

AI capabilities for Power BI to make AI accessible for everyone

DATA:Scotland



Microsoft

 adatis


DATA MOVEMENTS
BRINGING DATA INTO FOCUS

Arnold Clark


cathcart
associates
TECHNICAL RECRUITMENT SPECIALISTS


quorum



POWER BI SENTINEL™
Documentation · Data Lineage · Change Tracking · Backup

SentryOne®

F1F9

 Incremental
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 dbWatch
DATABASE CONTROL

 DLM
Consultants

 redgate

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Marc Lelijveld

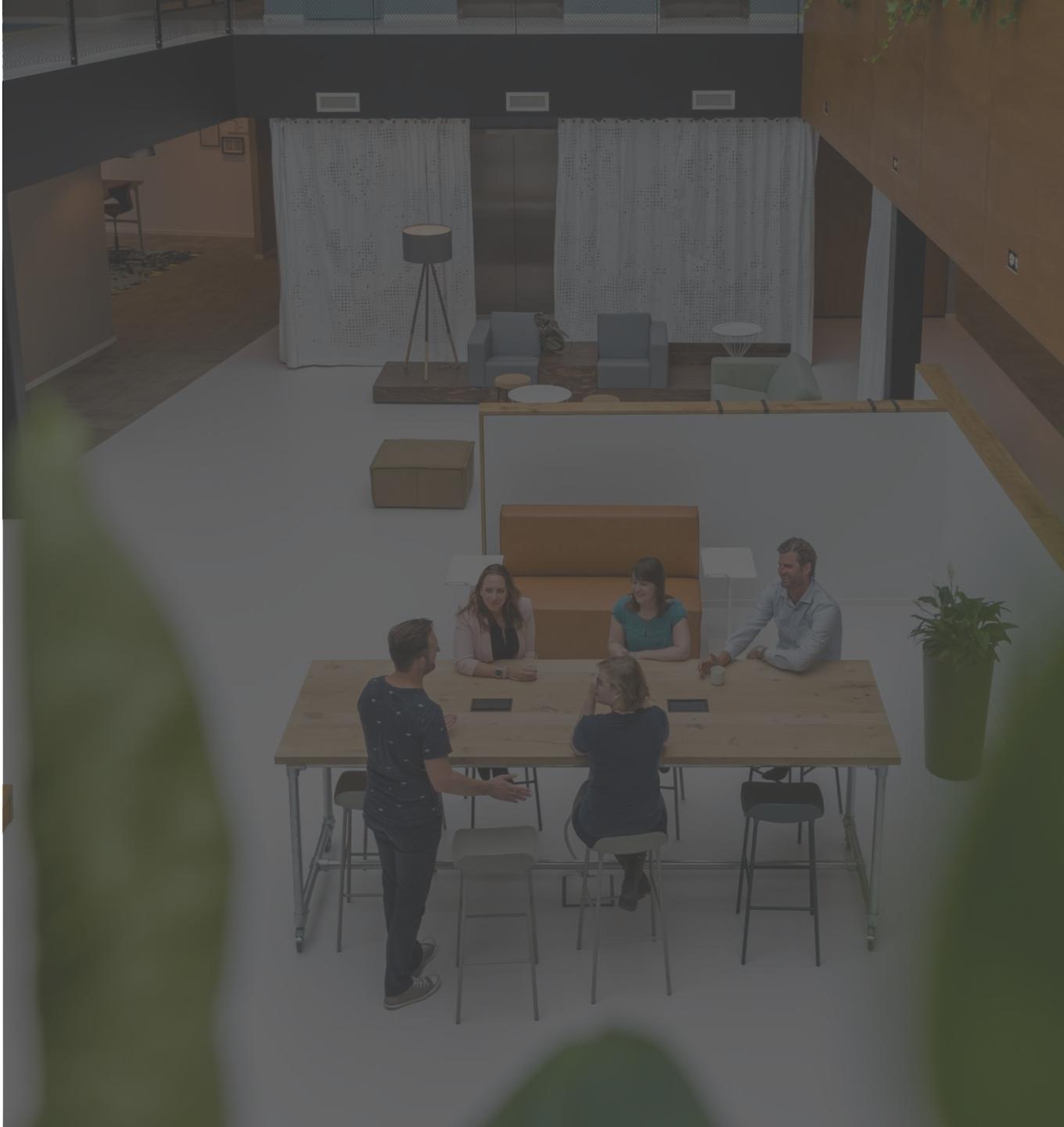
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-  Data-Marc.com



What we cover today

- Introduction to AI
- Reporting & dashboarding
now a days
- AI in Power BI
- Demo time!

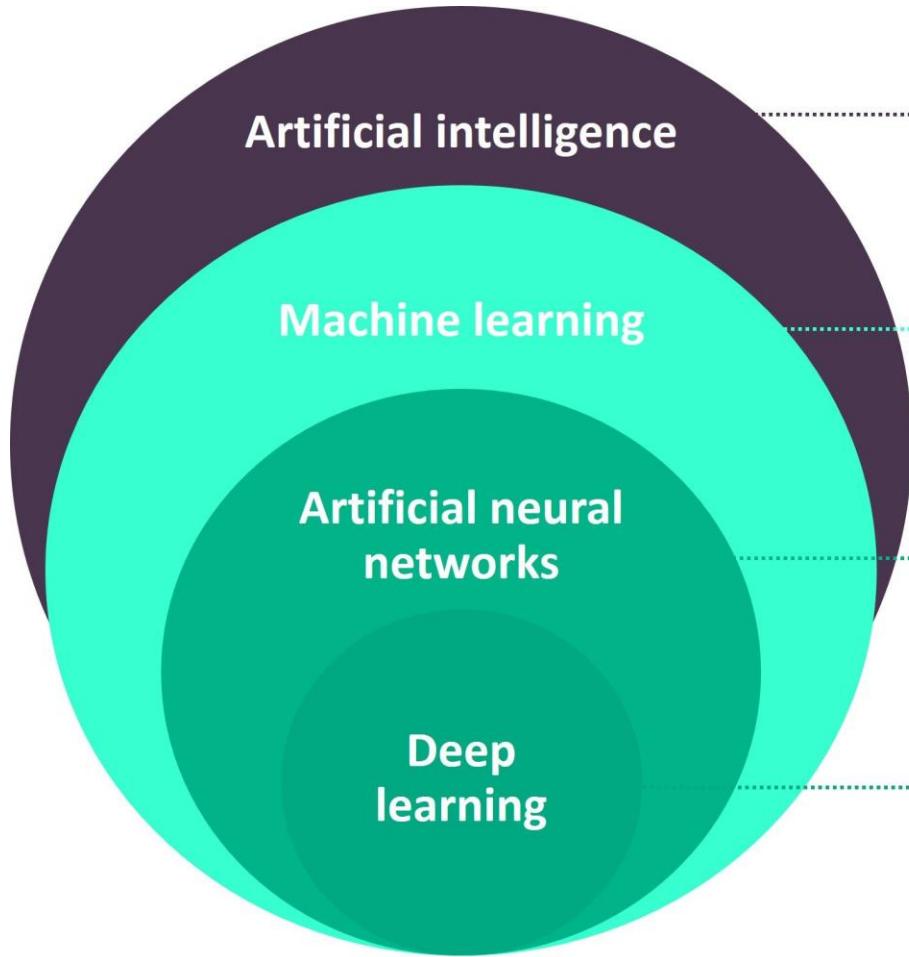




Artificial Intelligence

Mind-blowing?

For me as a newbie in this area



Artificial intelligence (AI)

Any techniques that enable machines to solve a task in a way like humans do

Machine learning (ML)

Algorithms that allow computers to learn from examples without being explicitly programmed

Artificial neural networks (ANN)

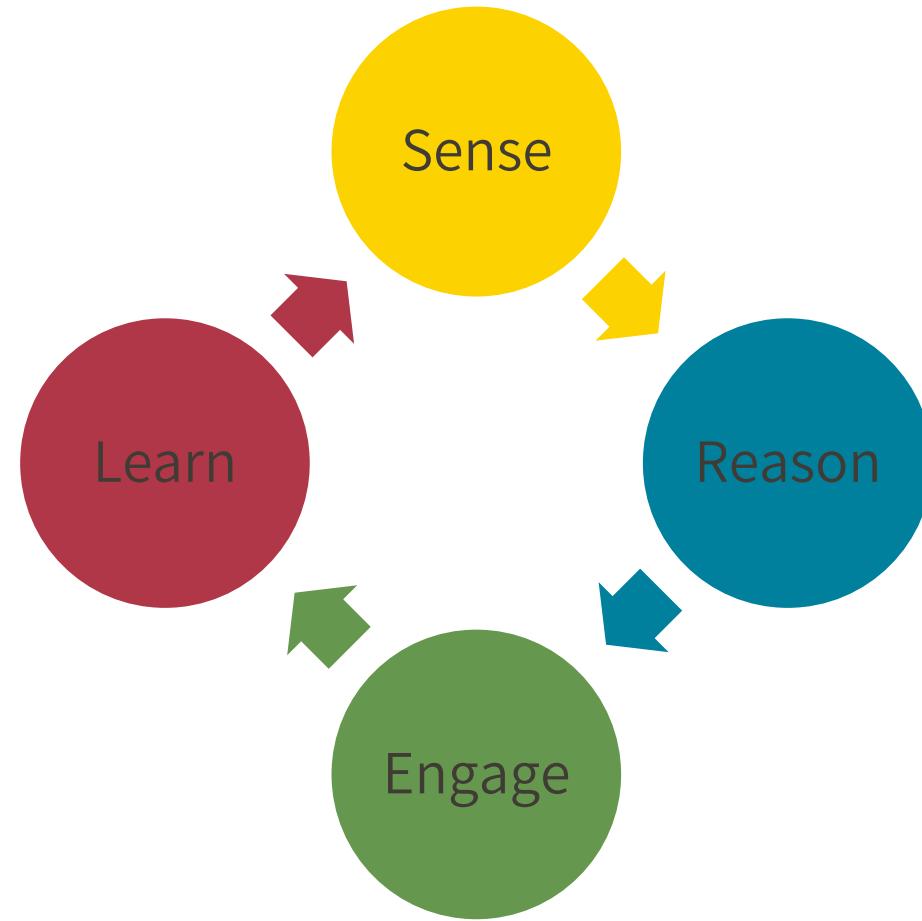
Brain-inspired machine learning models

Deep learning (DL)

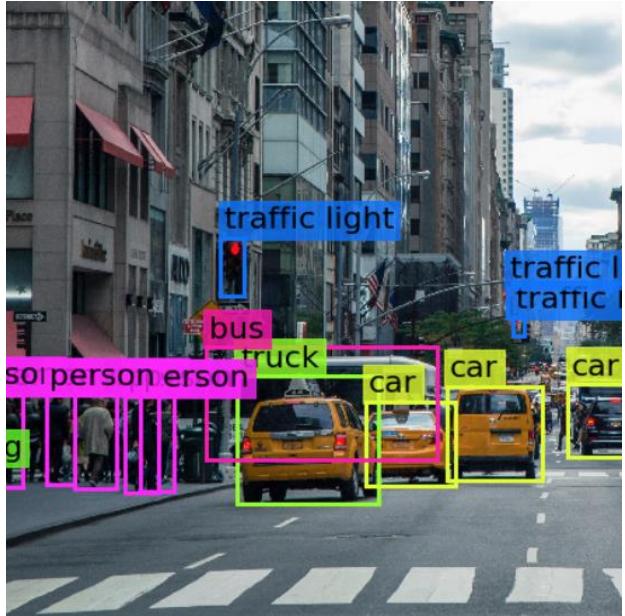
A subset of ML which uses deep artificial neural networks as models and automatically builds a hierarchy of data representations



Artificial Intelligence



Ability to sense, reason, engage and learn!



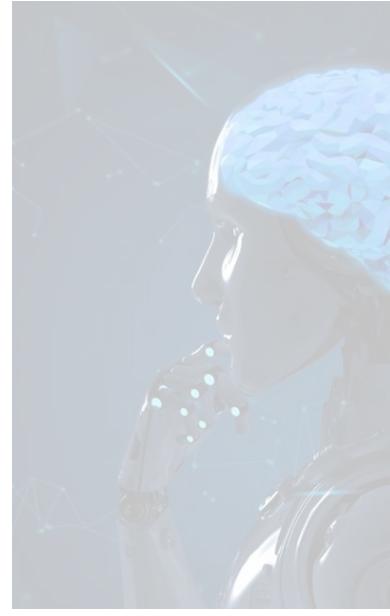
Computer vision



Voice recognition



Robotics



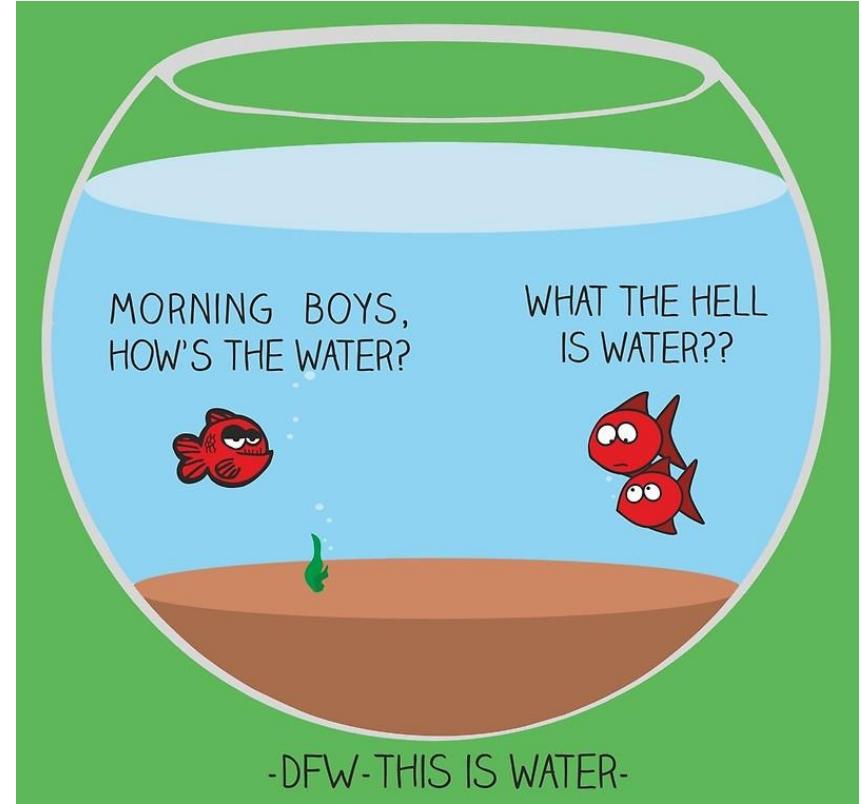
And more....

AI != Innovation

Does not understand the real world!

But Artificial Intelligence can:

- Learn
- Optimize
- Detect patterns
- Inform
- Inspire



AI lives in water, yet it doesn't know what water is.

David Foster Wallace



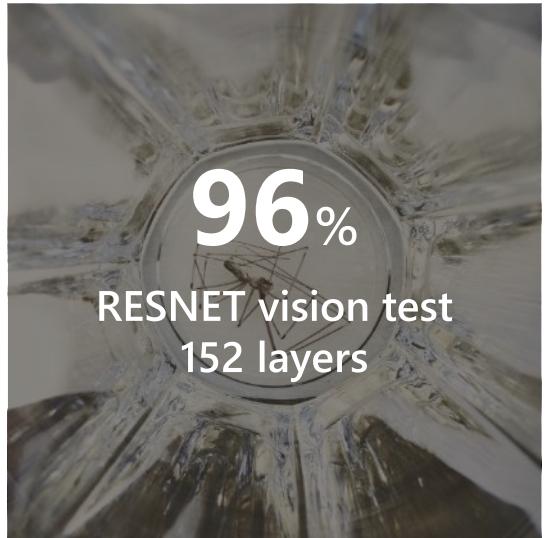
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Source: <https://towardsdatascience.com/artificial-intelligence-is-for-optimization-human-intelligence-is-for-innovation-f0bddce2ed79>

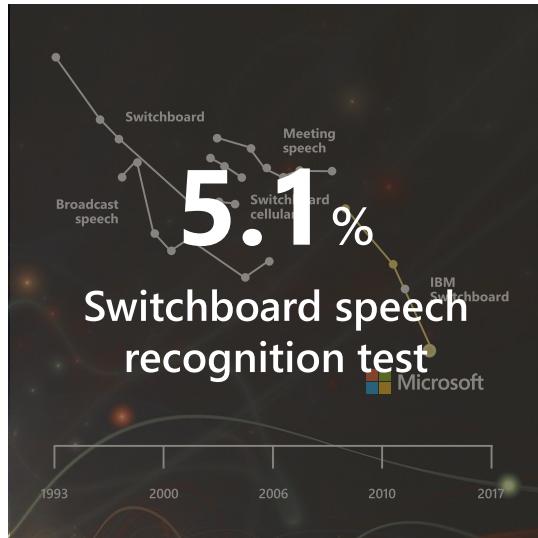
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Microsoft AI breakthrough

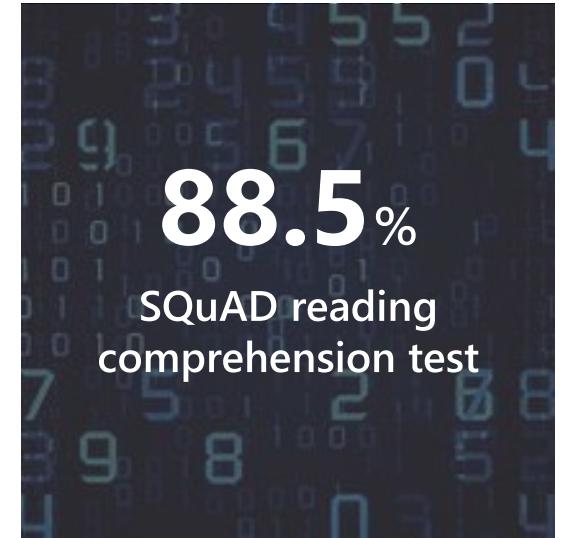
Vision



Speech



Language



2016

Object recognition
human parity

2017

Speech recognition
human parity

March 2018

Machine translation
human parity

January 2018

Machine reading
comprehension
human parity



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The world's first AI Whisky



Aqua vitae. Uisce beatha. Whisky - May 2019

“We want the AI to create a recipe that tastes good enough to win awards... we want to discover recipes that will never have occurred to a person”

Sales data

70

Azure
Cognitive
Services

million
recipes

Customer preferences

Azure
cloud
platform

Ingredients of
award-winning
blends



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Source: <https://news.microsoft.com/europe/features/meet-the-worlds-first-ai-created-whisky/>

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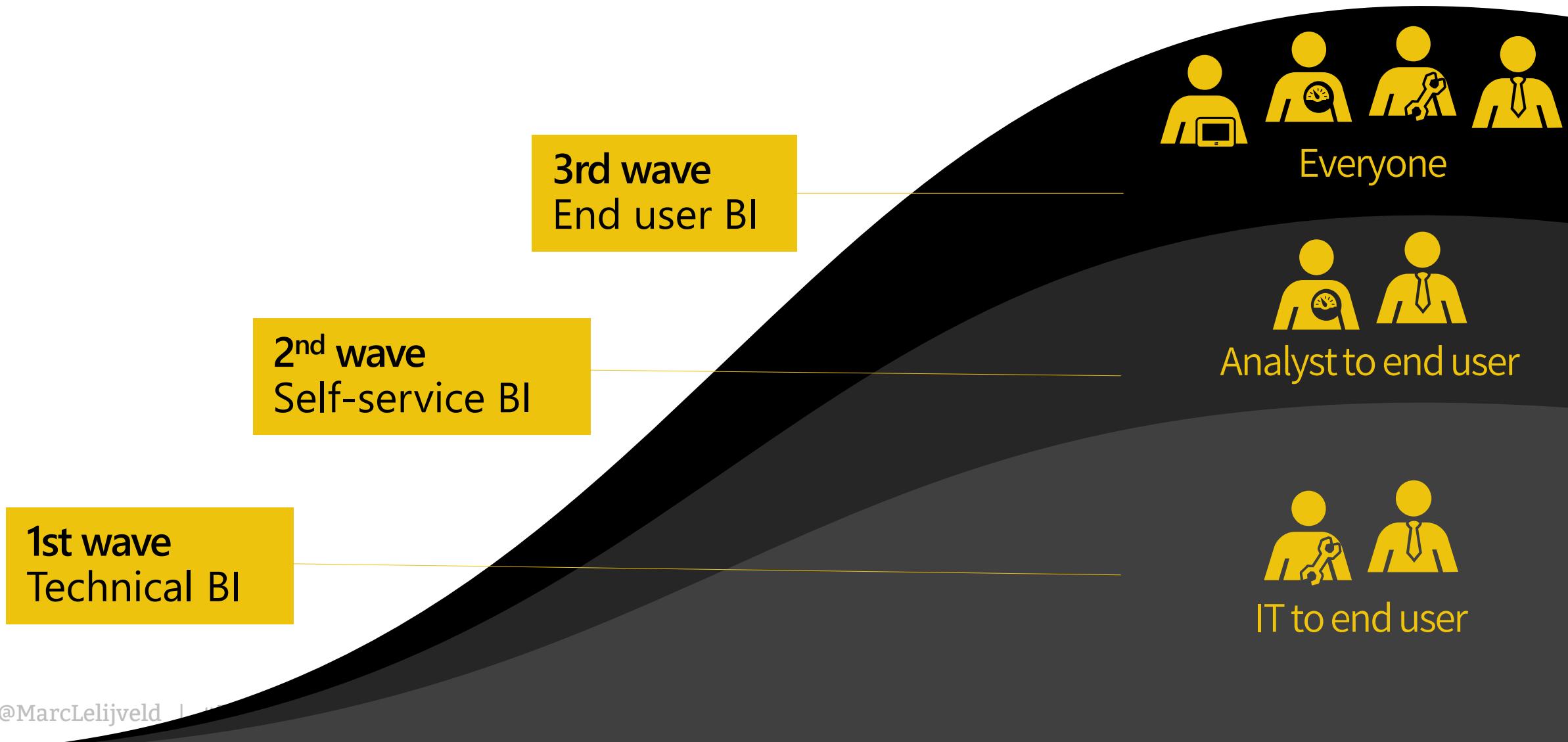


Reporting and dashboarding

Everyone engages with software Power BI



Power BI for everyone!



Types of reporting



Describe



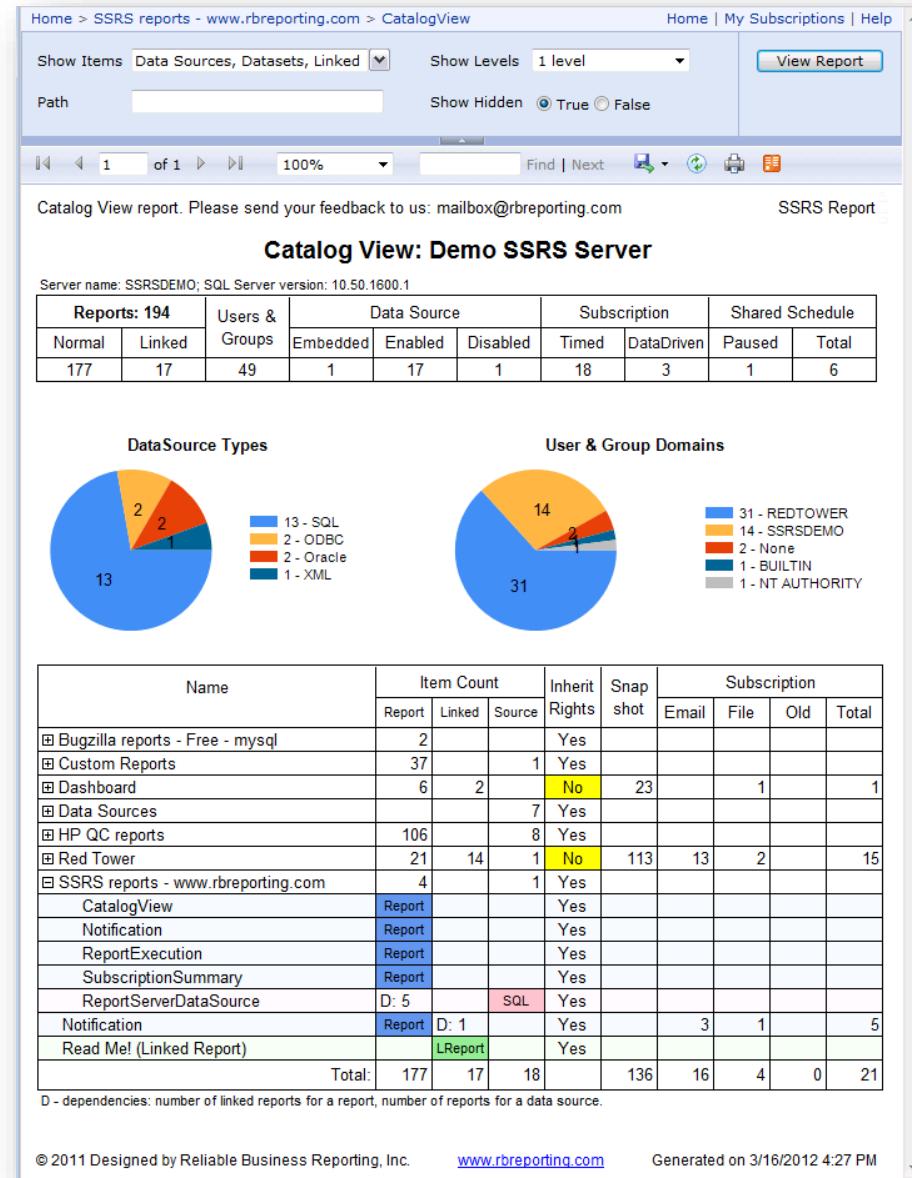
Declare



Explore

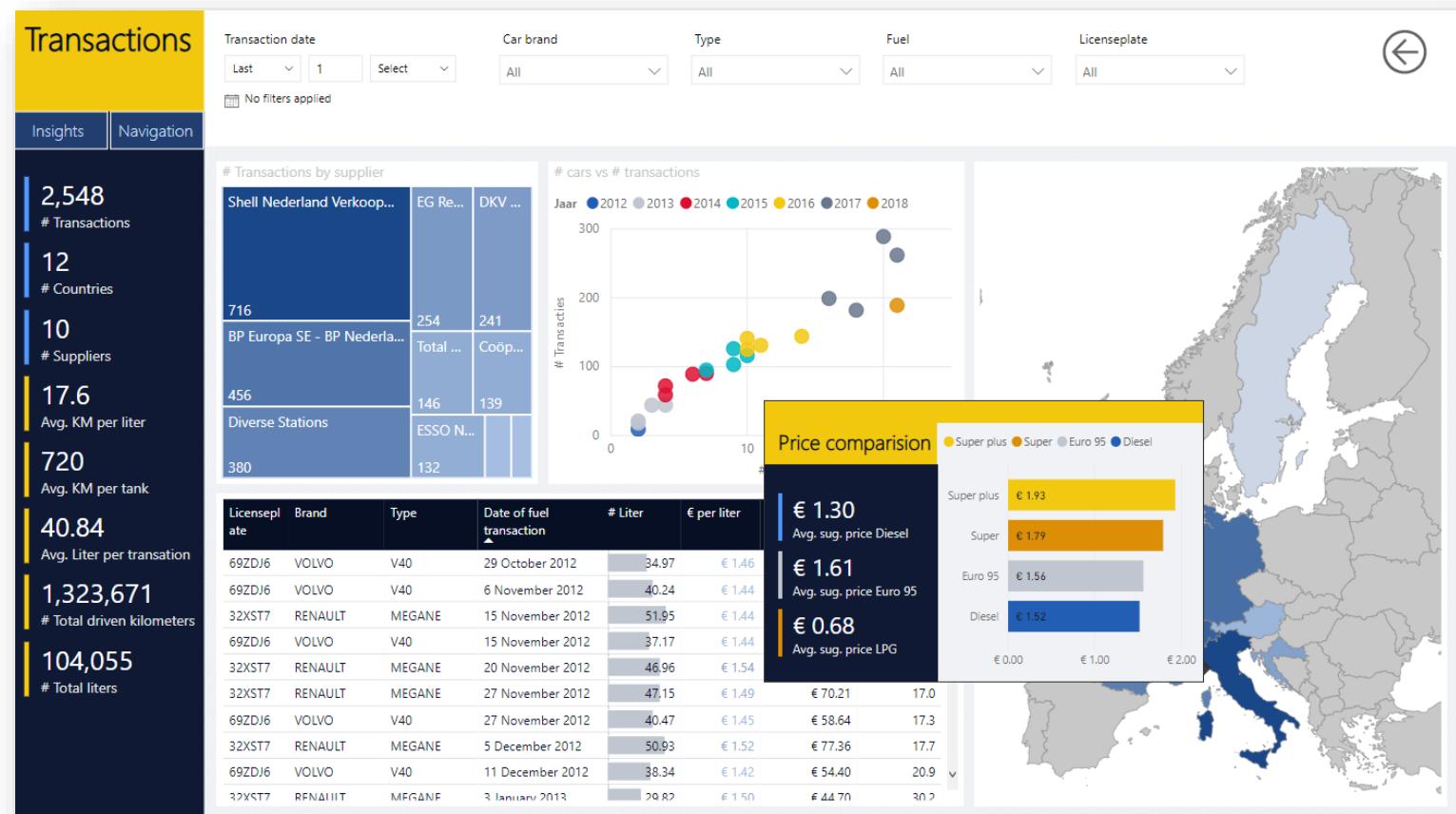
Reporting in the past

- Static
- Paginated
- Textual



Intuitive reporting

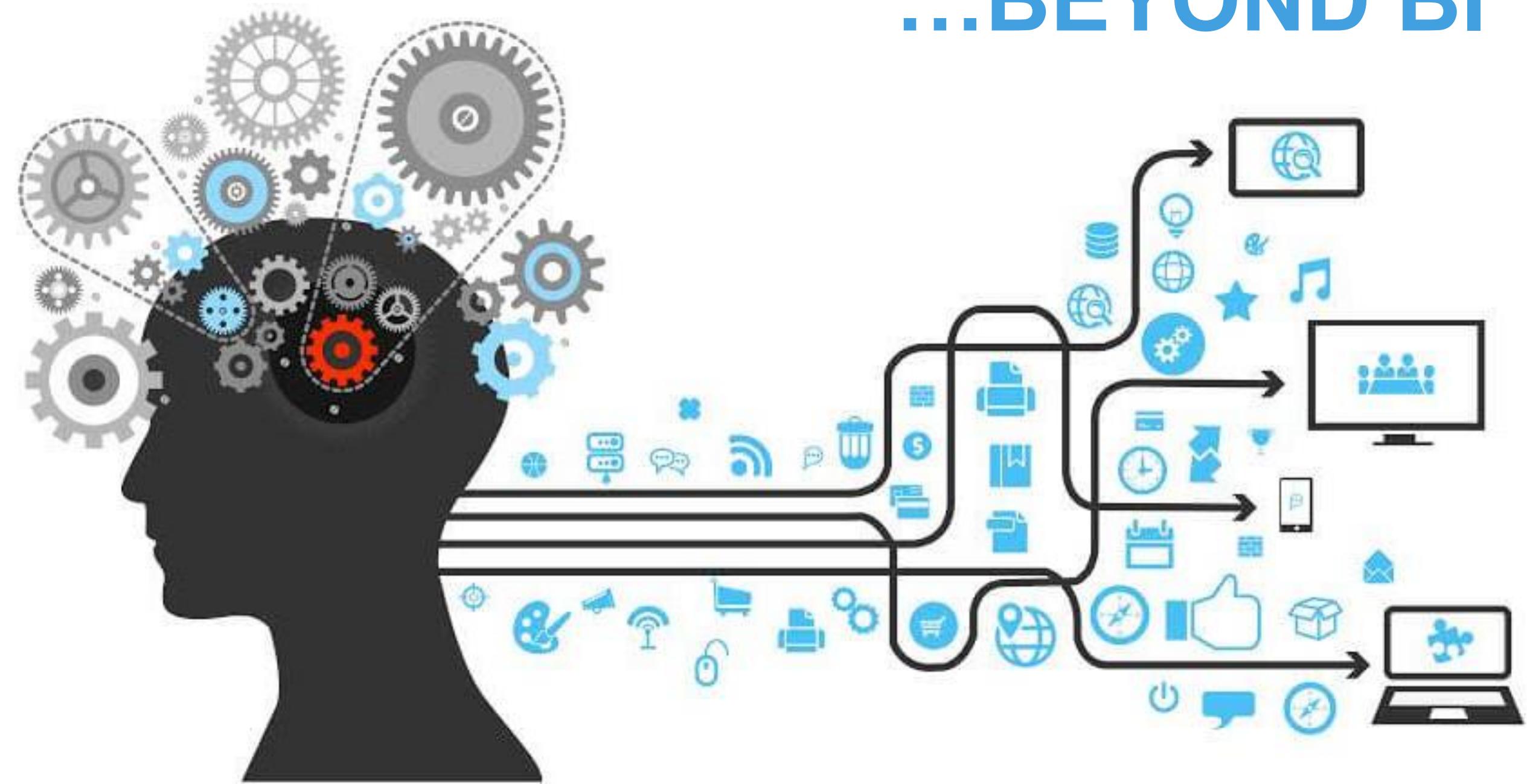
- Clear navigation
- Consistent across pages
- Interactive experience
- High-level > detailed level



BUSINESS INTELLIGENCE...



...BEYOND BI



Entities Machine learning models

Edit entities

Add entities

Save

Close

ENTITY NAME

Accounts

Contacts

Events

Leads

Messages

Opportunities

New to machine learning models? Here's what you'll be doing:

1. Create and train your model

Choose a model type

We'll help you pick the best model to achieve your business goals.



Select training data

Select your base data and related inputs to train your model.



Train your model

The model will train on your data and report on its performance.

2. Improve it

Iterate and retrain

Evaluate, customize and retrain your model until it's optimized.

3. Apply it

Apply the model

Apply your model to future data for predictive insights.

ACTIONS



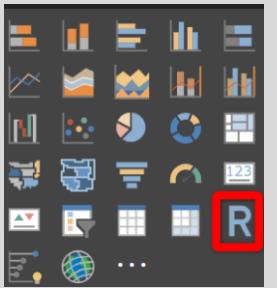
AI in Power BI

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Power BI advanced capabilities

Desktop

Run R in
Power BI
visuals



Desktop

Phyton in
Visuals +
Power
Query



2015

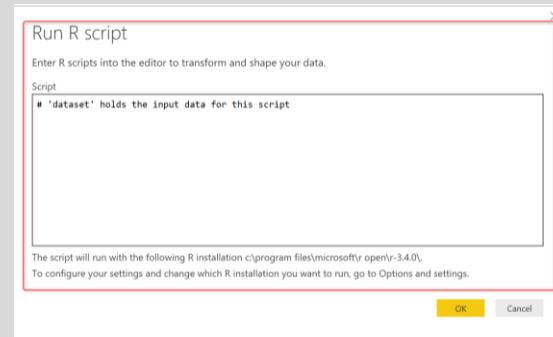
2016

2018

2019

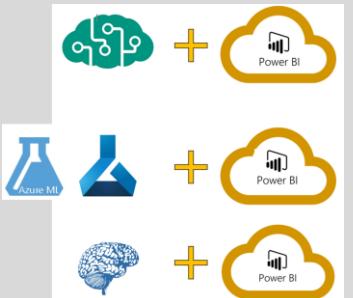
Desktop

R in
Power
Query



Premium features

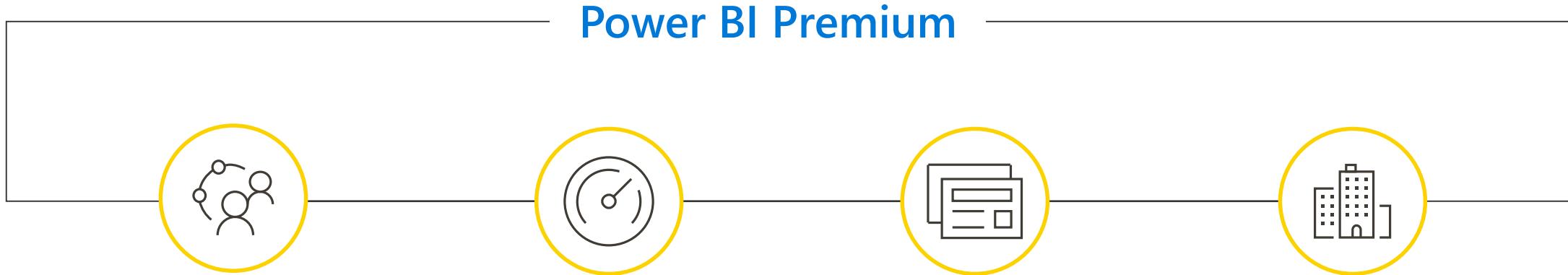
- AI in dataflows
- Key Influencer
- Azure Auto ML
- ML Studio



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Part of Power BI Premium



Flexibility to license
by capacity

Greater scale
and performance

Unifying self-service and
enterprise BI

Extending on-premises
capabilities

Dedicated resources in the cloud



Premium assignment

Acquire dedicated capacity



Office 365 admin portal

Assign workspaces to your dedicated capacity



Consistent performance

Premium workspaces running on dedicated resources

Distribute content to all users



Scale to meet your BI user needs

Power BI Apps / Embed



AI in Power BI



End users



Analysts



BI Professionals



Data Scientists

Natural Language

Automated Insights

CAPABILITIES

- Quick Insights
- Q&A
- AI Visualizations

AI Enrichment

AI Transformations

CAPABILITIES

- Sentiment analysis
- Key phrase extraction
- Image detection

ML Models

Model Deployments

CAPABILITIES

- Predictions
- Classifications

Extends for Data Scientists

CAPABILITIES

- R
- Phyton

Azure ML Integrations

CAPABILITIES

- Auto ML



Make AI available for everyone!

Goal	How?
Help Business Users understand their data	Q&A
	Quick Insights
	Key Drivers
	Clustering



Make AI available for everyone!

Goal	How?
Help Business Users understand their data	Q&A Quick Insights Key Drivers Clustering
Help Analysts prepare their data	Forecasting Cognitive Services Automated ML R Integration



Make AI available for everyone!

Goal	How?
Help Business Users understand their data	Q&A Quick Insights Key Drivers Clustering
Help Analysts prepare their data	Forecasting Cognitive Services Automated ML R Integration
Make it easy for Data Scientists and Analysts to collaborate	Python Integration Azure ML Integration



Demo time!

Because life is boring without risks



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Demos

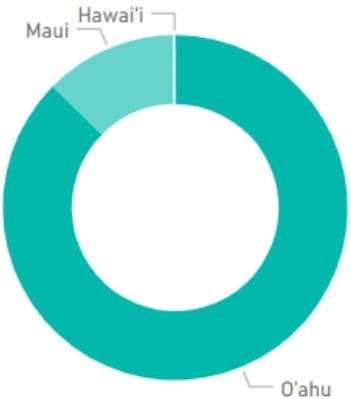
- Quick insights
- Power BI Natural Language Query
- Explain increase / decrease
- Analyze distribution
- Key influencer visual
- AI Insights in dataflows



Quick Insights for Hawaii Tourism Analysis

A subset of your data was analyzed and the following insights were found. [Learn more](#)

Index
BY NAME

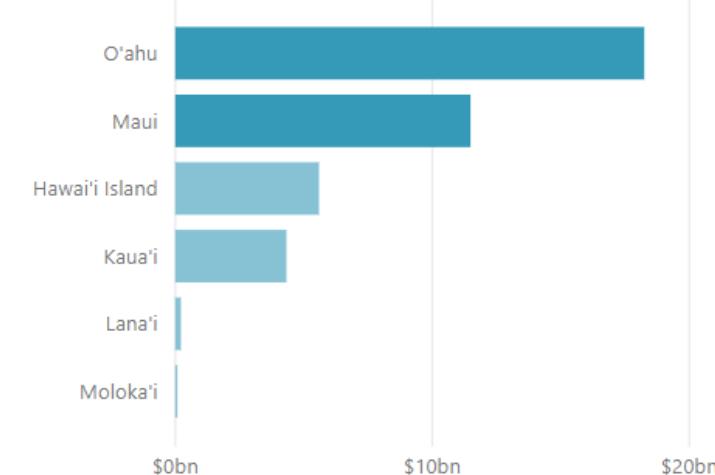


'O'ahu' accounts for the majority of Index.

NAME
● O'ahu
● Maui
● Hawai'i



Expenditures
BY ISLAND NAME



'O'ahu' and 'Maui' have noticeably more Expenditures.

Quick Insights

Questions to get you started

show me average trip length for the last year

show me average trip length YoY% for the last year

show me expenditures for the last year

show me expenditures YoY% for the last year

show me spending per trip (PP) for the last year

number of seasons

Number of visits by region over time

Ask a related question

Clear

Add this question

Visits by Date and Region

Region ● Canada ● Japan ● Other ● US East ● US West

450K

400K

350K

300K



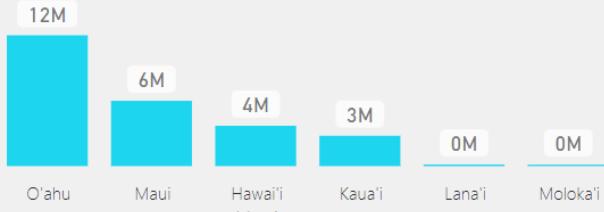
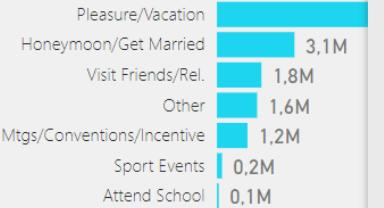
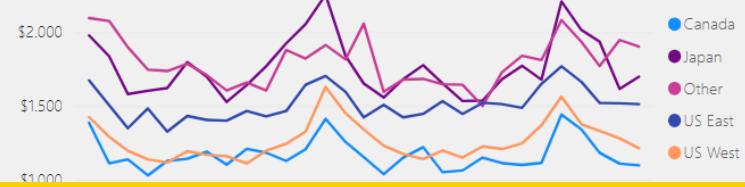
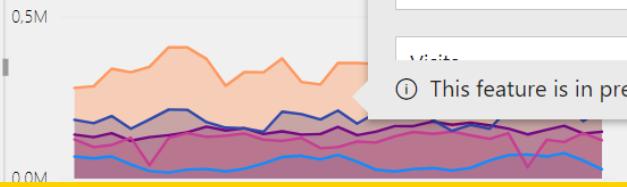
Natural Language Query

27.5M**948K****\$39.9bn**

Visitors

Arrivals per month

Expenditures

**VISITS BY ISLAND****TRIP PURPOSE****SPENDING PER TRIP (PP)****VISITS BY REGION**

'Pleasure/Vacation' accounted for the majority of the increase among Trip Purpose, offsetting the decrease of 'Visit Friends/Rel.'. The relative contributions made by 'Pleasure/Vacation' and 'Visit Friends/Rel.' changed the most.

● Increase ● Decrease ● Total ● Other



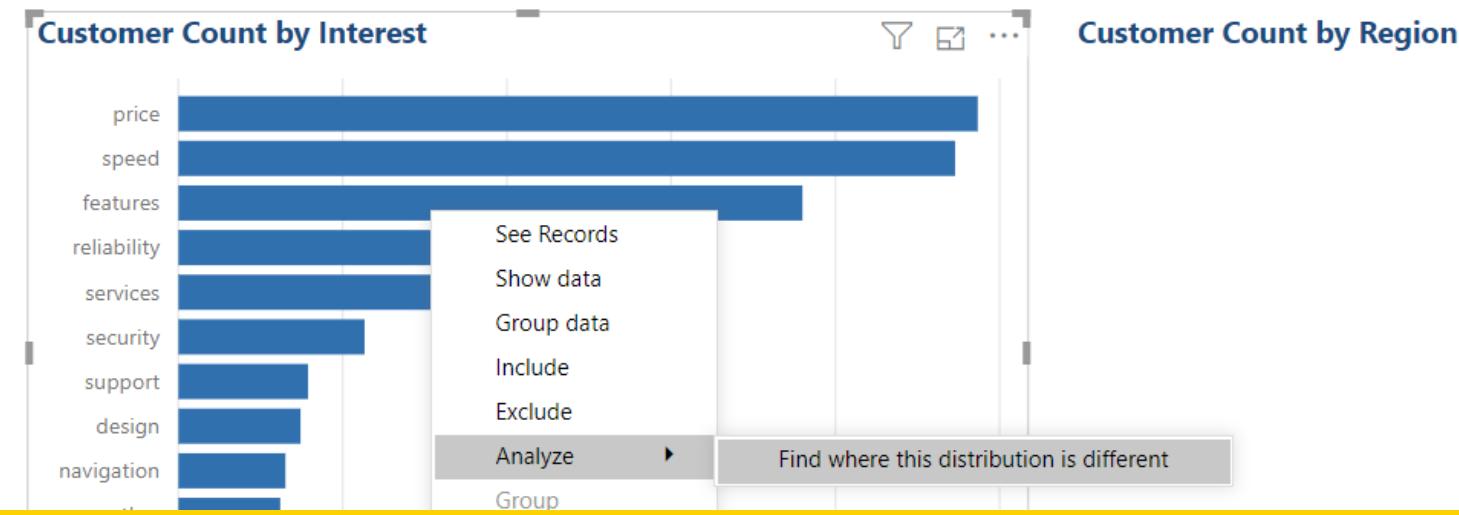
This feature is in preview. [Learn more](#)

Explain Increase / decrease

NEW CUSTOMERS

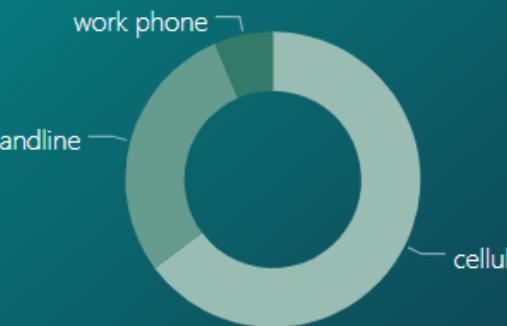
New Customers (February)

45.218



Analyze distribution

COMMUNICATION TYPE



CUSTOMERS BY AGE

Key influencers Top segments

What influences Customers to be Returning ?

When...

....the likelihood of
Customers being Returning
increases by

Country is UK

2.32x

Country is Japan

1.84x

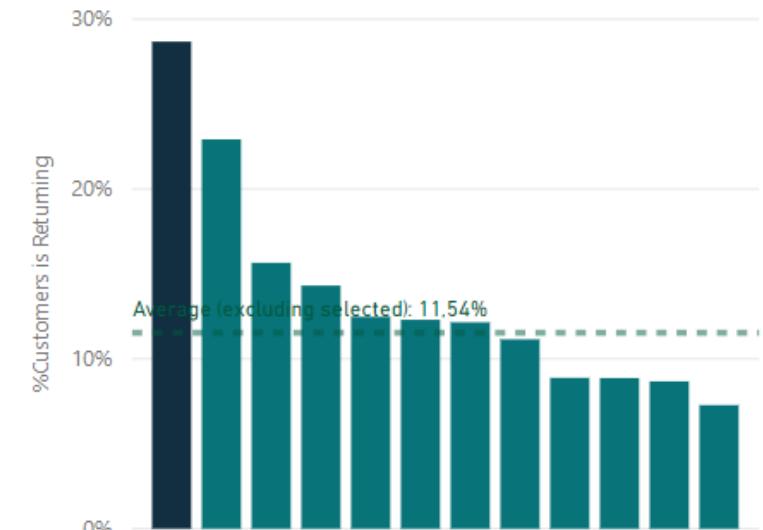
Purchased Spa Visit is yes

1.66x

Primary Interest is relaxation

1.54x

← Customers is more likely to be Returning when Country is UK than otherwise (on average).



Key Influencer Visual

ENTITY NAME

▶  Language Detection

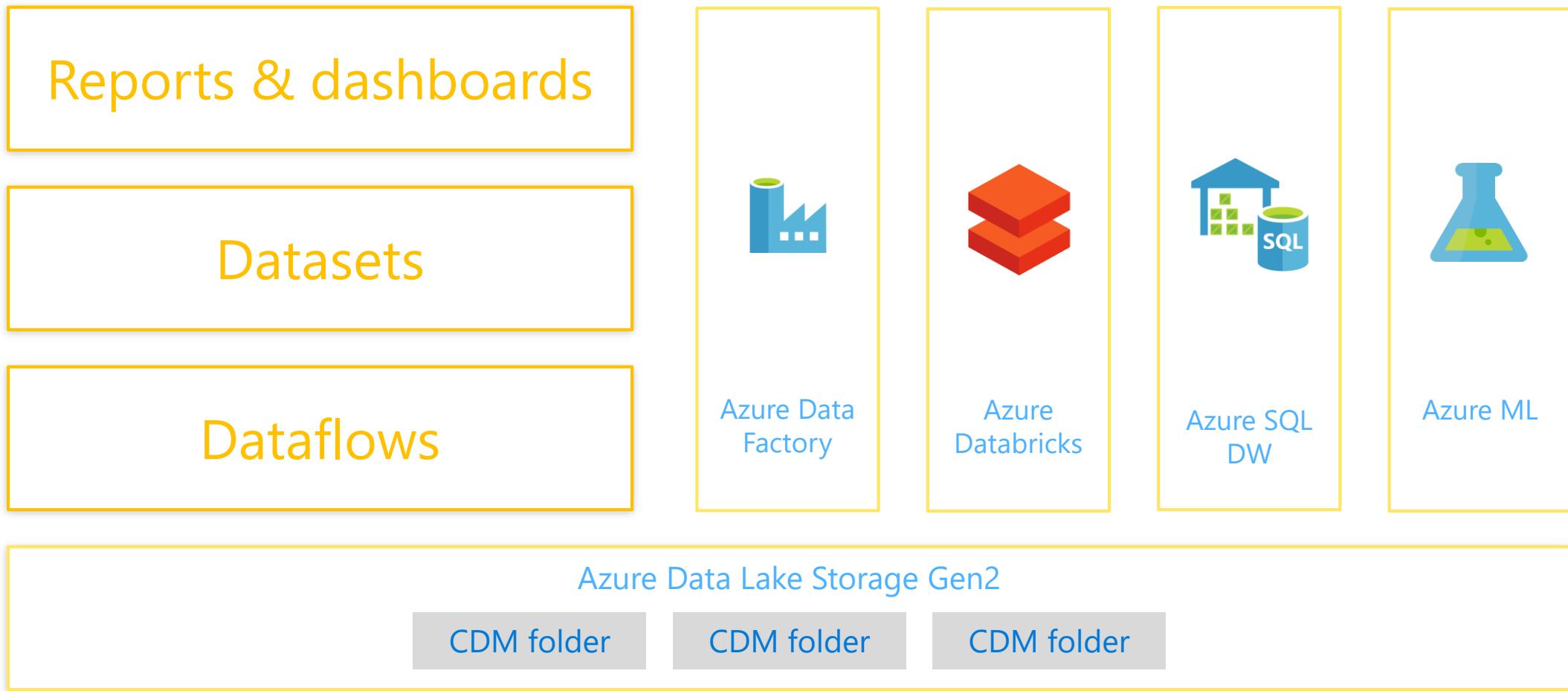
▶  Key Phrases

▶  Sentiment Score

AI Insights in dataflows

Trip advisor hotel reviews IBIS Styles Glasgow

Dataflows



Business analysts
Low/no code

CDM folder

CDM folder

Data scientists
Data engineers
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Cognitive services



Vision



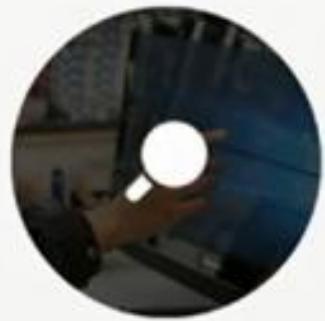
Speech



Language



Knowledge



Search

Pervasive application of AI

New capabilities that make AI accessible for everyone

- Text analytics and image recognition through Azure Cognitive Services integration
- Key driver analysis helps surface what drives an outcome
- Enable business analysts to create new ML models through Automated ML
- Seamless collaboration between business analysts and data scientists through Azure ML integration

The screenshot shows the Power BI Entities screen. At the top, there's a navigation bar with 'Power BI', a user icon, 'AI test', and 'SalesOpportunities'. Below the navigation is a toolbar with 'Edit entities', 'Add entities', 'Save', and 'Close'. The main area is titled 'Entities' and shows a list of custom entities:

ENTITY NAME	ENTITY TYPE	ACTIONS
Account	Custom	
Contact	Custom	
Lead	Custom	
Opportunity	Custom	
OpportunityProduct	Custom	
Product	Custom	
SystemUser	Custom	



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— / — / — Check Out
— / — / — Guests
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Lol.travel ↗	€96	TripAdvisor	€78

Certificate of Excellence

Traveler (510)

Room & Suite (150)

Dining

[View all photos \(602\)](#)

Big thanks to...

- Justyna Lucznik (MSFT) – Demo's and inspiration
- Leila Etaai (MVP) – Inspiration

Other resources:

- Microsoft News – Award winning Wisky with AI
- Towards Data Science – AI is not innovation
- HPE – AI, what it is



Recap

- AI is more than BI
- AI != Innovation
- Inspire, optimize and detect patterns
- AI on your fingertips in Power BI
- Next level insights with AI insights (PBI Premium)



LET'S
RECAP...



Download for free!

[Https://bit.ly/cheatsheetpbi](https://bit.ly/cheatsheetpbi)



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The graphic shows two pages of the Power BI Cheat Sheet. The top page is titled "Power BI Cheat Sheet" and "April 2019". It has sections for "Power Query" and "Data Model". The "Power Query" section contains 12 tips and tricks, such as giving every step an explanatory name and merging steps of the same type. The "Data Model" section contains 17 tips and tricks, including always using a separate Date table and utilizing DAX Calculated Columns. The bottom page is titled "I'VE GOT THE POWER BI" and "macaw". It lists resources like Power Query M Formula Reference and NotePad++ Power Query support.

Power BI Cheat Sheet
April 2019
<https://bit.ly/cheatsheetpbi>

Power Query

Tips & Tricks

1. Give every step an explanatory name and merge steps of the same type, for better manageability.
2. Give queries and columns user-friendly names (this is also necessary to utilize Q&A).
3. Make sure that each column has the correct data type. Making the model smaller and faster.
4. Remove columns you are not going to use in your report. Prefer 'Remove Other Columns' above the 'Remove Columns' option, for lower risk that structural changes in your data source break the query.
5. Maximize the use of Query Folding for faster and more efficient queries. With Query Folding, multiple transformations are merged as one query and then sent to the source. If 'View Native Query' is not available, Query Folding has stopped before that step.
6. Structure your queries in folders. For example Facts, Dimensions, Functions, Misc.
7. You can copy and paste Queries easily between files. Dependencies will be included (parameters/queries/functions), and Data Sources will be automatically listed.
8. Turn off 'Enable Load' for queries/tables that you don't need in the Data Model.
9. Re-use Power Query code and lower impact on your data source by using Power BI dataflows.
10. Turn on the Formula Bar so you get familiar with Power Query (M) code.
11. In general, prefer "Import" over "DirectQuery". Unless the amount of data is too large to import, or when there are other requirements (like real-time insights).
12. Automatically beautify all column names in a query, e.g. "CustomerName" → "Customer Name". Note: he also has a function to replace underscores in all column names automatically.

Code examples (don't forget that Power Query / M is case-sensitive!)

- `if T = 0 then A else B`
- `try A otherwise 0`
- `#Table([{"X", "Y"}, {1, 2}, {3, 4}])`
- `Date.Time.LocalNow()`
- `Date.From([Date.Time.LocalNow()])`
- `Excel.Workbook(Web.Contents("url")/[filename].xlsx"), null, true)`

Resources

- Power Query M Formula Reference: <http://bit.ly/PQMReference>.
- NotePad++ Power Query support by Lars Schreiber: <http://bit.ly/PQinNotePad>.

I'VE GOT THE POWER BI

macaw

Session Feedback
bit.ly/2019sfeedback



Please provide your feedback

[Https://bit.ly/2019sfeedback](https://bit.ly/2019sfeedback)



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Challenge accepted.