

# Microsoft Power BI: From the Basics

Nikkia T. Carter  
CEO/Owner  
Carter-McGowan Services, LLC  
@CarterMcGServ



About Me...

# About Me

- ❖ Nikkia T. Carter, CEO/Owner, Carter-McGowan Services, LLC (Industry Experience since 2001)
- ❖ CMS provides in business technology consulting, setup, migration, development, support, training, training material, managed services, app development, and website development. We specialize in SharePoint, InfoPath, and Office 365. Also social media and email marketing.
- ❖ **Microsoft Partner/VAR (Value Added Reseller):** Silver Small and MidMarket Cloud Solutions, SMB Champion; **Other Partnerships/VARs:** Constant Contact, Hootsuite, BrainStorm, SkyKick, BitTitan, ShareGate, TeamFusion, ServicePoint365
- ❖ **Past Experience:** Application, Intranet / **Recent:** SharePoint, InfoPath, Office 365
- ❖ **Past Clients:** DoD (Navy, Army, AF), NSF / **Recent Clients:** Mostly commercial organizations and entrepreneurs (many nonprofits, bail bondsman, insurance agent, tech consultant, defense contractors, facilities management company, US Courts, Center of Medicaid and Medicare, NIST, etc.).
- ❖ **Certifications:** CompTIA Certified Technical Trainer (CTT), Microsoft Certified Professional
- ❖ **Other Roles:** IAMCP DC Philanthropy Chair, Board Member, and WIT Community Leader, Microsoft VFI Board Member, SUGDC and MFCF-DC Co-organizer, FEDSPUG Board Member, Microsoft WPC Partner Engagement Board (PEB) Member, Microsoft MCC PEB Member, IAMCP WIT Board Member, IT ProCamp DC, Office 365 Ramp Up and Cloud One Day co



Before we begin...

# Thanks to our Sponsors!

➤ Platinum:



➤ Gold:



➤ Silver:





## More Fun Stuff

- Raffle: Please join us in the Atrium at 5:15 PM for the raffle. We are raffling some exciting prizes including a Wacom tablet, a BB-8 droid, and who knows, maybe a Xbox One S (need to be present to win)!!!

- SharePint will be held at Mad Mex (370 Atwood St, Pittsburgh, PA 15213). While it starts at 5:45 PM, there's no end time!!!! 😊😊😊



- Pittsburgh Area SharePoint User Group
  - Meets at the Microsoft office on the North Shore
  - More Info: <https://www.linkedin.com/groups/Pittsburgh-Area-SharePoint-User-Group-3769745/about>

## We do Request that...

- You fill out the Session Evals. These will also be your Raffle tickets. Print your name clearly if you intend to participate in the Raffle and drop the forms at the registration desk after the last session.
- You visit the sponsors. The event is possible due to their generous support and we request that you visit them and inquire about their products & services.
- Cell phones be kept on silent as a courtesy to other attendees and speakers

Without further adieu...



# What is BI?

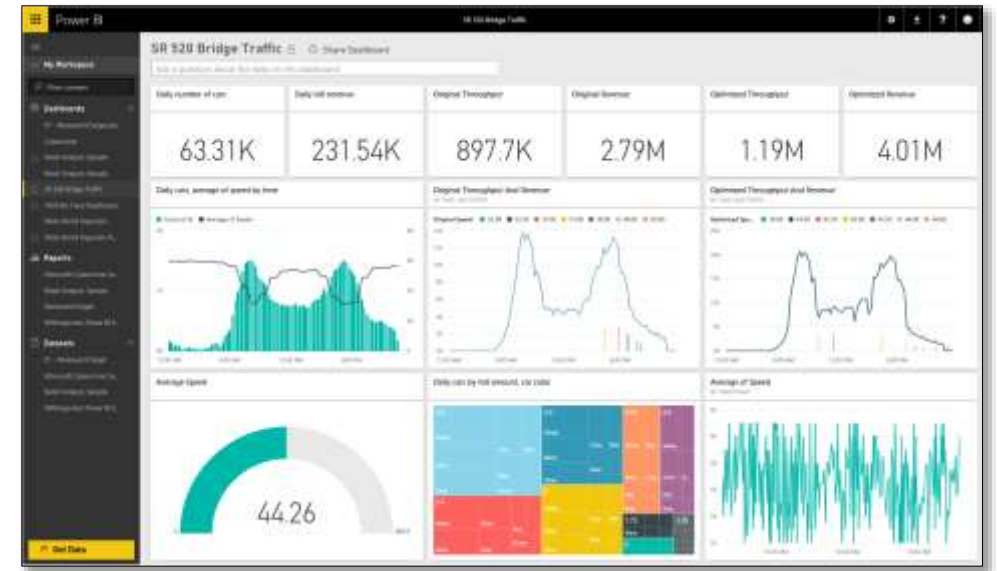
- Business intelligence (BI) is a technology-driven process for analyzing data and presenting actionable information to help corporate executives, business managers and other end users make more informed business decisions. BI encompasses a variety of tools, applications and methodologies that enable organizations to collect data from internal systems and external sources, prepare it for analysis, develop and run queries against the data, and create reports, dashboards and data visualizations to make the analytical results available to corporate decision makers as well as operational workers.

Definition via <http://searchdatamanagement.techtarget.com/definition/business-intelligence>

# What is Microsoft's Power BI

*Experience your data. Any data, any way, anywhere*

- Power BI is a cloud-based business analytics service that enables
  - fast and easy access to your data
  - a live 360° view of your business
  - data discovery and exploration
  - insights from any device
  - collaboration across your organization
  - anyone to visualize and analyze data



# Power BI: experience your data

Any data, any way, anywhere

## MICROSOFT CLOUD

Microsoft Azure    Office 365  
Microsoft Dynamics

Stream  
Analytics

## NON-MICROSOFT CLOUD

Acumatica    Marketo    salesforce  
COMSCORE    Intuit QuickBooks.    twilio



## ON-PREMISE DATA

Hadoop    SAP    Microsoft SQL Server  
ORACLE    TERADATA    IBM

Intelligent  
Apps



**45,000**  
organizations  
**500,000**  
unique users  
**185**  
countries

# Stay connected from any device



- ➔ Native apps for iPad, iPhone, and Windows devices
- ➔ Receive alerts to important changes in your data
- ➔ Share and collaborate with colleagues and take action



# Key benefits of Power BI



Pre-built dashboards and reports for popular SaaS solutions



Real-time dashboard updates



Secure, live connection to your data sources, on-premises and in the cloud



Intuitive data exploration using natural language query



Integrated with familiar Microsoft products and utilizes commitment for scale & availability in Azure

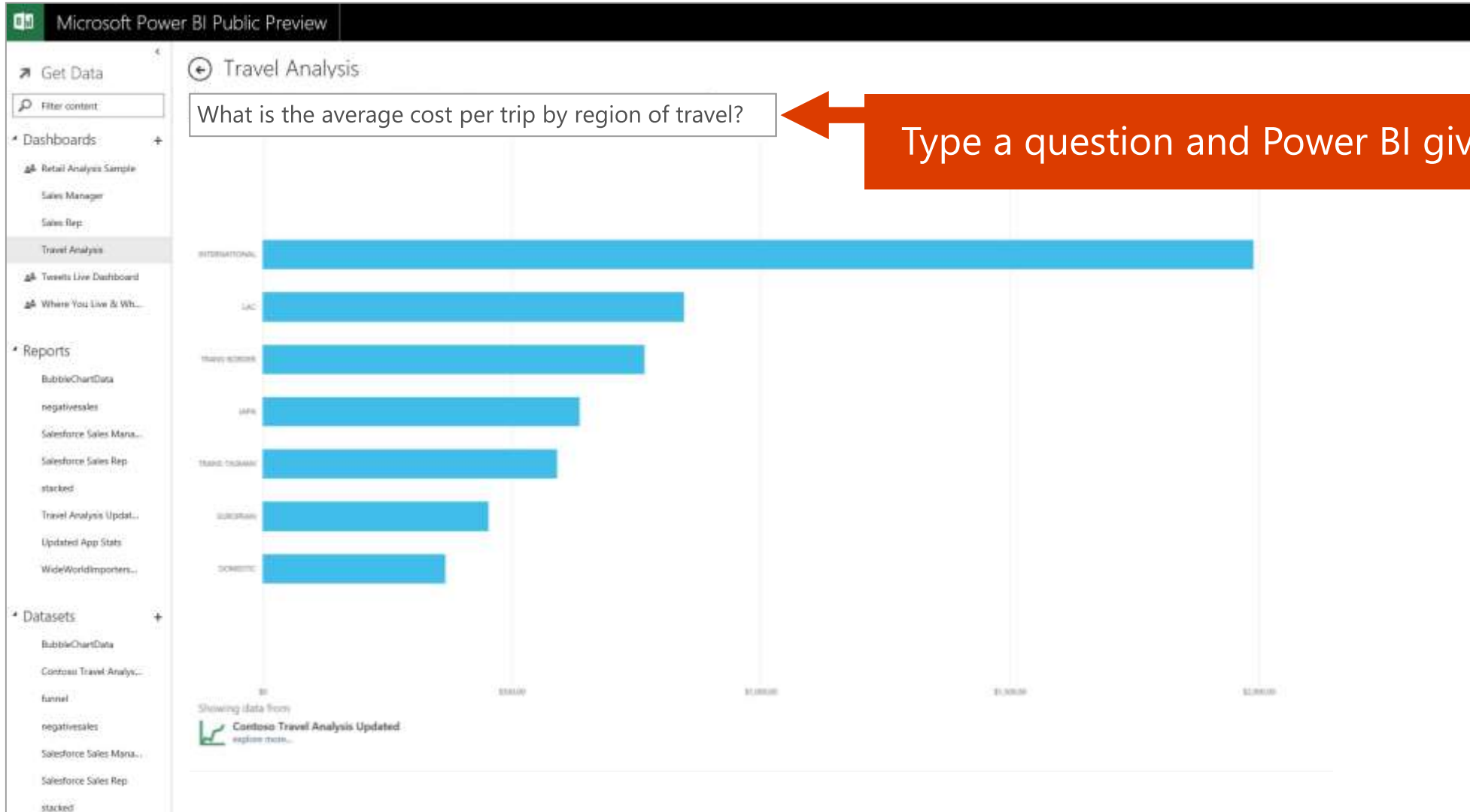


Fast deployment, hybrid configuration, secure, and integrated with existing IT systems.



# Ask questions of your data

## Natural Language Query



Type a question and Power BI gives you the answer

# Connect live to your on-premises data

## Live Query & Scheduled Data Refresh

Live Power BI reports  
& dashboards



Live  
Query

Scheduled  
Refresh

Cloud

On-premises



SQL Server  
Analysis Services



Data Source



- ➔ Deploy quickly with a hybrid BI solution
- ➔ Manage and secure data on-premises with SQL Server Analysis Services
- ➔ Optimized query performance for interactive data exploration
- ➔ Scheduled refresh from on-premises data sources





Excel

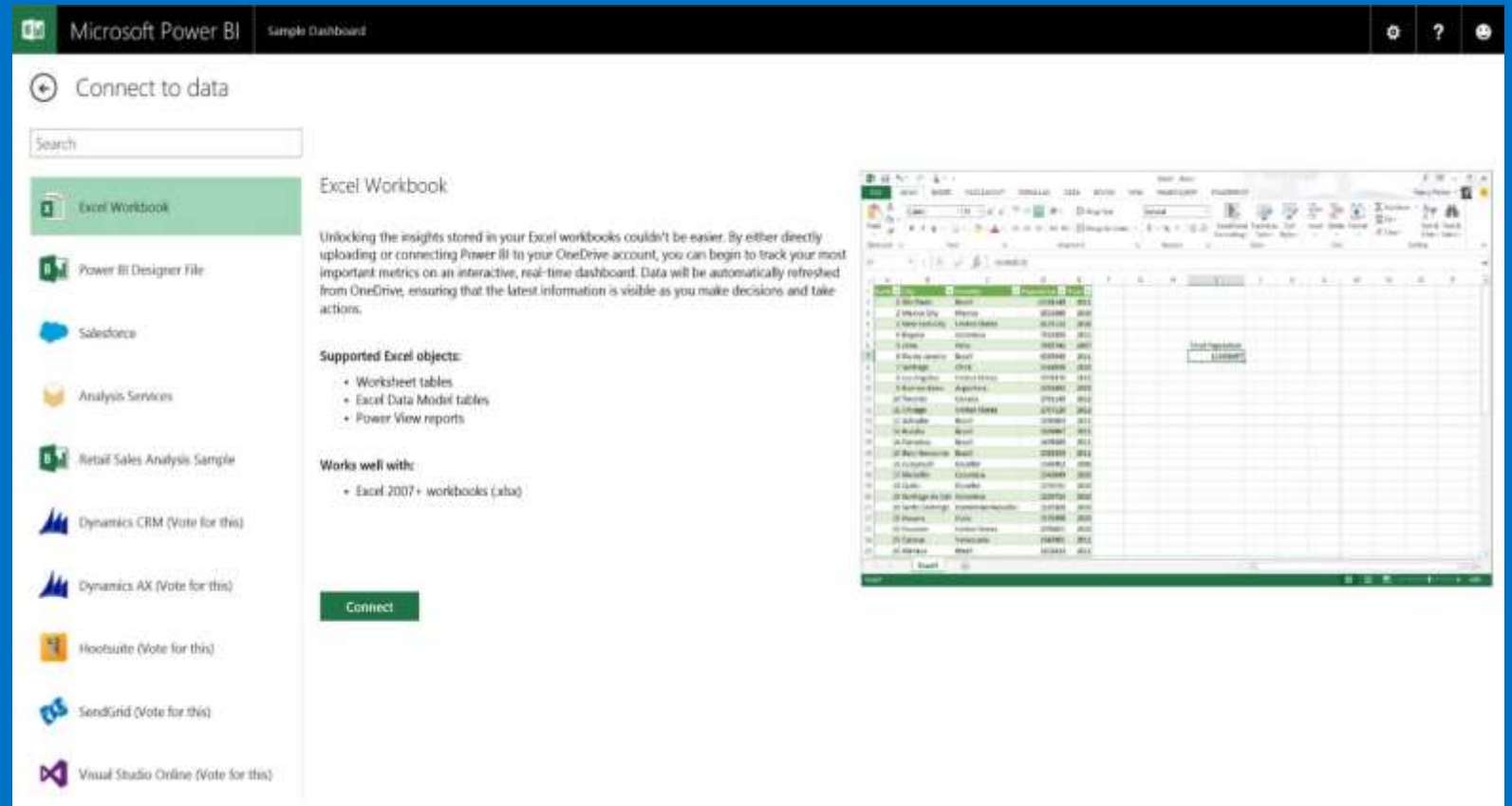
# Unlock your Excel data

Analyze data and publish your workbooks to Power BI

Prep and model data with familiar and flexible Excel

Publish to Power BI and view through Excel Online

Connect live to Excel workbooks in OneDrive





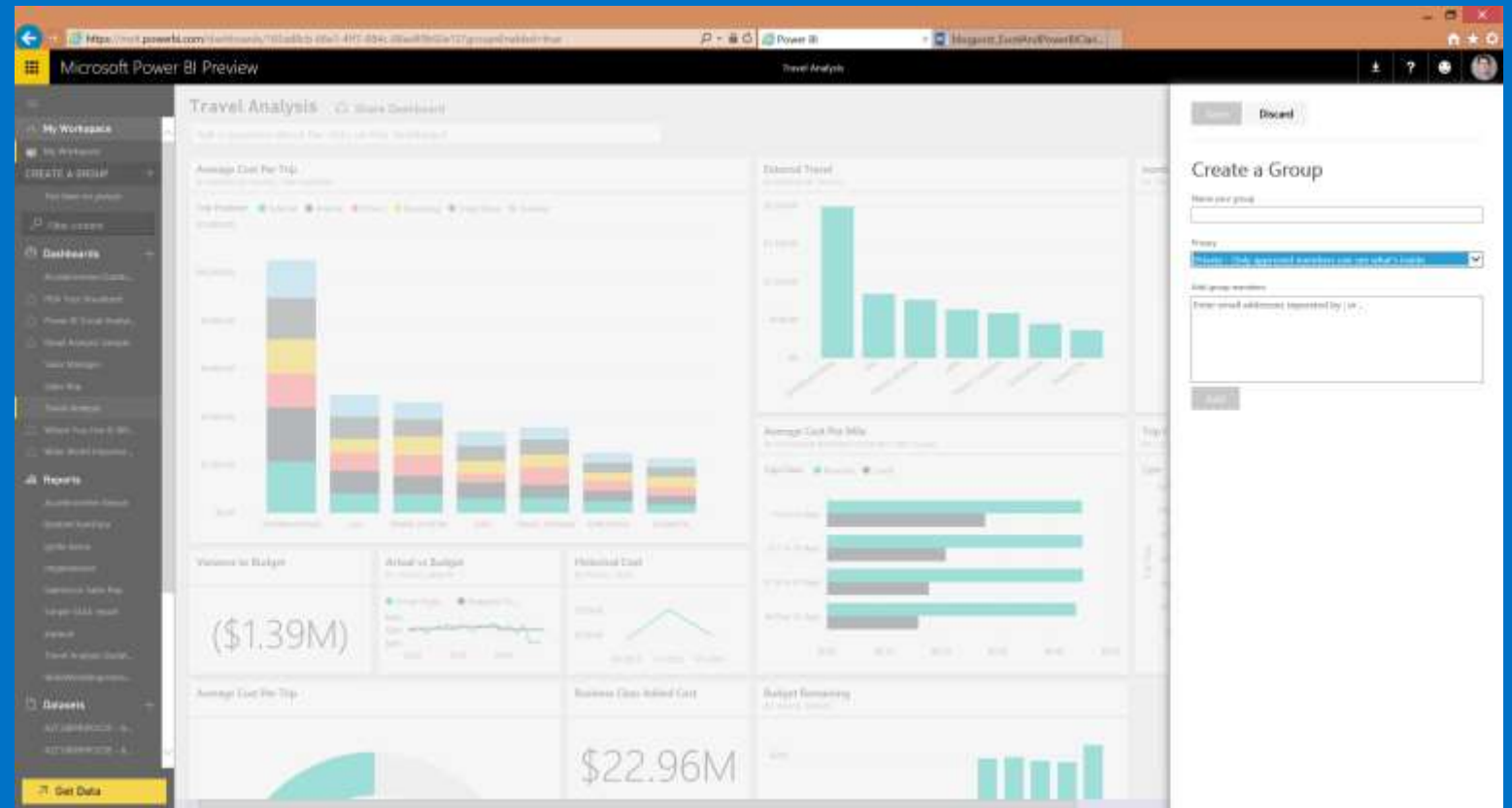
# Team Collaboration

Integrated into the O365 Groups experience

Create groups in Power BI service

Share dashboards and reports by work group

Navigate from Power BI to other Office 365 workloads





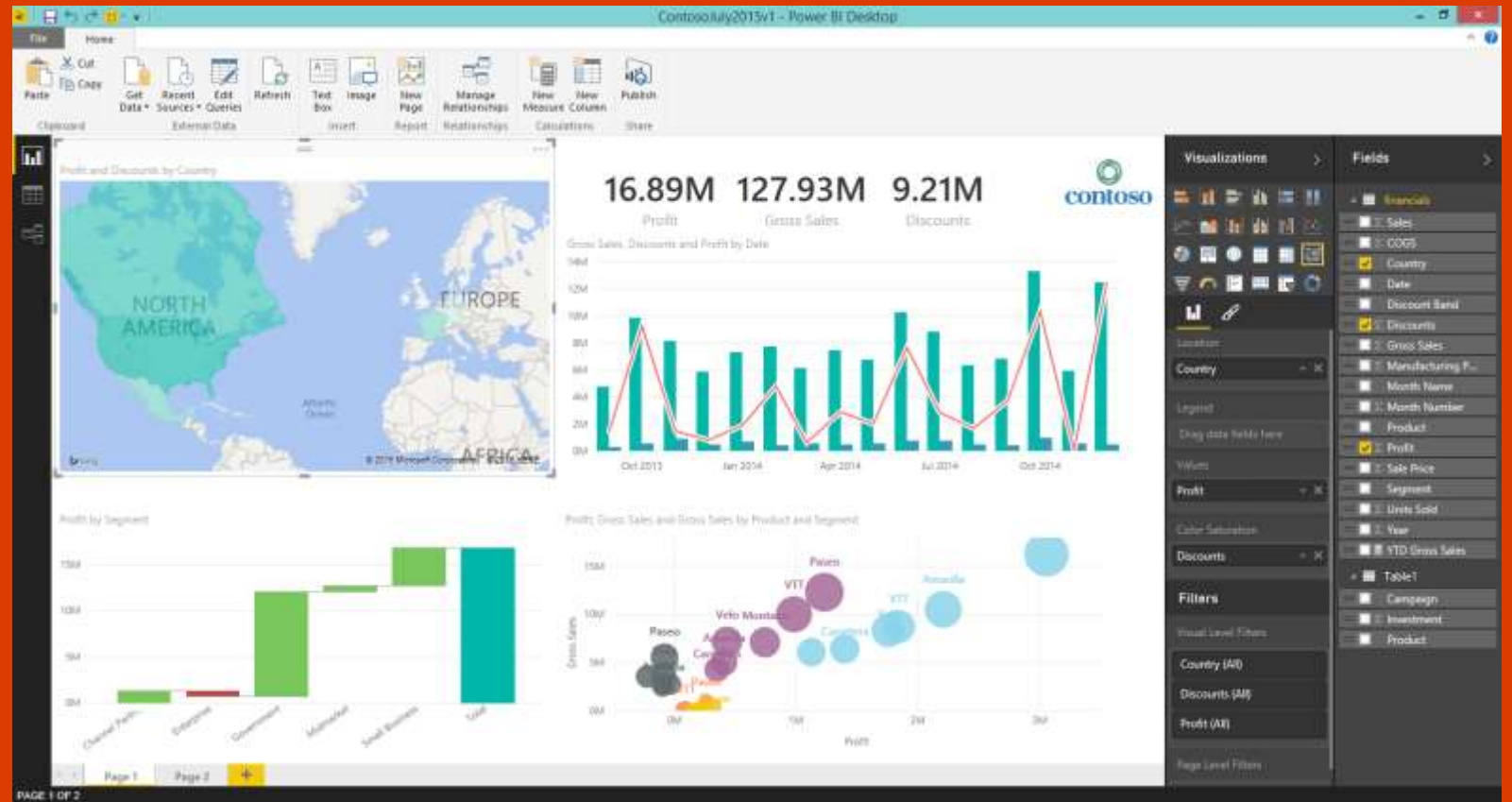
# Create Power BI content

## Visual data exploration & interactive reporting

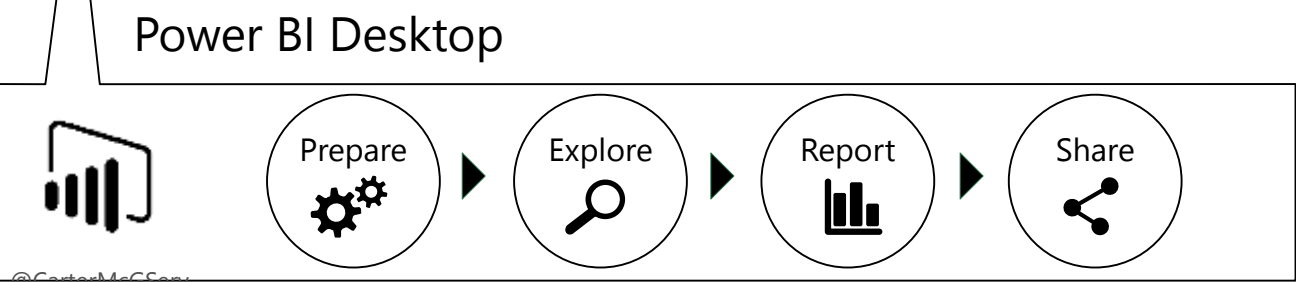
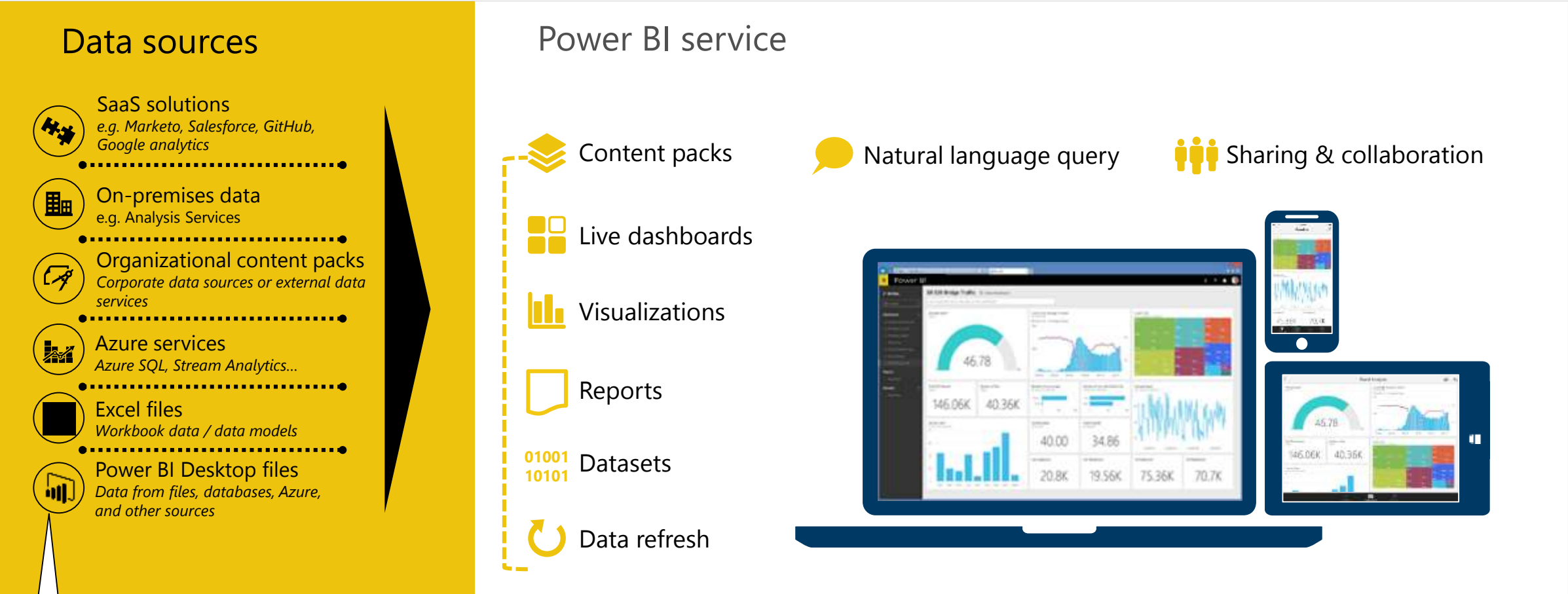
Desktop tool for data exploration and interactive reporting

Freeform drag and drop canvas

Effortless publishing to the Power BI service



# Power BI Overview



# Create Power BI Content

Connect to data and build reports for Power BI

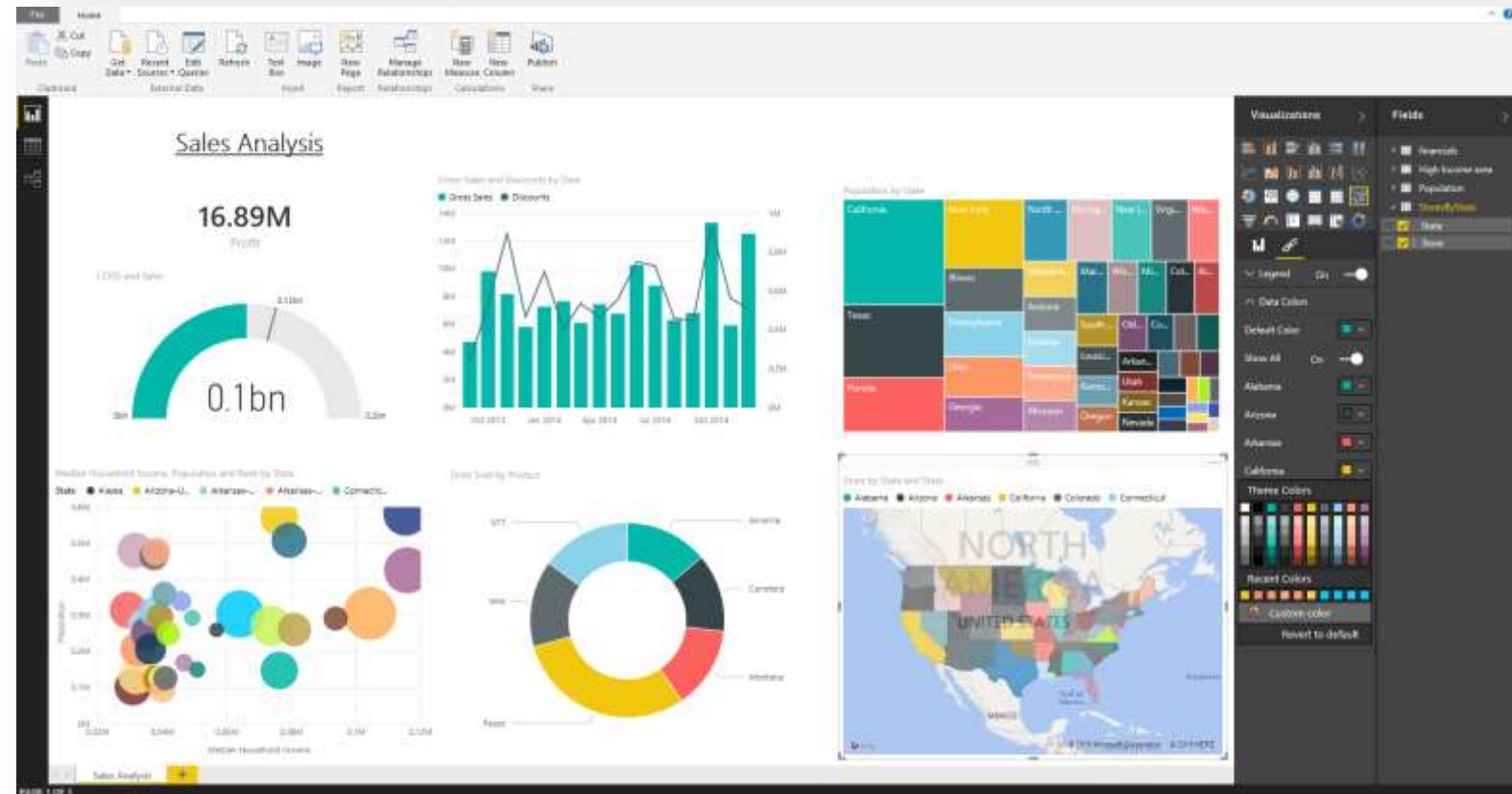
## Combines the power of Power Query, Power Pivot and Power View

## Dedicated BI workflow: Specializing in Interactive Visualization and Analysis

## Main output: Interactive Reports

## Effortlessly publish interactive visual reports to users of Power BI

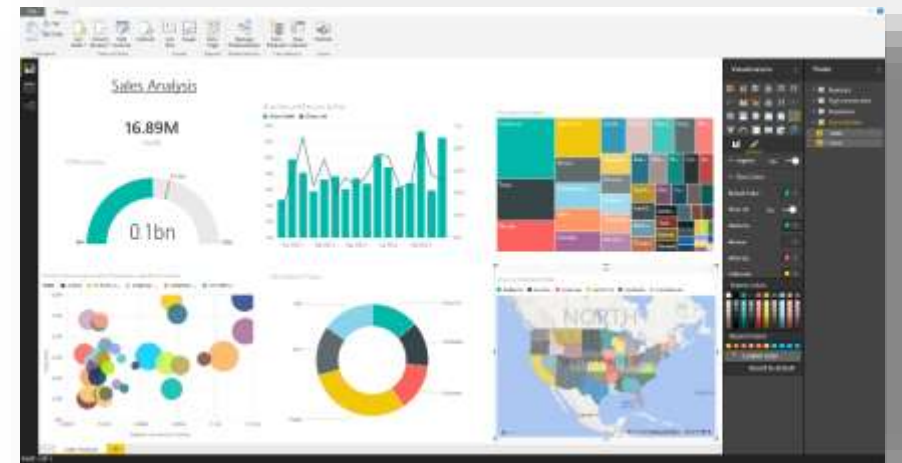
Updated on monthly basis



## Prepare, explore, report and collaborate with Power BI Desktop



- Acquire and prepare data with extensive query capabilities
- Establish data structure and transform and analyze data
- Explore data in new ways through a freeform, drag-and-drop canvas
- Author reports with a broad range of modern data visualizations
- Publish interactive reports to Power BI



Available as a free, downloadable desktop companion to the Power BI service, **Power BI Desktop is a visual data exploration and reporting tool**



# Consolidate data from a broad range of sources

- Use Query functionality to connect to data from a variety of sources beyond those available from powerbi.com
- Navigate data quickly with in-memory processing that optimizes performance
- Pare down datasets to only what's needed by editing queries before data loading

*Data sources available through Power BI Desktop*

File	Database	Azure	SaaS	Other
<ul style="list-style-type: none"><li>• Excel</li><li>• CSV</li><li>• XML</li><li>• Text</li><li>• JSON</li><li>• Folder</li></ul>	<ul style="list-style-type: none"><li>• SQL Server Database</li><li>• Access Database</li><li>• SQL Server Analysis Services Database</li><li>• Oracle Database</li><li>• IBM DB2 Database</li><li>• MySQL Database</li><li>• PostgreSQL Database</li><li>• Sybase Database</li><li>• Teradata Database</li></ul>	<ul style="list-style-type: none"><li>• Microsoft Azure SQL Database</li><li>• Microsoft Azure Marketplace</li><li>• Microsoft Azure HDInsight</li><li>• Microsoft Azure Blob Storage</li><li>• Microsoft Azure Table Storage</li></ul>	<ul style="list-style-type: none"><li>• appFigures</li><li>• QuickBooks Online</li><li>• Zendesk</li><li>• GitHub</li><li>• Twilio</li><li>• SweetIQ</li></ul>	<ul style="list-style-type: none"><li>• Web</li><li>• SharePoint List</li><li>• OData Feed</li><li>• Hadoop File (HDFS)</li><li>• Active Directory</li><li>• Microsoft Exchange</li><li>• Dynamics CRM Online</li><li>• Facebook</li><li>• Google Analytics</li><li>• SAP Business Objects BI Universe</li><li>• Salesforce Objects</li><li>• Salesforce Reports</li><li>• ODBC Query</li><li>• ODBC Tables</li></ul>





## Shape data into the format and structure you need



- Transform data to fit your needs using intuitive UI
  - Select data for inclusion
  - Cleanse data and remove errors
  - Precisely tune the query step sequence: re-order, add, edit or delete steps as needed
  - Modify data types to support specific calculation requirements
- Very powerful for advanced scenarios (M, Mashups)

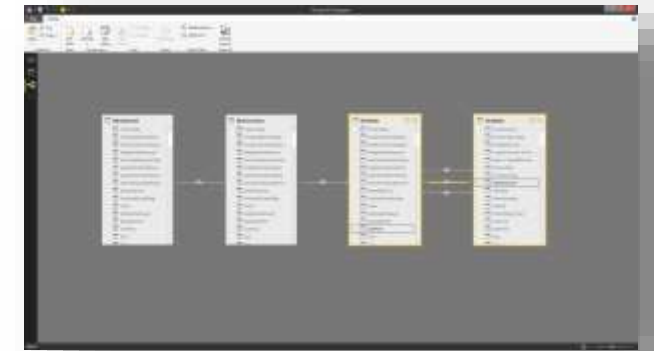
### Common data-shaping tasks

- Remove rows or columns
- Change a data type
- Pivot columns and group rows
- Modify a table name
- Identify and fix errors
- Merge or append queries to combine data from multiple queries into a single query

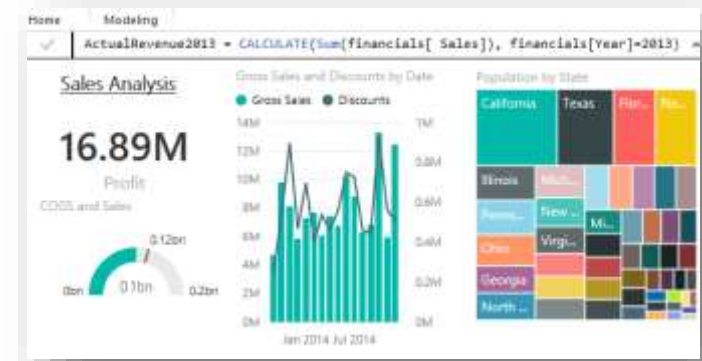
## Produce rich data models using formulas and relationships

- Automatically create a model by importing data
  - Desktop detects relationships automatically, categorizes data and applies default summarization
- Refine models to enable complex calculations
  - Create relationships between tables manually or using the AutoDetect feature
  - Adjust relationship type (1:1, many: many, m:1) and cross-filter data for new insights
- Define calculations – known as measures – to generate new fields for use in reports
  - Use automatically generated measures, or create custom measures with Data Analysis Expressions (DAX) formulas
- Develop advanced analytics using a combination of measures and relationships
  - Uncover correlations, highlight exceptions and understand business outcomes

*Apply complex schema and business logic to create rich, reusable data models*



*Create and modify relationships*



*Define and use measures with DAX formulas*

Prepare



Explore



Report

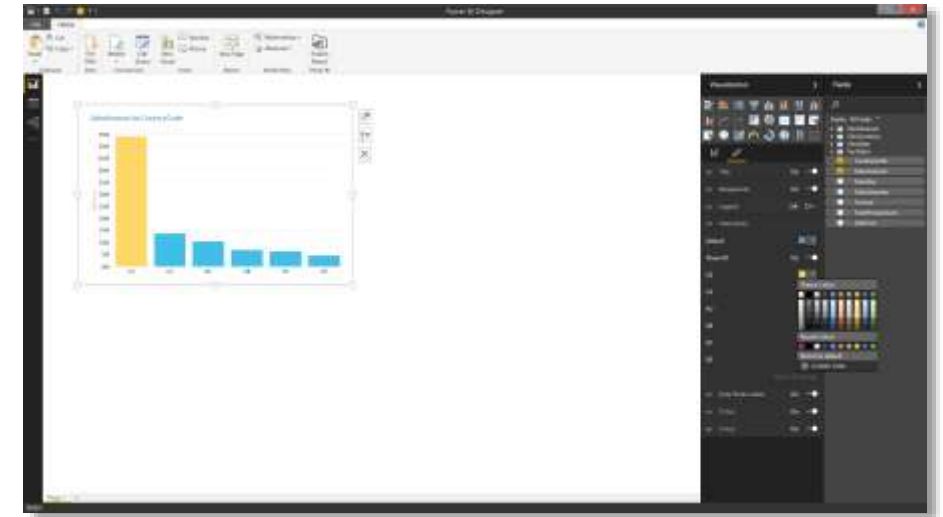


Share & collaborate



## Explore your data with freeform, drag and drop canvas

- Explore data in a variety of ways and across multiple visualizations
  - Select data elements and sort data
  - Filter data and use cross-filter capabilities
  - Drill into and across datasets
  - Pivot and slice data
  - Change visualization types
- Select, transform and mashup data via a freeform, drag-and-drop canvas



*Power BI Desktop allows you to explore your data and create insightful visualizations on a freeform canvas*

Prepare



Explore



Report



Share & collaborate



## Deliver valuable insights with customizable visual reports

- Visualize data and easily author reports
  - Depict data in compelling reports that tell stories using a range of interactive visualizations
  - Use data from different sources in a single, consolidated report
- Change colors, format and customize
  - Title, Background Color, Legend, Data Labels
  - New visual color formatting with fixed and data driven settings

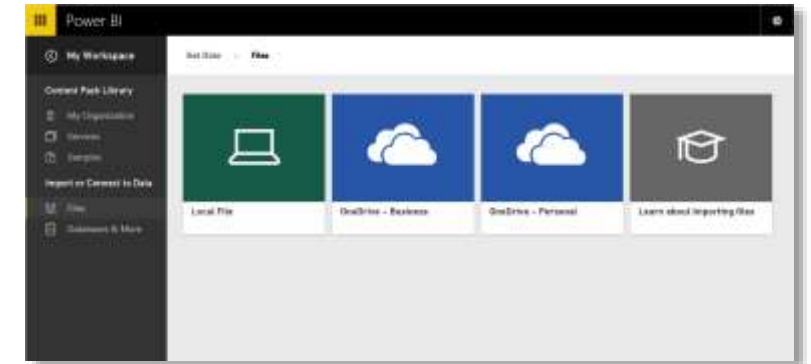


*Power BI Desktop allows you to create and customize reports that tell visually compelling data stories*



## Share your reports and visualizations with a broad audience

- Save Power BI Desktop report files and easily publish them to Power BI
- Share as appropriate with other Power BI users in your organization
- Changes to dashboards automatically sync across all users



*Import Power BI Desktop file in Power BI service*



*Publish from Power BI Desktop to Power BI service*



# A Few Case Studies



"By using Microsoft **Azure HDInsight**, **SQL Server**, and **Power BI** we can collect, analyze, and generate near-real-time BI with Big Data collected from social media feeds, GPS signals, and data from government systems."

Lluís Sanz Marco  
Director of Information  
**Municipal, Institute of Information**



"Microsoft **HDInsight**, **Azure ML**, and **Power BI** help Ziosk gain dining insights from more than 77,000 tabletop tablets deployed at Chili's and other restaurants."

Thad Chapman  
Co-Founder  
**Artis Consulting**

MRWPCA  
Monterey, CA Water



"By combining **Azure Stream Analytics**, **Power BI** and Candi's unifying IoT Platform, we are able to quickly and cost-effectively connect and present big data from industrial IoT devices for remote monitoring, analysis and control."

Steve Raschke  
CEO  
**Candi Controls**

How can I get started now?



A photograph of a modern office interior. In the foreground, a long, dark wooden conference table is surrounded by black ergonomic office chairs. Two people are seated at the table, working on laptops. The office has large floor-to-ceiling windows that offer a view of a city skyline with many high-rise buildings. The ceiling is white with recessed square lights. A large, semi-transparent yellow rectangle is overlaid across the middle of the image, containing the text "It's easy to get started...".

It's easy to get started...

# Sign up for FREE at powerbi.com

Get more info here: <https://powerbi.microsoft.com/en-us/pricing/>

[Products](#)[Solutions](#)[Support](#)[Sign In](#)

## Let us help you bring your data to life

Power BI transforms your company's data into rich visuals for you to collect and organize so you can focus on what matters to you. Stay in the know, spot trends as they happen, and push your business further.

[Use it free](#)

By clicking Use it free, you agree to the [Power BI Terms of Service](#)



# Have Office 365?

Get more info here: <https://products.office.com/en-us/business/compare-more-office-365-for-business-plans>

## Select a plan

See options for:

Small Business  
Education  
Government  
Nonprofit  
Home

Individual services:

Business-class email  
File storage & sharing  
Online meetings  
Domains & web hosting

### Office 365 ProPlus

\$12.00

user/month  
(annual commitment)

Buy now

[Learn more](#)

Fully installed Office on PC/Mac with apps for tablets and phones



- (Email not included)
- 1 TB file storage and sharing
- Fully installed Office on PC/Mac
- Office apps on tablets and phones
- Self-service BI in Excel

### Office 365 Enterprise E1

\$8.00

user/month  
(annual commitment)

Buy now

[Learn more](#)

Online versions of Office with email and video conferencing



- Email with 50 GB mailbox
- 1 TB file storage and sharing
- HD video conferencing
- Office Online
- Team sites

### Office 365 Enterprise E3

\$20.00

user/month  
(annual commitment)

Buy now

[Learn more](#)

All the features of ProPlus and E1 plus compliance tools, information protection, and voicemail integration



- Unlimited email storage for in-place archive
- Advanced email with archiving and legal hold
- Unified eDiscovery center
- Rights management, data loss prevention, and encryption
- Hosted voicemail support

### Office 365 Enterprise E5

\$35.00

user/month  
(annual commitment)

Buy now

[Learn more](#)

All the features of E3 plus a new class of unified communications solutions with advanced Skype for Business meetings and voice capabilities



- PSTN conferencing to dial in to Skype meetings from anywhere
- Cloud-based call management with option to add PSTN calling
- Advanced analytics with Power BI and Delve Analytics
- In-place, Advanced eDiscovery
- Advanced security with Advanced Threat Protection and Customer Lockbox
- Enhanced visibility and control of your Office 365 environment



Do more with the tool you already know: Excel. Discover and connect to data with Power Query, model and analyze this data with Power Pivot, and visualize insights in interactive reports and maps with Power View and Power Map. [Learn more](#)

## Self-service Business Intelligence in Excel

Power BI for Office 365 is a separate service that lets you easily set up an online gallery for your Excel reports so everyone in your organization can access the reports, share insights about the data, and collaborate from anywhere, on any device. [Learn more](#)

Demo 

# Need Help?





# Visit Learn at powerbi.com

[Power BI](#)[Products](#)[Solutions](#)[Partners](#)[Learn](#)[Sign in](#)[Sign up free](#)

## Learn Power BI

From creating your first graph to trying the latest advanced technique, our collected resources make it easy to learn about Power BI.



### Guided learning

Follow our courses of videos and articles that walk you through how to accomplish common tasks with Power BI.



### Samples

Review examples of dashboards, reports, and desktop files, and see how some of our partners are putting Power BI to use.



### Documentation

View in-depth articles for all of Power BI's tools and features, from getting started to advanced techniques.

# Visit the Blog at powerbi.com

 Microsoft | [Power BI](#) [Products](#) [Solutions](#) [Partners](#) [Learn](#)

[Sign in](#) [Sign up free](#)

## Microsoft Power BI Blog

### Power BI Desktop July feature summary


 July 29, 2016 by [Filip Karadzic](#)

This month Power BI Desktop is introducing some features that will enhance the overall user experience, such as using custom maps with ShapeMap and two new data connectors.

[Read more](#)

#### MOST RECENT ARTICLES

### Tech Tip Thursday: 3 ways to embed Power BI

[Support](#)  August 4, 2016 by [Jessica Cook](#)

Want to share your Power BI reports and dashboards as part of a website or application? This week, Guy in a Cube looks at three ways to embed Power BI, including publish to web, using the REST APIs, and the new Power BI Embedded service within Microsoft Azure.

@CarterMcGee

#### WHAT IS POWER BI?

Power BI is a suite of business analytics tools to analyze data and share insights. Monitor your business and get answers quickly with rich dashboards available on every device.

[Read more](#)



# Call Us

Carter-McGowan Services, LLC  
Toll-free/fax: (866) 721-6085  
Local: (540) 693-0578  
Email: [ncarter@cartermcgowanservices.com](mailto:ncarter@cartermcgowanservices.com)

SharePoint Online Trial with Office 365:  
<http://ow.ly/HAzZs>



Web: [www.cartermcgowanservices.com](http://www.cartermcgowanservices.com)  
Twitter: @CarterMcGServ  
FaceBook: CarterMcGowan  
Google+: Carter-McGowan Services  
LinkedIn: NikkiaTCarter

Free Monthly Business Technology Webinars/Q&A  
Sessions and Helpful Tips: <http://ow.ly/yVSFM>





# Appendix: DAX Functions

# New DAX functions

- DATEDIFF
  - PERCENTILE(X)
  - CONCATENATE(X)
  - MEDIAN(X)
  - GEOMEAN(X)
  - PRODUCT(X)
  - XIRR
  - XNPV
- SELECTCOLUMNS
  - SUMMARIZECOLUMNS
  - GROUPBY
  - UNION

# Median(X)

The MEDIAN function returns the median of the numbers in a column. The MEDIANX function returns the median of an expression evaluated for each row in a table.

Syntax:

```
=MEDIANX(ALLSELECTED(Product[ProductName])  
          ,[Sum of RevenueAmount])
```

# Percentile(X)

Returns the k-th percentile of values in a range, where k is in the range 0..1, inclusive or exclusive.

You can use this function to establish a threshold of acceptance. For example, you can decide to examine candidates who score above the 90th percentile.

Syntax:

PERCENTILE.INC (Column, K) or PERCENTILE.EXC (Column, K)

PERCENTILEX.INC (Table, Expression, K) or

PERCENTILEX.EXC (Table, Expression, K)

PERCENTILEX.INC (Product

,[Sum of RevenueAmount],0.9)

# DATEDIFF

Returns the count of the specified interval boundaries crossed between two dates.

Syntax:

```
DATEDIFF(<interval>, <start_date>, <end_date>)
```



# XNPV

The XNPV function returns the net present value for a schedule of cash flows that is not necessarily periodic.

Syntax: XNPV(<table>, <values>, <dates>, <rate>)

Date	Payment
1/1/2014	-10000
3/1/2014	2750
10/30/2014	4250
2/15/2015	3250
4/1/2015	2750

Present value := XNPV( CashFlows,  
[Payment],  
[Date], 0.09 )  
= 2086.65

# PRODUCT(X)

Returns the product of an expression evaluated for each row in a table.

Future investment= [Sum of RevenueAmount]  
                                  \* Productx(Rates,1+[Rates])

Rates
5.0%
4.0%
3.5%
2.0%
3.0%
5.0%

The PRODUCTX function takes as its first argument a table, or an expression that returns a table. The second argument is a column that contains the numbers for which you want to compute the product, or an expression that evaluates to a column.

# DAX Expressions for relationships

CrossFilter( FK, PK, direction )

- Similar to UseRelationship, you can change the filter direction
- Direction: both, one, none
- Calculate( [My measure], CrossFilter( ... ) )

# CrossFilter(FK, PK, direction)

Count of Customers = *//filters through Sales by default*  
Calculate( CountRows( Customer ) )

Count of Customers using Region =  
Calculate( [Count of Customers],  
*//Cut filtering between Sales and Customer, then use the inactive relationship*  
CrossFilter( Sales[CustomerId], Customer[Id], none ),  
UseRelationship ( Customer[RegionId], Region[Id] )  
)

Count of Customers using Sales and Region =  
Calculate( [Count of Customers], *//filters through Sales by default*  
*//Filter Customers to only those in remaining Regions*  
Filter( Customer, Contains( Region, [Id], Customer[RegionId] ) )  
)