

# Transactions

Transaction date Car brand Type Fuel Licenseplate

Last 1 Select All All All All All

No filters applied

Insights Navigation

Cars Transactions Fuel

# Transactions by supplier

	Shell Nederland Verkoop...	EG Re...	DKV ...
716		254	241
BP Europa SE - BP Nederla...	Total ...	Coöp...	
456	146	139	
Diverse Stations	ESSO N...		
380	132		

# cars vs # transactions

Jaar 2012 2013 2014 2015 2016 2017 2018

Scatter plot showing the relationship between the number of cars and the number of transactions. The x-axis represents the number of cars ('# Auto's') and the y-axis represents the number of transactions ('# Transactions'). The data points are color-coded by year, showing a positive correlation.

# Auto's	# Transactions	Jaar
2	20	2012
3	40	2013
4	50	2014
5	60	2015
6	70	2016
7	80	2017
8	90	2018
9	100	2012
10	110	2013
11	120	2014
12	130	2015
13	140	2016
14	150	2017
15	160	2018
16	170	2012
17	180	2013
18	190	2014
19	200	2015
20	210	2016
21	220	2017
22	230	2018
23	240	2012
24	250	2013
25	260	2014
26	270	2015
27	280	2016
28	290	2017
29	300	2018

A map of Europe with various regions highlighted in different shades of gray, representing the distribution of transactions across the continent.

# Storytelling & Interactive reports

with Power BI bookmarks and drill through





# Marc Lelijveld

Macaw – Data & Analytics Consultant



@MarcLelijveld



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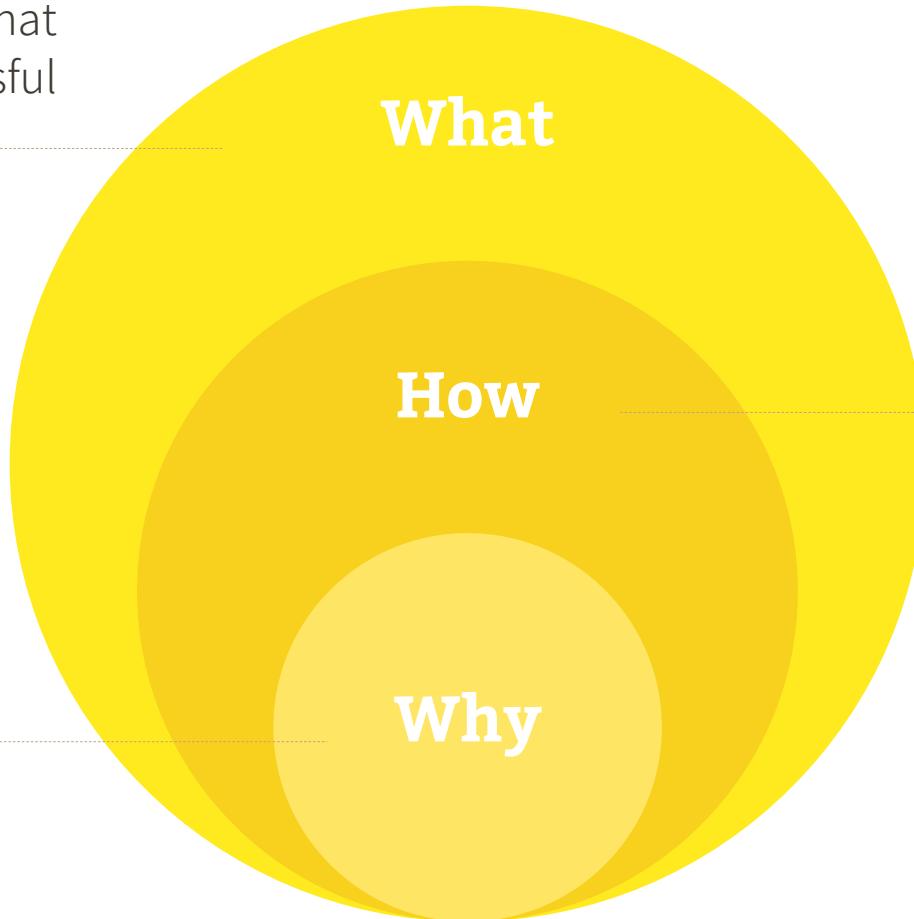


<https://Data-Marc.com>

# The Golden Circle

Best-in-class digital  
business solutions that  
make customers successful

We love challenges



By blending business  
understanding, the best  
people and top-notch  
technology

Gold

Microsoft Partner



---

**Best Partner**

*macaw*

- 
- Why Storytelling?
  - Storytelling Features!
  - Practical use, additional features and Tips

Background, Theme and Wallpaper  
Conditional formatting



# Why Storytelling?

# The definition of storytelling?

Data storytelling is the process of translating data analyses into layman's terms in order to influence a **business decision** or **action**.

Once upon a time ... <sob>

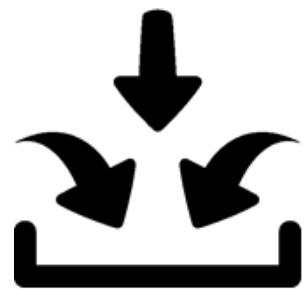


# Goals of storytelling

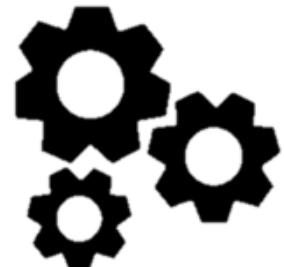
- Transfer of information which is interpreted correctly
- The origin of the question
- Possibility to answer the next question
- Motivation for data-driven decisions
- Connected to business processes



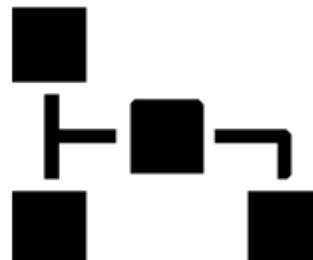
# What we used to do



Collect



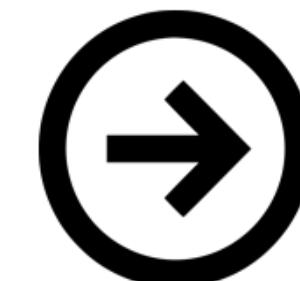
Transform



Model

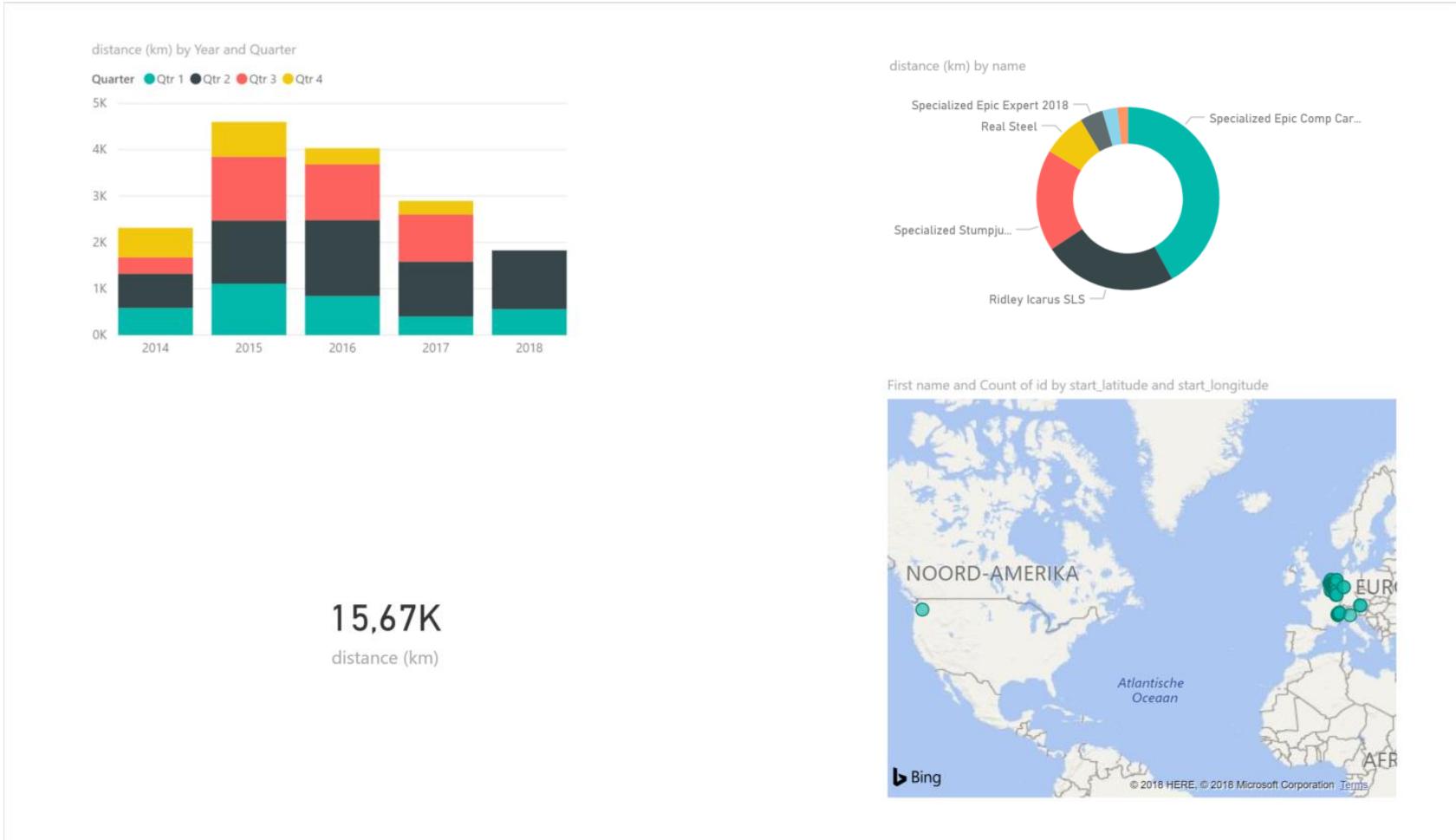


Analyze



Define

# Classic reports



# Storytelling, How and why?

```
["input"]?"val": "html"; e=e.Text", r.resetText(); n.data("resetText",n[i]()), n[i]{r[e]}; tThis.opt  
e=="loadingText"?n.addClass(t).attr(t,t):n.removeClass(t).removeAttr(t),0},t.prototype.to  
.closest("[data-toggle='buttons-radio']");e&e.find(".active").removeClass("active"),tThis.$c  
n.e.fn.button:e.fn.button#function(n){return this.each(function(){var re(this),i=r.data("bu  
.button","button",i=new t(this),n==#toggle"?i.toggle():i.setstate(n)}),e.fn.button.defau  
.button.Constructor=t,e.fn.button.noConflict=function(){return e.fn.button,n,this},e(document  
,"[data-toggle='button']",function(t){var me(t.target);n.hasClass("btn")})(n.n.closest("[.bt  
",function(e){use strict";var t=function(t,n){this.$element=e,it,$indicators=this.$el  
.options,n,$indicators.options.pause="#hover"66this.$element.on("mouseenter",e.proxy(this.pause,th  
this));t.prototype={cycle:function(){return t|(|this.paused=1),this.interval&&clearInterv  
.interval&&this.paused||(this.interval=setInterval(this.next,th),this.$options.int  
{return this.$active=this.$element.find(".item.active"),this.$items=this.$active.parent().ch  
$active},to:function(t){var me=this.getActiveIndex(),rThis;if(t>this.$items.length-1)t=0  
$element.one("slide",function(){fr.to(t))}n=t?this.$pause().cycle():this.slide(t?#next":"p  
(t){return t})(this.paused=0),nThis.$element.find("#next",".prev").length&&support.transit  
.support.transition.end,th.cycle(0)),clearInterval(this.interval),this.interval=null,th  
return;return this.slide("next"),prev:function(){if(this.sliding)return;return this.slide(#  
rThis.$element.find(".item.active"),i=n||r[t],s=nThis.interval,o=t=="next"?left:right",  
this.sliding=0,s&&this.$pause(),i=i.length?this.$element.find(".item")|u|(),fe.Event("sl  
if(i.hasClass("active"))return;this.$indicators.length&&(this.$indicators.find(".active").re  
("slide",function(){var t=e,$indicators.$children[i].getActiveIndex());t&t.addClass("act  
.$element.hasClass("slide")){this.$element.trigger(f);if(f.isDefaultPrevented())return;i.ad  
i.addClass(o),th.$element.one(e.support.transition.end,function(){i.removeClass(t,o).joi  
removeClass("active"),o.join(" ")),a.sliding=1,setTimeout(function(){a.$element.trigger(f  
);if(f.isDefaultPrevented())return;r.removeClass("active"),i.addClass("active"),this.slidi  
return s66this.cycle(),this};var me,e.fn.carousel:e.fn.carousel#function(n){return this.eac  
("carousel"),s=e.extend({},e.fn.carousel.defaults,typeof n=="object"66n,typeof n=="strin  
t(this,s),typeof n=="number"?i.to(n)|o|i[o]():s.interval&&i.pause().cycle()}),e.fn.carousel  
pause="#hover",e.fn.carousel.Constructor=e.fn.carousel.noConflict=function(){return e.fn.c  
.carousel.data-api,"[data-slide],[data-slide-to]",function(t){var me(this),r,i=e(n.attr(r  
,replace(/.*?#[^s]*$/,"")),s=e.extend({},i.data(),n.data()),o;i.carousel(s),o=o.attr(r  
,pause()).to(o).cycle(),t.preventDefault())}(window.jQuery),function(e){use strict";var t  
$options=e.extend({},e.fn.collapse.defaults,n),this.$options.parent&&(this.$parent=e(this.o  
.toggle()):t.prototype={constructor:t,dimension:function(){var e=this.$element.hasClass("wid  
show":function(){var t,n,r,i;if(this.transitioning){this.$element.hasClass("in"))return;t=the  
t].join("-"),$this.$parent&&$this.$parent.find("> .accordion-group > .in");if(r=r.length)i  
,transitioning{return;r.collapse("hide"),i|r.data("collapse",null))this.$element[t](#),this  
"shown"),e.support.transition&&this.$element[t](this.$element[t](n)).hide:function(){var t  
,hasClass("in"))return;t=this.dimension(),this.reset(this.$element[t]()),this.transition("re  
this.$element[t](#),reset:function(e){var t=this.dimension();return this.$element.removeClass  
.offsetWidth,th.$element[t]==null?"addClass":"removeClass"}("collapse",th),transition  
{n.type=="show"66i.reset(),i.transitioning=0,i.$element.trigger(r);th.$element.trigger(n
```



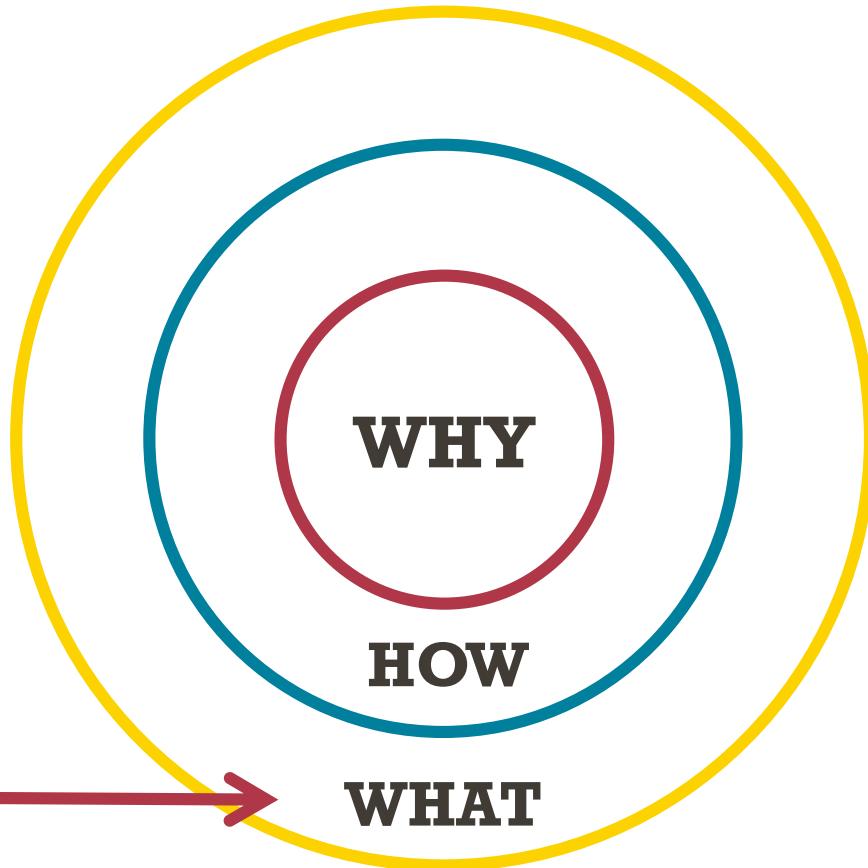
How = Usage of data

Why = Business understanding

# What as starting-point

We are good at:

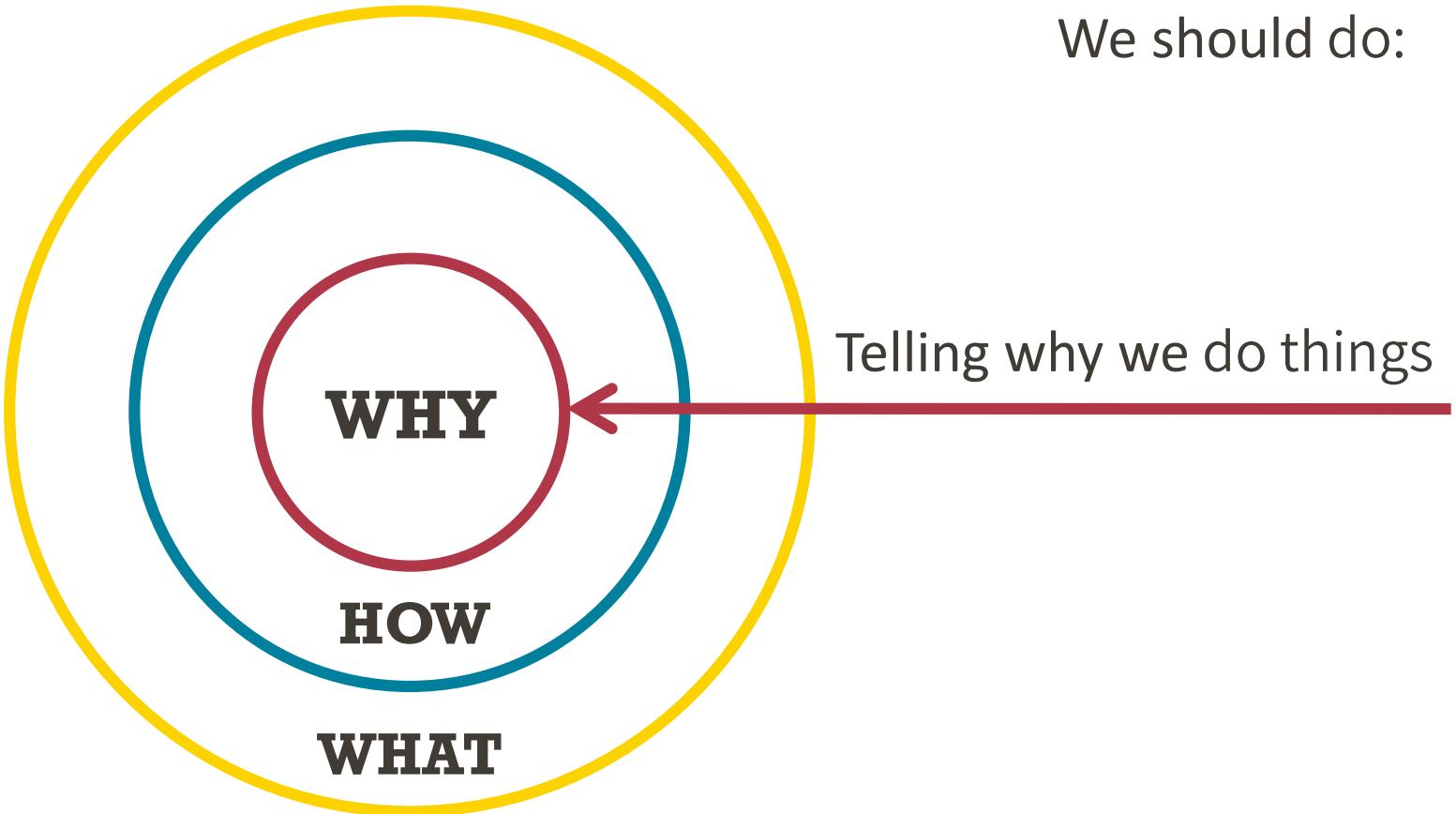
We should do:



Telling what we do

# Why as starting-point

We are good at:



# Define your type of storytelling



Describe



Declare



Explore

# Define your route (click-path)



# Think about your start & end-point



# Remove all bullshit!



# Visualization

Top Twenty Economies of the World  
[World GDP = \$74 Trillion]

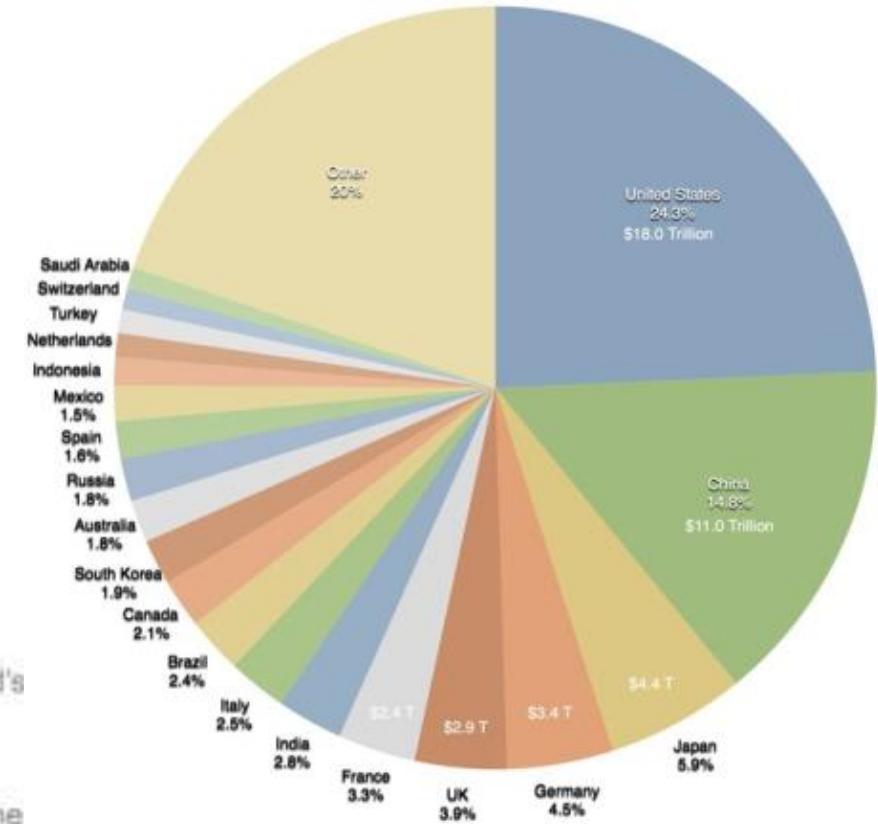


The U.S. is a quarter of the world's economy.

The U.S. is equal to the GDP of the largest Asian economies.

China's economy is equal to the GDP of the 4 largest Western European economies.

Brazil has the largest economy outside U.S., Asia and Europe.





# MARIOKART

# DELUXE

# 8

TM



1	King Boo	45
2	Lakitu	32
3	Villager	30
4	Shy Guy	27
5	Iggy	23
6	Ludwig	21
7	Roy	16
8	Peach	15
9	Cat Peach	14
10	Villager	10
11	Luigi	7
12	Mario	6

# Color usage



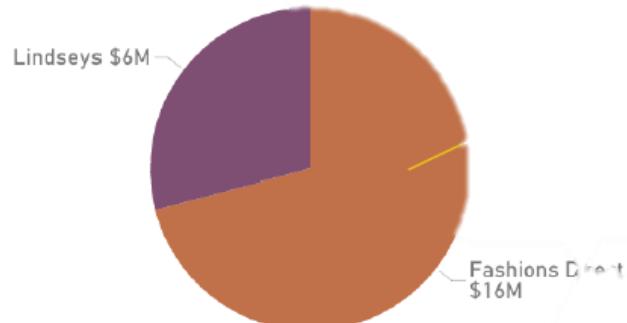
**EMPHASIZE  
DIFFERENCE**

**DEFINE  
CATEGORIES**

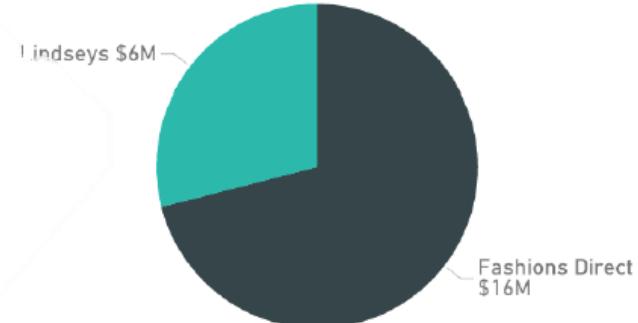


# Consistency

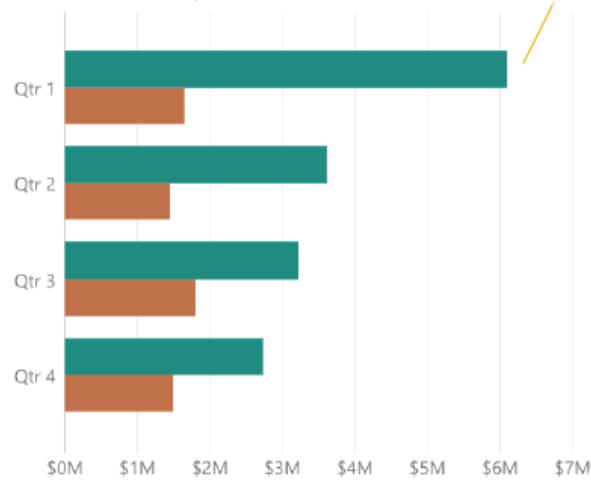
This Year Sales by Chain



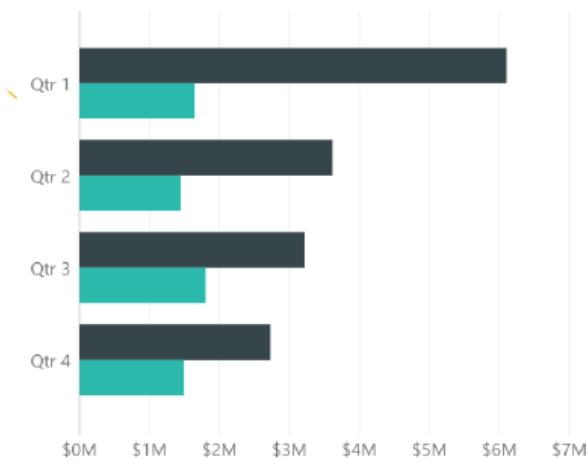
This Year Sales by Chain



This Year Sales by Quarter and Chain



This Year Sales by Quarter and Chain



A photograph of a mountain biker from behind, standing on a rocky outcrop. He is wearing a white helmet, a dark blue jacket, black shorts, and a black backpack. His white mountain bike with red accents is leaning against a rock to his left. The background features a majestic, snow-capped mountain range under a clear, bright blue sky.

Send your users on an  
adventure!

“**TENANT**  
A dweller or an occupant”

“**TENET**  
A principle or belief”

“**DIFFERENCE BETWEEN TENANT AND TENET**”

## Storytelling Features

# Provide easy navigation



## Published Date

Last ▾ 1 Years ▾

4/18/2017 - 4/17/2018

## Source



## Reimbursements by Product

● Medicaid Amount Reimbursed ● Non Medicaid Amount Reimbursed



Labeler Name	Medicaid Amount Reimbursed
Purdue Pharma	\$65,537,207
Rhodes Pharmaceuticals	\$13,386,981
Alvogen	\$11,685,277
Kvk-Tech	\$10,564,303
Aurobindo Pharma	\$4,453,260
Amneal Pharmaceuticals	\$3,724,979
Ranbaxy Pharmaceuticals	\$3,554,774
Zydus Pharmaceuticals	\$3,484,614
Epic Pharma	\$1,801,086
Sun Pharmaceutical Industries	\$1,630,451
Mayne Pharma	\$1,007,351
Par Pharmaceutical	\$804,096
Lahigh Valley Technologies	\$470,073



An Osteoarthritis Drug May Be the Answer to America's Opioid Crisis futurism.com • Mar. 2, 2018 A drug developed to treat osteoarthritis pain has shown promise as a method of preventing opioid tolerance and physical dependence. With the opioid epidemic still



A telling anecdote about Trump and the opioid abuse crisis www.vox.com • Mar. 2, 2018 originally from prescription opioids but increasingly now from heroin and fentanyl ? have emerged as an increasingly grave social issue, steadily worsening over



White House To Give Status Update On Opioid Emergency wypr.org • Mar. 2, 2018 ET Since President Trump declared the opioid epidemic a national public health

**here&  
Now**

Wyoming Prepares To Grapple With Opioid Crisis www.wbur.org • Mar. 2, 2018 discuss the country's opioid epidemic. Rural coal mining states like West Virginia and



White House to host opioid summit and highlight Trump administration's efforts www.pbs.org • Mar. 2, 2018 The White House is hosting a summit to highlight Trump administration efforts to

WATCH LIVE: White House to highlight administration anti-opioid efforts fox61.com • Mar. 2, 2018

The White House is hosting a summit to highlight Trump administration efforts to combat the opioid crisis. First lady Melania Trump is scheduled to



Be dynamic

# KPI BREAKDOWN



REGION

All

COUNTRY

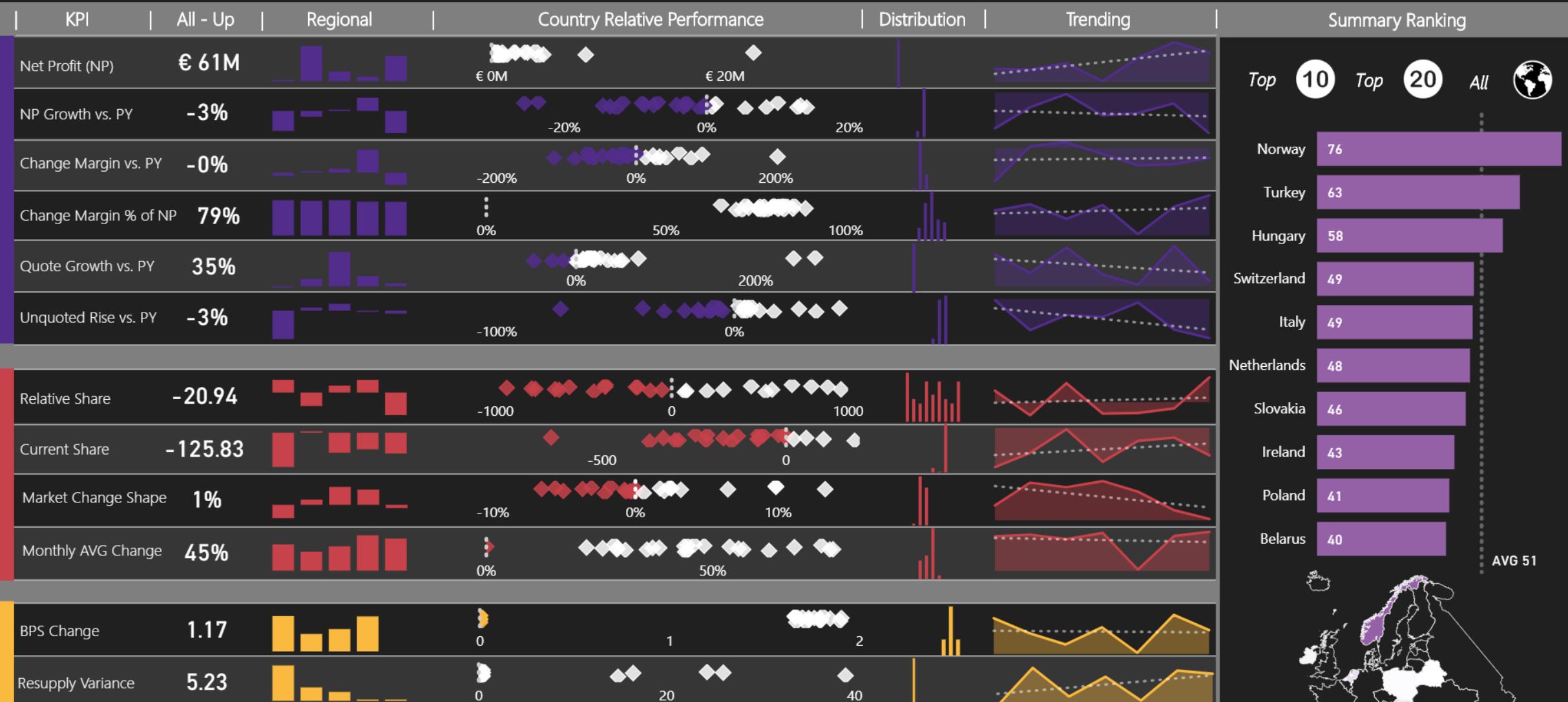
All



Select for FAQ

Decisive Data  
insights for decisions

FINANCIAL



SUPPLY

Filters

Date

6/1/2017

12/1/2017

Summary Ranking

0

91

NP Growth vs PY

-30%

16%

Quote Growth

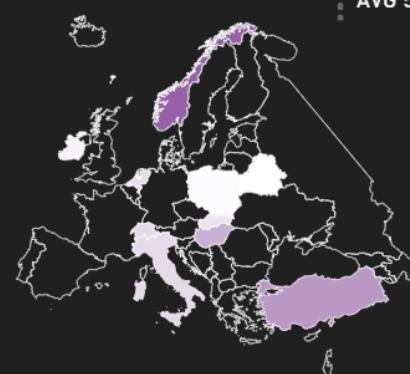
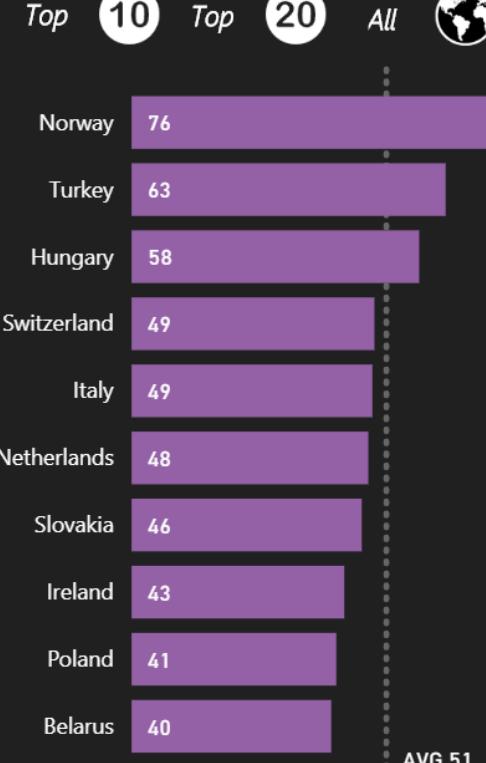
-55%

281%

Market Change Shape

-7%

16%





Have guided experiences

## REIMBURSEMENTS BY STATE

**CALLOUT**    **PAGES**

Opiod Crisis Investigation

Media Discussion

Reimbursements by State

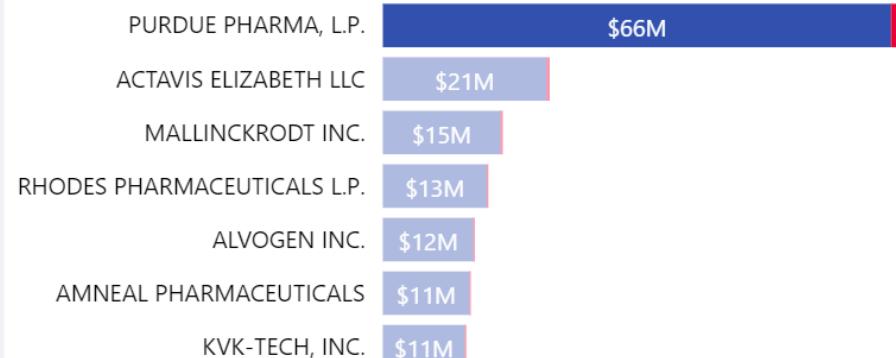
Take Action

Opioid Type

All

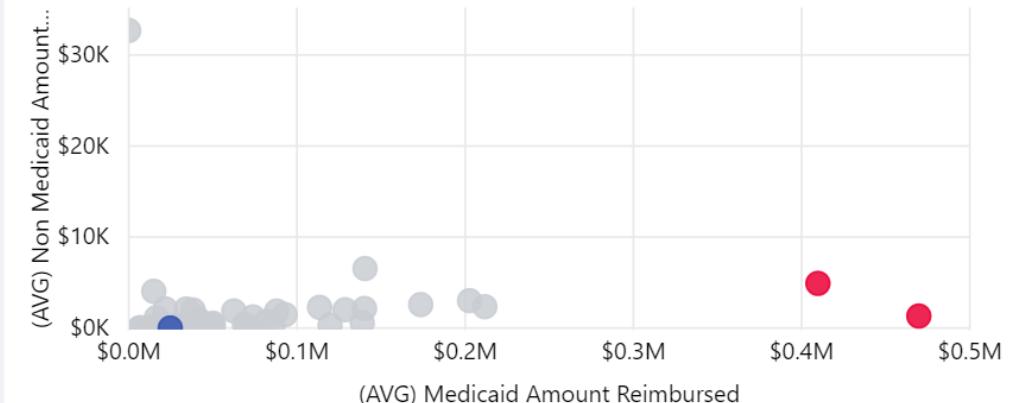
### Medicaid Amount Reimbursed and Non Medicaid Amount Reimbursed by Labeler Name

● Medicaid Amount Reimbursed ● Non Medicaid Amount Reimbursed



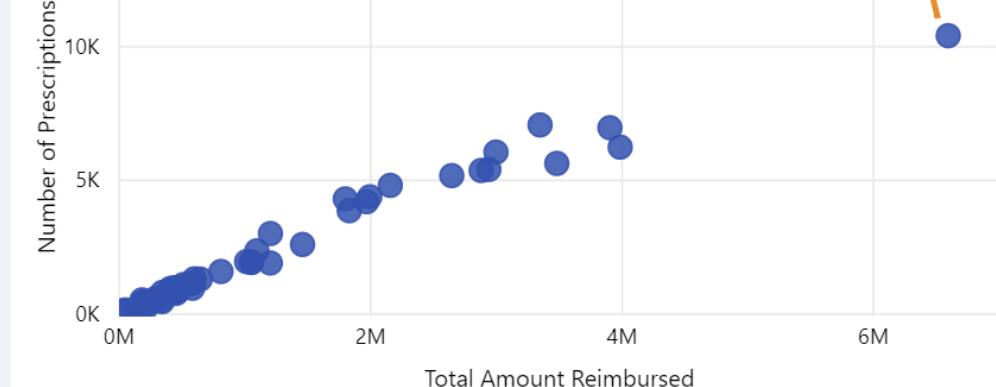
### (AVG) Medicaid Amount Reimbursed and (AVG) Non Medicaid Amount Reimbursed by...

● Missouri & North Carolina ● Other ● South Carolina



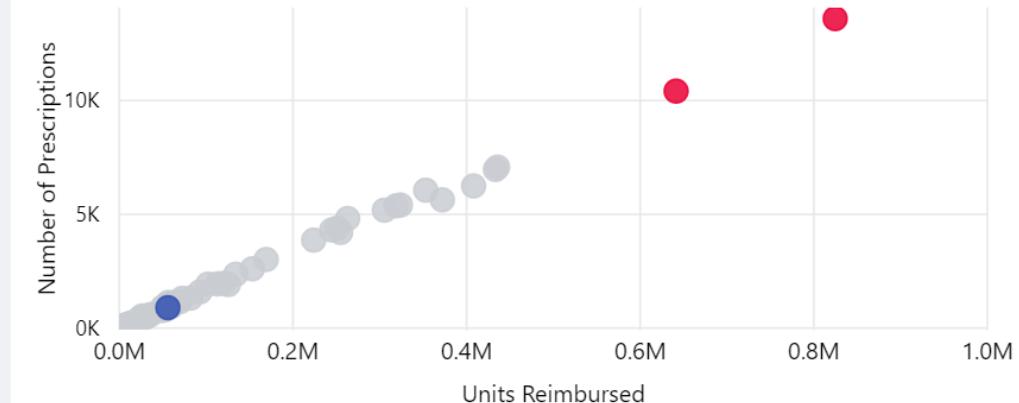
**Missouri and North Carolina** are at the centre of a lawsuit involving mis-marketing of OxyContin. Purdue settled a lawsuit in 2007 with South Carolina.

### Total Amount Reimbursed and Number of Prescriptions by State



### Units Reimbursed and Number of Prescriptions by State and State (groups)

● Missouri & North Carolina ● Other ● South Carolina



# Have interactive experiences



## Power BI Filter Selection

## Report Title



Bar Chart

Item

Slicer 1

- CategoryName
- Beverages
  - Condiments
  - Confections
  - Dairy Products
  - Grains/Cereals
  - Meat/Poultry
  - Produce
  - Seafood

February

March



KPI 1

Slicer 2

- Country
- Argentina
  - Austria
  - Belgium
  - Brazil
  - Canada
  - Denmark
  - Finland
  - France
  - Germany
  - Ireland
  - Italy
  - Mexico
  - Norway
  - Poland
  - Portugal
  - Spain

July

Aug



KPI 2

Slicer 3

- City
- Aachen
  - Albuquerque
  - Anchorage
  - Århus
  - Barcelona
  - Barquisimeto
  - Bergamo
  - Berlin
  - Bern
  - Boise
  - Bräcke
  - Brandenburg
  - Bruxelles
  - Buenos Aires
  - Butte
  - Campinas

December



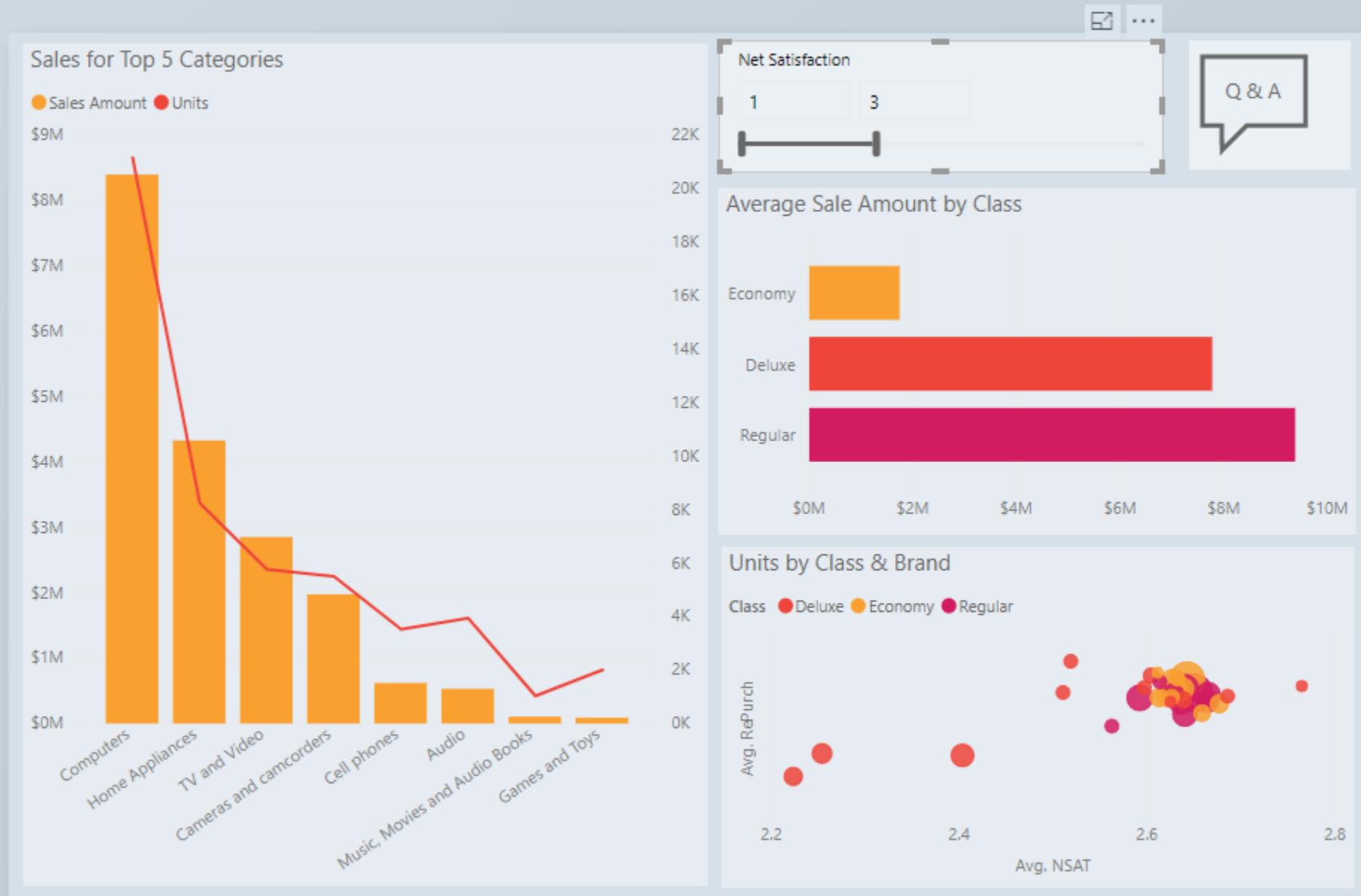
KPI 3



Power BI tips

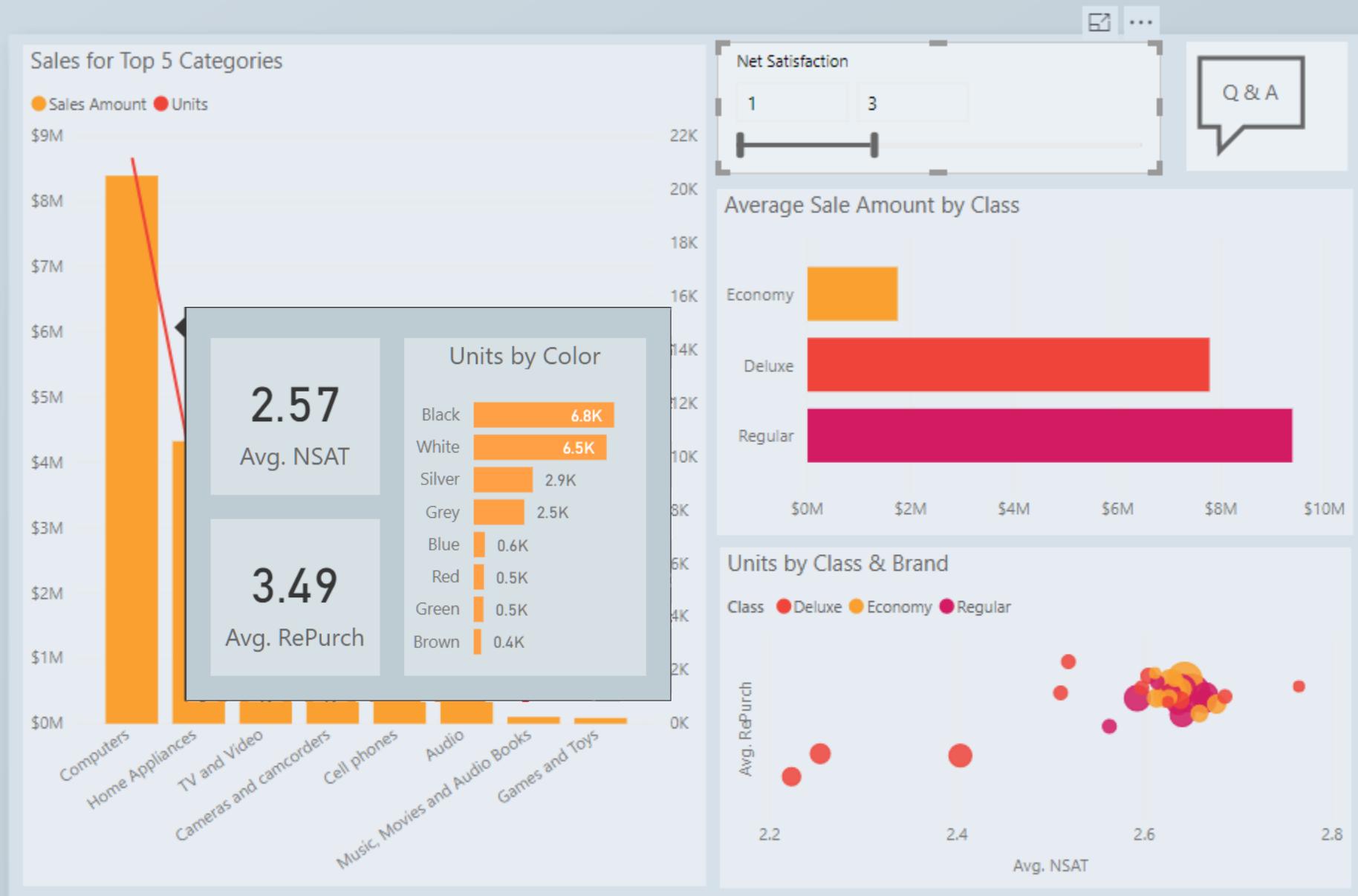


Ensure consistent context



# Progressive disclosure

[This Photo](#) by Unknown Author is licensed under [CC BY-NC-SA](#)





Let them ask questions

## SUGGESTED QUESTIONS

sales amount for Germany

sales amount for Germany by year

Add



SalesAmount by OrderDate

\$16K

\$14K

\$12K

\$10K

\$8K

\$6K

\$4K

\$2K

\$0K

Showing sales amount sorted by order date when Germany sales were ordered

Filters (including highlights) from the source page have been applied.

year (Sales &gt; Date Hierarchy &gt; Year)

sale (Sales)

date hierarchy (Sales &gt; Date Hierarchy)

manufacturer (Sales &gt; Manufacturer)

order date (Sales &gt; OrderDate)

sales order ID (Sales &gt; SalesOrderID)

sales channel code (Sales &gt; SalesChannelCode)

prod ID (Sales &gt; ProdID)

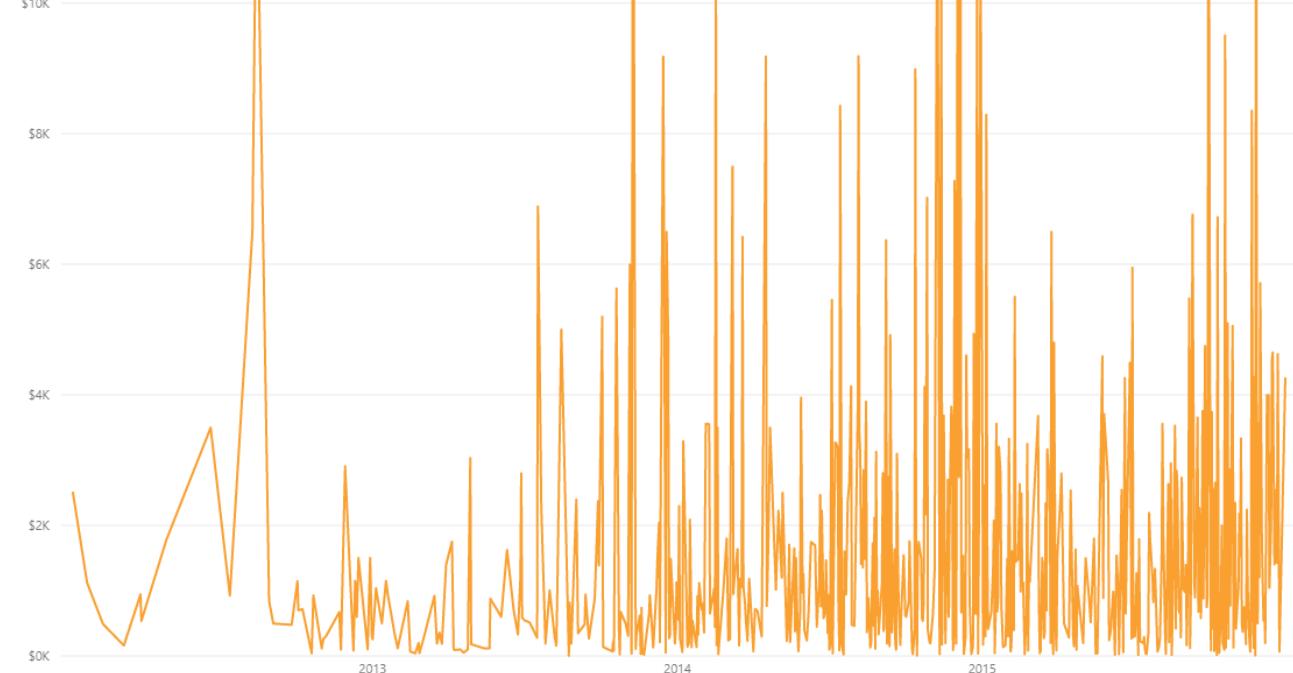
style name (Sales &gt; StyleName)

customer account number (Sales &gt; CustomerAccountNumber)

store key (Sales &gt; StoreKey)

year by style name

YEAR BY CUSTOMER ACCOUNT NUMBER



Save and close

Cancel

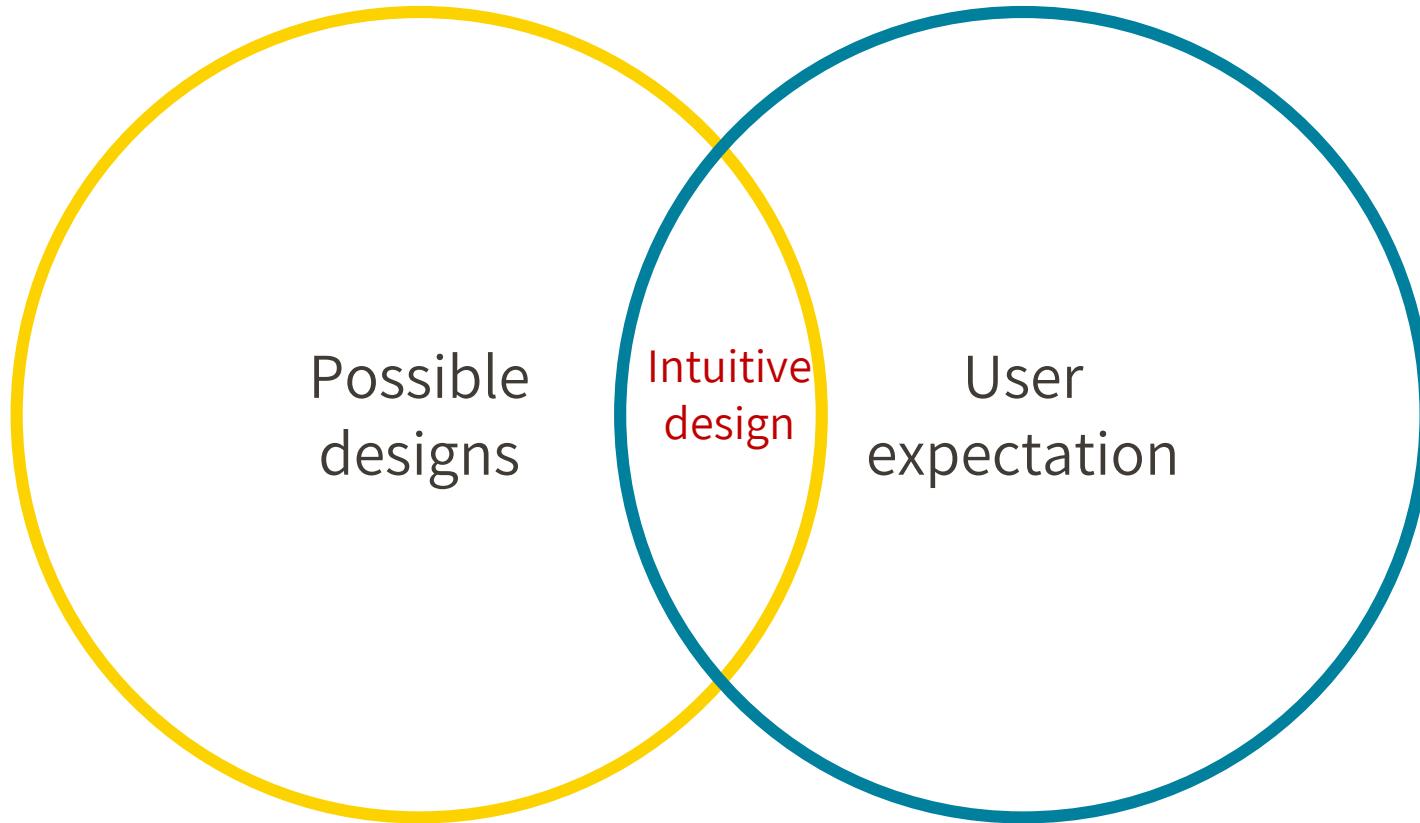
# STORY

Practical use, some additional features & tips

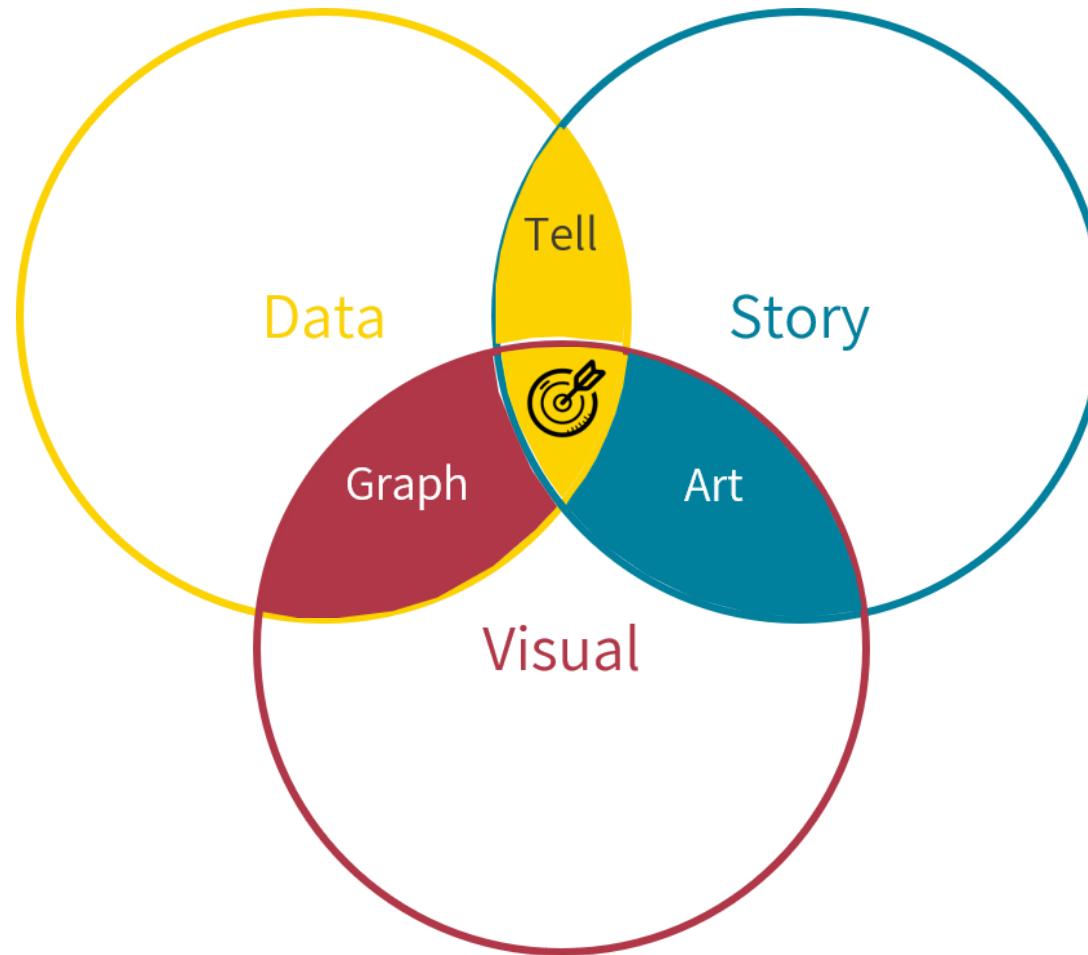
# Add context



# Make it intuitive!



# Find the right balance



```
"name": "StravaDemoFile",  
  
"dataColors": [  
    "#FC4C02",  
    "#00B7F0"  
],  
  
"background": "#D0CECE",  
"foreground": "#070f25",  
"tableAccent": "#FC4C02",  
"visualStyles":  
{  
    "treemap": {  
        "*": {  
            "labels": [{  
                "show": true,  
                "color": {  
                    "solid": {  
                        "color": "#FC4C02"  
                    }  
                }  
            }  
        }  
    }  
}
```

# Background, Theme & Wallpaper

# Demo Strava data – part 1

- Choose a lay-out for your report for be consistent in your presentation
- Create background to limit the amount of objects
- Create theme file and apply your corporate identity
- Add a wallpaper for further customizing the lay-out

x

## Conditional formatting

Format cells based on their values.

Base value

Column

Diverging

Minimum

Number ▾

1

Center

Number ▾

5

Maximum

Number ▾

16



# Conditional Formatting

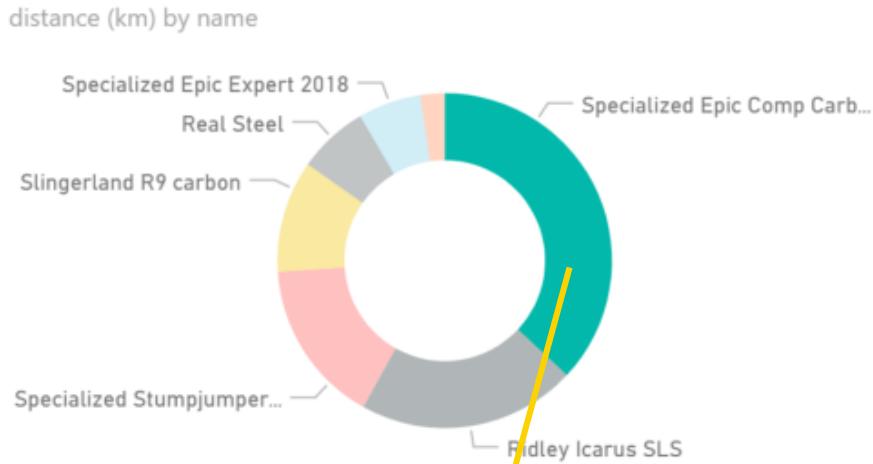
## Demo Strava data – part 2

- Tables and matrixes look boring and like classic reports!
- Databars, text color and cell color!
- Based on cell value or other measure.

I'm going to tell you a story

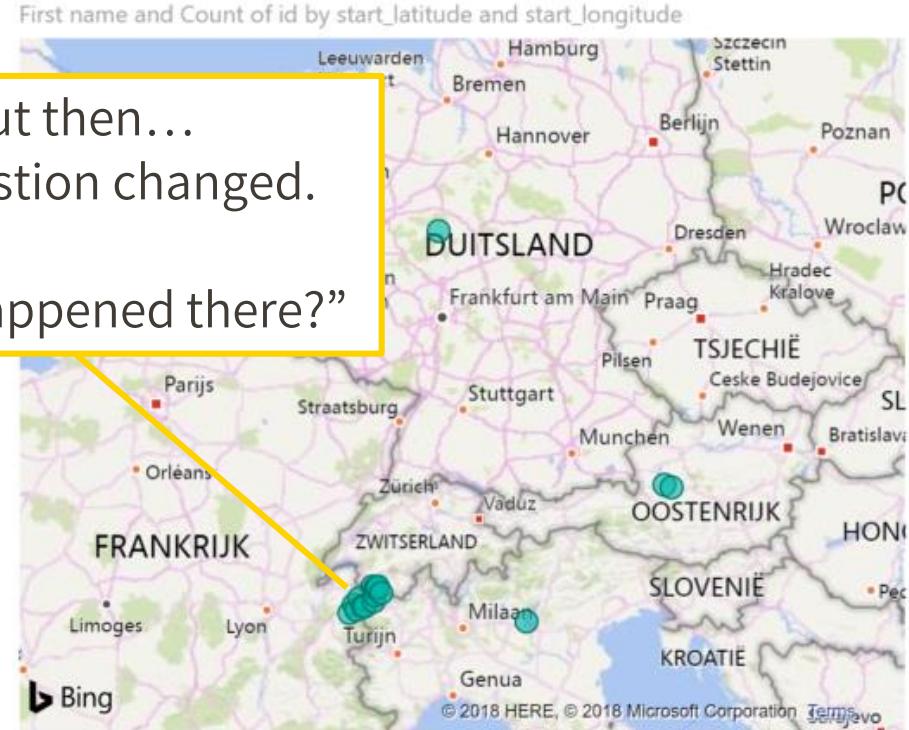


# The next question



I want to know the distribution of kilometers by bike

But then...  
My question changed.  
“What happened there?”



# Demo Strava data – result

# Recap

Storytelling is not a science; it is an **art**!

**Understand** your end-user. Facilitate them with data.

Send your users on an adventure and make them part of **your** story!

Add your **identity** (corporate or your own) .

Power BI is full of great features, **make boring data shine!**



# Download for free!

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



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<https://Data-Marc.com>

The booklet is titled "POWER BI CHEAT SHEET" at the top. It has two main sections: "Power Query" and "Data Model". Each section contains a "Tips & Tricks" list and a "Resources" section.

**Power Query**

**Tips & Tricks**

- Give every step an explanatory name and merge steps of the same type, for better manageability.
- Give queries and columns user-friendly names (this is also necessary to utilize Q&A).
- Make sure that each column in each table has the correct data type. This will make the data model smaller and (as a result) 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 structure 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.
- Structure your queries in folders. For example: Facts, Dimensions, Functions, Misc, (parameters,queries/functions), and Data Sources will be automatically listed.
- You can copy and paste Queries easily between files. Dependencies will be included.
- Turn off 'Enable Load' for queries/tables that you don't need in the Data Model.
- Prefer "reference" over "duplicate" of a query.
- 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. M is an easy way to quickly make small adjustments.
- 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).
- Did you know you can transform your data by using Python and R in the Power BI Query Editor?

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

- if T > 0 then A else B
- try A/B otherwise 0
- #table({ "X", "Y"}, {{1, 2}, {3, 4}})
- DateTime.LocalNow()
- Date.From(DateTime.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>.

**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.
- Hide columns that are needed but are irrelevant for the user. Quick Tip: use Relationships view to hide multiple columns: use SHIFT + DOWN ARROW for selection of columns ▶ SHIFT + F10 for menu ▶ Hide.
- Hide the key at the many side of a many-to-one relation (e.g. [OrderDate] in Revenue table).
- Use the new filter pane and hide your filters for end users to make sure your end-users can't change it.
- 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 enables you to easily change the calculation in the future (e.g. adding a filter condition). Also, it is easier to reference this measure in other DAX calculations.
- Always use the table name when you refer to a column, for example: 'Product'[Category].
- Use DIVIDE() to prevent division by 0, and to improve the speed of your divisions.
- Use ISINSCOPE to get the right hierarchy level in DAX (read all about it in Kasper de Jonge's blog: <https://bit.ly/KasperOnBIScope>).
- Give measures a prefix (#, #, #).
- Use standard abbreviations like YTD, LY, PY, PP as suffix, to keep the base fields together.
- 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.
- Use Tabular Editor to make changes to your Power BI file (currently unsupported by Microsoft), also check-out the best-practices analyzer.
- Use the new model diagram to break-out complex models by subject area in separate diagrams.
- Bulk edit fields with multi-select in the new model diagram, and to group measures in display folders.
- Combine historical data with live data by using composite models.

**Resources**

- Increase the readability of your DAX calculations: <https://www.daxformatter.com>.
- Practical DAX use cases, with incredible explanations: <http://www.daxpatterns.com>.
- Use DAX Studio to analyze and tune your calculations: <http://daxstudio.org>.
- Find all about DAX expressions: <https://dax-guide>.
- Download Tabular Editor: <https://tabulareditor.github.io>.
- Show the last refresh date of your dataset: <https://bit.ly/KasperOnBIRefreshDate>.

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Challenge accepted.