



Introduction to Power BI

Sekou Tyler
12-03-2019



Introduction



Who Am I?

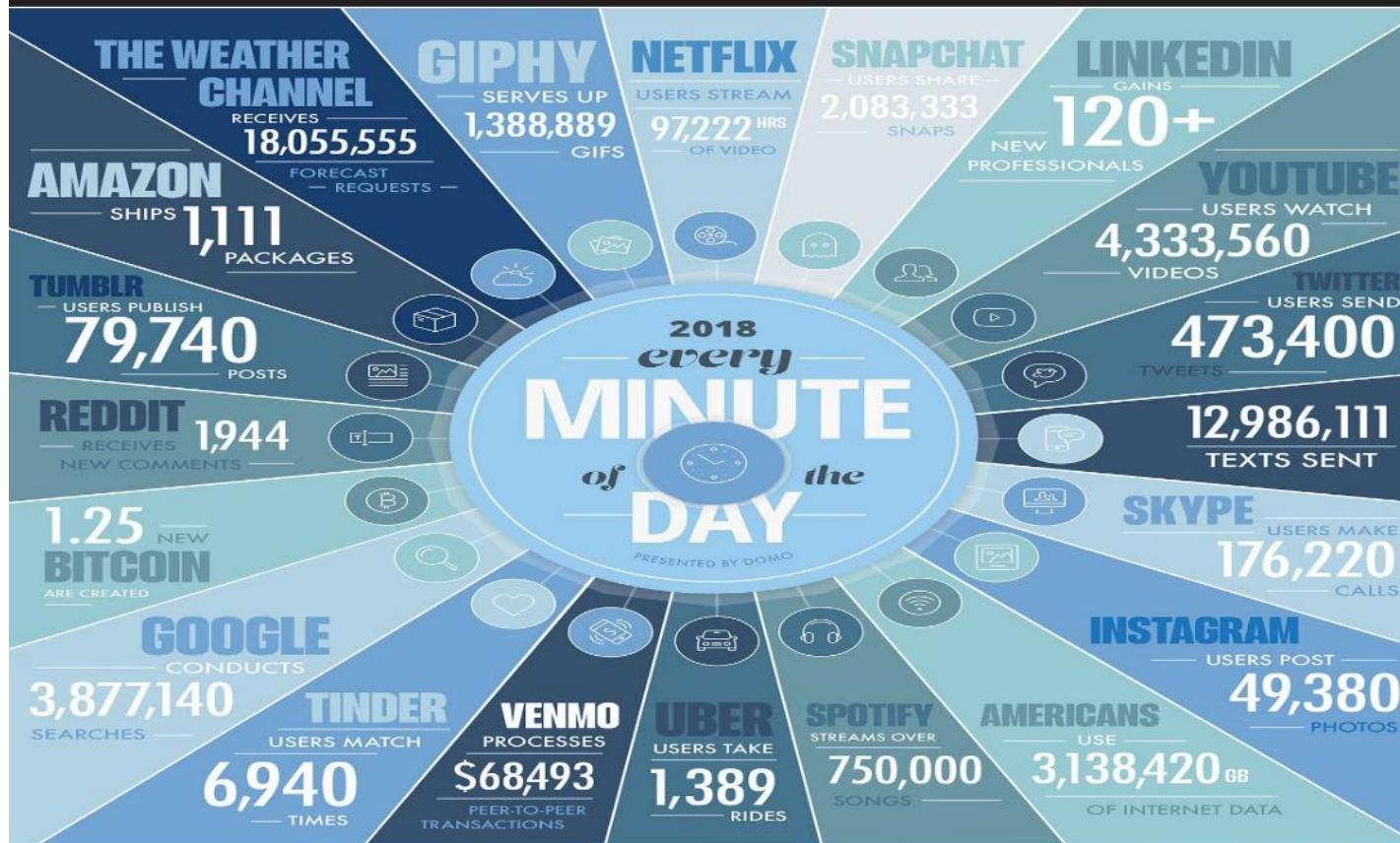
I aim to empower people to make better decisions
by delightfully displaying data that matters.

DOMO

DATA NEVER SLEEPS 6.0

How much data is generated *every minute*?

There's no way around it: big data just keeps getting bigger. The numbers are staggering, but they're not slowing down. By 2020, it's estimated that for every person on earth, 1.7 MB of data will be created every second. In our 6th edition of Data Never Sleeps, we once again take a look at how much data is being created all around us every single minute of the day—and we have a feeling things are just getting started.



The world's internet population is growing significantly year-over-year. In 2017, internet usage reached 47% of the world's population and now represents 3.8 billion people.

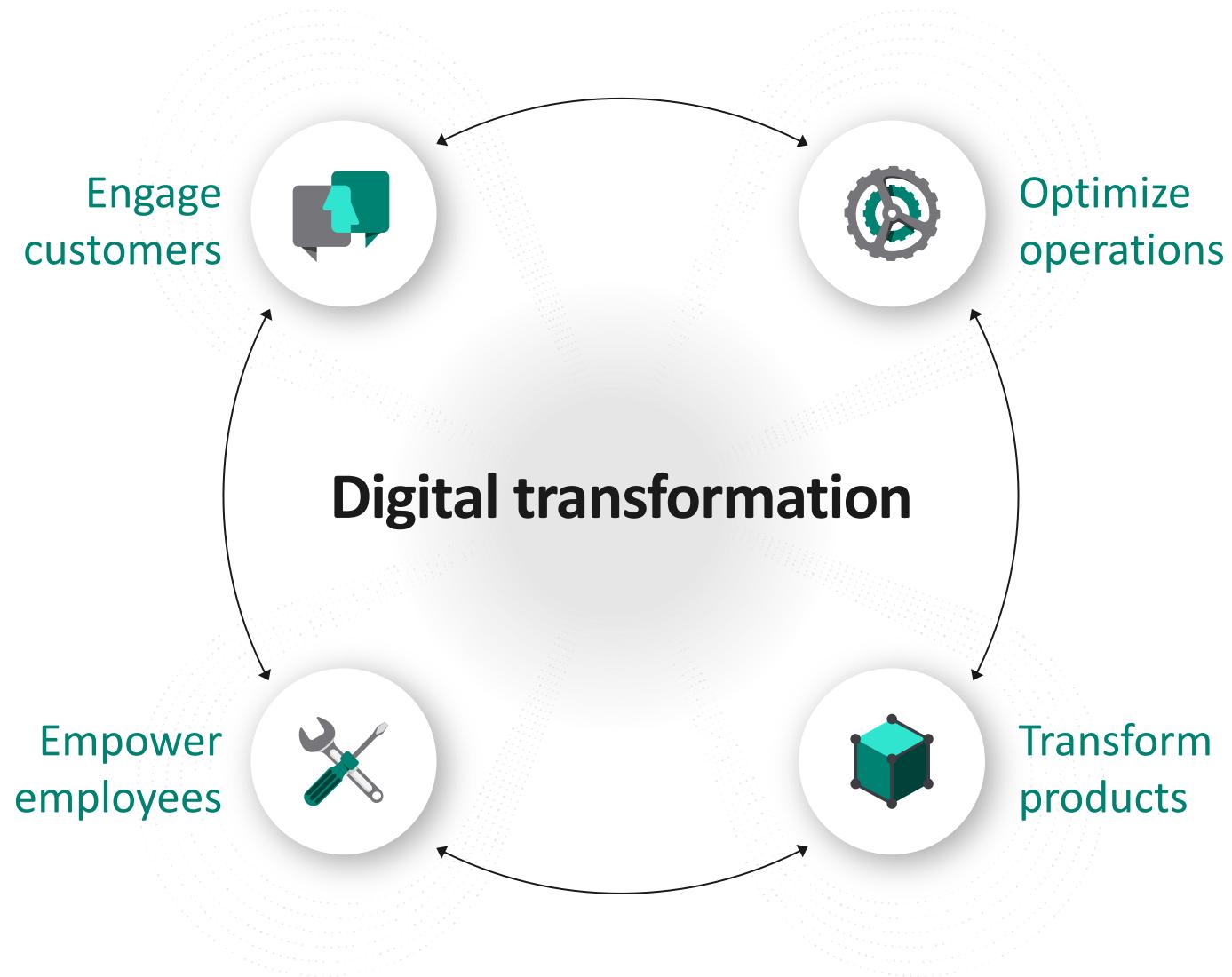


GLOBAL INTERNET POPULATION GROWTH 2012–2017
(IN BILLIONS)

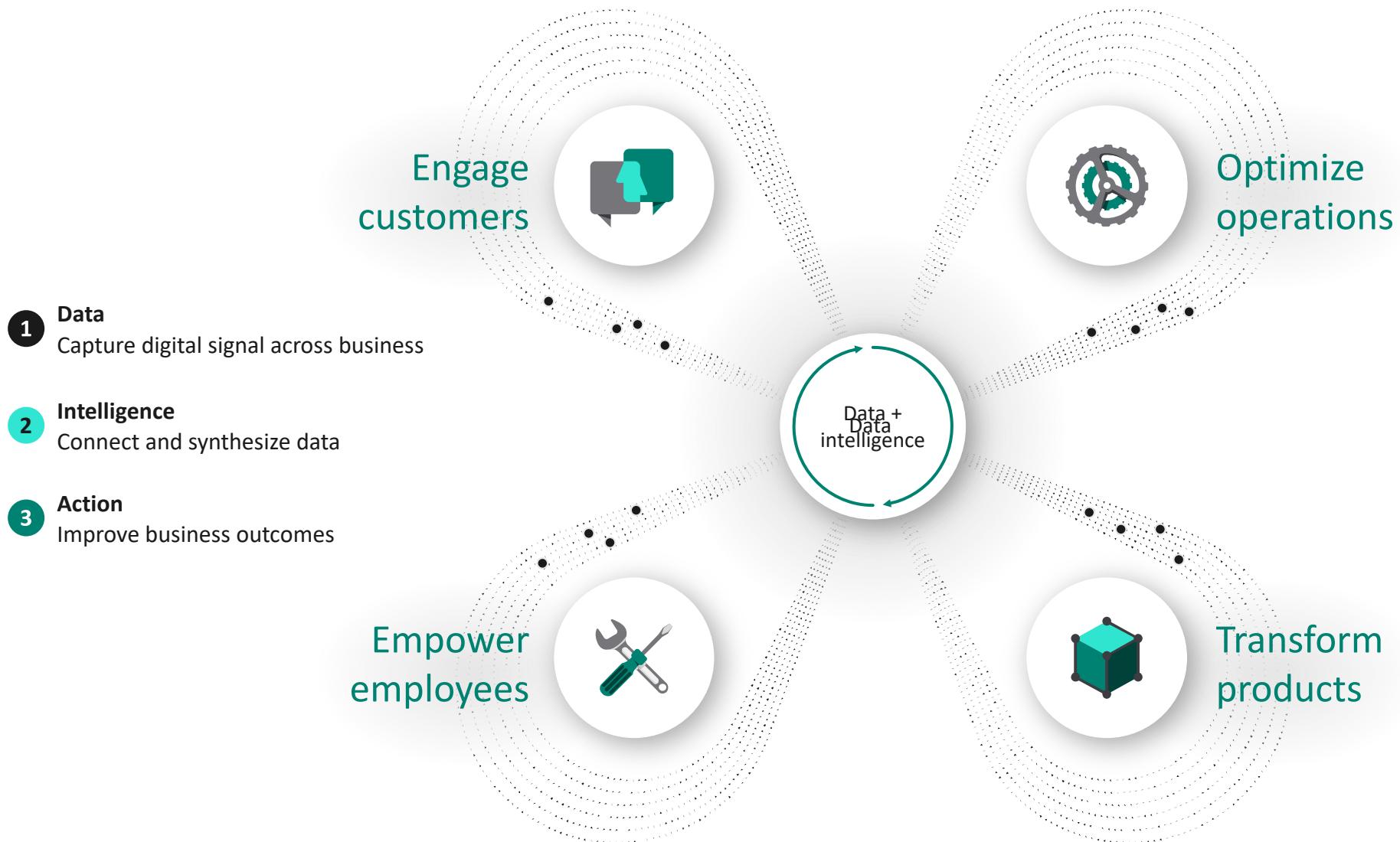
The ability to make data-driven decisions is crucial to any business. With each click, swipe, share, and like, a world of valuable information is created. Domo puts the power to make those decisions right into the palm of your hand by connecting your data and your people at any moment, on any device, so they can make the kind of decisions that make an impact.

Learn more at domo.com

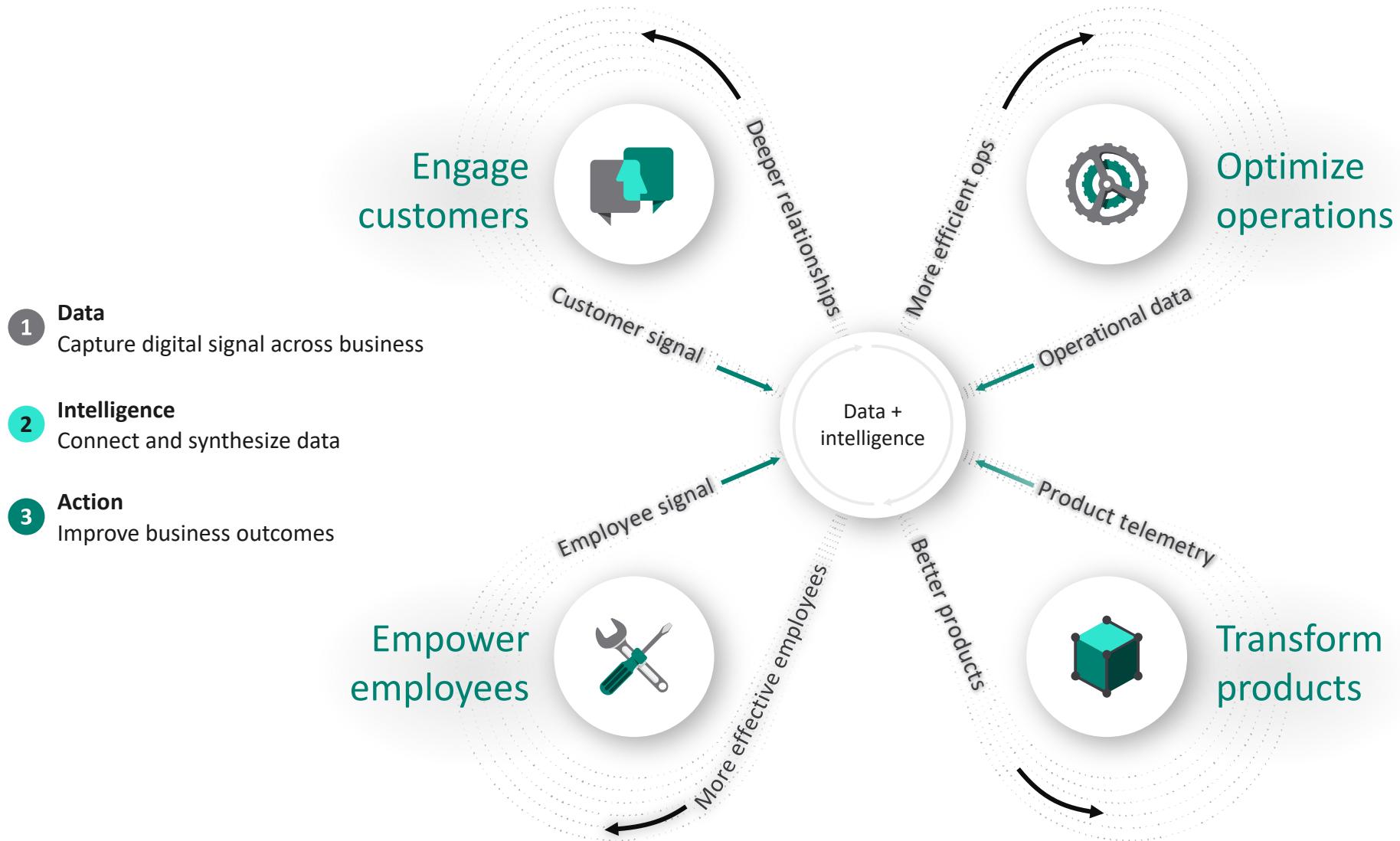
What do you think of when hear the phrase
“Business Intelligence”?



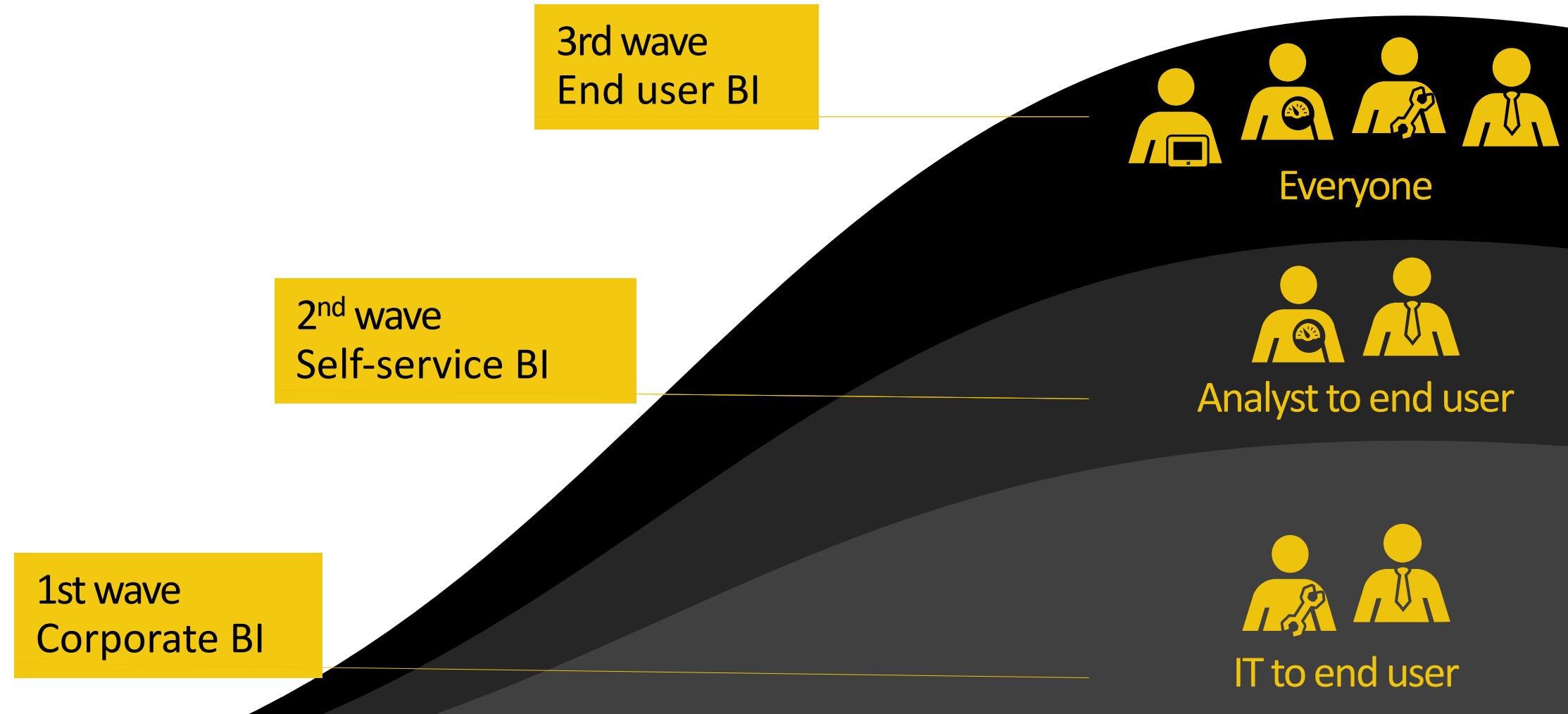
DIGITAL FEEDBACK LOOP



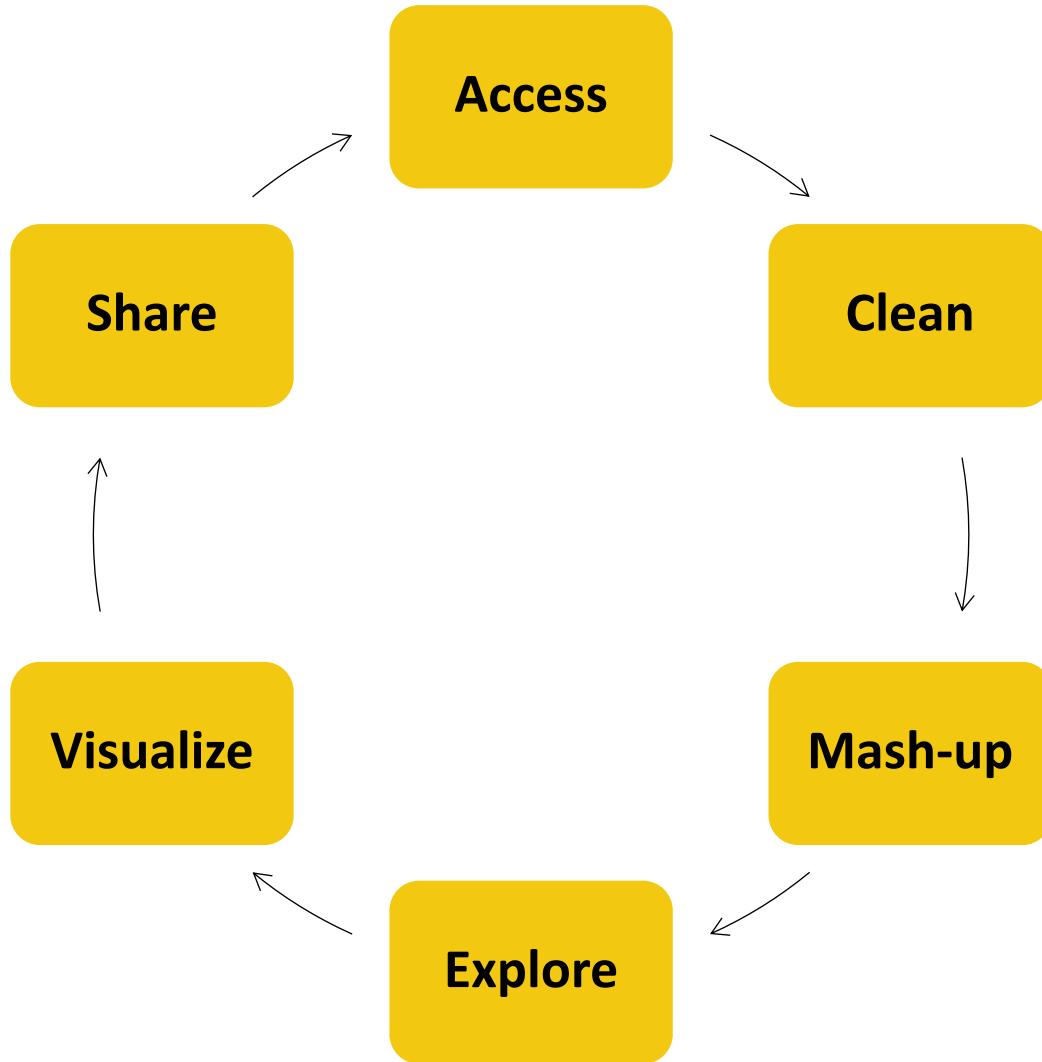
DIGITAL FEEDBACK LOOP



The Evolution of BI

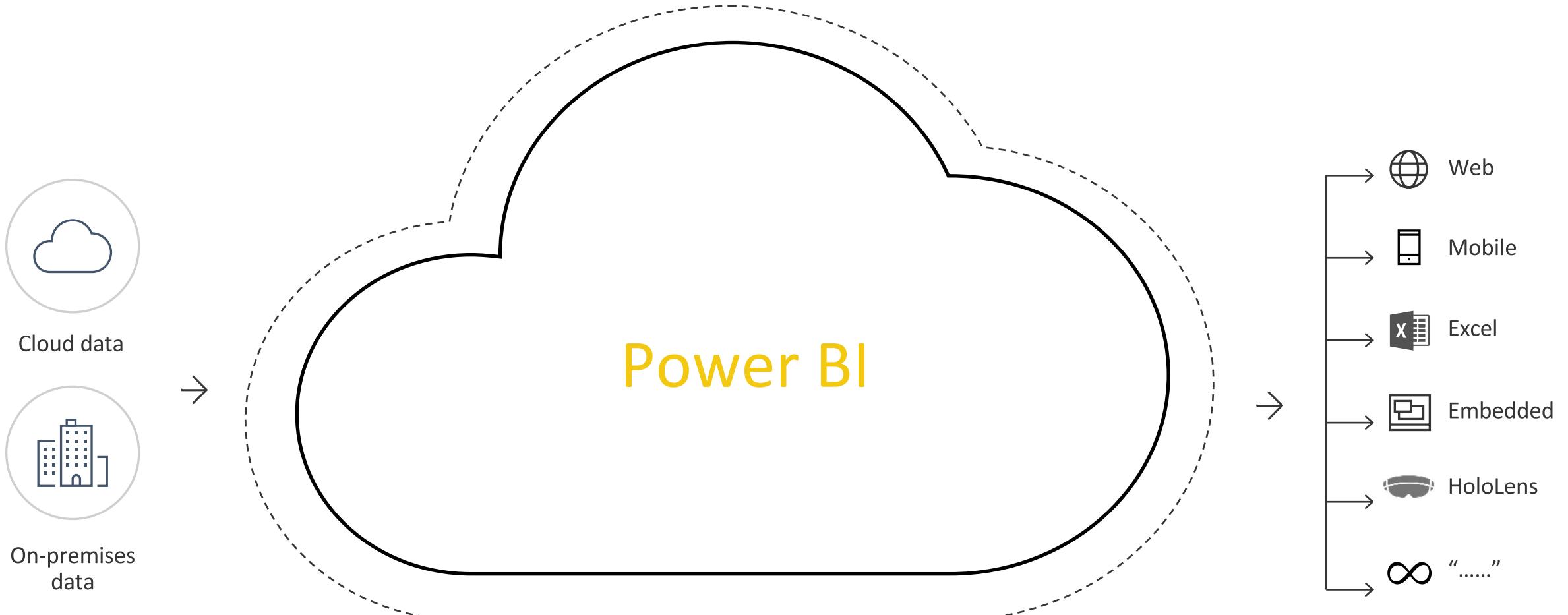


End User Needs



Power BI: experience your data

Any data, any way, anywhere



Data sources



SaaS solutions
e.g. *Marketo, Salesforce, GitHub, Google Analytics*



Organizational
Corporate data sources or external data services



On-premises Data



Azure services
Azure SQL, Stream Analytics...



Excel files



Power BI Desktop files
Data from files, databases, Azure, and other sources

Connect to 80+ data sources, both on-premises and cloud

- Data from Applications
 - SaaS services that you already use
- Data from your organization
 - Content published by others in your org (Datasets and Dataflows)
- Big data and more
 - Azure data services, e.g. HDI, ASA, AML etc.
 - On-premises data sources, e.g. Oracle & SSAS
- Data from files
 - Import data from Text, CSV, Excel and Power BI Desktop files

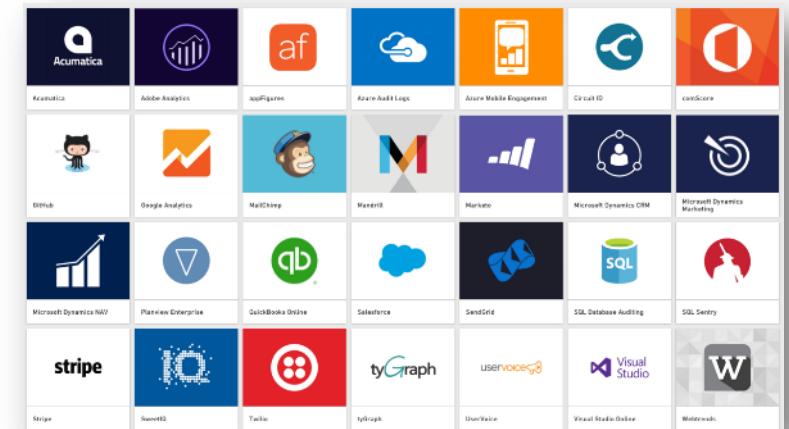
Access all your DATA

Get Data
Need more guidance? [Try this tutorial](#) or [watch a video](#)

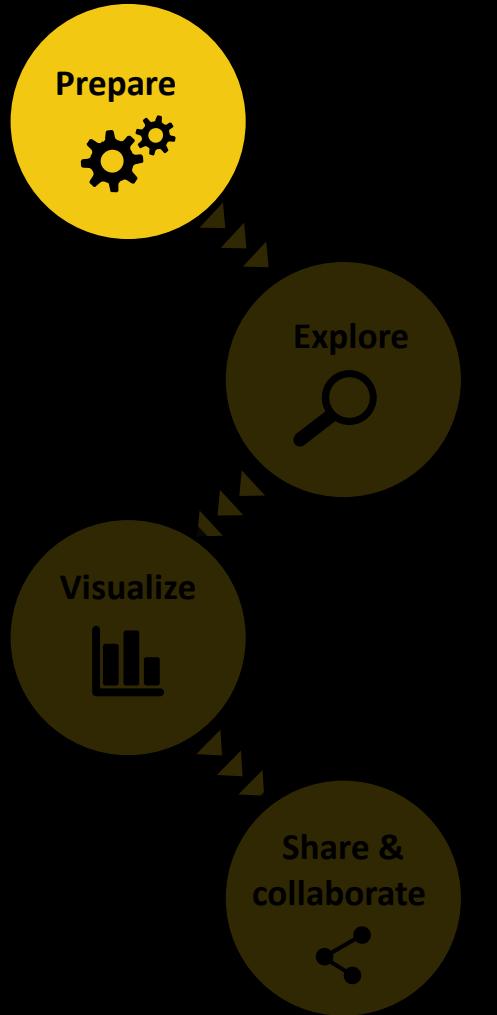
Discover content

My organization Discover apps published by other people in your organization. Get	Services Choose apps from online services that you use. Get	Files Bring in your reports, workbooks, or data from Excel, Power BI Desktop or CSV files. Get	Databases Use Power BI Desktop to connect to data in Azure SQL Database and more. Get
--	--	---	--

More ways to create your own content
[Samples](#) [Organizational Content Packs](#)
[Partner Showcase](#) [Service Content Packs](#)

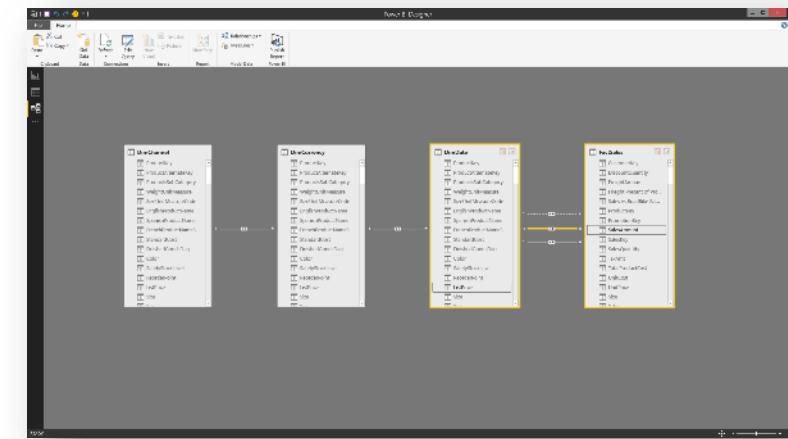


Clean and mash-up your DATA

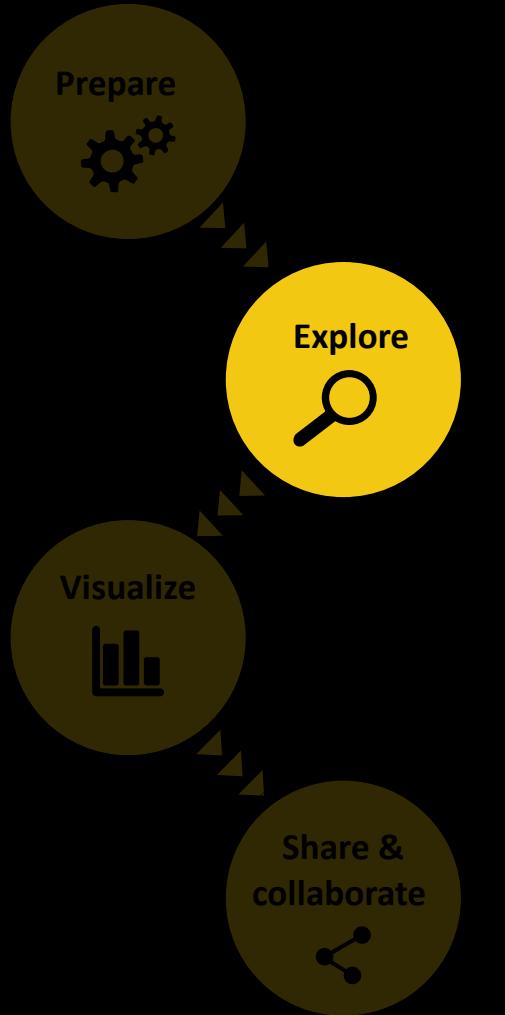


- Consolidate data from a broad range of sources
 - Merge or append queries to combine data from multiple queries into a single query
- Transform data to fit your needs using intuitive UI
 - Select data for inclusion
 - Cleanse data and remove errors
- Define calculations to generate new fields for use in reports
- Develop advanced analytics using a combination of measures and relationships
 - Uncover correlations, highlight exceptions and understand business outcomes

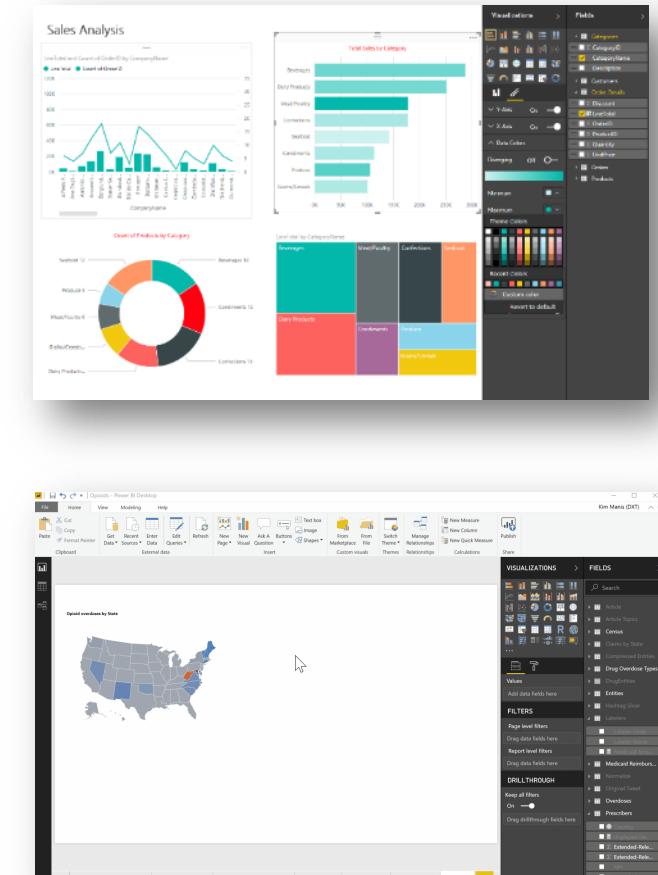
A screenshot of the Microsoft Power Query ribbon interface. The ribbon tabs include File, Home, Transform, Add Column, and View. Under the Transform tab, there are several options like Transpose, Detect Data Type, Replace Errors, and Pivot Column. The main area shows a table with 7 Queries listed on the left: Sales, Date, Geo, Manufacturer, and Product. The table itself has columns for ProductID, Date, Zip, Units, Revenue, and Country, with data rows 1 through 6.



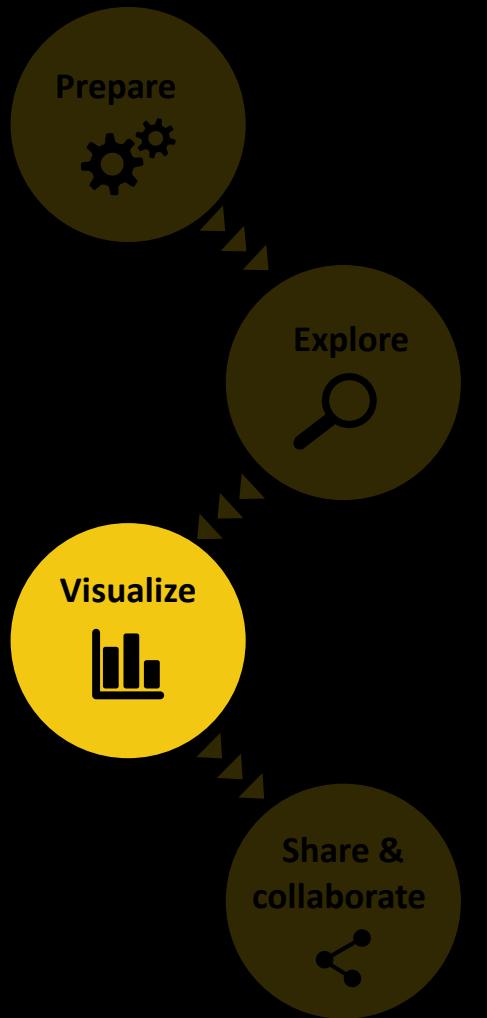
Explore your DATA



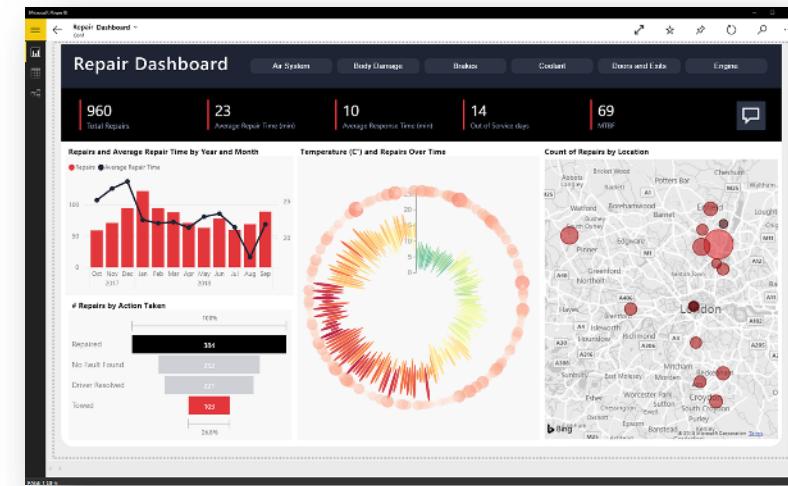
- Explore data in a variety of ways and across multiple visualizations using drag and drop canvas
- Dig deeper into your reports
 - Drill-down in your hierarchical data
 - Filter, sort, hover over and highlight data
- Leverage Quick Insights to find insights in your data
- Ask questions of your data in natural language with Q&A
 - Type questions in plain language
 - Q&A intelligently filters, sorts, aggregates, groups and displays data based on the question



Visualize your DATA



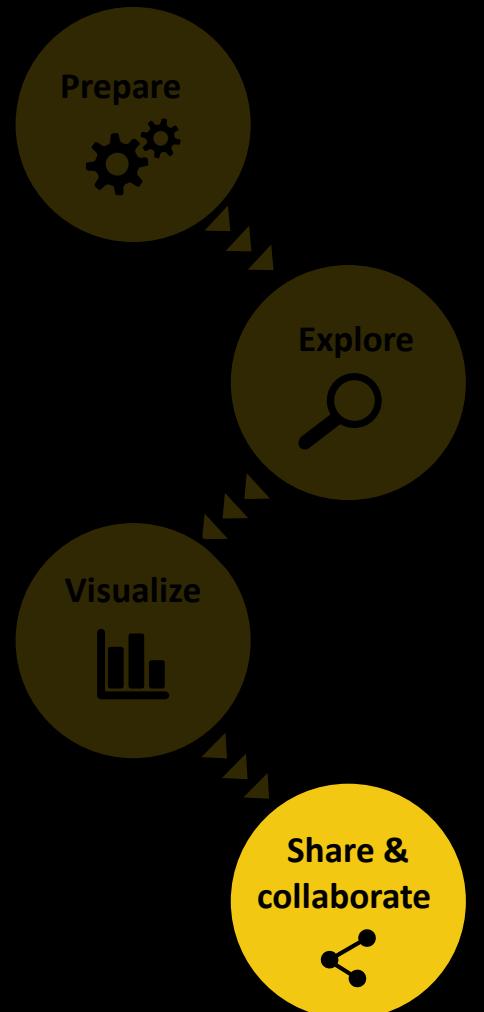
- Visualize data in a variety of ways
- Growing number of visualization types
 - Donuts, basic area, waterfall, filled maps, tree maps, funnel, gauges combo charts and more
 - Custom visuals available from Power BI Visuals Marketplace
 - Tools to develop, test, package new custom visuals
- Visualizations on report page are connected
 - select value in one visualization to change other visualizations
- Full screen pop out mode for report visuals to show additional details



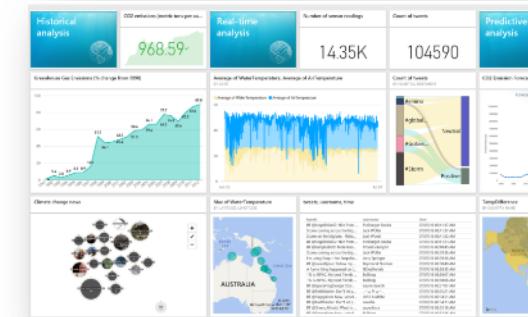
A screenshot of the Power BI Visuals Marketplace. The top navigation bar shows 'MARKETPLACE' and 'MY ORGANIZATION'. Below the search bar, there are sections for 'Category' (Advanced Analytics, Data Visualizations, Editor's Picks, Filters, Gauges, Infographics, KPIs, Maps, Power BI Certified, Time), 'Suggested for you', and a list of featured visual components:

- Histogram Chart**: Visualises the distribution of data over a continuous interval or certain time period. Add
- Time series decomposition chart**: Understand the time series components using "Seasonal and Trend decomposition using Loess". Add
- Association rules**: Uncover relationships between seemingly unrelated data using if-then statements. Add
- KPI Column by MAQ Software**: Line and Column chart that measures progress toward key performance indicator (KPI) targets. Add

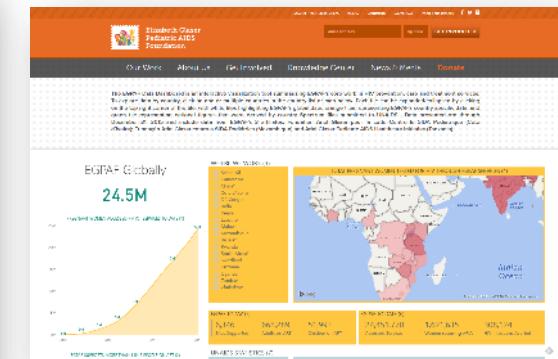
Bring your story to life with DATA



- Save Power BI Desktop report files and easily publish them to [powerbi.com](#)
- Access dashboards using native mobile apps for Windows, iOS and Android
- Share as appropriate with other Power BI users in your organization
- Package your reports in apps for easy consumption and control
- Easily embed interactive Power BI visualizations in blog posts, websites, through emails or social media With **Power BI Publish to web**

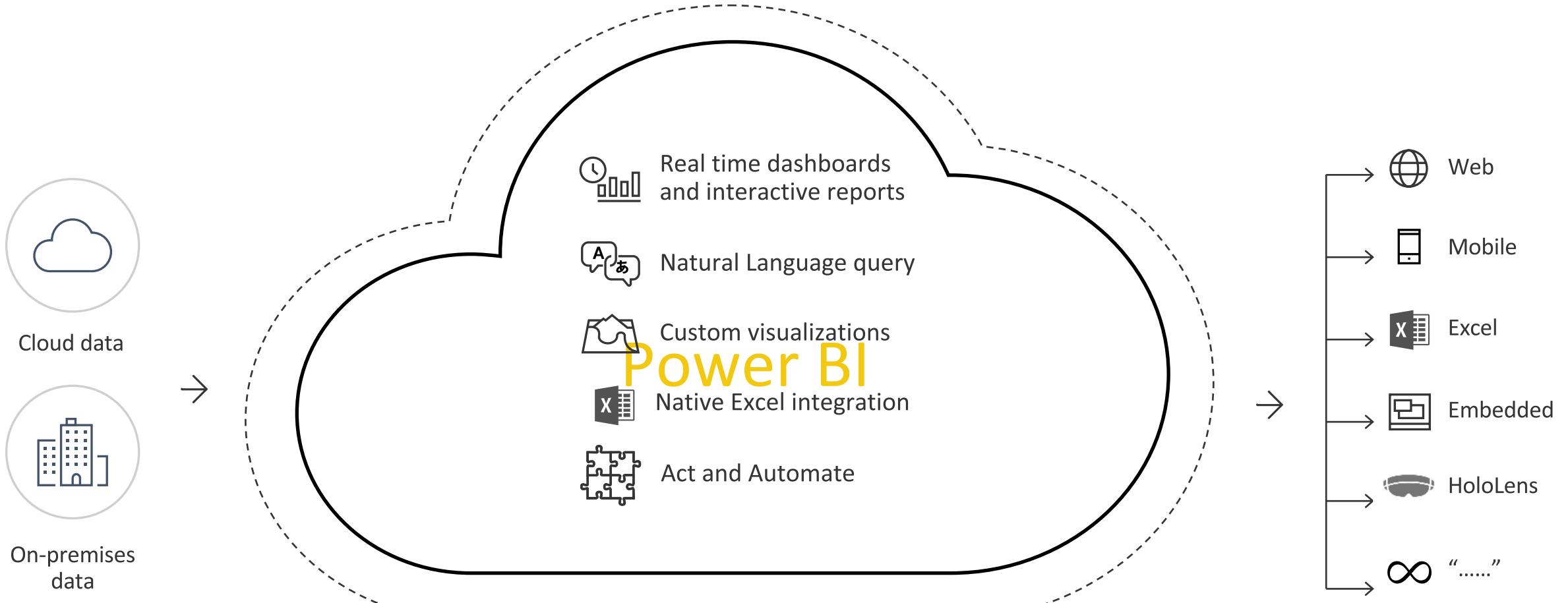


A screenshot of a "Create an app workspace" dialog box. It includes fields for workspace name, location, and access controls, along with a "Add" button and a "Review + Create" button at the bottom.

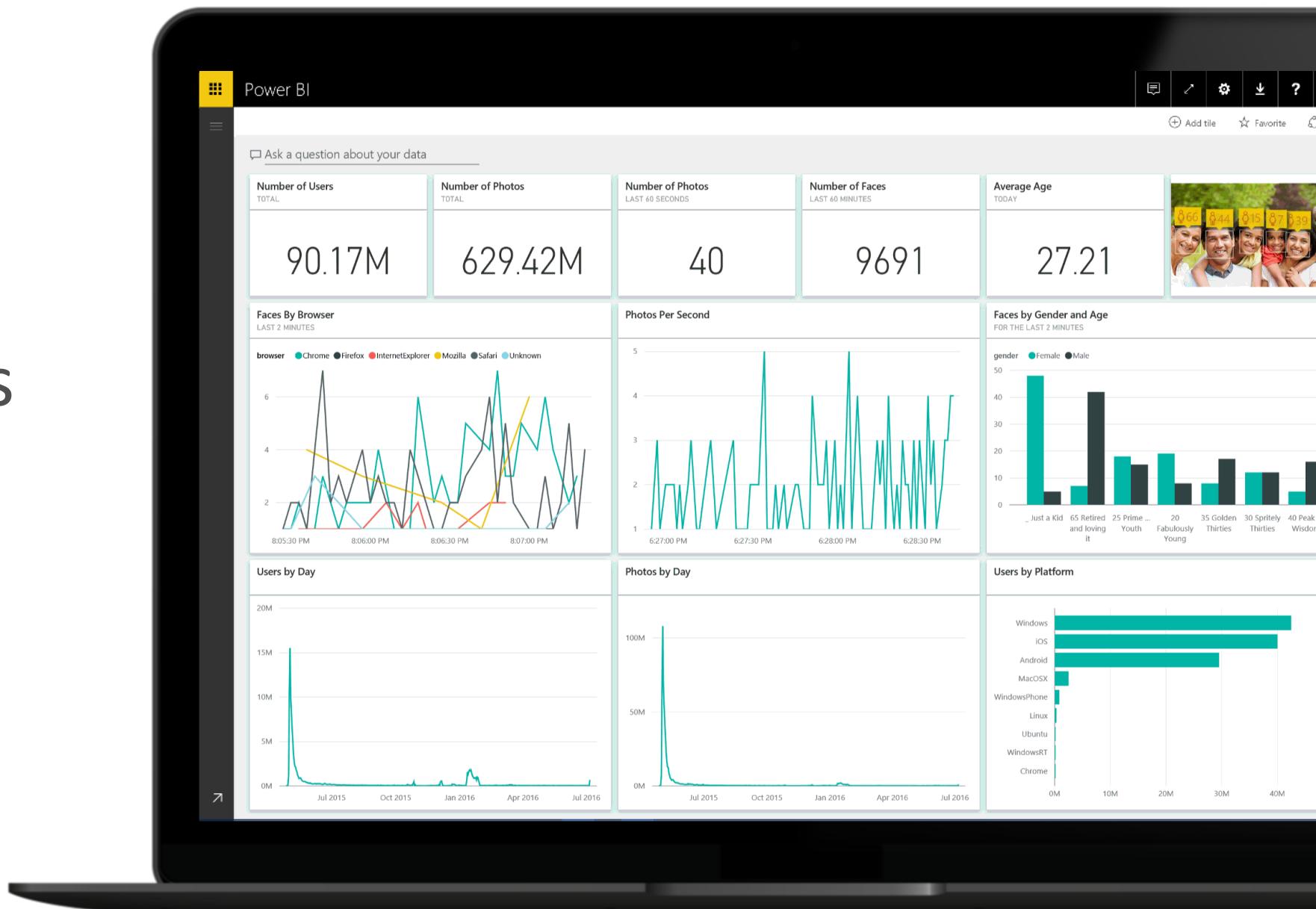


Power BI: experience your data

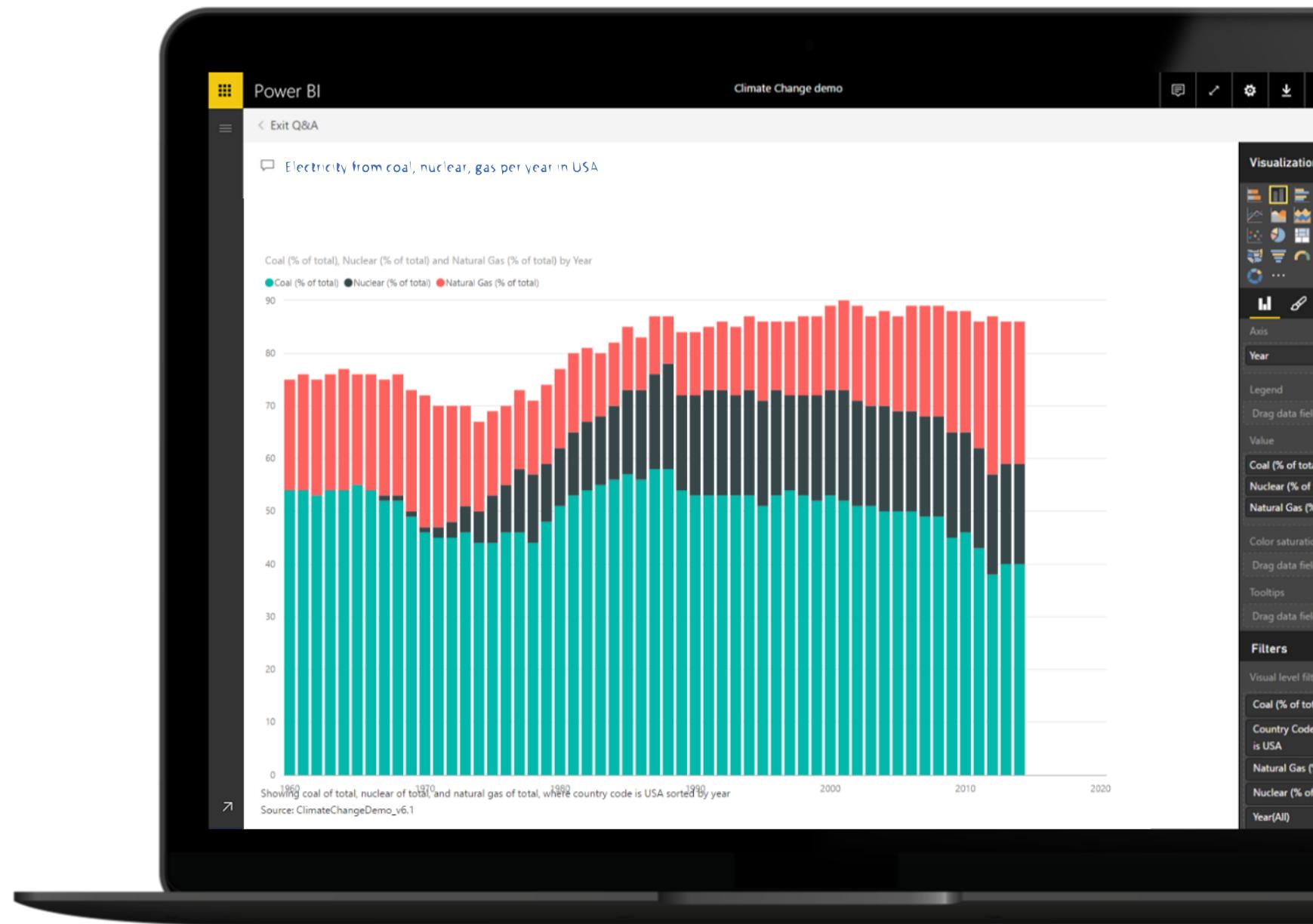
Any data, any way, anywhere



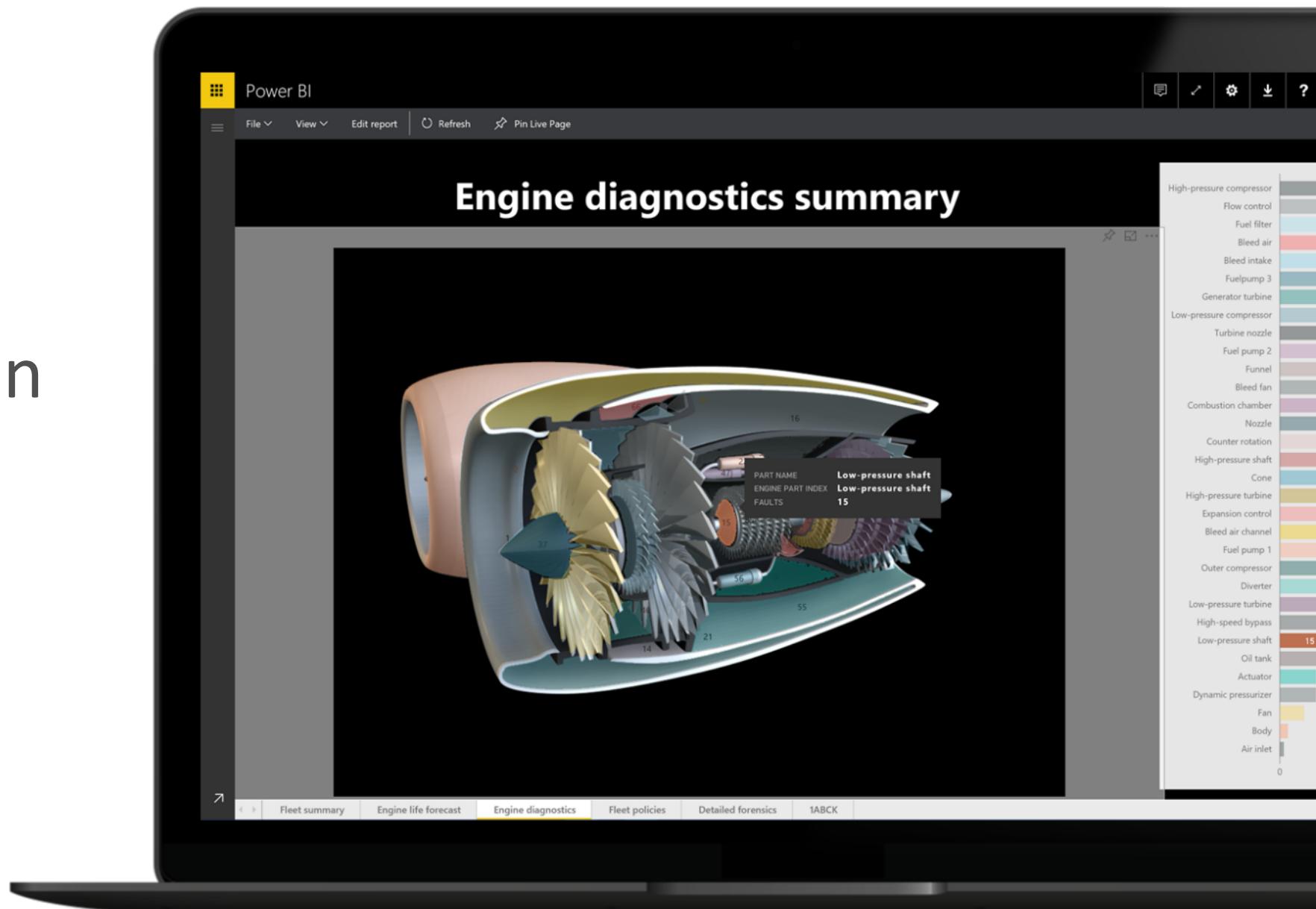
Run your business in real time with live dashboards



Ask questions of your data



Visualize insights in
the context of
your business



Deliver insights through deep integration with Excel



Publish



Publish to Power BI

Use Power BI to create and share rich visual reports and dashboards from your workbook. [Learn more](#)

You're signed in to Power BI as tfarag@microsoft.com. [Use another account](#)

Select where you'd like to publish to in Power BI:

My Workspace

[Refresh](#)



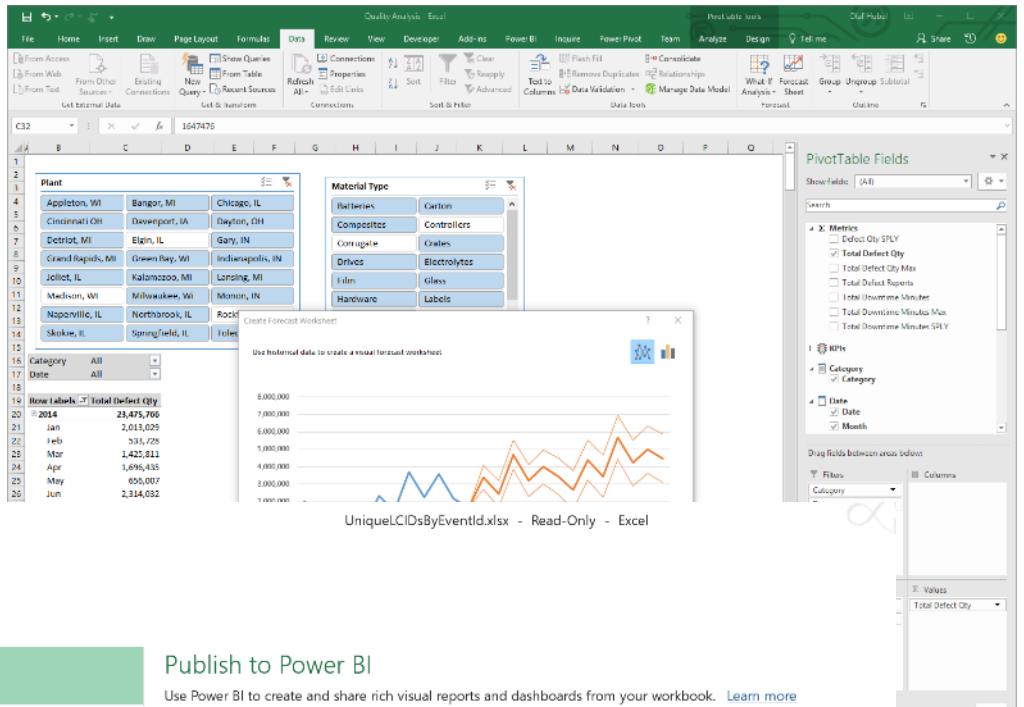
Upload your workbook to Power BI

- Interact with your Excel workbook just as you would in Excel Online.
- Pin selections from your workbook to Power BI dashboards.
- Share your workbook or selected elements through Power BI.



Export workbook data to Power BI

- Export table data and data model into a Power BI dataset.
- Create Power BI reports and dashboards from your dataset.



Get from insights to actions quickly

Power BI Belron > Fleet Check Performance

File View Edit report Explore Refresh Pin Live Page Reset to default Bookmarks Usage metrics View related Unfavorite Subscribe

AUTOGLASS® Fleet Check Performance

Replacement Performance by Region

Repair performance by Region

Repairs and Replacements by Location

Repairs and Replacements by Quarter

Quarter	Value
Qtr 1	218.40
Qtr 2	187.20
Qtr 3	202.67
Qtr 4	209.33

Fleet Name Make Model Is Damaged Needs Replacement

Fleet Name	Make	Model	Is Damaged	Needs Replacement
Adventa	BMW	Active Hybrid Sedan	No	No
Adventa	Nissan	Altima S Sedan	No	No
Adventa	Mercedes-Benz	GLS 454	No	No
Adventa	BMW	M3 Sedan	No	No
Adventa	Toyota	Prius Hybrid 3 Hatchback	No	No
Brevens	BMW	Active Hybrid Sedan	No	No
Brevens	Nissan	Altima S Sedan	No	No
Brevens	Honda	Civic LX Coupe	No	No
Brevens	Mercedes-Benz	GLS 453	No	No
Brevens	BMW	M3 Sedan	No	No
Brevens	Toyota	Prius Hybrid 3 Hatchback	No	No
Main Campus	BMW	Active Hybrid Sedan	No	No
Main Campus	Nissan	Altima S Sedan	No	Yes

Model Year Plate

Date 12/31/2001

Fleet Redwest

Damage On

Replacement Off

Follow Up By 10/17/2018

Argic No. WSB1244ADFBLA

Confirm



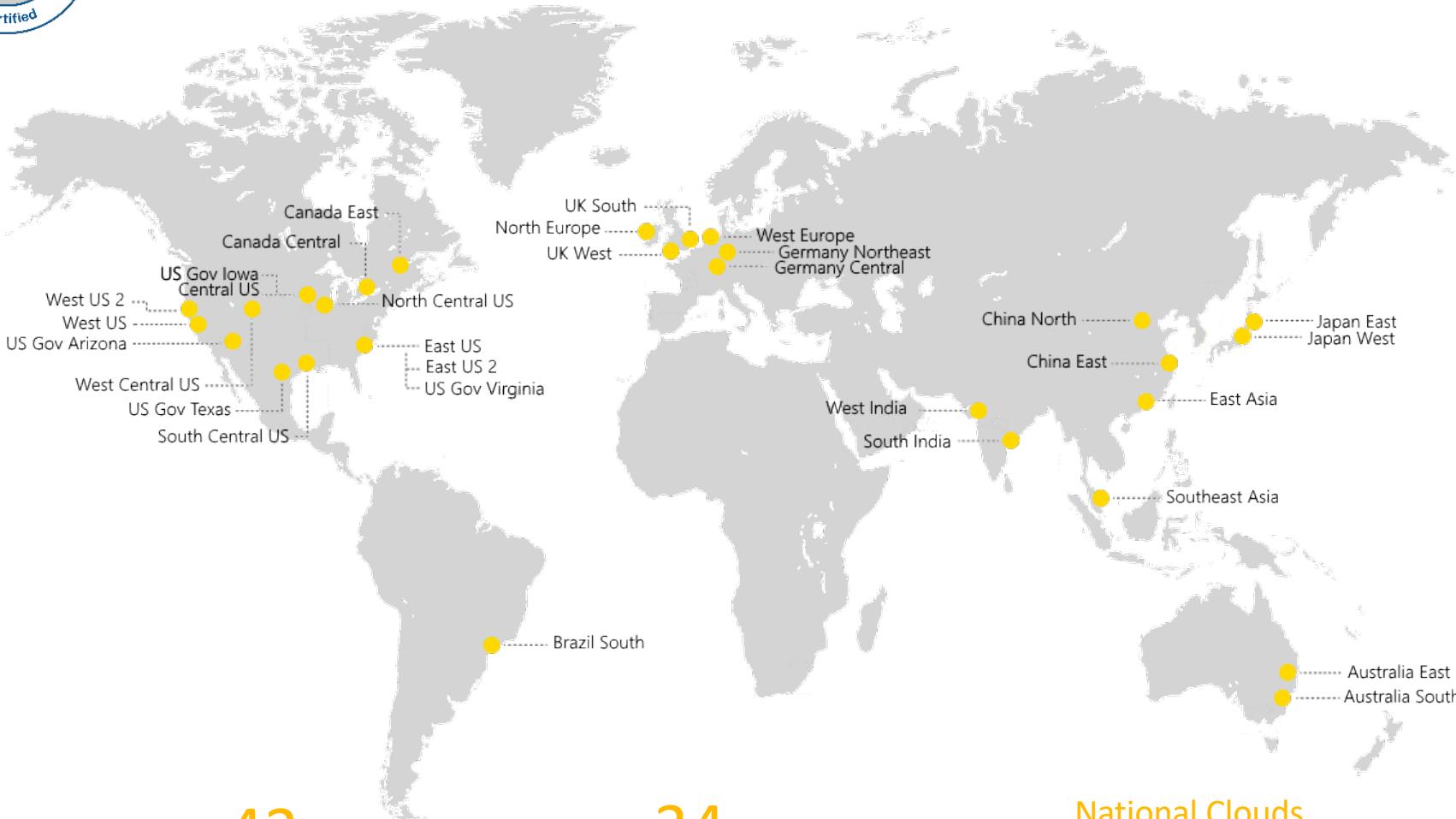
EU Model Clauses



China GB 18030

43
Languages

Largest Global Footprint



34
Primary and backup
datacenters worldwide

National Clouds
US Government
China
Germany



Federal Office
for Information Security



February 2019

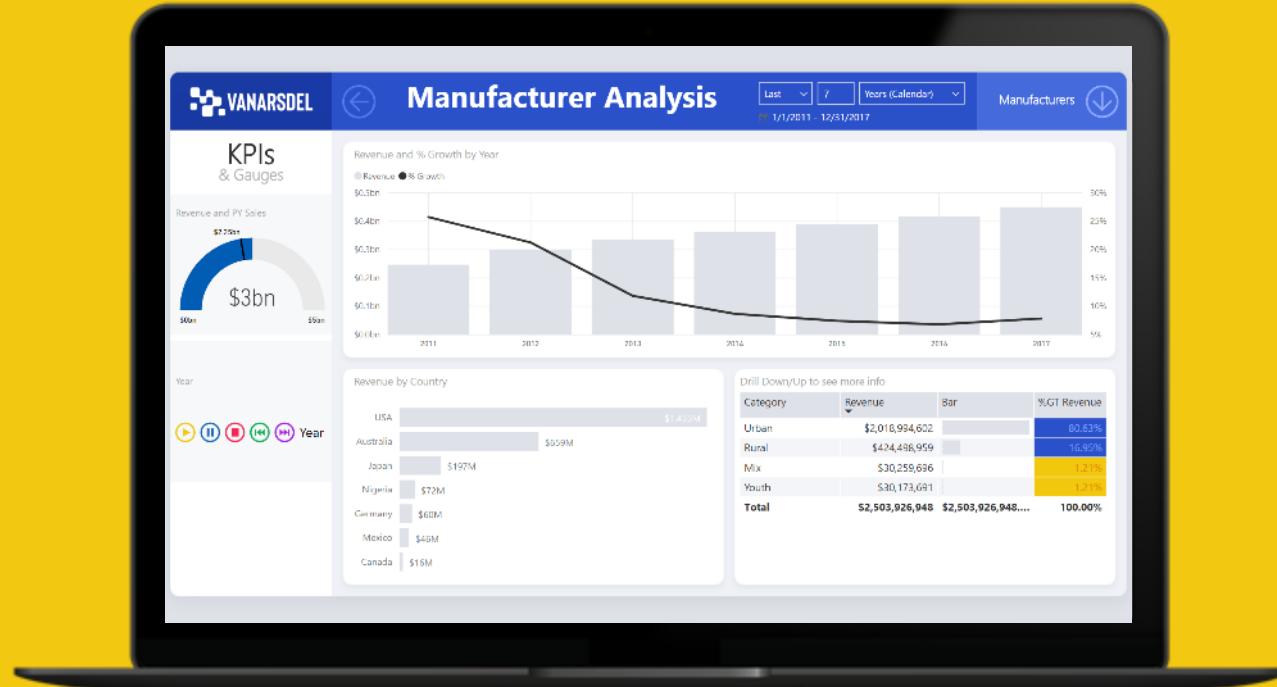
A Leader in Analytics & BI Platforms*



*Gartner "Magic Quadrant for Analytics and Business Intelligence Platforms," by Cindi Howson, James Richardson, Rita Sallam, Austin Kronz, 11 February 2019

The above graphics were published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from Microsoft. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved.

Business Intelligence Terminology



Dimensions

Descriptive/ Qualitative Information

- Color
- Country
- Region
- State
- City
- Person
- Gender
- Age
- Dates

Measures

Quantitative Information

- Expressed in numbers and can be counted and aggregated easily

DAX Functions

Data Analysis Expressions

- <https://docs.microsoft.com/en-us/dax/dax-function-reference>
- Examples:
 - SUM
 - AVERAGE
 - COUNT
 - DISTINCTCOUNT
 - IF/THEN
 - TODAY

Scenario 1

How many shoes were sold in Tennessee in 2017?

Scenario 1

How many shoes were sold in Tennessee in 2017?

Dimension

Measure

Scenario 2

How many kids under the age of 10 bought red Nikes in the USA in 2018?

Scenario 2

How many kids under the age of 10 bought red Nikes in the USA in 2018?

Dimension

Measure

Scenario 3

How many kids under the age of 10 bought red Nikes in the USA in 2018?

Dimension

What percentage of those shoes were returned within one month?

Measure

Scenario 3

How many kids under the age of 10 bought red Nikes in the USA in 2018?

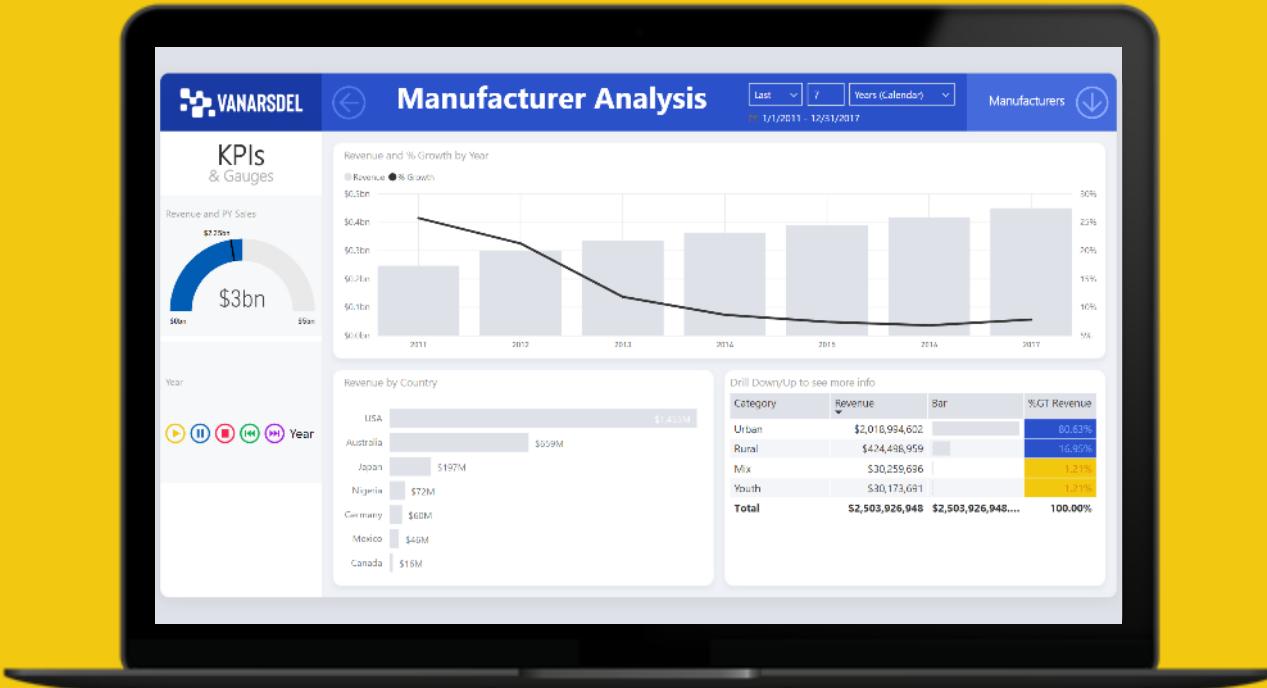
Dimension

What percentage of those shoes were returned within one month?

Measure

Power BI

Demo



Request from a stakeholder

I would like to know the total incidents that happened in 2018, and of those incidents I would like to know how many incidents had a status of dispatched. I would like to know the status types of the incidents, and I would like to know how many incidents happened in each month. I would like to know how many incidents happen to men and women, and I would like to see a map of where the incidents happened broken out by zip code.

Example 1

Create a card of total incidents

Create a card showing total incidents that have been dispatched. Filter using Report Type

Create a bar chart of incident status description

Create a line chart of total incidents by month

Create a pie chart of incidents broken out by Victim Gender

Create a map broken out by location with a number of incidents in tooltip

Example 2

Filter out all null zip codes in the data source

Create a card of total incidents

Create a card of total incidents that were dispatched and occurred after Feb 28th

Create a bar chart showing the total number of incidents by Victim Description

Create an area chart of total incidents by incident reported month. Show the values in the line chart

Create a pie chart of incidents broken out by Ethnicity. Filter out Null Values

Create a map broken out by zip code with a number of incidents in tooltip. Show different colors for each zip code

Insert a picture in the top right left from Metro Nashville Website

Bonus: Show total incidents by the time of day

How To Tell A Story With Data

Storyboarding

Problem

- What are we trying to solve

Who

- Audience
- You

What

- Action

Mechanism

- PowerPoint?
- Power BI?
- Excel?
- Tableau

Tone

- Success/Failure?

How

- Possible types of graph/chart

Two main types of data visualization

- Exploration
- Explanation

Exploration

- Discover new areas of interest
- Pose new questions
- Discover new stories

Explanation

- Answer a question
- Support a decision
- Convey information
- Increase efficiency

The need to visualize data

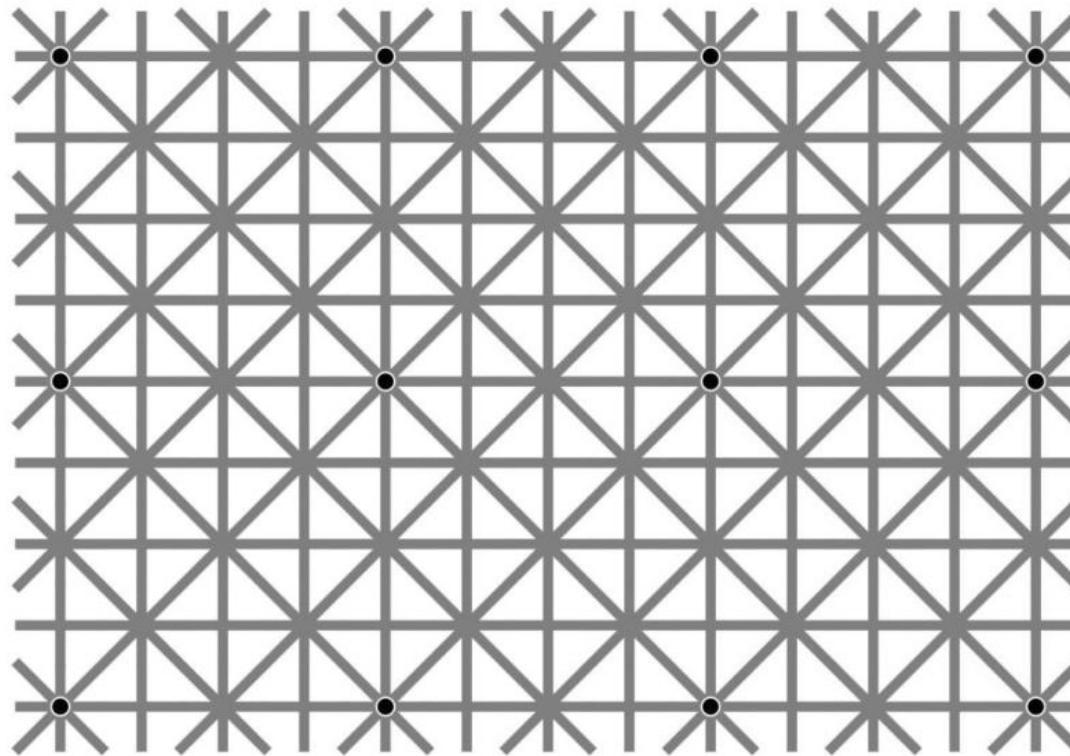
- Human brain processes images 60,000x faster than text.

-Persuasion and the Role of Visual Presentation Support: The UM/3M Study, 1986

- 90 percent of the information transmitted to the brain is visual.

-MIT News, January 16, 2014

How many dots do you see at once?



Ninio's Extension Illusion

How many dots do you see?

- There are 12 dots. It is difficult to see all of the dots because the grid prevents us from seeing the whole picture. If we removed the grid we could see all 12 dots, but when presented on a grid, our perception changes entirely.
- “Our visual system is lazy. Regular patterns are tempting because you can look at a small portion and think you have the whole thing figured out”- Martinez-Conde

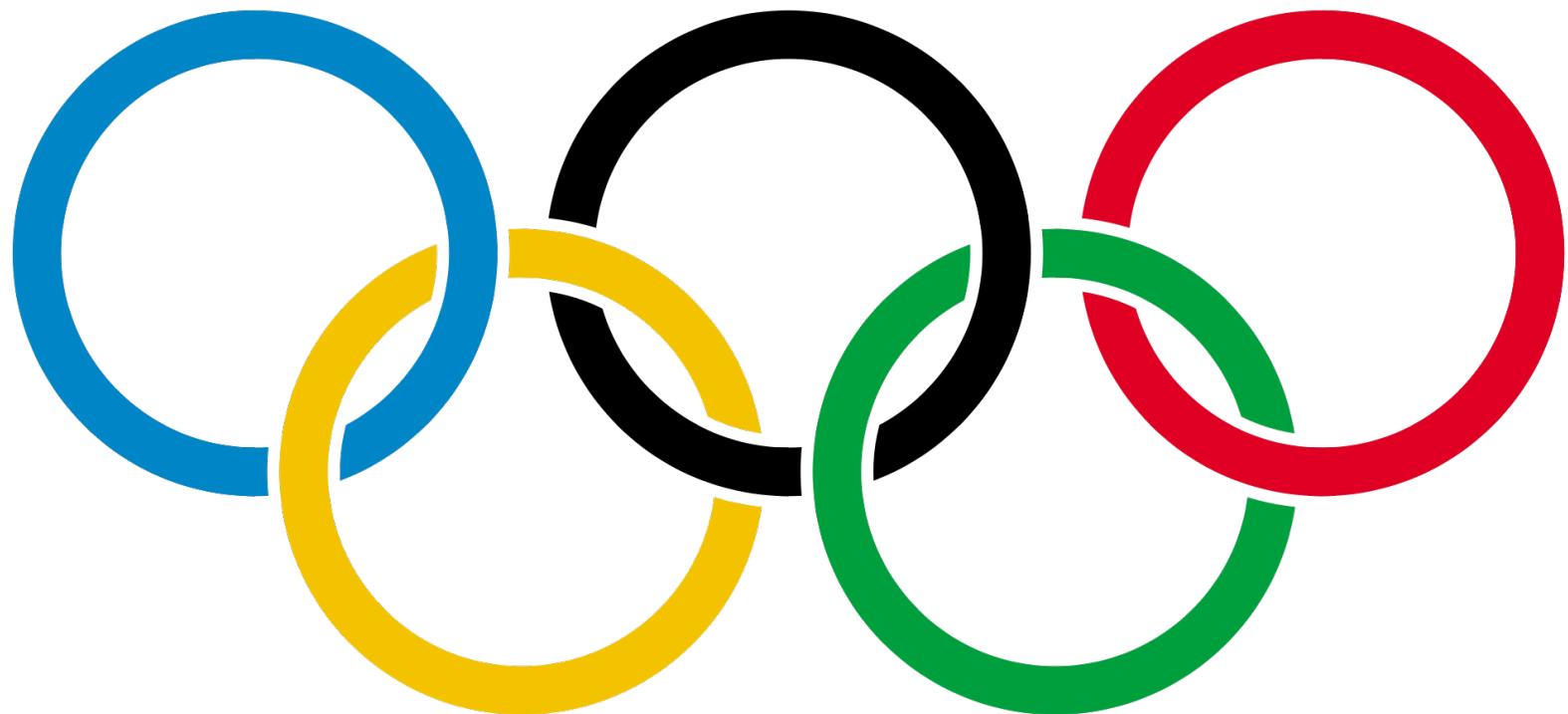
Ninio’s Extension Illusion

The Gestalt Principles

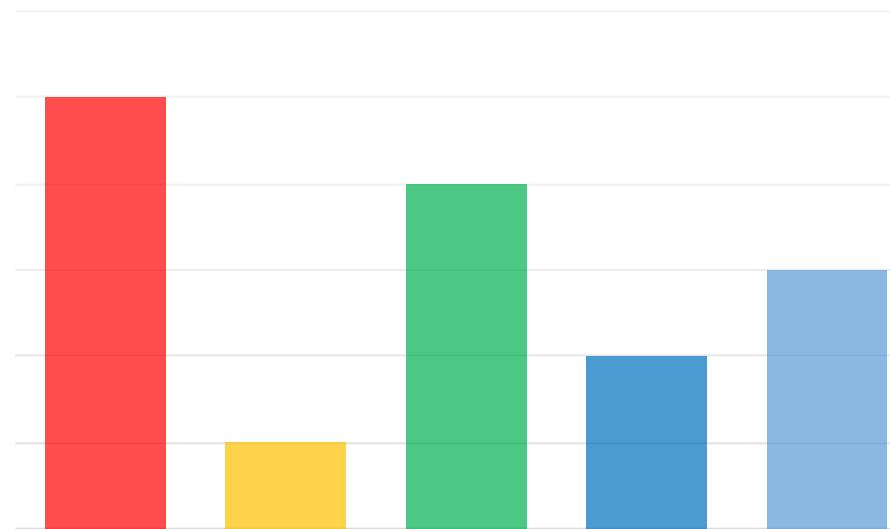
Gestalt

- Introduced by Christian von Ehrenfels
- Psychological term meaning unified whole
 - The whole is different (not greater) than the sum
- Gestalt Effect –
 - Ability of the mind to generate whole images from a collection of parts

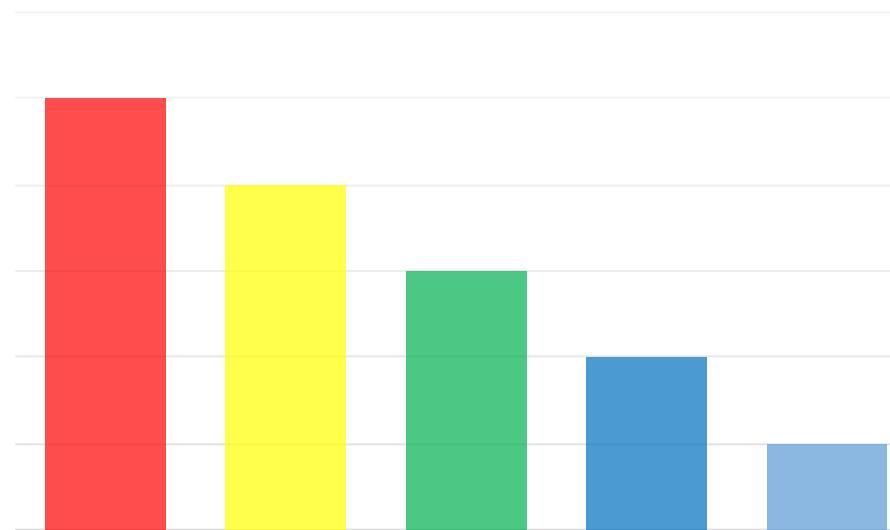
Law of Pragnanz



Law of Pragnanz



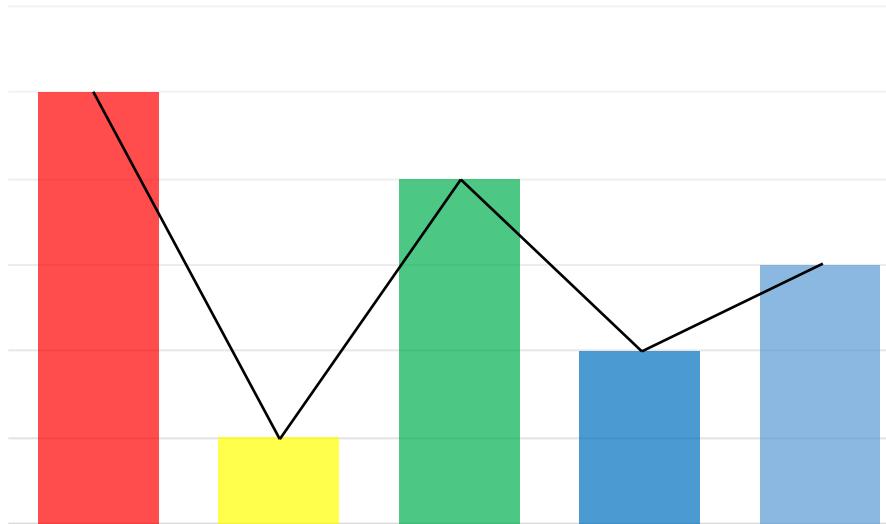
Law of Pragnanz



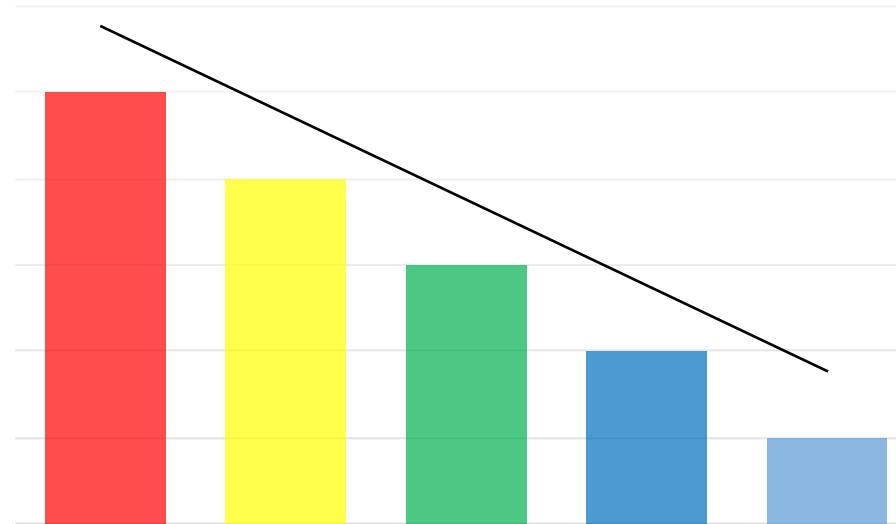
Law of Continuity



Law of Continuity



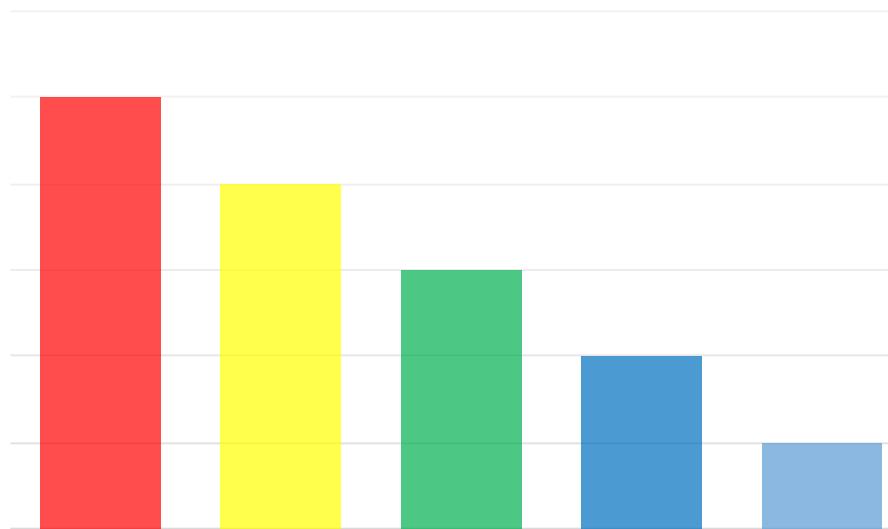
Law of Continuity



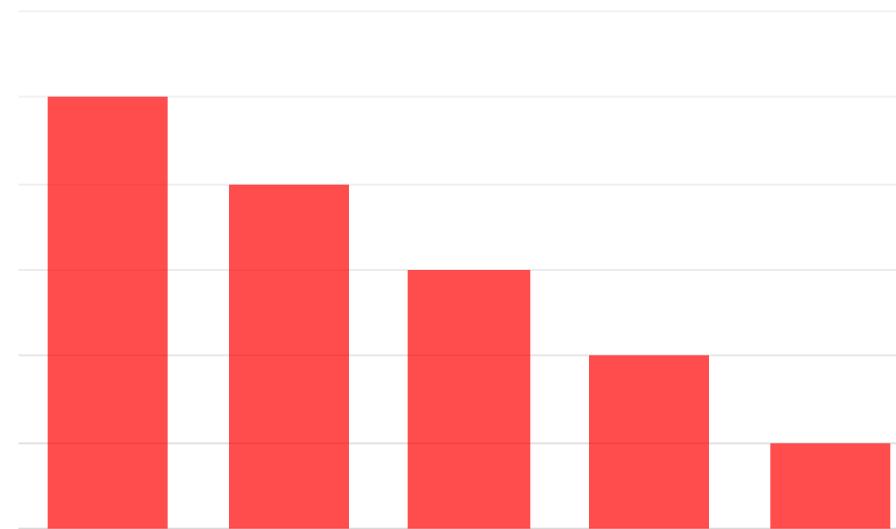
Law of Similarity



Law of Similarity



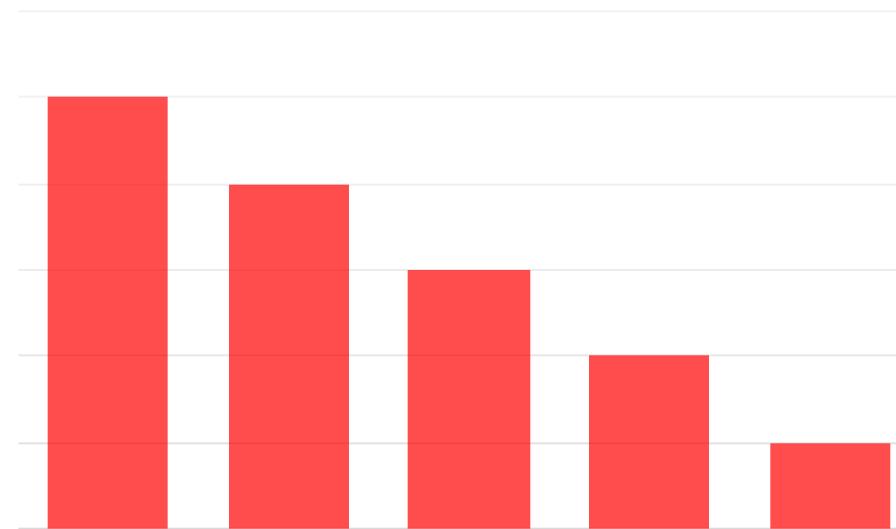
Law of Similarity



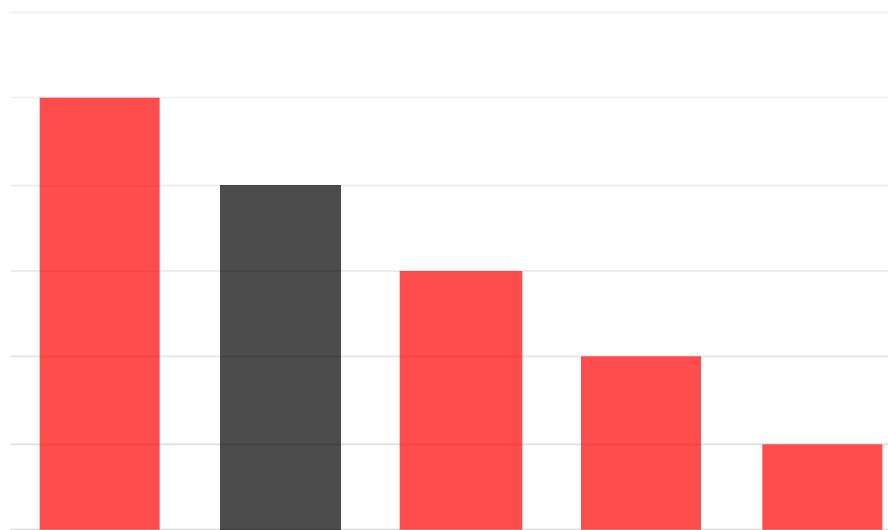
Law of Focal Point



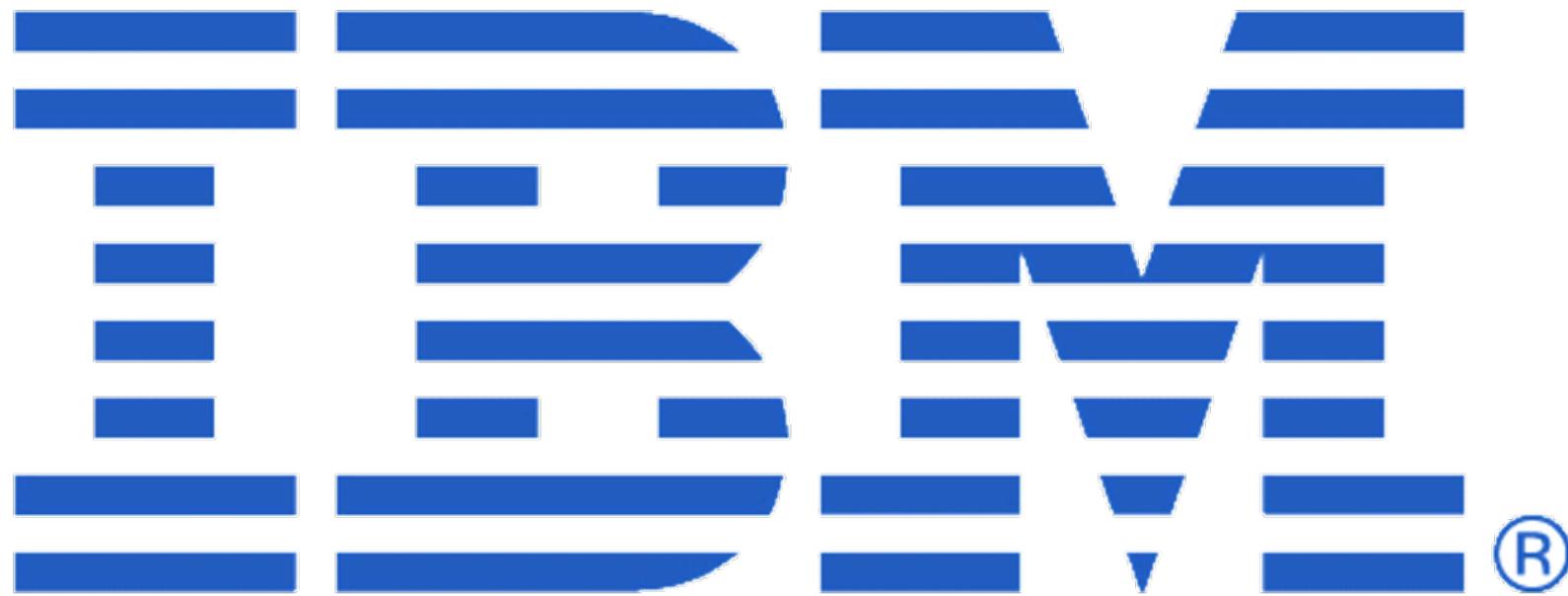
Law of Focal Point



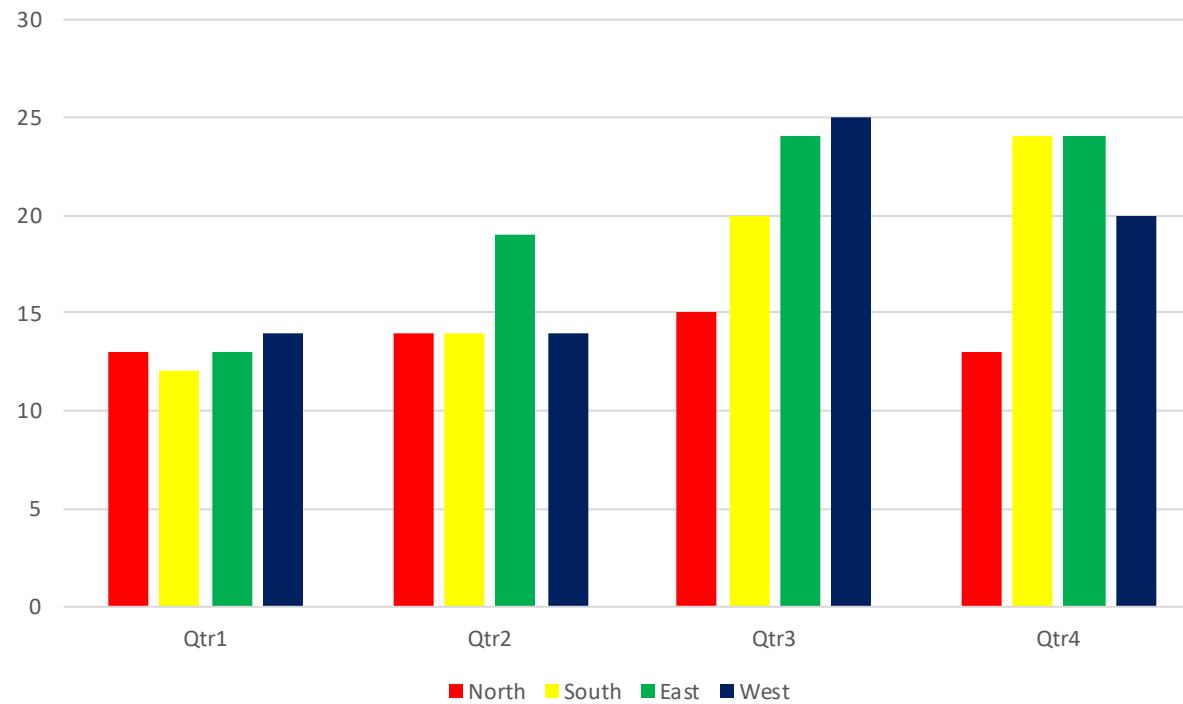
Law of Focal Point



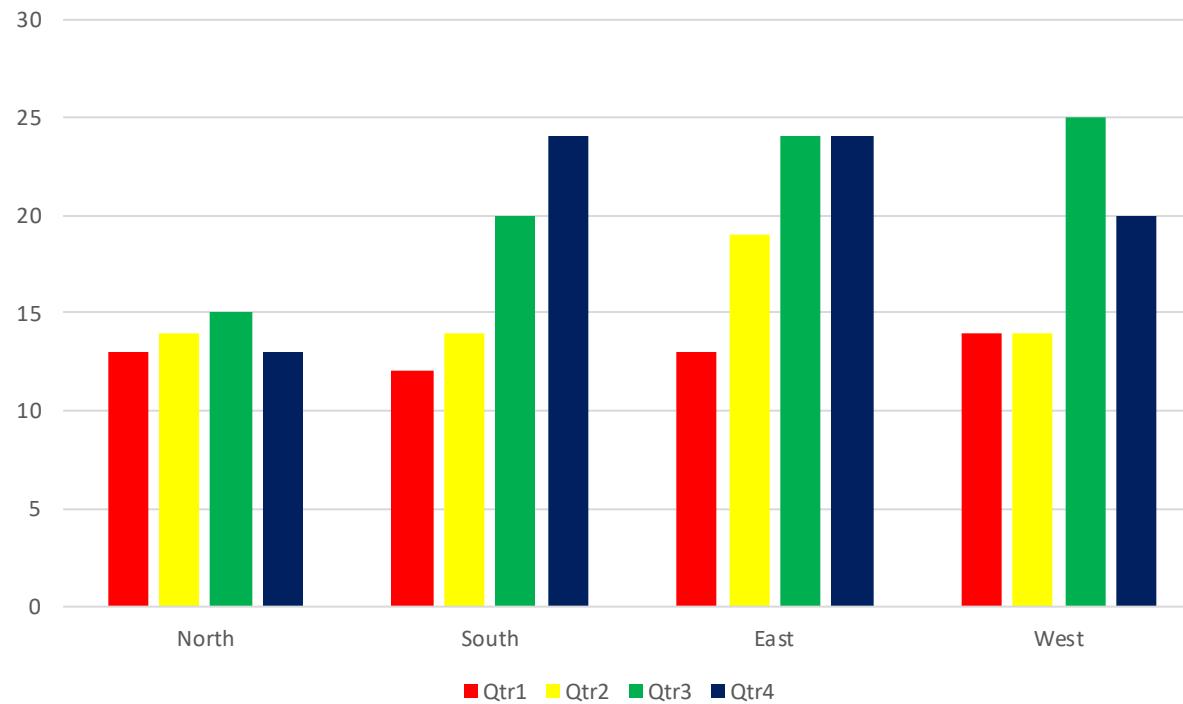
Law of Proximity



Law of Proximity



Law of Proximity



Resources

- Gestalt Psychology – http://en.wikipedia.org/wiki/Gestalt_psychology
- Color Matters – <http://www.colormatters.com>
- CVD Color Lab - <http://colorlab.wickline.org/colorblind/colorlab/>
- Coblis - <http://www.color-blindness.com/coblis-color-blindness-simulator/>
- Data Visualization Catalogue - <https://datavizcatalogue.com/search.html>

DATA



SORTED



ARRANGED



PRESENTED
VISUALLY





**JOIN OUR THRIVING
COMMUNITY**

850k

Active Community
Members

100k+

Users touched in-person at
Microsoft sponsored events

USER VOICE:

103,431 Users

16,432

Ideas Submitted

3,162

Active Ideas



**ENGAGE WITH A
USER GROUP**



222

Independent Power BI User
Groups World Wide

49,685

User Groups Members in
over 60 countries

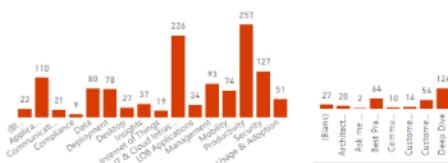
Join your local PUG today!
pbiusergroup.com

Explore and share your data stories

Data Stories Gallery : Microsoft Ignite Session Browser

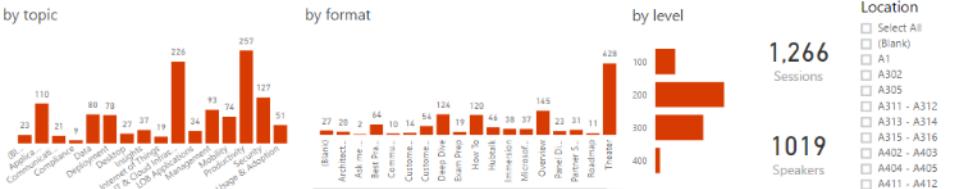
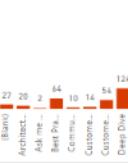
Microsoft Ignite Session Browser

by topic



Session Browser

by format



Data Stories Gallery : Analysis of the Congress of the Republic of Peru

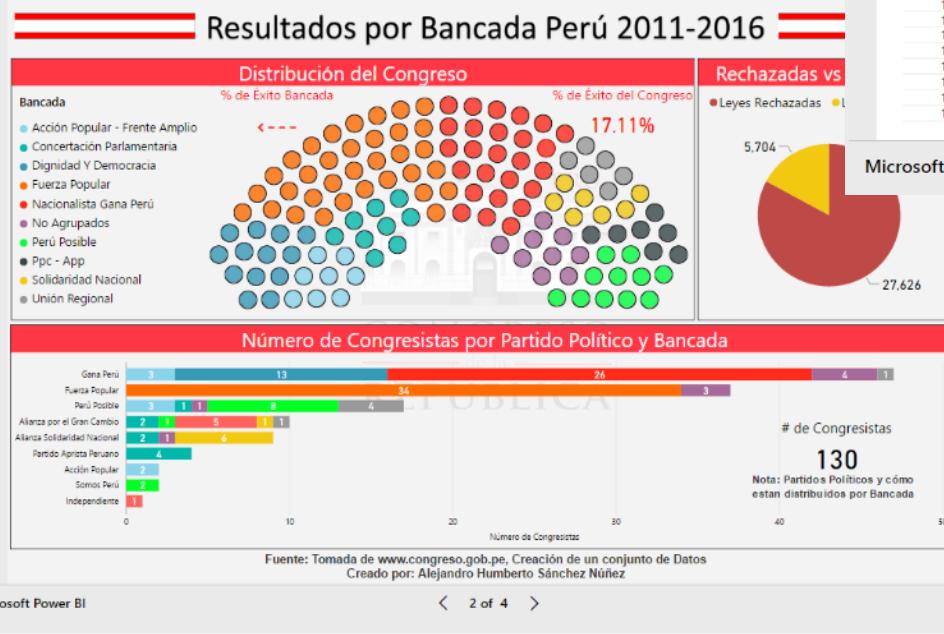
Day Start Session Code Duration Level Title

Sunday	9/25/2016 9:00:00 AM	PRI001	480	300	Build an Office
Sunday	9/25/2016 9:00:00 AM	PRI001	480	300	Build an Office
Sunday	9/25/2016 9:00:00 AM	PRI002	480	200	Build cross-plat
Sunday	9/25/2016 9:00:00 AM	PRI002	480	200	Build cross-plat
Sunday	9/25/2016 9:00:00 AM	PRI003	480	200	Get started with
Sunday	9/25/2016 9:00:00 AM	PRI004	480	200	Dashboard in a
Sunday	9/25/2016 9:00:00 AM	PRI005	480	200	DEV Immersion
Sunday	9/25/2016 9:00:00 AM	PRI005	480	200	DEV Immersion
Sunday	9/25/2016 9:00:00 AM	PRI006	480	400	DevOps Hackat
Sunday	9/25/2016 9:00:00 AM	PRI007	480	400	Get Microsoft's

Select All (Blank) Sunday

Select All (Blank) 09:00 AM 09:15 AM 09:50 AM 10:00 AM 10:15 AM

Microsoft Power BI



Microsoft Power BI

CORTANA INTELLIGENCE COMPETITION
Women's Health Risk Assessment
[Visit Competition page for more details](#)

\$5,000 prizes in total
Ended 10/1/2016, 7:59:59 AM (GMT Daylight Time)

Summary
Based on the World Health Organization (WHO) report in 2011, about 820,000 women and men aged 15-24 were newly infected with HIV in developing countries. Among these newly infected, more than 60% were women.

Developing countries face serious reproductive health problems such as sexually transmitted infections (STIs), unintended pregnancies, and complications from childbirth. Emphasize prevention and provision of information about STIs and other reproductive tract infections (RTIs) was listed as one of the top priorities for policymakers, researchers, and health care providers.

To help achieve the goal of improving women's reproductive health outcomes in underdeveloped regions, [this competition calls for optimized machine learning solutions](#) so that a patient can be accurately categorized into different health risk segments and subgroups.

Please see [this video](#) and [this blog post](#).

WHR Competition Power BI Companion by DevScope.

1 of 7

In the [Data Stories Gallery](#)

Q&A

Contact Information

Social Media: @SQLsekou

Blog: sqlsekou.com

Email: sqlsekou@gmail.com