

AI capabilities in Power BI

to make AI accessible for everyone





Artificial intelligence



Ongeveer 119.000.000 resultaten

Artificial Intelligence



ALL

IMAGES

VIDEOS

MAPS

NEWS

MY SAVES



Artificial Intelligence in 2020, waar moeten business leaders op letten?

Emerce - 23 jan



Nieuw op YouTube: Artificial Intelligence

EPO 3FM - 23 jan



4 dingen waar we in 2020 meer over kunnen gaan praten

Business Insider - 23 jan



NEDERLAND: Persberichten over de AI-trends in Nederland

Amsterdam, 23 jan



Dominante rol voor artificial intelligence in IT-trends 2020

Customer Talk - 23 jan



AI Is About To Change Everything

TIME - 23 jan

But the latest prospect of n



Artificial intelligence in 2020

ZDNet - 23 jan



Topverhalen



Zaken



Entertainment



Nederland



Wetenschap/techniek



Sport



Wereld

Past 24 hours

Best match

All sources

Emerce

customertalk.nl

FashionUnited

De Morgen

Computable



Artificial Intelligence in 2020, waar moeten business leaders op letten?

Artificial Intelligence is veelomvattend: van het spelen van games tot gezichtsherkenning en zelfrijdende auto's. De meeste mensen realiseren zich niet eens hoe vaak AI achter de schermen werkt om ...

Emerce | 1d



Dominante rol voor artificial intelligence in IT-trends 2020

En hoewel er voor 2020 een hoop voorspellingen worden gedaan over de nieuwste trends en invloeden, is artificial intelligence ...

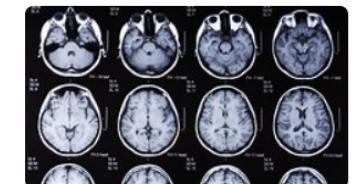
customertalk.nl | 9d



Aandeel artificial intelligence (AI) in de modeindustrie naar verwachting meer dan 36 procent gegroeid in 2027

New York - De waarde van artificial intelligence (AI) in de modeindustrie bedroeg wereldwijd 270 miljoen dollar (242 miljoen ...

FashionUnited | 8d



Trifork helpt detacheerde The Employment Group met AI

Trifork ontwikkelde hiervoor samen met The Employment Group(TEG) en PwC het digitale matchingplatform Boest. Dit platform ...

Emerce | 2d

Vrouw? Computer says no



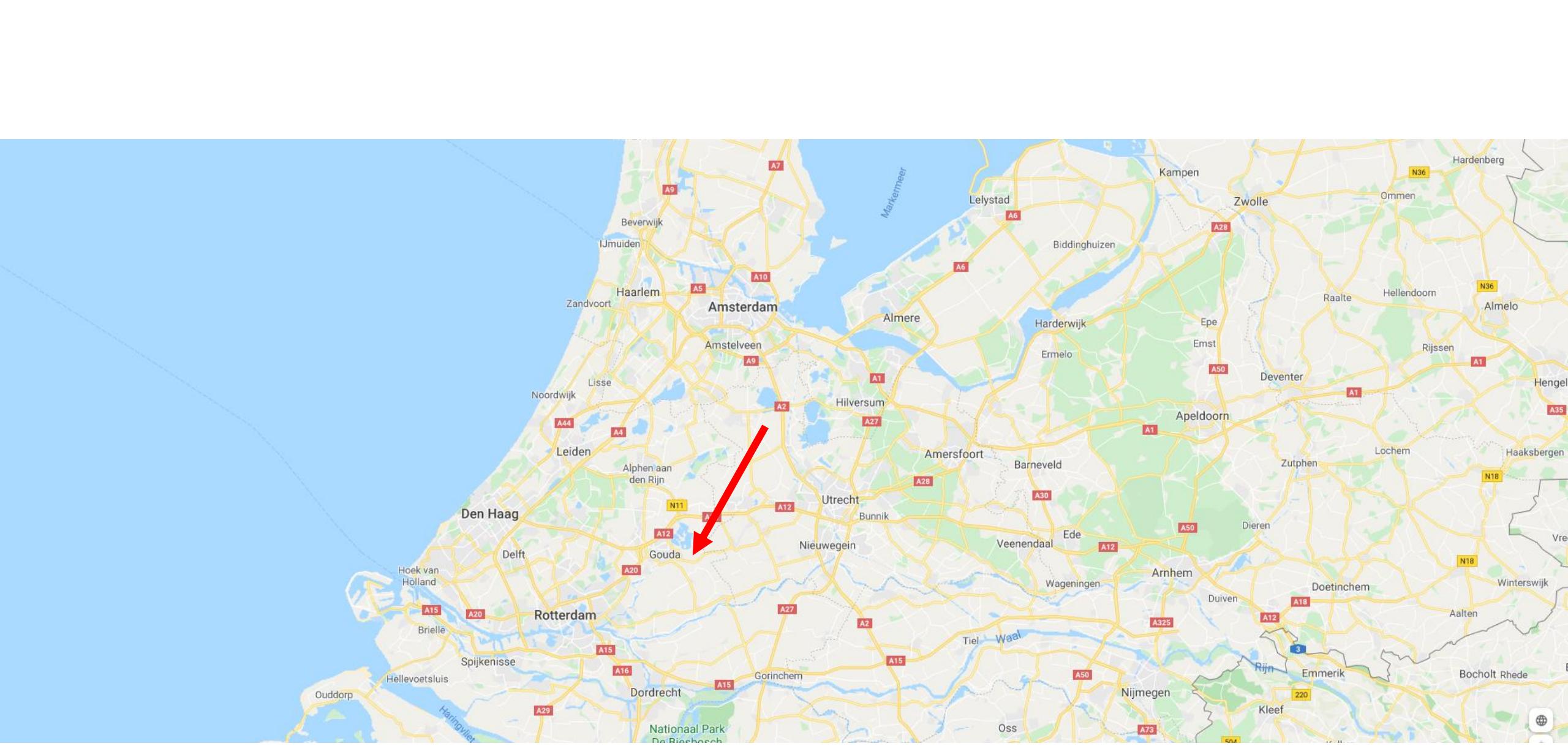
Marc Lelijveld

Data & AI consultant
Macaw Netherlands



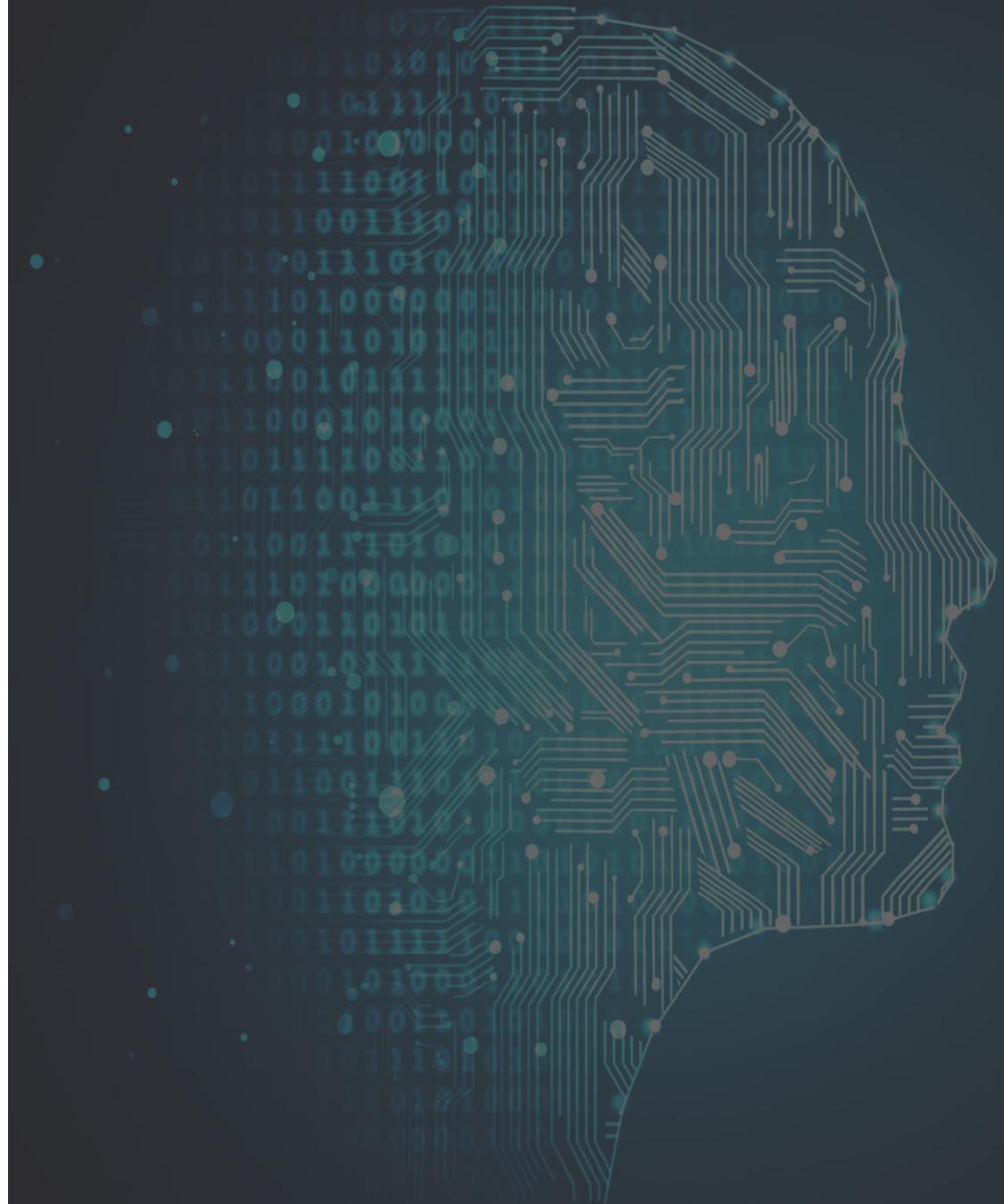
- ✉ Marc.Lelijveld@outlook.com
- 🐦 @MarcLelijveld
- linkedin.com/in/MarcLelijveld
- 🌐 Data-Marc.com





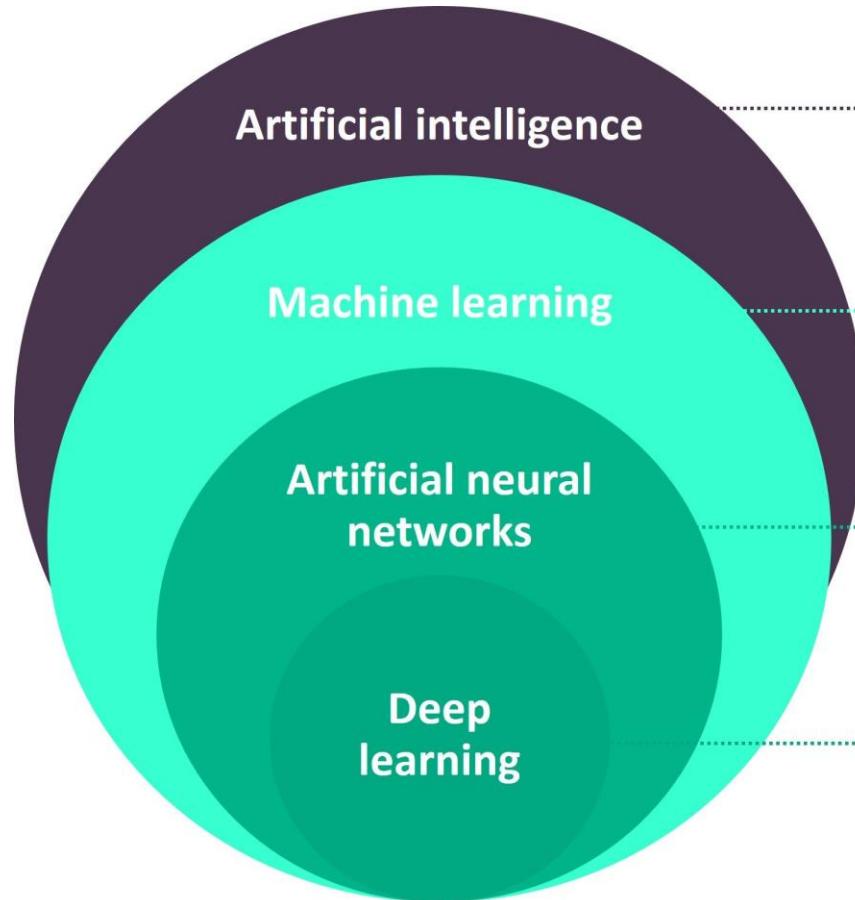
What we cover today

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



Artificial Intelligence

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

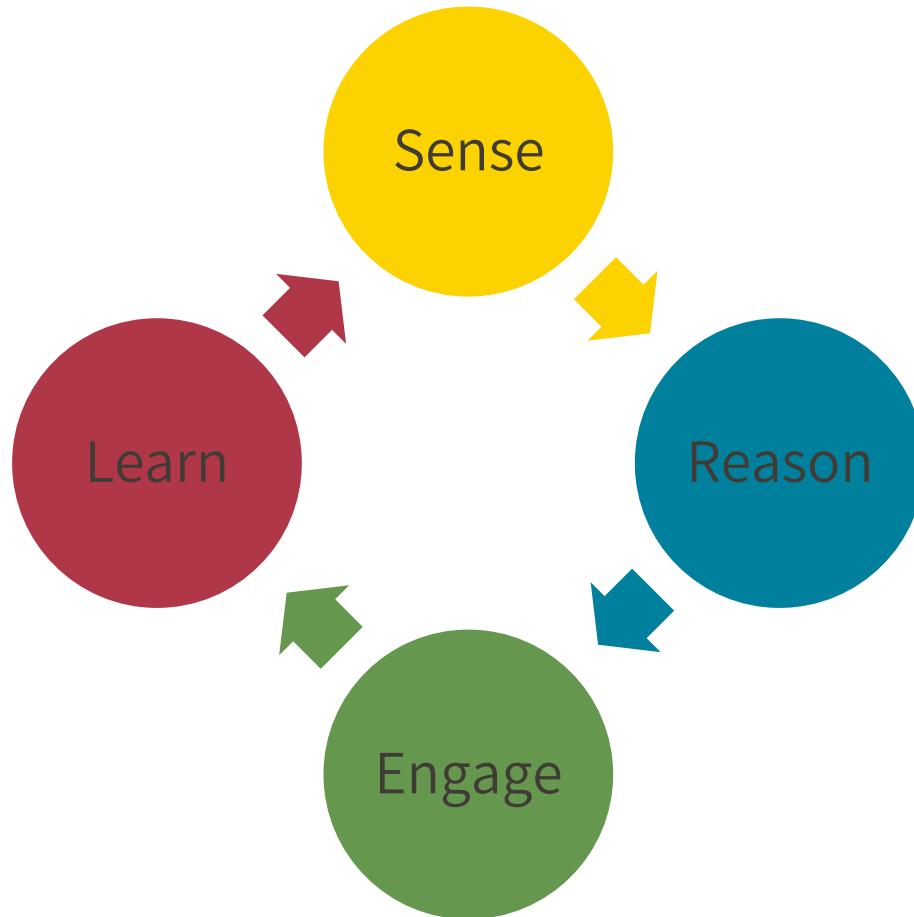
Artificial neural networks (ANN)

Brain-inspired machine learning models

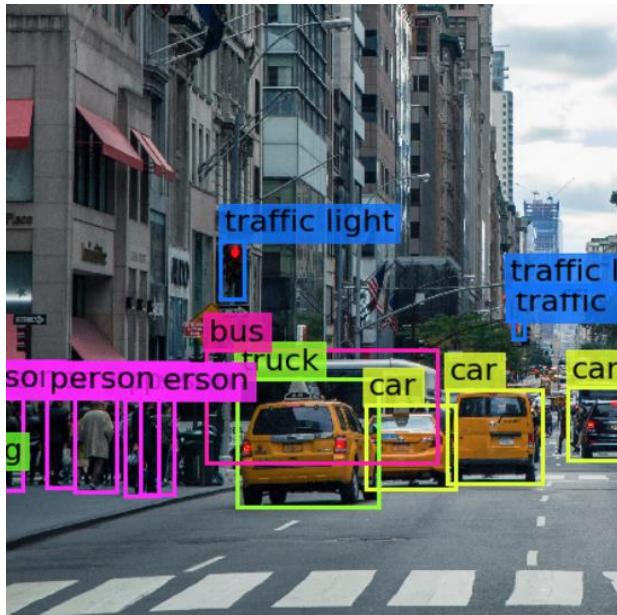
Deep learning (DL)

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



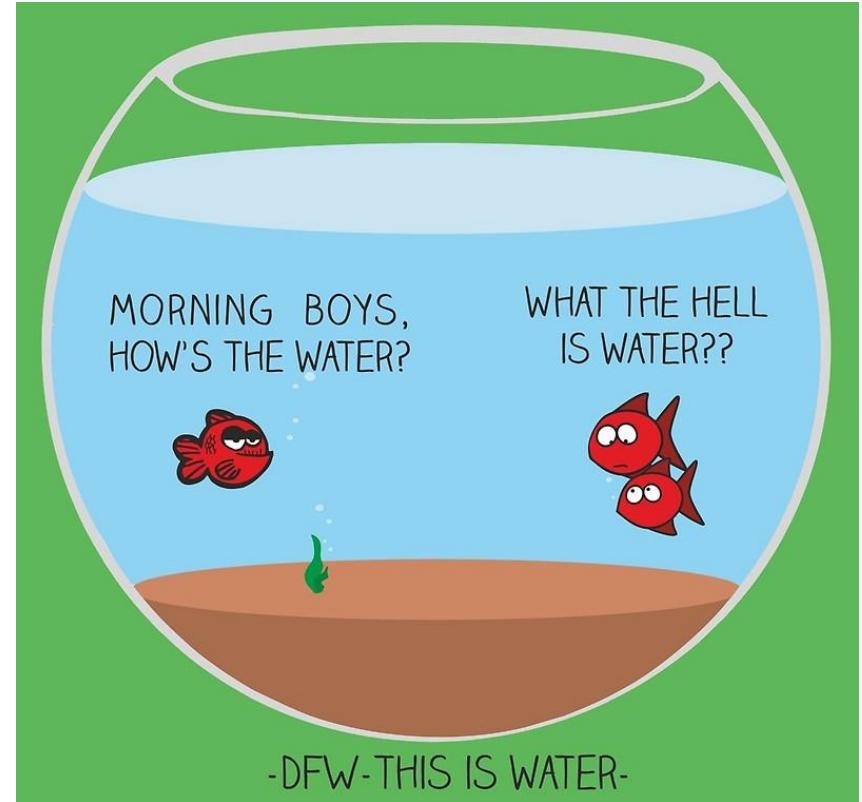
And more....

AI != Innovation

Does not understand the real world!

But Artificial Intelligence can:

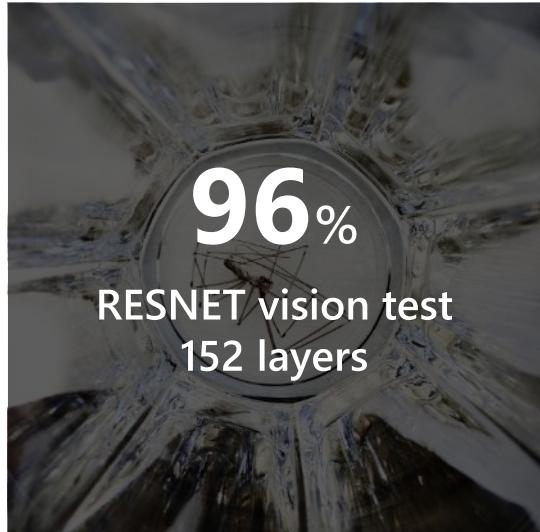
- Learn
- Optimize
- Detect patterns
- Inform
- Inspire



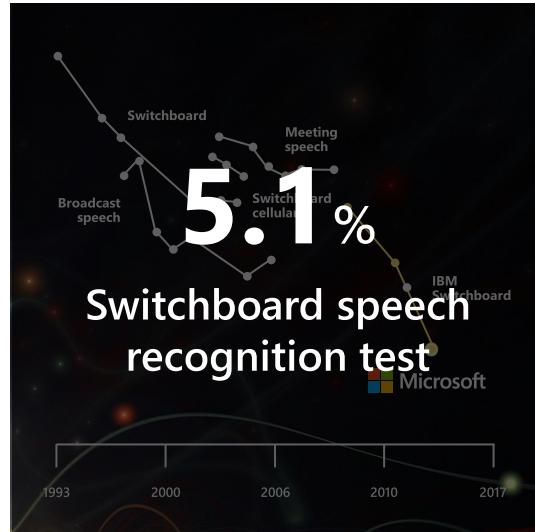
AI lives in water, yet it doesn't know what water is.
David Foster Wallace

Microsoft AI breakthrough

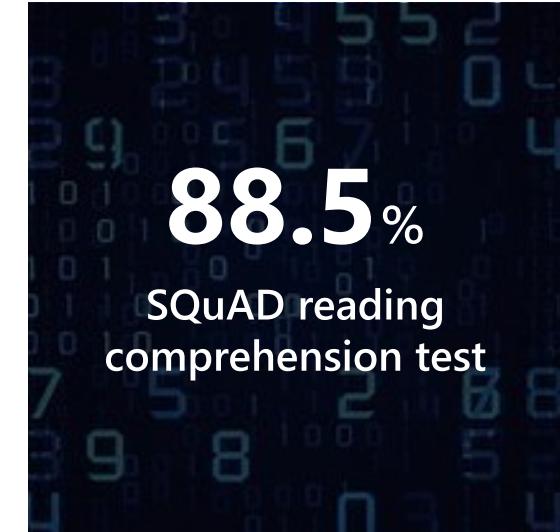
Vision



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

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

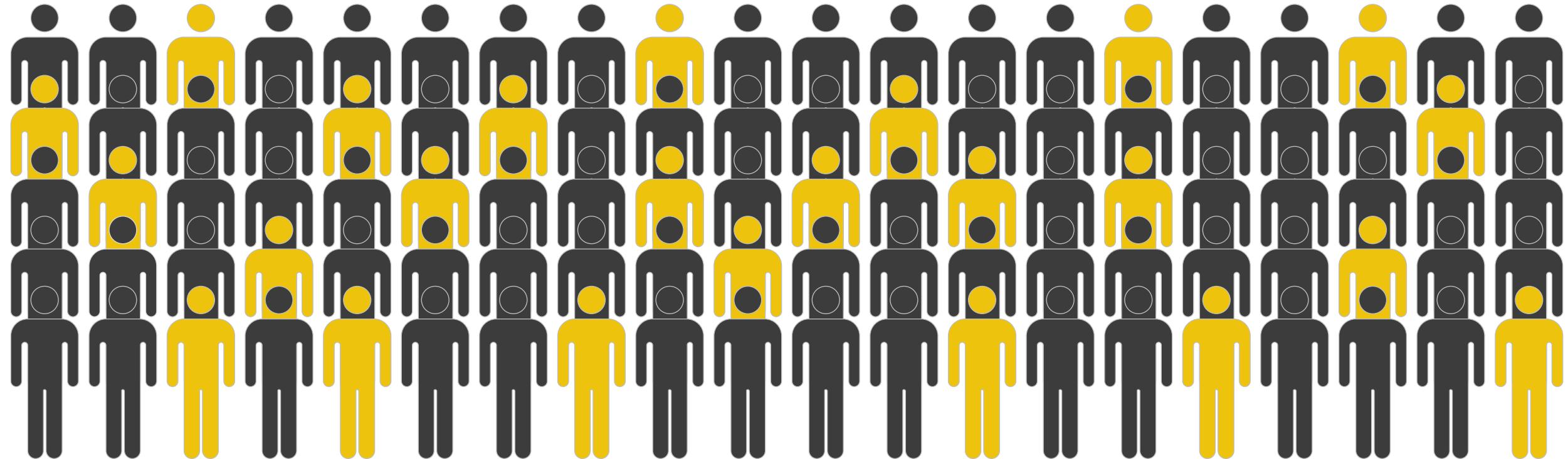
Customer preferences

Azure
cloud platform

Ingredients of
award-winning
blends

Reporting and dashboarding

Everyone engages with ~~software~~ Power BI



Types of reporting



Describe



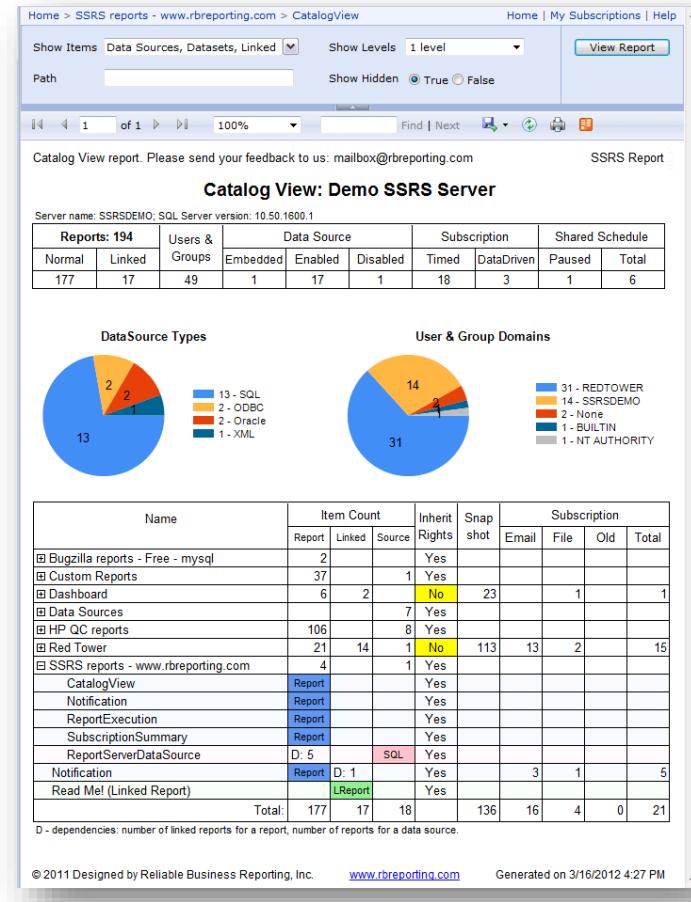
Declare



Explore

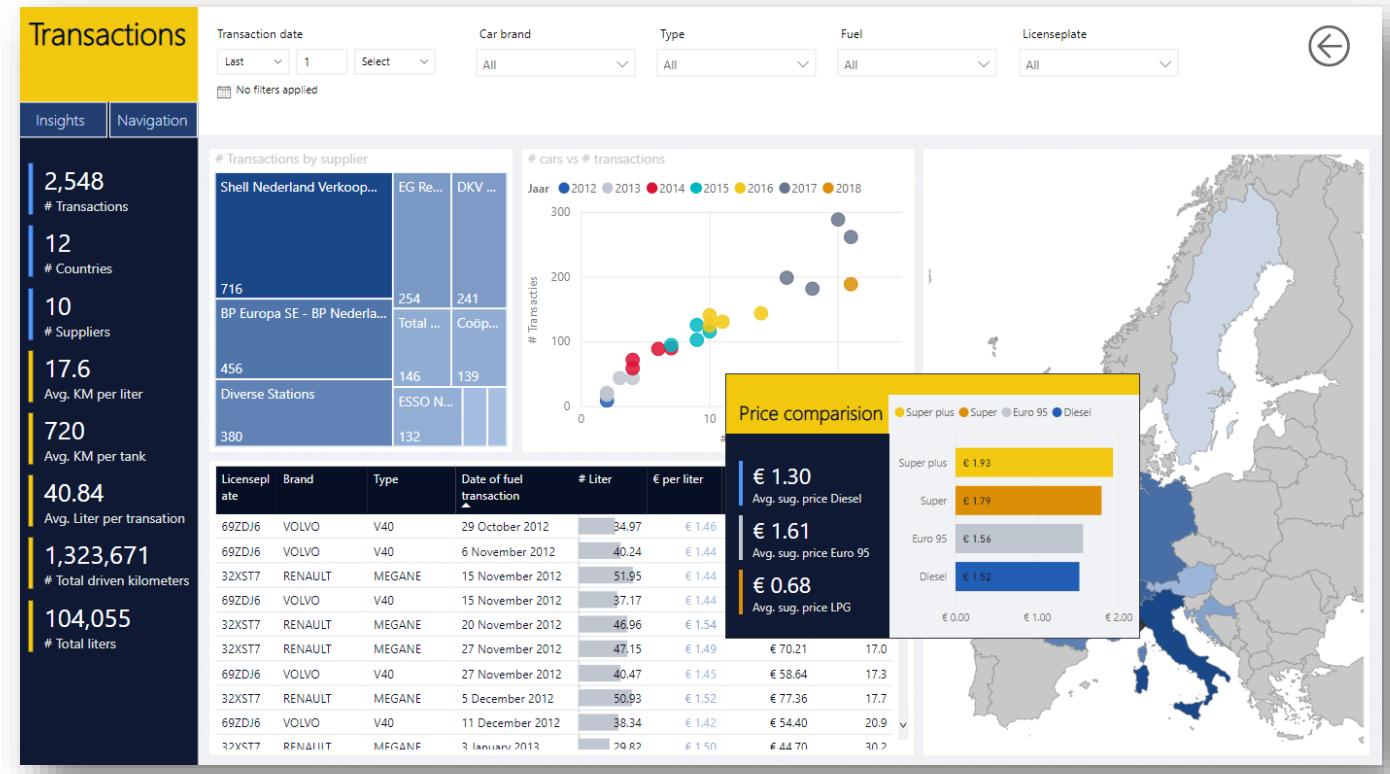
Reporting in the past

- Static
- Paginated
- Textual



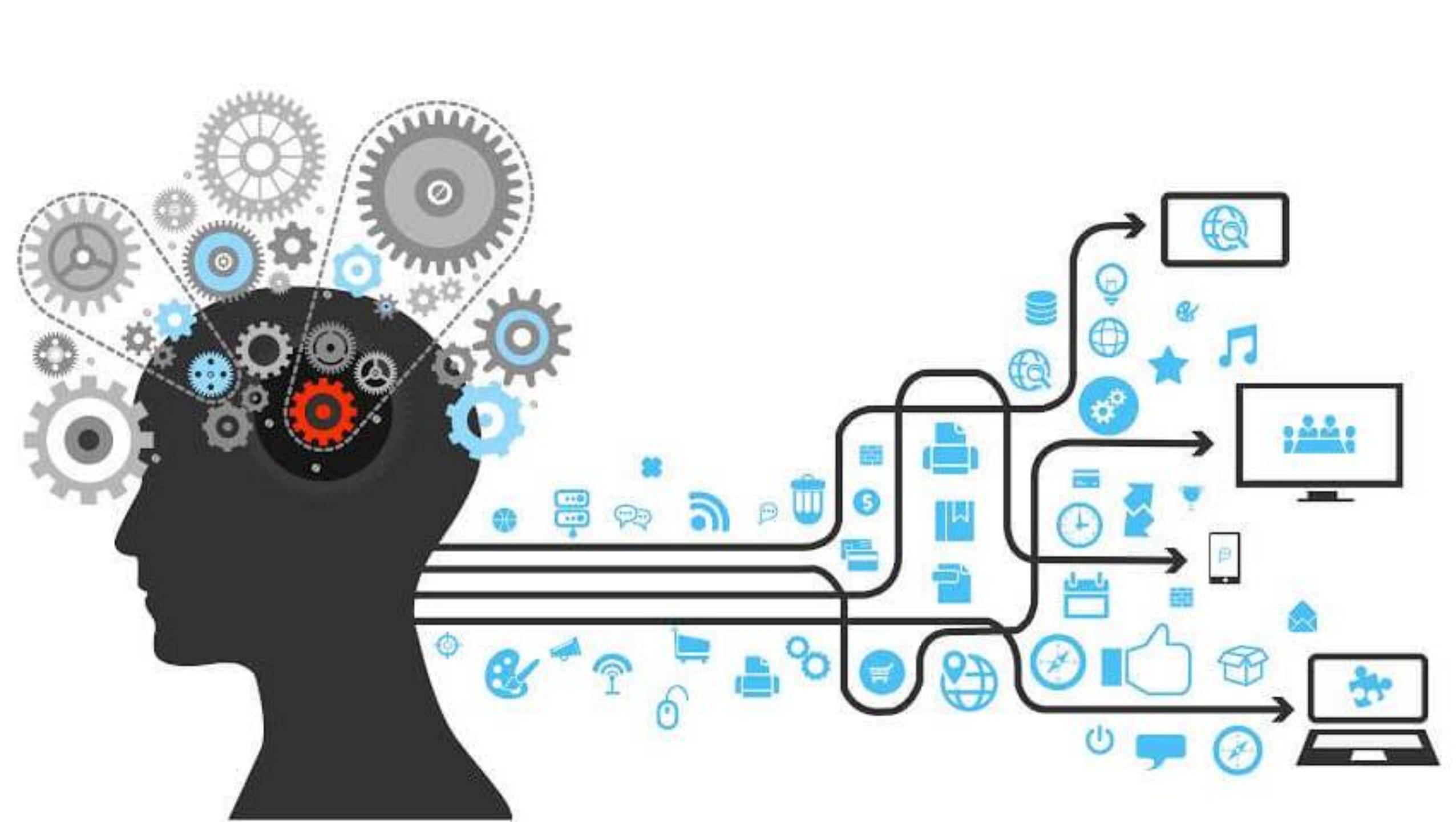
Intuitive reporting

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



BUSINESS INTELLIGENCE

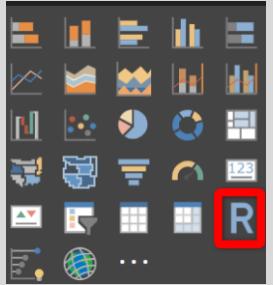




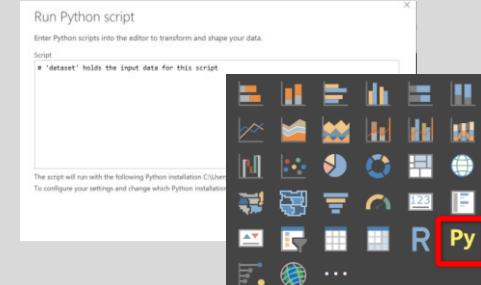
AI in Power BI

Power BI advanced capabilities

Desktop
Run R in
Power BI
visuals



Desktop
Phyton in
Visuals +
Power
Query



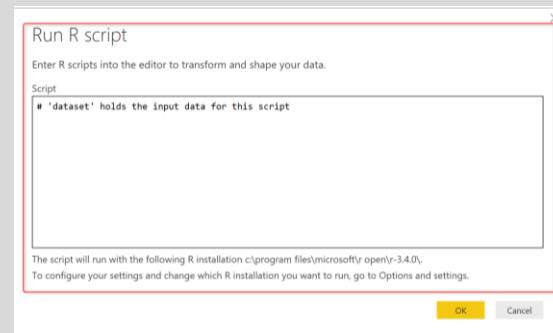
2015

2016

2018

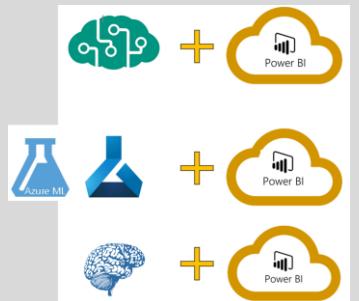
2019

Desktop
R in
Power
Query

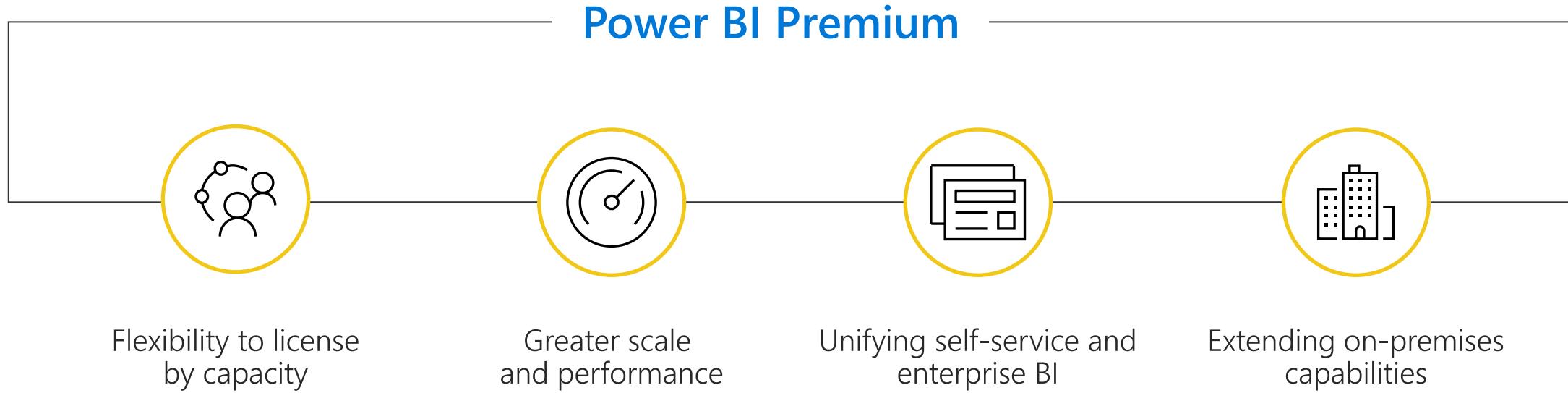


Premium features

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



Part of Power BI Premium



Dedicated resources in the cloud

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
Help Analysts prepare their data	Clustering
	Forecasting
	Cognitive Services
Make it easy for Data Scientists and Analysts to collaborate	Automated ML
	R Integration
	Python Integration
	Azure ML Integration

Demo time!

Because life is boring without risks



Demos

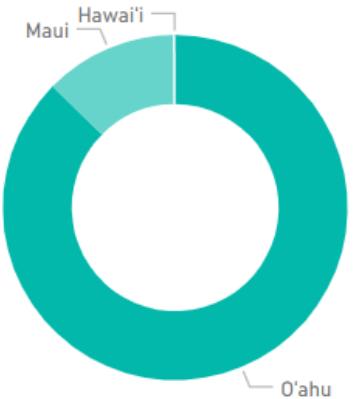
- Quick insights
- Power BI Natural Language Query
- Explain increase / decrease
- Analyze distribution
- Key influencer visual
- Decomposition tree
- AI Insights (in dataflows)



Quick Insights for Hawaii Tourism Analysis

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

Index
BY NAME

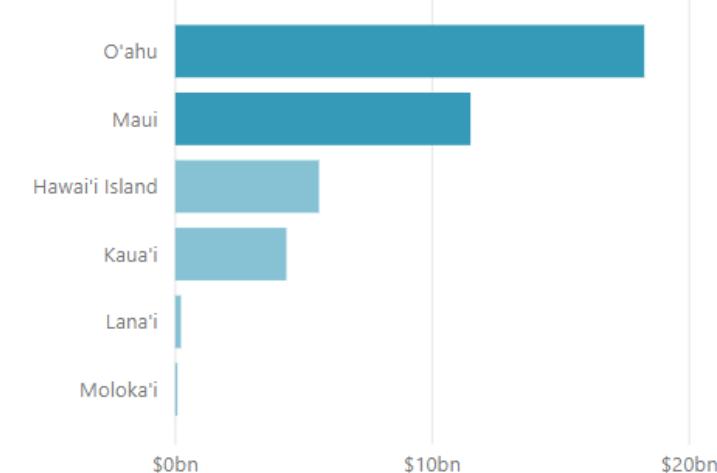


'O'ahu' accounts for the majority of Index.

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



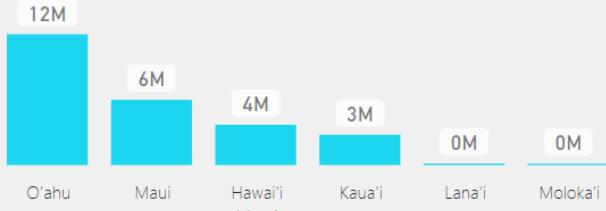
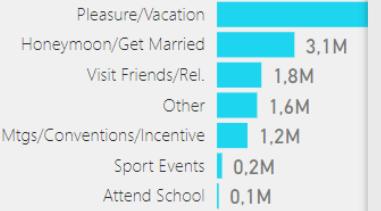
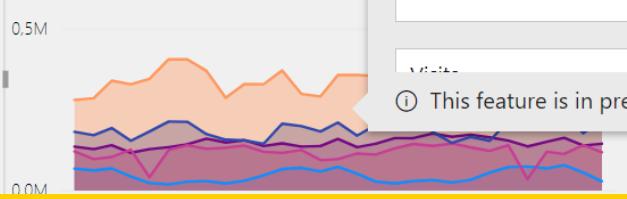
Natural Language Query

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

Island Weather

Islands

Major Market Areas

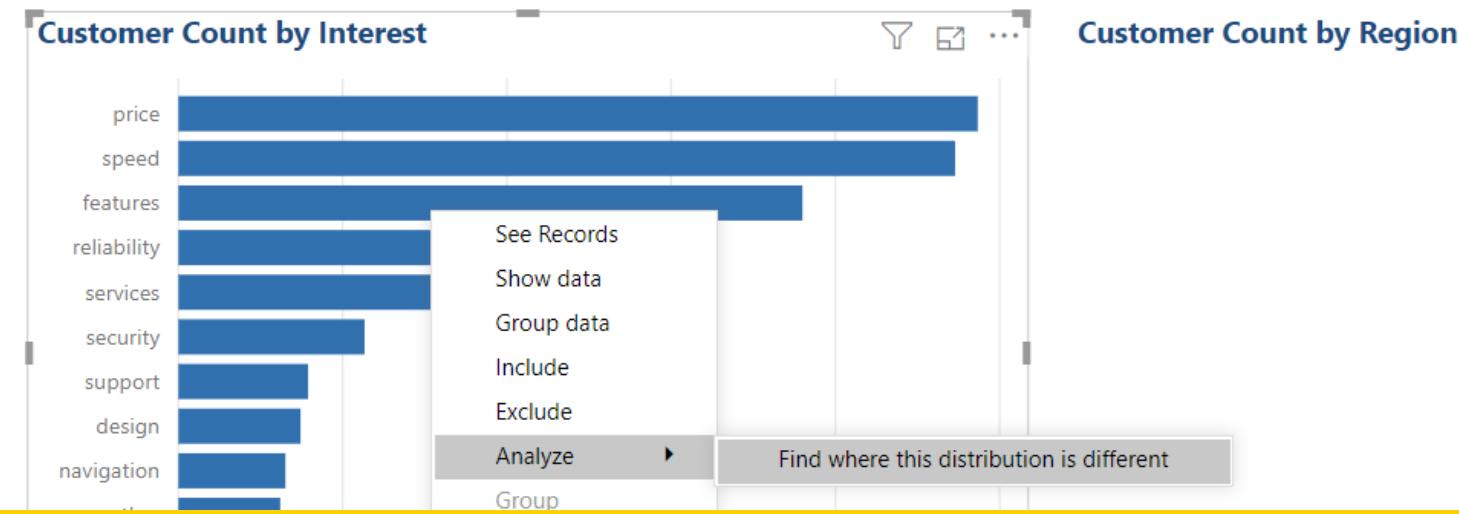
Table

Trip Purpose Statist...

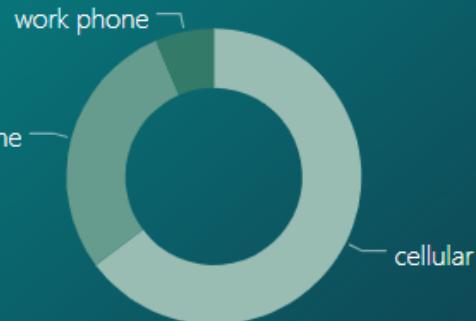
NEW CUSTOMERS

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

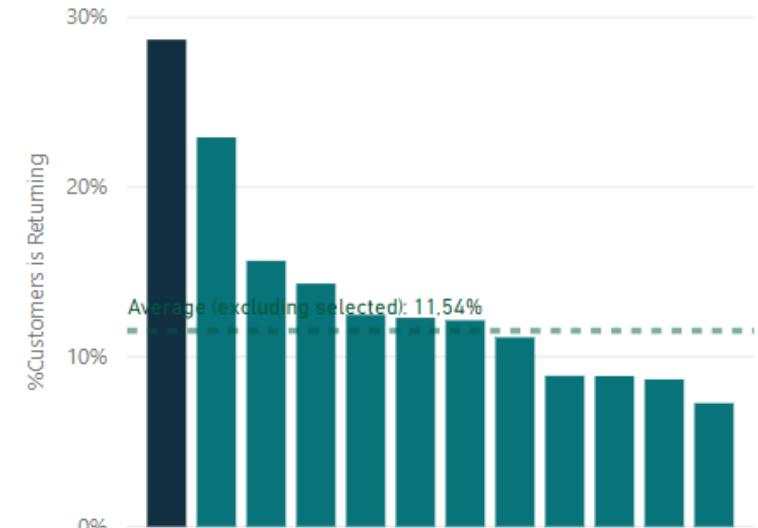
Purchased Spa Visit is yes

1.66x

Primary Interest is relaxation

1.54x

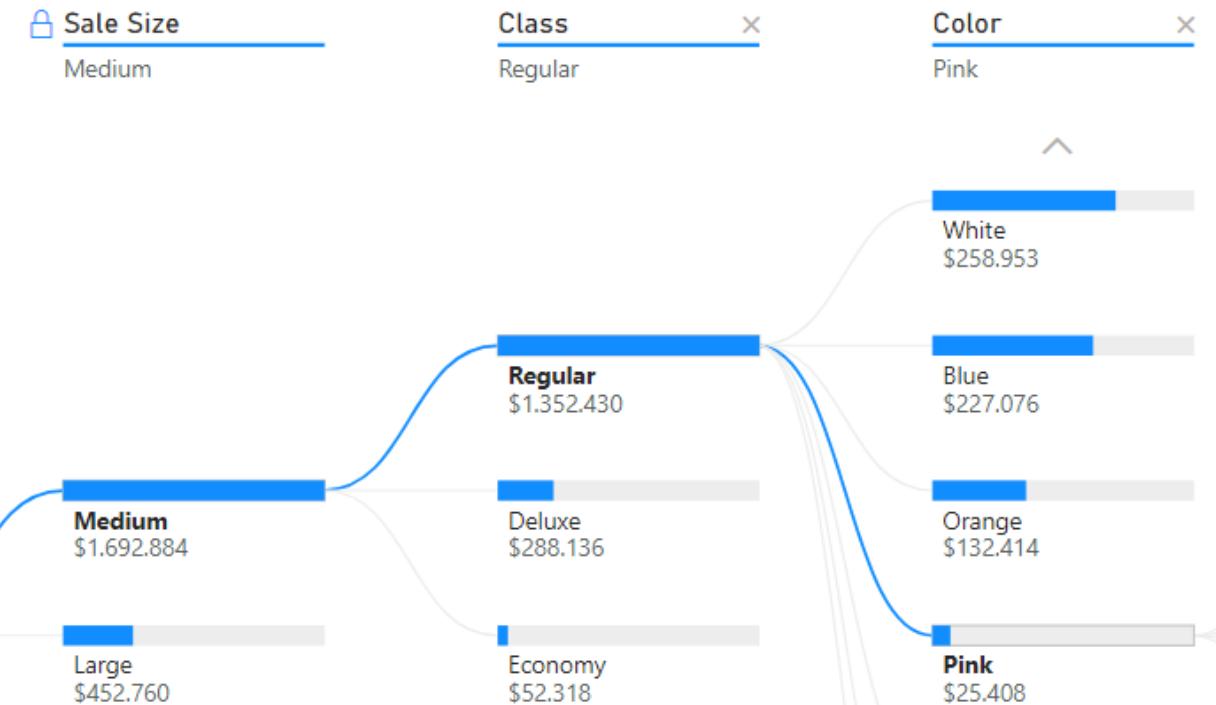
← Customers is more likely to be Returning when Country is UK than otherwise (on average).



Key Influencer Visual



ProductName	Sales Amount
Fabrikam Budget Movie-Maker 1" 25mm E400	\$10.550
Fabrikam Budget Moviemaker 1" 25mm E400	\$50.996
Fabrikam Budget Movie-Maker 1/2" 3mm E300	\$8.208
Fabrikam Budget Moviemaker 1/2" 3mm E300	\$42.158
Fabrikam Budget Movie-Maker 1/3" 8.5mm E200	\$11.508
Fabrikam Budget Moviemaker 1/3" 8.5mm E200	\$34.182
Fabrikam Budget Movie-Maker 2/3" 17mm E100	\$13.120
Fabrikam Budget Moviemaker 2/3" 17mm E100	\$31.130
Fabrikam Business Videographer 1 25mm M600	\$24.030



Decomposition Tree

ENTITY NAME

- ▶  Language Detection
- ▶  Key Phrases
- ▶  Sentiment Score

AI Insights (in dataflows)

Airbnb analysis

Dataflows

Reports & dashboards

Datasets

Dataflows



Azure Data
Factory



Azure
Databricks



Azure SQL
DW



Azure ML

Azure Data Lake Storage Gen2

CDM folder

CDM folder

CDM folder

Business analysts
Low/no code

Data scientists
Data engineers

Cognitive services



Vision



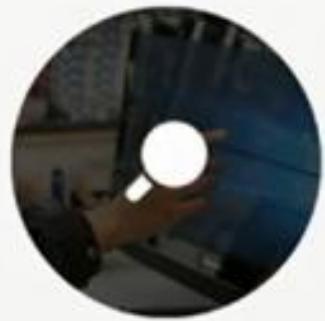
Speech



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. The title bar reads "Power BI AI test > SalesOpportunities". The left sidebar has icons for Home, Entity, Machine learning models, and Data flow. The main area shows a table with columns: ENTITY NAME, ENTITY TYPE, and ACTIONS. The ACTIONS column contains icons for Edit entities, Add entities, Save, and Close. The table lists the following entities:

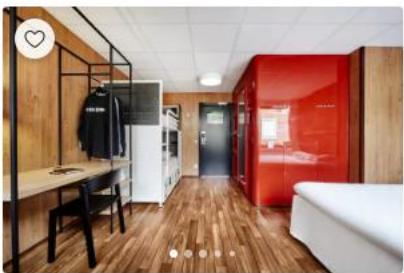
ENTITY NAME	ENTITY TYPE	ACTIONS
Account	Custom	
Contact	Custom	
Lead	Custom	
Opportunity	Custom	
OpportunityProduct	Custom	
Product	Custom	
SystemUser	Custom	

300+ stays · May 28 - 29 · 1 guest

Stays in Stockholm

[Cancellation flexibility](#)[Type of place](#)[Price](#)[Instant Book](#)[More filters](#)

Check travel restrictions before booking. The health and safety of our communities come first. Please follow government guidelines and travel only if it's essential. [Learn more](#)



Hotel room

Generator - Bed in 6 Bed Dorm

1 guest · 1 bedroom · 1 bed · 1 bath

Wifi · Washer

Rare find

★ 4.48 (206)

€19 / night

€19 total

**SUPERHOST** Private room**Great Room in City Center**

2 guests · 1 bedroom · 0 beds · 1 shared bath

Kitchen · Wifi

★ 4.91 (558)

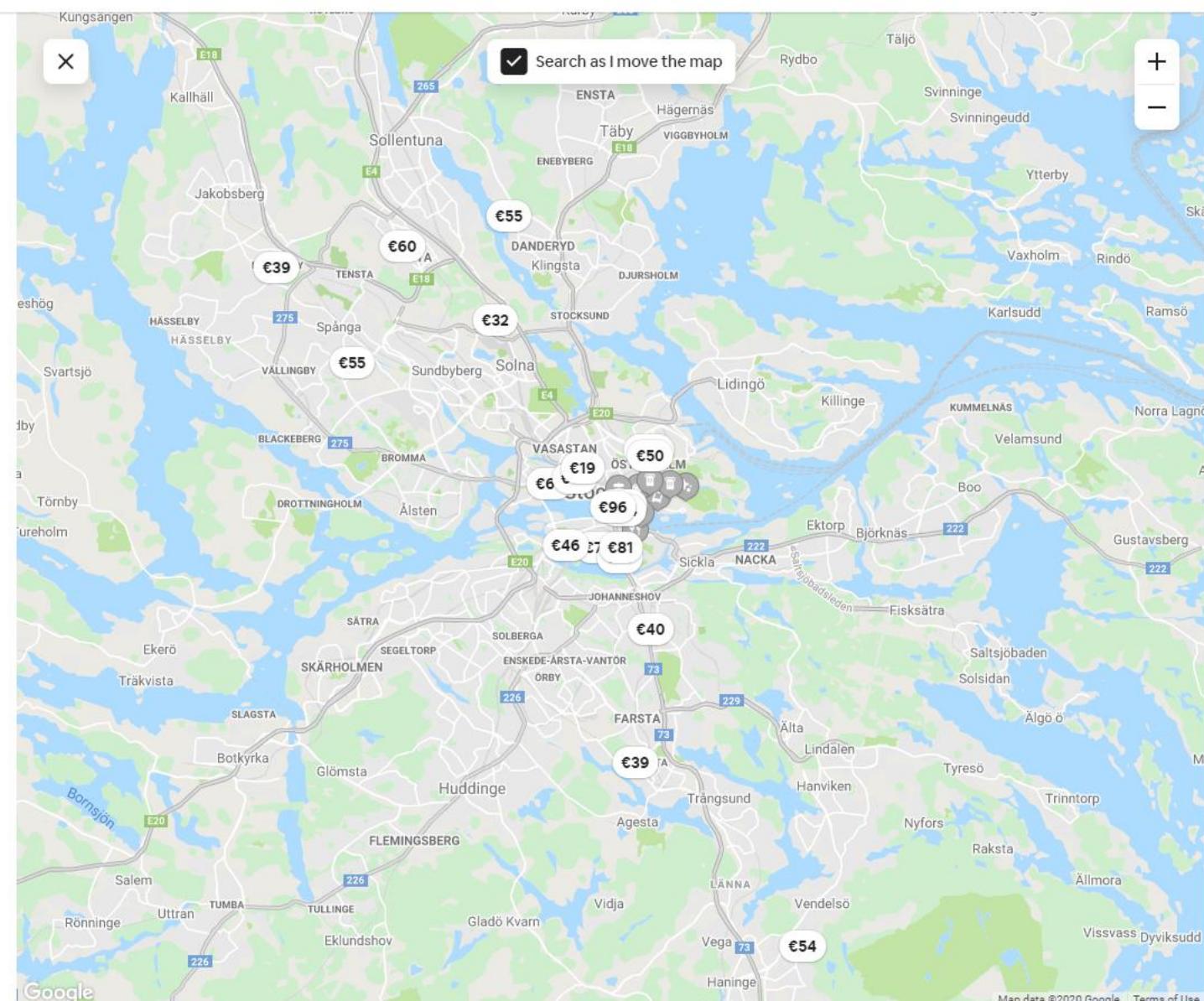
€50 / night

€50 total

**SUPERHOST** Private room**Fint stort rum i Solna**

2 guests · 1 bedroom · 1 bed · 1.5 shared baths

Kitchen · Wifi · Washer



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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- 🌐 Data-Marc.com

The image shows a yellow-themed cheat sheet for Power BI. It includes sections for Power Query (with tips like 'Give every step an explanatory name and merge steps of the same type, for better M coding experience.'), Data Model (with tips like 'Always use a separate Date table in your data model. Mark it as a Date Table.'), and DAX (with tips like 'In DAX, (un)comment DAX lines by pressing Alt + Shift + A or CTRL + /, and Shift + Enter for line breaks.'). The document also features a 'Resources' section with links to Power Query M Formula Reference, Power BI Studio, and Tabular Editor.

Power BI Cheat Sheet

Power Query

Tips & Tricks

- Give every step an explanatory name and merge steps of the same type, for better M coding experience.
- Some people prefer to not use spaces in the name of a step, for a better M coding experience.
- Give queries and columns user-friendly names, as they will become part of your data model.
- Make sure that each column has the correct data type. Making the model smaller and faster.
- 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.
- 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.
- In general, prefer 'Import' over 'DirectQuery'. Unless the amount of data is too large to import, or where there are other requirements (like real-time insights).
- Use Date From instead of Date-Time.Date to extract a date from another field, and to make sure Query folding won't break. More info on this blog post: <http://bit.ly/DateFrom>.
- Turn off 'Enable Load' for queries/tables that you don't need in the Data Model.
- Re-use Power Query code and lower impact on your data source by using Power BI Dataflows.
- Turn on the Formula Bar so you get familiar with Power Query (M) code.
- 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 > 0 then A else B
- try A/B otherwise 0
- #table("Text", "Text", {{[1,2],{3,4}}})
- Date.Time.LocalNow()
- Date.From(Date.Time.LocalNow())
- Excel.WorkbookWeb.Contents("url://filename.xlsx", null, true)
- #shared to list all functions and get PQ documentation

Resources

- Power Query M Formula Reference: <http://bit.ly/PQMReference>. Repo by Imke Feldmann with a lot of custom Power Query functions: <https://github.com/Imkef/M/>.

I'VE GOT THE POWER BI

Data Model

Tips & Tricks

- Always use a separate Date table in your data model. Mark it as a Date Table.
- Only use DAX Calculated Columns when it's not possible to create it using Power Query. This improves clarity and manageability of your report as transformations are located where you expect them. It also improves query speed of the model and reduces refresh duration.
- Give measures a prefix (%_#, #, #, #).
- Use abbreviations like YTD, LY, PY, PP as a suffix, to keep the base fields together in the sort order.
- Hide columns that are needed but are irrelevant for the user.
- For each measure column in your data model, make a DAX Calculated Measure instead of using the Default Summarization; then hide the original column. This way all measures will have the same icon. And it's easier to reference this measure in the future (e.g. adding a filter condition).
- Always use the table name when you refer to a column, for example: 'Product'[Category].
- Use IsInScope to get prevention by 0, and to improve the speed of your divisions.
- In DAX: (un)comment DAX lines by pressing Alt + Shift + A or CTRL + /, and Shift + Enter for line breaks.
- Use aggregations to keep your model small and performant, and still have all detailed data available. make sure to check-out its best-practices analyzer.
- Use Tabular Editor to make changes to your Power BI file (currently unsupported by Microsoft). Also,
- Avoid bi-directional cross filtering and make use of measure filters <http://bit.ly/MeasureFilters>.
- For very large models, group measures or fields in display folders for better usability.
- Use DAX Studio to capture all DAX queries executed on your Premium Capacity.
- Keep your PBI desktop file fast and small by using TOP N (<http://bit.ly/ImproveReportBuilding>) and switch underlying data source in PBI service after publishing (<http://bit.ly/ParameterizeDataSource>).
- Increase the readability of your DAX calculations: <https://www.daxformatter.com>.
- Use DAX Studio to analyze and tune your calculations: <http://daxstudio.org>.
- Find all about DAX expressions: <https://daxguide.com>.
- Use Tabular Editor to easily build and manage your models: <https://tabulareditor.github.io>.

macaw