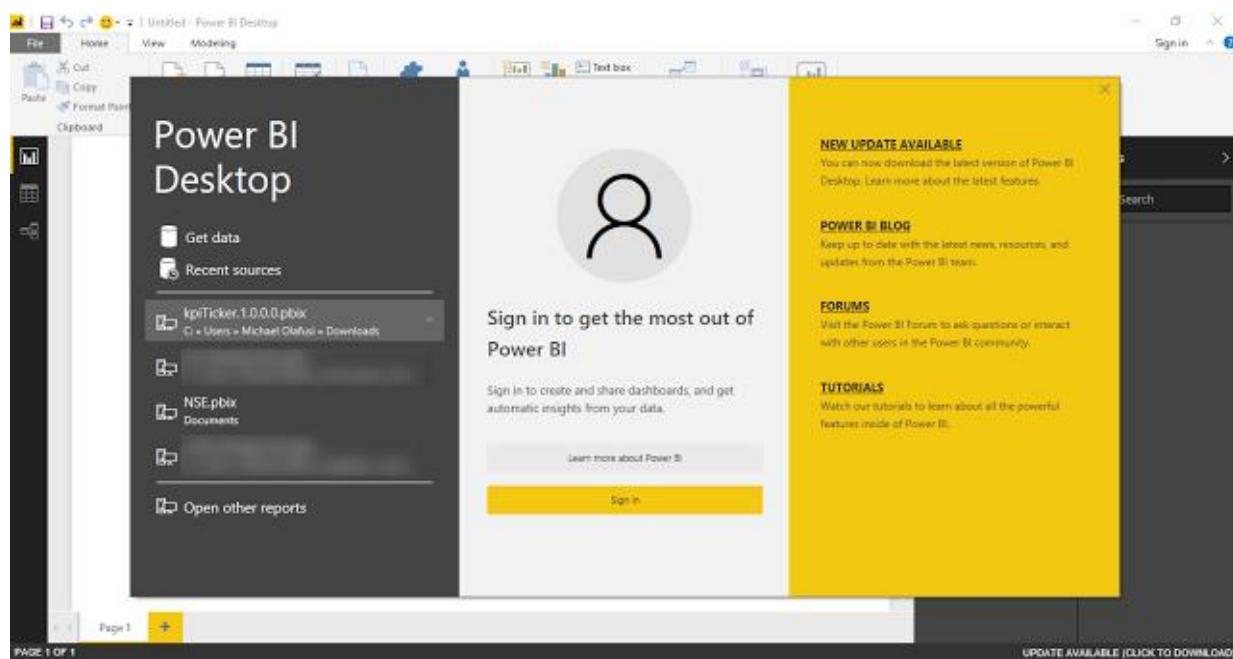
## Getting To Know The Power BI Desktop

The Power BI Desktop is the main tool you would be using in creating Power BI reports. You can [freely download it here from Microsoft](https://powerbi.microsoft.com/en-us/desktop/) (<https://powerbi.microsoft.com/en-us/desktop/>).



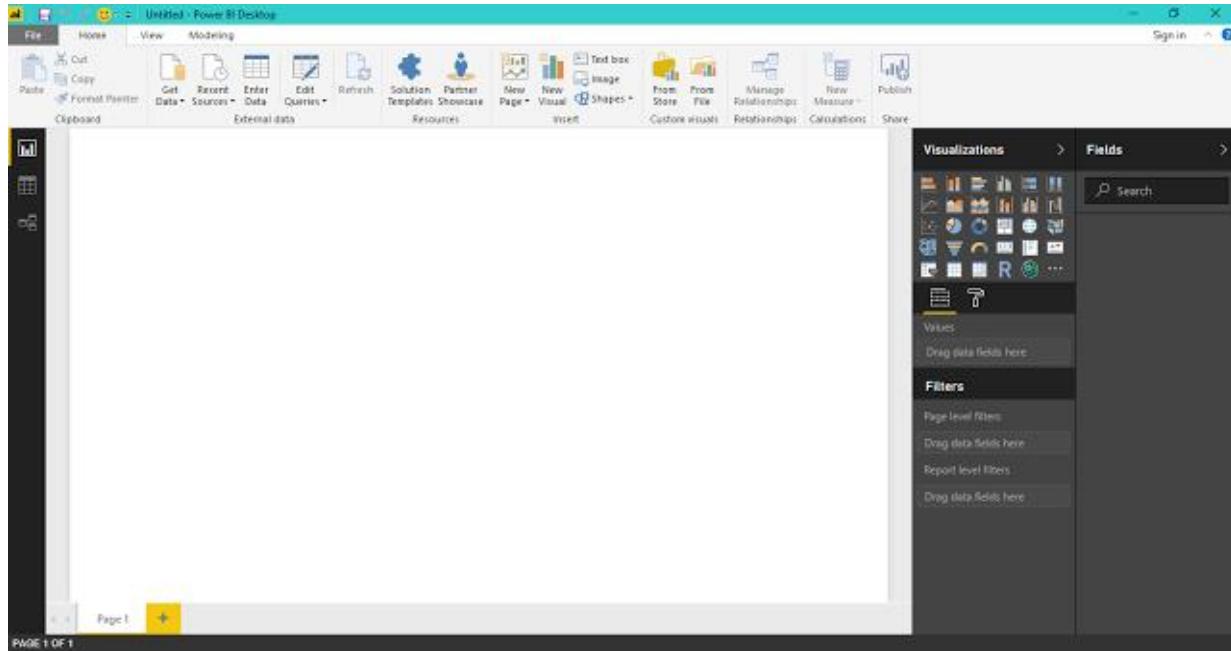


Once you are done installing it. You get a startup screen like the one below.

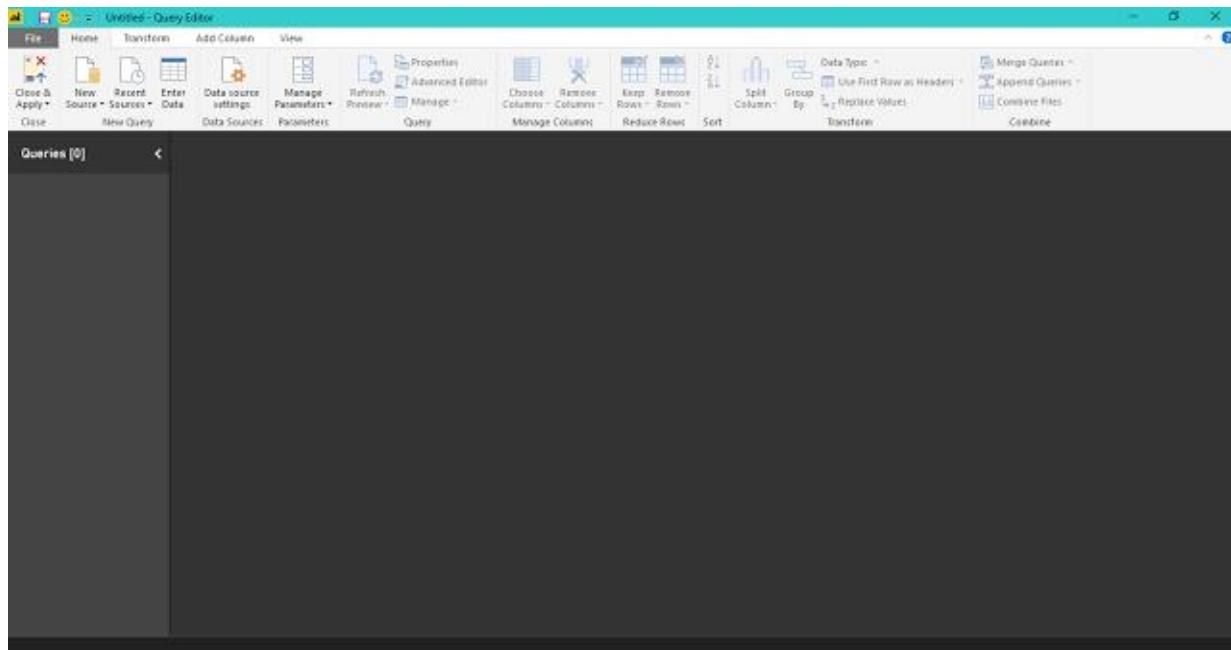


There are two major parts of Power BI Desktop you will need to get very familiar with:

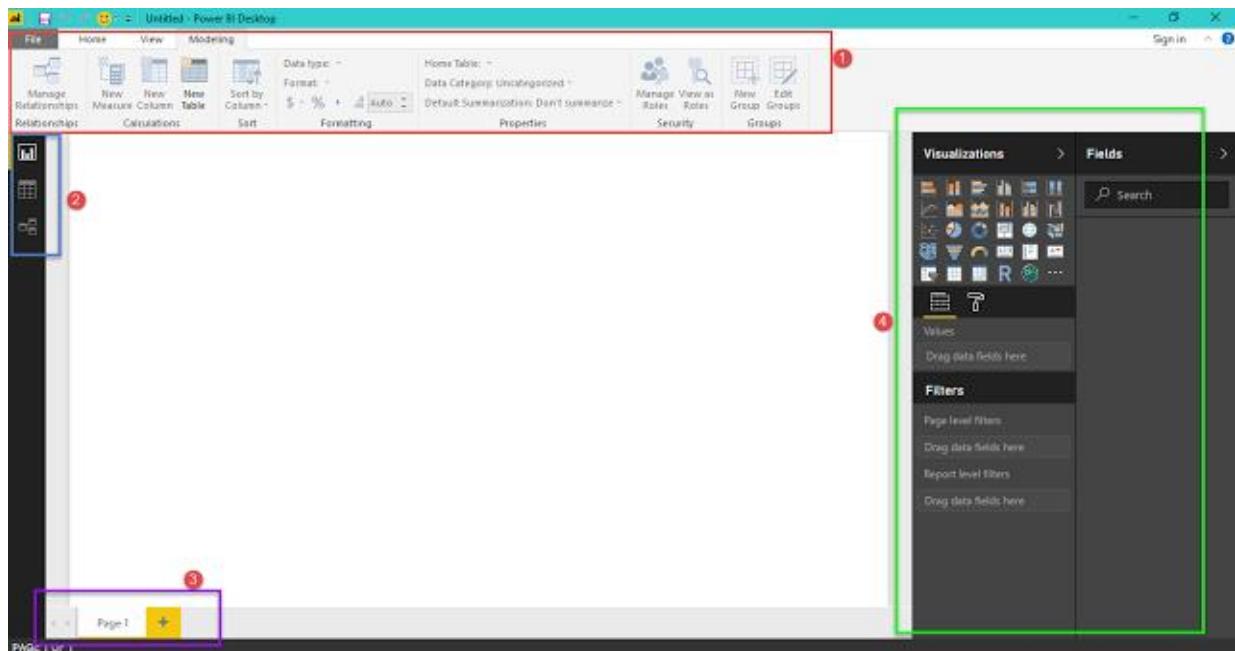
## 1. The Designer part.



## 2. The Query Editor part.



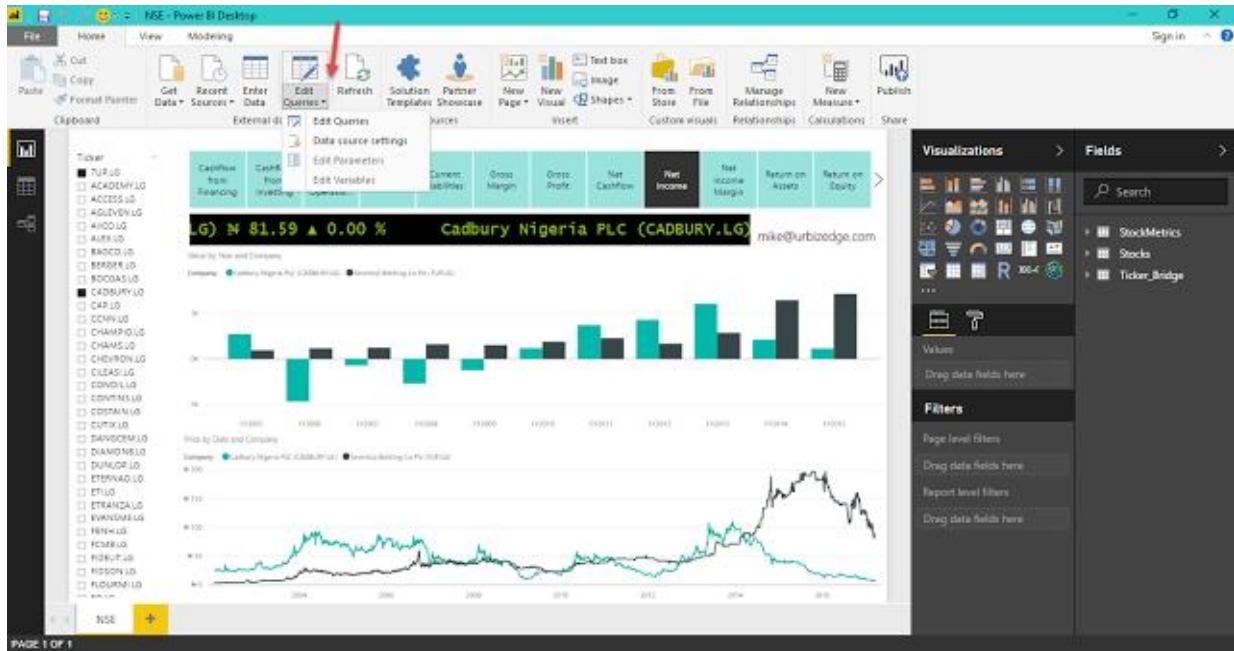
Let's start first with the Designer part or the main Power BI window. It is the window you are presented with upon launching Power BI. It has four main sections.



1. The menu section comprising File (for Open, Save, Options/Preference settings etc.), Home, View and Modelling.
2. The Report, Data and Relationship tabs section
3. Page section (like Sheets in Excel), and
4. The context based section. This section shows Fields and Visualization when you are in Reports, Fields only when you are in Data and nothing when you are in Relationship.

Now to the Query Editor. It is the exact equivalent of PowerQuery (now merged into Get & Transform Data in Excel 2016). Its main function is to help you wrangle data before they are fully loaded/downloaded into the Power BI. So instead of downloading a 16 GB database table and then specifying which fields/rows to keep and which to discard, you can do the specifying using just a preview of the data and only import just the very data you want/need. This is a life and time saver. And space/memory saver too. Then you can do some very interesting and complex stuff you can't do from the Designer part -- like merge or append data from different sources, unpivot and a few other things I find myself doing repeatedly on client/commercial projects.

You get to the Query Editor from the Home menu in the Designer part.



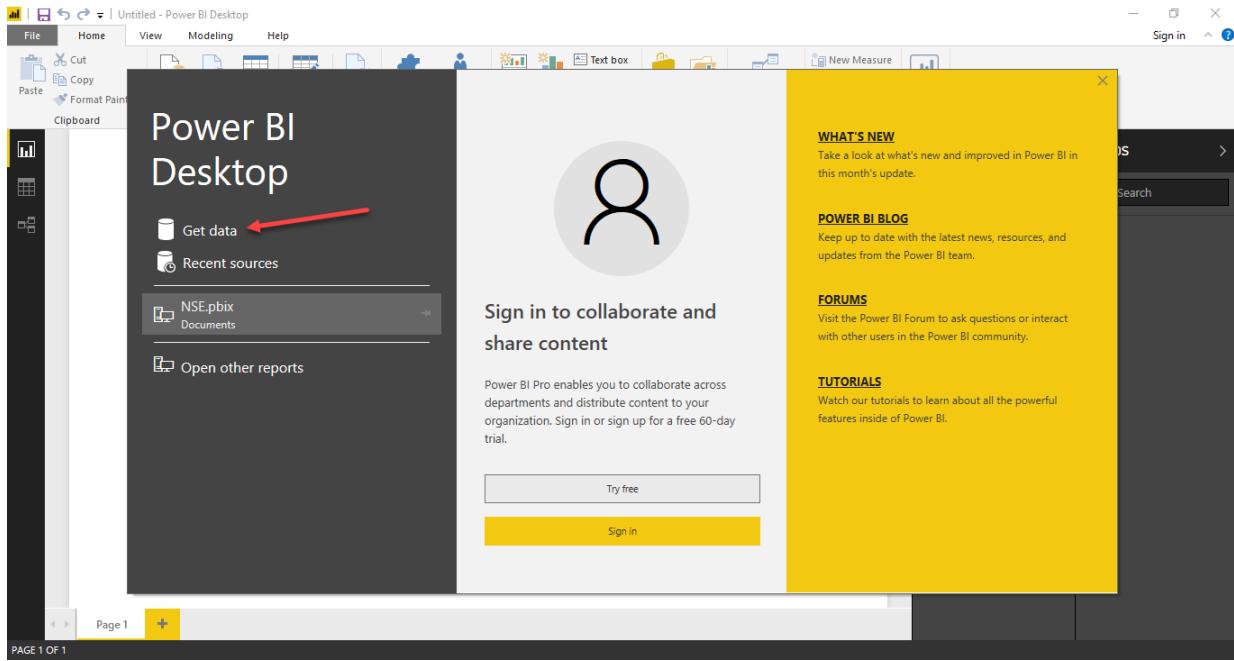
And it has four sections too.

Id	Ticker	Metric	Company	Year	Value
1	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2007	3919.037
2	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2008	-548.221
3	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2009	-472.047
4	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2010	0
5	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2011	0
6	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2012	0
7	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2013	0
8	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2014	0
9	LASACO.LG	CashFlow from Financing	Lasaco Assurance PLC (LASACO.LG)	PY2015	0
10	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2005	0
11	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2006	0
12	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2007	0
13	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2008	-483.475
14	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2009	-417.41
15	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2010	-400
16	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2011	425.353
17	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2012	1419.45
18	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2013	-171.187
19	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2014	269.116
20	MANSARD.LG	CashFlow from Financing	Axemansard Insurance PLC (MANSARD.LG)	PY2015	-410.869
21	MAYBKE.LG	CashFlow from Financing	M&B Baker Nigeria PLC (MAYBKE.LG)	PY2005	454.332.9993
22	MAYBKE.LG	CashFlow from Financing	M&B Baker Nigeria PLC (MAYBKE.LG)	PY2006	3430.270016
23	MAYBKE.LG	CashFlow from Financing	M&B Baker Nigeria PLC (MAYBKE.LG)	PY2007	-911.647
24	MAYBKE.LG	CashFlow from Financing	M&B Baker Nigeria PLC (MAYBKE.LG)	PY2008	-117.957

1. The menu section
2. The Queries section
3. The Data Preview section, and
4. The Query Settings section (which only shows up when you have/selected a Query)

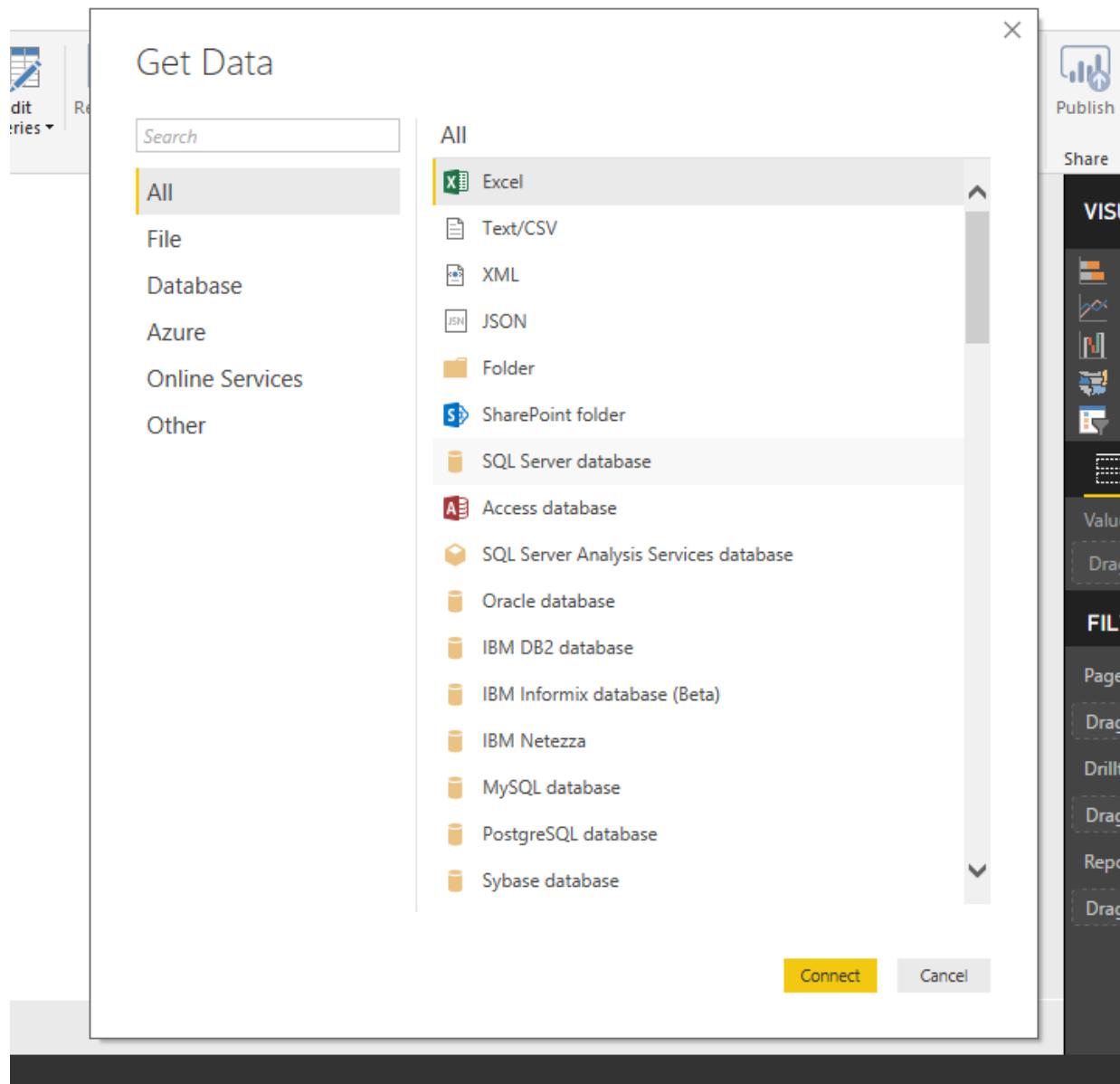
## The Query Editor

When you launch the Power BI Desktop, the start up screen you get has Get Data on the top left side.



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The Get Data is the your first window into the Query Editor. If you are familiar with Excel, the Query Editor is the exact replica of PowerQuery.



In Power BI, it is your main data manipulation and data cleaning tool. Once you connect to the data you want to analyse, it is good to go to the Query Editor to examine the data and if the data needs some cleaning or transformation, do all that transformation in the Query Editor.

## Get Data

The screenshot shows the 'Get Data' interface in Power BI. On the left, a sidebar lists categories: All, File, Database, Azure, Online Services, and Other. A red arrow points from the 'Database' category to the list of data sources on the right. The list is titled 'All' and includes: Excel, Text/CSV, XML, JSON, Folder, SharePoint folder, SQL Server database (which is highlighted with a yellow background), Access database, SQL Server Analysis Services database, Oracle database, IBM DB2 database, IBM Informix database (Beta), IBM Netezza, MySQL database, PostgreSQL database, and Sybase database. A second red arrow points from the 'SQL Server database' item to the 'Connect' button at the bottom right of the list. The 'Connect' button is highlighted with a yellow background.

Search

All

File

Database

Azure

Online Services

Other

All

Excel

Text/CSV

XML

JSON

Folder

SharePoint folder

SQL Server database

Access database

SQL Server Analysis Services database

Oracle database

IBM DB2 database

IBM Informix database (Beta)

IBM Netezza

MySQL database

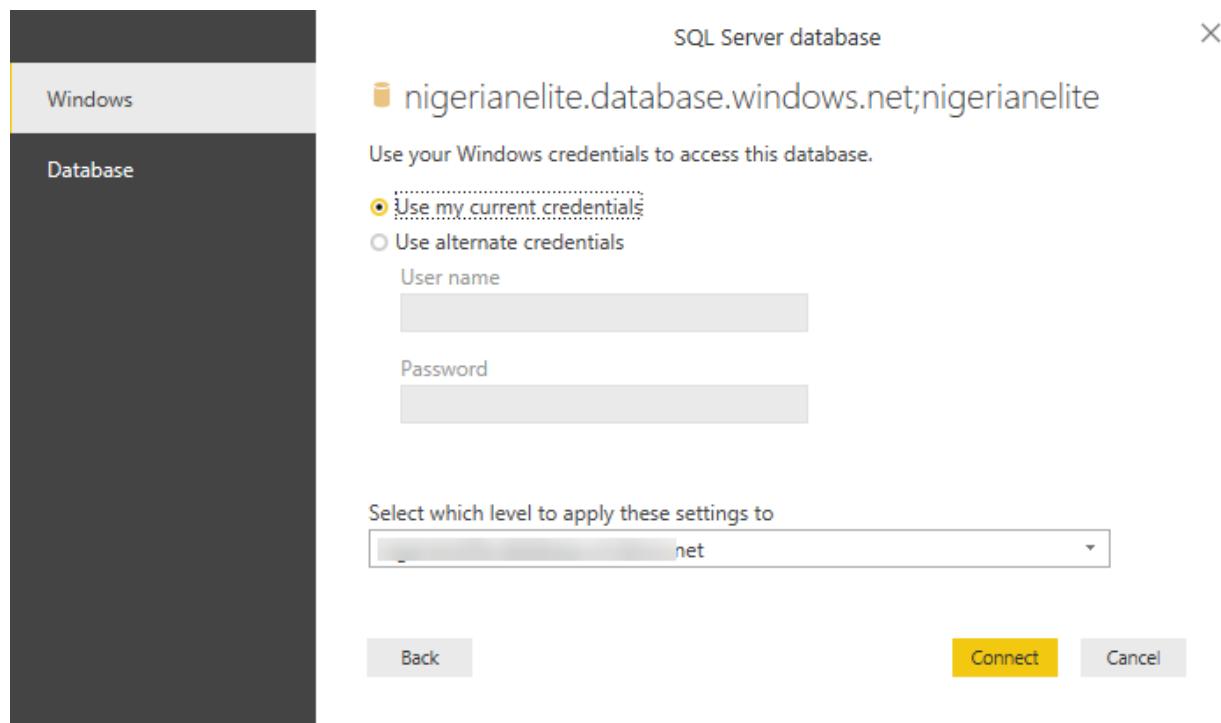
PostgreSQL database

Sybase database

Connect

Cancel

## SQL Server database



## Navigator

The screenshot shows the Power BI Navigator interface. At the top right are close and search/x icons. Below the title is a search bar and a 'Display Options' dropdown. A tree view lists various tables under a folder named 'iigeria...'. The tables listed include pbist\_twitter.vw\_authorhashtag\_graph, pbist\_twitter.vw\_authormention\_graph, pbist\_twitter.vw\_configuration, pbist\_twitter.vw\_hashtag\_slicer, pbist\_twitter.vw\_mention\_slicer, pbist\_twitter.vw\_tweets\_normalized, pbist\_twitter.vw\_tweets\_processed, sys.database\_firewall\_rules, \_\_EFMigrationsHistory, \_\_MigrationHistory, AspNetRoleClaims, AspNetRoles, AspNetUserClaims, AspNetUserLogins, AspNetUserRoles, AspNetUsers, AspNetUserTokens, CrudePrice, and Current\_Assets. To the right of the tree view is a vertical scroll bar. Below the tree view is a message: 'No items selected for preview'. At the bottom are three buttons: 'Select Related Tables' (highlighted in a red box), 'Load', 'Edit', and 'Cancel'.

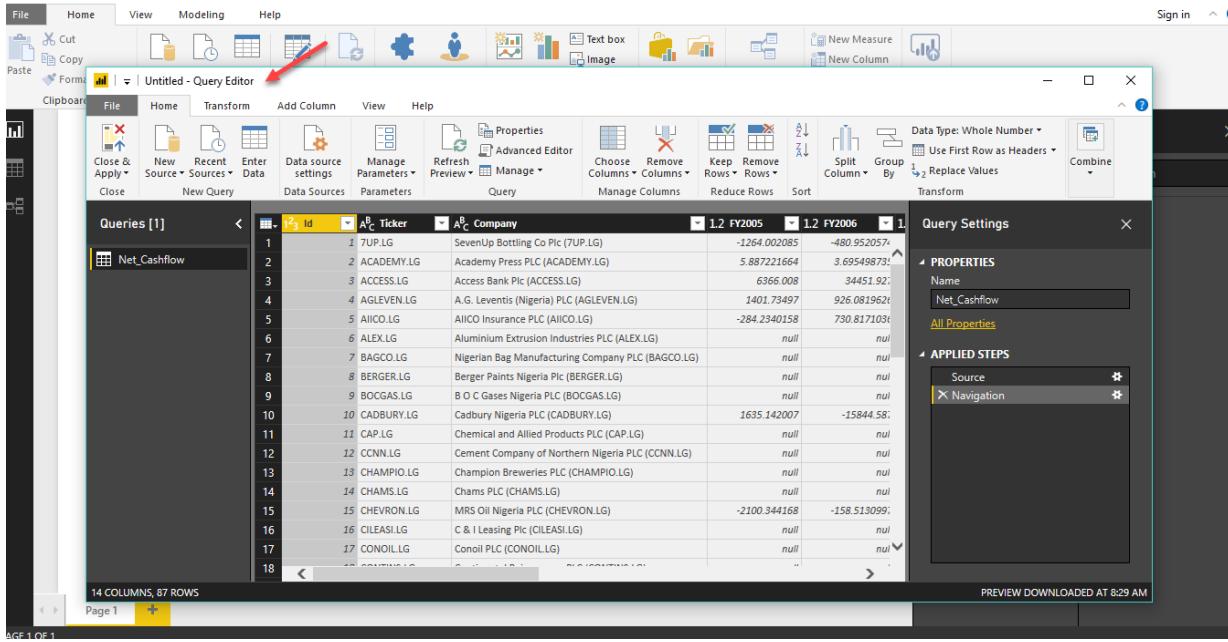
## Navigator

The screenshot shows the Power BI Navigator interface. On the left, there is a tree view of data sources and tables. The 'Net\_Cashflow' table is selected, indicated by a yellow border around its row in the tree view. The main area displays the 'Net\_Cashflow' table with columns: Id, Ticker, Company, and FY2005. The table contains 23 rows of data. At the bottom right of the table view, there are three buttons: 'Load' (yellow), 'Edit' (grey with a red arrow pointing to it), and 'Cancel'. The 'Edit' button is highlighted with a red arrow.

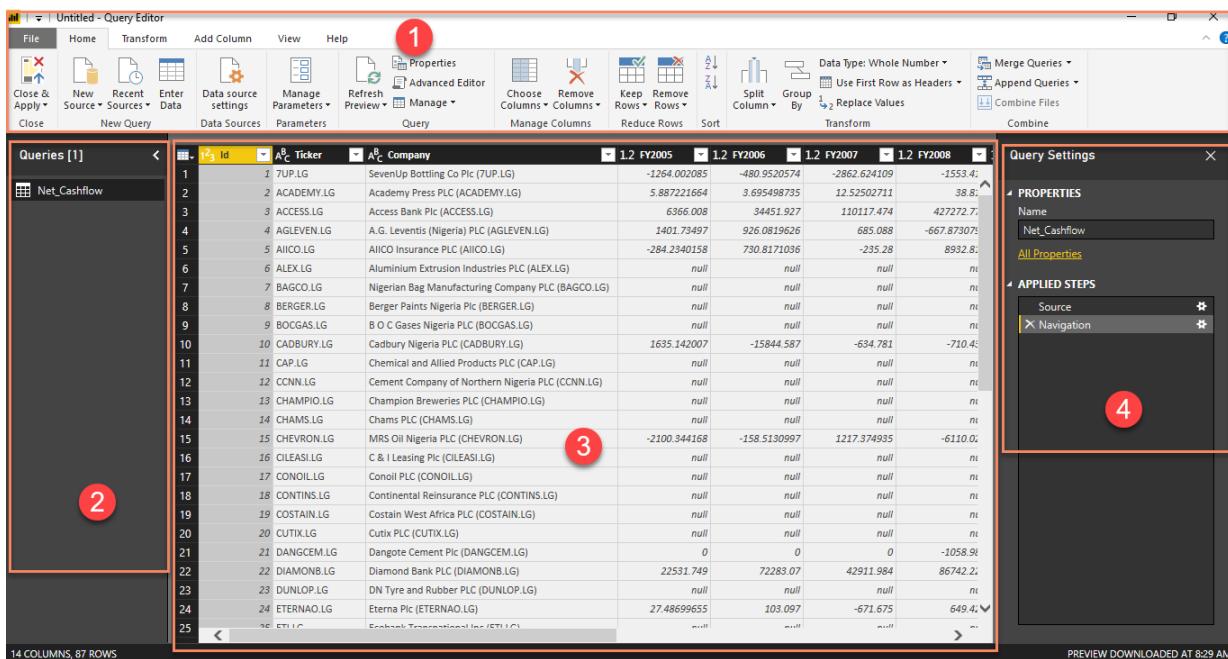
ID	Ticker	Company	FY2005
1	7UP.LG	SevenUp Bottling Co Plc (7UP.LG)	
2	ACADEMY.LG	Academy Press PLC (ACADEMY.LG)	
3	ACCESS.LG	Access Bank Plc (ACCESS.LG)	
4	AGLEVEN.LG	A.G. Leventis (Nigeria) PLC (AGLEVEN.LG)	
5	AIICO.LG	AIICO Insurance PLC (AIICO.LG)	
6	ALEX.LG	Aluminium Extrusion Industries PLC (ALEX.LG)	
7	BAGCO.LG	Nigerian Bag Manufacturing Company PLC (BAGCO.LG)	
8	BERGER.LG	Berger Paints Nigeria Plc (BERGER.LG)	
9	BOCGAS.LG	B O C Gases Nigeria PLC (BOCGAS.LG)	
10	CADBURY.LG	Cadbury Nigeria PLC (CADBURY.LG)	
11	CAP.LG	Chemical and Allied Products PLC (CAP.LG)	
12	CCNN.LG	Cement Company of Northern Nigeria PLC (CCNN.LG)	
13	CHAMPIO.LG	Champion Breweries PLC (CHAMPIO.LG)	
14	CHAMS.LG	Chams PLC (CHAMS.LG)	
15	CHEVRON.LG	MRS Oil Nigeria PLC (CHEVRON.LG)	
16	CILEASI.LG	C & I Leasing Plc (CILEASI.LG)	
17	CONOIL.LG	Conoil PLC (CONOIL.LG)	
18	CONTINS.LG	Continental Reinsurance PLC (CONTINS.LG)	
19	COSTAIN.LG	Costain West Africa PLC (COSTAIN.LG)	
20	CUTIX.LG	Cutix PLC (CUTIX.LG)	
21	DANGCEM.LG	Dangote Cement Plc (DANGCEM.LG)	
22	DIAMONB.LG	Diamond Bank PLC (DIAMONB.LG)	
23	DUNLOP.LG	DN Tyre and Rubber PLC (DUNLOP.LG)	

Clicking on Edit when finally done takes you to the Query Editor, and I recommend you always use Edit rather than Load which brings in the entire data without allowing for preview and modification/transformation.

Below is what the Query Editor looks like and it always opens as a separate window from the main Power BI window.



The Query Editor can be divided into four functional sections.



1. Menu section
2. Queries section
3. Data Preview section, and
4. Query Settings section.

The Menu section is more like the control panel housing all the tools you will need for most of your data cleaning and data transformation processes. In the end, it is a

section you will have to be very conversant with and we will do some practical demonstration of real world analysis that involves using this section.

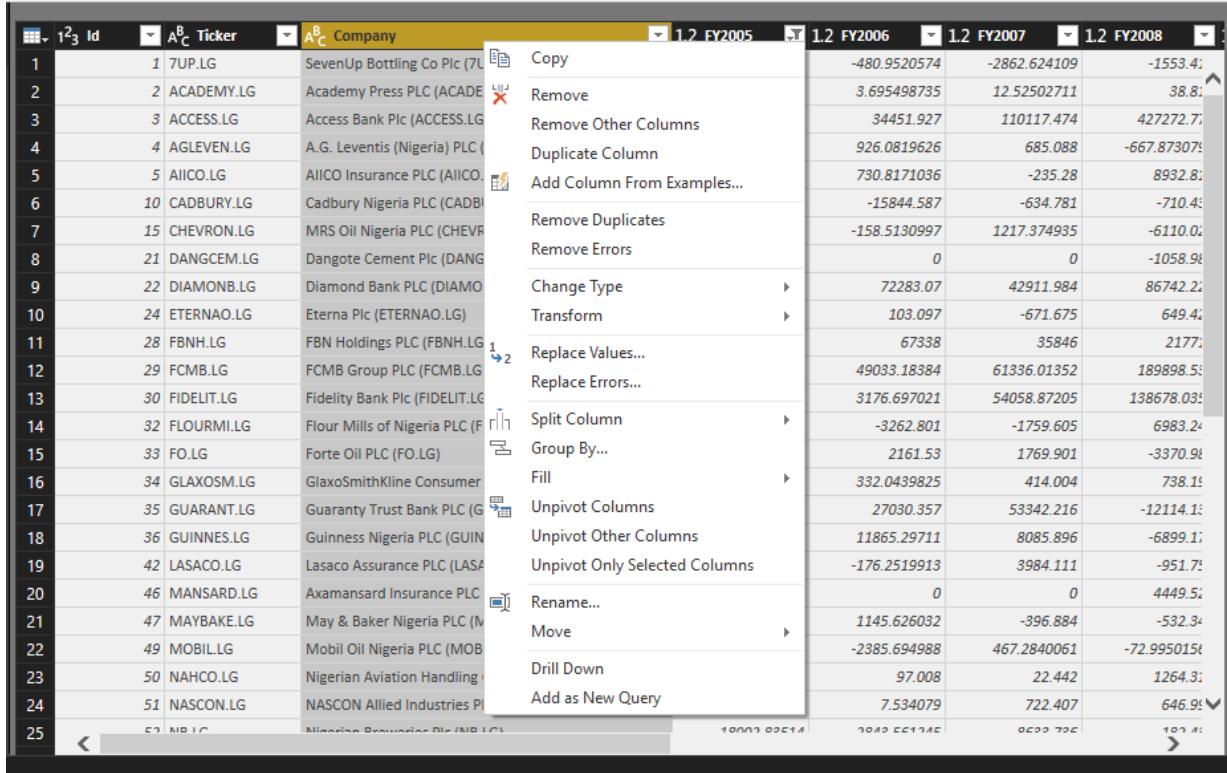
The Queries section mainly lists all the data sources you are connected to. Right-clicking on any of the data source gives you some very useful set of options.

The screenshot shows the Power BI Query Editor interface. The top navigation bar includes File, Home, Transform, Add Column, View, and Help. Below the navigation bar are various icons for managing data sources and queries. The main area displays a table with columns 'Id' and 'Ticker'. A context menu is open over the first row of the table, listing options such as Copy, Paste, Delete, Rename, Enable load, Include in report refresh, Duplicate, Reference, Move To Group, Move Up, Move Down, Create Function..., Convert To Parameter, Advanced Editor, and Properties... The table preview shows three rows of data: Id 1, Ticker 7UP.LG; Id 20, Ticker CUTIX.LG; and Id 21, Ticker DANGCEM.LG.

	Id	Ticker
1	7UP.LG	
20	CUTIX.LG	
21	DANGCEM.LG	

The Data Preview section shows a preview of the data selected in the Queries section. This gives the Query Editor some advantages over loading the data directly into the Data model, especially in a case of a large data set that would take too many system resources and time to load. By loading just a preview, one can get working immediately on the data and even set filters and formulas to pull in just the segment

of the dataset that is needed rather than pulling in the entire dataset. It also has some useful features — like filter, rename, delete, replace errors and others.



The screenshot shows the Power BI Query Editor interface. A context menu is open over a table containing data for various companies. The table has columns: Id, Ticker, Company, and four financial years: FY2005, FY2006, FY2007, and FY2008. The context menu includes options such as Copy, Remove, Remove Other Columns, Duplicate Column, Add Column From Examples..., Remove Duplicates, Remove Errors, Change Type, Transform, Replace Values..., Replace Errors..., Split Column, Group By..., Fill, Unpivot Columns, Unpivot Other Columns, Unpivot Only Selected Columns, Rename..., Move, Drill Down, and Add as New Query. The data in the table includes entries like SevenUp Bottling Co Plc (7UP.LG), Academy Press PLC (ACADEMY.LG), Access Bank Plc (ACCESS.LG), A.G. Leventis (Nigeria) PLC (AGLEVEN.LG), and many others from the Nigerian stock market.

The Query Settings serves as a very interactive and feature-rich audit trail. It allows you to see all the transformation steps carried out in applied order. You can modify any step and re-order the steps if you want.

The screenshot shows the Power BI Query Editor interface. On the left, there is a preview of a data table with three columns: 'FY2006', '1.2 FY2007', and '1.2 FY2008'. The data consists of various numerical values, mostly negative, representing cash flows over three years. At the top of the editor, there are several transformation steps listed under the 'Transform' tab, including 'Group By', 'Replace Values', and 'Data Type: Text'. To the right of the preview, there is a 'Query Settings' pane. The 'PROPERTIES' section contains a 'Name' field set to 'Net\_Cashflow' and a link to 'All Properties'. The 'APPLIED STEPS' section lists four steps: 'Source', 'Navigation', 'Filtered Rows', and 'Renamed Columns', with 'Renamed Columns' being the most recent step applied.

FY2006	1.2 FY2007	1.2 FY2008
-480.9520574	-2862.624109	-155
3.695498735	12.52502711	3
34451.927	110117.474	42727
926.0819626	685.088	-667.87
730.8171036	-235.28	893
-15844.587	-634.781	-71
-158.5130997	1217.374935	-611
0	0	-105
72283.07	42911.984	8674
103.097	-671.675	64
67338	35846	2.
49033.18384	61336.01352	18989
3176.697021	54058.87205	138678
-3262.801	-1759.605	698
2161.53	1769.901	-337
332.0439825	414.004	73
27030.357	53342.216	-1211
11865.29711	8085.896	-685
-176.2519913	3984.111	-95
0	0	444
1145.626032	-396.884	-53
-2385.694988	467.2840061	-72.9951
97.008	22.442	126
7.534079	722.407	64
7042.551745	8033.735	10

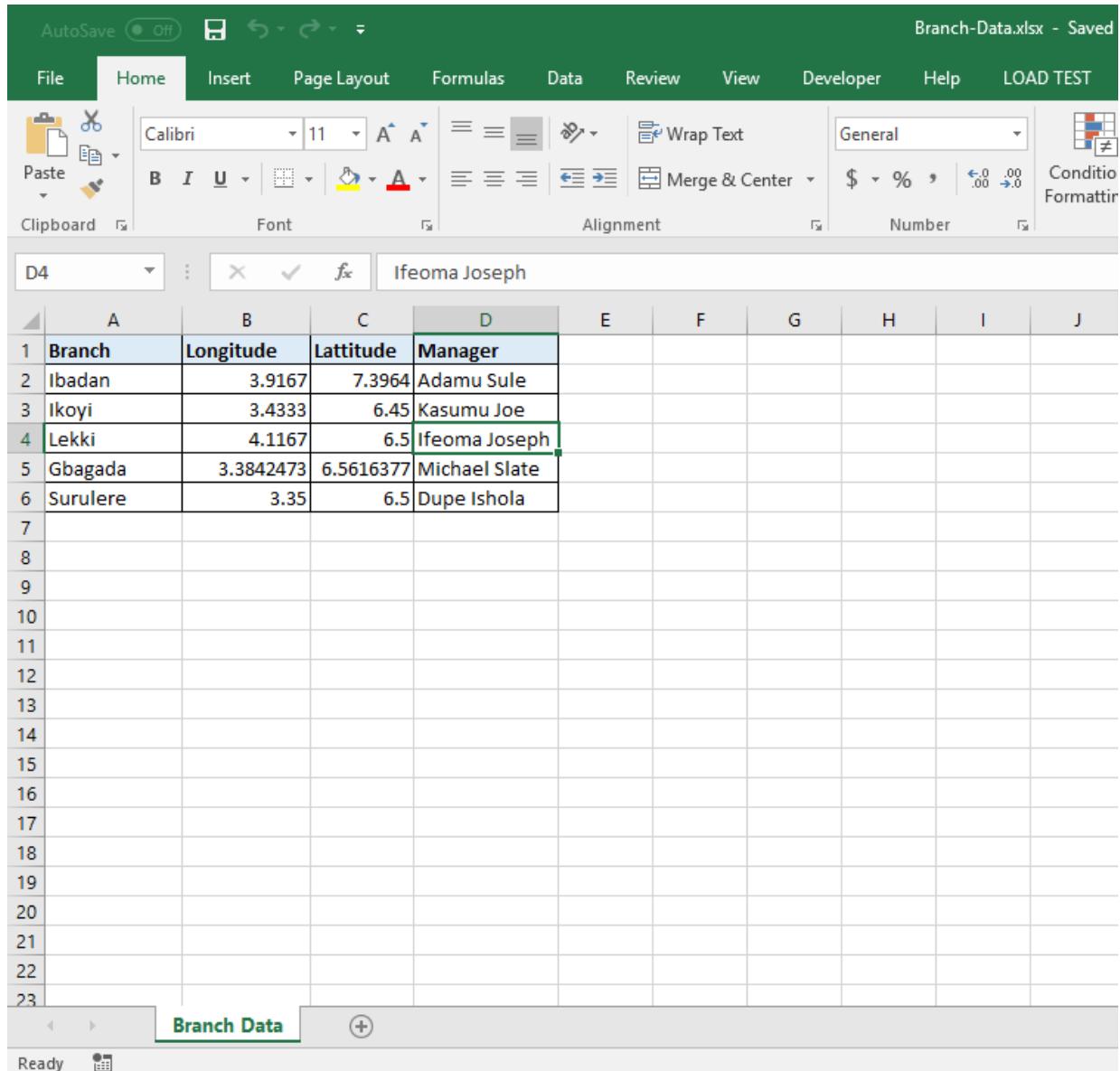
PREVIEW DOWNLOADED AT 8:29 AM

In future chapters we will do a few demonstrations that will help us further dive into the Query Editor and see its practical usefulness.

## Sample Project On Analysing Sales Data By Branch, Product And Target

For this sample project, we are going to build a Power BI report and dashboard for Domino's Pizza. I have gotten some fictitious data on their branches in Nigeria, two weeks sales data, daily target figures and product target figures for the period under analysis.

I have the data exported as Excel files. You can download the practice along files at <https://drive.google.com/file/d/1FCEkyJvW4viszv9wo43QaljXI2ADpCDD/view?usp=sharing>



The screenshot shows a Microsoft Excel spreadsheet titled "Branch-Data.xlsx - Saved". The ribbon menu is visible at the top, showing tabs for File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Help, and LOAD TEST. The Home tab is selected. The main area displays a table with data in rows 1 through 6. The columns are labeled A, B, C, D, E, F, G, H, I, and J. The first row contains column headers: "Branch", "Longitude", "Latitude", and "Manager". The second row contains data for Ibadan: 3.9167, 7.3964, Adamu Sule. The third row contains data for Ikoyi: 3.4333, 6.45, Kasumu Joe. The fourth row contains data for Lekki: 4.1167, 6.5, Ifeoma Joseph. The fifth row contains data for Gbagada: 3.3842473, 6.5616377, Michael Slate. The sixth row contains data for Surulere: 3.35, 6.5, Dupe Ishola. The "Manager" column for Lekki and Gbagada is highlighted with a green border. The table has a light gray background with white borders between cells. Row numbers 7 through 23 are listed on the left side, and column letters A through J are at the top. The status bar at the bottom shows "Ready" and a small icon.

	A	B	C	D	E	F	G	H	I	J
1	Branch	Longitude	Latitude	Manager						
2	Ibadan	3.9167	7.3964	Adamu Sule						
3	Ikoyi	3.4333	6.45	Kasumu Joe						
4	Lekki	4.1167	6.5	Ifeoma Joseph						
5	Gbagada	3.3842473	6.5616377	Michael Slate						
6	Surulere	3.35	6.5	Dupe Ishola						
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										

Sales-Data.xlsx - Saved

	A	B	C	D	E	F	G	H	I
1	S/N	Date	Branch	Pizza Sold	Price	Quantity	Time	Time Range	
2	1	12/11/2015	Ibadan	Meatzaa	₦ 2,000.00	5	8:00:01 AM	Before 9:00am	
3	2	12/14/2015	Ikoyi	Extravaganza	₦ 2,000.00	4	8:00:02 AM	Before 9:00am	
4	3	12/4/2015	Lekki	BBQ Chicken	₦ 4,000.00	5	8:00:04 AM	Before 9:00am	
5	4	12/14/2015	Ikoyi	Extravaganza	₦ 2,000.00	1	8:00:07 AM	Before 9:00am	
6	5	12/7/2015	Gbagada	Meatzaa	₦ 2,000.00	4	8:00:08 AM	Before 9:00am	
7	6	12/8/2015	Surulere	Hot Veggie	₦ 4,000.00	2	8:00:14 AM	Before 9:00am	
8	7	12/4/2015	Ibadan	BBQ Philly Steak	₦ 4,000.00	5	8:00:20 AM	Before 9:00am	
9	8	12/7/2015	Ikoyi	Chicken Feast	₦ 2,000.00	1	8:00:20 AM	Before 9:00am	
10	9	12/7/2015	Gbagada	Meatzaa	₦ 2,000.00	3	8:00:22 AM	Before 9:00am	
11	10	12/4/2015	Ibadan	Chicken Suya	₦ 4,000.00	5	8:00:25 AM	Before 9:00am	
12	11	12/12/2015	Lekki	Chicken Legend	₦ 2,000.00	5	8:00:26 AM	Before 9:00am	
13	12	12/9/2015	Gbagada	BBQ Philly Steak	₦ 4,000.00	4	8:00:27 AM	Before 9:00am	
14	13	12/15/2015	Gbagada	Chicken Suya	₦ 4,000.00	2	8:00:29 AM	Before 9:00am	
15	14	12/11/2015	Ibadan	Chicken Feast	₦ 2,000.00	5	8:00:33 AM	Before 9:00am	
16	15	12/5/2015	Surulere	Chicken Feast	₦ 2,000.00	4	8:00:33 AM	Before 9:00am	
17	16	12/7/2015	Lekki	Beef Suya	₦ 3,000.00	5	8:00:34 AM	Before 9:00am	
18	17	12/8/2015	Gbagada	Chicken Feast	₦ 2,000.00	5	8:00:35 AM	Before 9:00am	
19	18	12/14/2015	Lekki	Hot Veggie	₦ 4,000.00	5	8:00:35 AM	Before 9:00am	
20	19	12/11/2015	Surulere	Meatzaa	₦ 2,000.00	5	8:00:35 AM	Before 9:00am	
21	20	12/11/2015	Ibadan	Meatzaa	₦ 2,000.00	2	8:00:36 AM	Before 9:00am	
22	21	12/6/2015	Lekki	Margarita	₦ 4,000.00	3	8:00:37 AM	Before 9:00am	
23	22	12/14/2015	Surulere	Italiano	₦ 3,000.00	5	8:00:40 AM	Before 9:00am	

Sales Data

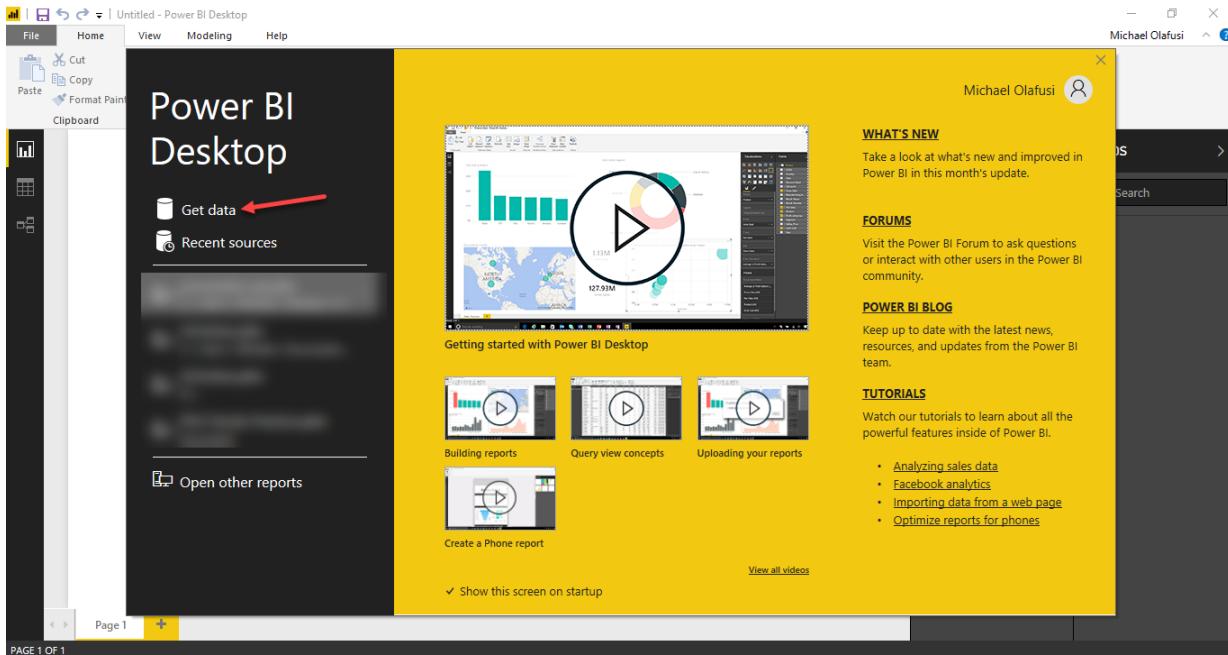
The screenshot shows a Microsoft Excel spreadsheet titled "Daily-Sales-Target.xlsx - Saved". The ribbon menu is visible at the top, with the "Home" tab selected. The main content is a table with columns labeled A through J. Column A is "Day" and column B is "Target". The data starts from row 2 and continues to row 14. The cells contain dates from December 3, 2015, to December 15, 2015, and their corresponding targets in Nigerian Naira (₦). Row 15 is empty, followed by rows 16 through 23 which are also empty. The status bar at the bottom shows "Ready" and a small icon.

	A	B	C	D	E	F	G	H	I	J
1	Day	Target								
2	12/3/2015	₦ 4,138,200.00								
3	12/4/2015	₦ 2,870,400.00								
4	12/5/2015	₦ 4,193,200.00								
5	12/6/2015	₦ 3,872,000.00								
6	12/7/2015	₦ 4,506,000.00								
7	12/8/2015	₦ 4,269,600.00								
8	12/9/2015	₦ 4,148,400.00								
9	12/10/2015	₦ 3,852,200.00								
10	12/11/2015	₦ 2,935,200.00								
11	12/12/2015	₦ 3,475,800.00								
12	12/13/2015	₦ 3,231,900.00								
13	12/14/2015	₦ 3,231,900.00								
14	12/15/2015	₦ 3,686,100.00								
15										
16										
17										
18										
19										
20										
21										
22										
23										

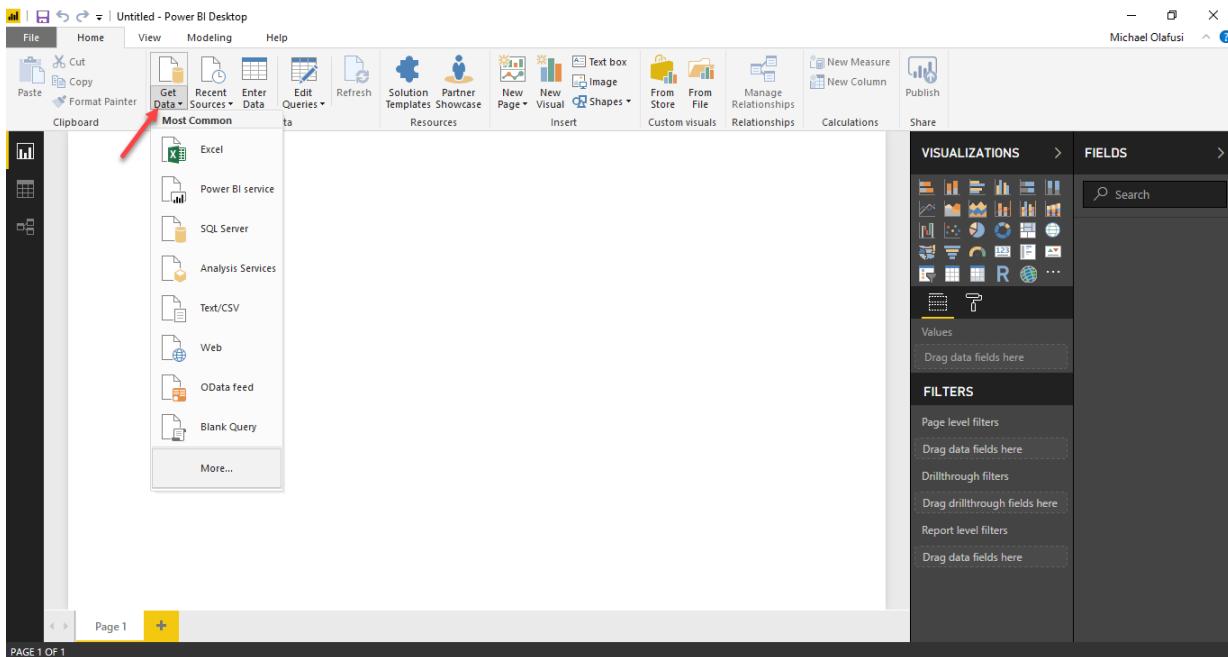
The screenshot shows a Microsoft Excel spreadsheet titled "Sales-Target.xlsx - Saved". The ribbon menu is visible at the top, with "Home" selected. The table below contains 17 rows of data, each consisting of a food item name in column A and its corresponding sales target in column B. The formula bar at the bottom displays the text "=Sales Target".

	A	B	C	D	E	F	G	H
1	Pizza	Sales Target						
2	BBQ Chicken	₦ 4,320,000.00						
3	BBQ Philly Steak	₦ 3,808,000.00						
4	Beef Suya	₦ 2,943,000.00						
5	Chicken Bali	₦ 1,600,200.00						
6	Chicken Feast	₦ 1,395,200.00						
7	Chicken Legend	₦ 1,766,000.00						
8	Chicken Suya	₦ 3,441,600.00						
9	Extravaganza	₦ 1,451,200.00						
10	Hot Pepperoni Feast	₦ 4,292,000.00						
11	Hot Veggie	₦ 3,040,000.00						
12	Italiano	₦ 3,250,500.00						
13	Margarita	₦ 3,832,400.00						
14	Meatzaa	₦ 1,508,400.00						
15	Pepperoni Feast	₦ 3,265,200.00						
16	Pepperoni Suya	₦ 2,907,900.00						
17	Veggie Supreme	₦ 2,421,600.00						
18								
19								
20								
21								
22								
23								

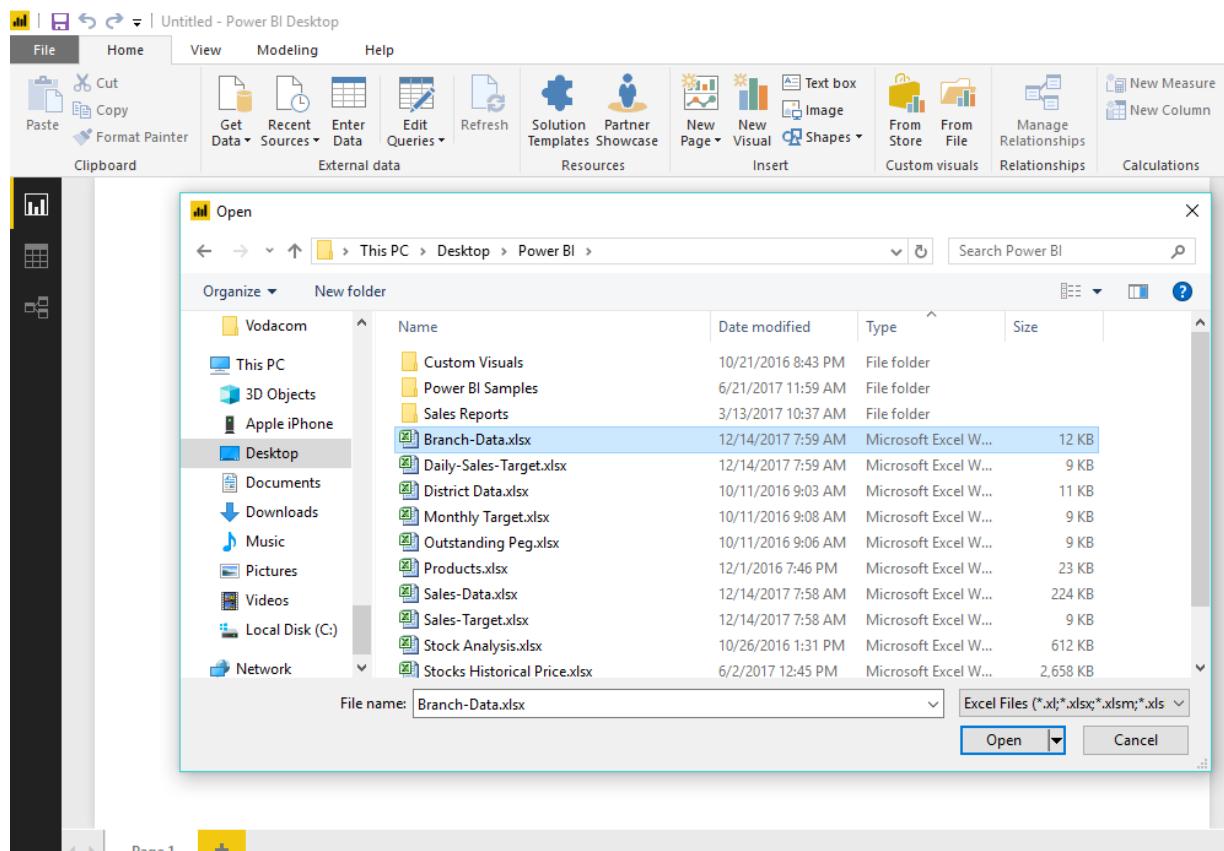
Making sure the Excel files are closed, we are going to use Power BI's Get Data to bring in the data. If you have the startup screen then you can locate the Get Data on the top left.

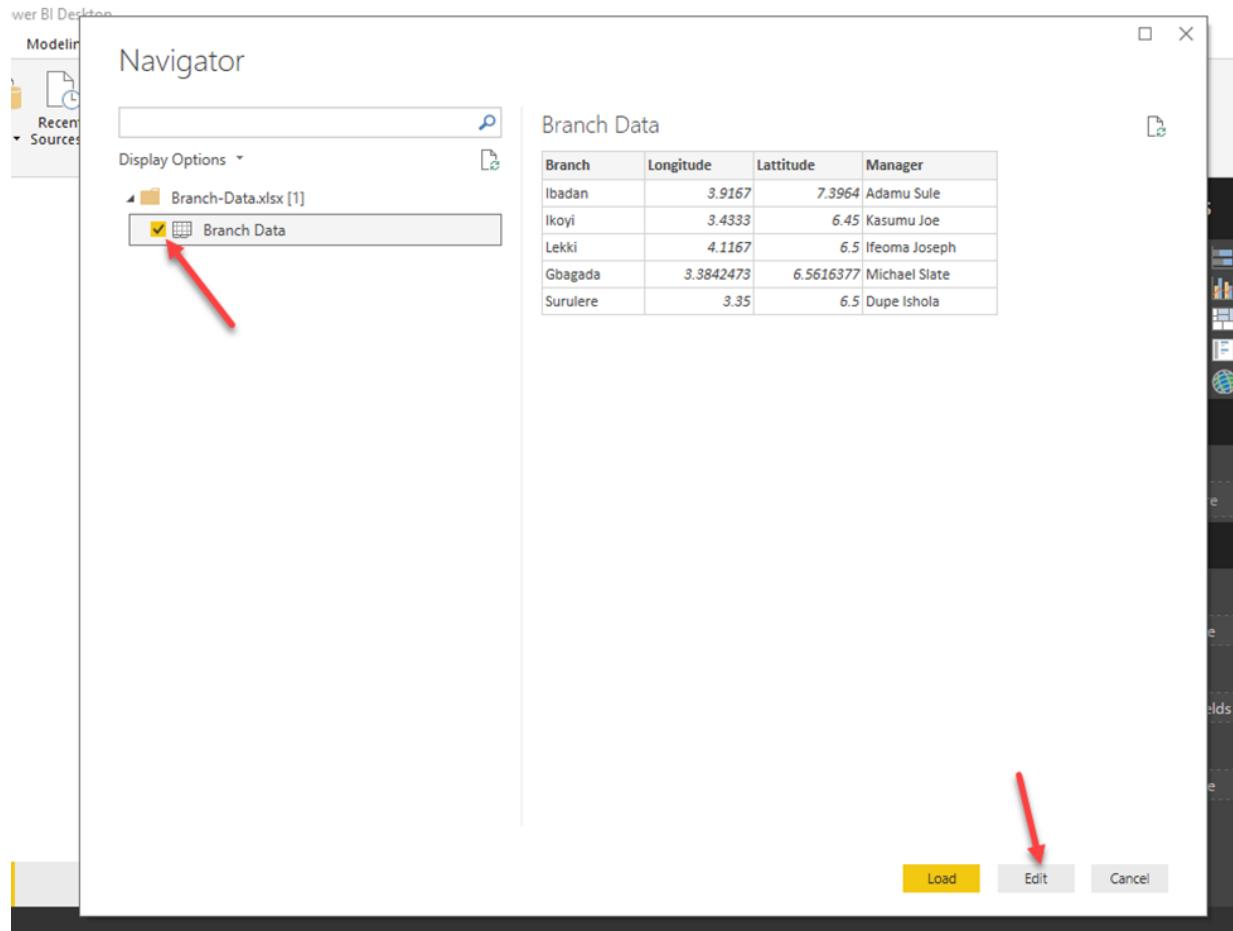


But if you are on the main Power BI window, then you will have to access it on the Home menu bar.



Bring in the data





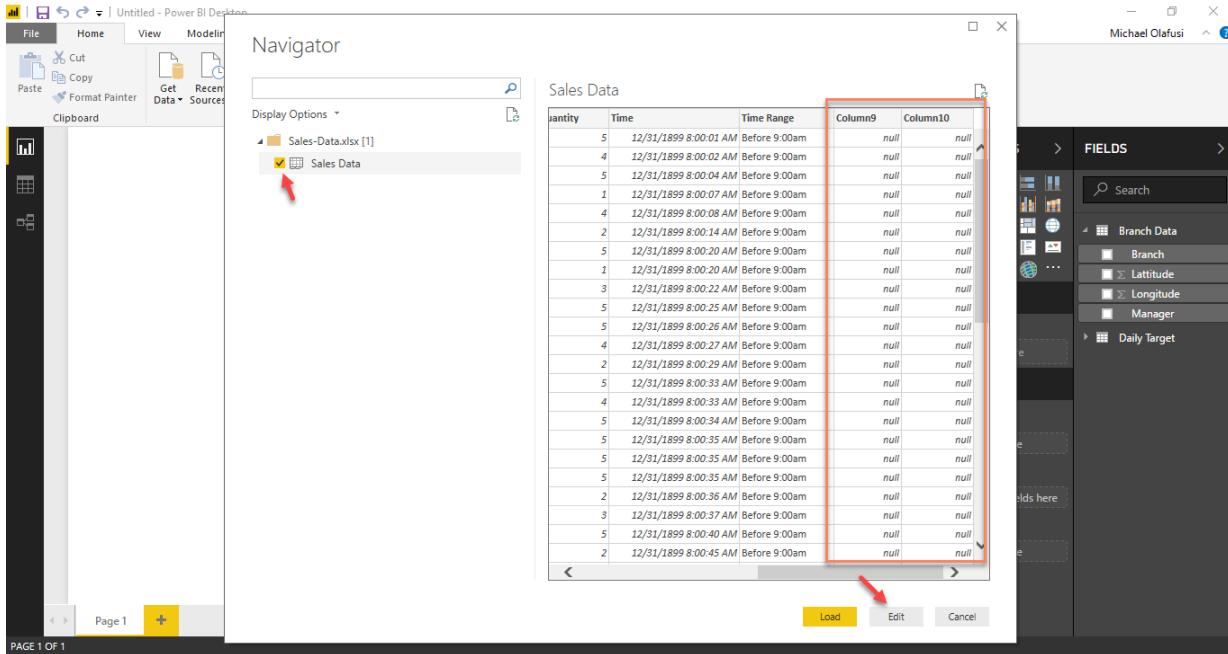
I prefer you make a habit of choosing Edit (when you work a lot more, especially with large live databases, you'll experience the why).

The screenshot shows the Power BI Query Editor interface. On the left, there's a sidebar titled 'Queries [1]' containing 'Branch Data'. The main area displays a table with 5 rows and 4 columns. The columns are labeled 'Branch', 'Longitude', 'Latitude', and 'Manager'. The 'Manager' column contains names like 'Adamu Sule', 'Kasumu Joe', etc. The 'Latitude' column is highlighted in yellow. In the top-left corner of the main area, there's a red arrow pointing to the 'Close & Apply' button. To the right, there's a 'Query Settings' pane showing 'Properties' (Name: Branch Data) and 'Applied Steps' (Source, Navigation, Promoted Headers, Changed Type).

Check if you need to make any changes, like delete an unneeded column or filter out rows you don't need. Then click Close and Apply on the top left corner of the Query Editor.

The screenshot shows the Power BI Desktop interface. At the top, there's a ribbon with 'File', 'Home', 'Modeling', and 'Help' tabs. Below the ribbon, there are various toolbars and panes. A central modal dialog box is open, titled 'Apply query changes', showing 'Branch Data' and 'Loading data to model...'. To the right, there are two large panes: 'VISUALIZATIONS' and 'FIELDS'. The 'FIELDS' pane includes a search bar and sections for 'Values' (with a placeholder 'Drag data fields here') and 'FILTERS' (with sections for 'Page level filters', 'Drillthrough filters', 'Report level filters', each with a placeholder 'Drag data fields here').

And you are back in the Data Model (or main Power BI window). Now load in the other data files. Below is the step for the Sales Data.



This is a case where you'll need to get rid of unwanted columns and it's better to do it in the Edit step and also set the Time field to Time data type. It is also good to let you know that you can actually do all this from the main Power BI window, in the Data section.

The screenshot shows the Power BI Editor interface. A context menu is open over the 'Time' column header, which is highlighted in yellow. The menu is titled 'Data Type: Date/Time'. Three red numbered callouts point to specific items:

- Callout 1 points to the 'Manage Columns' button in the ribbon toolbar.
- Callout 2 points to the 'Data Type: Date/Time' dropdown menu.
- Callout 3 points to the 'Time' option in the dropdown menu.

The main data grid below shows a list of rows with columns 'Quantity', 'Time', and 'Time Range'. The 'Time' column contains dates and times like '12/31/1899 8:00:01 AM'. The 'Time Range' column contains descriptions like 'Before 9:00am'. The 'Time' column header is currently set to 'Date/Time'.

Quantity	Time	Time Range
5	12/31/1899 8:00:01 AM	Before 9:00am
4	12/31/1899 8:00:02 AM	Before 9:00am
5	12/31/1899 8:00:04 AM	Before 9:00am
1	12/31/1899 8:00:07 AM	Before 9:00am
4	12/31/1899 8:00:08 AM	Before 9:00am
2	12/31/1899 8:00:14 AM	Before 9:00am
5	12/31/1899 8:00:20 AM	Before 9:00am
1	12/31/1899 8:00:20 AM	Before 9:00am
3	12/31/1899 8:00:22 AM	Before 9:00am
5	12/31/1899 8:00:25 AM	Before 9:00am
5	12/31/1899 8:00:26 AM	Before 9:00am
4	12/31/1899 8:00:27 AM	Before 9:00am
2	12/31/1899 8:00:29 AM	Before 9:00am
5	12/31/1899 8:00:33 AM	Before 9:00am
4	12/31/1899 8:00:33 AM	Before 9:00am
5	12/31/1899 8:00:34 AM	Before 9:00am
5	12/31/1899 8:00:35 AM	Before 9:00am
5	12/31/1899 8:00:35 AM	Before 9:00am
5	12/31/1899 8:00:35 AM	Before 9:00am

The screenshot shows the Power BI Query Editor interface. A modal dialog box titled "Change Column Type" is open over the data grid. The dialog contains the message: "The selected column has an existing type conversion. Would you like to replace the existing conversion, or preserve the existing conversion and add the new conversion as a separate step?" Below the message are three buttons: "Replace current" (highlighted with a red arrow), "Add new step", and "Cancel". The background data grid shows columns: Price, Quantity, Time, Time Range, Column9, and Column1. The "Time" column is currently set to "Data Type: Date/Time" and "Use First Row as Headers".

The screenshot shows the Power BI Query Editor interface with the "Time" column selected. The "Data Type" dropdown is set to "Time" and "Use First Row as Headers". The "Applied Steps" pane on the right shows a list of steps, with "Changed Type" highlighted with a red arrow. The "Properties" pane shows the query is named "Sales Data".

Price	Quantity	Time	Time Range	Column9	Column10
2000	5	8:00:01 AM	Before 9:00am	null	null
2000	4	8:00:02 AM	Before 9:00am	null	null
4000	5	8:00:04 AM	Before 9:00am	null	null
2000	1	8:00:07 AM	Before 9:00am	null	null
2000	4	8:00:08 AM	Before 9:00am	null	null
4000	2	8:00:14 AM	Before 9:00am	null	null
4000	5	8:00:20 AM	Before 9:00am	null	null
2000	1	8:00:20 AM	Before 9:00am	null	null
2000	3	8:00:22 AM	Before 9:00am	null	null
4000	5	8:00:25 AM	Before 9:00am	null	null
2000	5	8:00:26 AM	Before 9:00am	null	null
4000	4	8:00:27 AM	Before 9:00am	null	null
4000	2	8:00:29 AM	Before 9:00am	null	null
2000	5	8:00:33 AM	Before 9:00am	null	null
2000	4	8:00:33 AM	Before 9:00am	null	null
3000	5	8:00:34 AM	Before 9:00am	null	null

Sales Editor

Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Any Use First Row as Headers Replace Values Merge Queries Append Queries Combine Files Combine

Manage Columns Reduce Rows Transform

Quantity Time ABC Time Range ABC Column9 ABC Column10

Quantity	Time	ABC Time Range	Column9	Column10
5	8:00:01 AM	Before 9:00am	null	
4	8:00:02 AM	Before 9:00am	null	
5	8:00:04 AM	Before 9:00am	null	
1	8:00:07 AM	Before 9:00am	null	
4	8:00:08 AM	Before 9:00am	null	
2	8:00:14 AM	Before 9:00am	null	
5	8:00:20 AM	Before 9:00am	null	
1	8:00:20 AM	Before 9:00am	null	
3	8:00:22 AM	Before 9:00am	null	
5	8:00:25 AM	Before 9:00am	null	
5	8:00:26 AM	Before 9:00am	null	
4	8:00:27 AM	Before 9:00am	null	
2	8:00:29 AM	Before 9:00am	null	
5	8:00:33 AM	Before 9:00am	null	
4	8:00:33 AM	Before 9:00am	null	
5	8:00:34 AM	Before 9:00am	null	
5	8:00:35 AM	Before 9:00am	null	
5	8:00:35 AM	Before 9:00am	null	
5	8:00:35 AM	Before 9:00am	null	
2	8:00:36 AM	Before 9:00am	null	

Query Settings

- Copy
- Remove Columns X
- Remove Other Columns
- Add Column From Example
- Remove Errors
- Fill
- Change Type
- Merge Columns
- Unpivot Columns
- Unpivot Other Columns
- Unpivot Only Selected Columns
- Move

The screenshot shows the Power BI Data Editor interface. On the left is a table with columns: Pizza Sold, Price, Quantity, Time, and Time Range. The table contains various pizza names and their sales details. On the right is the 'Query Settings' pane, which includes sections for 'PROPERTIES' (Name set to 'Sales Data') and 'APPLIED STEPS'. The 'APPLIED STEPS' section lists several steps: 'Source', 'Navigation', 'Promoted Headers', 'Changed Type', and 'Removed Columns'. A red arrow points to the 'Removed Columns' step, highlighting it.

Pizza Sold	Price	Quantity	Time	Time Range
Meatzaa	2000	5	8:00:01 AM	Before 9:00am
Extravaganza	2000	4	8:00:02 AM	Before 9:00am
BBQ_Chicken	4000	5	8:00:04 AM	Before 9:00am
Extravaganza	2000	1	8:00:07 AM	Before 9:00am
Meatzaa	2000	4	8:00:08 AM	Before 9:00am
Hot Veggie	4000	2	8:00:14 AM	Before 9:00am
BBQ Philly Steak	4000	5	8:00:20 AM	Before 9:00am
Chicken Feast	2000	1	8:00:20 AM	Before 9:00am
Meatzaa	2000	3	8:00:22 AM	Before 9:00am
Chicken Suya	4000	5	8:00:25 AM	Before 9:00am
Chicken Legend	2000	5	8:00:26 AM	Before 9:00am
BBQ Philly Steak	4000	4	8:00:27 AM	Before 9:00am
Chicken Suya	4000	2	8:00:29 AM	Before 9:00am
Chicken Feast	2000	5	8:00:33 AM	Before 9:00am
Chicken Feast	2000	4	8:00:33 AM	Before 9:00am
Beef Suya	3000	5	8:00:34 AM	Before 9:00am
Chicken Feast	2000	5	8:00:35 AM	Before 9:00am
Hot Veggie	4000	5	8:00:35 AM	Before 9:00am
Meatzaa	2000	5	8:00:35 AM	Before 9:00am
Meatzaa	2000	2	8:00:36 AM	Before 9:00am
Margarita	4000	3	8:00:37 AM	Before 9:00am

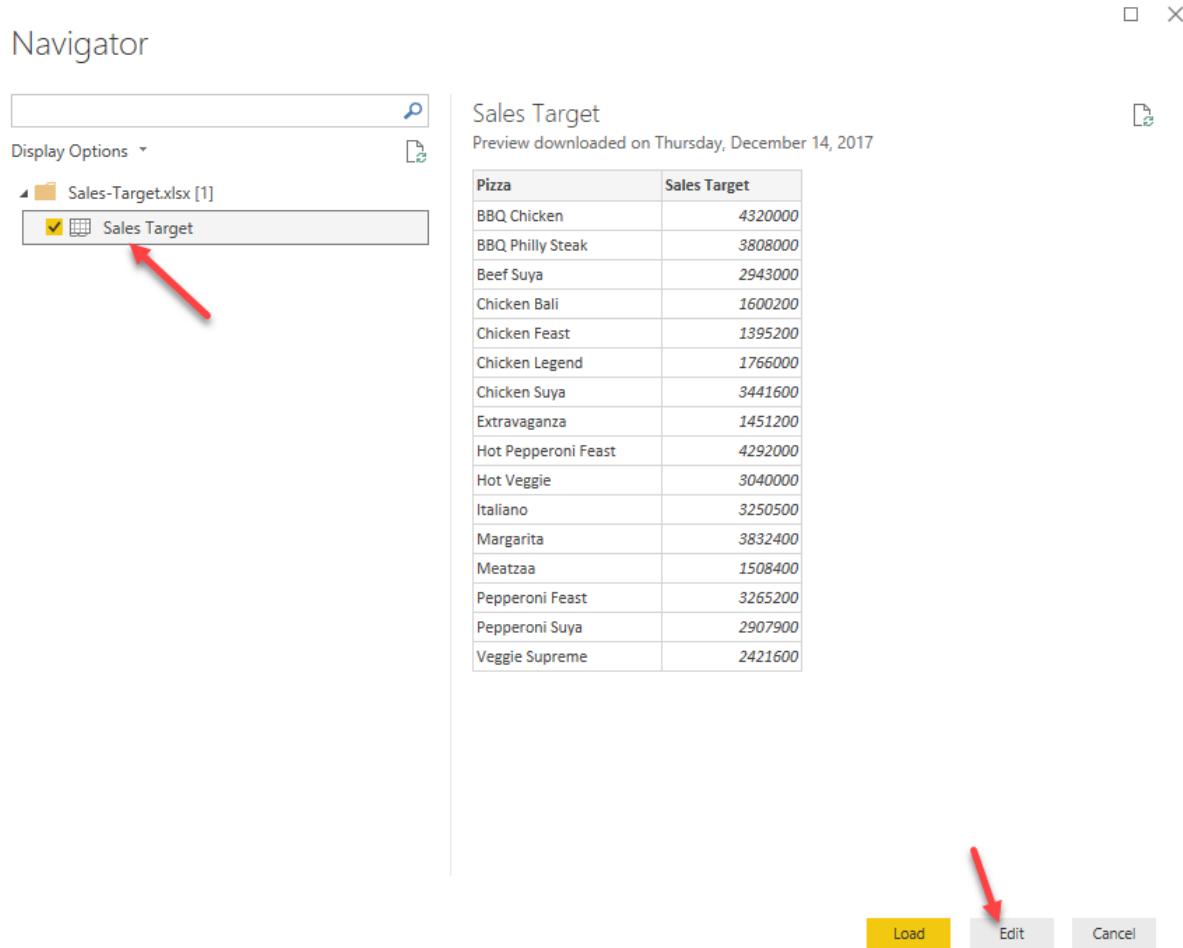
You will notice an audit trail of your steps on the right.

Don't forget to do the Close and Apply.

The screenshot shows the Power BI Query Editor interface. The ribbon at the top has tabs for File, Home, Transform, Add Column, View, and Help. The 'File' tab is selected, showing options like Close, Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters, Refresh Preview, Properties, Advanced Editor, and Manage. Below the ribbon is a 'Queries [3]' pane on the left containing three items: Branch Data, Daily Target, and Sales Data (which is currently selected). The main area displays a table of sales data with columns: S/N, Date, Branch, Pizza Sold, Price, and Quantity. The data consists of 19 rows of sales records.

S/N	Date	Branch	Pizza Sold	Price	Quantity
1	12/11/2015	Ibadan	Meatzaa	2000	5
2	12/14/2015	Ikoyi	Extravaganza	2000	4
3	12/4/2015	Lekki	BBQ Chicken	4000	5
4	12/14/2015	Ikoyi	Extravaganza	2000	1
5	12/7/2015	Gbagada	Meatzaa	2000	4
6	12/8/2015	Surulere	Hot Veggie	4000	2
7	12/4/2015	Ibadan	BBQ Philly Steak	4000	5
8	12/7/2015	Ikoyi	Chicken Feast	2000	1
9	12/7/2015	Gbagada	Meatzaa	2000	3
10	12/4/2015	Ibadan	Chicken Suya	4000	5
11	12/12/2015	Lekki	Chicken Legend	2000	5
12	12/9/2015	Gbagada	BBQ Philly Steak	4000	4
13	12/15/2015	Gbagada	Chicken Suya	4000	2
14	12/11/2015	Ibadan	Chicken Feast	2000	5
15	12/5/2015	Surulere	Chicken Feast	2000	4
16	12/7/2015	Lekki	Beef Suya	3000	5
17	12/8/2015	Gbagada	Chicken Feast	2000	5
18	12/14/2015	Lekki	Hot Veggie	4000	5
19	12/11/2015	Surulere	Meatzaa	2000	5

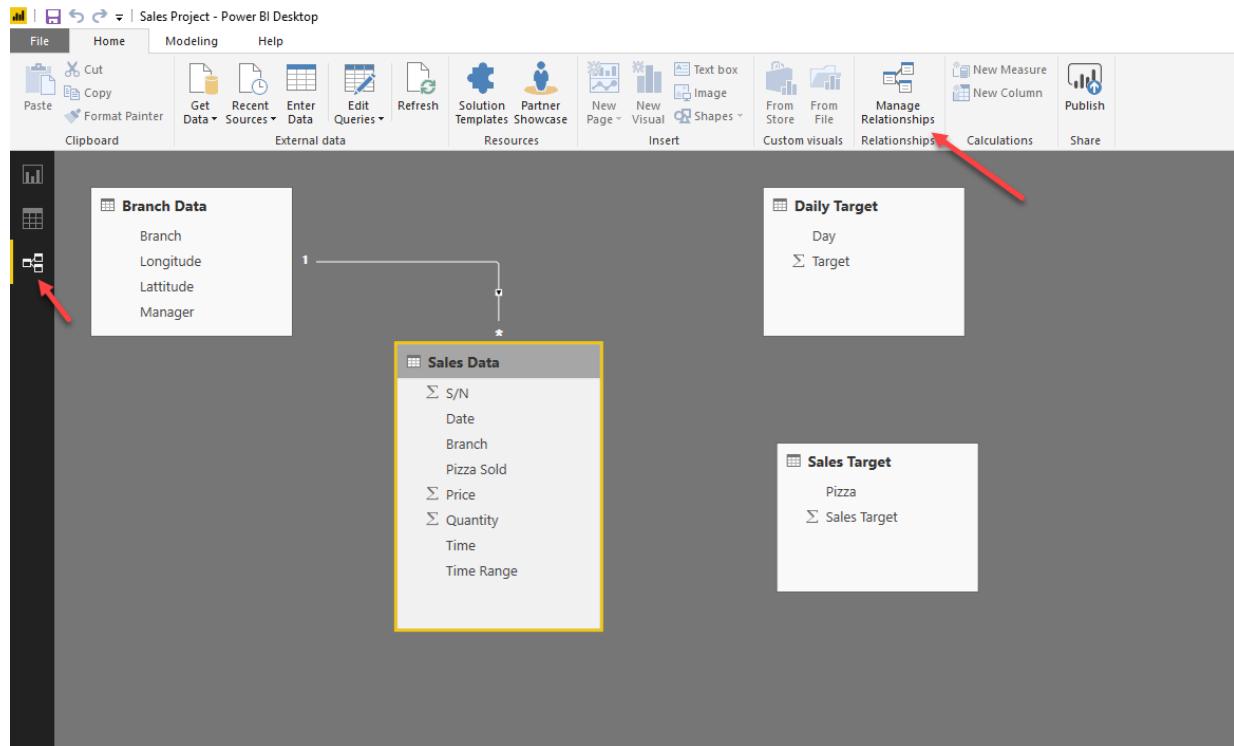
Bring in the Sales Target and Daily target files too.



After bringing in the data, you need to create relationships between the tables. That way you can create interactive reports with charts that respond to clicks on other charts. You wouldn't also have to do a VLOOKUP (Excel formula for relating different tables) in order to use fields from different tables in the same chart.

Power BI is quite smart and tries to infer relationships between the tables you have based on the field names and the data types. Unfortunately, it always does single direction relationships and either create too many or too few relationships. So you have to get familiar with creating relationships from scratch and editing the ones it created for you.

Double click on the line of the relationship it created for you (between Branch Data and Sales Data) and set it to Both direction. Single direction means you can go in one direction only: great if you have a database background and will always remember the direction, additionally it helps prevent ambiguity in the relationships (the main advantage that should make you consider it and the trouble of always remembering to go from the dimensioning table to the data table). Alternatively, you can click on Manage Relationships to edit and create new relationships.



## Manage relationships

The screenshot shows the 'Manage relationships' dialog box. It displays a single relationship entry:

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	Sales Data (Branch)	Branch Data (Branch)

At the bottom of the dialog, there are several buttons: New..., Autodetect..., Edit... (highlighted with a red box and arrow), Delete, and Close.

## Edit relationship

X

Select tables and columns that are related.

Sales Data

S/N	Date	Branch	Pizza Sold	Price	Quantity	Time	Time Range
46	Tuesday, December 8, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:01:28 AM	Before 9:00am
147	Saturday, December 12, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:04:41 AM	Before 9:00am
167	Saturday, December 5, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:05:14 AM	Before 9:00am

Branch Data

Branch	Longitude	Latitude	Manager
Ibadan	3.9167	7.3964	Adamu Sule
Ikoyi	3.4333	6.45	Kasumu Joe
Lekki	4.1167	6.5	Ifeoma Joseph

Cardinality

Many to one (\*:1)

Make this relationship active

Assume referential integrity

Cross filter direction

Single

Single

Both



OK

Cancel

## Manage relationships

The screenshot shows the 'Manage relationships' dialog box in Power BI. It displays a table with one row. The first column, 'Active', has a checked checkbox. The second column, 'From: Table (Column)', contains 'Sales Data (Branch)'. The third column, 'To: Table (Column)', contains 'Branch Data (Branch)'. At the bottom of the dialog, there are four buttons: 'New...', 'Autodetect...', 'Edit...', and 'Delete'. A red arrow points to the 'New...' button. In the top right corner, there is a close button represented by a small 'X'.

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	Sales Data (Branch)	Branch Data (Branch)

New... Autodetect... Edit... Delete

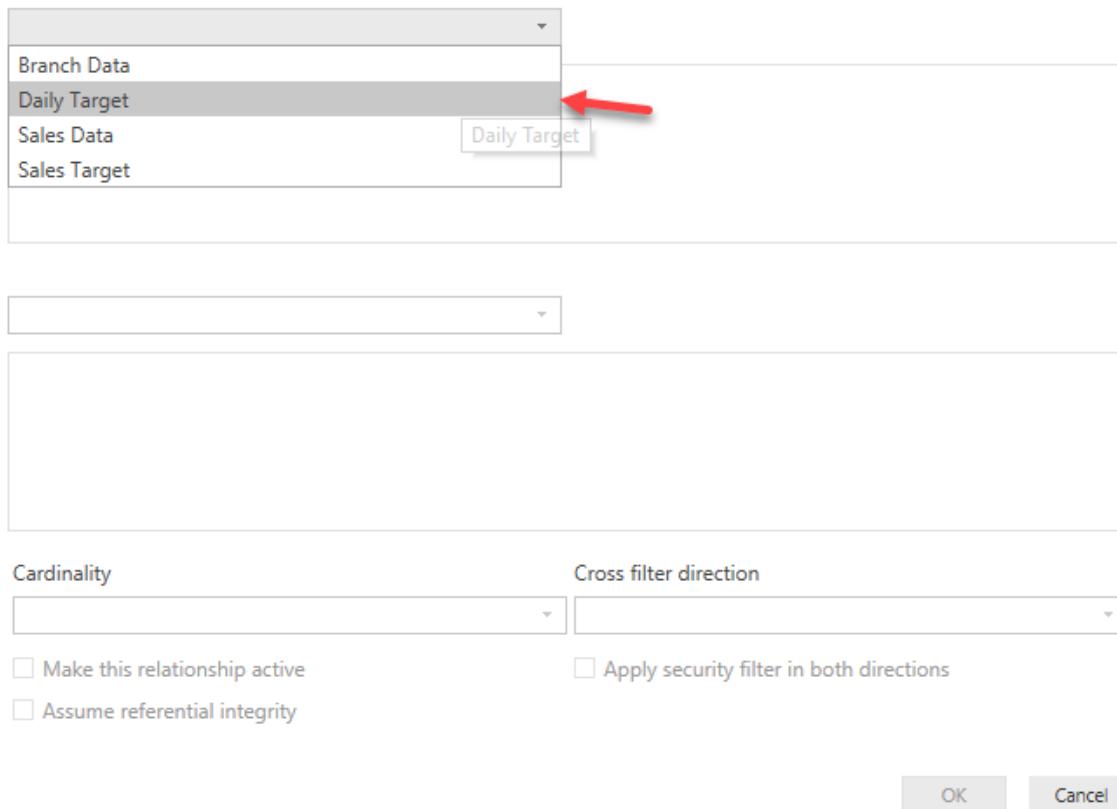
Close

We'll create relationships between the other tables. Daily Target to Sales Data.

## Create relationship

X

Select tables and columns that are related.



X

## Create relationship

Select tables and columns that are related.

Daily Target

Day	Target
Thursday, December 3, 2015	4138200
Friday, December 4, 2015	2870400
Saturday, December 5, 2015	4193200

2

Sales Data

S/N	Date	Branch	Pizza Sold	Price	Quantity	Time	Time Range
46	Tuesday, December 8, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:01:28 AM	Before 9:00am
147	Saturday, December 12, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:04:41 AM	Before 9:00am
167	Saturday, December 5, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:05:14 AM	Before 9:00am

1

Cardinality

One to many (1:\*)

Make this relationship active

Assume referential integrity

Cross filter direction

Both

Apply security filter in both directions

4

OK Cancel

And Sales Target to Sales Data

X

## Create relationship

Select tables and columns that are related.

Sales Target

Pizza	Sales Target
BBQ Chicken	4320000
BBQ Philly Steak	3808000
Beef Suya	2943000

Sales Data

S/N	Date	Branch	Pizza Sold	Price	Quantity	Time	Time Range
46	Tuesday, December 8, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:01:28 AM	Before 9:00am
147	Saturday, December 12, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:04:41 AM	Before 9:00am
167	Saturday, December 5, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:05:14 AM	Before 9:00am

Cardinality

One to many (1:\*)

Cross filter direction

Both

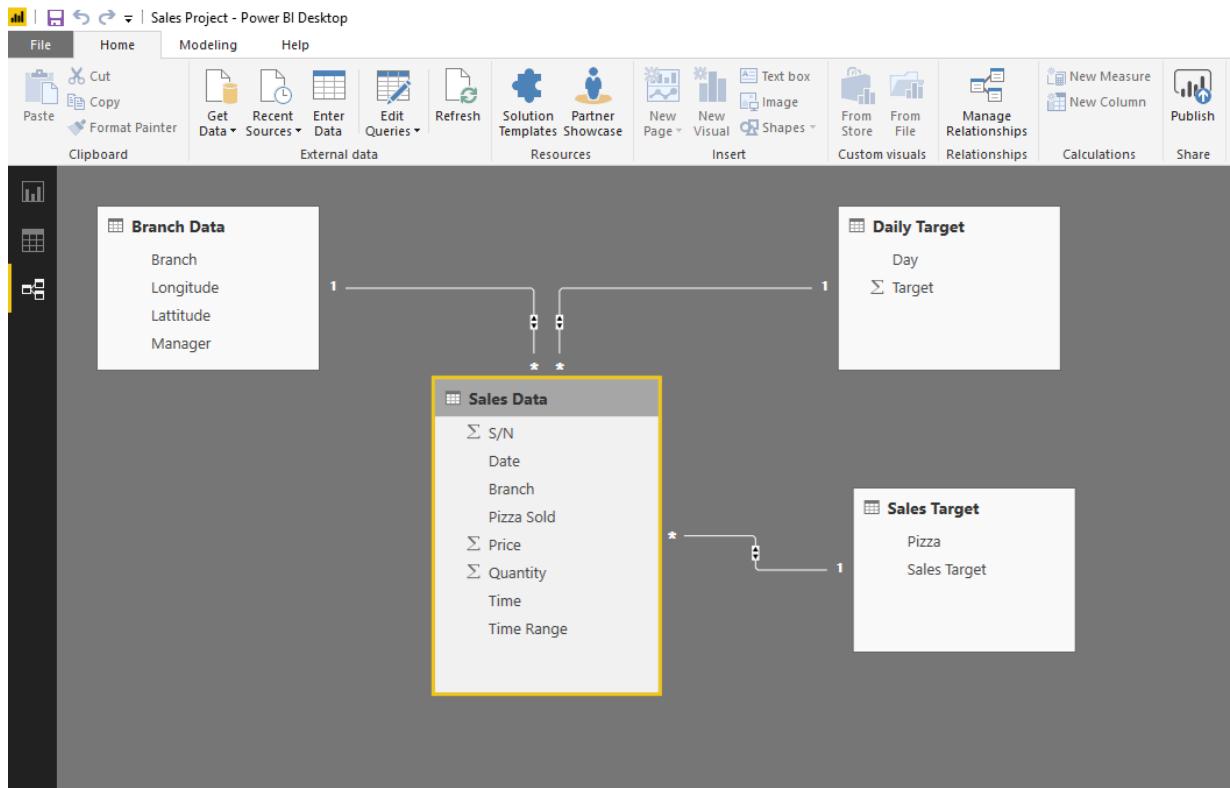
Make this relationship active

Apply security filter in both directions

Assume referential integrity

OK Cancel

And below is what it would all look like when you are done.



Now it's time to do some formula-ing. Or DAX-ing as Power BI uses Data Analysis Expressions (DAX). You can download the official Microsoft reference material for the DAX formulas here: <http://download.microsoft.com/download/0/f/b/0fbfaa46-2bfd-478f-8e56-7bf3c672df9d/data%20analysis%20expressions%20-%20dax%20-%20reference.pdf>

So head to the Data part (on the left) of the main Power BI window. And select the Sales Data table as we need to do some tasks on it.

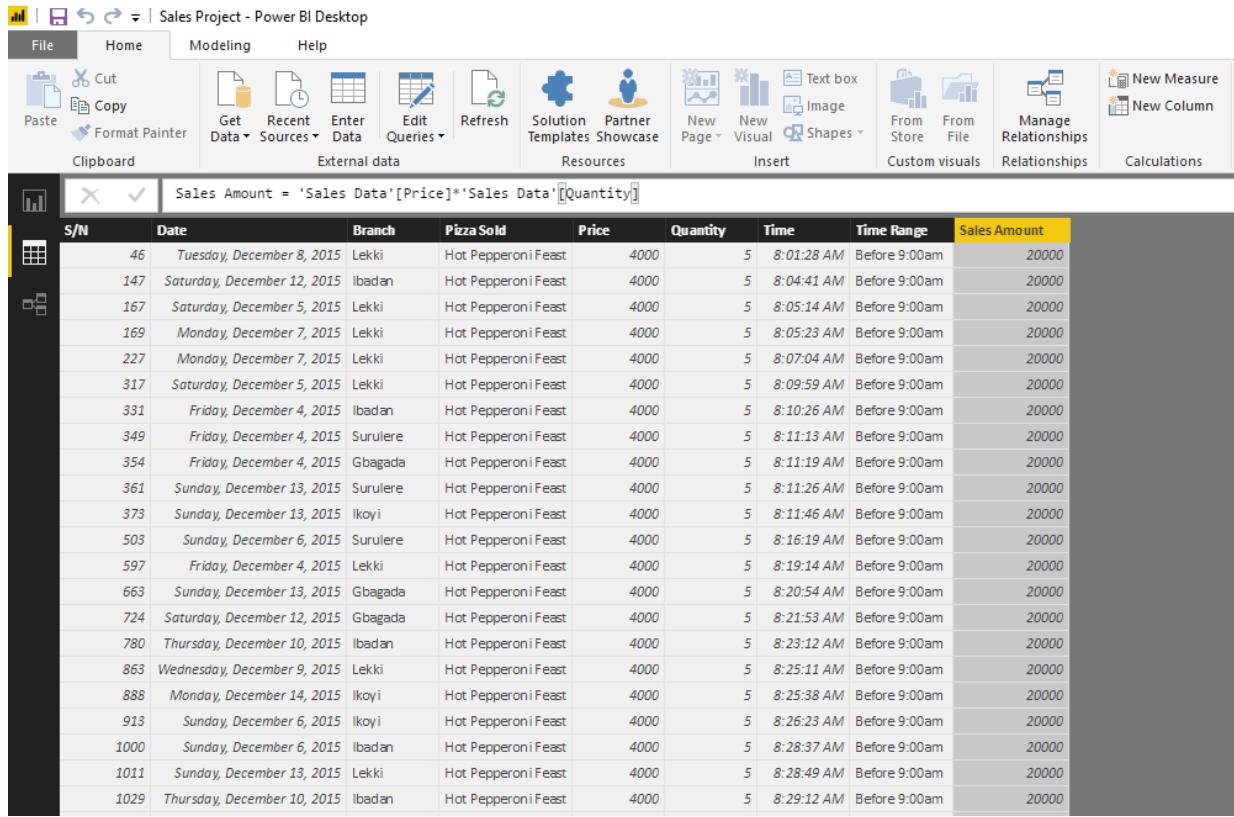
The screenshot shows the Power BI Desktop interface. On the left is a table titled "Sales Data" with columns: S/N, Date, Branch, Pizza Sold, Price, Quantity, Time, and Time Range. The table contains 5,000 rows of sales data. On the right is the "FIELDS" pane, which lists various data sources and their fields. A red arrow points from the "Sales Data" node in the tree view to the table on the left.

The Sales Data has Price and Quantity field but no Sales Amount field. So we need to create that. And the good thing is that the formula syntax is similar to that in Excel, especially formulas in Excel Tables.

So we first create a new column, by rightclicking any field in the table and selecting New Column or clicking on New Column at the extreme right under the Home menu. Then change the name from the default “Column” to any name you find more appropriate.

The screenshot shows the Power BI Desktop interface after creating a new column. The table now includes a new column named "Sales Amount" with the formula "`=Sales Data'[Price]*Quantity`". The "New Column" button in the ribbon is highlighted with a red arrow. The table contains the same 5,000 rows of sales data as before.

Sales Amount = 'Sales Data'[Price]\*'Sales Data'[Quantity]



The screenshot shows the Power BI Desktop interface with the title bar "Sales Project - Power BI Desktop". The ribbon menu is visible with tabs like File, Home, Modeling, and Help. The Home tab is selected, showing various icons for clipboard operations (Cut, Copy, Paste), external data (Get Data, Recent Sources, Enter Data, Edit Queries, Refresh), resources (Solution Templates, Partner Showcase), and insert options (New Page, New Visual, Text box, Image, Shapes). Below the ribbon is a table view titled "Sales Amount = 'Sales Data'[Price]\*'Sales Data'[Quantity]". The table has columns: S/N, Date, Branch, Pizza Sold, Price, Quantity, Time, Time Range, and Sales Amount. The data shows multiple entries for different dates and branches, all resulting in a Sales Amount of 20000.

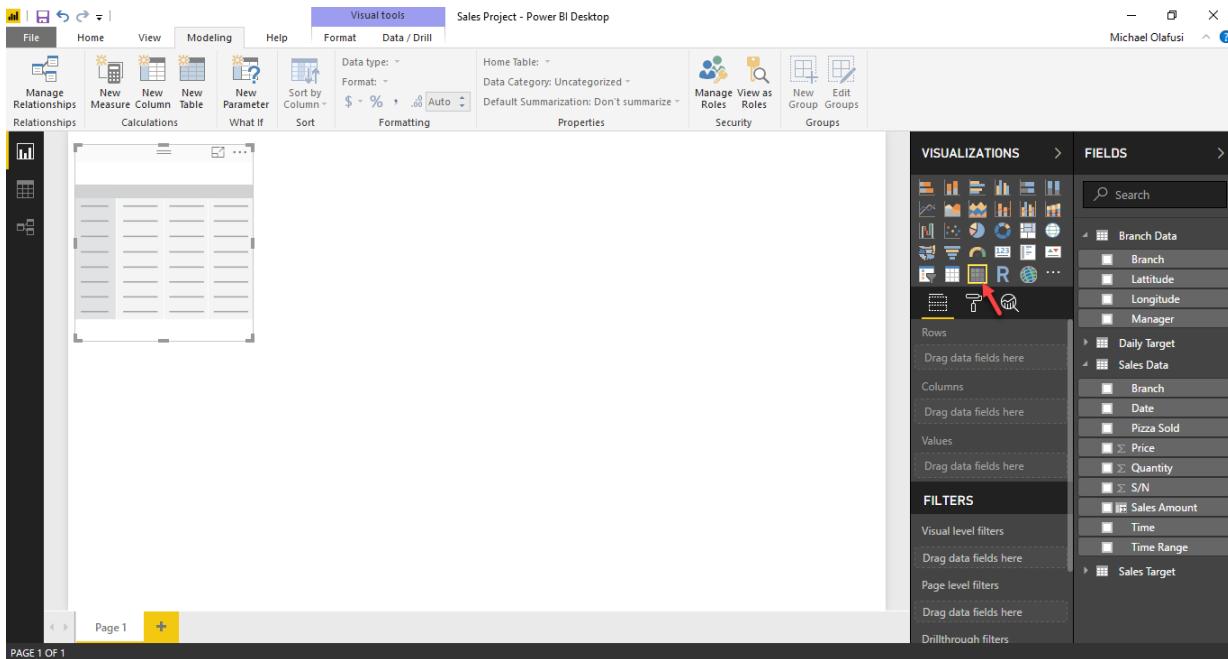
S/N	Date	Branch	Pizza Sold	Price	Quantity	Time	Time Range	Sales Amount
46	Tuesday, December 8, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:01:28 AM	Before 9:00am	20000
147	Saturday, December 12, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:04:41 AM	Before 9:00am	20000
167	Saturday, December 5, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:05:14 AM	Before 9:00am	20000
169	Monday, December 7, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:05:23 AM	Before 9:00am	20000
227	Monday, December 7, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:07:04 AM	Before 9:00am	20000
317	Saturday, December 5, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:09:59 AM	Before 9:00am	20000
331	Friday, December 4, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:10:26 AM	Before 9:00am	20000
349	Friday, December 4, 2015	Surulere	Hot Pepperoni Feast	4000	5	8:11:13 AM	Before 9:00am	20000
354	Friday, December 4, 2015	Gbagada	Hot Pepperoni Feast	4000	5	8:11:19 AM	Before 9:00am	20000
361	Sunday, December 13, 2015	Surulere	Hot Pepperoni Feast	4000	5	8:11:26 AM	Before 9:00am	20000
373	Sunday, December 13, 2015	Ikoyi	Hot Pepperoni Feast	4000	5	8:11:46 AM	Before 9:00am	20000
503	Sunday, December 6, 2015	Surulere	Hot Pepperoni Feast	4000	5	8:16:19 AM	Before 9:00am	20000
597	Friday, December 4, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:19:14 AM	Before 9:00am	20000
663	Sunday, December 13, 2015	Gbagada	Hot Pepperoni Feast	4000	5	8:20:54 AM	Before 9:00am	20000
724	Saturday, December 12, 2015	Gbagada	Hot Pepperoni Feast	4000	5	8:21:53 AM	Before 9:00am	20000
780	Thursday, December 10, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:23:12 AM	Before 9:00am	20000
863	Wednesday, December 9, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:25:11 AM	Before 9:00am	20000
888	Monday, December 14, 2015	Ikoyi	Hot Pepperoni Feast	4000	5	8:25:38 AM	Before 9:00am	20000
913	Sunday, December 6, 2015	Ikoyi	Hot Pepperoni Feast	4000	5	8:26:23 AM	Before 9:00am	20000
1000	Sunday, December 6, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:28:37 AM	Before 9:00am	20000
1011	Sunday, December 13, 2015	Lekki	Hot Pepperoni Feast	4000	5	8:28:49 AM	Before 9:00am	20000
1029	Thursday, December 10, 2015	Ibadan	Hot Pepperoni Feast	4000	5	8:29:12 AM	Before 9:00am	20000

One more cool thing. Change the Sales field and other money fields to Currency. I'll select my country currency: Naira.

The screenshot shows the Power BI Desktop interface with the 'Sales Project - Power BI Desktop' title bar. The ribbon has tabs: File, Home, Modeling, and Help. Below the ribbon are icons for Manage Relationships, New Measure, New Column, New Table, New Parameter, Sort by Column (with a red arrow pointing to it), Sort, and Sort by Column dropdown. The main area displays a table titled 'Sales Amount = 'Sales Data'[Price]\*' with columns S/N, Date, Branch, and Price. The 'Sort by Column' dropdown is open, showing various data types and formats. A red arrow points to the 'Format: Whole number' option under 'Currency'. Another red arrow points to the '# Edo (Nigeria)' entry in the list of currency formats.

Now we go into the visual part of the report creation.

Click on Reports on the left part of the main Power BI window. And let's start with a PivotTable-like report showing products against sales amount.



In Power BI, everything is a visual. Even a table is a visual. You have to pick the visual you want and drop the fields you need into the appropriate sections of the visual components.

Notice the similarity between the Matrix visual in Power BI and the PivotTable in Excel. If you ask me, I'll say they are exactly same. So huge bonus for you if you already use PivotTable in Excel.

Power BI Desktop

Michael Olafusi

The screenshot shows the Power BI Desktop interface with a PivotTable visual on the left and the Fields pane on the right.

**PivotTable Visual:**

- Rows:** Pizza Sold
- Columns:** Drag data fields here
- Values:** Sales Amount

**Fields Pane:**

- VISUALIZATIONS:** Shows various chart icons.
- FIELDS:**
  - Search bar: Search
  - Branch Data:
    - Branch
    - Latitude
    - Longitude
    - Manager
  - Daily Target
  - Sales Data:
    - Branch
    - Date
    - Pizza Sold
    - $\Sigma$  Price
    - $\Sigma$  Quantity
    - $\Sigma$  S/N
    - Sales Amount
    - Time
    - Time Range
  - Sales Target

Two red arrows point to the "Pizza Sold" field in the Rows section and the "Sales Amount" field in the Values section of the PivotTable visual's configuration area.

Pizza Sold	Sales Amount
BBQ Chicken	₦ 3,600,000
BBQ Philly Steak	₦ 3,808,000
Beef Suya	₦ 2,943,000
Chicken Bali	₦ 1,778,000
Chicken Feast	₦ 1,744,000
Chicken Legend	₦ 1,766,000
Chicken Suya	₦ 3,824,000
Extravaganza	₦ 1,814,000
Hot Pepperoni Feast	₦ 4,292,000
Hot Veggie	₦ 3,800,000
Italiano	₦ 2,955,000
Margarita	₦ 3,484,000
Meatzaa	₦ 1,676,000
Pepperoni Feast	₦ 3,628,000
Pepperoni Suya	₦ 3,231,000
Veggie Supreme	₦ 3,027,000
<b>Total</b>	<b>₦ 47,370,000</b>

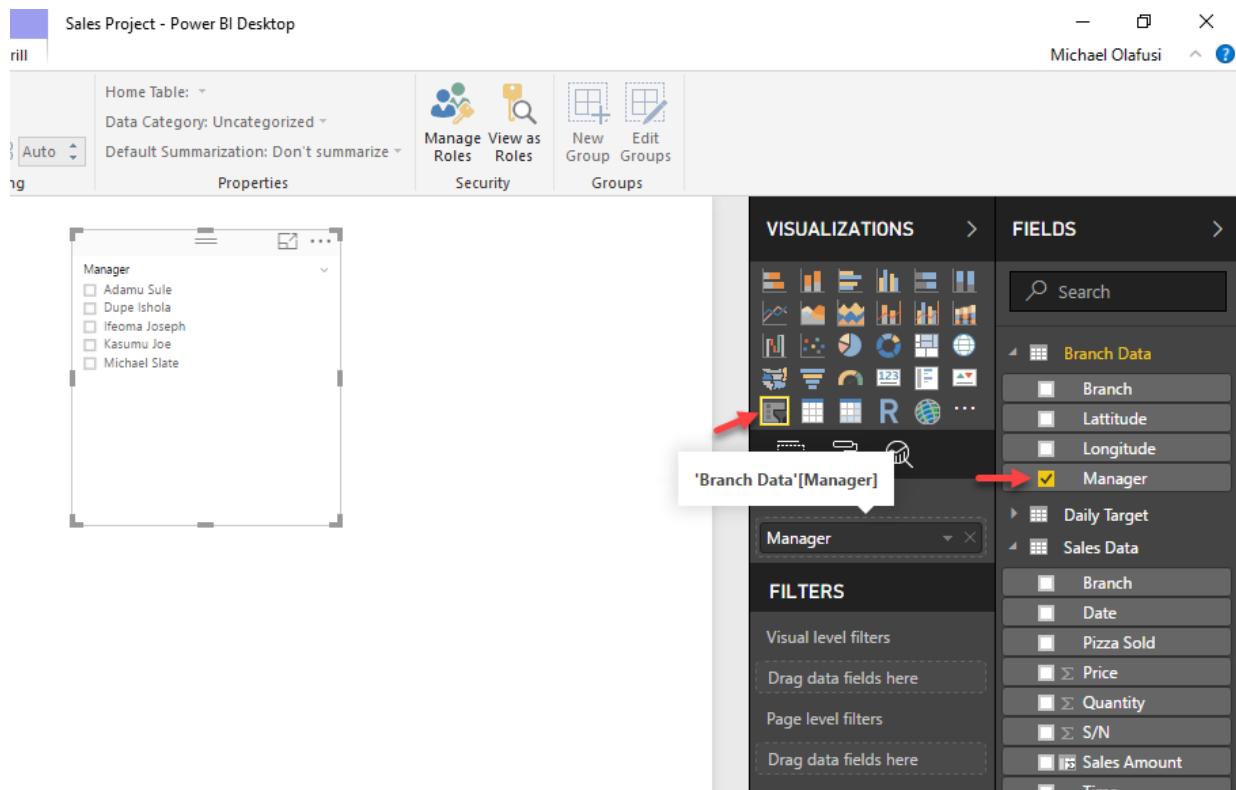
The screenshot shows a Microsoft Excel spreadsheet titled "Sales-Data.xlsx - Excel". The ribbon is visible at the top with tabs like File, Home, Insert, Page, Form, Data, Review, View, Devel, Help, LOA!, Fuzzy, Powe, Powe, Analyze, Design, Tell me, and a smiley face icon. The "Analyze" tab is selected.

The main area displays a PivotTable with the following data:

	A	B
1		
2		
3	Row Labels	Sum of Sales Amount
4	BBQ Chicken	3600000
5	BBQ Philly Steak	3808000
6	Beef Suya	2943000
7	Chicken Bali	1778000
8	Chicken Feast	1744000
9	Chicken Legend	1766000
10	Chicken Suya	3824000
11	Extravaganza	1814000
12	Hot Pepperoni Feast	4292000
13	Hot Veggie	3800000
14	Italiano	2955000
15	Margarita	3484000
16	Meatzaa	1676000
17	Pepperoni Feast	3628000
18	Pepperoni Suya	3231000
19	Veggie Supreme	3027000
20	Grand Total	47370000
21		
22		
23		

To the right of the PivotTable is the "PivotTable Fields" pane. It includes a search bar and a list of fields: Pizza Sold (checked), Price, Quantity, Time, and Time Range. Below this is a section to "Drag fields between areas below:" with "Filters" and "Columns" sections. The "Rows" section contains "Pizza Sold" and the "Values" section contains "Sum of Sales ...". Red arrows point to both the "Rows" and "Values" sections.

Since we are now done with the Sales by Product table, let's put in a Slicer that acts as a filter on the Branch Manager.



I think it would look better if it displays horizontally. To change the look of any visual, you click on paint brush icon, you get a bouquet of options that lets you change everything from text size and color to structure of the visual. There I change the Orientation from Vertical to Horizontal.

The screenshot shows the Power BI desktop interface. At the top, there's a ribbon with tabs for 'Properties', 'Security', and 'Groups'. Below the ribbon, a hierarchy tree titled 'Manager' is displayed, listing five names: Adamu Sule, Dupe Ishola, Ifeoma Joseph, Kasumu Joe, and Michael Slate. To the right of the tree is a 'VISUALIZATIONS' pane containing various chart icons. A red arrow points to the 'General' section of the properties pane, specifically highlighting the 'X Position' dropdown menu. The dropdown is open, showing two options: 'Vertical' (which is selected) and 'Horizontal'. Other settings visible in the properties pane include 'Outline color' (set to grey), 'Outline...' (set to 1), and 'Y Position' (set to 34).

Sales Project - Power BI Desktop

Visual tools

File Home View Modeling Help Format Data / Drill

Manage Relationships New Measure New Column New Table New Parameter Sort by Column Sort Data type: \$ % , .00 Auto

Home Table: Data Category: Uncategorized Default Summarization: Don't summarize

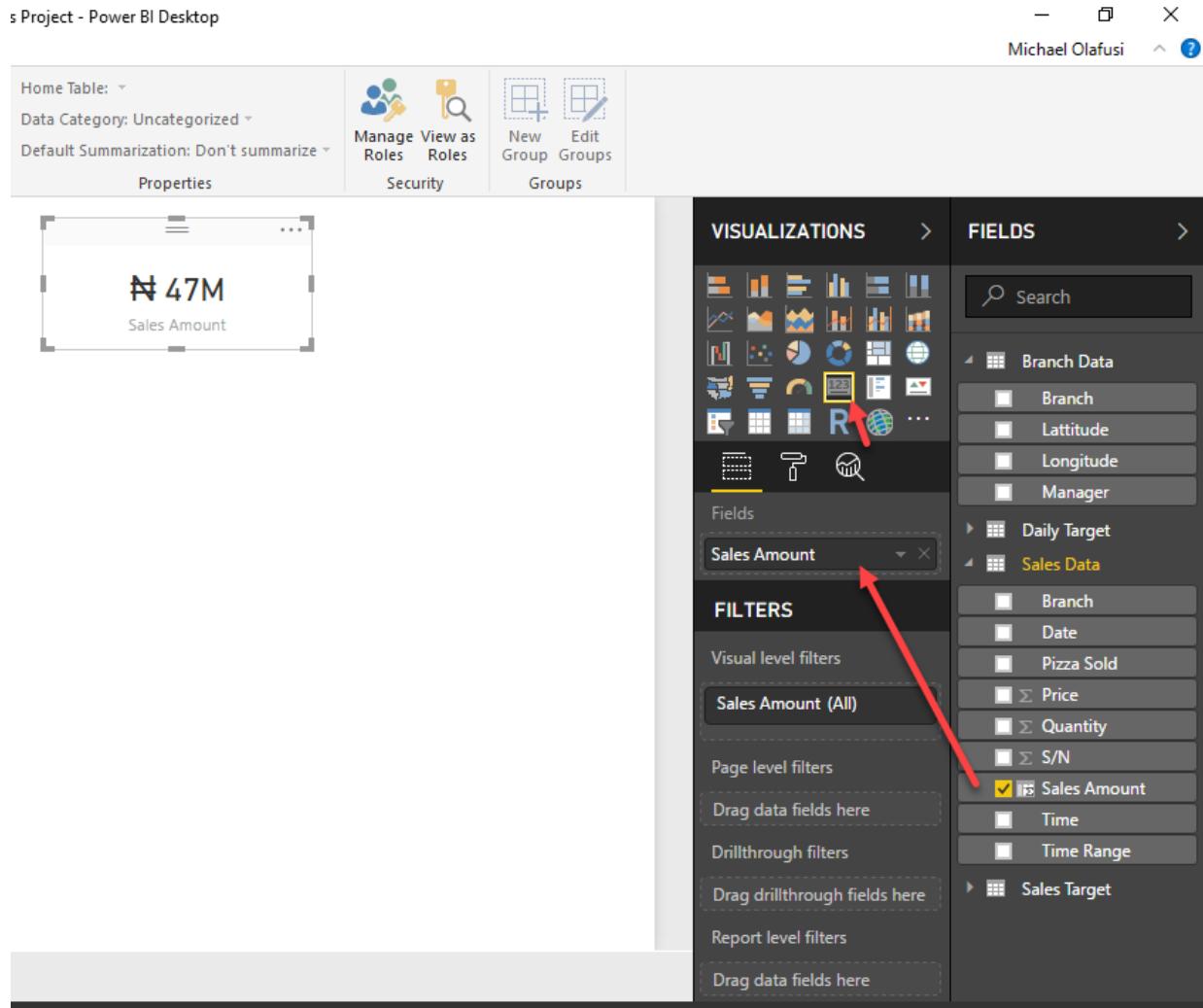
Properties

Manager

	Adamu Sule	Dupe Ishola	Ifeoma Joseph	Kasumu Joe	Michael Slate
<b>Pizza Sold</b>					
BBQ Chicken	₦ 3,600,000				
BBQ Philly Steak	₦ 3,808,000				
Beef Suya	₦ 2,943,000				
Chicken Bali	₦ 1,778,000				
Chicken Feast	₦ 1,744,000				
Chicken Legend	₦ 1,766,000				
Chicken Suya	₦ 3,824,000				
Extravaganza	₦ 1,814,000				
Hot Pepperoni Feast	₦ 4,292,000				
Hot Veggie	₦ 3,800,000				
Italiano	₦ 2,955,000				
Margarita	₦ 3,484,000				
Meatzaa	₦ 1,676,000				
Pepperoni Feast	₦ 3,628,000				
Pepperoni Suya	₦ 3,231,000				
Veggie Supreme	₦ 3,027,000				
<b>Total</b>	<b>₦ 47,370,000</b>				

Page 1 +

Next is we add a Card that shows the total sales figure.

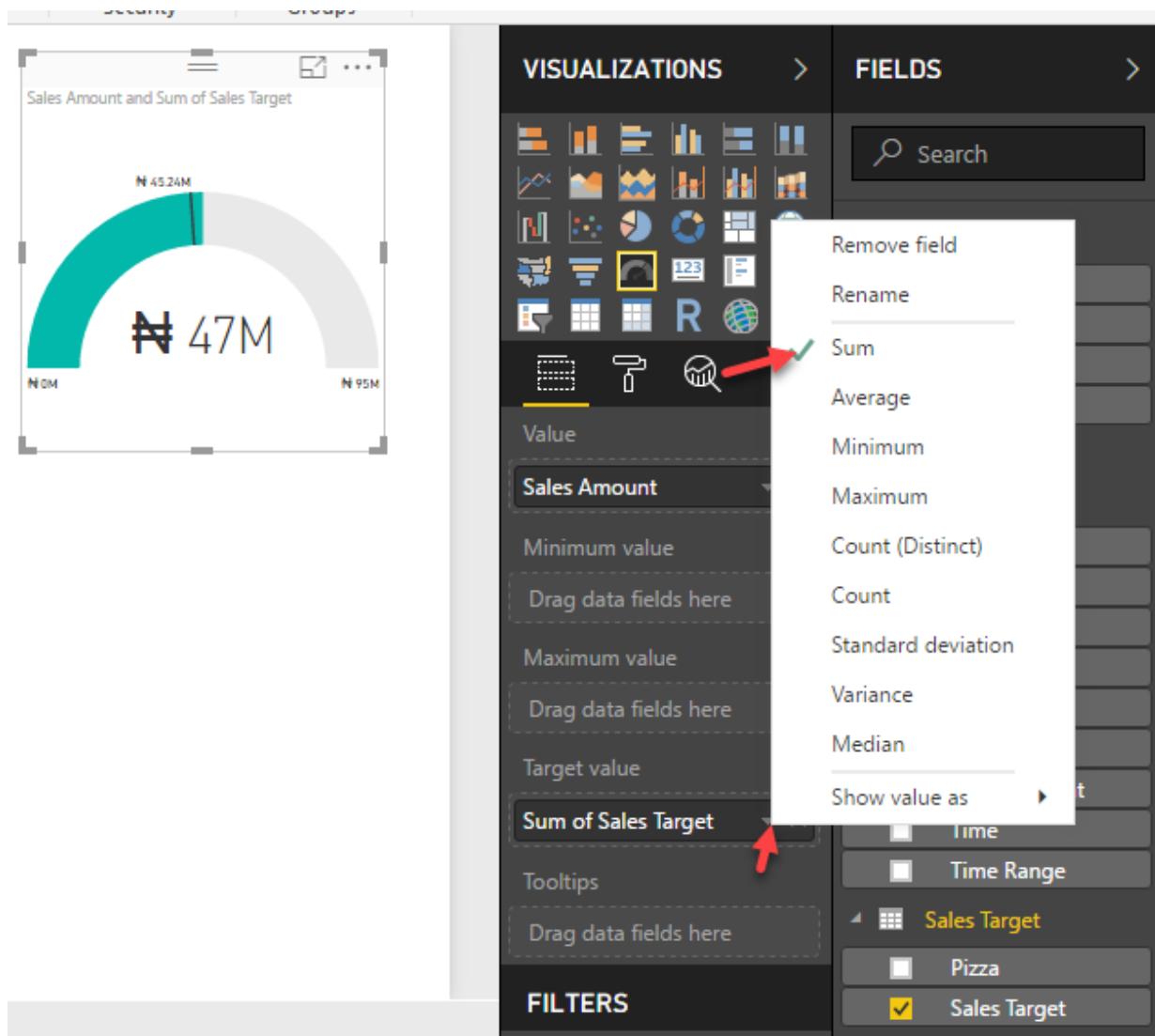


See how everything is a visual.

Now we add a Gauge that shows sales against target.

The screenshot shows the Power BI interface with a gauge visual on the left and the Visualizations pane open on the right. The gauge visual displays 'Sales Amount' at ₦ 47M against a target of ₦ 95M. The Visualizations pane shows the 'Sales Amount' field selected under 'Value'. A red arrow points from the 'Sales Amount' dropdown in the Value section to the 'Sales Amount' dropdown in the Fields pane, indicating how to change calculation types. Another red arrow points from the 'Sum of Sales Target' dropdown in the Value section to the 'Sales Target' section in the Fields pane, where 'Sales Target' is also selected.

And you can change the type of calculations done on any field you use. Just click on the dropdown arrow beside the field name in the visual panel.



And now we add bar chart of sales by products against targets.

The screenshot shows the Power BI desktop application interface. At the top, there are navigation icons and the user name "Michael Olafusi". Below the ribbon, the "Security" tab is selected, showing options to "Manage Roles" and "View as Roles", and buttons for "New Group" and "Edit Groups".

The main workspace displays two visualizations:

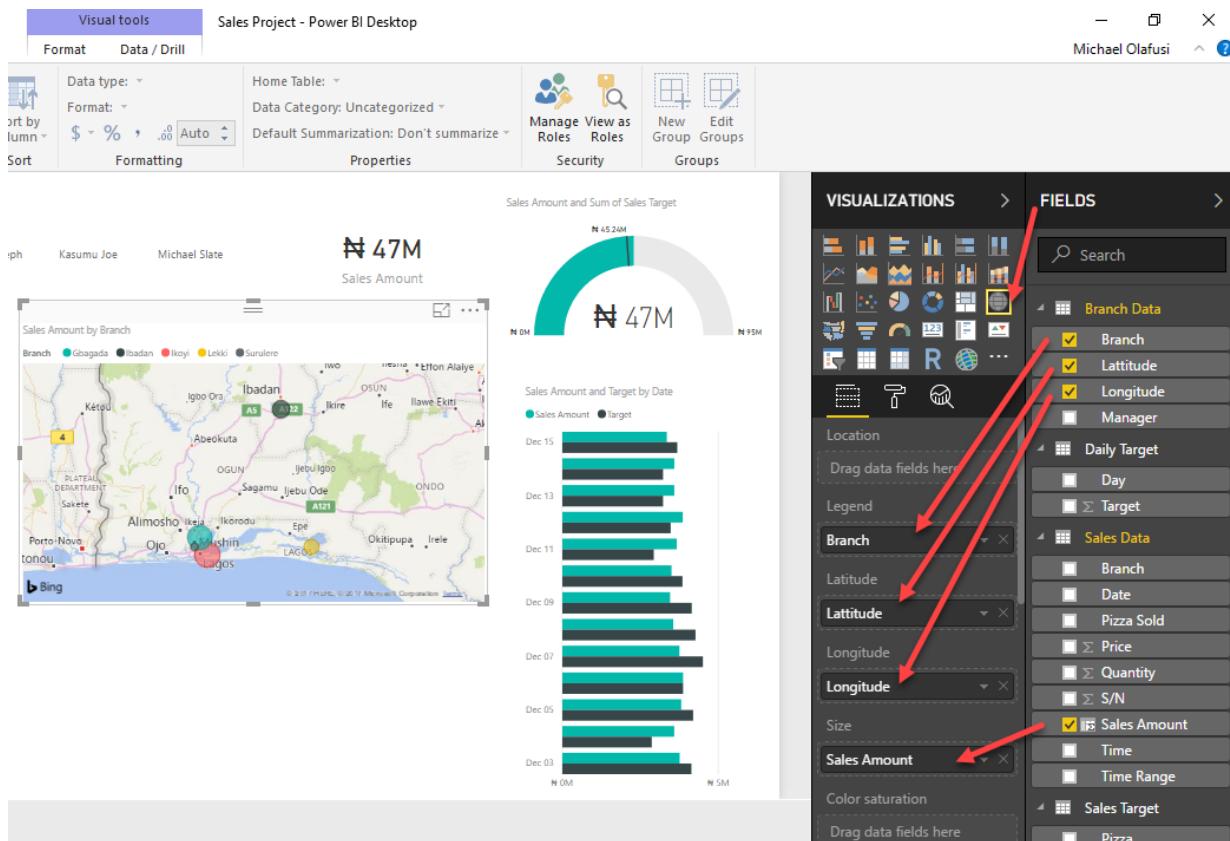
- A gauge chart titled "Sales Amount and Sum of Sales Target" showing a value of 47M.
- A bar chart titled "Sales Amount and Target by Date" comparing actual sales (teal bars) against targets (black bars) for dates from Dec 03 to Dec 15.

To the right of the workspace are the "VISUALIZATIONS" and "FIELDS" panes:

- VISUALIZATIONS:** A grid of visualization icons.
- FIELDS:** A list of data fields categorized under "Branch Data", "Daily Target", "Sales Data", and "Sales Target".
  - Branch Data:** Branch, Latitude, Longitude, Manager.
  - Daily Target:** Day, Target.
  - Sales Data:** Branch, Date, Pizza Sold, Price, Quantity, S/N, Sales Amount, Time, Time Range.
  - Sales Target:** Pizza.

Red arrows highlight specific items in the "FIELDS" pane: one arrow points to the "Date" field in the "Axis" section, another points to the "Target" field in the "Value" section, and a large red X is drawn over the entire "FIELDS" pane area.

Let's do a cool one now. Add a map visual.



And finally, we add a Pie Chart.

The screenshot shows a Power BI desktop interface with several visualizations:

- Sales Amount and Sum of Sales Target:** A donut chart showing sales amount.
- Sales Amount by Branch:** A map of Nigeria with markers for different branches.
- Quantity by Manager and Branch:** A pie chart showing the distribution of quantity by manager.
- Sales Amount and Target by Date:** A bar chart comparing actual sales against targets for each day from December 3rd to December 15th.

The **FIELDS** pane on the right lists fields categorized under **Branch Data**, **Daily Target**, **Sales Data**, and **Sales Target**. Red arrows point to the **Manager** field in the **Branch Data** section, the **Quantity** field in the **Sales Data** section, and the **Branch** field in the **Sales Target** section.

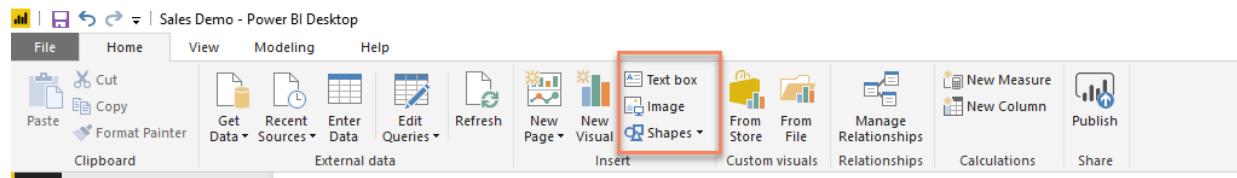
You might want to change the look of some or all of the visuals. You can even add a background image or colour to the white page.

See below what I did to the Slicer to improve its look.

The screenshot shows the same Power BI desktop interface with the following changes:

- Slicer:** The **Manager** slicer has been modified with a background color and font styling.
- Visualizations:** The donut chart and map have been removed.
- Fields pane:** The **General** section of the **Items** group in the **Selection Controls** category is highlighted with a red border. It shows settings for **Font color** (black), **Background** (light blue), **Outline** (none), and **Text Size** (14).

You can also add images, shapes and text boxes to your report.



And we are done with our first report building from scratch.

Next phase is to publish it and share with our boss and colleagues.

The screenshot shows the Power BI Desktop interface. A report titled "Power BI Desktop" is open, displaying a pie chart and a bar chart. On the ribbon, the "Publish" button is highlighted with a red arrow. The right side of the screen features the "Visualizations" and "Fields" panes, which contain various data sources and filters.

If you've not signed in to your Power BI account, you will be prompted to.

Then you pick the workspace you want the report published to. In every Power BI account, there is a default workspace called My workspace. Workspaces are what you create when you want to collaborate with colleagues on a report. It allows for equal access to making changes to the report and those changes are propagated rather than limited to your own copy of the report. You create them from the online Power BI service ([www.powerbi.com](http://www.powerbi.com)).

The screenshot shows the Power BI desktop interface. A modal dialog box titled "Publish to Power BI" is open, prompting the user to "Select a destination". Under "My workspace", "ICT" is listed. Other options like "Logistics" and "Stock Analysis" are also visible. Below the dialog, the main report area displays a pie chart with segments labeled "Obagada", "Ibadan", "Surulere", and "Ikoyi", and a bar chart showing sales for Dec 05, Dec 07, and Dec 09.

I chose My workspace.

Then click on the report link upon successful publishing.

The screenshot shows the Power BI desktop interface again. A modal dialog box titled "Publishing to Power BI" is open, indicating the process of publishing the report. It shows the status "Publishing 'Sales Demo.pbix' to Power BI". A "Did you know?" section provides information on creating a portrait view for mobile phones. The main report area shows a pie chart and a bar chart, with a specific bar for Dec 09 highlighted in blue.

The screenshot shows the Power BI desktop application. At the top, there's a ribbon with various icons like Refresh, New Page, Insert, and Share. On the left, there's a navigation pane with sections for Favorites, Recent, Apps, Shared with me, Workspaces, and My Workspace. The main area displays a report titled "Publishing to Power BI". The report features a summary card with "₦ 47M Sales Amount" and a donut chart. Below this is a table showing sales targets for different managers. To the right of the table is a bar chart for December 2017. On the far right, there are two panes: "VISUALIZATIONS" and "FIELDS". The "FIELDS" pane contains a search bar and a list of fields categorized under "Branch Data", "Daily Target", "Sales Data", and "Sales Target".

And here is what the online published version is like.

The screenshot shows the online published version of the Power BI report in a web browser. The URL is https://app.powerbi.com/groups/me/reports/d7bf7e0-b233-4c47-b1fc-54215f740bc/ReportSection. The interface is similar to the desktop version, with a sidebar for navigation and a main area for the report. The report itself includes a summary card with "₦ 47M Sales Amount", a donut chart, a table of sales targets, and a bar chart for December 2017. A map of Nigeria is also present in the background.

And you can do super cool stuffs like export the entire report as a PowerPoint deck or print or even publish as a web link that can be shared with anyone. Just click on File.

https://app.powerbi.com/groups/me/reports/d7bff7e0-b233-4c47-b1fc-54215f7540bc/ReportSection

Sites Nokia Siemens Network Hello, World | Android Submit MVP Activity MVP Bookmarklet To (Ivo Welch) Corporation

My Workspace > Sales Demo

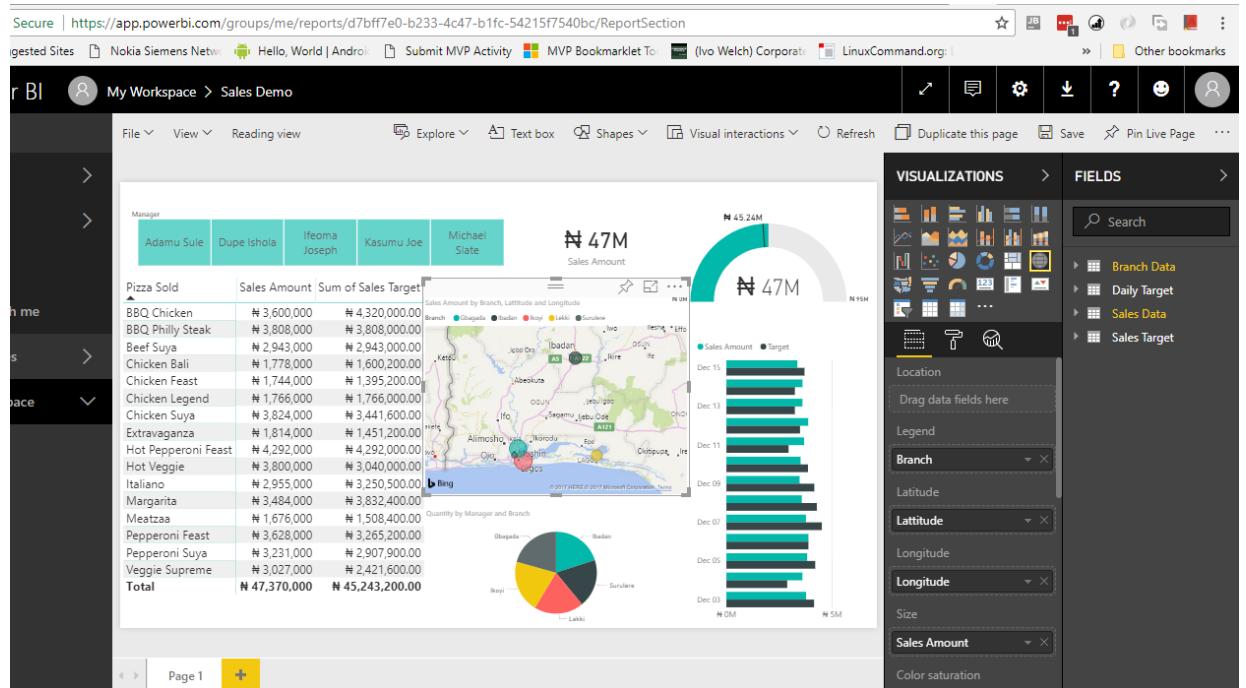
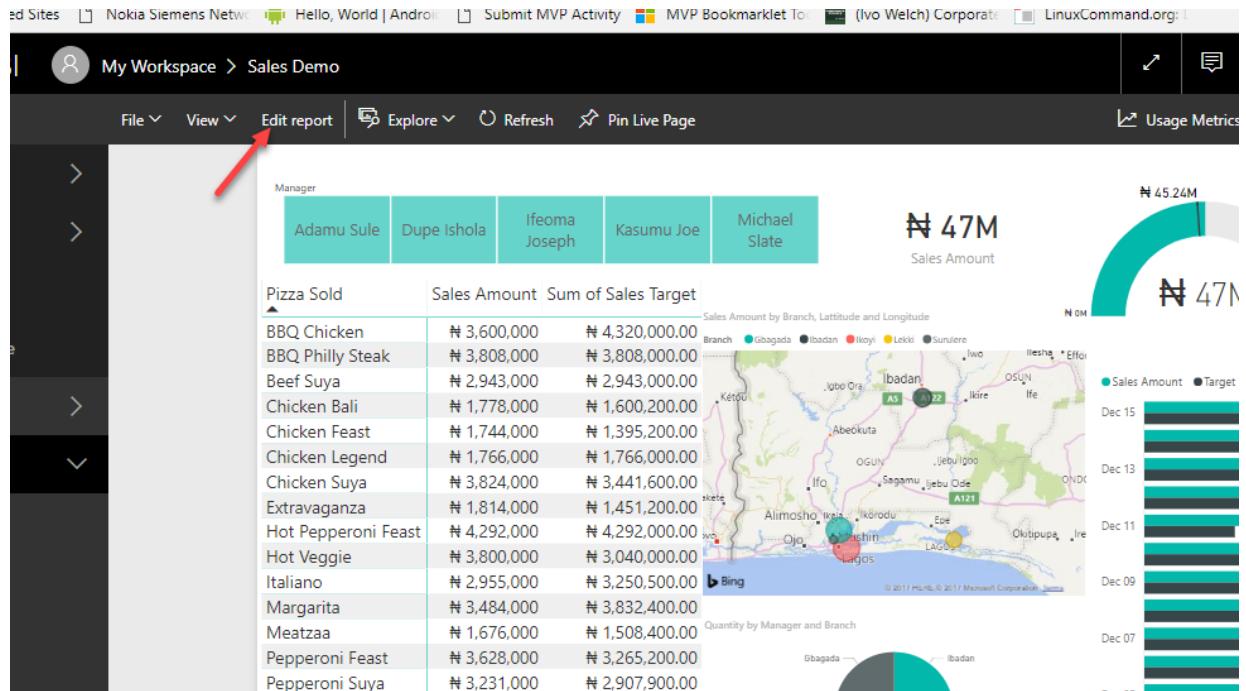
**File** →

- Save as Save a copy of this report
- Print Print current page
- Publish to web Embed this report for public access by anyone on the Internet
- Embed in SharePoint Online Get a link to securely embed this report in a SharePoint page
- Export to PowerPoint (Preview) Export this report as a PowerPoint presentation
- Download report (Preview) Download a .pbix copy

	Italiano	₦ 2,955,000	₦ 3,250,500.00
Margarita	₦ 3,484,000	₦ 3,832,400.00	
Meatzaa	₦ 1,676,000	₦ 1,508,400.00	
Pepperoni Feast	₦ 3,628,000	₦ 3,265,200.00	

You can also edit the visuals or add new ones, even on new report pages. Just click on Edit and you get access to the type of designer tools you already are familiar with in the Power BI software.

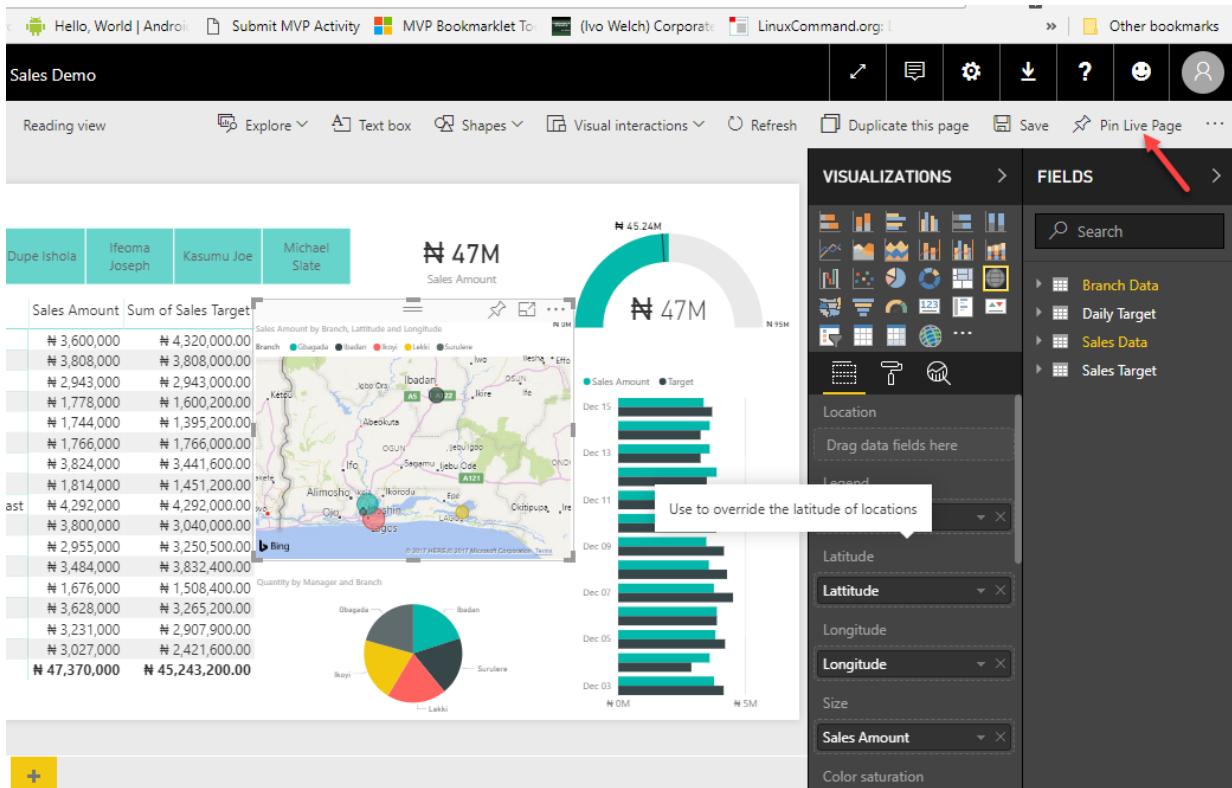
## Power BI for the Busy Professional



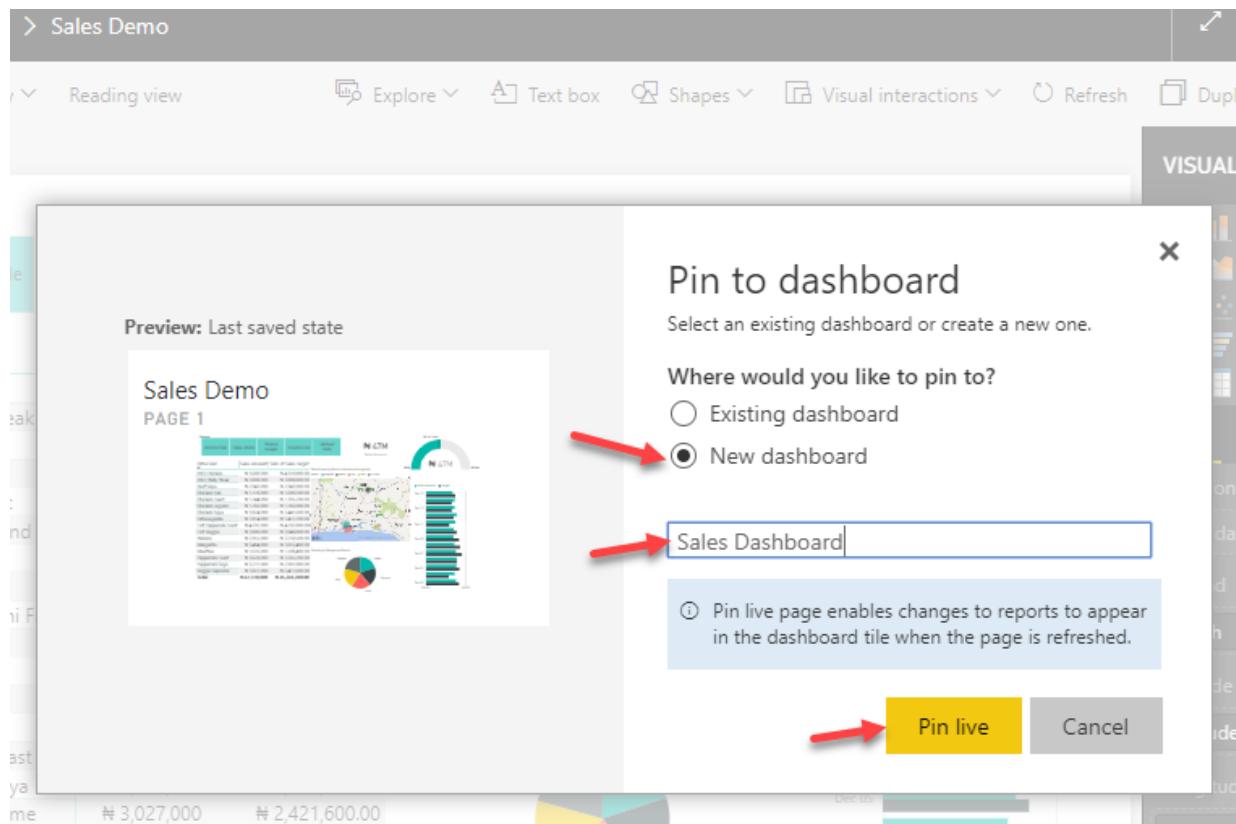
It is time we share our report with others. To do that we need to create a Dashboard and pin the visuals we want to show in that dashboard. Not to be confused, the user we share with can still access the entire report we created but the Dashboard is the first thing they see and interact with. It has extra cool features like Q&A that generates visual answers to questions, even the sharing we want to do can only be done from the Dashboard.

Just so you know, you can do the pinning that creates the dashboard from either the report view mode or the report edit mode.

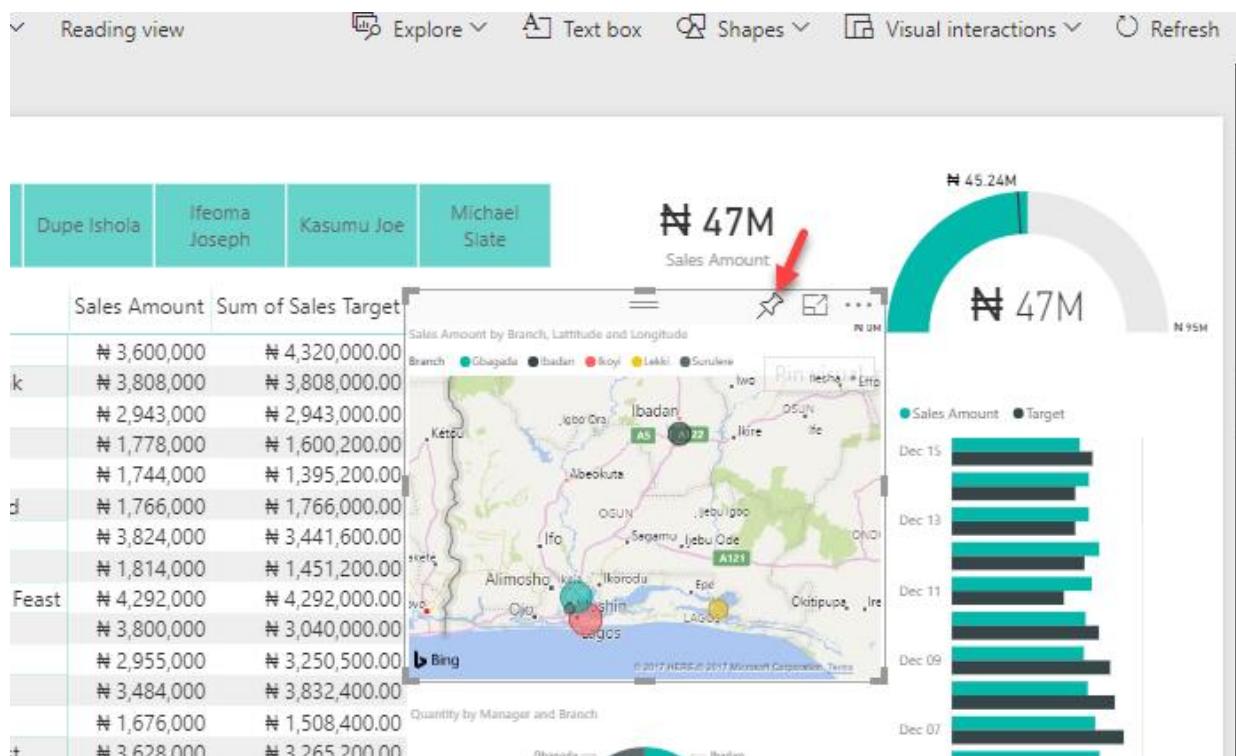
To create the dashboard, lets pin the entire report. That is called Pin Live Page and you can see it at the upper right side above the report itself.



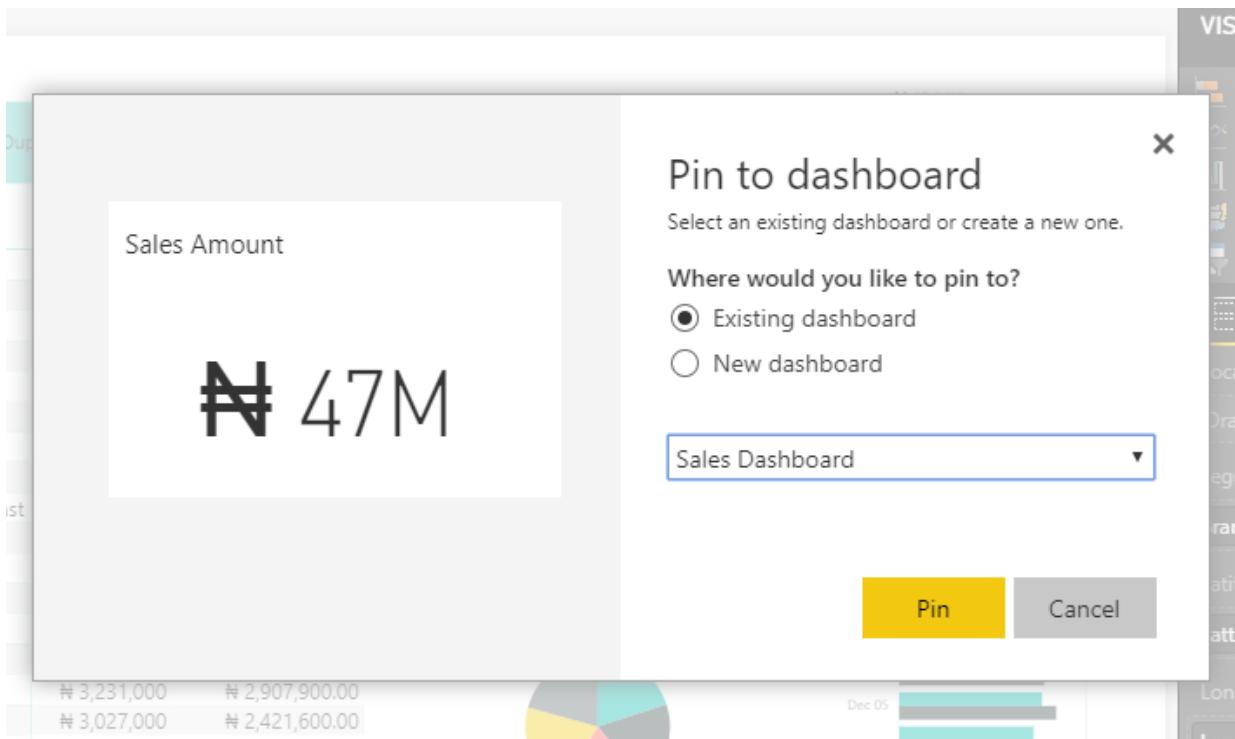
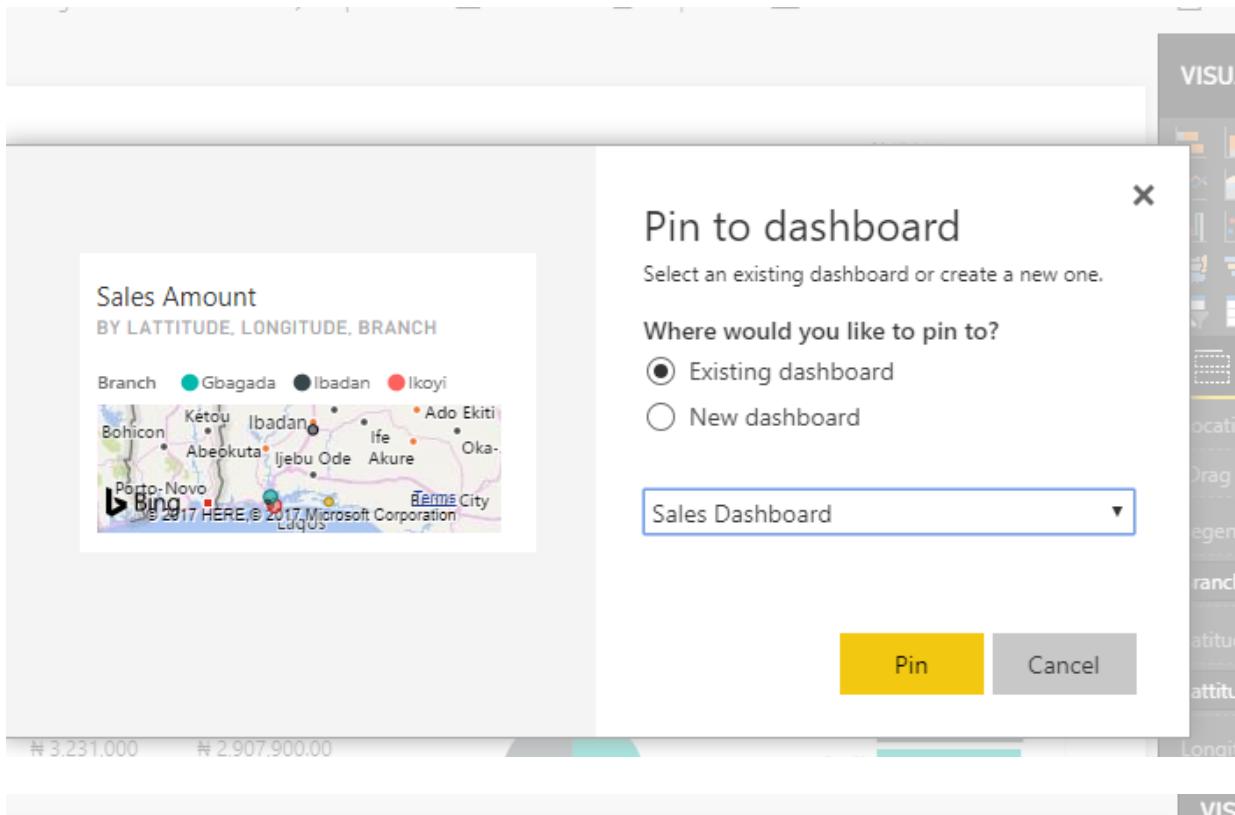
I pick New Dashboard and give it a name.



I can also pin any visual by clicking on the pin icon at the upper right edge of the visual. I will pin the map and the card.



And I choose an Existing Dashboard, picking the one I already created.



Now I can go see the Dashboard.

I expand Workspaces on the mid left and scroll to the dashboard I created.

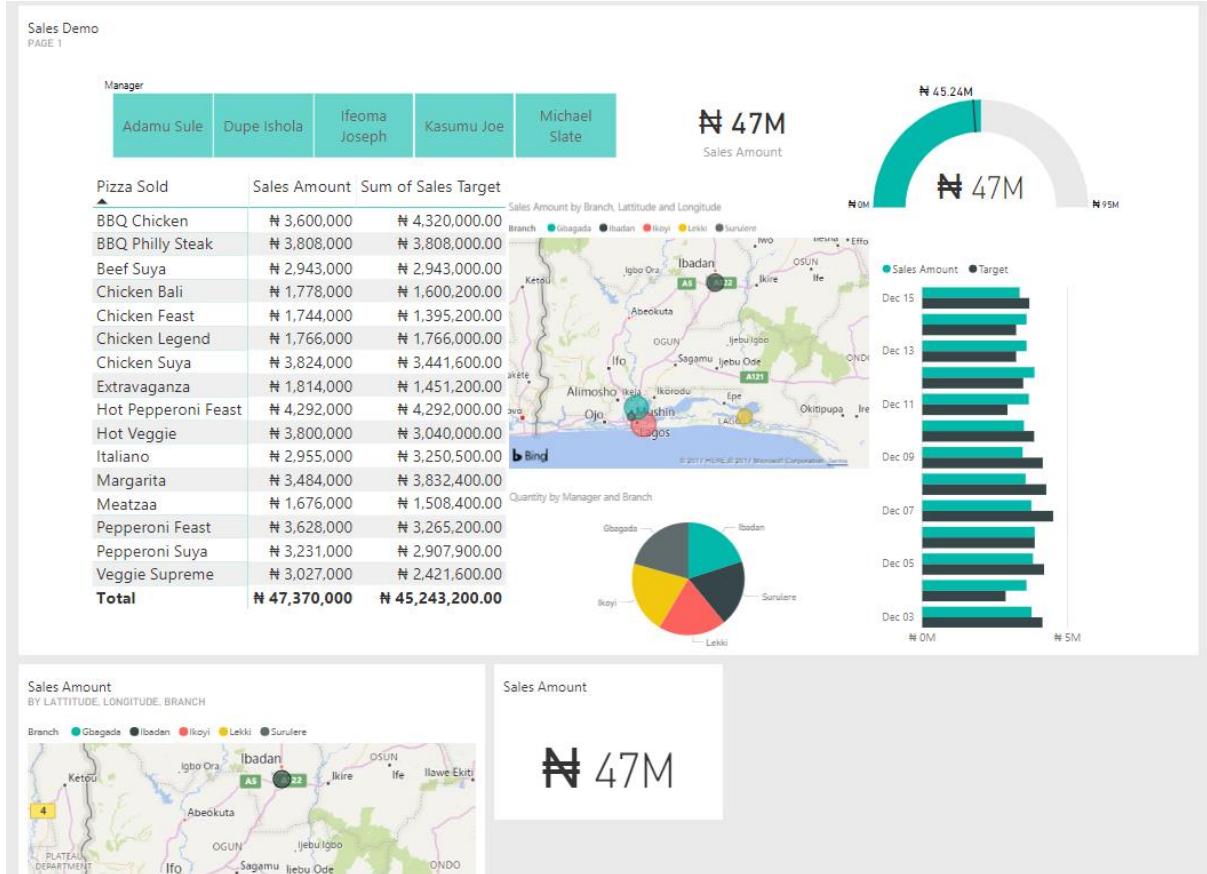
The screenshot shows the Power BI web interface. At the top, there's a navigation bar with back, forward, refresh, and search icons, followed by a secure connection indicator and the URL <https://app.powerbi.com/groups/me/reports/d7bff>. Below the URL are links for Apps, Suggested Sites, Nokia Siemens Networks, and Hello, World | Android.

The main header reads "Power BI" and "My Workspace > Sales Demo". On the left, a sidebar menu includes "Favorites", "Recent", "Apps", "Shared with me", "Workspaces" (with an arrow pointing to it), and "My Workspace".

The main content area displays a dashboard titled "Sales Demo". It features a card for "Manager" with names Adamu Sule, Dupe Ishola, Ifeoma Joseph, and Kas. Below this is a table titled "Pizza Sold" with columns for "Pizza Sold", "Sales Amount", and "Sum of Sales". The table lists various pizza types with their respective sales figures. A red arrow points from the "Workspaces" menu item towards the "My Workspace" link.

Pizza Sold	Sales Amount	Sum of Sales
BBQ Chicken	₦ 3,600,000	₦ 4,320,000
BBQ Philly Steak	₦ 3,808,000	₦ 3,808,000
Beef Suya	₦ 2,943,000	₦ 2,943,000
Chicken Bali	₦ 1,778,000	₦ 1,600,000
Chicken Feast	₦ 1,744,000	₦ 1,395,000
Chicken Legend	₦ 1,766,000	₦ 1,766,000
Chicken Suya	₦ 3,824,000	₦ 3,441,000
Extravaganza	₦ 1,814,000	₦ 1,451,000
Hot Pepperoni Feast	₦ 4,292,000	₦ 4,292,000
Hot Veggie	₦ 3,800,000	₦ 3,040,000
Italiano	₦ 2,955,000	₦ 3,250,000
Margarita	₦ 3,484,000	₦ 3,832,000
Meatzaa	₦ 1,676,000	₦ 1,508,000
Pepperoni Feast	₦ 3,628,000	₦ 3,265,000
Pepperoni Suya	₦ 3,231,000	₦ 2,907,000
Veggie Supreme	₦ 3,027,000	₦ 2,421,000
<b>Total</b>	<b>₦ 47,370,000</b>	<b>₦ 45,243,000</b>

And here it is.



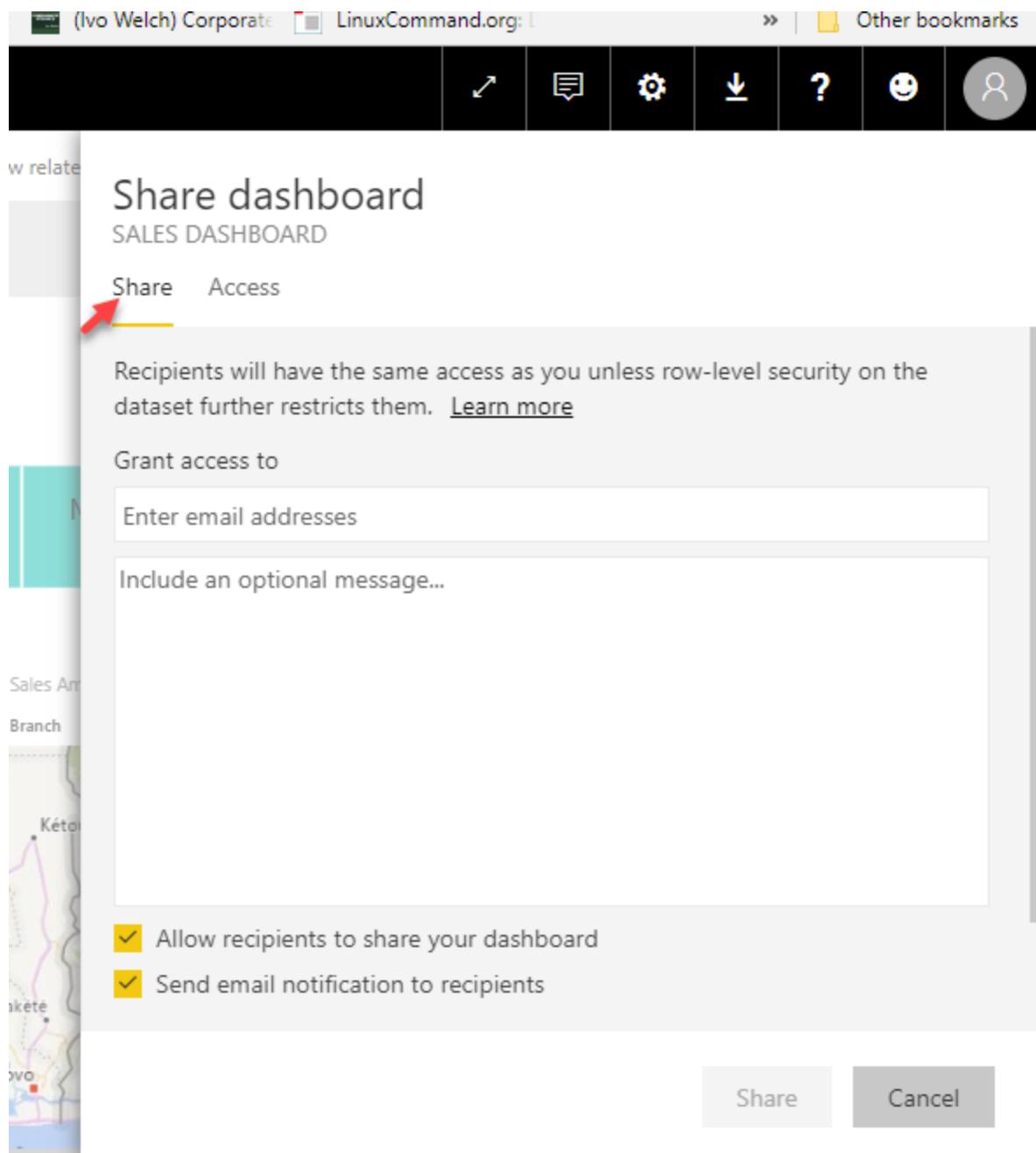
See that it has all the things I pinned. You can move the visuals around to re-arrange them and can also adjust the size.

You can see in the screenshot below, the interesting features I hinted that it has.

The screenshot shows the Power BI web interface with the following elements:

- Header:** Shows the URL [Secure | https://app.powerbi.com/groups/me/dashboards/4cb93473-2e61-4470-9aa-fad45215a006b](https://app.powerbi.com/groups/me/dashboards/4cb93473-2e61-4470-9aa-fad45215a006b).
- Left Sidebar:** Includes sections for Favorites, Recent, Apps, Shared with me, and Workspaces.
- Search Bar:** A search bar with the placeholder "Ask a question about your data" highlighted with a red box.
- Dashboard Content:** Displays the "Sales Demo" page with the Manager chart, Sales Amount gauge, and other visualizations.

It is time we shared the report with colleagues. I simply click on Share at the upper right and enter the email of those I want to share with. Just note that you can't share with non-corporate email ids (no yahoo or gmail email addresses will be accepted by Power BI).



The Access tab (beside Share) allows you to remove people you've previously shared with or edit their access right.

You can also subscribe to receive daily emails when the dashboard is refreshed (usually means updated with new data).

## Power BI for the Busy Professional

+

Add tile

Usage Metrics

View related

Set as featured

Favorite

Subscribe

Share

Web view

...

Ask a question about your data

Sales Demo  
PAGE 1

Branch Manager

Adamu Sule	Dupe Ishola	Ifeoma Joseph	Kasumu Joe	Michael Slate
------------	-------------	---------------	------------	---------------

₦ 47M

₦ 45.24M

Sales Amount

₦ 0M

₦ 47M

Branch

Gbagada Ibadan Ikoyi Lekki Surulere

Ilesha Effo Fiditi Iwo Ife Ikeri OSUN Ife Sagamu Jibeu Ode ONDO

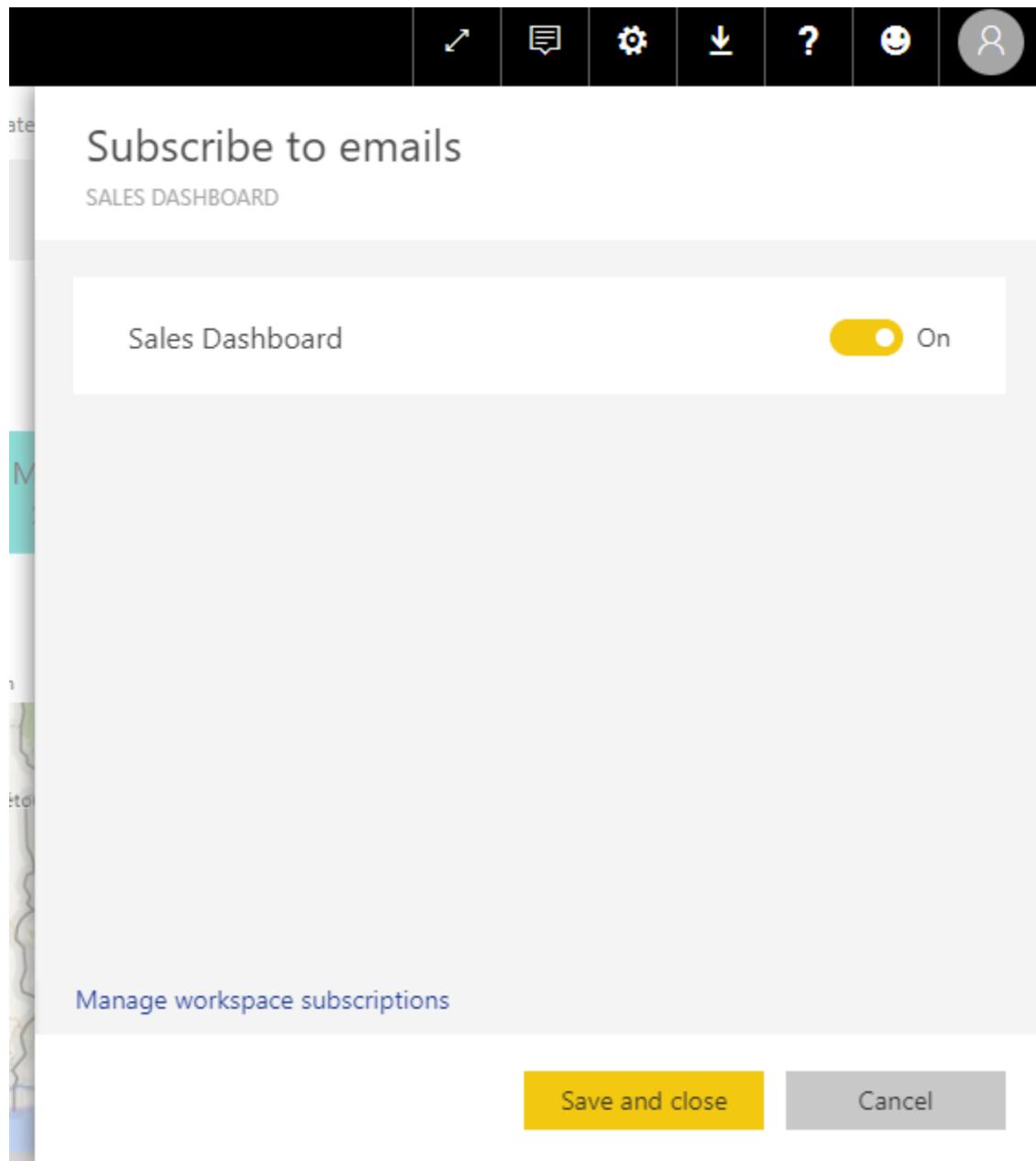
Dec 15 Dec 13 Dec 11

AS A121

Map showing branch locations in Lagos and surrounding states.

Pizza Sold

Pizza Sold	Sales Amount	Sales Target
BBQ Chicken	₦ 3,600,000	₦ 4,320,000.00
BBQ Philly Steak	₦ 3,808,000	₦ 3,808,000.00
Beef Suya	₦ 2,943,000	₦ 2,943,000.00
Chicken Bali	₦ 1,778,000	₦ 1,600,200.00
Chicken Feast	₦ 1,744,000	₦ 1,395,200.00
Chicken Legend	₦ 1,766,000	₦ 1,766,000.00
Chicken Suya	₦ 3,824,000	₦ 3,441,600.00
Extravaganza	₦ 1,814,000	₦ 1,451,200.00
Hot Pepperoni Feast	₦ 4,292,000	₦ 4,292,000.00
Hot Veggie	₦ 3,800,000	₦ 3,040,000.00



You can also publish the entire dashboard, report and dataset as a content pack, or just the report and dataset, or just the dataset.

Choose who will have access to this content pack:

Specific groups  My entire organization

Enter email addresses

Title

Description

Upload an image or company logo  
Image size: 45 KB or less, 4:3 aspect ratio, JPG or PNG format

Select items to publish

Dashboards	Reports	Datasets
<input type="checkbox"/> Google Analytics - Olafus...	<input type="checkbox"/> Big Data analysis	<input type="checkbox"/> Google Analytics - olafus...
<input type="checkbox"/> MailChimp 	<input type="checkbox"/> Class June	<input type="checkbox"/> Customer Profitability Sa...
<input type="checkbox"/> Customer Profitability Sa...	<input type="checkbox"/> Class practice	<input type="checkbox"/> Human Resources Sample
<input type="checkbox"/> Human Resources Sample	<input checked="" type="checkbox"/> Customer Profitability...	<input type="checkbox"/> IT Spend Analysis Sample
<input type="checkbox"/> IT Spend Analysis Sample	<input type="checkbox"/> Customer Profitability...	<input type="checkbox"/> Opportunity Analysis Sa...
<input type="checkbox"/> Opportunity Analysis Sa...	<input type="checkbox"/> Customer Profitability...	<input type="checkbox"/> Procurement Analysis Sa...
<input type="checkbox"/> Procurement Analysis Sa...	<input type="checkbox"/> December Training	<input type="checkbox"/> Retail Analysis Sample
<input type="checkbox"/> Retail Analysis Sample	<input type="checkbox"/> Google Analytics - ola...	<input type="checkbox"/> Sales and Marketing Sa...

The content pack will be available in your organization's content gallery. [Learn more](#)

**Publish** **Cancel**

Sales Dashboard

Ask a question about your data

Branch Manager

	Adamu Sule	Dupe Ishola	Ifeoma Joseph	Kasumu Joe	Michael Slate
Pizza Sold					
BBQ Chicken	₦ 3,600,000	₦ 4,320,000.00			
BBQ Philly Steak	₦ 3,808,000	₦ 3,808,000.00			
Beef Suya	₦ 2,943,000	₦ 2,943,000.00			

Manage personal storage  
126 MB of 10 GB used

Create content pack

View content pack

Admin portal

Manage gateways

Settings

Manage embed codes

Share Web view ...

₦ 45.24M

₦ 47M

**Branch**: Gbagada, Ibadan, Ikoyi, Lekki, Surulere

Nigeria map showing branch locations: Gbagada (green dot), Ibadan (black dot), Ikoyi (red dot), Lekki (yellow dot), and Surulere (grey dot). Major cities like Lagos, Abuja, and Port Harcourt are also marked.

Let's try out the Q&A. Ask it to show you Sales Amount by branch as bar chart

Ask a question about your data

Sales Demo

PAGE 1

Branch Manager

	Adamu Sule	Dupe Ishola	Ifeoma Joseph	Kasumu Joe	Michael Slate
Pizza Sold					
BBQ Chicken	₦ 3,600,000	₦ 4,320,000.00			
BBQ Philly Steak	₦ 3,808,000	₦ 3,808,000.00			
Beef Suya	₦ 2,943,000	₦ 2,943,000.00			
Chicken Bali	₦ 1,778,000	₦ 1,600,200.00			
Chicken Feast	₦ 1,744,000	₦ 1,395,200.00			
Chicken Legend	₦ 1,766,000	₦ 1,766,000.00			
Chicken Suya	₦ 3,824,000	₦ 3,441,600.00			
Extravaganza	₦ 1,814,000	₦ 1,451,200.00			
Hot Pepperoni Feast	₦ 4,292,000	₦ 4,292,000.00			
Hot Veggie	₦ 3,800,000	₦ 3,040,000.00			
Italiano	₦ 2,955,000	₦ 3,250,500.00			
Margarita	₦ 3,484,000	₦ 3,832,400.00			
Meatzaa	₦ 1,676,000	₦ 1,508,400.00			
Pepperoni Feast	₦ 3,628,000	₦ 3,265,200.00			
Penneroni Suya	₦ 3,231,000	₦ 2,907,900.00			

₦ 47M

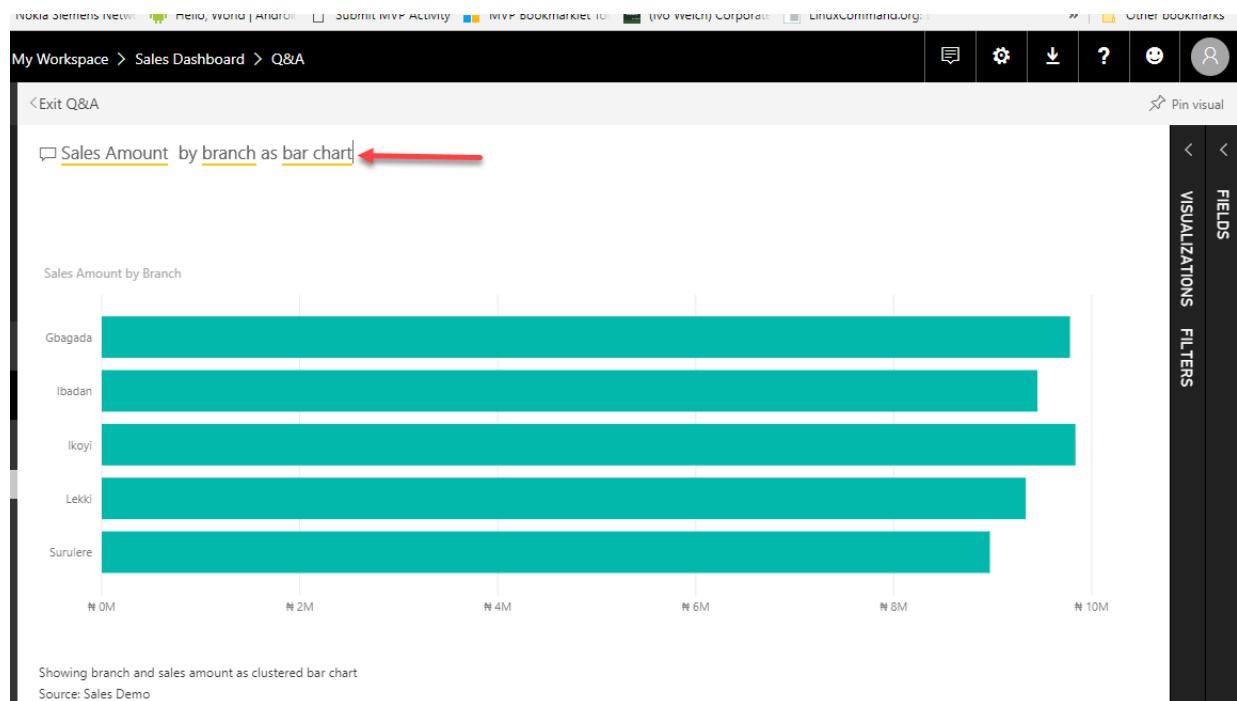
Sales Amount

Branch: Gbagada, Ibadan, Ikoyi, Lekki, Surulere

Nigeria map showing branch locations: Gbagada (green dot), Ibadan (black dot), Ikoyi (red dot), Lekki (yellow dot), and Surulere (grey dot). Major cities like Lagos, Abuja, and Port Harcourt are also marked.

Gbagada 3K

Ibadan 3K



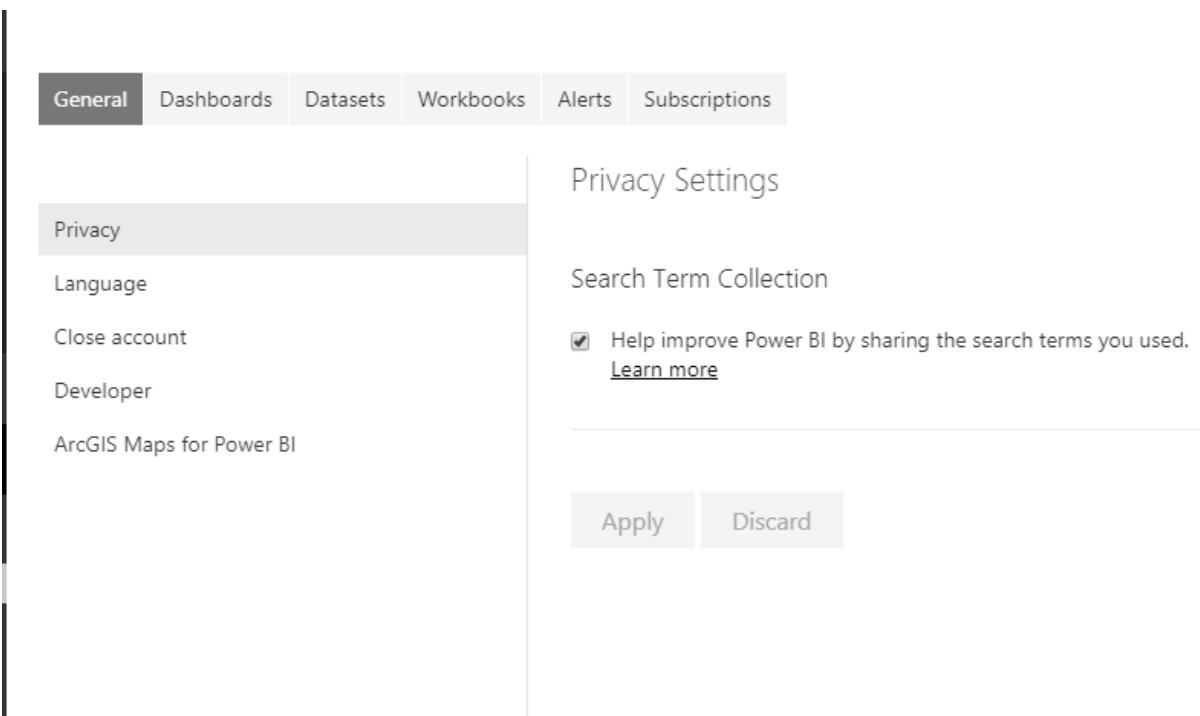
Lastly, let me take you through all the settings available for the report and dashboard you have just created. To the right of the dashboard name, click on the ellipsis (three dots), then click on Settings.

The screenshot shows the Power BI desktop application. At the top, it says "Power BI" and "My Workspace > Sales Dashboard". On the left, there's a sidebar with "Favorites", "Recent", "Apps", "Shared with me", "Workspaces", and "My Workspace" (which is expanded). Under "My Workspace", several sample workspaces are listed: "Procurement Analysis Sample", "QuickBooks Online", "Retail Analysis Sample", "Sales and Marketing Sample", "Sales Dashboard" (with a red arrow pointing to its three-dot menu), "Sales Dashboard3", "Sales Report", "Salesy", "Stocks New", and "Supplier Quality Analysis Sa...". Below this is a "Get Data" section. In the center, there's a "Sales Demo" page with a header "PAGE 1" and some names: Adamu Sule, Dupe Ishola, Ifeoma Joseph, and K. To the right, there's a "Branch Manager" section with a table showing Sales Amount and Sales Target for various categories. A context menu is open over the "Sales Dashboard" item in the workspace list. The menu options are: OWNED BY (with "Michael Olafusi - mike@urBizEdge.onmicrosoft.com" selected), OPEN, SHARE, RENAME, REMOVE, and SETTINGS (with a red arrow pointing to it).

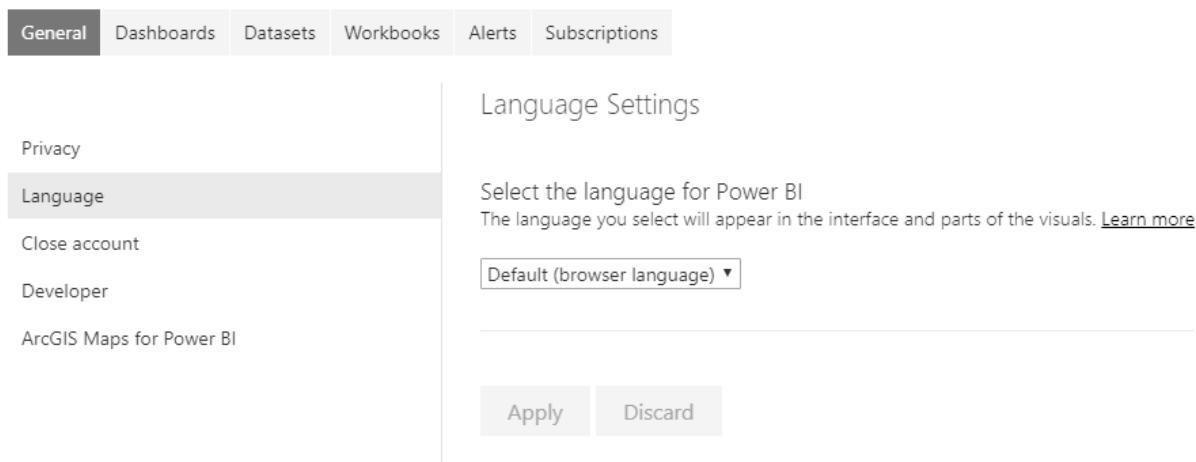
	Sales Amount	Sales Target
Category 1	₦ 3,600,000	₦ 4,320,000
Category 2	₦ 3,808,000	₦ 3,800,000
Category 3	₦ 2,943,000	₦ 2,940,000
Category 4	₦ 1,778,000	₦ 1,600,000
Category 5	₦ 1,744,000	₦ 1,390,000
Category 6	₦ 1,766,000	₦ 1,760,000
Category 7	₦ 3,824,000	₦ 3,440,000
Category 8	₦ 1,814,000	₦ 1,450,000
Category 9	₦ 4,292,000	₦ 4,290,000
Category 10	₦ 3,800,000	₦ 3,040,000

In the page that will come up, you will see all the settings that control how you consume the reports from automatic scheduling of refresh to update the reports with new data without your manual intervention to sending you an email notification when a the report has been refreshed (data updated).

The first settings tab is General. Allows you to set privacy - whether to allow Microsoft get performance log from you or not. And Language, account closure, enable developer mode for coding custom visuals and enable ArcGIS Maps for Power BI.



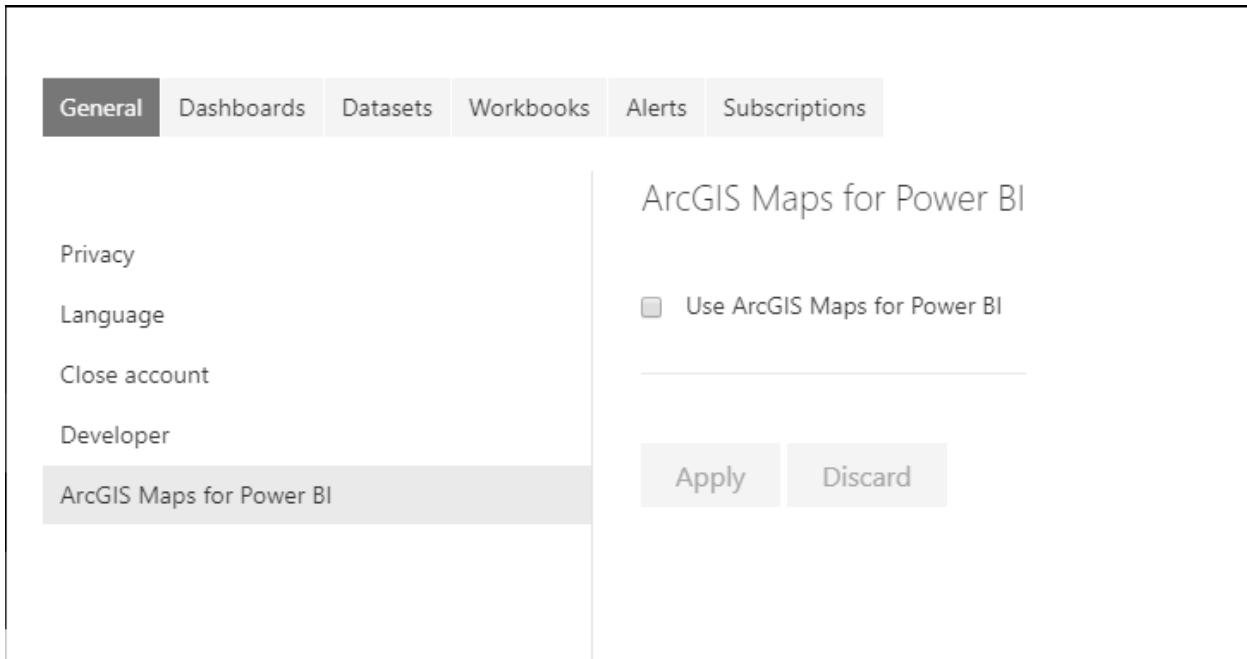
The screenshot shows the 'Privacy' settings page in Power BI. The top navigation bar includes tabs for General, Dashboards, Datasets, Workbooks, Alerts, and Subscriptions. The 'General' tab is selected. On the left, a sidebar lists options: Privacy, Language, Close account, Developer, and ArcGIS Maps for Power BI. The main content area is titled 'Privacy Settings' and contains a section for 'Search Term Collection'. It features a checkbox labeled 'Help improve Power BI by sharing the search terms you used.' followed by a link 'Learn more'. At the bottom right are 'Apply' and 'Discard' buttons.



The screenshot shows the 'Language' settings page in Power BI. The top navigation bar includes tabs for General, Dashboards, Datasets, Workbooks, Alerts, and Subscriptions. The 'General' tab is selected. On the left, a sidebar lists options: Privacy, Language, Close account, Developer, and ArcGIS Maps for Power BI. The main content area is titled 'Language Settings' and contains a section for selecting the language for Power BI. It states: 'Select the language for Power BI. The language you select will appear in the interface and parts of the visuals.' followed by a link 'Learn more'. A dropdown menu is shown with the option 'Default (browser language) ▾'. At the bottom right are 'Apply' and 'Discard' buttons.

The screenshot shows the 'General' tab selected in the top navigation bar. On the left, a sidebar lists 'Privacy', 'Language', 'Close account' (which is highlighted), 'Developer', and 'ArcGIS Maps for Power BI'. The main content area is titled 'Close account' and contains a yellow callout box with the text: 'Your account is managed by your organization's IT department. changes.' Below the title is a button labeled 'Close account'.

The screenshot shows the 'General' tab selected in the top navigation bar. On the left, a sidebar lists 'Privacy', 'Language', 'Close account', 'Developer' (which is highlighted), and 'ArcGIS Maps for Power BI'. The main content area is titled 'Developer Settings' and contains a checkbox labeled 'Enable developer visual for testing' with a link 'Learn more' below it.



The second settings tab is Dashboards. It allows you to set whether to enable Q&A and Dashboard tile flow (automatic adjusting of the visuals shape and size based on the screen size of the device you are using to access the dashboard).

It is good to make sure that you are configuring the settings for the right dashboard.

The screenshot shows the 'Dashboards' tab selected in the top navigation bar. On the left, there's a list of dashboards: PGH, PGH\_N, Procurement Analysis Sample, QuickBooks Online, Retail Analysis Sample, Sales and Marketing Sample, Sales Dashboard (which has a red arrow pointing to it), Sales Dashboard3, Sales Report, and Sales. The 'Sales Dashboard' item is highlighted with a grey background. The main content area is titled 'Settings for Sales Dashboard'. It includes sections for 'Q&A' (with a note about enabling users to find data and create charts using natural language) and 'Dashboard tile flow' (with a note about automatically aligning content to the canvas). A yellow warning box at the bottom states: '⚠ By turning on tile flow for this dashboard, once you move a tile on the dashboard, it will automatically adjust your tile layout.'

The third settings tab is Datasets. It allows you to schedule refresh which depends on you manually setting gateway connection if your datasets are not on a cloud or publicly accessible datasource/database. You will notice a yellow warning notice

saying that you've not configured a data gateway for the data sources you used (this is because the Excel files we used as the data source are locally saved on our PC and not from a cloud or internet data source).

The screenshot shows the 'Datasets' tab selected in the navigation bar. On the left, a list of datasets includes 'QuickBooks Online', 'Retail Analysis Sample', 'Sales and Marketing Sample', 'Sales Dashboard2', 'Sales Dashboards3', 'Sales Demo' (which is highlighted), 'Supplier Quality Analysis Sample', 'Task and Project Tracker', 'Task Manager', and 'test'. To the right, under 'Settings for Sales Demo', there is a yellow warning box stating: '⚠ You don't have any gateway installed or configured for the data sources in this dataset. Please install a new personal gateway or configure the data source for an existing data gateway.' Below this, there are several expandable sections: 'Refresh history', 'Gateway connection', 'Data source credentials', 'Scheduled refresh', 'Q&A and Cortana', and 'Featured Q&A questions'.

Once you configure a data gateway on your PC and register the Excel files as data sources housed in that gateway, the warning will go off and you can set the scheduled refresh.

[Refresh history](#)

- ▶ Gateway connection
- ▶ Data source credentials
- ◀ Scheduled refresh

Keep your data up to date



On

Refresh frequency

▼

Time zone

▼

Time

▼ ▼ ▼ 

[Add another time](#)

Send refresh failure notification email to me

You can allow Cortana to access your datasets relying on the Q&A feature of Power BI. Also, you can preset some Q&A questions.

Last refresh succeeded: Sun Dec 31 2017 01:02:08 GMT+0100 (W. Central Africa Standard Time)

Next refresh: Mon Jan 01 2018 01:00:00 GMT+0100 (W. Central Africa Standard Time)

[Refresh history](#)

- ▶ Gateway connection
- ▶ Data source credentials
- ▶ Scheduled refresh
- ◀ Q&A and Cortana

Allow Cortana to access this dataset

Cortana will only share this information with Power BI users who have access to it.

[Apply](#)

[Discard](#)

- ◀ Featured Q&A questions

Featured questions are shown as suggestions for this dataset in Q&A.

[Add a question](#)

[Apply](#)

[Discard](#)

The fourth settings tab is Workbooks. Power BI allows you to import Excel files as Workbooks. This is only possible from the web Power BI service.



You don't have any workbooks

The fifth settings tab is Alerts. It allows you manage the triggers you've set regarding some metrics/values reaching a threshold figure.

#### My workspace

ALERT	DASHBOARD	DATE CREATED	
Alert for Total Volume	Sales and Marketing Sample	Aug 30, 2016, 11:04:28 AM	<input checked="" type="button"/> On <a href="#">Edit</a> <a href="#">Delete</a>
Alert for This Year's Sales	Retail Analysis Sample	Sep 13, 2016, 5:28:34 PM	<input checked="" type="button"/> On <a href="#">Edit</a> <a href="#">Delete</a>
Alert for Sales Amount	July Pin	Jun 21, 2017, 3:36:19 PM	<input checked="" type="button"/> On <a href="#">Edit</a> <a href="#">Delete</a>
Alert for Gross Margin %	Customer Profitability Sample	Dec 11, 2017, 12:19:55 PM	<input checked="" type="button"/> On <a href="#">Edit</a> <a href="#">Delete</a>

The last settings tab is Subscriptions. It allows you manage the email subscriptions you have to existing dashboards so that you get a daily notification once the dataset (ultimately, the report and dashboard) is refreshed (usually indicating new data added).



### My Workspace

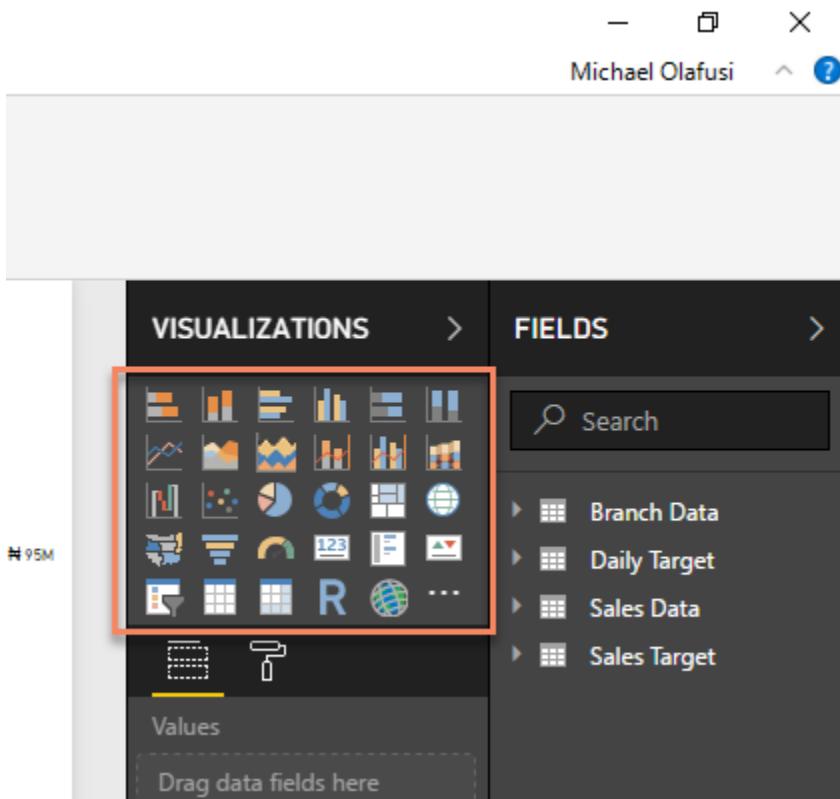
CONTENT NAME	ACTIONS	OVERVIEW
 Customer Profitability Sample		1 subscription
 Sales Dashboard		1 subscription

And so we have come to the end of our sample sales analysis report in Power BI.

Again, you can download the practice along files at  
<https://drive.google.com/file/d/1FCEkyJvW4viszv9wo43QaljXI2ADpCDD/view?usp=sharing>

## Power BI Visuals

Power BI visuals are the actual elements – tables, charts, filters/slicers, maps, etc – that present the data in your report. By default, Power BI comes with 29 visuals.

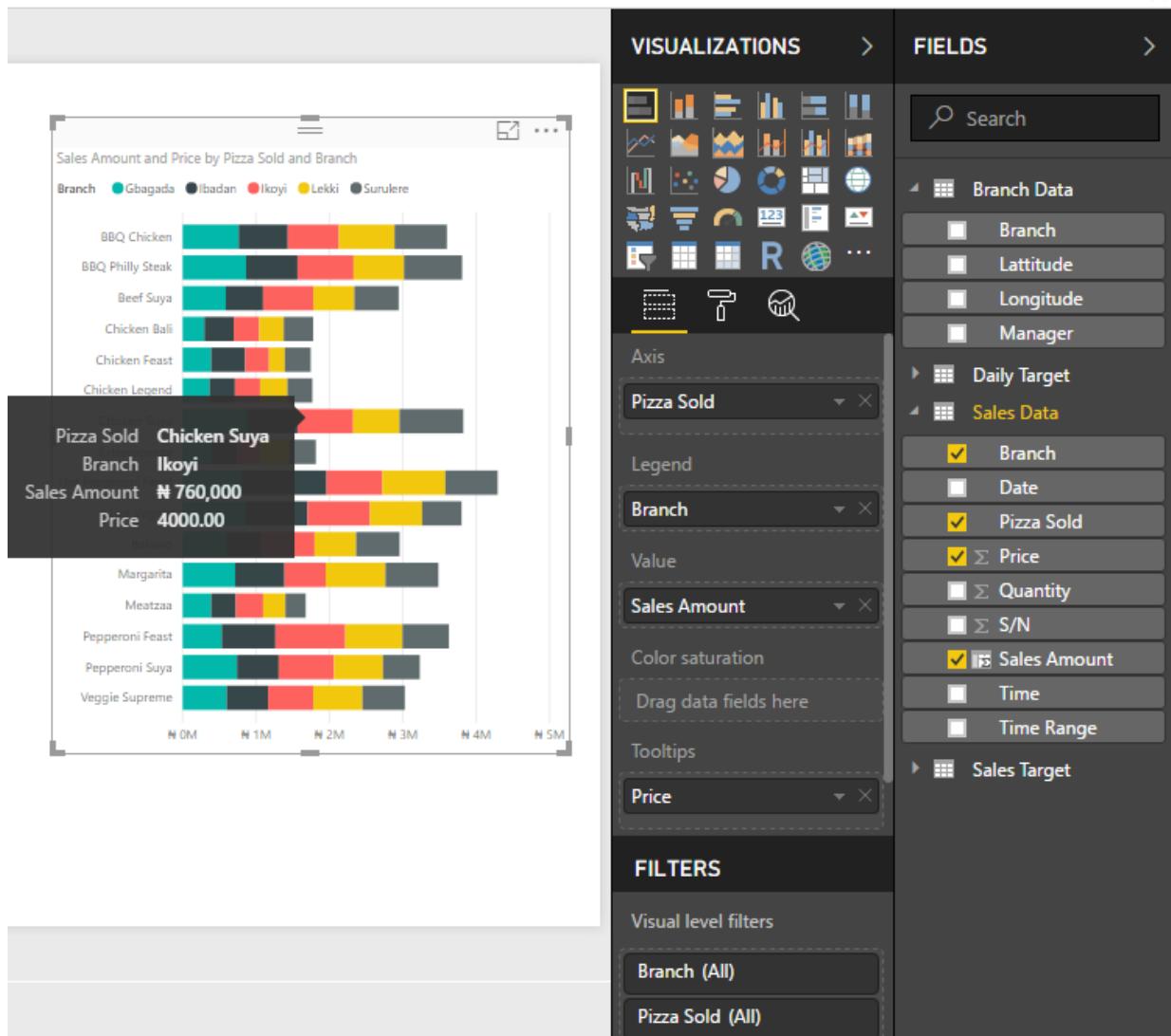


They are:

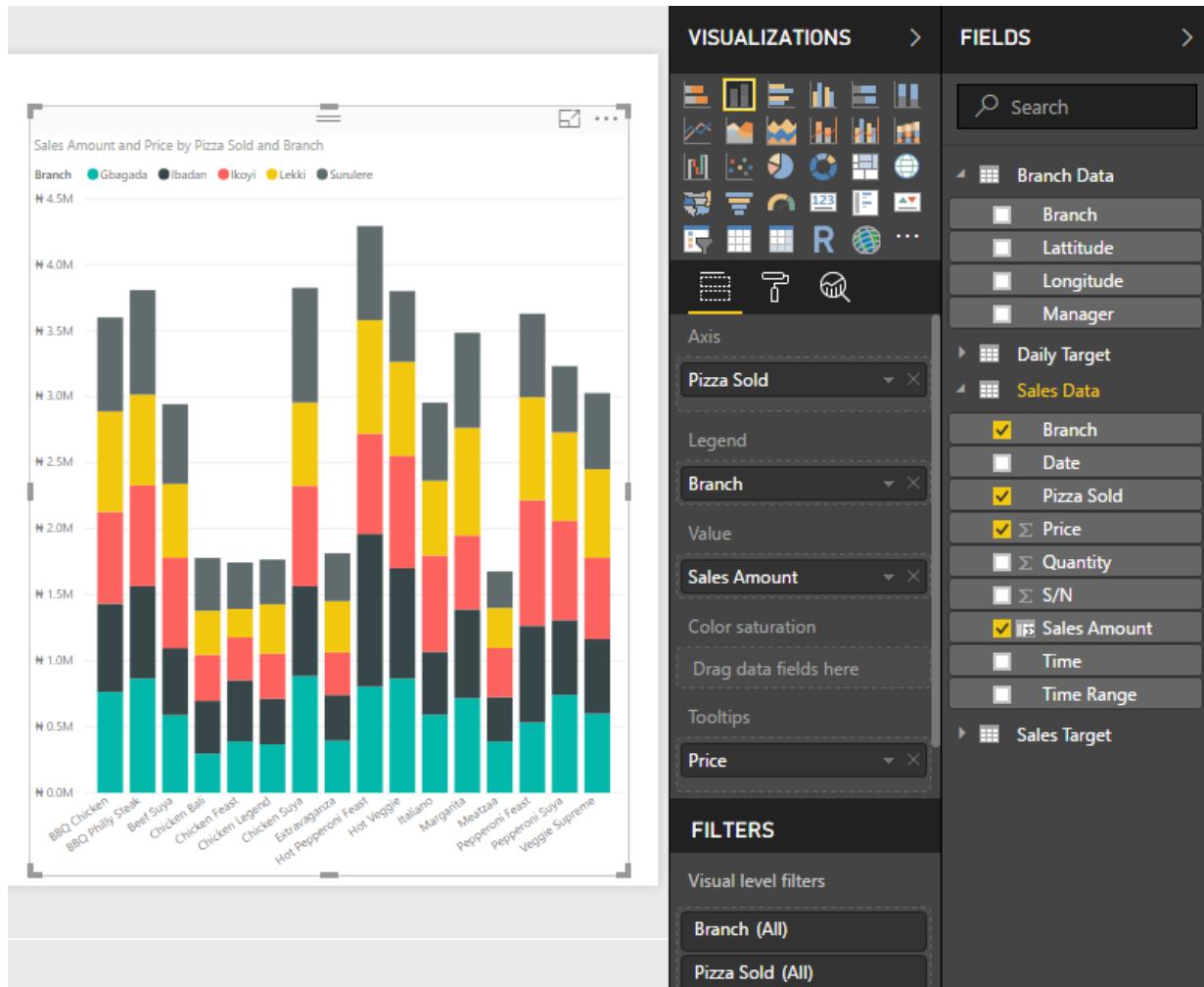
- 1. Stacked Bar Chart:** This allows you to create a bar chart with the breakdowns (field in legend) stacked on top of each other. It can be used to show total sales with breakdown by products or region. It has five components – Axis (where you put the field that should have separate bars, like date), Legend (where you put the field to stack one on another for each category in the axis, e.g. products or regions; anything you drag into Legend comes out with different colors), Value (where you put the field with the figures you want to plot), Color Saturation (allows you to represent the values in a field on a light to dark color intensity on the plotted value bars. You can't use it and Legend together. A likely use will be to show volume/quantity of products sold while the bar values present the sales amount), and Tooltips (allows you to show extra details, like price per unit of the product).

I Desktop

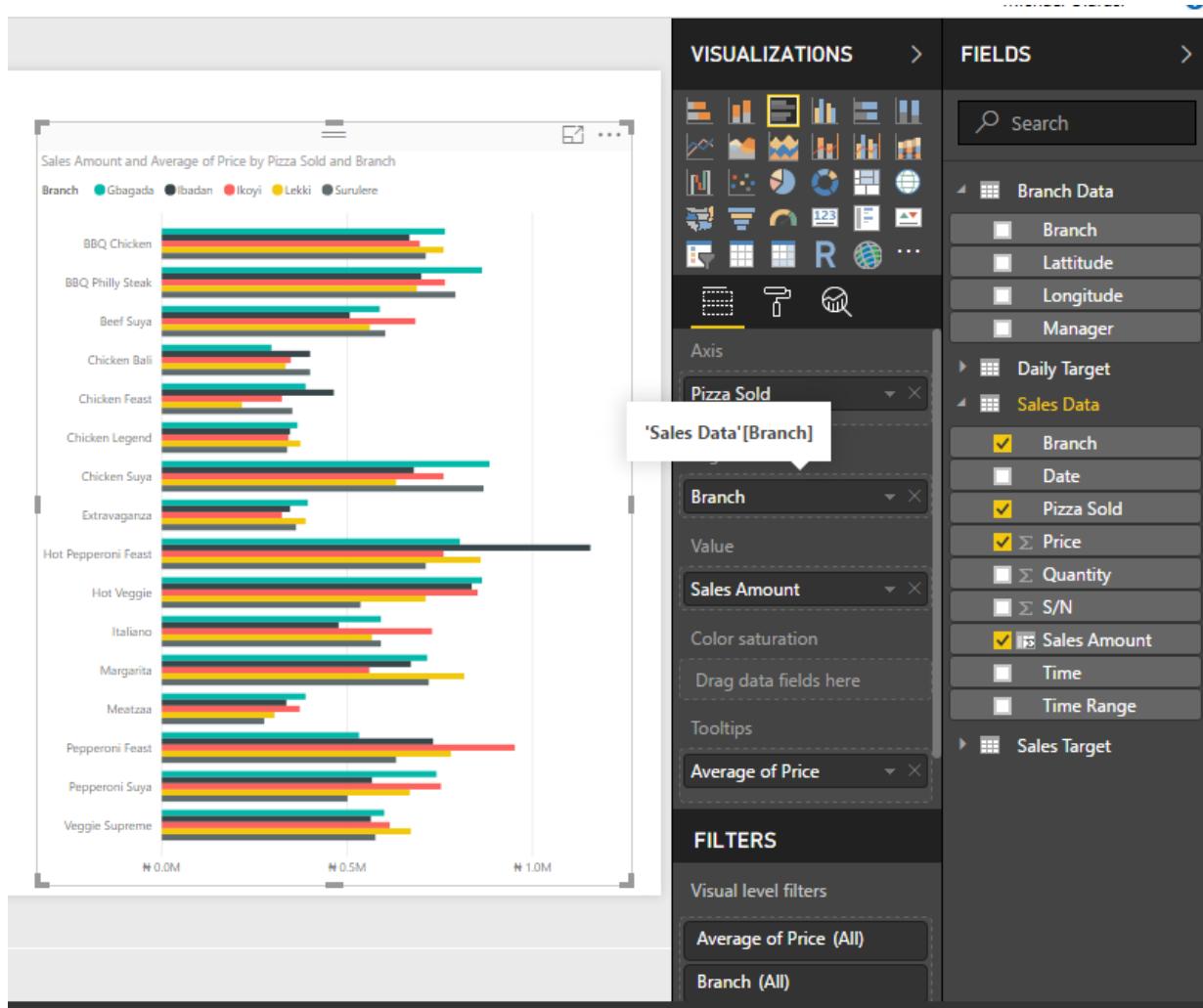
Michael Olafusi ?



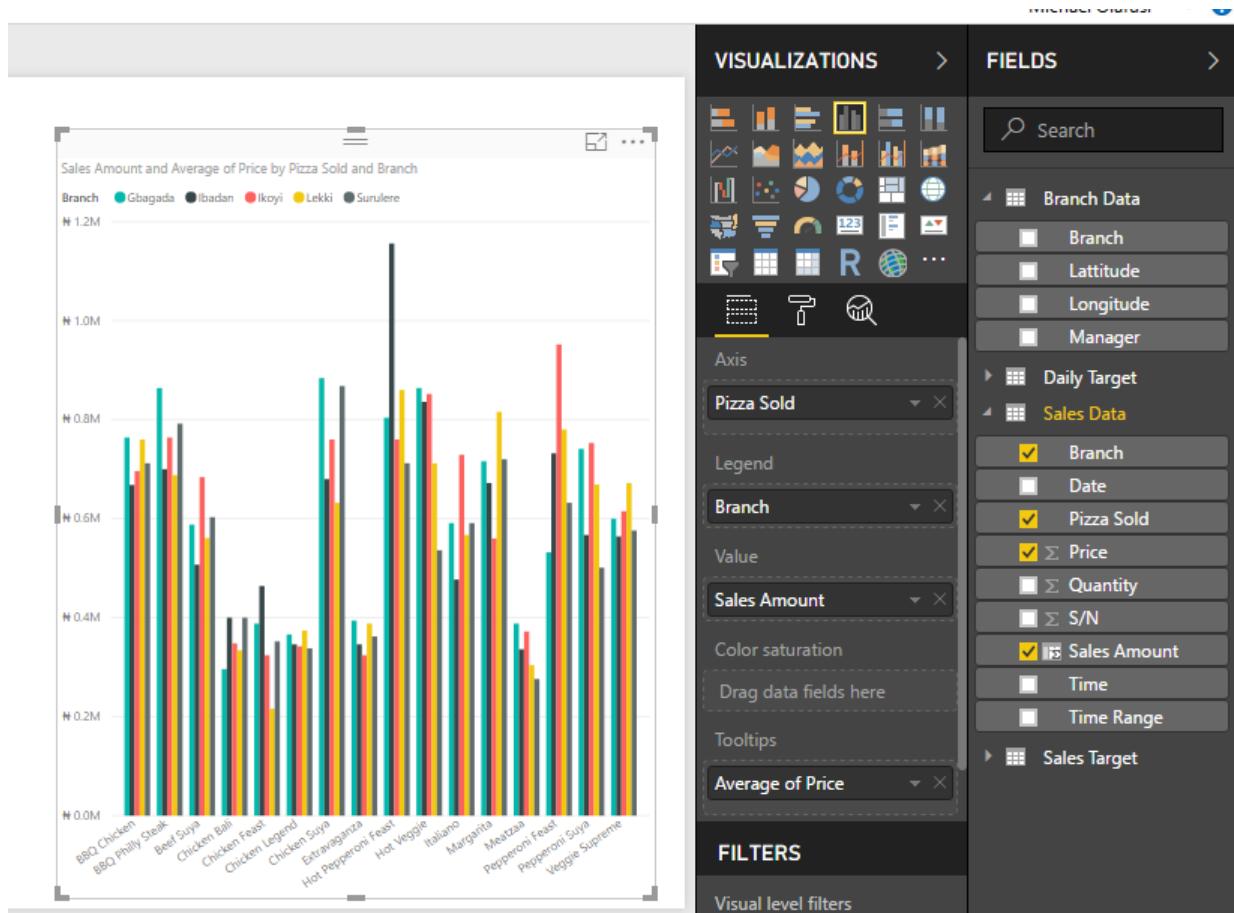
**2. Stacked Column Chart:** Technically same as the Stacked Bar Chart just the orientation is different, its bars are vertical.



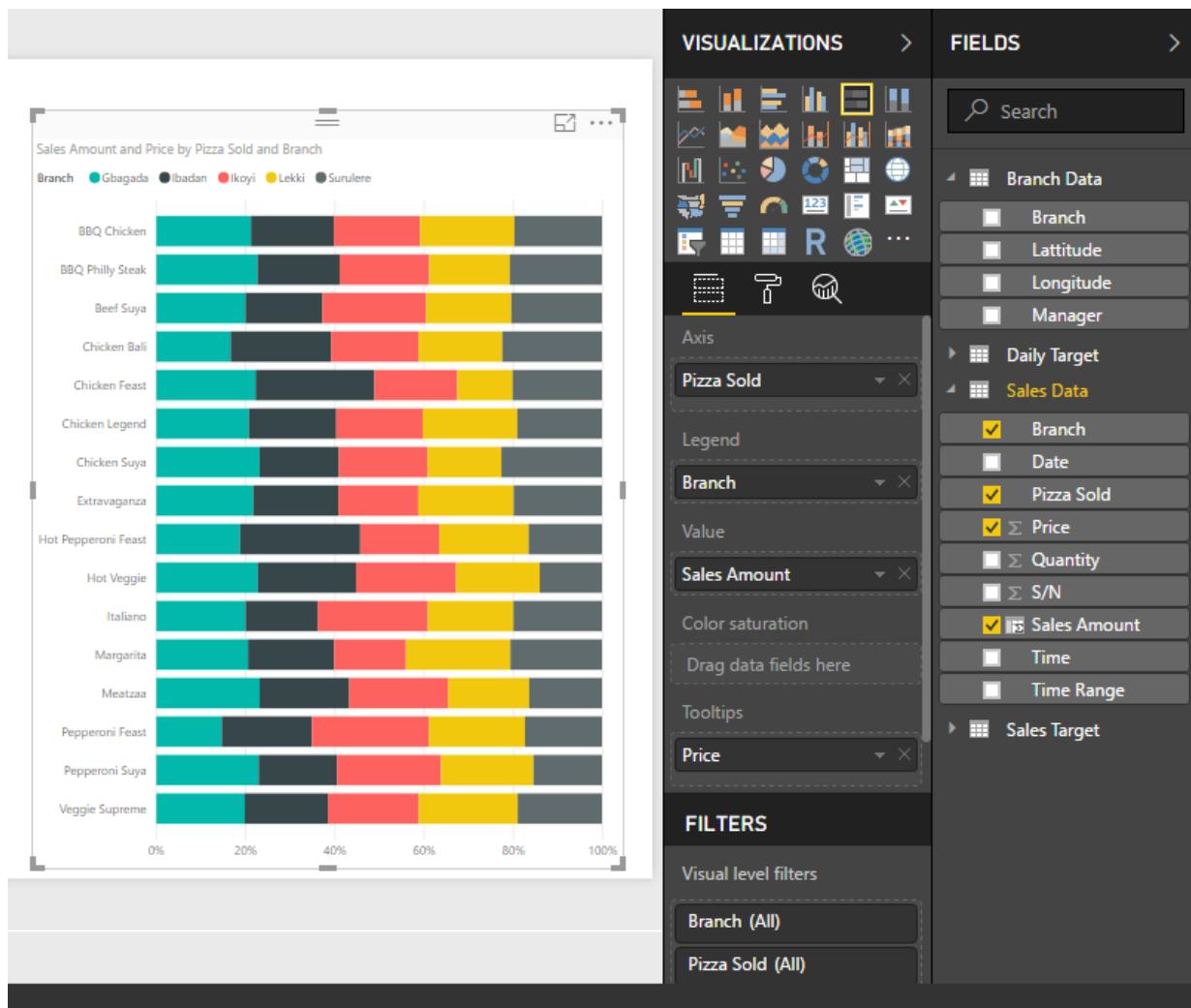
**3. Clustered Bar Chart:** The difference between this and the stacked one is that it has the breakdowns (legend values) plotted on independent bars rather than stacked one on another.



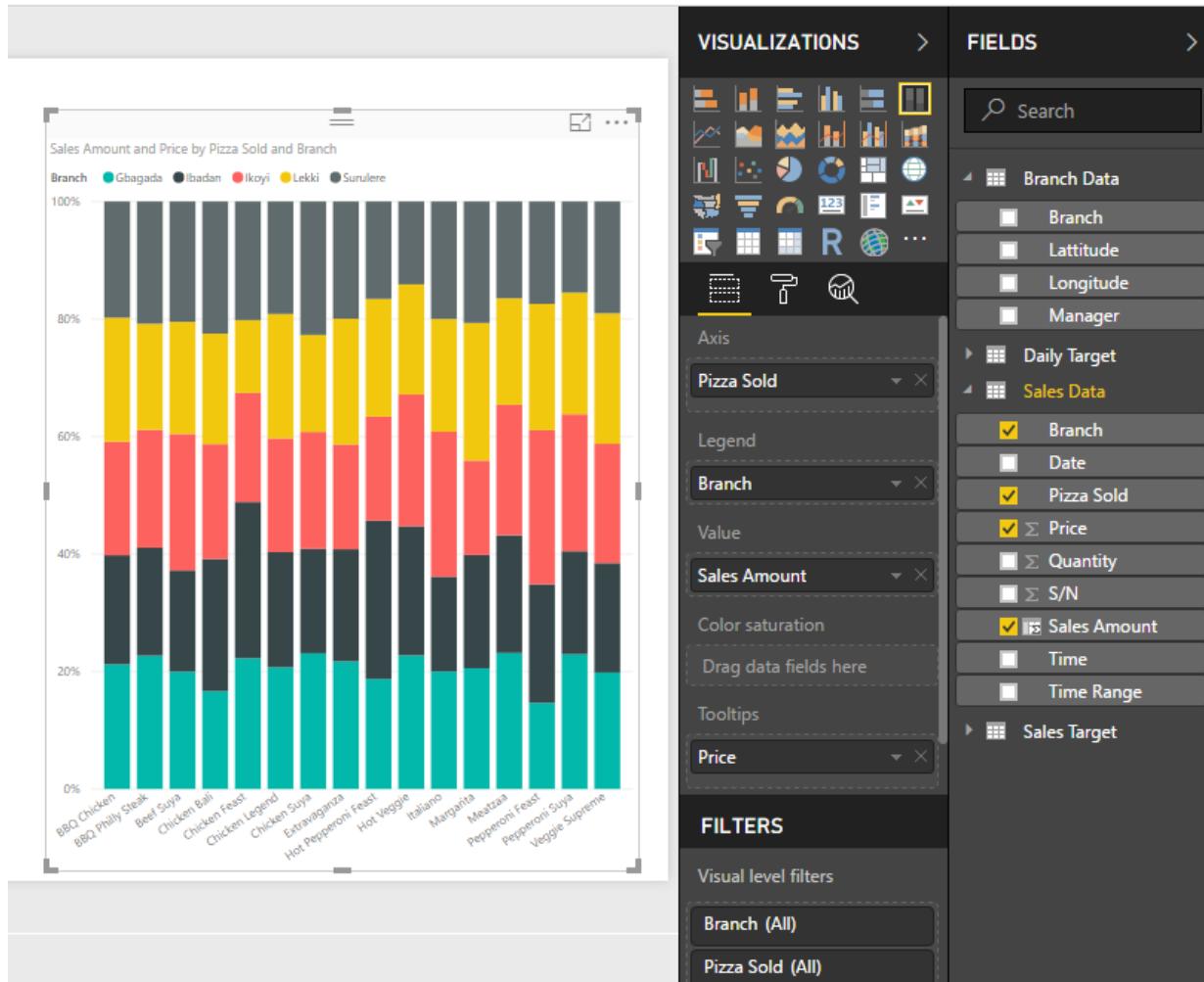
**4. Clustered Column Chart:** The difference between this and the stacked column chart is that it has the breakdowns (legend values) plotted on independent bars rather than stacked one on another.



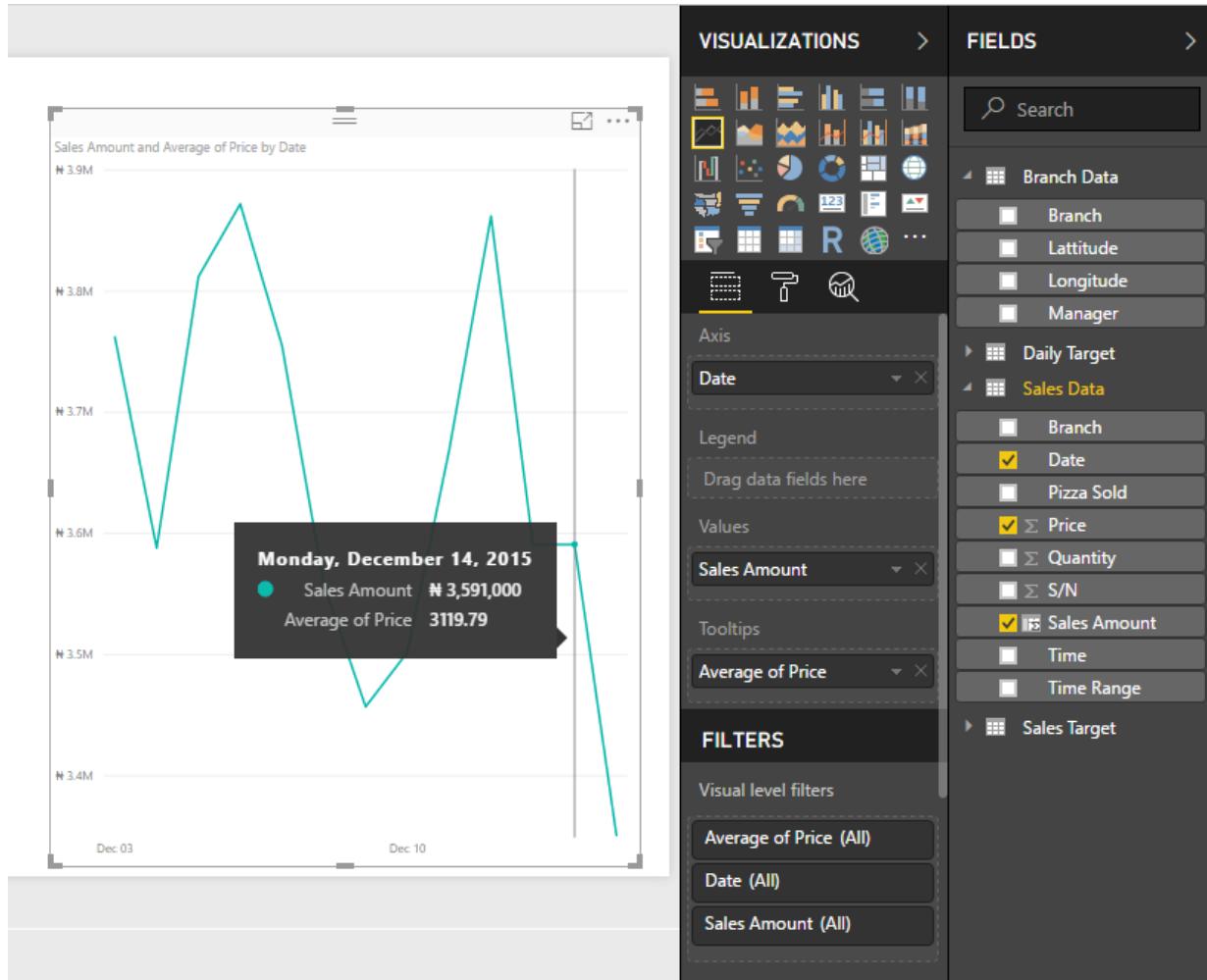
**5.100% Stacked Bar Chart:** This has the legend values (breakdown) expressed as percentages of the total value per axis item. Useful for showing relative contribution of sales by the different branches to total sales each day/month. And if you work with market research data, excellent for market share representation.



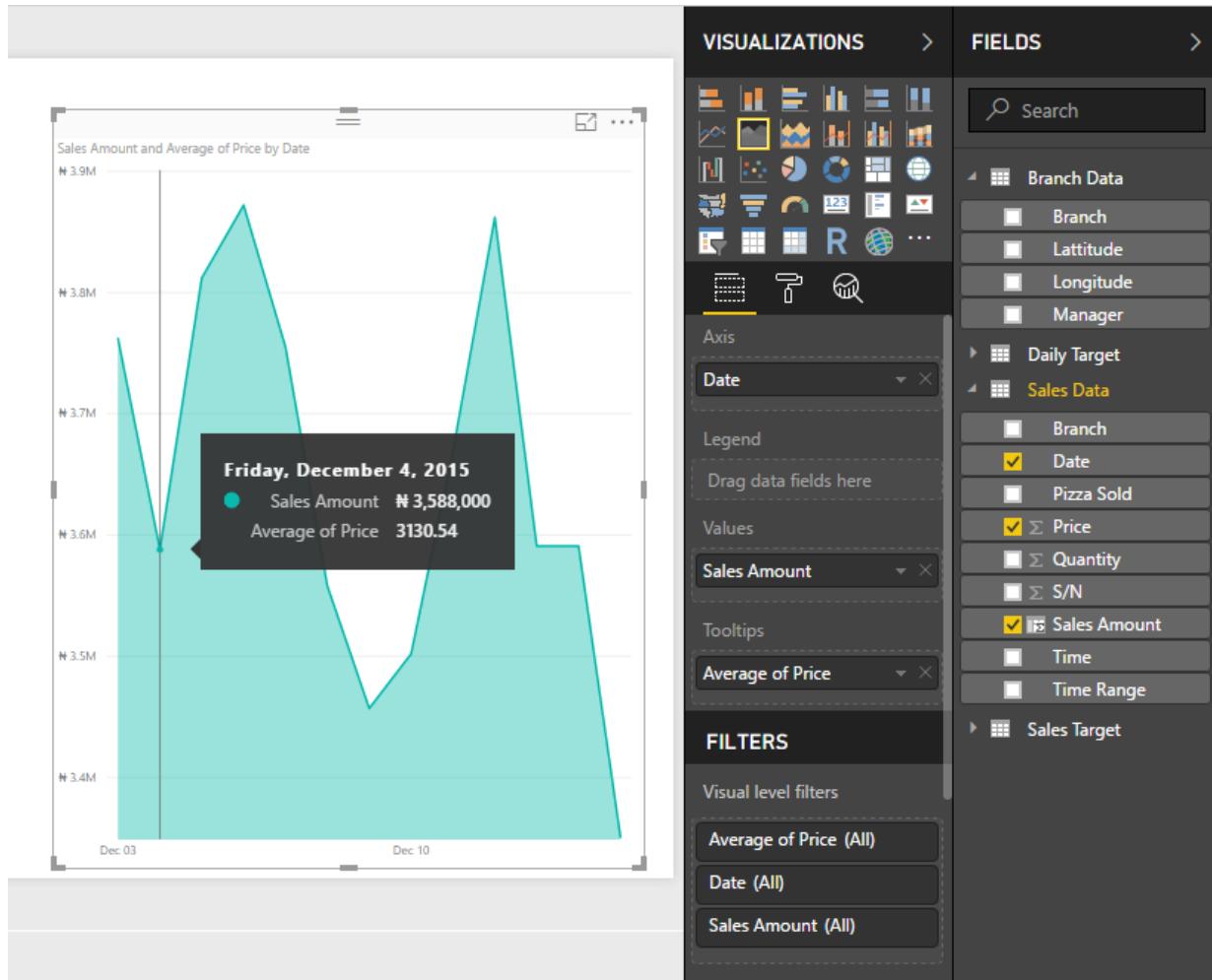
**6.100% Stacked Column Chart:** Just as you would have guessed, it is the column version of the 100% Stacked Bar Chart.



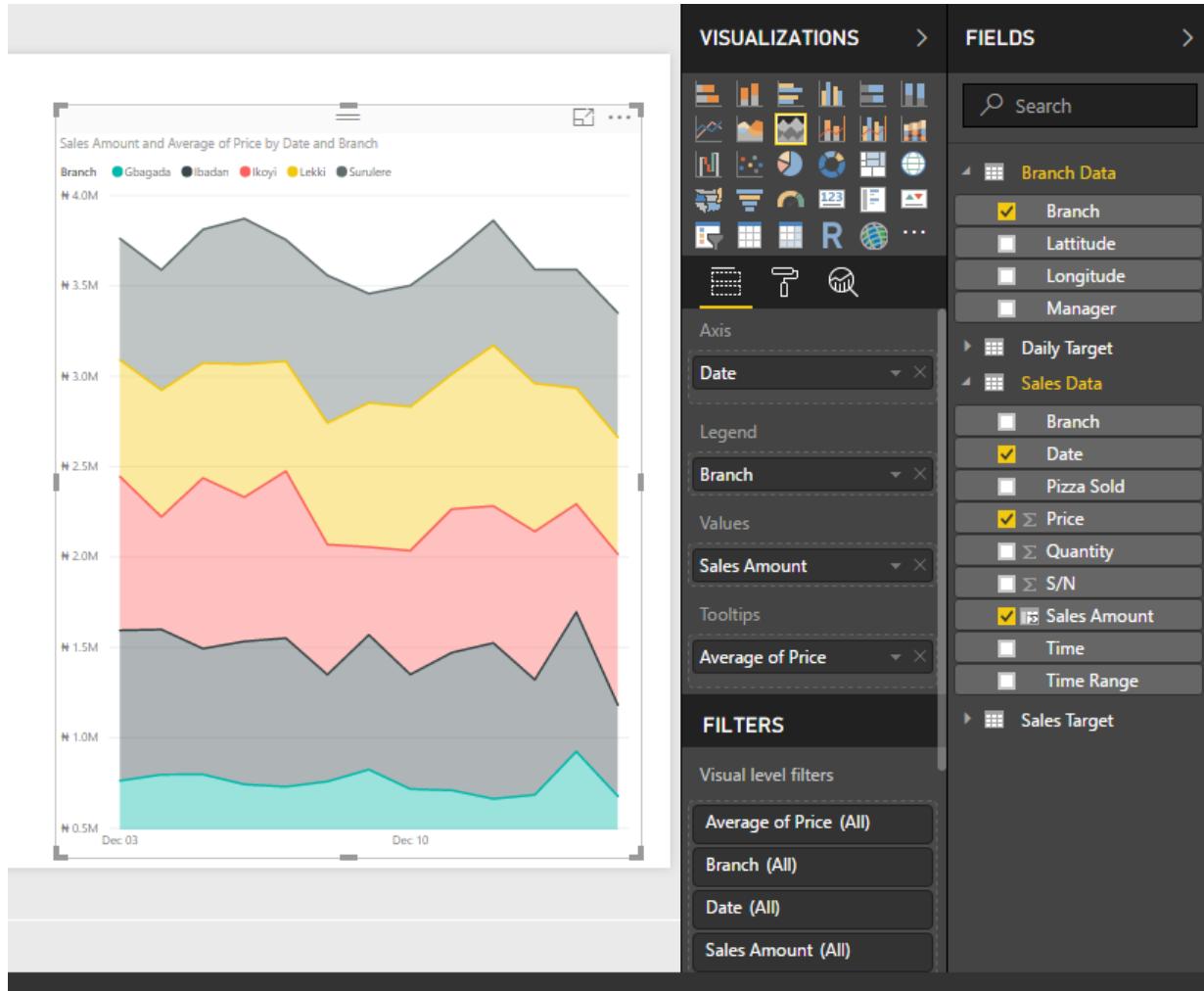
**7. Line Chart:** Has all the components of the Bar/Column chart except the Color Saturation one. The line chart is to show trend (change over time), so you should always put a date or time field in the Axis.



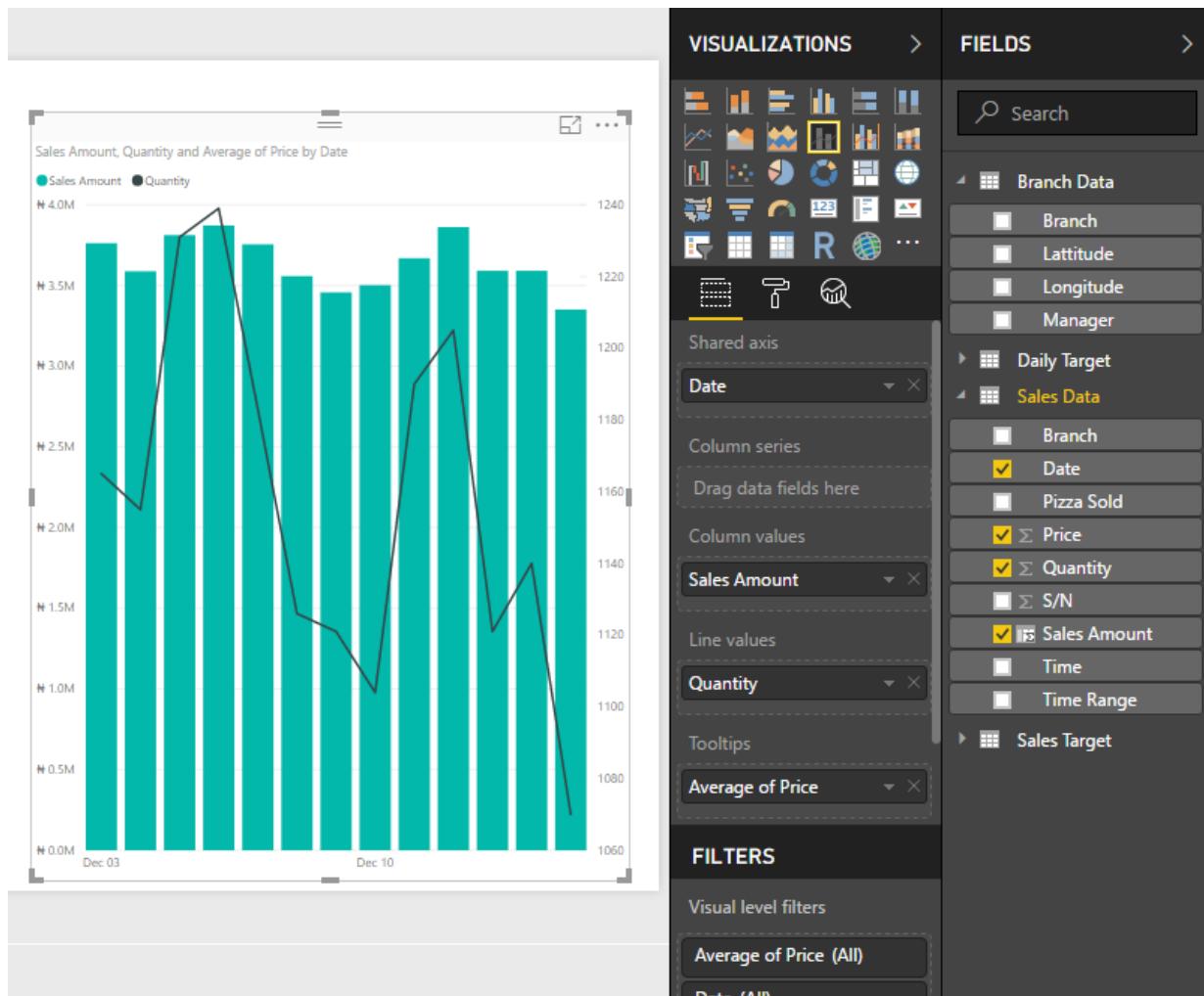
**8. Area Chart:** It is very much like the line chart but with the area under the lines shaded. Has same components as the line chart.



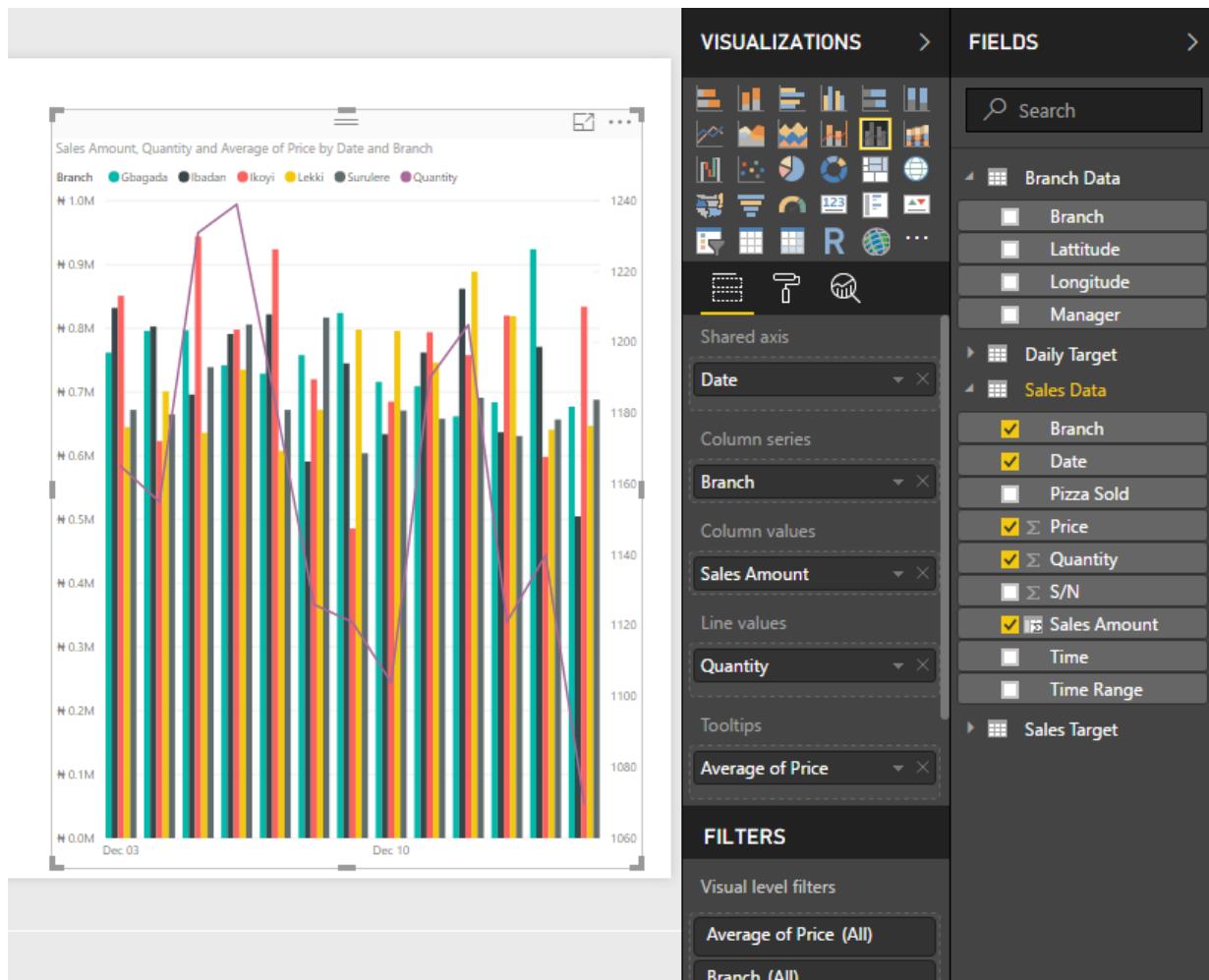
**9. Stacked Area Chart:** You already know area chart, this is when you stack the legend entries one on another.



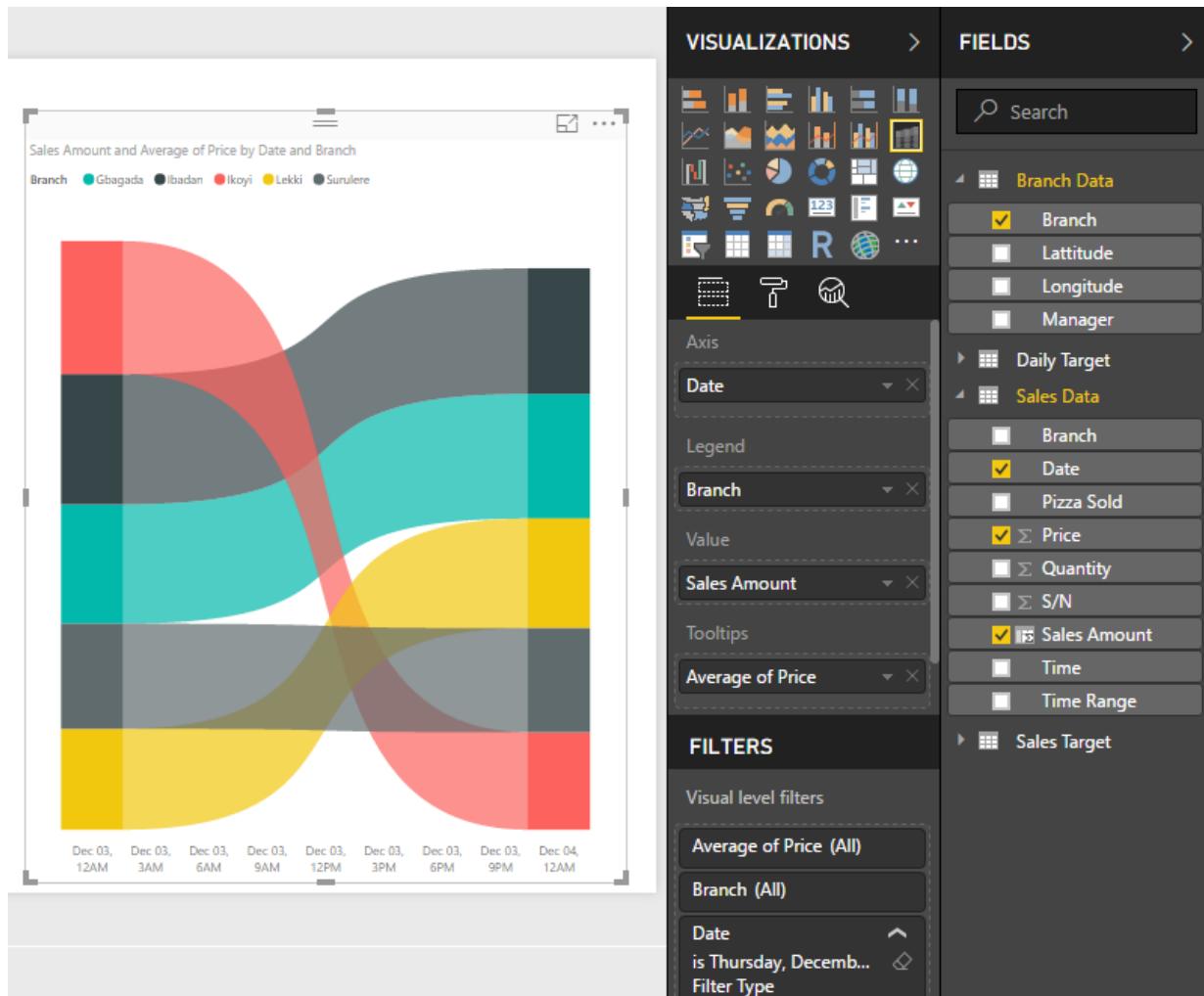
10. **Line and Stacked Column Chart:** This is just combining line chart with column chart in the same visual. It is what we call Combo Chart in Excel and can be useful for showing two distinct insights in one visual – like the gross margin as a line chart and the revenue as a column chart over a period of time.



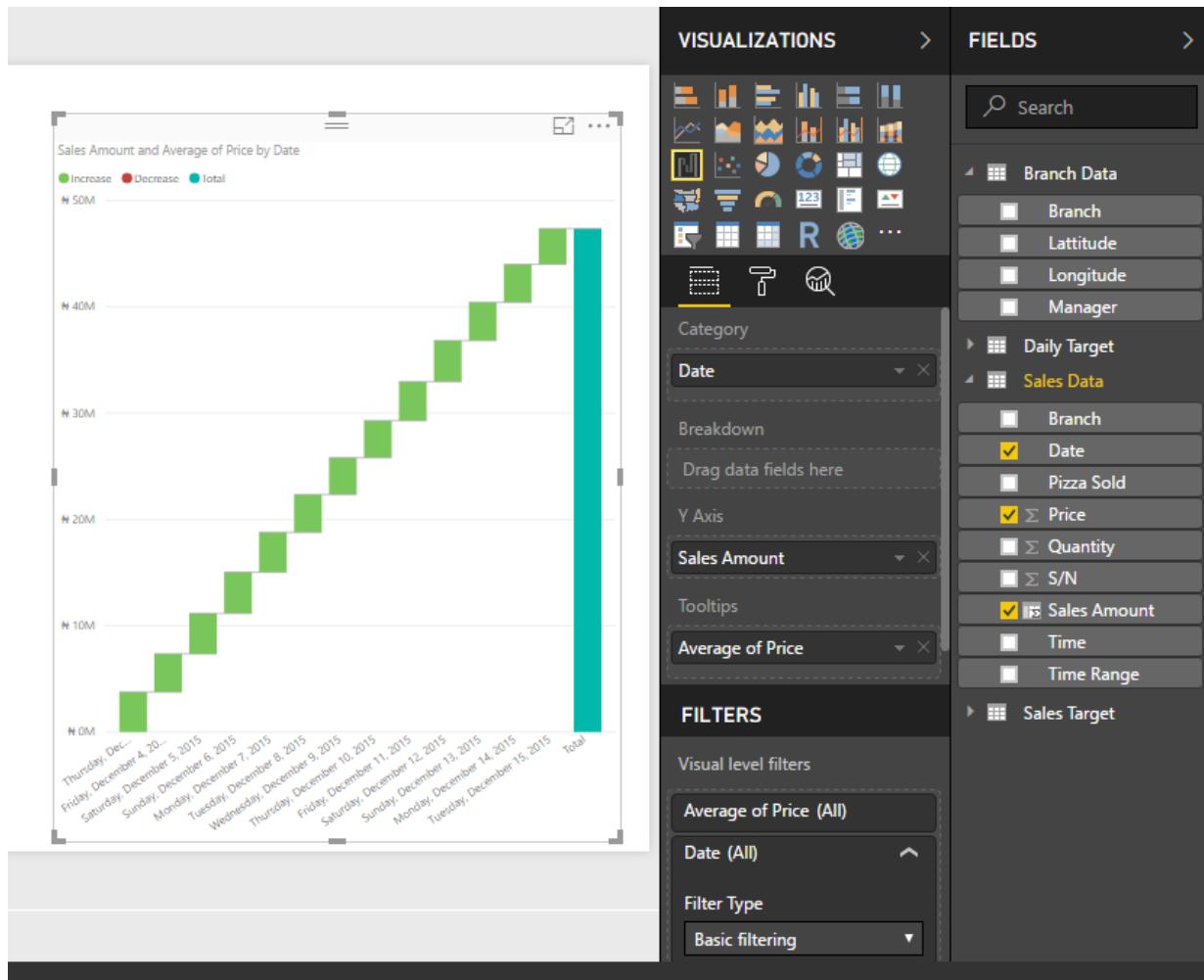
11. **Line and Clustered Column Chart:** Again, just like the line and stacked column one except that the columns aren't stacked.



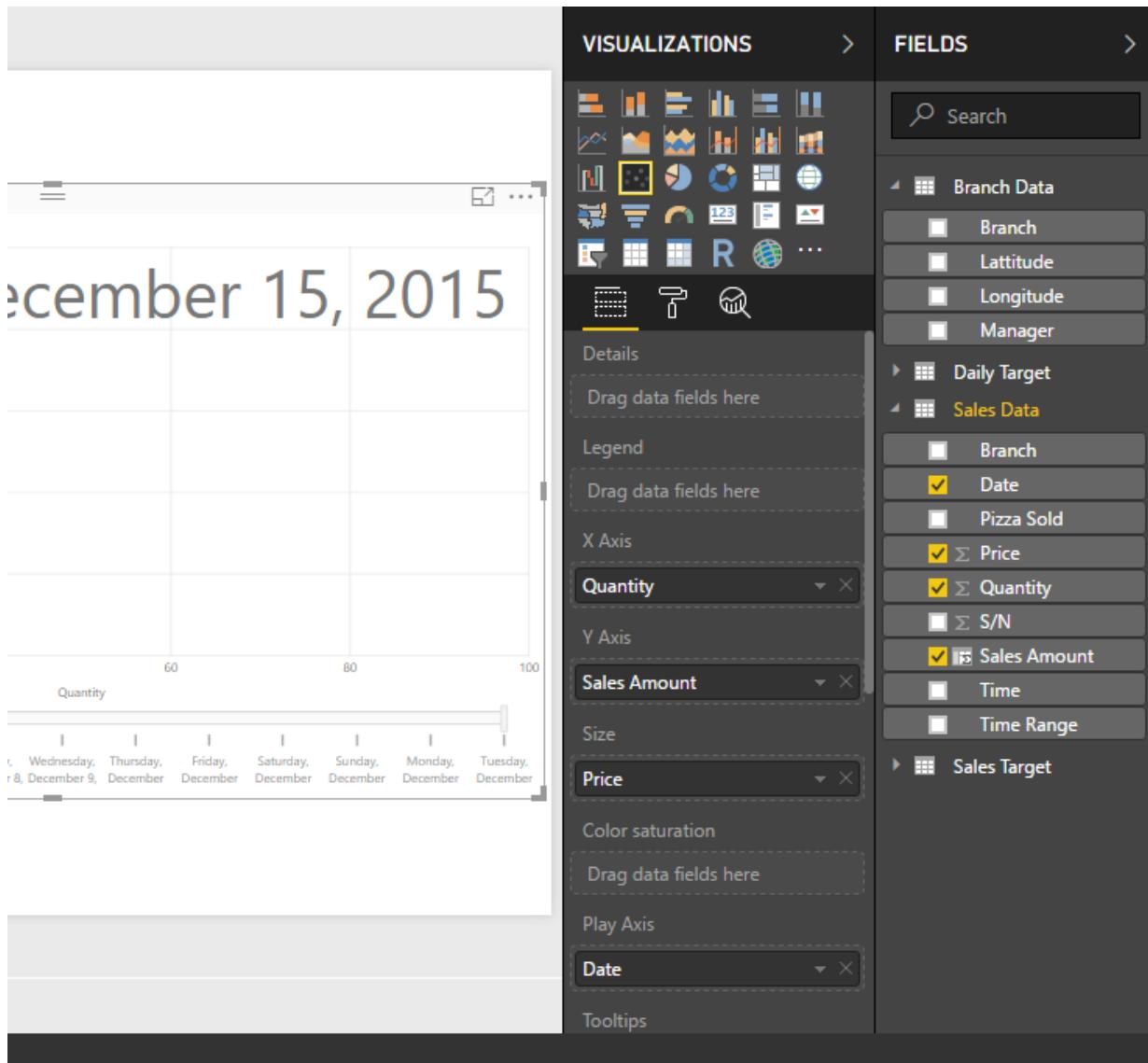
12. **Ribbon Chart:** This chart is a lot like the area chart but with the added advantage that it makes it easier to see the changes in the values of the entries in the legend.



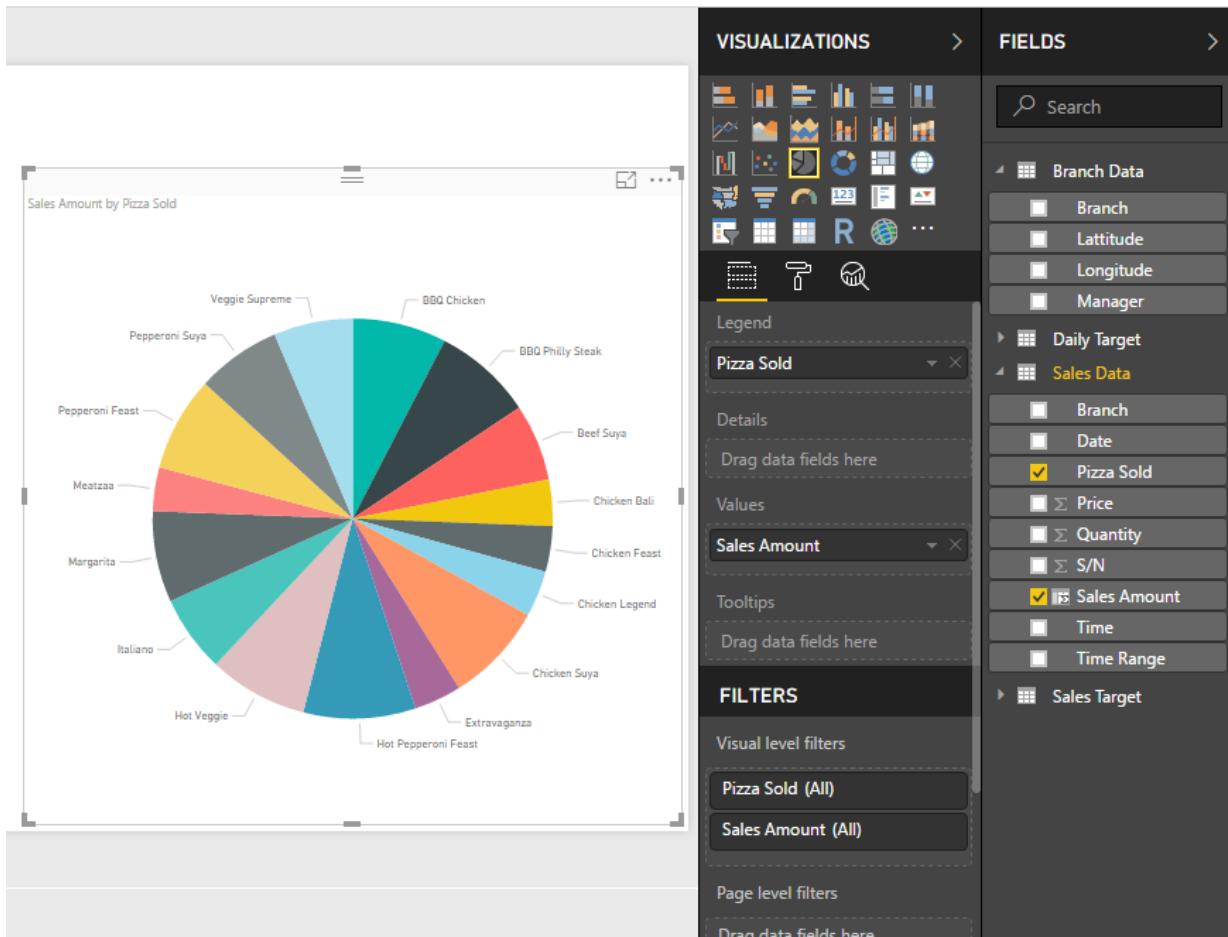
13. **Waterfall Chart:** This chart is for showing the movement in a metric over a period of time, emphasizing the initial value and the end value. It is a beloved chart of finance analysts, it is often used to present changes in a company's cashflow from opening cashflow to closing cashflow over a reporting financial period.



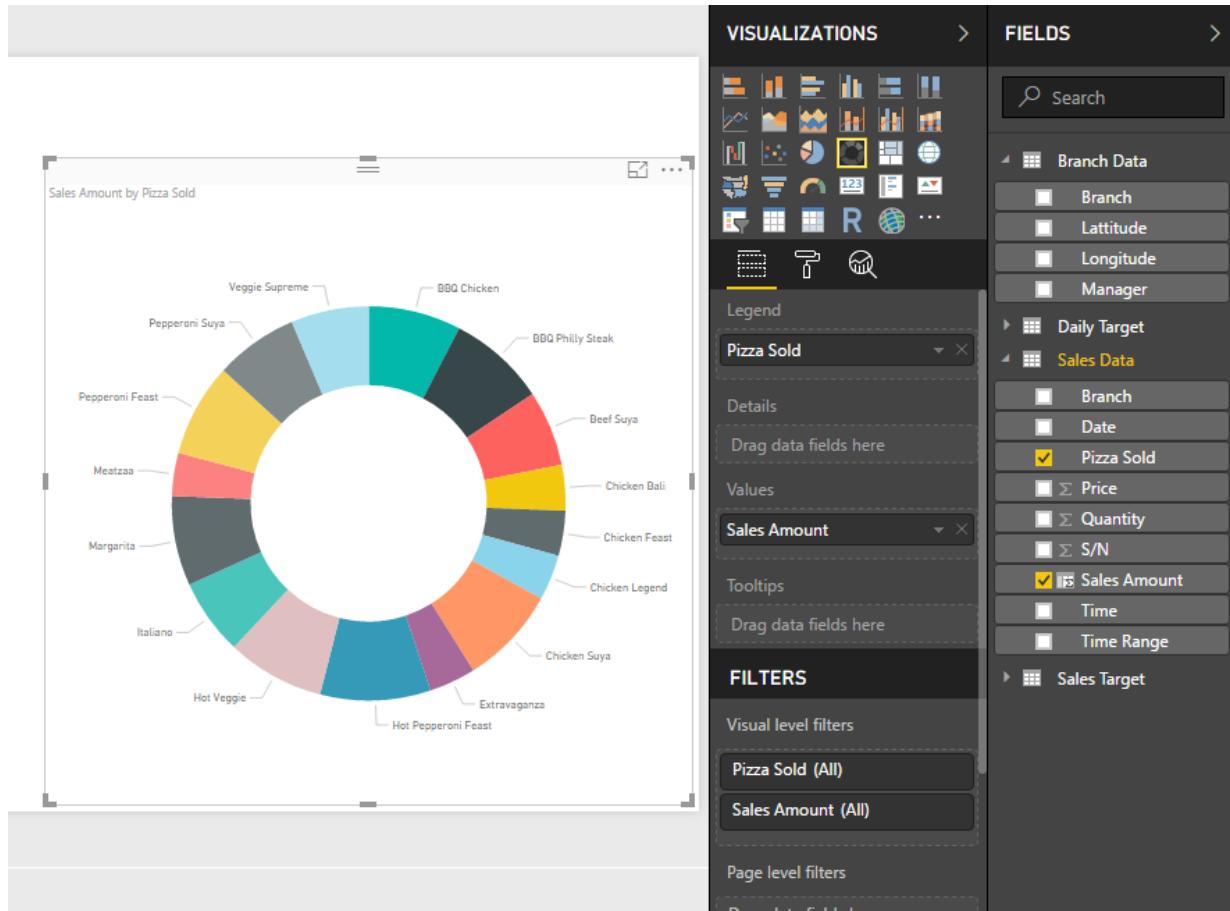
14. **Scatter Chart:** This chart is for showing the relationship between two variables. That is why it requires you put a field in X-axis and another in Y-axis. And it can also serve as bubble chart, you only need to drag the field to determine the bubble size into Size.



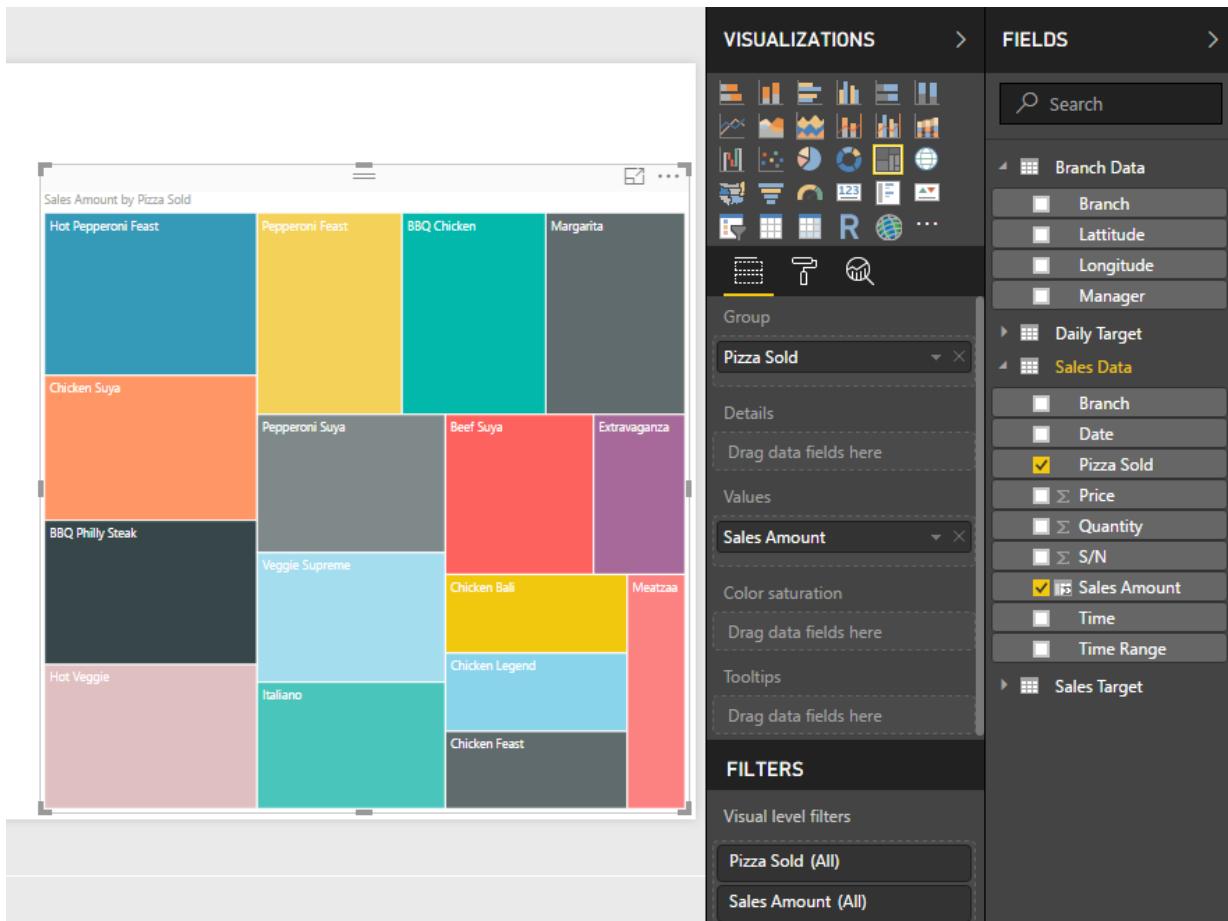
15. **Pie Chart:** This chart shows relative contribution of entries in the field put in the Legend to the field put in the Values. You can also put a field with additional useful information in the Details.



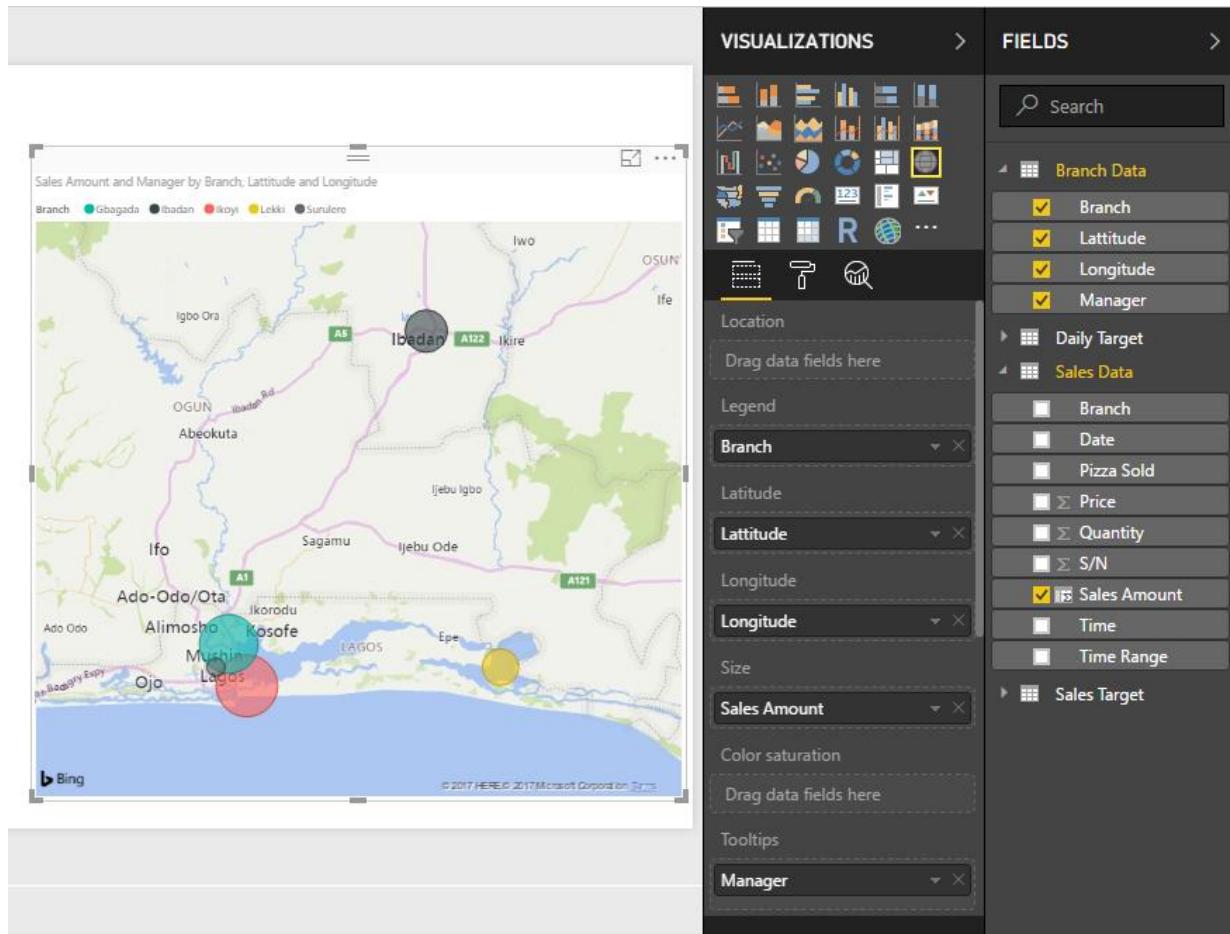
**16. Donut Chart:** It is exactly pie chart but with the traditional donut hole.



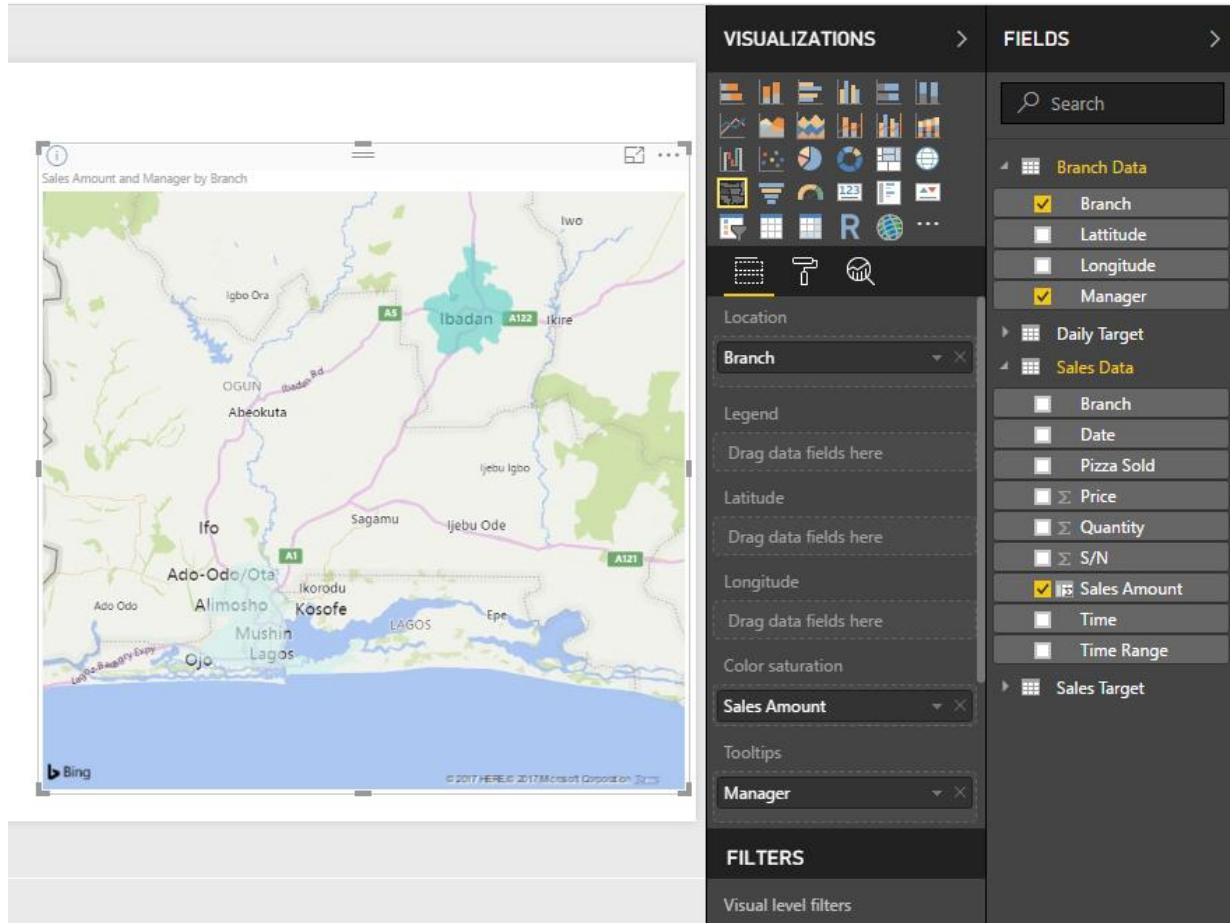
17. **Treemap:** This chart shows relative contribution but unlike pie chart that fits everything in a big circle this one fits everything in a resizable rectangle.



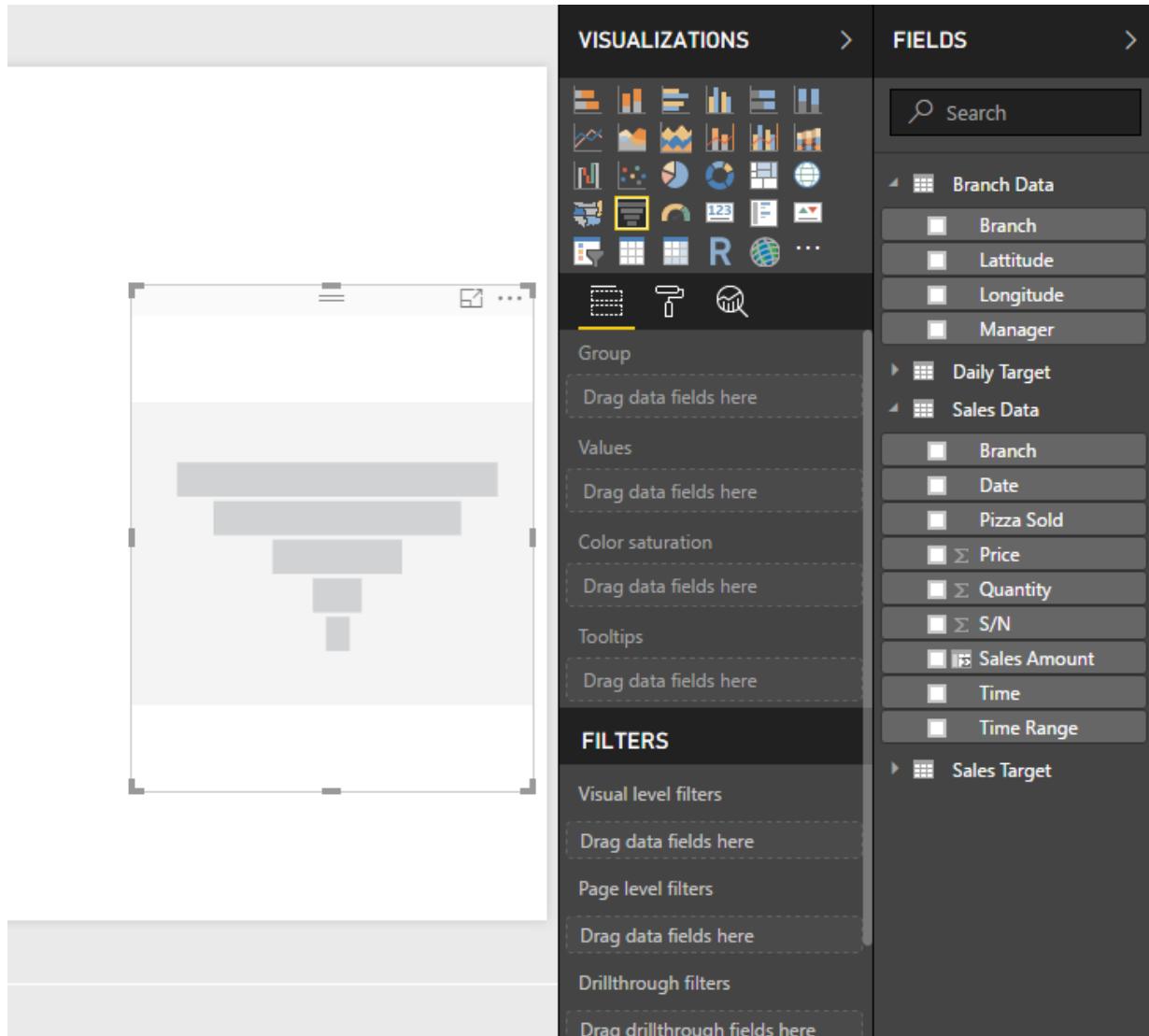
18. **Map:** The name is very self-explanatory. Normally, you would drag countries/cities or any location field to Location but if the locations are not very popular places you might need to get the GPS coordinates and place in the Latitude and Longitude.



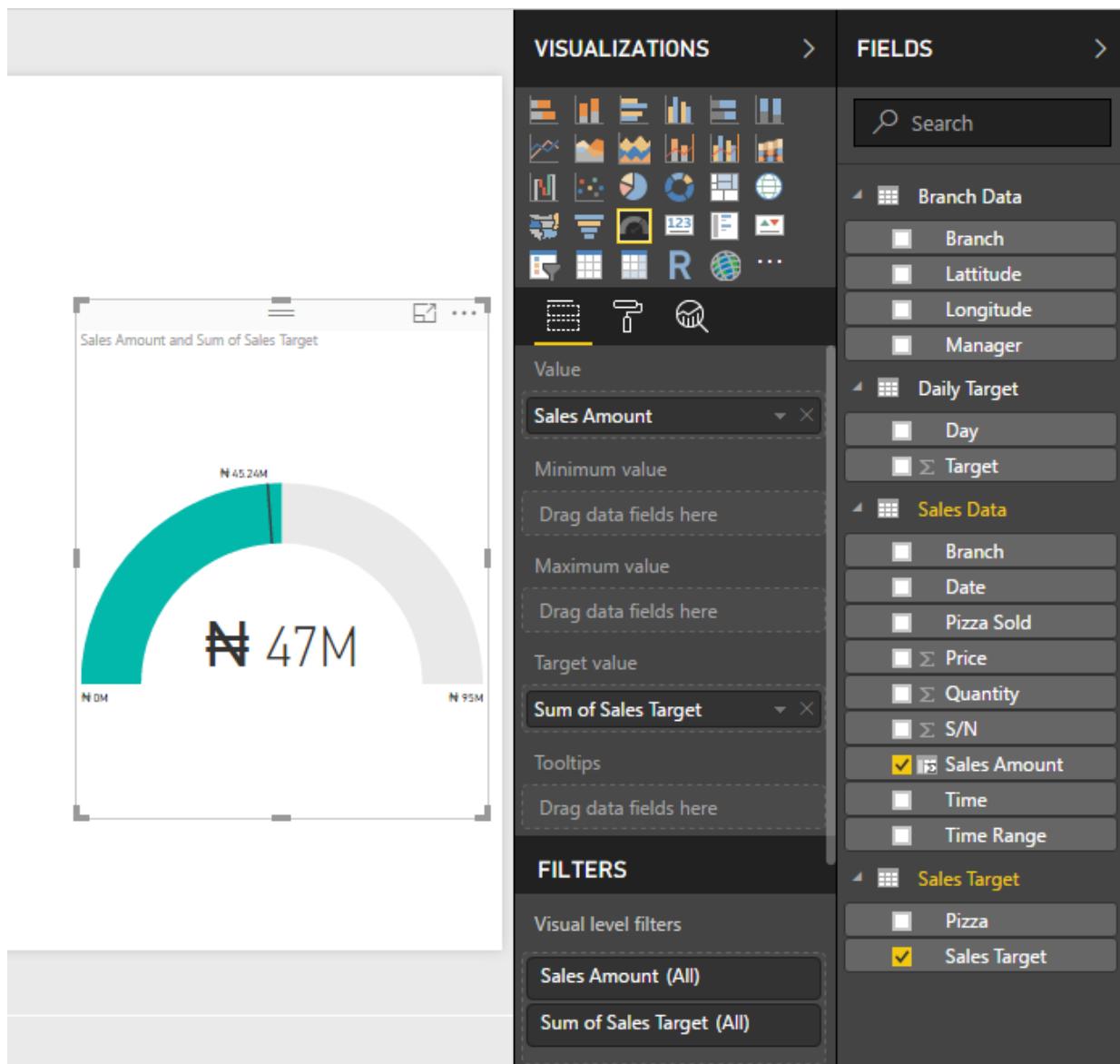
19. **Filled Map:** It is like the Map but fills the entire location area on the map taking the shape of the country/state/city.



20. **Funnel:** This chart is best for stage-like fields and values. Popular for sales conversion records. You can put the sales/conversion stages in the Group.



21. **Gauge:** This chart is great for showing the values against target on a gauge-like scale. And you can set the dimensions (minimum and maximum of the scale). It is one of the few visuals that allow you to set an alert on in the published Power BI dashboard



22. **Card:** It displays just one thing. Can be very useful for showing total sales, KPI figure and counts (like number of stores or orders). It is also one of the visuals that allow you to set an alert on it in the published Power BI dashboard.

The screenshot shows the Power BI desktop interface. On the left, a card visualization displays the value '\$ 47M' under the heading 'Sales Amount'. In the center, the 'FIELDS' pane is open, showing a hierarchical list of fields categorized into 'Branch Data', 'Daily Target', 'Sales Data', and 'Sales Target'. Under 'Sales Data', 'Sales Amount' is selected, indicated by a checked checkbox. The 'FILTERS' pane on the right contains sections for Visual level filters, Page level filters, Drillthrough filters, and Report level filters, each with a 'Drag data fields here' placeholder.

23. **Multi-row Card:** It is like card with extra features – ability to display values of more than one field. An example is sales by branch.

The screenshot shows the Power BI Visualizations pane on the left, displaying a KPI visual for Sales Amount. The visual lists five locations with their respective sales amounts:

- Gbagada: ₦ 9,780,000 Sales Amount
- Ibadan: ₦ 9,451,000 Sales Amount
- Ikoyi: ₦ 9,835,000 Sales Amount
- Lekki: ₦ 9,333,000 Sales Amount
- Surulere: ₦ 8,971,000 Sales Amount

The Fields section of the Visualizations pane shows "Branch" and "Sales Amount" selected. The Filters section shows "Branch (All)" and "Sales Amount (All)" selected. The Fields pane on the right lists various data fields categorized under Branch Data, Daily Target, Sales Data, and Sales Target.

24. KPI: It shows the variance between a value and its set target. Very useful for key performance indicators (KPIs).

The screenshot shows the Power BI desktop interface. On the left is the visual canvas with a single indicator card titled "Sales Amount and Target by Day". The card displays a large red number "₦ 3,762,000" and a goal of "₦ 4.14M (-9.09%)". In the center is the "Visualizations" pane, which contains a grid of visualization icons and a "Indicator" card selected. Below the indicator card is a "FILTERS" section. The "FILTERS" section includes a "Visual level filters" section for "Day" set to "is Thursday, December 3,...", and a "Basic filtering" dropdown menu. The menu lists several filter options: "Select All" (unchecked), "Thursday, December ... 1" (checked), "Friday, December 4, ... 1" (unchecked), "Saturday, December ... 1" (unchecked), and "Sunday, December 6, ... 1" (unchecked). On the right is the "FIELDS" pane, which lists various data fields categorized under "Branch Data", "Daily Target", "Sales Data", and "Sales Target". Under "Daily Target", "Day" and "Σ Target" are checked. Under "Sales Data", "Sales Amount" is checked. Under "Sales Target", "Pizza" and "Sales Target" are listed.

25. **Slicers:** I often call them nicer filters. Work exactly as a filter.

The screenshot shows the Power BI desktop interface. On the left, there is a visual with a date range selector labeled "Day" containing the dates "12/3/2015" and "12/15/2015". In the center, there is a "FILTERS" section with four categories: Visual level filters, Page level filters, Drillthrough filters, and Report level filters, each with a placeholder "Drag data fields here". To the right, the "FIELDS" pane is open, displaying a search bar and a list of fields categorized into Branch Data, Daily Target, Sales Data, and Sales Target. Under "Daily Target", "Day" is checked. Under "Sales Data", "Branch", "Date", "Pizza Sold", "Σ Price", "Σ Quantity", "Σ S/N", "Sales Amount", "Time", and "Time Range" are listed. Under "Sales Target", "Pizza" and "Sales Target" are listed.

26. **Table:** It is an intuitive table that aggregates the fields you put in intelligently.

The screenshot shows the Power BI desktop interface. On the left, a matrix visual displays sales data for December 2015. The columns are labeled 'Day', 'Sales Amount', and 'Target'. The rows list dates from December 3 to December 15, with a 'Total' row at the bottom. The 'Sales Amount' column shows values like ₦ 3,762,000 and ₦ 4,138,200.00. The 'Target' column shows values like ₦ 4,138,200.00 and ₦ 48,410,900.00. The 'Day' column lists the specific dates.

The right side of the screen shows the 'FIELDS' pane, which contains a search bar and a list of fields categorized under 'Branch Data', 'Daily Target', 'Sales Data', and 'Sales Target'. Under 'Daily Target', 'Day' and 'Target' are selected. Under 'Sales Data', 'Branch', 'Date', 'Pizza Sold', 'Price', 'Quantity', 'S/N', and 'Sales Amount' are listed, with 'Sales Amount' checked. Under 'Sales Target', 'Pizza' and 'Sales Target' are listed.

Day	Sales Amount	Target
Thursday, December 3, 2015	₦ 3,762,000	₦ 4,138,200.00
Friday, December 4, 2015	₦ 3,588,000	₦ 2,870,400.00
Saturday, December 5, 2015	₦ 3,812,000	₦ 4,193,200.00
Sunday, December 6, 2015	₦ 3,872,000	₦ 3,872,000.00
Monday, December 7, 2015	₦ 3,755,000	₦ 4,506,000.00
Tuesday, December 8, 2015	₦ 3,558,000	₦ 4,269,600.00
Wednesday, December 9, 2015	₦ 3,457,000	₦ 4,148,400.00
Thursday, December 10, 2015	₦ 3,502,000	₦ 3,852,200.00
Friday, December 11, 2015	₦ 3,669,000	₦ 2,935,200.00
Saturday, December 12, 2015	₦ 3,862,000	₦ 3,475,800.00
Sunday, December 13, 2015	₦ 3,591,000	₦ 3,231,900.00
Monday, December 14, 2015	₦ 3,591,000	₦ 3,231,900.00
Tuesday, December 15, 2015	₦ 3,351,000	₦ 3,686,100.00
<b>Total</b>	<b>₦ 47,370,000</b>	<b>₦ 48,410,900.00</b>

27. **Matrix:** It is exact replica of PivotTable. We have already used it in the last sample project.

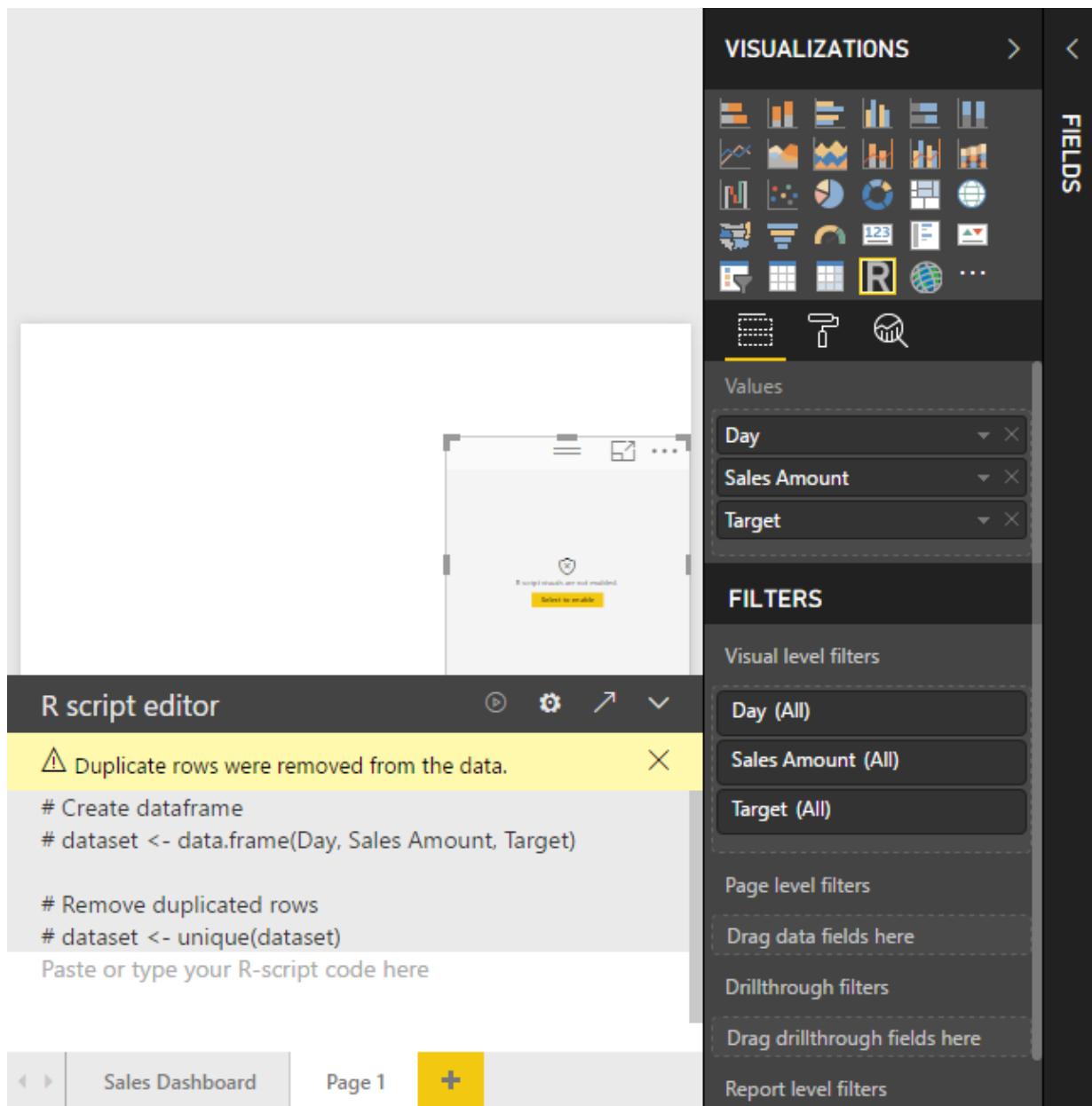
The screenshot shows the Power BI desktop interface. On the left, there is a table visual titled "Day" with columns "Sales Amount" and "Target". The table data is as follows:

Day	Sales Amount	Target
Thursday, December 3, 2015	₦ 3,762,000	₦ 4,138,200.00
Friday, December 4, 2015	₦ 3,588,000	₦ 2,870,400.00
Saturday, December 5, 2015	₦ 3,812,000	₦ 4,193,200.00
Sunday, December 6, 2015	₦ 3,872,000	₦ 3,872,000.00
Monday, December 7, 2015	₦ 3,755,000	₦ 4,506,000.00
Tuesday, December 8, 2015	₦ 3,558,000	₦ 4,269,600.00
Wednesday, December 9, 2015	₦ 3,457,000	₦ 4,148,400.00
Thursday, December 10, 2015	₦ 3,502,000	₦ 3,852,200.00
Friday, December 11, 2015	₦ 3,669,000	₦ 2,935,200.00
Saturday, December 12, 2015	₦ 3,862,000	₦ 3,475,800.00
Sunday, December 13, 2015	₦ 3,591,000	₦ 3,231,900.00
Monday, December 14, 2015	₦ 3,591,000	₦ 3,231,900.00
Tuesday, December 15, 2015	₦ 3,351,000	₦ 3,686,100.00
Total	₦ 47,370,000	₦ 48,410,900.00

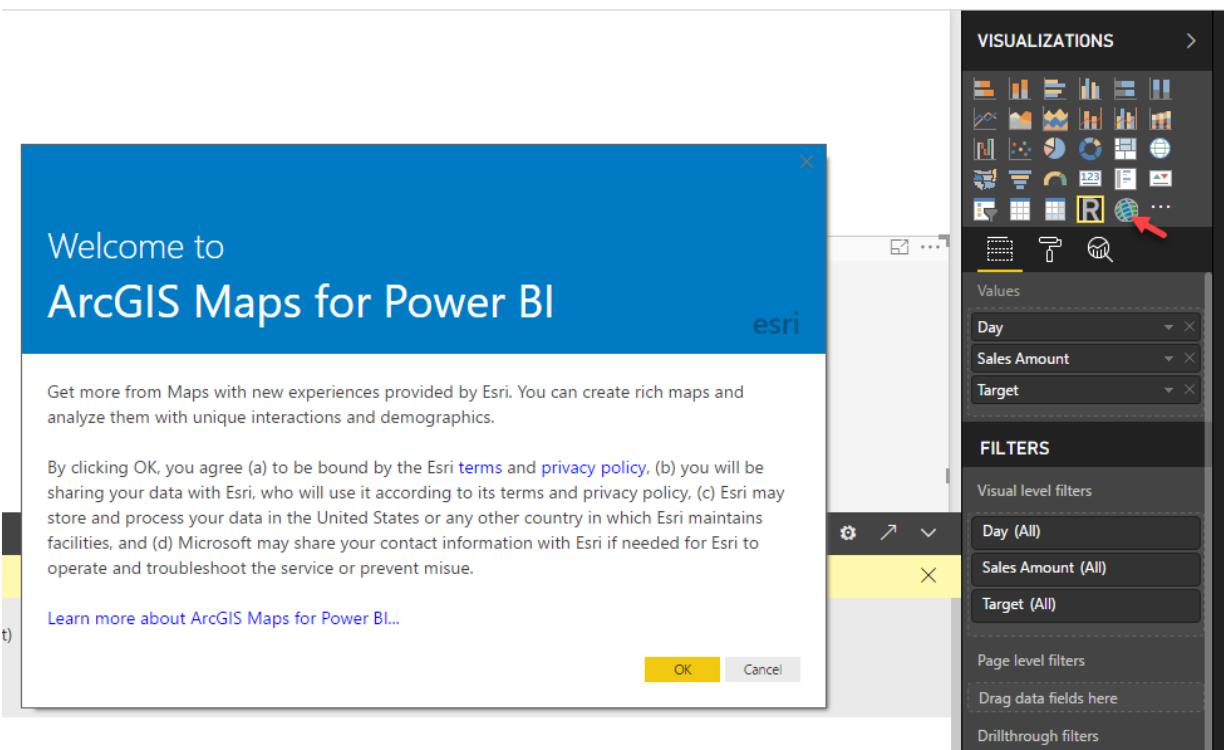
The "VISUALIZATIONS" pane on the right shows various chart icons. The "FIELDS" pane on the right lists data sources and fields:

- Branch Data**: Branch, Latitude, Longitude, Manager
- Daily Target**: Day, Target (selected)
- Sales Data**: Branch, Date, Pizza Sold, Price, Quantity, S/N, Sales Amount (selected), Time, Time Range
- Sales Target**: Pizza, Sales Target

28. **R Script Visual:** This allows you to run R scripts in Power BI. Might be of particular interest to people already proficient in data analysis using R.



29. **ArcGIS Maps for Power BI:** This is very much like Map but with some peculiar features you might find very useful.



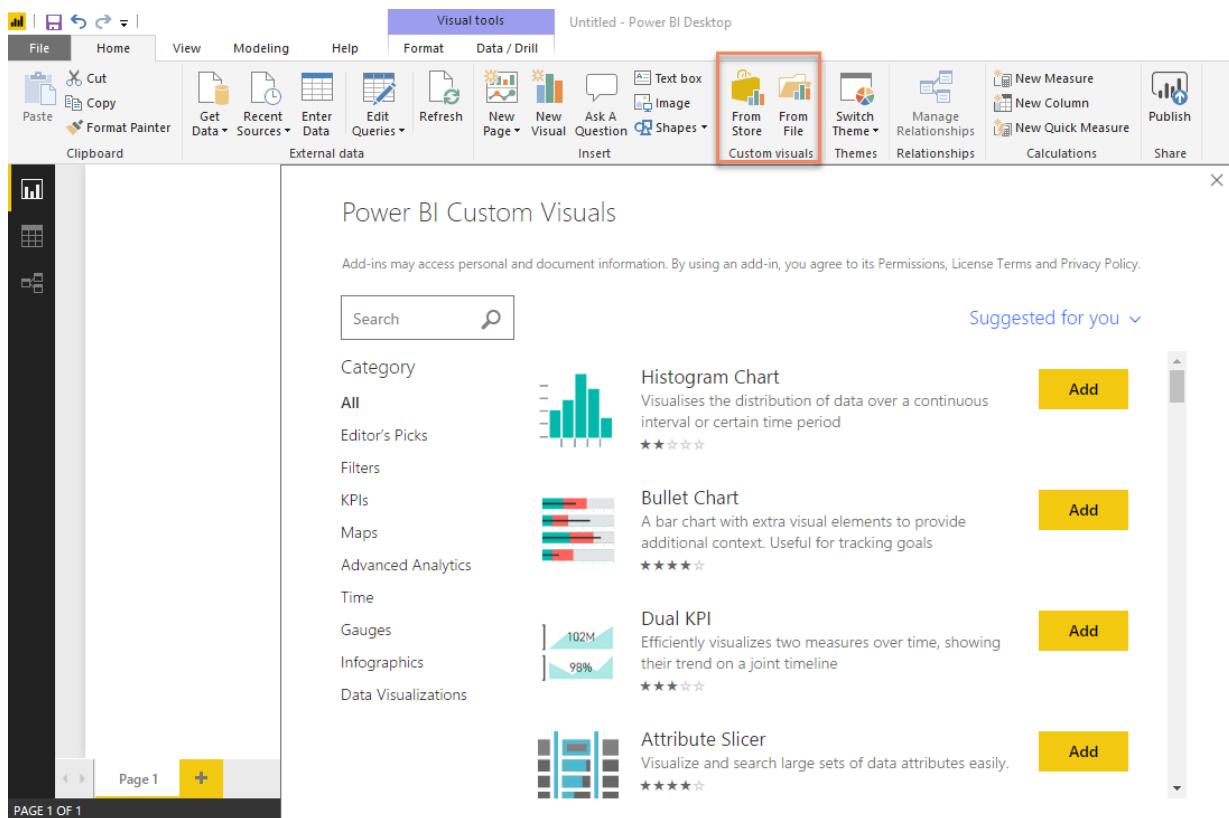
The screenshot shows the Power BI interface with a map visualization on the left and the Fields pane on the right.

**Visualizations:** Sales Amount by Latitude, Longitude and Branch

**Fields pane:**

- Location:**
  - Latitude: Longitude
  - Longitude: Latitude
- Size:** Sales Amount
- Color:** Branch
  - Branch Data:
    - Branch
    - Latitude
    - Longitude
    - Manager
  - Daily Target:
    - Day
    - Target
  - Sales Data:
    - Branch
    - Date
    - Pizza Sold
    - Price
    - Quantity
    - S/N
    - Sales Amount
    - Time
    - Time Range
  - Sales Target
- Time:** Drag data fields here
- Tooltips:** Drag data fields here

Lastly, Power BI allows you to access more visuals to use in your reports via Custom Visuals on the Home menu.



## Data Transformation with Query Editor

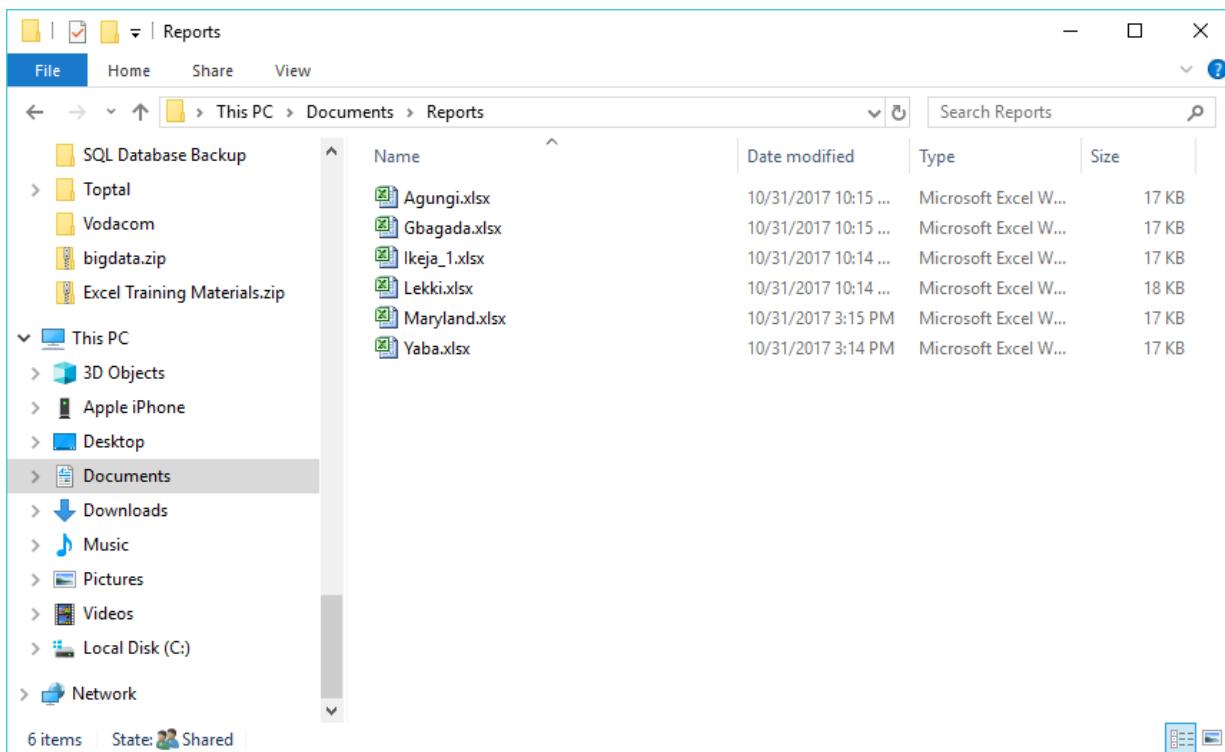
Query Editor is the main tool for shaping your data into the right structure for your analysis. And in the following segments I am going to touch on the very common tasks you need to be proficient at carrying out with the Query Editor.

### Combining Data From Different Files

Power BI allows you to combine data from different sources easily. In this demonstration, I will show you how to combine sales data from different branches of a Pizza restaurant easily and even automatically capture new data from other branches as they come in.

So say we have all the branch sales data saved in a specific folder. You can download the practice data at

<https://drive.google.com/drive/folders/1BiffqllezavfHwJmdEs5AT6saT5nmcu?usp=sharing>



And I want to bring them all into Power BI and combine them to get the overall sales data. Well, it's very easy.

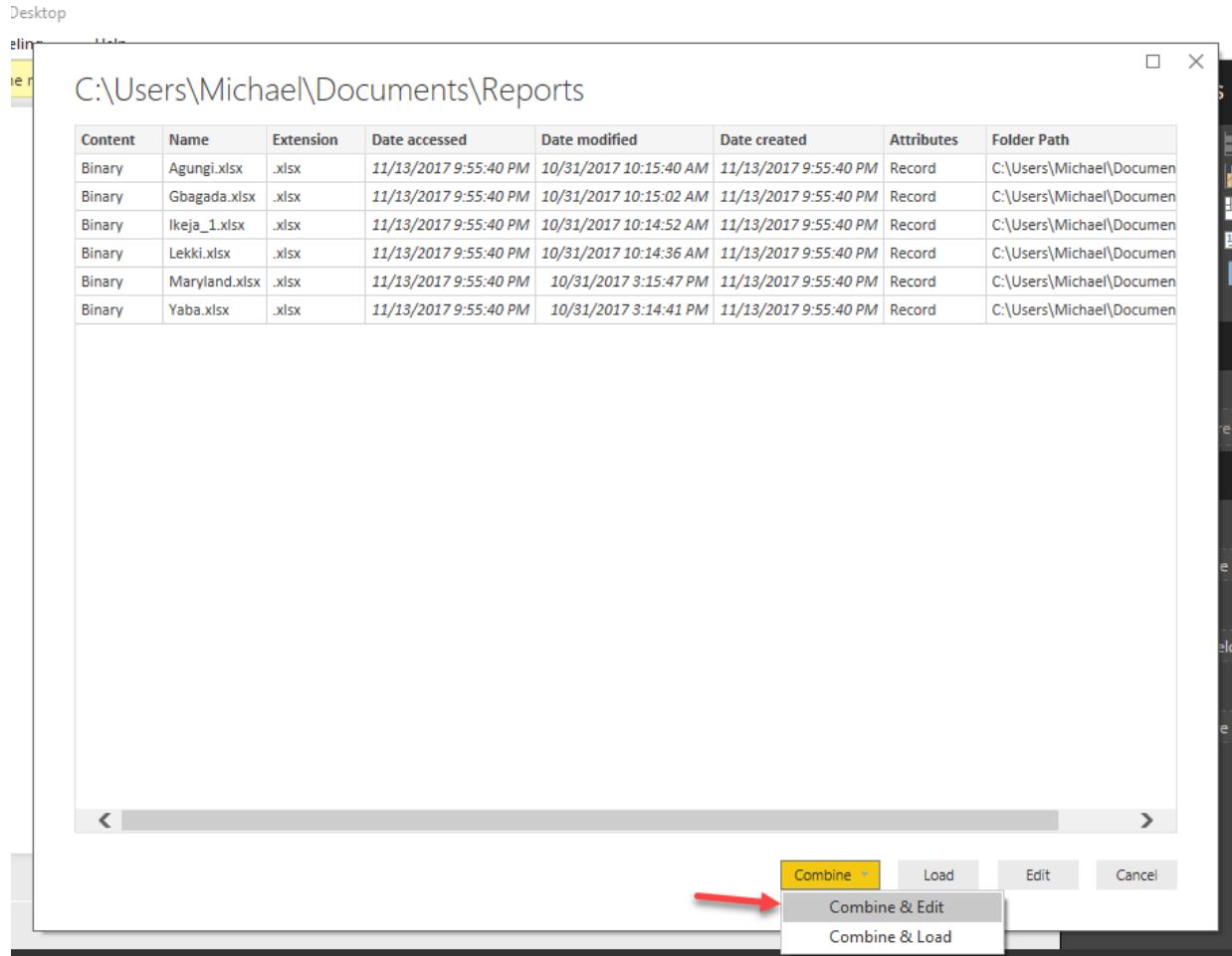
Via Get Data, select the folder that houses the data files.

## Get Data

The screenshot shows the 'Get Data' dialog in Power BI. On the left, a sidebar lists categories: All, File, Database, Azure, Online Services, and Other. The 'All' category is highlighted with a yellow bar. A red arrow points from the 'All' category to the 'Folder' item in the main list. The main list contains the following items:

- Excel
- Text/CSV
- XML
- JSON
- Folder** (highlighted with a yellow bar)
- SharePoint folder
- SQL Server database
- Access database
- SQL Server Analysis Services database
- Oracle database
- IBM DB2 database
- IBM Informix database (Beta)
- IBM Netezza
- MySQL database
- PostgreSQL database
- Sybase database

At the bottom right, there are 'Connect' and 'Cancel' buttons. A red arrow points to the 'Connect' button.



I hope you remember why I always recommend Edit, which is the reason I am selecting Combine & Edit.

In the window that comes up next, you confirm the data you want to bring in using the first file as a prototype. At the bottom left, you can set it to skip files with errors. I ignore it for now and go straight to OK.

## Combine Files

Select the object to be extracted from each file. [Learn more](#)

Example File: First file

The screenshot shows the 'Combine Files' dialog box. On the left, there's a sidebar with 'Display Options' and a tree view showing 'Sample File Parameter1 [2]' expanded to show 'Table1' and 'Agungi'. The main area displays a preview of 'Table1' with columns: Branch, Pizza Type, 1-Oct-17, 2-Oct-17, 3-Oct-17, and 4-Oct-17. The data includes various pizza types like BBQ Chicken, BBQ Philly Steak, Beef Suya, etc., across different branches. A note at the bottom says 'The data in the preview has been truncated due to size limits.' At the bottom right are 'OK' and 'Cancel' buttons.

Branch	Pizza Type	1-Oct-17	2-Oct-17	3-Oct-17	4-Oct-17
Agungi	BBQ Chicken	2522000	1112000	1660000	1112000
Agungi	BBQ Philly Steak	1362000	1798000	1134000	2102000
Agungi	Beef Suya	2827000	1543000	2102000	2102000
Agungi	Chicken Bali	2112000	1439000	1960000	2102000
Agungi	Chicken Feast	2538000	2454000	1260000	2102000
Agungi	Chicken Legend	2770000	1617000	2579000	1112000
Agungi	Chicken Suya	2304000	1894000	1024000	1112000
Agungi	Extravaganza	2390000	1328000	1055000	2102000
Agungi	Hot Pepperoni Feast	2838000	1265000	2423000	1112000
Agungi	Hot Veggie	2867000	1365000	2125000	1112000
Agungi	Italiano	2609000	2171000	1440000	1112000
Agungi	Margarita	2776000	1821000	1640000	2102000
Agungi	Meatzaa	1507000	1665000	1322000	2102000
Agungi	Pepperoni Feast	2909000	2785000	1461000	1112000
Agungi	Pepperoni Suya	1320000	1039000	939000	1112000

i The data in the preview has been truncated due to size limits.

Skip files with errors

The Query Editor window opens and you will see that it has combined the data from the different files in the folder.

The screenshot shows the Power BI Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, and Help. Under the Home tab, there are buttons for Close & Apply, New Source, Recent Sources, Enter Data, Data Sources, Manage Parameters, Refresh Preview, Advanced Editor, Properties, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Use First Row as Headers, Data Type: Text, Sort, Reduce Rows, Transform, and Merge Queries, Append Queries, Combine Files, and Combine. The main area displays a list of 'Queries [5]'. The first query, 'Agungi.xlsx', contains data for various branches and pizza types with their respective sales figures. The 'Properties' pane on the right shows the 'Name' is 'Reports' and the 'Applied Steps' include 'Source', 'Invoke Custom Function1', 'Renamed Columns1', 'Removed Other Columns1', 'Expanded Table Column1', and 'Changed Type'. The status bar at the bottom indicates '33 COLUMNS, 96 ROWS' and 'PREVIEW DOWNLOADED AT 10:24 AM'.

After examining that all is as I want it – no irrelevant columns to remove and no unneeded rows to filter out – I then click Close & Apply.

Now all the data is loaded into the Data Model. And if any new branch is added to the folder or new data added to existing files in the folder, all you need to do to bring in those data is to refresh in the Query Editor and do Close & Apply.

This screenshot is similar to the previous one but focuses on the 'Transform' tab of the ribbon. The 'Refresh' button is highlighted with a red arrow. The rest of the interface and data preview are identical to the first screenshot.

And below is how the data looks in the Data Model.

The screenshot shows the Power BI Desktop interface with a large table named "Reports" containing 96 rows. The table has columns for "Source.Name", "Branch", "Pizza Type", and dates from "1-Oct-17" to "12-Oct-17". The "Fields" pane on the right displays a hierarchical tree structure under the "Reports" node, listing various dates from "1-Oct-17" to "30-Oct-17".

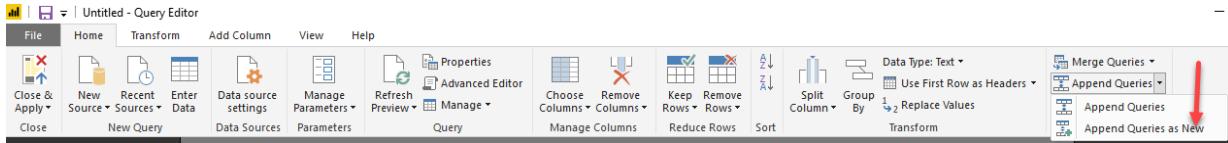
Alternatively, one can load in all the individual files or tables and do the combining right from within the Query Editor. This method may be the only way to combine data from different parent sources (different folders, different database, or even a mix of different source types).

The screenshot shows the Power BI Query Editor interface. The "Home" ribbon tab is selected. The "Transform" ribbon tab is highlighted, and its ribbon group is shown. A red box highlights the "Combine" option under the "Transform" group.

You will see the combine tab under the Home menu and at the extreme right. You also get extra options of how you'll like to combine the files – merge queries or append queries. Merge tries to not duplicate entries across the individual data files (meaning if one record is in the first file and the third file, it skips the one in the third file). Append doesn't examine the entries in the files, it just appends all the files as one.

Lastly, if you want to keep all the source files data separate from the combined one, then do Merge Queries as New or Append Queries as New.

The screenshot shows the Power BI Query Editor interface. The "Home" ribbon tab is selected. The "Transform" ribbon tab is highlighted, and its ribbon group is shown. A red arrow points to the "Merge Queries as New" option under the "Transform" group.



## Unpivot: A Powerful Tool To Know

If you've used Excel a lot then you'll be familiar with PivotTables and might wonder what unpivot means. Well, unpivot is one of those Power BI tools that is better to show how it works on a real life-like demo than using many words to explain.

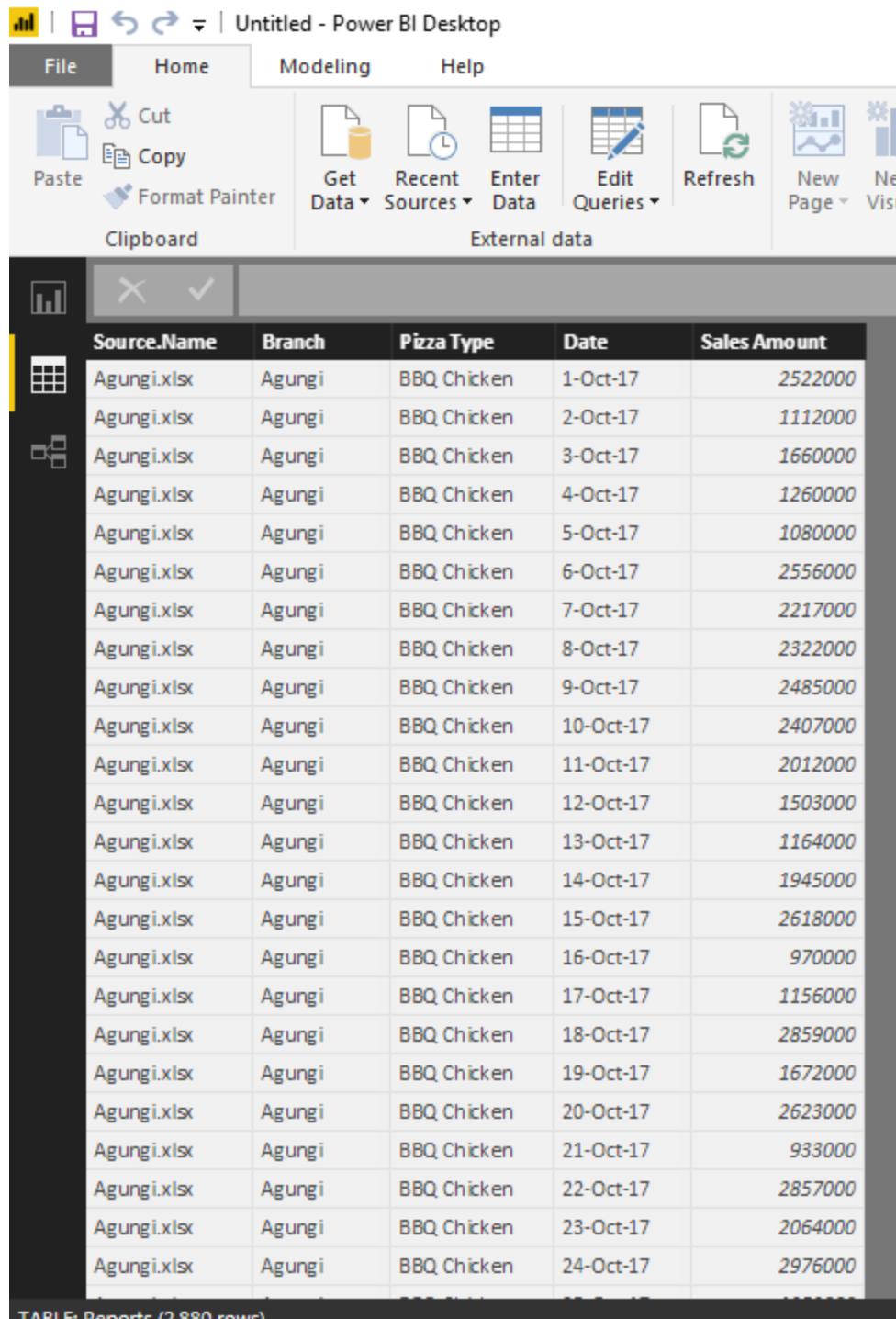
Continuing with our sales data analysis demo. We have already brought in the combined data into the Data Model, it would make sense to do a line chart of the total daily sales by branch.

But it seems impossible to do. I would need to drag the date field to Axis, the branch field to Legend and the sales amount field to Values. It is only Branch field I have. The dates are not put in one single field but spread as a separate field for each date with sales figure underneath as values.

In order to achieve my sales line chart, I need to transform the data from:

Source.Name	Branch	Pizza Type	1-Oct-17	2-Oct-17	3-Oct-17	4-Oct-17	5-Oct-17	6-Oct-17	7-Oct-17	8-Oct-17	9-Oct-17	10-Oct-17	11-Oct-17	12-Oct-
Agung.xlsx	Agungi	BBQ Chicken	2522000	1112000	1660000	1260000	1080000	2556000	2217000	2322000	2485000	2407000	2012000	
Agung.xlsx	Agungi	BBQ Philly Steak	1362000	1798000	1134000	2642000	2293000	997000	2119000	1190000	2497000	2019000	2363000	
Agung.xlsx	Agungi	Beef Suya	2827000	1543000	2102000	2524000	1365000	1430000	2424000	2170000	1977000	1503000	1572000	
Agung.xlsx	Agungi	Chicken Bali	2112000	1439000	1960000	2200000	2724000	1994000	2018000	1867000	2743000	1766000	1596000	
Agung.xlsx	Agungi	Chicken Feast	2538000	2454000	1260000	2648000	2928000	1014000	1443000	1999000	2774000	2003000	1125000	
Agung.xlsx	Agungi	Chicken Legend	2770000	1617000	2579000	1010000	2792000	1324000	2094000	2167000	1482000	1507000	1248000	
Agung.xlsx	Agungi	Chicken Suya	2304000	1894000	1024000	1416000	1903000	2889000	2332000	1513000	2527000	2688000	969000	
Agung.xlsx	Agungi	Extravaganza	2390000	1328000	1055000	2918000	1390000	2467000	972000	1734000	1179000	2004000	1787000	
Agung.xlsx	Agungi	Hot Pepperoni Feast	2838000	1265000	2423000	1545000	2116000	1515000	1773000	1980000	2384000	1818000	2136000	
Agung.xlsx	Agungi	Hot Veggie	2867000	1365000	2125000	1718000	2904000	2641000	1482000	1369000	1009000	2589000	1965000	
Agung.xlsx	Agungi	Italiano	2609000	2171000	1440000	1211000	2075000	1780000	2995000	2816000	1995000	1241000	2806000	
Agung.xlsx	Agungi	Margarita	2776000	1821000	1640000	2872000	1425000	1665000	2527000	1304000	2574000	1032000	1273000	
Agung.xlsx	Agungi	Meatzae	1507000	1665000	1322000	2860000	2987000	1585000	930000	2825000	2549000	2080000	2608000	
Agung.xlsx	Agungi	Pepperoni Feast	2909000	2785000	1461000	1807000	2465000	1864000	1010000	1844000	1624000	1472000	2026000	
Agung.xlsx	Agungi	Pepperoni Suya	1320000	1039000	939000	1886000	1855000	1372000	1532000	2510000	1760000	1701000	1014000	
Agung.xlsx	Agungi	Veggie Supreme	1272000	1675000	1515000	1413000	947000	2544000	2821000	2191000	2240000	1537000	2220000	
Gbagada.xlsx	Gbagada	BBQ Chicken	1277000	2057000	1875000	1181000	1052000	2678000	2236000	942000	2165000	1634000	2465000	
Gbagada.xlsx	Gbagada	BBQ Philly Steak	1979000	2078000	2769000	966000	2555000	1949000	1346000	1791000	2352000	2581000	998000	
Gbagada.xlsx	Gbagada	Beef Suya	2767000	2706000	1773000	2240000	1102000	2121000	2115000	2187000	2664000	1423000	2416000	
Gbagada.xlsx	Gbagada	Chicken Bali	1708000	1944000	2767000	1679000	2397000	2190000	2219000	2328000	1778000	1373000	1149000	
Gbagada.xlsx	Gbagada	Chicken Feast	2021000	1228000	2433000	2806000	1114000	2574000	1543000	1645000	983000	1479000	1942000	
Gbagada.xlsx	Gbagada	Chicken Legend	1216000	2078000	2529000	2920000	1064000	2307000	1027000	978000	1857000	2588000	2822000	
Gbagada.xlsx	Gbagada	Chicken Suya	1558000	2491000	2798000	1040000	1414000	977000	2573000	1813000	1985000	1059000	1833000	
Gbaanda.xlsx	Gbaanda	Extravaganza	1437000	2915000	2910000	1918000	2396000	1291000	2907000	1048000	1863000	2493000	1926000	

Into this:



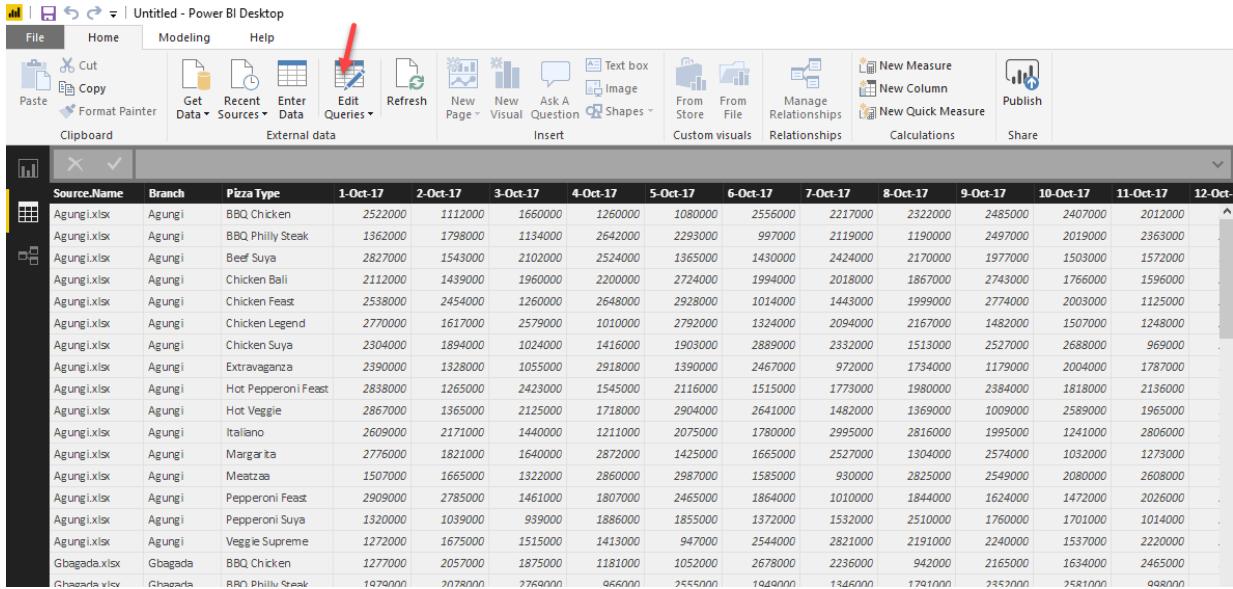
The screenshot shows the Power BI Desktop interface with the 'Home' tab selected. A data grid is displayed, showing a table with 2,880 rows. The columns are labeled: Source.Name, Branch, Pizza Type, Date, and Sales Amount. The data consists of 24 rows of sales records from Agungi.xlsx, all categorized under BBQ Chicken.

Source.Name	Branch	Pizza Type	Date	Sales Amount
Agungi.xlsx	Agungi	BBQ Chicken	1-Oct-17	2522000
Agungi.xlsx	Agungi	BBQ Chicken	2-Oct-17	1112000
Agungi.xlsx	Agungi	BBQ Chicken	3-Oct-17	1660000
Agungi.xlsx	Agungi	BBQ Chicken	4-Oct-17	1260000
Agungi.xlsx	Agungi	BBQ Chicken	5-Oct-17	1080000
Agungi.xlsx	Agungi	BBQ Chicken	6-Oct-17	2556000
Agungi.xlsx	Agungi	BBQ Chicken	7-Oct-17	2217000
Agungi.xlsx	Agungi	BBQ Chicken	8-Oct-17	2322000
Agungi.xlsx	Agungi	BBQ Chicken	9-Oct-17	2485000
Agungi.xlsx	Agungi	BBQ Chicken	10-Oct-17	2407000
Agungi.xlsx	Agungi	BBQ Chicken	11-Oct-17	2012000
Agungi.xlsx	Agungi	BBQ Chicken	12-Oct-17	1503000
Agungi.xlsx	Agungi	BBQ Chicken	13-Oct-17	1164000
Agungi.xlsx	Agungi	BBQ Chicken	14-Oct-17	1945000
Agungi.xlsx	Agungi	BBQ Chicken	15-Oct-17	2618000
Agungi.xlsx	Agungi	BBQ Chicken	16-Oct-17	970000
Agungi.xlsx	Agungi	BBQ Chicken	17-Oct-17	1156000
Agungi.xlsx	Agungi	BBQ Chicken	18-Oct-17	2859000
Agungi.xlsx	Agungi	BBQ Chicken	19-Oct-17	1672000
Agungi.xlsx	Agungi	BBQ Chicken	20-Oct-17	2623000
Agungi.xlsx	Agungi	BBQ Chicken	21-Oct-17	933000
Agungi.xlsx	Agungi	BBQ Chicken	22-Oct-17	2857000
Agungi.xlsx	Agungi	BBQ Chicken	23-Oct-17	2064000
Agungi.xlsx	Agungi	BBQ Chicken	24-Oct-17	2976000

And that is what unpivot does for us.

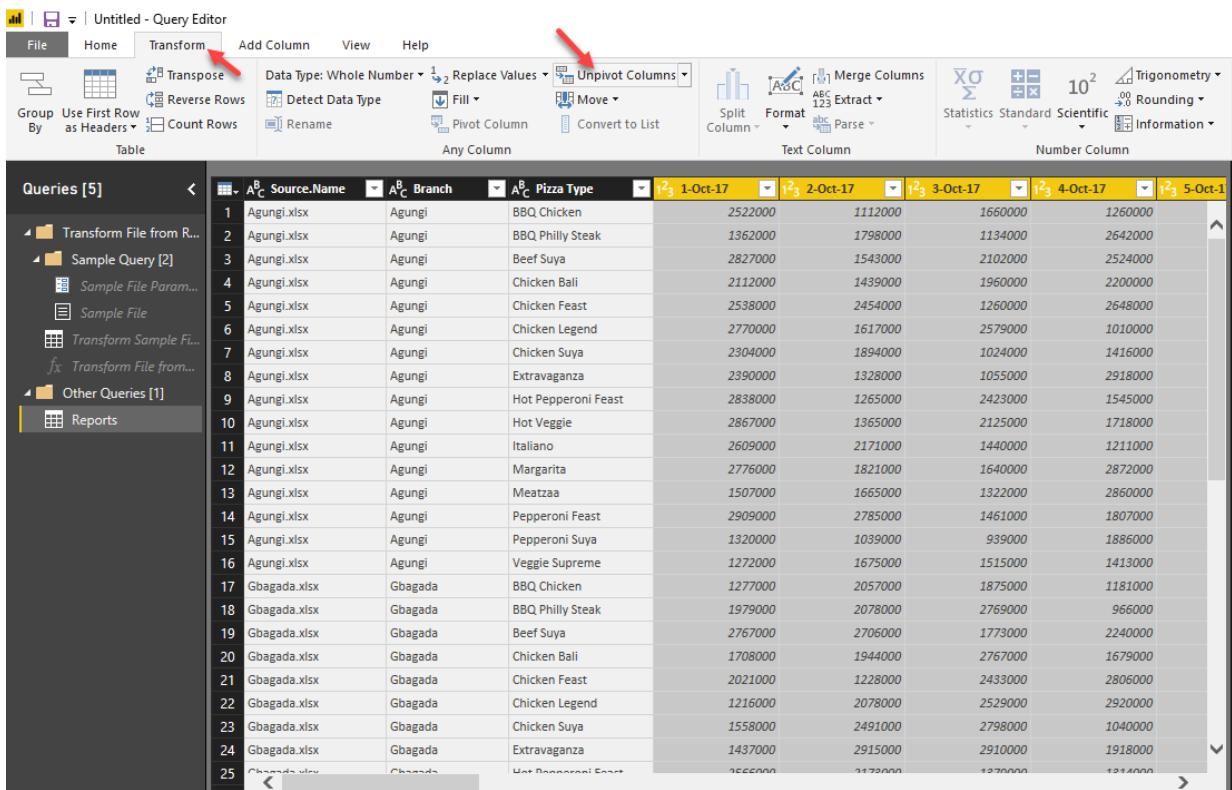
So now let's do it from scratch.

We head back to the Query Editor.



A screenshot of the Power BI Desktop interface. The ribbon at the top has tabs for File, Home, Modeling, and Help. Under the Home tab, there are sections for Paste, Clipboard, Get Data, Recent Sources, Enter Data, Edit Queries (with a red arrow pointing to it), Refresh, New Page, New Visual, Ask A Question, Insert, From Store, From File, Relationships, Calculations, and Publish. Below the ribbon is a data grid containing a table with columns: Source.Name, Branch, Pizza Type, and dates from 1-Oct-17 to 12-Oct-17. The data shows sales figures for various branches and pizza types across different dates.

Then, I select all the dates fields and go to Unpivot Columns under Transform menu.



A screenshot of the Power BI Query Editor. The ribbon at the top has tabs for File, Home, Transform (with a red arrow pointing to it), Add Column, View, and Help. The Transform tab has various tools like Transpose, Reverse Rows, Detect Data Type, Fill, Pivot Column, Convert to List, Move, Split Column, Format, Extract, Parse, Merge Columns, Trigonometry, Rounding, Statistics, Standard, Scientific, and Information. Below the ribbon is a list of queries and a preview pane showing the data structure. The preview pane displays the data with columns: Source.Name, Branch, Pizza Type, and dates from 1-Oct-17 to 5-Oct-17. The data shows sales figures for various branches and pizza types across different dates.

And that is all. Except that I change the default names from Attribute to Date and Values to Sales Amount.

The screenshot shows the Power BI Query Editor interface. The top navigation bar includes File, Home, Transform (selected), Add Column, View, and Help. The Transform ribbon tab is active, displaying various data manipulation tools like Transpose, Replace Values, Unpivot Columns, and Pivot Column.

The main area displays a table with 25 rows of data. The columns are labeled: Source.Name, Branch, Pizza Type, Attribute, and Value. The data shows repeated entries for 'Agungi.xlsx' under 'Source.Name' and 'Agungi' under 'Branch'. The 'Value' column contains numerical values ranging from 1112000 to 2976000.

	Source.Name	Branch	Pizza Type	Attribute	Value
1	Agungi.xlsx	Agungi	BBQ Chicken	1-Oct-17	2522000
2	Agungi.xlsx	Agungi	BBQ Chicken	2-Oct-17	1112000
3	Agungi.xlsx	Agungi	BBQ Chicken	3-Oct-17	1660000
4	Agungi.xlsx	Agungi	BBQ Chicken	4-Oct-17	1260000
5	Agungi.xlsx	Agungi	BBQ Chicken	5-Oct-17	1080000
6	Agungi.xlsx	Agungi	BBQ Chicken	6-Oct-17	2556000
7	Agungi.xlsx	Agungi	BBQ Chicken	7-Oct-17	2217000
8	Agungi.xlsx	Agungi	BBQ Chicken	8-Oct-17	2322000
9	Agungi.xlsx	Agungi	BBQ Chicken	9-Oct-17	2485000
10	Agungi.xlsx	Agungi	BBQ Chicken	10-Oct-17	2407000
11	Agungi.xlsx	Agungi	BBQ Chicken	11-Oct-17	2012000
12	Agungi.xlsx	Agungi	BBQ Chicken	12-Oct-17	1503000
13	Agungi.xlsx	Agungi	BBQ Chicken	13-Oct-17	1164000
14	Agungi.xlsx	Agungi	BBQ Chicken	14-Oct-17	1945000
15	Agungi.xlsx	Agungi	BBQ Chicken	15-Oct-17	2618000
16	Agungi.xlsx	Agungi	BBQ Chicken	16-Oct-17	970000
17	Agungi.xlsx	Agungi	BBQ Chicken	17-Oct-17	1156000
18	Agungi.xlsx	Agungi	BBQ Chicken	18-Oct-17	2859000
19	Agungi.xlsx	Agungi	BBQ Chicken	19-Oct-17	1672000
20	Agungi.xlsx	Agungi	BBQ Chicken	20-Oct-17	2623000
21	Agungi.xlsx	Agungi	BBQ Chicken	21-Oct-17	933000
22	Agungi.xlsx	Agungi	BBQ Chicken	22-Oct-17	2857000
23	Agungi.xlsx	Agungi	BBQ Chicken	23-Oct-17	2064000
24	Agungi.xlsx	Agungi	BBQ Chicken	24-Oct-17	2976000
25	Agungi.xlsx	Agungi	BBQ Chicken	25-Oct-17	1252000

The left sidebar shows the 'Queries [5]' list, which includes 'Transform File from R...', 'Sample Query [2]', 'Sample File', 'Transform Sample Fi...', 'Other Queries [1]', and 'Reports'. The 'Reports' item is currently selected.

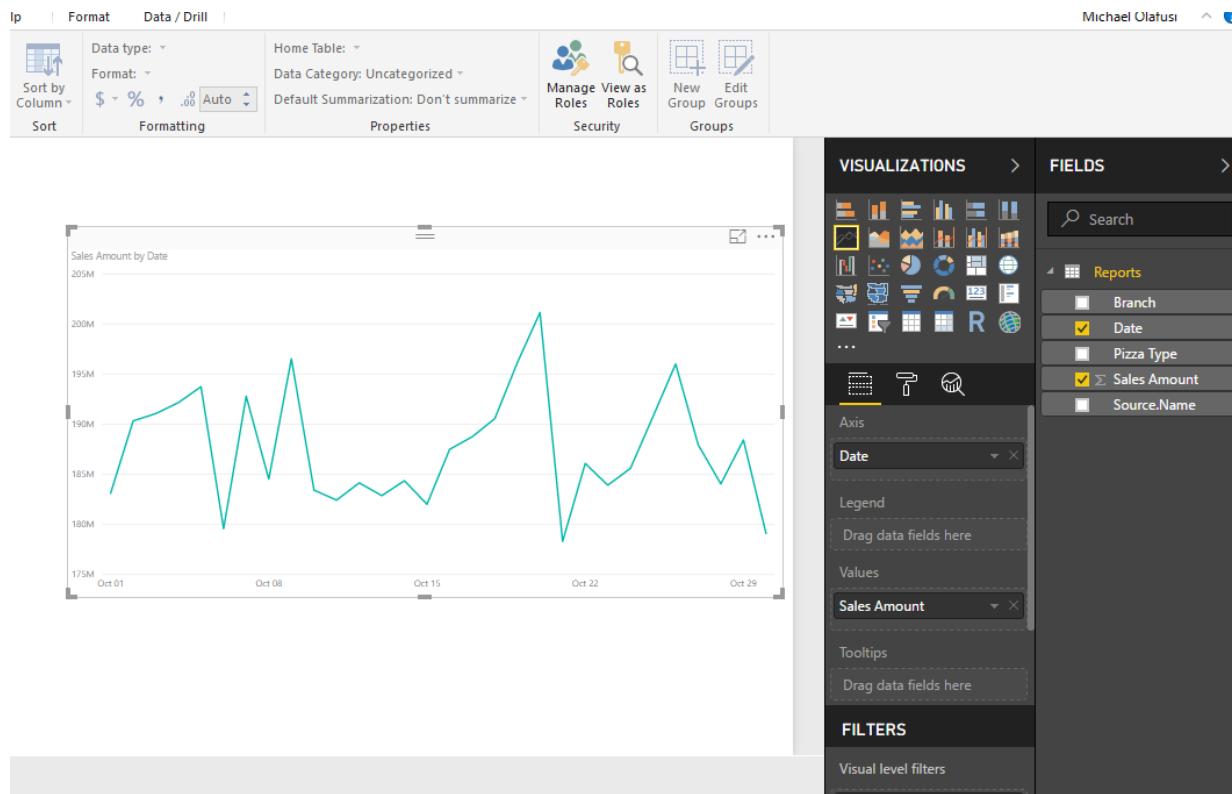
Close & Apply.

The screenshot shows the Power BI Desktop interface with the title bar "Untitled - Power BI Desktop". The ribbon menu is visible with tabs "File", "Home", "Modeling", and "Help". The "Home" tab is selected. Below the ribbon, there's a toolbar with icons for Paste, Cut, Copy, Format Painter, Get Data, Refresh, New Page, New Visual, Ask A Question, and Shape. The main area displays a table titled "Source.Name" with columns: Source.Name, Branch, Pizza Type, Date, and Sales Amount. The data shows 2,880 rows of sales records for BBQ Chicken from October 1st to 24th, 2017, across multiple branches. A caption at the bottom of the table reads "TABLE: Reports (2,880 rows)".

Source.Name	Branch	Pizza Type	Date	Sales Amount
Agungi.xlsx	Agungi	BBQ Chicken	1-Oct-17	2522000
Agungi.xlsx	Agungi	BBQ Chicken	2-Oct-17	1112000
Agungi.xlsx	Agungi	BBQ Chicken	3-Oct-17	1660000
Agungi.xlsx	Agungi	BBQ Chicken	4-Oct-17	1260000
Agungi.xlsx	Agungi	BBQ Chicken	5-Oct-17	1080000
Agungi.xlsx	Agungi	BBQ Chicken	6-Oct-17	2556000
Agungi.xlsx	Agungi	BBQ Chicken	7-Oct-17	2217000
Agungi.xlsx	Agungi	BBQ Chicken	8-Oct-17	2322000
Agungi.xlsx	Agungi	BBQ Chicken	9-Oct-17	2485000
Agungi.xlsx	Agungi	BBQ Chicken	10-Oct-17	2407000
Agungi.xlsx	Agungi	BBQ Chicken	11-Oct-17	2012000
Agungi.xlsx	Agungi	BBQ Chicken	12-Oct-17	1503000
Agungi.xlsx	Agungi	BBQ Chicken	13-Oct-17	1164000
Agungi.xlsx	Agungi	BBQ Chicken	14-Oct-17	1945000
Agungi.xlsx	Agungi	BBQ Chicken	15-Oct-17	2618000
Agungi.xlsx	Agungi	BBQ Chicken	16-Oct-17	970000
Agungi.xlsx	Agungi	BBQ Chicken	17-Oct-17	1156000
Agungi.xlsx	Agungi	BBQ Chicken	18-Oct-17	2859000
Agungi.xlsx	Agungi	BBQ Chicken	19-Oct-17	1672000
Agungi.xlsx	Agungi	BBQ Chicken	20-Oct-17	2623000
Agungi.xlsx	Agungi	BBQ Chicken	21-Oct-17	933000
Agungi.xlsx	Agungi	BBQ Chicken	22-Oct-17	2857000
Agungi.xlsx	Agungi	BBQ Chicken	23-Oct-17	2064000
Agungi.xlsx	Agungi	BBQ Chicken	24-Oct-17	2976000

TABLE: Reports (2,880 rows)

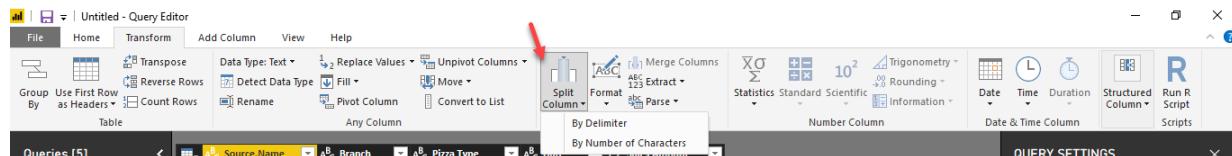
And now we can successfully build the sales chart we want.



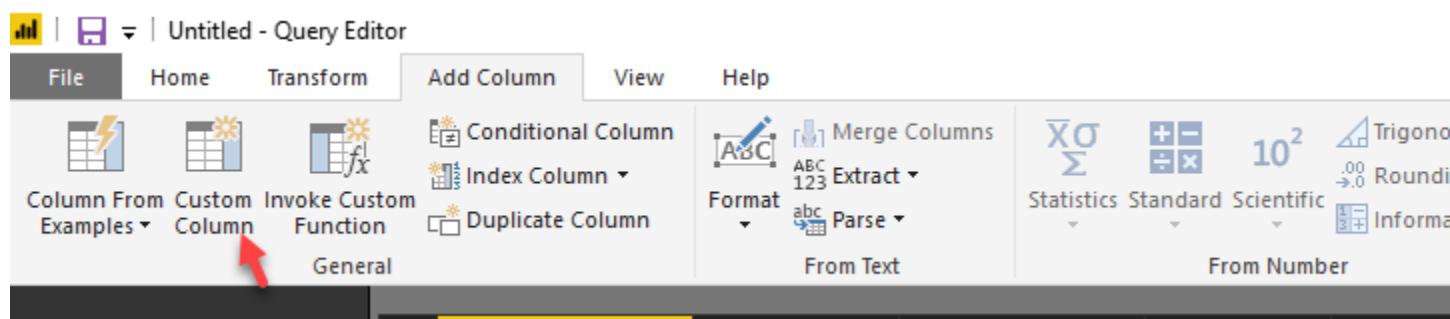
## Other Common Data Transformation tools

Luckily, the tools in the Query Editor all have self-explanatory names. Take your time to go through each menu and the tools under each.

Two other tools I'll like to specially draw your attention to because I use them often are: the Split Column



and the Add Custom Column



You will also find Count Rows and Statistics useful when dealing with a large data table and want to have an idea of how many rows are in there, and maybe the distinct values too.

The screenshot shows the Power BI Query Editor interface. The top navigation bar includes File, Home, Transform, Add Column, View, and Help. The Transform tab is selected. Below the ribbon, there are several icons for data manipulation: Group By, Use First Row as Headers, Count Rows (highlighted with a red arrow), Transpose, Reverse Rows, Detect Data Type, Fill, Move, Rename, Pivot Column, Convert to List, Split Column, Format, Extract, Parse, and Text Column. A context menu is open over the 'Count Rows' icon, with 'Statistics' selected. This menu lists various statistical functions: Sum, Minimum, Maximum, Median, Average, Standard Deviation, Count Values, and Count Distinct Values. The main workspace displays a table with 15 rows of data:

	Source.Name	Branch	Pizza Type	Date	1.2 Sales Amount
1	Agungi.xlsx	Agungi	BBQ.Chicken	1-Oct-17	2522000
2	Agungi.xlsx	Agungi	BBQ.Chicken	2-Oct-17	1112000
3	Agungi.xlsx	Agungi	BBQ.Chicken	3-Oct-17	1660000
4	Agungi.xlsx	Agungi	BBQ.Chicken	4-Oct-17	1260000
5	Agungi.xlsx	Agungi	BBQ.Chicken	5-Oct-17	1080000
6	Agungi.xlsx	Agungi	BBQ.Chicken	6-Oct-17	2556000
7	Agungi.xlsx	Agungi	BBQ.Chicken	7-Oct-17	2217000
8	Agungi.xlsx	Agungi	BBQ.Chicken	8-Oct-17	2322000
9	Agungi.xlsx	Agungi	BBQ.Chicken	9-Oct-17	2485000
10	Agungi.xlsx	Agungi	BBQ.Chicken	10-Oct-17	2407000
11	Agungi.xlsx	Agungi	BBQ.Chicken	11-Oct-17	2012000
12	Agungi.xlsx	Agungi	BBQ.Chicken	12-Oct-17	1503000
13	Agungi.xlsx	Agungi	BBQ.Chicken	13-Oct-17	1164000
14	Agungi.xlsx	Agungi	BBQ.Chicken	14-Oct-17	1945000
15	Agungi.xlsx	Agungi	BBQ.Chicken	15-Oct-17	2618000

## Data Analysis Expressions (DAX)

In the Power BI data model, the formulas you use are called DAX. They are in some ways similar to Excel formulas, so if you are already proficient at using Excel formulas you will find that skill useful in Power BI. There are, however, some significant differences between DAX and the formulas used in Excel even when they've got same names and purpose. One main difference is that DAX operates on entire columns or an entire table rather than individual cell entries like you can in Excel. Another difference is that DAX is structured to work within a database-like ecosystem. It recognises table relationships, recognises more data types than Excel and can generate a single (scalar) value or a column or a table.

Thanks to the compilation by Paul Turkey (<https://sqlserverbi.blog/2015/11/25/complete-dax-function-reference/>), below is a listing of all the DAX formulas (Microsoft continually create new ones, so this list may not be exhaustive). You can always access the Microsoft documentation at <https://msdn.microsoft.com/en-us/library/ee634396.aspx>

Category	Function	Description
DATETIME	CLOSINGBALANCEMONTH	Evaluates the specified expression for the date corresponding to the end of the current month after applying specified filters.
DATETIME	CLOSINGBALANCEQUARTER	Evaluates the specified expression for the date corresponding to the end of the current quarter after applying specified filters.
DATETIME	CLOSINGBALANCEYEAR	Evaluates the specified expression for the date corresponding to the end of the current year after applying specified filters.
DATETIME	DATE	Returns the specified date in datetime format.
DATETIME	DATEADD	Moves the given set of dates by a specified interval.
DATETIME	DATEDIFF	Returns the number of units (unit specified in Interval) between the input two dates.
DATETIME	DATESBETWEEN	Returns the dates between two given dates.
DATETIME	DATESINPERIOD	Returns the dates from the given period.
DATETIME	DATESMTD	Returns a set of dates in the month up to current date.
DATETIME	DATESQTD	Returns a set of dates in the quarter up to current date.

DATETIME	DATESYTD	Returns a set of dates in the year up to current date.
DATETIME	DATEVALUE	Converts a date in the form of text to a date in datetime format.
DATETIME	DAY	Returns a number from 1 to 31 representing the day of the month.
DATETIME	EDATE	Returns the date that is the indicated number of months before or after the start date.
DATETIME	ENDOFMONTH	Returns the end of month.
DATETIME	ENDOFQUARTER	Returns the end of quarter.
DATETIME	ENDOFYEAR	Returns the end of year.
DATETIME	EOMONTH	Returns the date in datetime format of the last day of the month before or after a specified number of months.
DATETIME	FIRSTDATE	Returns first non blank date.
DATETIME	FIRSTNONBLANK	Returns the first value in the column for which the expression has a non blank value.
DATETIME	HOUR	Returns the hour as a number from 0 (12:00 A.M.) to 23 (11:00 P.M.).
DATETIME	LASTDATE	Returns last non blank date.
DATETIME	LASTNONBLANK	Returns the last value in the column for which the expression has a non blank value.
DATETIME	MINUTE	Returns a number from 0 to 59 representing the minute.
DATETIME	MONTH	Returns a number from 1 (January) to 12 (December) representing the month.
DATETIME	NEXTDAY	Returns a next day.
DATETIME	NEXTMONTH	Returns a next month.
DATETIME	NEXTQUARTER	Returns a next quarter.
DATETIME	NEXTYEAR	Returns a next year.
DATETIME	NOW	Returns the current date and time in datetime format.
DATETIME	OPENINGBALANCEMONTH	Evaluates the specified expression for the date corresponding to the end of the previous month after applying specified filters.
DATETIME	OPENINGBALANCEQUARTER	Evaluates the specified expression for the date corresponding to the end of the previous quarter after applying specified filters.

DATETIME	OPENINGBALANCEYEAR	Evaluates the specified expression for the date corresponding to the end of the previous year after applying specified filters.
DATETIME	PARALLELPERIOD	Returns a parallel period of dates by the given set of dates and a specified interval.
DATETIME	PREVIOUSDAY	Returns a previous day.
DATETIME	PREVIOUSMONTH	Returns a previous month.
DATETIME	PREVIOUSQUARTER	Returns a previous quarter.
DATETIME	PREVIOUSYEAR	Returns a previous year.
DATETIME	SAMEPERIODLASTYEAR	Returns a set of dates in the current selection from the previous year.
DATETIME	SECOND	Returns a number from 0 to 59 representing the second.
DATETIME	STARTOFMONTH	Returns the start of month.
DATETIME	STARTOFQUARTER	Returns the start of quarter.
DATETIME	STARTOFYEAR	Returns the start of year.
DATETIME	TIME	Converts hours, minutes, and seconds given as numbers to a time in datetime format.
DATETIME	TIMEVALUE	Converts a time in text format to a time in datetime format.
DATETIME	TODAY	Returns the current date in datetime format.
DATETIME	TOTALMTD	Evaluates the specified expression over the interval which begins on the first of the month and ends with the last date in the specified date column after applying specified filters.
DATETIME	TOTALQTD	Evaluates the specified expression over the interval which begins on the first day of the quarter and ends with the last date in the specified date column after applying specified filters.
DATETIME	TOTALYTD	Evaluates the specified expression over the interval which begins on the first day of the year and ends with the last date in the specified date column after applying specified filters.
DATETIME	WEEKDAY	Returns a number from 1 to 7 identifying the day of the week of a date.

DATETIME	WEEKNUM	Returns the week number in the year.
DATETIME	YEAR	Returns the year of a date as a four digit integer.
DATETIME	YEARFRAC	Returns the year fraction representing the number of whole days between start_date and end_date.
FILTER	ADDCOLUMNS	Returns a table with new columns specified by the DAX expressions.
FILTER	ADDMISSINGITEMS	Add the rows with empty measure values back.
FILTER	ALL	Returns all the rows in a table, or all the values in a column, ignoring any filters that might have been applied.
FILTER	ALLEXCEPT	Returns all the rows in a table except for those rows that are affected by the specified column filters.
FILTER	ALLNOBLANKROW	Returns all the rows except blank row in a table, or all the values in a column, ignoring any filters that might have been applied.
FILTER	ALLSELECTED	Returns all the rows in a table, or all the values in a column, ignoring any filters that might have been applied inside the query, but keeping filters that come from outside.
FILTER	CALCULATE	Evaluates an expression in a context modified by filters.
FILTER	CALCULATETABLE	Evaluates a table expression in a context modified by filters.
FILTER	CALENDAR	Returns a table with one column of all dates between StartDate and EndDate.
FILTER	CALENDARAUTO	Returns a table with one column of dates calculated from the model automatically.
FILTER	CROSSFILTER	Specifies cross filtering direction to be used in the evaluation of a DAX expression. The relationship is defined by naming, as arguments, the two columns that serve as endpoints.
FILTER	CROSSJOIN	Returns a table that is a crossjoin of the specified tables.

FILTER	CURRENTGROUP	Access to the (sub)table representing current group in GroupBy function. Can be used only inside GroupBy function.
FILTER	DISTINCT	Returns a one column table that contains the distinct (unique) values in a column, for a column argument. Or multiple columns with distinct (unique) combination of values, for a table expression argument.
FILTER	EARLIER	Returns the value in the column prior to the specified number of table scans (default is 1).
FILTER	EARLIEST	Returns the value in the column for the very first point at which there was a row context.
FILTER	EXCEPT	Returns the rows of left-side table which do not appear in right-side table.
FILTER	FILTER	Returns a table that has been filtered.
FILTER	FILTERS	Returns a table of the filter values applied directly to the specified column.
FILTER	GENERATE	The second table expression will be evaluated for each row in the first table. Returns the crossjoin of the first table with these results.
FILTER	GENERATEALL	The second table expression will be evaluated for each row in the first table. Returns the crossjoin of the first table with these results, including rows for which the second table expression is empty.
FILTER	GROUPBY	Creates a summary the input table grouped by the specified columns.
FILTER	IGNORE	Tags a measure expression specified in the call to SUMMARIZECOLUMNS function to be ignored when determining the non-blank rows.
FILTER	INTERSECT	Returns the rows of left-side table which appear in right-side table.
FILTER	ISONORAFTER	The IsOnOrAfter function is a boolean function that emulates

		the behavior of Start At clause and returns true for a row that meets all the conditions mentioned as parameters in this function.
FILTER	KEEPFILTERS	Changes the CALCULATE and CALCULATETABLE function filtering semantics.
FILTER	LOOKUPVALUE	Retrieves a value from a table.
FILTER	NATURALINNERJOIN	Joins the Left table with right table using the Inner Join semantics.
FILTER	NATURALLEFTOUTERJOIN	Joins the Left table with right table using the Left Outer Join semantics.
FILTER	RELATED	Returns a related value from another table.
FILTER	RELATEDTABLE	Returns the related tables filtered so that it only includes the related rows.
FILTER	ROLLUP	Identifies a subset of columns specified in the call to SUMMARIZE function that should be used to calculate subtotals.
FILTER	ROLLUPADDISSTOTAL	Identifies a subset of columns specified in the call to SUMMARIZECOLUMNS function that should be used to calculate groups of subtotals.
FILTER	ROLLUPGROUP	Identifies a subset of columns specified in the call to SUMMARIZE function that should be used to calculate groups of subtotals.
FILTER	ROLLUPISSUBTOTAL	Pairs up the rollup groups with the column added by ROLLUPADDISSTOTAL.
FILTER	ROW	Returns a single row table with new columns specified by the DAX expressions.
FILTER	SAMPLE	Returns a sample subset from a given table expression.
FILTER	SELECTCOLUMNS	Returns a table with selected columns from the table and new columns specified by the DAX expressions.
FILTER	SUBSTITUTEWITHINDEX	Returns a table which represents the semijoin of two tables supplied and for which the

		common set of columns are replaced by a 0-based index column. The index is based on the rows of the second table sorted by specified order expressions.
FILTER	SUMMARIZE	Creates a summary the input table grouped by the specified columns.
FILTER	SUMMARIZECOLUMNS	Create a summary table for the requested totals over set of groups.
FILTER	TOPN	Returns a given number of top rows according to a specified expression.
FILTER	UNION	Returns the union of the two tables whose columns match.
FILTER	USERELATIONSHIP	Specifies an existing relationship to be used in the evaluation of a DAX expression. The relationship is defined by naming, as arguments, the two columns that serve as endpoints.
FILTER	VALUES	Returns a one column table or a table that contains the distinct (unique) values in a column.
INFO	CONTAINS	Returns TRUE if there exists at least one row where all columns have specified values.
INFO	CUSTOMDATA	Returns the value of the CustomData connection string property if defined; otherwise, BLANK().
INFO	HASONEFILTER	Returns true the specified table or column have one and only one filter.
INFO	HASONEVALUE	Returns true when there's only one value in the specified column.
INFO	ISBLANK	Checks whether a value is blank, and returns TRUE or FALSE.
INFO	ISCROSSFILTERED	Returns true when the specified table or column is crossfiltered.
INFO	ISEMPTY	Returns true if the specified table or table-expression is Empty.
INFO	ISERROR	Checks whether a value is an error, and returns TRUE or FALSE.
INFO	ISEVEN	Returns TRUE if number is even, or FALSE if number is odd.

INFO	ISFILTERED	Returns true when there are direct filters on the specified column.
INFO	ISLOGICAL	Checks whether a value is a logical value (TRUE or FALSE), and returns TRUE or FALSE.
INFO	ISNONTEXT	Checks whether a value is not text (blank cells are not text), and returns TRUE or FALSE.
INFO	ISNUMBER	Checks whether a value is a number, and returns TRUE or FALSE.
INFO	ISODD	Returns TRUE if number is odd, or FALSE if number is even.
INFO	ISSUBTOTAL	Returns TRUE if the current row contains a subtotal for a specified column and FALSE otherwise.
INFO	ISTEXT	Checks whether a value is text, and returns TRUE or FALSE.
INFO	USERNAME	Returns the domain name and user name of the current connection with the format of domain-name\user-name.
LOGICAL	AND	Checks whether all arguments are TRUE, and returns TRUE if all arguments are TRUE.
LOGICAL	IF	Checks whether a condition is met, and returns one value if TRUE, and another value if FALSE.
LOGICAL	IFERROR	Returns value_if_error if the first expression is an error and the value of the expression itself otherwise.
LOGICAL	NOT	Changes FALSE to TRUE, or TRUE to FALSE.
LOGICAL	OR	Returns TRUE if any of the arguments are TRUE, and returns FALSE if all arguments are FALSE.
LOGICAL	SWITCH	Returns different results depending on the value of an expression.
LOGICAL	FALSE	Returns the logical value FALSE.
LOGICAL	TRUE	Returns the logical value TRUE.
MATHTRIG	ABS	Returns the absolute value of a number.
MATHTRIG	ACOS	Returns the arccosine, or inverse cosine, of a number. The arccosine is the angle whose

		cosine is number. The returned angle is given in radians in the range 0 (zero) to pi.
MATHTRIG	ACOSH	Returns the inverse hyperbolic cosine of a number. The number must be greater than or equal to 1. The inverse hyperbolic cosine is the value whose hyperbolic cosine is number, so ACOSH(COSH(number)) equals number.
MATHTRIG	ACOT	Returns the principal value of the arccotangent, or inverse cotangent, of a number.
MATHTRIG	ACOTH	Returns the inverse hyperbolic cotangent of a number.
MATHTRIG	ASIN	Returns the arcsine, or inverse sine, of a number. The arcsine is the angle whose sine is number. The returned angle is given in radians in the range -pi/2 to pi/2.
MATHTRIG	ASINH	Returns the inverse hyperbolic sine of a number. The inverse hyperbolic sine is the value whose hyperbolic sine is number, so ASINH(SINH(number)) equals number.
MATHTRIG	ATAN	Returns the arctangent, or inverse tangent, of a number. The arctangent is the angle whose tangent is number. The returned angle is given in radians in the range -pi/2 to pi/2.
MATHTRIG	ATANH	Returns the inverse hyperbolic tangent of a number. Number must be between -1 and 1 (excluding -1 and 1). The inverse hyperbolic tangent is the value whose hyperbolic tangent is number, so ATANH(TANH(number)) equals number.
MATHTRIG	BETA.DIST	Returns the beta distribution. The beta distribution is commonly used to study variation in the percentage of something across samples, such as the fraction of the day people spend watching television.

MATHTRIG	BETA.INV	Returns the inverse of the beta cumulative probability density function (BETA.DIST). If probability = BETA.DIST(x,...TRUE), then BETA.INV(probability,...) = x. The beta distribution can be used in project planning to model probable completion times given an expected completion time and variability.
MATHTRIG	CEILING	Rounds a number up, to the nearest integer or to the nearest unit of significance.
MATHTRIG	CHISQ.DIST	Returns the chi-squared distribution. The chi-squared distribution is commonly used to study variation in the percentage of something across samples, such as the fraction of the day people spend watching television.
MATHTRIG	CHISQ.DIST.RT	Returns the right-tailed probability of the chi-squared distribution. The chi-squared distribution is associated with a chi-squared test. Use the chi-squared test to compare observed and expected values. For example, a genetic experiment might hypothesize that the next generation of plants will exhibit a certain set of colors. By comparing the observed results with the expected ones, you can decide whether your original hypothesis is valid.
MATHTRIG	CHISQ.INV	Returns the inverse of the left-tailed probability of the chi-squared distribution. The chi-squared distribution is commonly used to study variation in the percentage of something across samples, such as the fraction of the day people spend watching television.
MATHTRIG	CHISQ.INV.RT	Returns the inverse of the right-tailed probability of the chi-squared distribution. If probability = CHISQ.DIST.RT(x,...), then

		CHISQ.INV.RT(probability,...) = x. Use this function to compare observed results with expected ones in order to decide whether your original hypothesis is valid.
MATHTRIG	COMBIN	Returns the number of combinations for a given number of items. Use COMBIN to determine the total possible number of groups for a given number of items.
MATHTRIG	COMBINA	Returns the number of combinations (with repetitions) for a given number of items.
MATHTRIG	CONFIDENCE.NORM	Returns the confidence interval for a population mean, using a normal distribution.
MATHTRIG	CONFIDENCE.T	Returns the confidence interval for a population mean, using a Student's t distribution.
MATHTRIG	COS	Returns the cosine of the given angle.
MATHTRIG	COSH	Returns the hyperbolic cosine of a number.
MATHTRIG	COT	Return the cotangent of an angle specified in radians.
MATHTRIG	COTH	Return the hyperbolic cotangent of a hyperbolic angle.
MATHTRIG	CURRENCY	Returns the value as a currency data type.
MATHTRIG	DEGREES	Converts radians into degrees.
MATHTRIG	EVEN	Returns number rounded up to the nearest even integer. You can use this function for processing items that come in twos. For example, a packing crate accepts rows of one or two items. The crate is full when the number of items, rounded up to the nearest two, matches the crate's capacity.
MATHTRIG	EXP	Returns e raised to the power of a given number.
MATHTRIG	EXPON.DIST	Returns the exponential distribution. Use EXPON.DIST to model the time between events, such as how long an automated bank teller takes to deliver cash.

		For example, you can use EXPON.DIST to determine the probability that the process takes at most 1 minute.
MATHTRIG	FACT	Returns the factorial of a number, equal to $1*2*3*...* \text{Number}$ .
MATHTRIG	FLOOR	Rounds a number down, toward zero, to the nearest multiple of significance.
MATHTRIG	GCD	Returns the greatest common divisor of two integers. The greatest common divisor is the largest integer that divides both number1 and number2 without a remainder.
MATHTRIG	INT	Rounds a number down to the nearest integer.
MATHTRIG	ISO.CEILING	Rounds a number up, to the nearest integer or to the nearest multiple of significance.
MATHTRIG	LCM	Returns the least common multiple of integers. The least common multiple is the smallest positive integer that is a multiple of both integer arguments number1, number2. Use LCM to add fractions with different denominators.
MATHTRIG	LN	Returns the natural logarithm of a number.
MATHTRIG	LOG	Returns the logarithm of a number to the base you specify.
MATHTRIG	LOG10	Returns the base-10 logarithm of a number.
MATHTRIG	MOD	Returns the remainder after a number is divided by a divisor.
MATHTRIG	MROUND	Returns a number rounded to the desired multiple.
MATHTRIG	ODD	Returns number rounded up to the nearest odd integer.
MATHTRIG	PERMUT	Returns the number of permutations for a given number of objects that can be selected from number objects. A permutation is any set or subset of objects or events where internal order is significant. Permutations are different from

		combinations, for which the internal order is not significant. Use this function for lottery-style probability calculations.
MATHTRIG	PI	Returns the value of Pi, 3.14159265358979, accurate to 15 digits.
MATHTRIG	POISSON.DIST	Returns the Poisson distribution. A common application of the Poisson distribution is predicting the number of events over a specific time, such as the number of cars arriving at a toll plaza in 1 minute.
MATHTRIG	POWER	Returns the result of a number raised to a power.
MATHTRIG	QUOTIENT	Returns the integer portion of a division.
MATHTRIG	RADIANS	Converts degrees to radians.
MATHTRIG	RAND	Returns a random number greater than or equal to 0 and less than 1, evenly distributed. Random numbers change on recalculation.
MATHTRIG	RANDBETWEEN	Returns a random number between the numbers you specify.
MATHTRIG	ROUND	Rounds a number to a specified number of digits.
MATHTRIG	ROUNDDOWN	Rounds a number down, toward zero.
MATHTRIG	ROUNDUP	Rounds a number up, away from zero.
MATHTRIG	SIGN	Returns the sign of a number: 1 if the number is positive, zero if the number is zero, or -1 if the number is negative.
MATHTRIG	SIN	Returns the sine of the given angle.
MATHTRIG	SINH	Returns the hyperbolic sine of a number.
MATHTRIG	SQRT	Returns the square root of a number.
MATHTRIG	SQRTPI	Returns the square root of (number * pi).
MATHTRIG	SUM	Adds all the numbers in a column.
MATHTRIG	SUMX	Returns the sum of an expression evaluated for each row in a table.
MATHTRIG	TAN	Returns the tangent of the given angle.

MATHTRIG	TANH	Returns the hyperbolic tangent of a number.
MATHTRIG	TRUNC	Truncates a number to an integer by removing the decimal, or fractional, part of the number.
PARENTCHILD	PATH	Returns a string which contains a delimited list of IDs, starting with the top/root of a hierarchy and ending with the specified ID.
PARENTCHILD	PATHCONTAINS	Returns TRUE if the specified Item exists within the specified Path.
PARENTCHILD	PATHITEM	Returns the nth item in the delimited list produced by the Path function.
PARENTCHILD	PATHITEMREVERSE	Returns the nth item in the delimited list produced by the Path function, counting backwards from the last item in the path.
PARENTCHILD	PATHLENGTH	Returns returns the number of items in a particular path string. This function returns 1 for the path generated for an ID at the top/root of a hierarchy.
STATISTICAL	AVERAGE	Returns the average (arithmetic mean) of all the numbers in a column.
STATISTICAL	AVERAGEA	Returns the average (arithmetic mean) of all the values in a column.
STATISTICAL	AVERAGEX	Returns the average (arithmetic mean) of all the numbers in a column.
STATISTICAL	COUNT	Counts the numbers in a column.
STATISTICAL	COUNTA	Counts the number of values in a column.
STATISTICAL	COUNTAX	Counts the number of values which result from evaluating an expression for each row of a table.
STATISTICAL	COUNTBLANK	Counts the number of blanks in a column.
STATISTICAL	COUNTROWS	Counts the number of rows in a table.
STATISTICAL	COUNTX	Counts the number of values which result from evaluating an expression for each row of a table.

STATISTICAL	DISTINCTCOUNT	Counts the number of distinct values in a column.
STATISTICAL	DIVIDE	Safe Divide function with ability to handle divide by zero case.
STATISTICAL	GEOMEAN	Returns geometric mean of given column reference.
STATISTICAL	GEOMEANX	Returns geometric mean of an expression values in a table.
STATISTICAL	MAX	Returns the largest numeric value in a column, or the larger value between two scalar expressions. Ignores logical values and text.
STATISTICAL	MAXA	Returns the largest value in a column. Does not ignore logical values and text.
STATISTICAL	MAXX	Returns the largest numeric value that results from evaluating an expression for each row of a table.
STATISTICAL	MEDIAN	Returns the 50th percentile of values in a column.
STATISTICAL	MEDIANX	Returns the 50th percentile of an expression values in a table.
STATISTICAL	MIN	Returns the smallest numeric value in a column, or the smaller value between two scalar expressions. Ignores logical values and text.
STATISTICAL	MINA	Returns the smallest value in a column. Does not ignore logical values and text.
STATISTICAL	MINX	Returns the smallest numeric value that results from evaluating an expression for each row of a table.
STATISTICAL	PERCENTILE.EXC	Returns the k-th (exclusive) percentile of values in a column.
STATISTICAL	PERCENTILE.INC	Returns the k-th (inclusive) percentile of values in a column.
STATISTICAL	PERCENTILEX.EXC	Returns the k-th (exclusive) percentile of an expression values in a table.
STATISTICAL	PERCENTILEX.INC	Returns the k-th (inclusive) percentile of an expression values in a table.
STATISTICAL	PRODUCT	Returns the product of given column reference.

STATISTICAL	PRODUCTX	Returns the product of an expression values in a table.
STATISTICAL	RANK.EQ	Returns the rank of a number in a column of numbers. If more than one value has the same rank, the top rank of that set of values is returned.
STATISTICAL	RANKX	Returns the rank of an expression evaluated in the current context in the list of values for the expression evaluated for each row in the specified table.
STATISTICAL	STDEV.P	Calculates standard deviation based on the entire population given as arguments. Ignores logical values and text.
STATISTICAL	STDEV.S	Estimates standard deviation based on a sample. Ignores logical values and text in the sample.
STATISTICAL	STDEVX.P	Estimates standard deviation based on the entire population that results from evaluating an expression for each row of a table.
STATISTICAL	STDEVX.S	Estimates standard deviation based on a sample that results from evaluating an expression for each row of a table.
STATISTICAL	VAR.P	Calculates variance based on the entire population. Ignores logical values and text in the population.
STATISTICAL	VAR.S	Estimates variance based on a sample. Ignores logical values and text in the sample.
STATISTICAL	VARX.P	Estimates variance based on the entire population that results from evaluating an expression for each row of a table.
STATISTICAL	VARX.S	Estimates variance based on a sample that results from evaluating an expression for each row of a table.
STATISTICAL	XIRR	Returns the internal rate of return for a schedule of cash flows that is not necessarily periodic.
STATISTICAL	XNPV	Returns the net present value for a schedule of cash flows.
TEXT	BLANK	Returns a blank.

TEXT	CONCATENATE	Joins two text strings into one text string.
TEXT	CONCATENATEX	Evaluates expression for each row on the table, then return the concatenation of those values in a single string result, separated by the specified delimiter.
TEXT	EXACT	Checks whether two text strings are exactly the same, and returns TRUE or FALSE. EXACT is case-sensitive.
TEXT	FIND	Returns the starting position of one text string within another text string. FIND is case-sensitive.
TEXT	FIXED	Rounds a number to the specified number of decimals and returns the result as text with optional commas.
TEXT	FORMAT	Converts a value to text in the specified number format.
TEXT	KEYWORDMATCH	Returns TRUE if there is a match between the MatchExpression and Text.
TEXT	LEFT	Returns the specified number of characters from the start of a text string.
TEXT	LEN	Returns the number of characters in a text string.
TEXT	LOWER	Converts all letters in a text string to lowercase.
TEXT	MID	Returns a string of characters from the middle of a text string, given a starting position and length.
TEXT	REPLACE	Replaces part of a text string with a different text string.
TEXT	REPT	Repeats text a given number of times. Use REPT to fill a cell with a number of instances of a text string.
TEXT	RIGHT	Returns the specified number of characters from the end of a text string.
TEXT	SEARCH	Returns the starting position of one text string within another text string. SEARCH is not case-sensitive.

TEXT	SUBSTITUTE	Replaces existing text with new text in a text string.
TEXT	TRIM	Removes all spaces from a text string except for single spaces between words.
TEXT	UNICODE	Returns the number (code point) corresponding to the first character of the text.
TEXT	UPPER	Converts a text string to all uppercase letters.
TEXT	VALUE	Converts a text string that represents a number to a number.

It is quite a long list but if I have to single out the ones to spend more time on at the beginning, the list would be:

1. CALCULATE. This is absolutely the formula you will use the most as you build complex reports in Power BI. I rate it number 1 in the priority list.
2. SUM
3. FILTER
4. ALL
5. ALLEXCEPT
6. ALLSELECTED
7. RELATED
8. FORMAT
9. IF
10. AND, OR, &&, ||
11. SEARCH
12. CONCATENATE, &
13. DIVIDE
14. SUMX
15. COUNTROWS
16. VALUES
17. DISTINCT
18. CROSSJOIN
19. SUMMARIZE
20. DATE

## Data Gateway and Other Complementary Tools

Power BI has a few tools that extend its base features. One of the main ones is the data gateway which allows you to sync with on-premise data sources. Most of the other Complementary tools allow integrating Excel with Power BI.

### Data Gateway

One of the main advantages of using Power BI for your reporting is the automatic update. The ability to have your reports update when the underlying data files are updated. This is often the default (requiring no extra work from you) when your data files are cloud hosted (online databases or OneDrive hosted files). But when you have one or more of your data files on your computer hard-disk or what we call an on-premise data source (source not on a publicly accessible cloud), you will need to install Data Gateway to have that automatic update feature.

Data Gateway is Microsoft's special software tool that makes it possible to sync your private (on-premise) data sources with your published Power BI reports and dashboards that you share. You can download it at  
<https://powerbi.microsoft.com/en-us/gateway/>

**Keep your dashboards and reports up-to-date with your on-premises data sources**

With the on-premises gateways, you can keep your data fresh by connecting to your on-premises data sources without the need to move the data. Query large datasets and benefit from your existing investments. The gateways provide the flexibility you need to meet individual needs, and the needs of your organization.

[DOWNLOAD GATEWAY](#) [LEARN MORE >](#)

**One gateway for all your cloud services**

Install once and deploy multiple on-premises data connections across Power BI, PowerApps, Microsoft Flow and Azure Logic Apps using the same gateway.

**Easy setup**

Download and install the gateway with minimal interactions. Then sign in with your organization account to register the gateway to be used by cloud services.

**Secured access to data**

Data transfer between Power BI and the gateway is secured through Azure Service Bus. Credentials provided by gateway administrators are encrypted to help protect your information in transit. [Request demo](#)

When you run it, you'll see an installer like the one below come up.



## On-premises data gateway installer



Start your on-premises data gateway installation.

A gateway acts as a bridge between on-premises data (not in the cloud), and Power BI, PowerApps, Logic Apps, and Microsoft Flow.

Gateways should be installed on a computer that is always on.

Performance may be slower on a wireless network.

[Learn more](#)

Next

Cancel

## On-premises data gateway installer

Choose the type of gateway you need.

On-premises data gateway (recommended)

- Can be shared and reused by multiple users
- Can be used by Power BI, PowerApps, Logic Apps, and Microsoft Flow
- Supports schedule refresh and live query for Power BI

[Learn more](#)

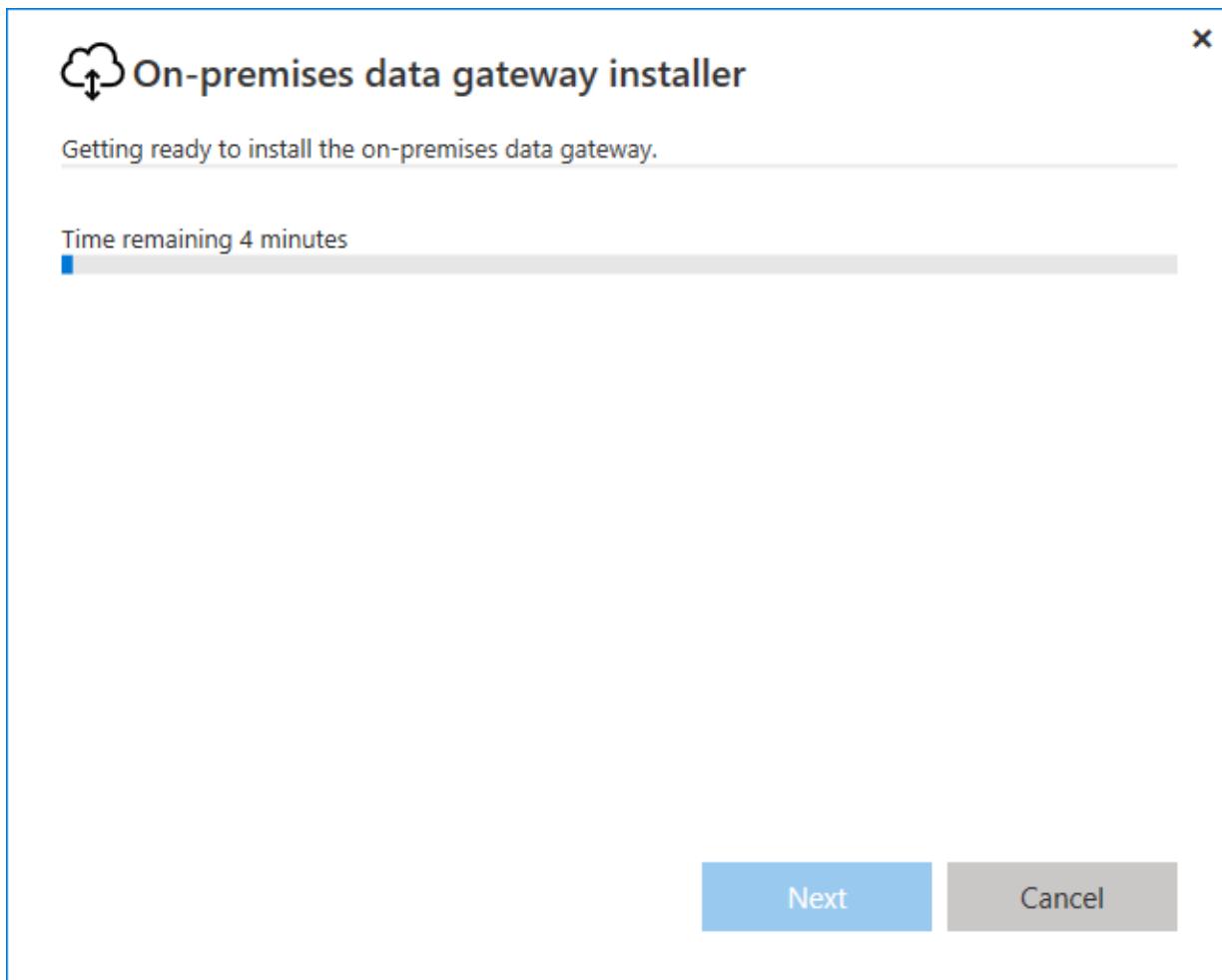
On-premises data gateway (personal mode)

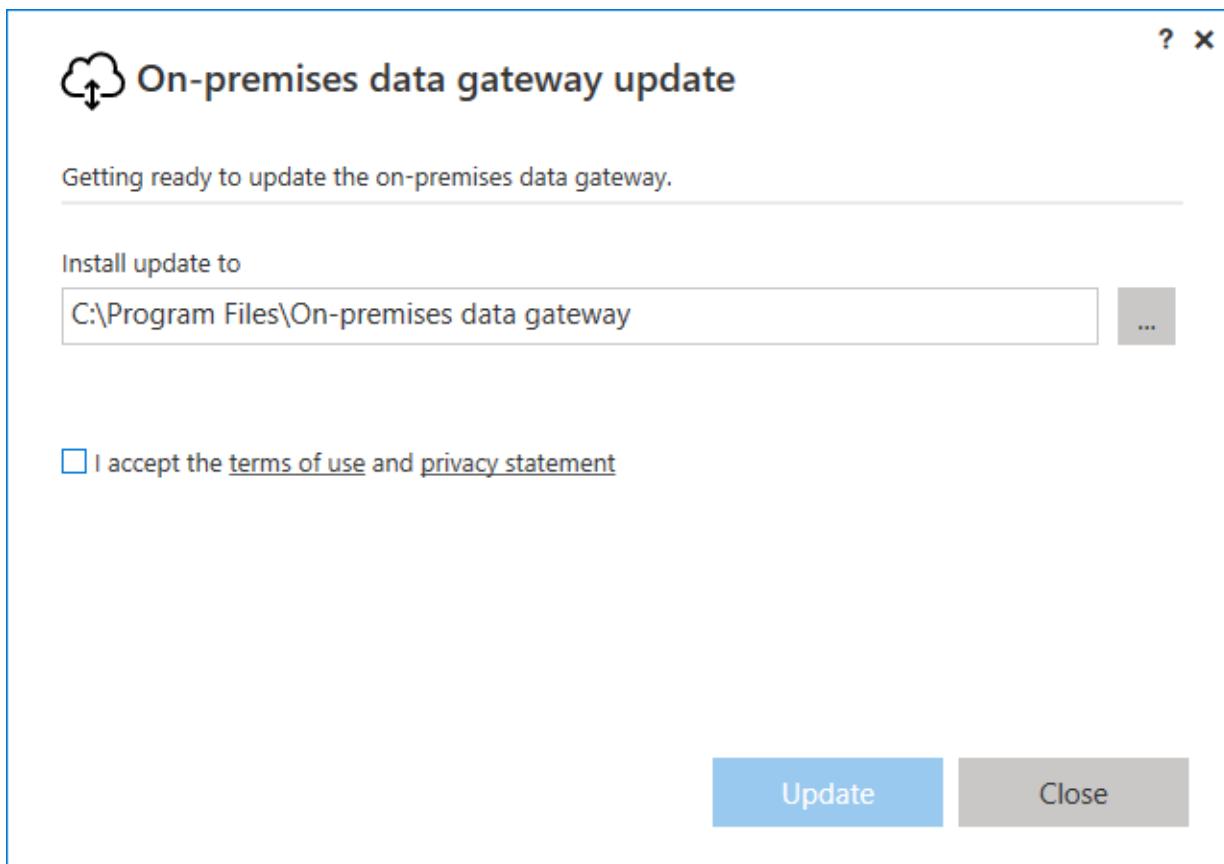
- Can only be used by you
- Can only be used in Power BI
- Only schedule refresh is supported

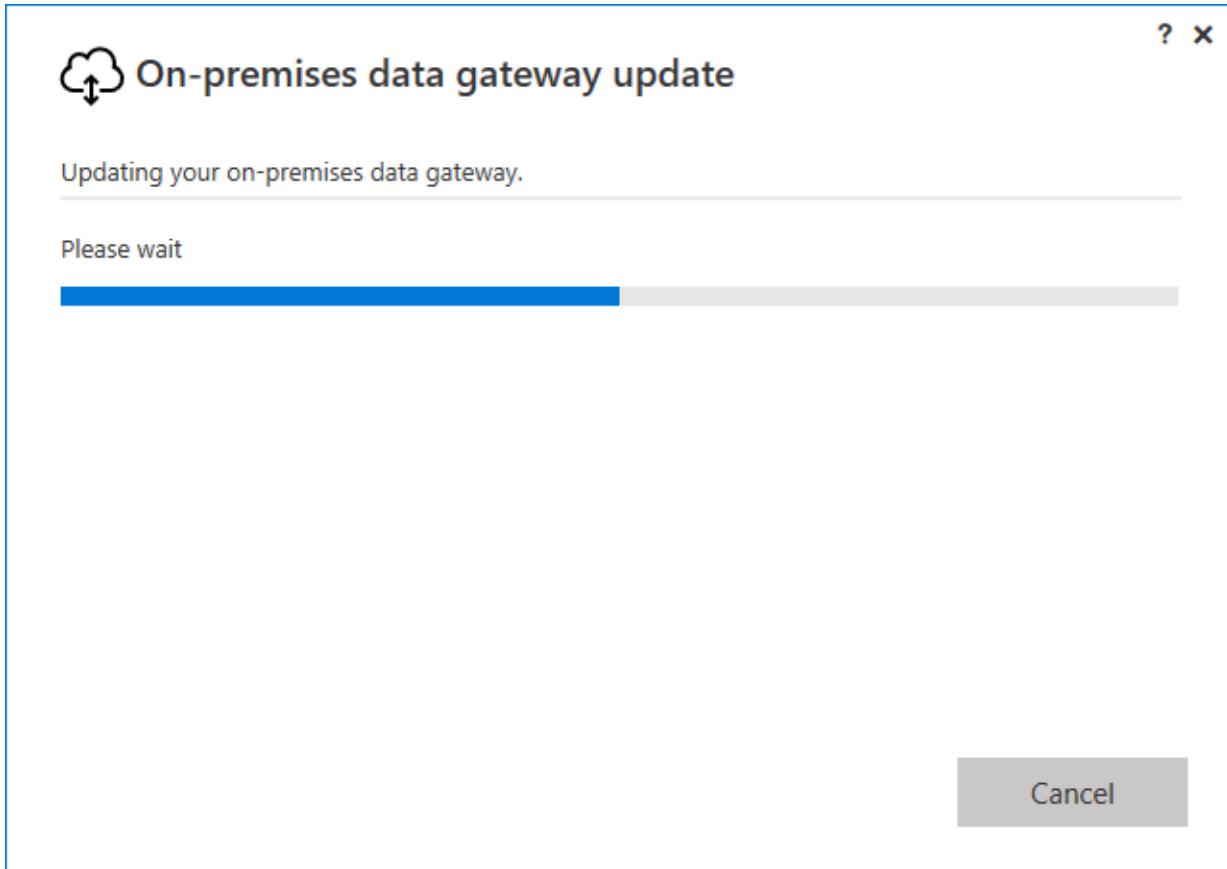
[Learn more](#)

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I always go with the first option: On-premises data gateway (recommended).

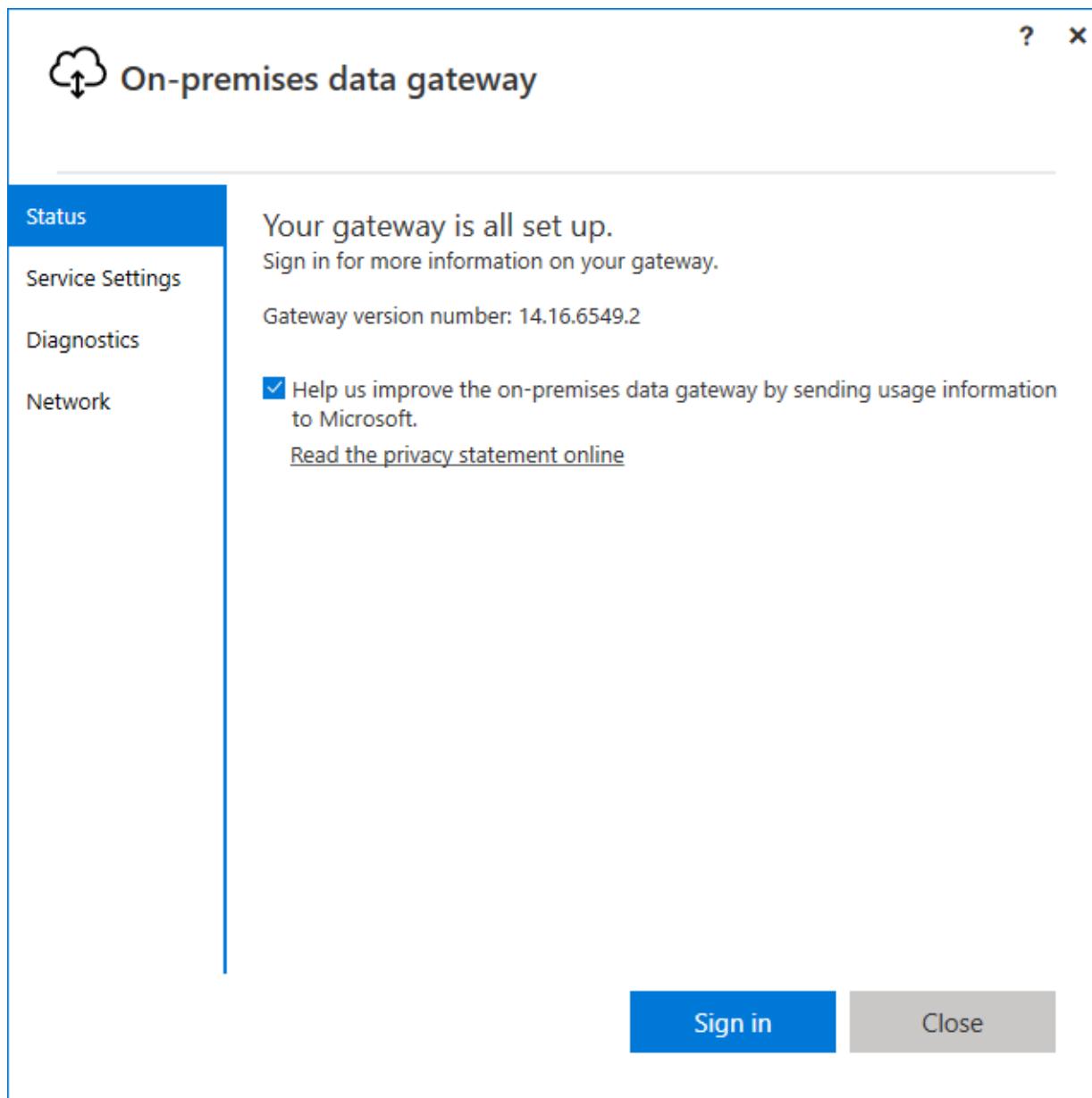




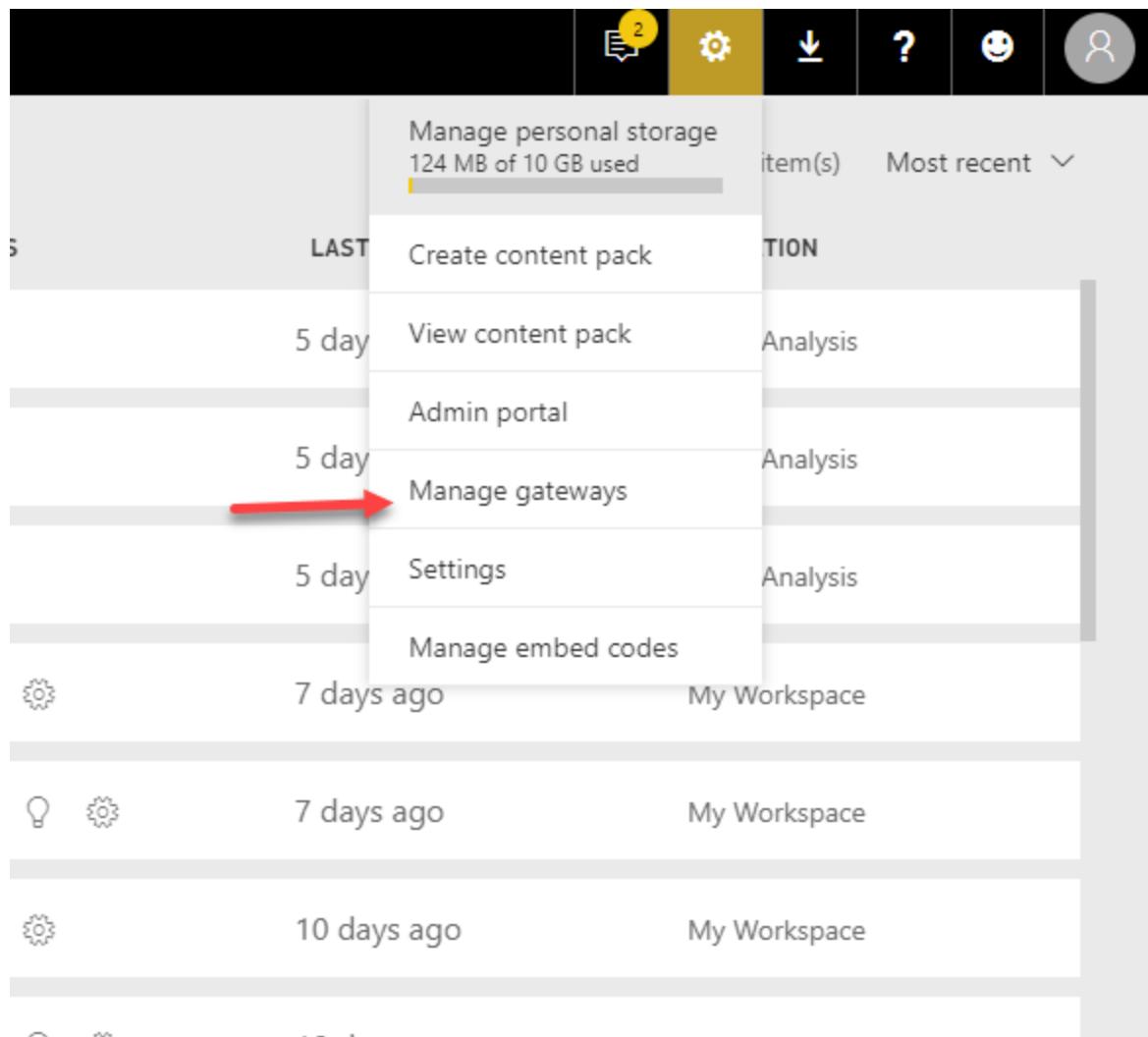


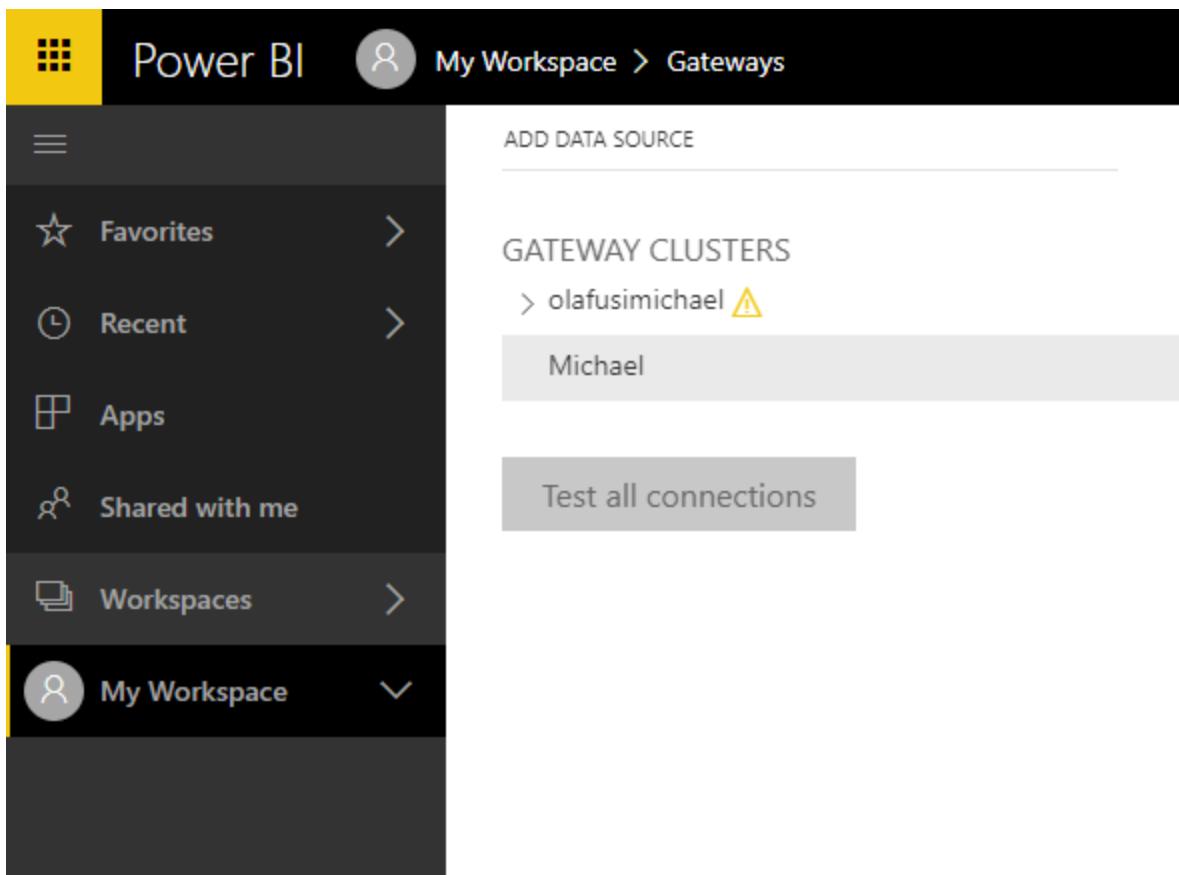
Mine is showing updating because I had installed one before.

On the final screen, you'll have to sign in with your Power BI account details, so it will be able to establish that linking to your published reports.



Now that the installation is complete if you go to your online Power BI account, you'll see the gateway you just installed showing under Manage Gateways.





From now on, whenever you publish any report where one or more of the data files/table is stored on your computer, you have to add new data source in the gateway linked to your computer, and indicate the type and location of the file(s).

A screenshot of the Power BI desktop application showing the 'Gateway Cluster Settings' screen. A red arrow points to the 'ADD DATA SOURCE' button in the top left. The main area displays 'Gateway Cluster Settings' and 'Administrators'. It shows a green checkmark indicating 'Online: You are good to go.' Below this is a blue bar with the text '① Add data sources to use the gateway'. There are input fields for 'Gateway Cluster Name' (set to 'Michael'), 'Department', and 'Description'.

The screenshot shows the 'Data Source Settings' page in the Power BI service. On the left, there's a sidebar with 'ADD DATA SOURCE' and a tree view under 'GATEWAY CLUSTERS' showing 'olafusimichael' and 'Michael'. A 'New data source' button is highlighted. Below it is a 'Test all connections' button. The main area has tabs for 'Data Source Settings' (selected), 'Advanced settings', and 'Scheduled refresh'. Under 'Data Source Settings', fields include 'Data Source Name' (Sales Data Folder), 'Data Source Type' (Folder), 'Full path' (C:\Users\Michael\Documents\Reports), and 'Windows username' (olafusimichael). A note says 'The credentials are encrypted using the key stored on-premises on the gateway server.' Buttons at the bottom are 'Add' (yellow) and 'Discard'.

This will make Scheduled Refresh (under earlier discussed Settings) work.

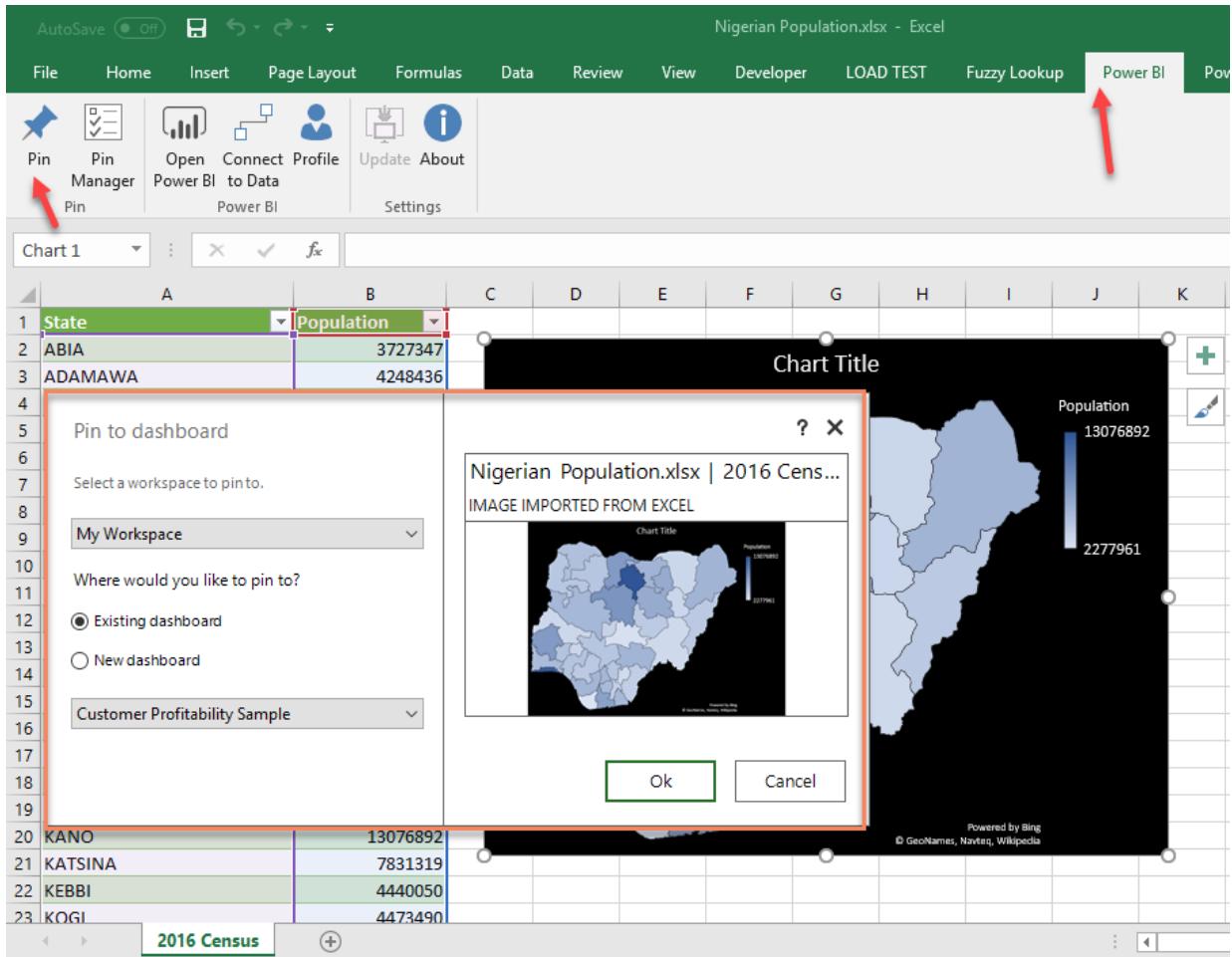
## Other Complementary Tools

There are other tools that help you make more use of your Power BI.

An easy central place to get them is under the download icon in the online Power BI service.

The screenshot shows the Power BI service interface. At the top, there's a navigation bar with icons for 'My Workspace', 'Gateways', 'Data', 'Settings', 'Download' (highlighted with a red arrow), '?', 'Smiley', and 'User'. Below the navigation bar is a table with columns 'ACTIONS', 'LAST ACCES...', and '...'. The first row shows '5 days ago' for both actions and last access. A dropdown menu is open over the first row, listing 'Power BI Desktop', 'Data Gateway', 'Power BI for Mobile', 'Power BI publisher for Excel', and 'Analyze in Excel updates'. The 'Most recent' dropdown is also visible. At the bottom of the table, there are two more rows: '5 days ago' and 'Stock Analysis'.

I use the Power BI publisher for Excel. It is an Excel add-in that lets you pin things from your Excel sheet directly to a Power BI dashboard.



The Analyse In Excel updates is another very useful tool to have if you want to be able to pull data from from Power BI into Excel for analysis.

verbi.com/recentlyviewed

Open star

News Network Hello, World | Android Submit MVP Activity MVP Bookmarklet To (Ivo Welch) Corporate LinuxCommand.org L

## Analyze in Excel updates

With Analyze in Excel, use Pivot Table, Chart, and Slicer features in Excel just like you are used to, all while connected to your data in Power BI. Download the latest update to get started.

[Download](#) [Learn more](#)

After you install it, you can click on the three dots (ellipsis) in front of the report you want to pull into Excel and select Analyse in Excel. And your Excel will be able to open the ODC file it generates and pull the data for you into a PivotTable.

The screenshot shows the Power BI desktop application. In the top navigation bar, the workspace is set to "My Workspace > Sales Dashboard3". The left sidebar lists various workspaces, with "Sales Dashboard3" selected and a context menu open. The menu options are: OPEN, RENAME, REMOVE, and ANALYZE IN EXCEL. A red arrow points to the "ANALYZE IN EXCEL" option. In the main content area, there is a table titled "Sales Amount by Pizza Sold" and a bar chart titled "Sales Dashboard3".

Pizza Sold	Sales Amount	Sum of Sales Targ
BBC Chicken	N 3,600,000	N 1,203,638,64
BBQ Philly Steak	N 3,808,000	N 1,206,010,28
Beef Suya	N 2,943,000	N 482,825,62
Chicken Balli	N 1,778,000	N 427,230,73
Chicken Feast	N 1,744,000	N 758,446,22
Chicken Legend	N 1,766,000	N 1,062,799,06
Chicken Suya	N 3,824,000	N 989,337,40
Extravaganza	N 1,814,000	N 1,213,893,94
Hot Pepperoni Feast	N 4,292,000	N 405,297,81
Hot Veggie	N 3,800,000	N 423,812,98
Italiano	N 2,955,000	N 928,606,40
Margarita	N 3,484,000	N 839,758,27
Meatzaa	N 1,676,000	N 1,026,555,37
Pepperoni Feast	N 3,628,000	N 740,201,77
Pepperoni Suya	N 3,231,000	N 417,793,25
Veggie Supreme	N 3,027,000	N 939,597,40
Total	N 47,370,000	N 13,065,805,19

Also, don't forget to install the Power BI phone apps and Windows 10 store app. They give you some more intuitive ways to consume the reports and dashboards – like having a threshold alert that notifies you on your phone like your SMS alert or Whatsapp message alert does.

## Engage Us Today for Your Data Analysis Needs and Training

UrBizEdge is a registered Microsoft Excel/Power BI consulting, business data analysis and enterprise solutions firm in Nigeria. We specialise in helping companies and high value professionals be on top of their business data. We focus exclusively on the world's most used and most flexible business intelligence tools. We have the only Microsoft Excel Most Valuable Professional in Africa. And there are just about 125 in the whole world. It's the highest recognition Microsoft gives an independent industry expert.

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You can directly reach us on 0700ANALYTICS, +234-808-938-2423 and email [info@urbizedge.com](mailto:info@urbizedge.com)

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