

# HACK THE VISUAL

*„Make your data shine!“*

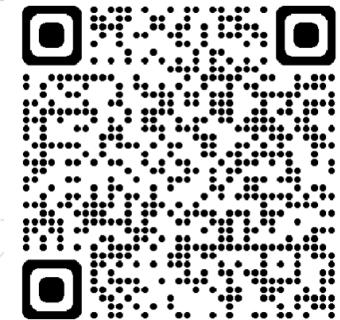
2023

# SPEAKER

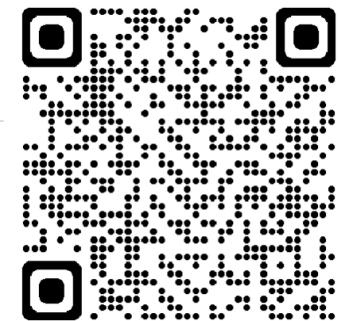


**ŠTĚPÁN REŠL**

**LINKEDIN**



**TWITTER**



**Data  
Brothers**



**JAK NA  
POWER BI**



**Power BI  
kafíčko**



**Data  
Meerkat**

# AGENDA

- What is meant by Hacking Visuals
- Specific elements to hack
- Showcases
  - Matrix for a TOP products
  - Cumulative sales development
  - Fulfilling the sales target
  - Tooltip details by Matrix

# **WHAT IS MEANT BY HACKING VISUALS**

# HACKING VISUALS

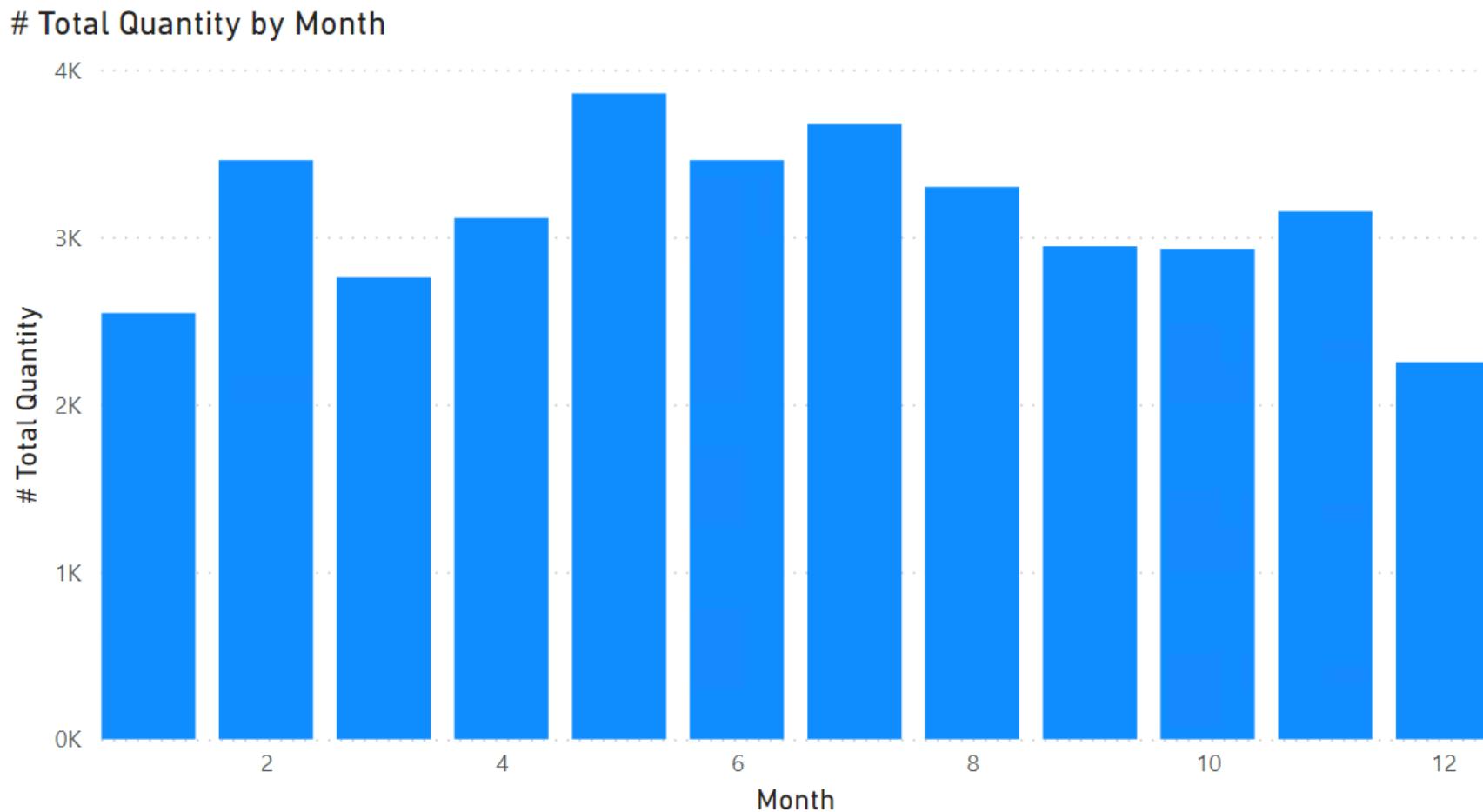


What are we actually trying to do?

- We are trying to hack the visual capabilities of Power BI to get the necessary information from our data.
- By "hacking" we mean the use of various available methods and possibilities that we put together.
- Modeling, mathematical, computational, visualization and manipulation methods.

# How many times we have sold more then 3000 units?

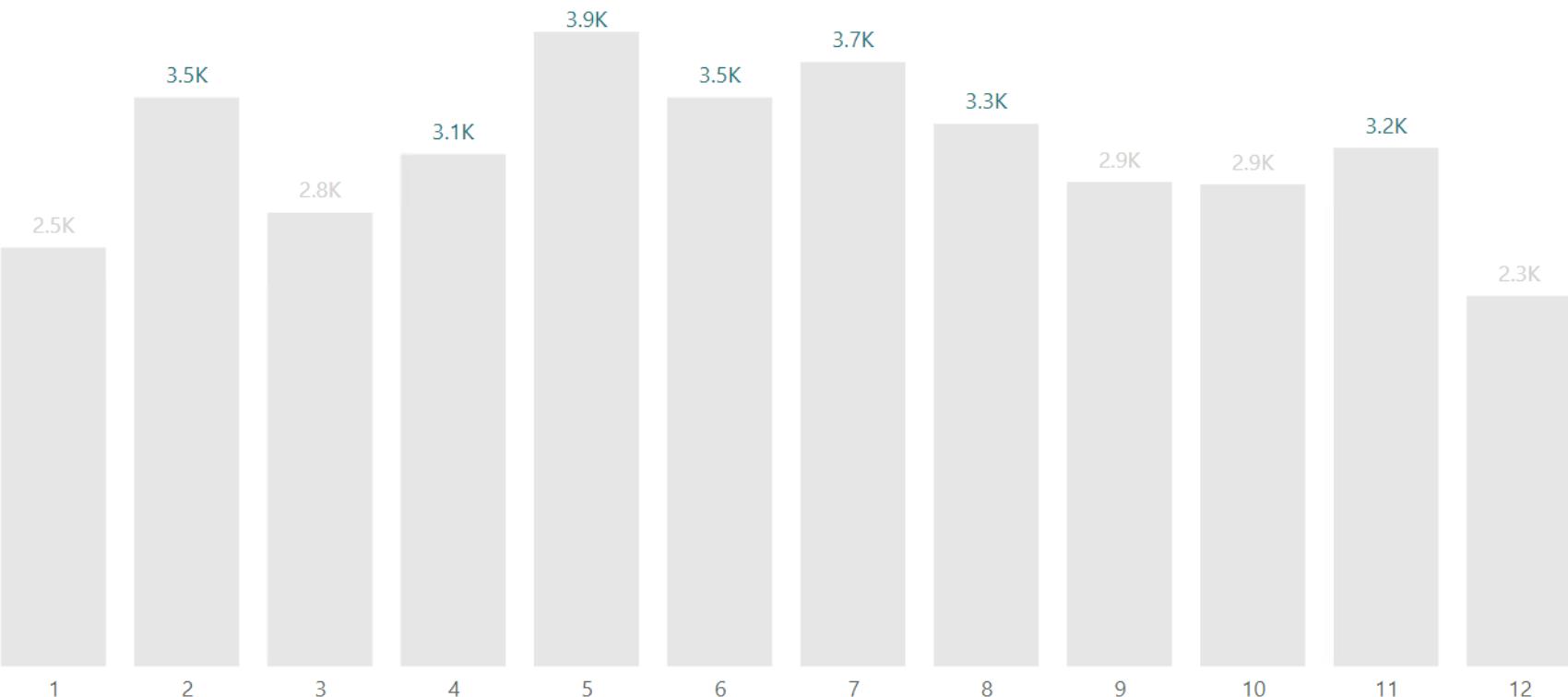
Can you answer?



# What about now?

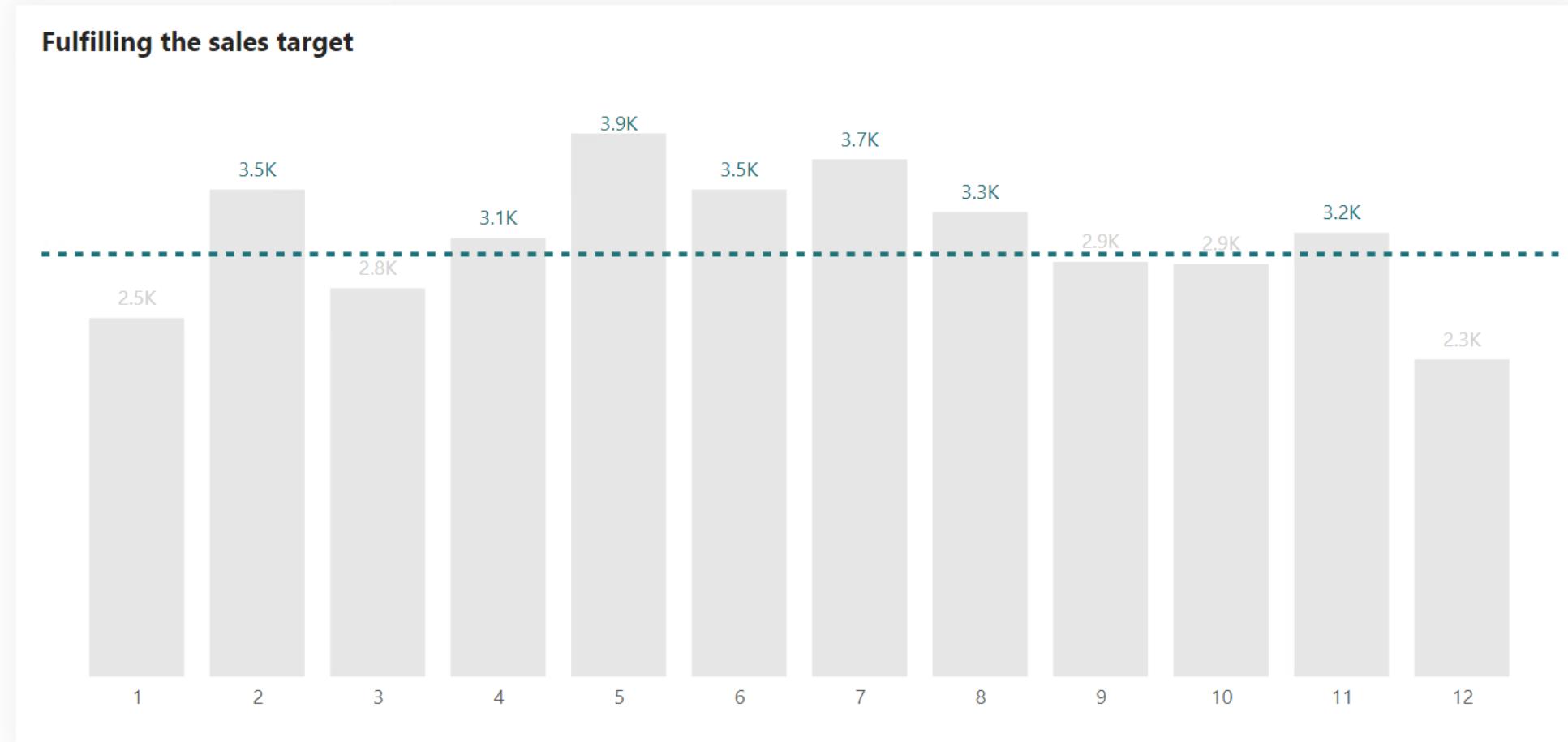
That's better but still... terrible!

Fulfilling the sales target



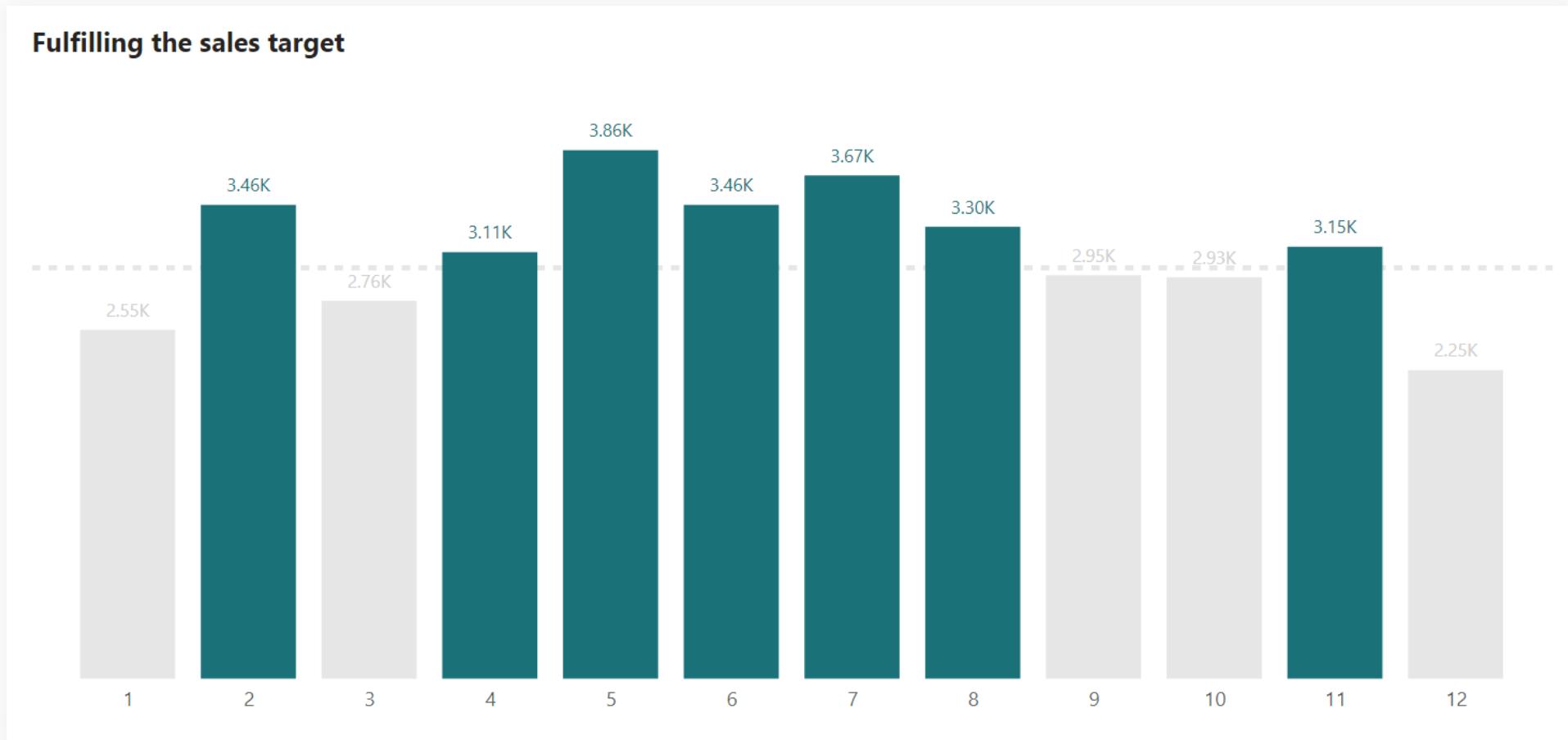
# Better isn't it?

Did the line also guide your eye like a line on paper?



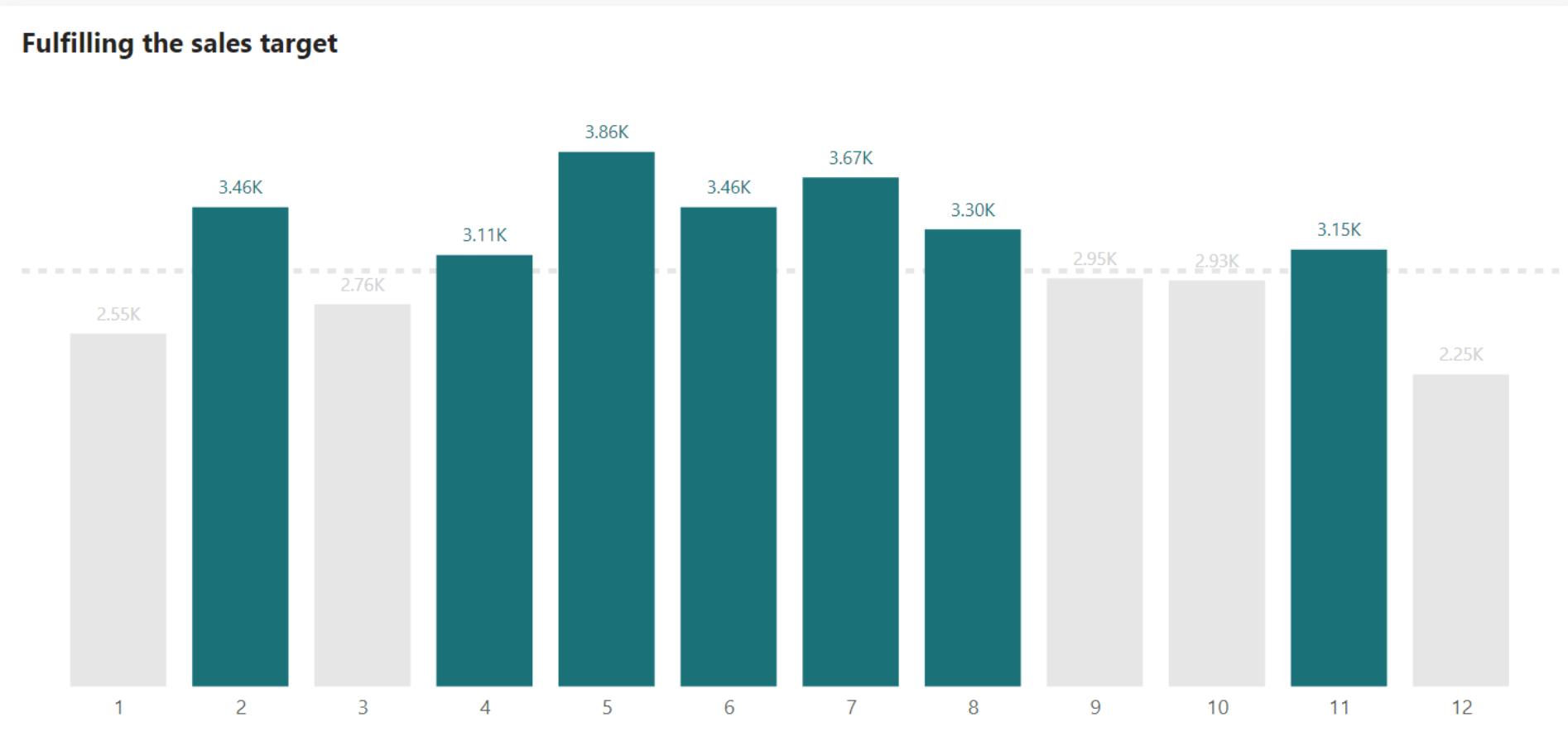
# How about color?

Now counting them is easy! So we make it more difficult!



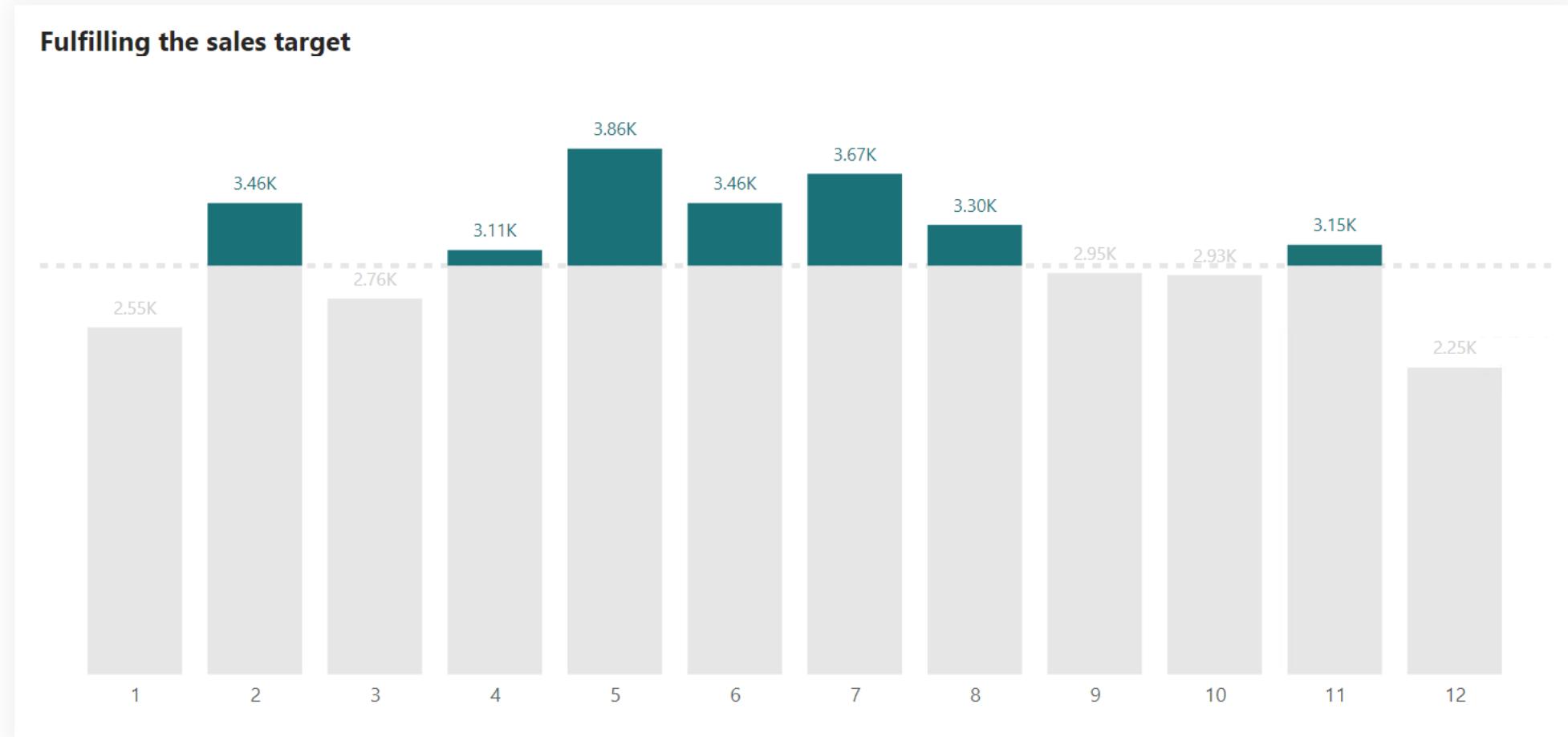
# Are the targets exceeded significantly? >30%?

Can you answer?



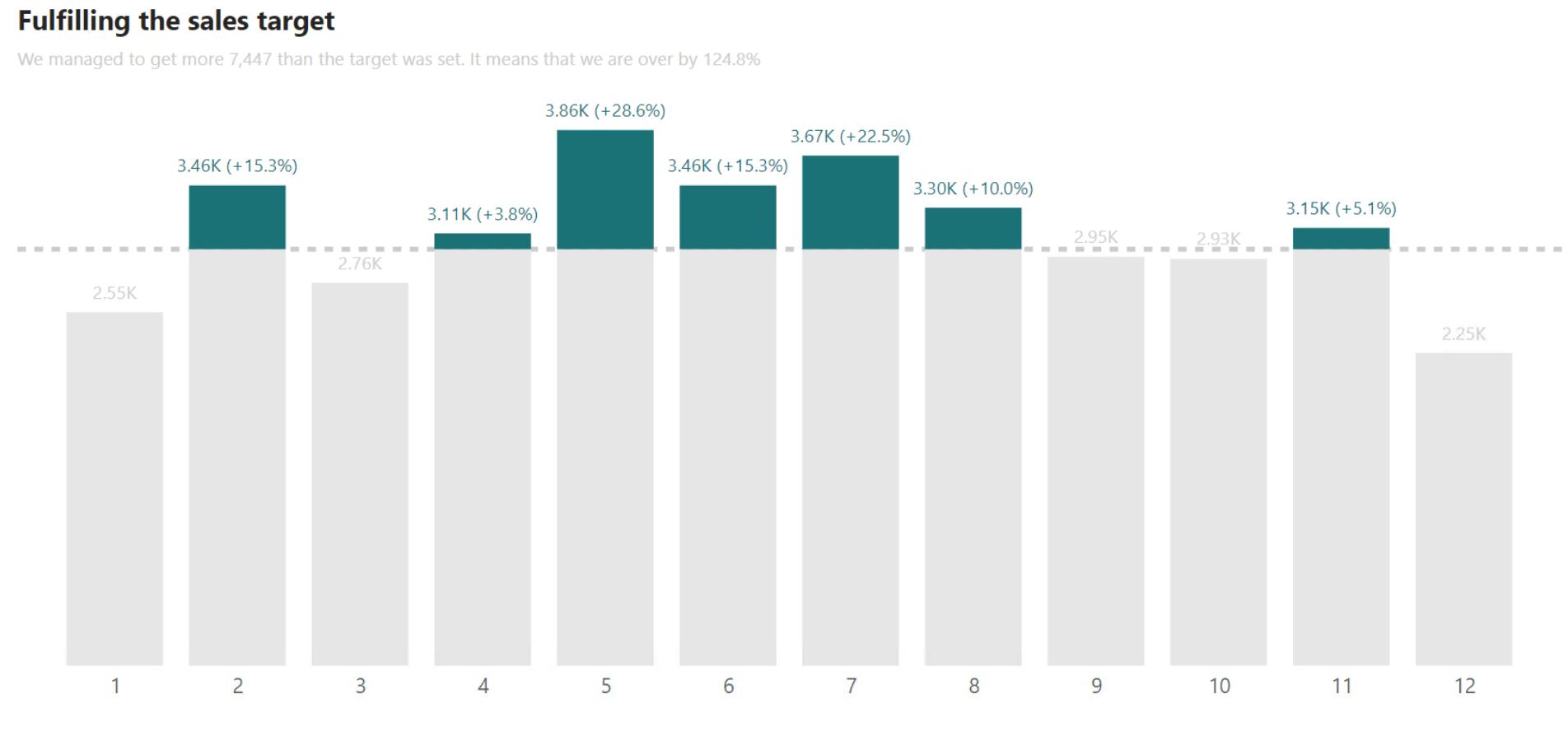
# A little better, but not enough!

That ratio can distort reality a lot



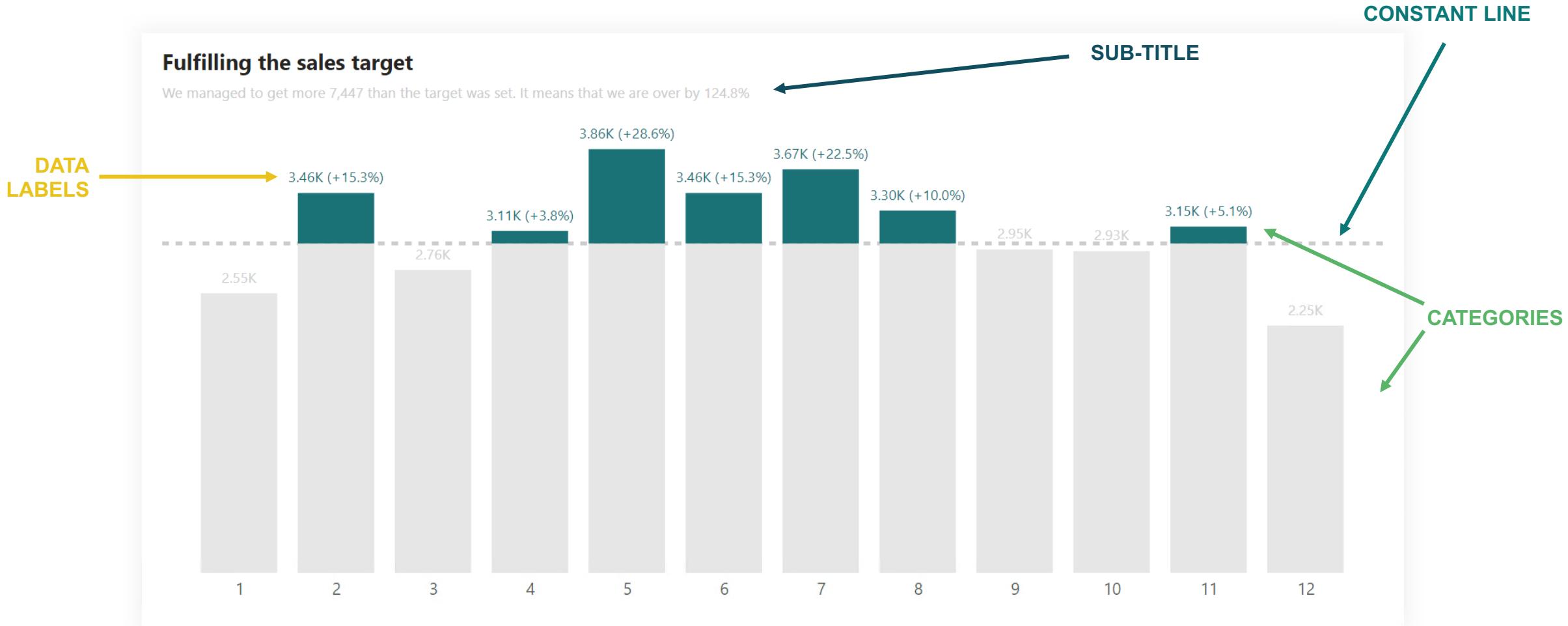
# Now it's probably completely clear!

And the subtitle will tell us the exact result!



# Now it's probably completely clear!

And the subtitle will tell us the exact result!



# SPECIFIC ELEMENTS TO HACK

# WHAT CAN WE HACK?

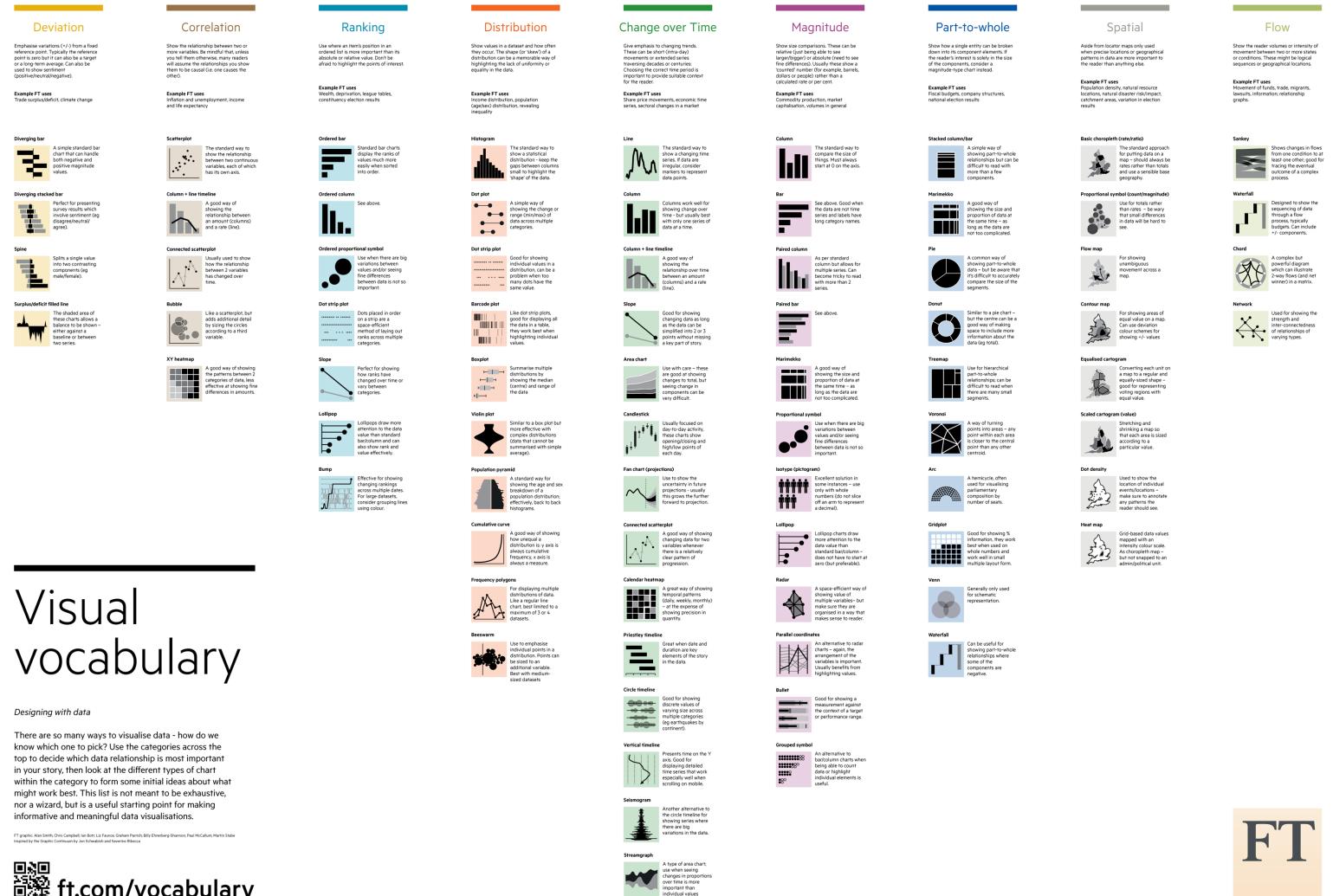


EVERYTHING!!!

- Chart types
- Title
- Subtitle
- Values
- Axis
- Categories
- Labels
- Format Strings
- Colors
- Spaces
- Tooltips
- Backgrounds
- Images
- Lines
- Small Multiples
- Visibility
- Shades
- Analytical addons
- ...

# Chart types

We need to select proper type that will supports our message



## Visual vocabulary

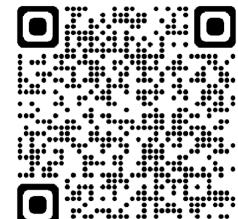
### Designing with data

There are so many ways to visualise data - how do we know which one to pick? Use the categories across the top to decide which data relationship is most important in your story, then look at the different types of chart within that category to think about what initial idea about what might work best. This list is not meant to be exhaustive, nor a wizard, but is a useful starting point for making informative and meaningful data visualisations.

FT graphic: Alex Smith, Chris Campbell, Ian Bent, Li Fausto, Gabriele Pernici, Billy Dzherberg, Sharmin, Paul McCullum, Martin Dohle  
Inspired by The Graphic Communicator by Jim Schatzki and Steven Rizzo



[ft.com/vocabulary](http://ft.com/vocabulary)

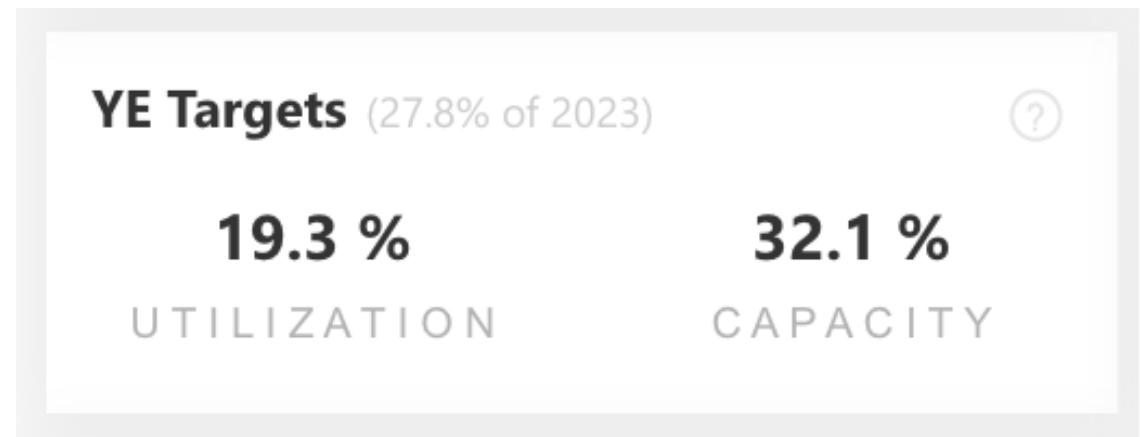
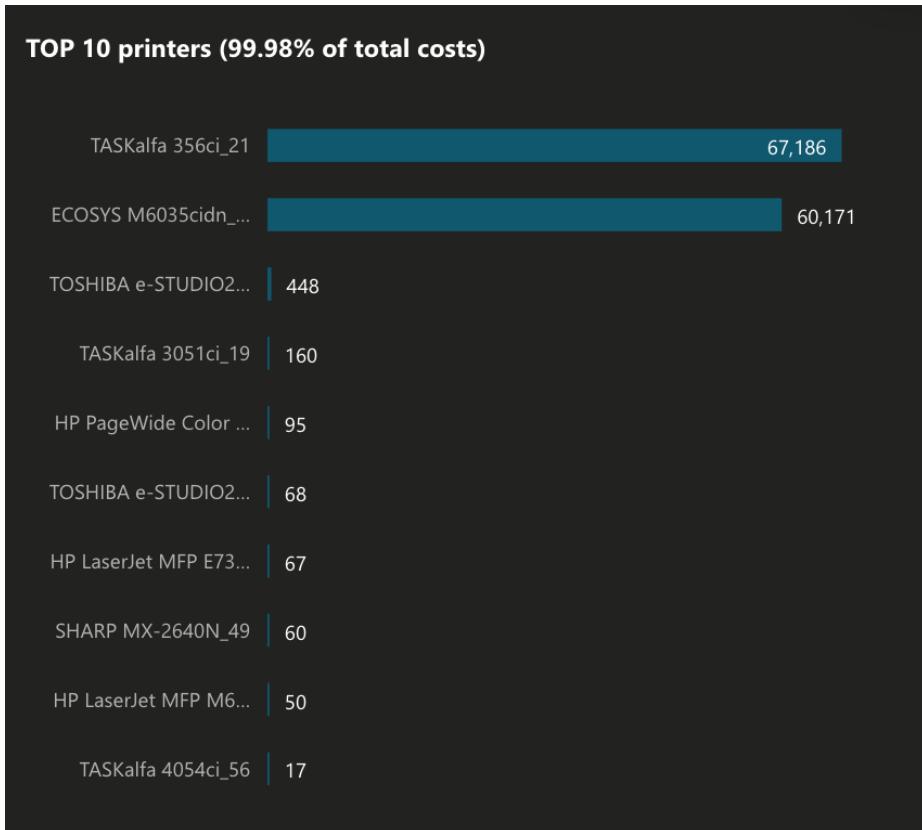


© Financial Times 2019-2020  
This work is licensed under a Creative Commons  
Attribution-NonCommercial 4.0 International License

# Title + Subtitle

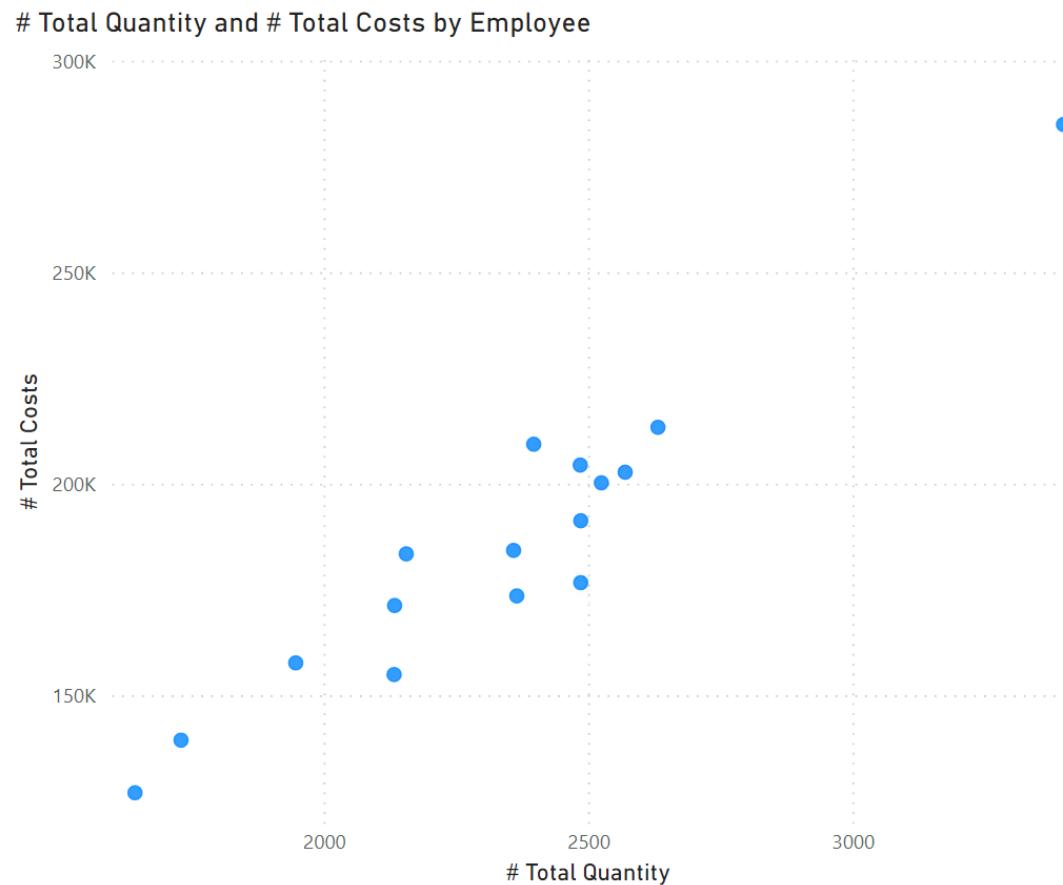


They can also bring better understanding and more details



# Axis

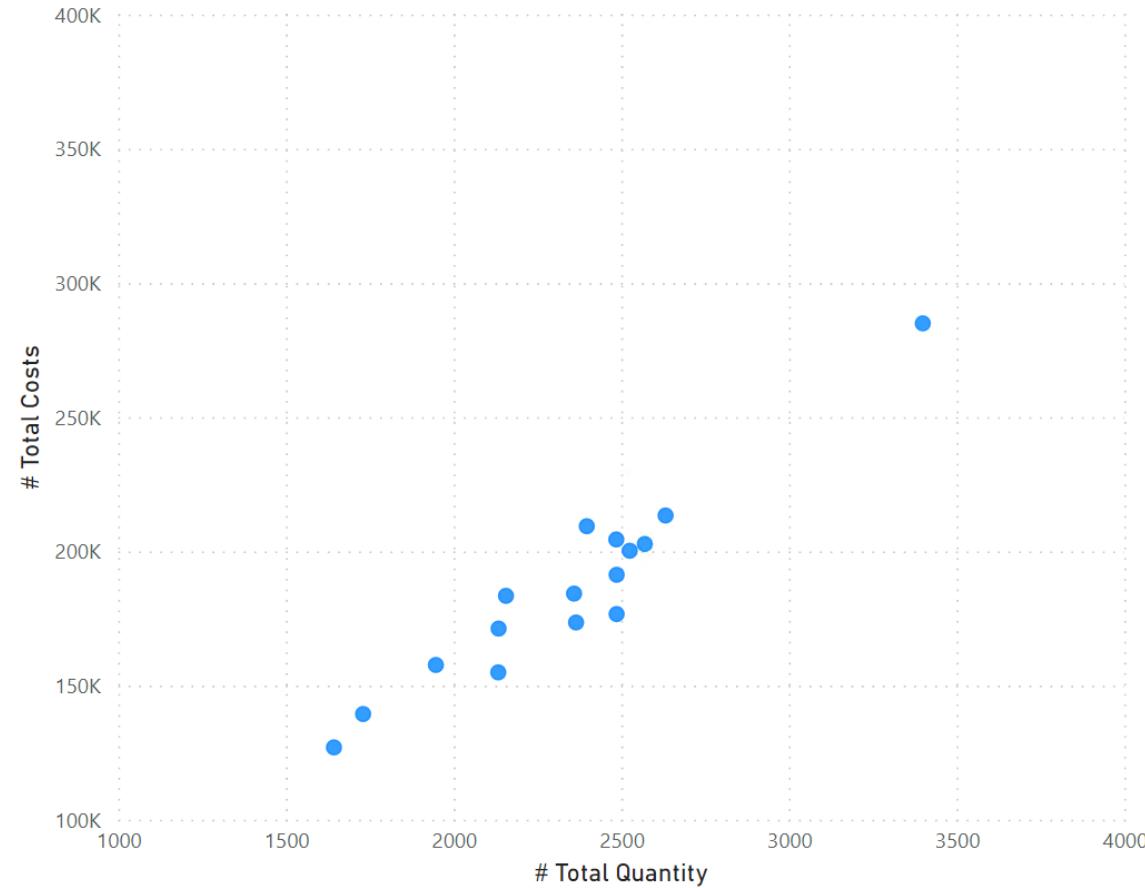
So that the values correspond to the real scale... ARE THEY?



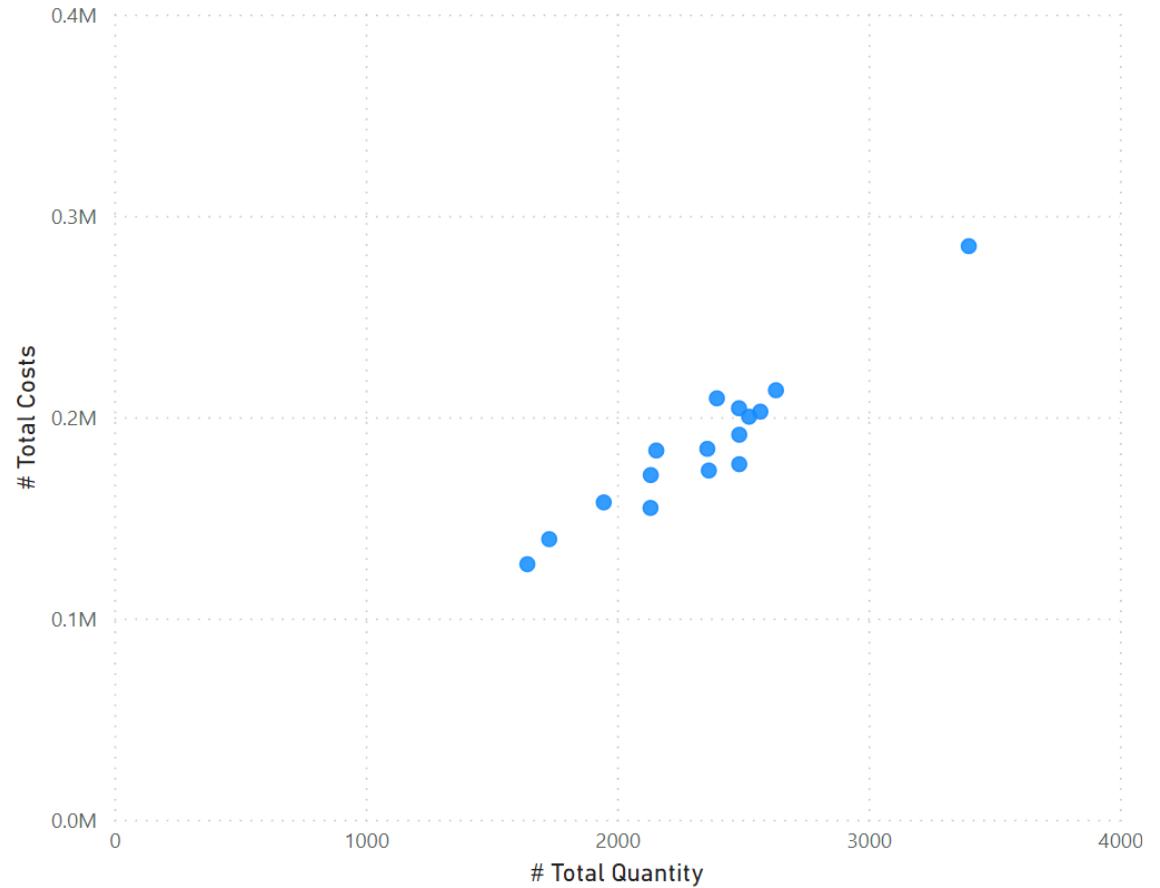
# Axis

NOW values correspond to the real scale

# Total Quantity and # Total Costs by Employee



# Total Quantity and # Total Costs by Employee



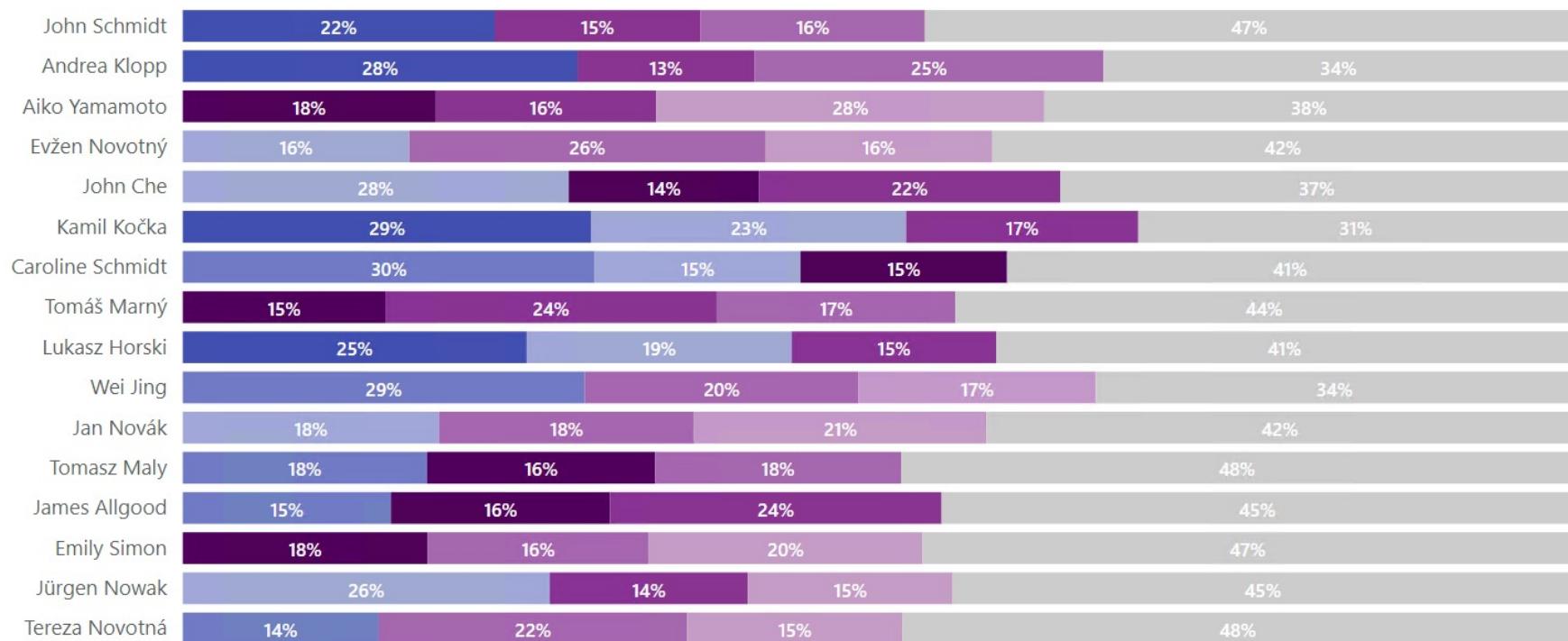
# Categories



Use them so that they bring you more benefit

## Best selling products by salesman

Best selling product is Motherboard C, its sales account for 16% of the total and it is the best selling product at 3 out of 16 salesmans

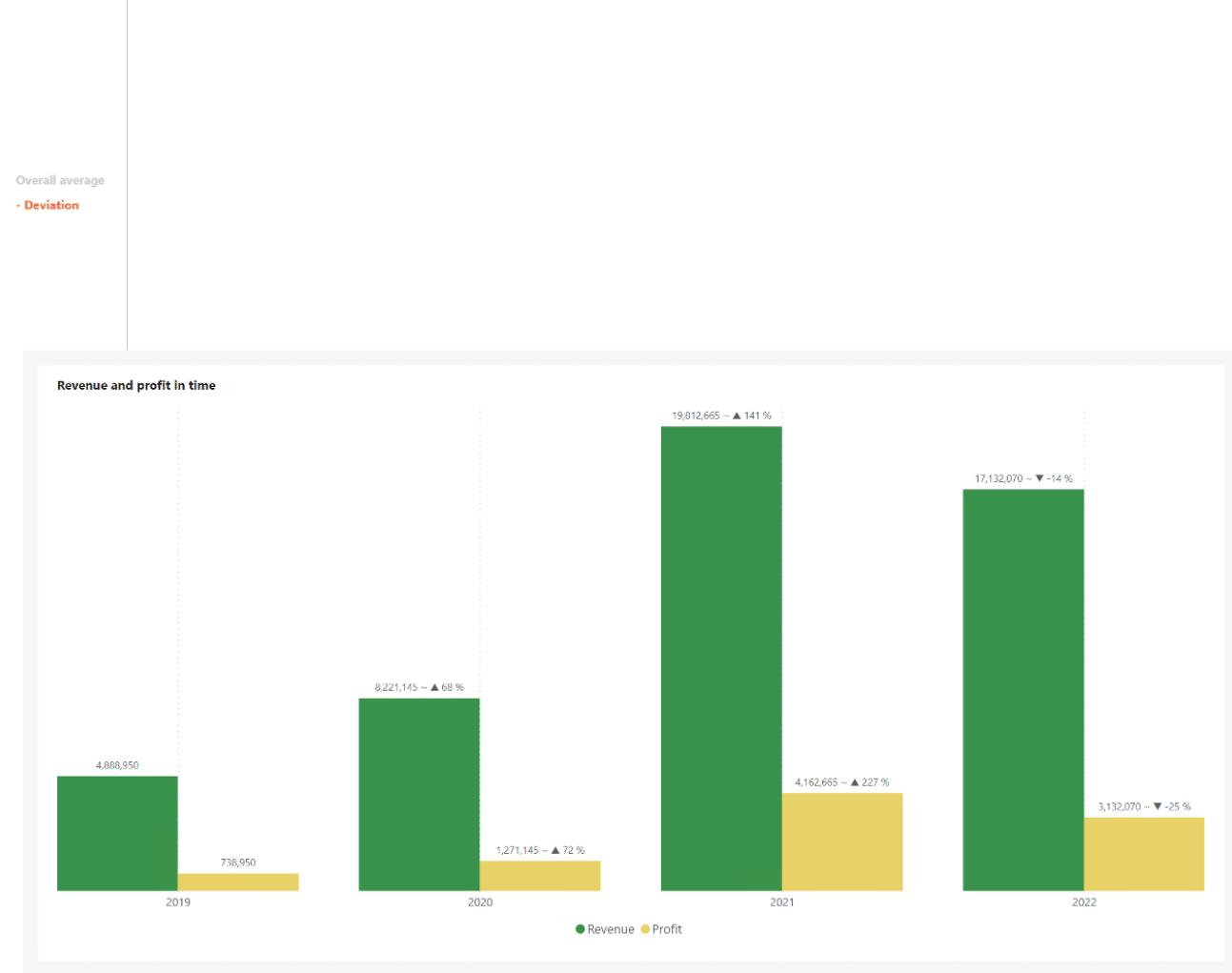
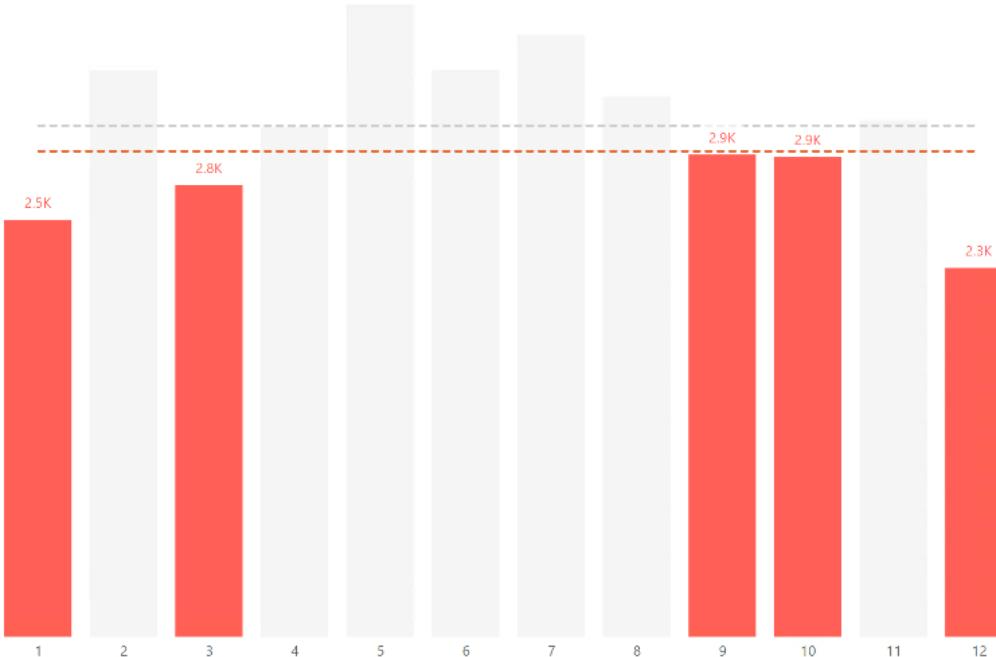


● IoT sensor A ● IoT sensor B ● IoT sensor C ● Motherboard A ● Motherboard B ● Motherboard C ● Motherboard D ● Other products

# Labels + Format Strings

They tell the truth. Why can't they say something more!

Monthly sales and their deviations from the overall average



# Labels + Format Strings



They tell the truth. Why can't they say something more!

04.25.2023

Format	Result
dd/mm/yyyy	25/04/2023
dd/mmm/yy	25/Apr/23
d	25
mmmm	April
m	4
ddd	Tue

1234.9

Format	Result
0.00	1234.90
#.0#	1234.9
#,0.0	1 234.9
#,,,,,0	1234
0,,,,,0	0,,,1,234
.00	.90

FORMAT( 100, "">\$ \$"; ⚡; 💀" )  
FORMAT( -100, ">\$ \$"; ⚡; 💀" )  
FORMAT( 0, ">\$ \$"; ⚡; 💀" )

# Colors



Colors can be both our friend and our unsuspecting enemy

ProductName	Quantity Sold
Anti-blue Light Glasses	79800
Intelligent Table Lamp	77726
Portable Projector	72861
5000 Powerbank	71857
Wireless Phone Charger	71107
Universal Charging Cable	70916
Interactive Whiteboard	69583
<b>Total</b>	<b>513850</b>

% YTD revenue + projects

156.5%

Last month 184.1%

Decrease by -27.6%

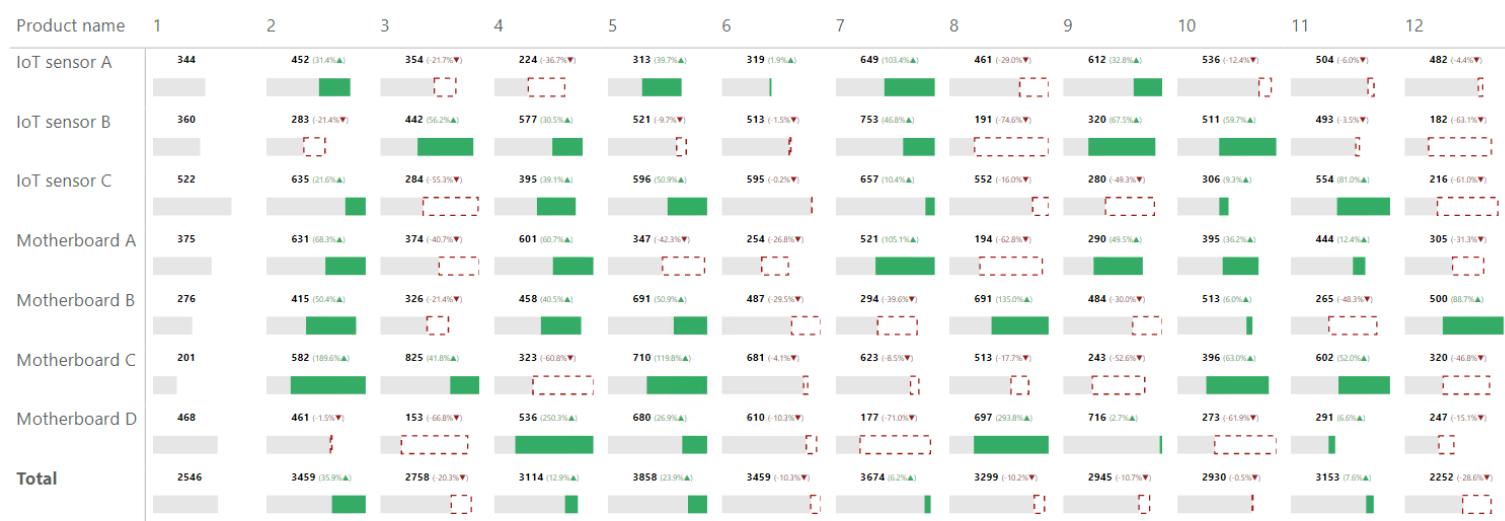
Category	Andrea	Caroline	Evžen	Jan	John	Jürgen	Kamil	Lukasz	Tereza	Tomáš	Tomasz
<b>Strategic thinking</b>											
Analytical	15	16	2	7	2	8	2	1	4	28	4
Learner	19	8	13	1	5	7	12	16	15	14	1
Input	28	15	15	4	8	23	4	23	12	7	8
Ideation	33	2	18	32	10	14	1	20	8	27	6
Intellection	22	24	31	14	11	28	15	12	9	5	5
Futuristic	11	4	11	26	21	19	22	14	13	21	30
Strategic	1	1	22	34	33	33	17	15	1	33	3
Context	24	32	28	31	25	10	27	32	28	19	19
<b>Executing</b>											
Achiever	34	6	25	10	34	1	13	3	3	10	2
Focus	17	21	8	11	13	2	20	2	2	29	20
Responsibility	18	10	10	12	7	6	14	19	21	8	23
Restorative	14	3	9	6	1	29	11	26	22	1	32
Deliberative	16	31	29	8	26	4	21	7	6	4	16
Arranger	10	19	7	28	12	15	19	8	23	24	22
Discipline	3	30	12	3	17	24	33	18	16	12	33
Belief	12	14	27	20	16	26	24	25	11	11	27
Consistency	5	34	30	5	20	21	28	28	31	20	34
<b>Relationship building</b>											
Relator	2	7	4	9	3	5	7	5	7	2	11
Individualization	8	5	3	18	6	3	6	17	10	15	7
Developer	4	22	1	19	4	12	32	27	26	3	12
Empathy	7	25	21	17	19	17	34	21	33	6	15
Positivity	23	11	16	22	9	18	29	31	25	13	21
Connectedness	26	28	34	13	23	20	23	24	14	9	18
Harmony	9	33	5	2	30	22	31	33	32	17	31
Adaptability	25	29	33	27	22	27	3	29	34	16	17
Includer	21	26	26	33	14	30	25	34	30	18	26
<b>Influencing</b>											
Significance	6	20	20	16	15	16	5	13	5	25	28
Self-Assurance	27	9	14	15	24	9	10	4	19	31	13
Maximazer	13	27	24	25	32	11	26	11	24	23	10
Competition	29	17	32	23	28	13	9	9	17	26	25
Command	32	12	23	21	31	31	8	6	18	32	24
Communications	20	23	6	30	27	25	16	22	27	34	14
Activator	30	18	17	24	29	34	18	10	20	22	29
Woo	31	13	19	29	18	32	30	30	29	30	9

# Images



For some, they can be much more instructive than color

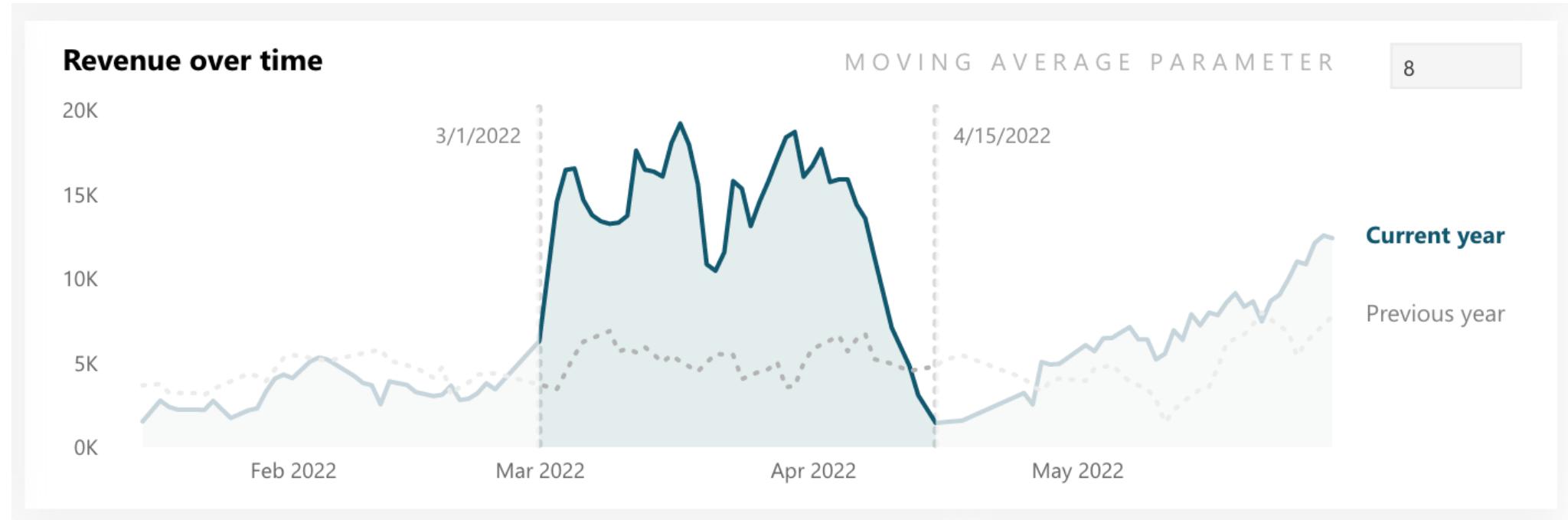
Employee	Sum of Quantity	% increase from previous salesman
John Schmidt	17977	4.87%
Aiko Yamamoto	17142	1.58%
Wei Jing	16875	4.12%
Evžen Novotný	16207	2.27%
John Che	15848	0.25%
Jürgen Nowak	15808	0.38%
Kamil Kočka	15748	0.59%
James Allgood	15655	0.64%
Tomasz Maly	15555	0.05%
Caroline Schmidt	15548	0.35%
Andrea Klopp	15493	1.48%
Lukasz Horski	15267	1.92%
Tereza Novotná	14979	1.53%
Tomáš Marný	14753	2.74%
Jan Novák	14359	0.48%
Emily Simon	14290	0.48%



# Shade + Visibility



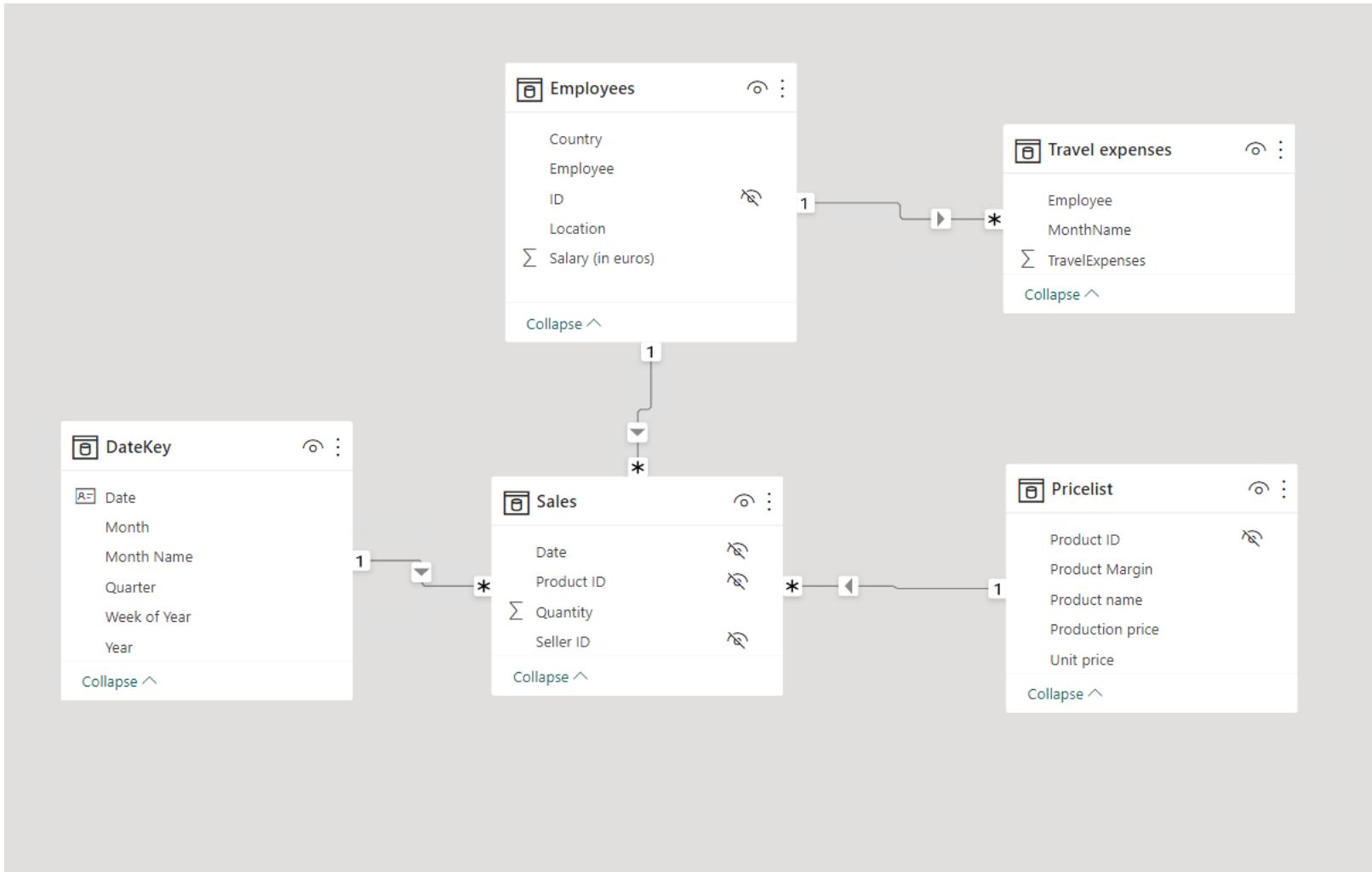
Let what is essential stand out



# SHOWCASES

# Model

We will work with this model.



# MATRIX FOR A TOP PRODUCTS

# Which product is sold the most in which country?

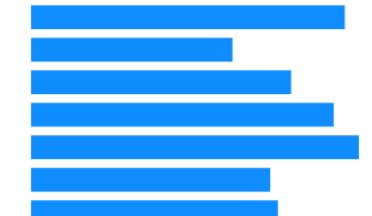
Choosing a chart may seem like a chore... but it's not!

Sold Quantity by Top product and TOP Product by Location and Product name

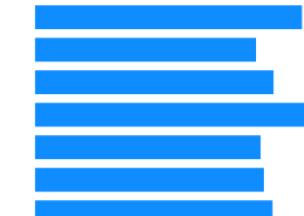
IoT sensor A



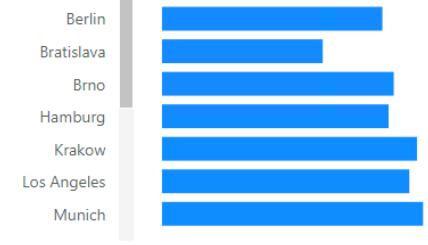
IoT sensor B



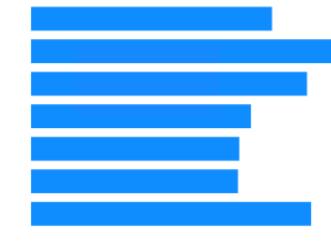
IoT sensor C



Motherboard A



Motherboard B



Motherboard C



Motherboard D



# But it won't be this one!

Brrr... nobody would want to guess that!

# Sum of Quantity for top product by Location and Product name

5K

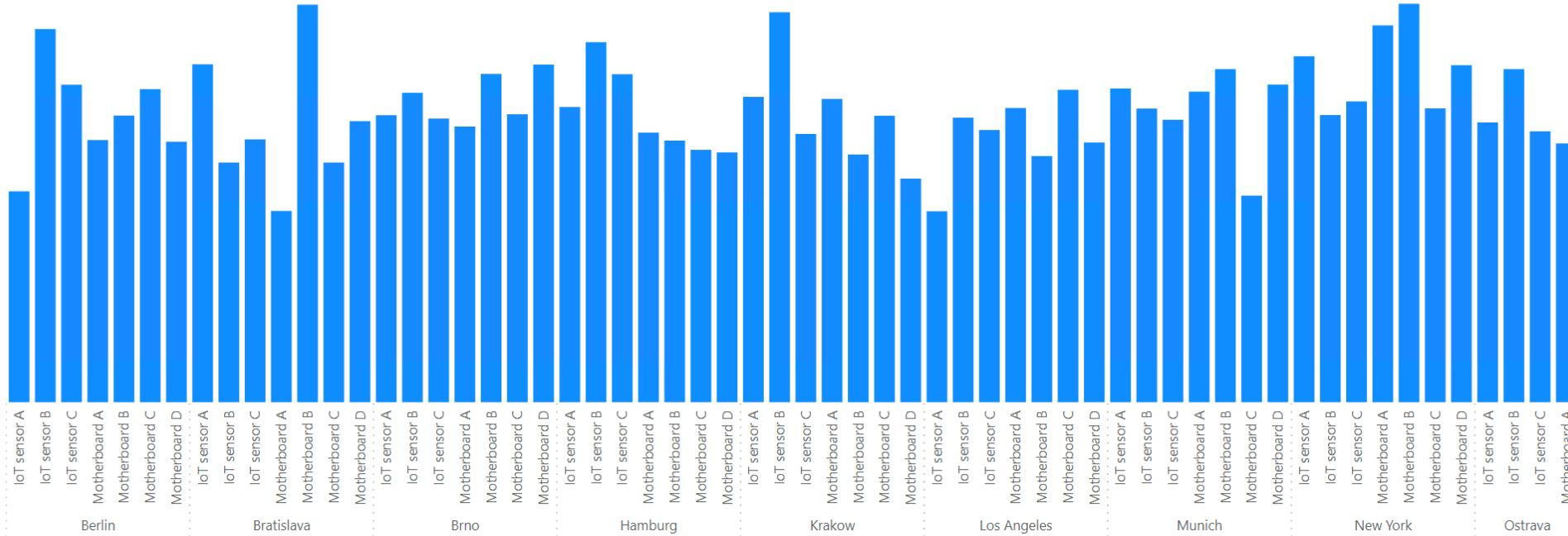
4K

3K

2K

1K

0K



# The Matrix is a classic that will not disappoint!

But in this state, he doesn't even get excited!

Location	IoT sensor A	IoT sensor B	IoT sensor C	Motherboard A	Motherboard B	Motherboard C	Motherboard D	Total
Berlin	1620	2867	2439	2014	2202	2405	2001	<b>2867</b>
Bratislava	2596	1841	2019	1469	3054	1841	2159	<b>3054</b>
Brno	2205	2377	2179	2118	2522	2212	2594	<b>2594</b>
Hamburg	2268	2766	2520	2071	2010	1939	1919	<b>2766</b>
Krakow	2346	2996	2061	2330	1903	2201	1718	<b>2996</b>
Los Angeles	1467	2186	2091	2260	1891	2400	1995	<b>2400</b>
Munich	2410	2256	2170	2386	2559	1587	2440	<b>2559</b>
New York	2658	2206	2311	2895	3061	2257	2589	<b>3061</b>
Ostrava	2149	2559	2081	1988	2574	2591	1806	<b>2591</b>
Peking	2186	3034	1961	2301	2187	2749	2457	<b>3034</b>
Prague	3908	3970	3958	4424	4661	4023	4168	<b>4661</b>
Sydney	2340	2227	1835	2769	3102	1619	1763	<b>3102</b>
Tokio	1928	2135	2083	2319	2264	2908	3505	<b>3505</b>
Vancouver	1780	2479	2563	2206	2337	2474	2009	<b>2563</b>
Warsaw	2753	2317	1769	2132	2903	1750	1643	<b>2903</b>
<b>Total</b>	<b>34614</b>	<b>38216</b>	<b>34040</b>	<b>35682</b>	<b>39230</b>	<b>34956</b>	<b>34766</b>	<b>39230</b>

# Would color help?

Yes, but there are a lot of other distracting numbers!

Location	IoT sensor A	IoT sensor B	IoT sensor C	Motherboard A	Motherboard B	Motherboard C	Motherboard D	Total
Berlin	1620	2867	2439	2014	2202	2405	2001	<b>2867</b>
Bratislava	2596	1841	2019	1469	3054	1841	2159	<b>3054</b>
Brno	2205	2377	2179	2118	2522	2212	2594	<b>2594</b>
Hamburg	2268	2766	2520	2071	2010	1939	1919	<b>2766</b>
Krakow	2346	2996	2061	2330	1903	2201	1718	<b>2996</b>
Los Angeles	1467	2186	2091	2260	1891	2400	1995	<b>2400</b>
Munich	2410	2256	2170	2386	2559	1587	2440	<b>2559</b>
New York	2658	2206	2311	2895	3061	2257	2589	<b>3061</b>
Ostrava	2149	2559	2081	1988	2574	2591	1806	<b>2591</b>
Peking	2186	3034	1961	2301	2187	2749	2457	<b>3034</b>
Prague	3908	3970	3958	4424	4661	4023	4168	<b>4661</b>
Sydney	2340	2227	1835	2769	3102	1619	1763	<b>3102</b>
Tokio	1928	2135	2083	2319	2264	2908	3505	<b>3505</b>
Vancouver	1780	2479	2563	2206	2337	2474	2009	<b>2563</b>
Warsaw	2753	2317	1769	2132	2903	1750	1643	<b>2903</b>
<b>Total</b>	<b>34614</b>	<b>38216</b>	<b>34040</b>	<b>35682</b>	<b>39230</b>	<b>34956</b>	<b>34766</b>	<b>39230</b>

# Little of DAX magic = simpler matrix

Where did it sell the most?

Location	TOP Product	Sold Quantity by Top product
Berlin	IoT sensor B	2867
Bratislava	Motherboard B	3054
Brno	Motherboard D	2594
Hamburg	IoT sensor B	2766
Krakow	IoT sensor B	2996
Los Angeles	Motherboard C	2400
Munich	Motherboard B	2559
New York	Motherboard B	3061
Ostrava	Motherboard C	2591
Peking	IoT sensor B	3034
Prague	Motherboard B	4661
Sydney	Motherboard B	3102
Tokio	Motherboard D	3505
Vancouver	IoT sensor C	2563
Warsaw	Motherboard B	2903

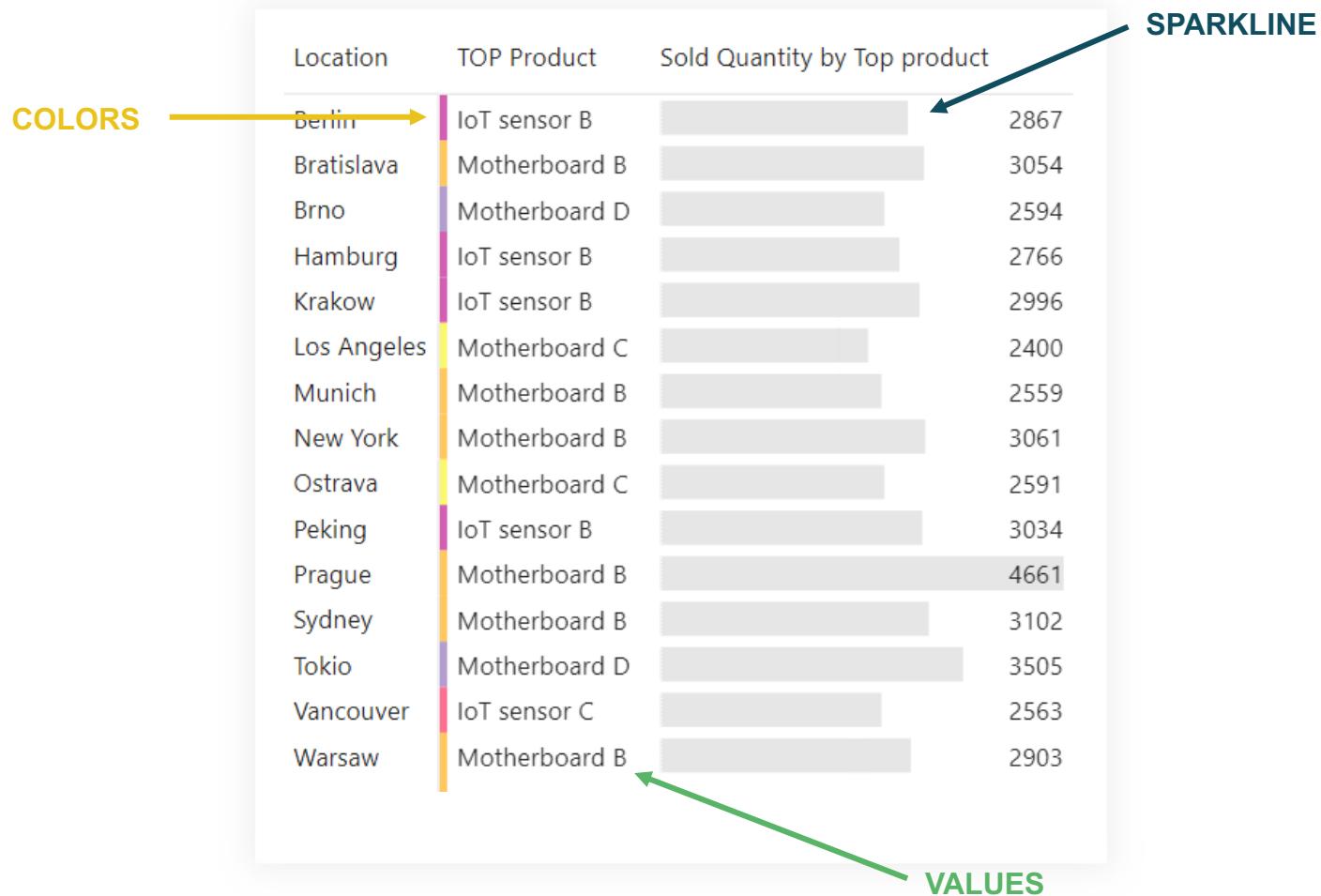
# One sparkline + color and you can immediately read the results

At the same time, cleanliness, clarity and simplicity remained.



# One sparkline + color and you can immediately read the results

At the same time, cleanliness, clarity and simplicity remained.



# CUMULATIVE SALES DEVELOPMENT



# The line that goes up tells me little by itself

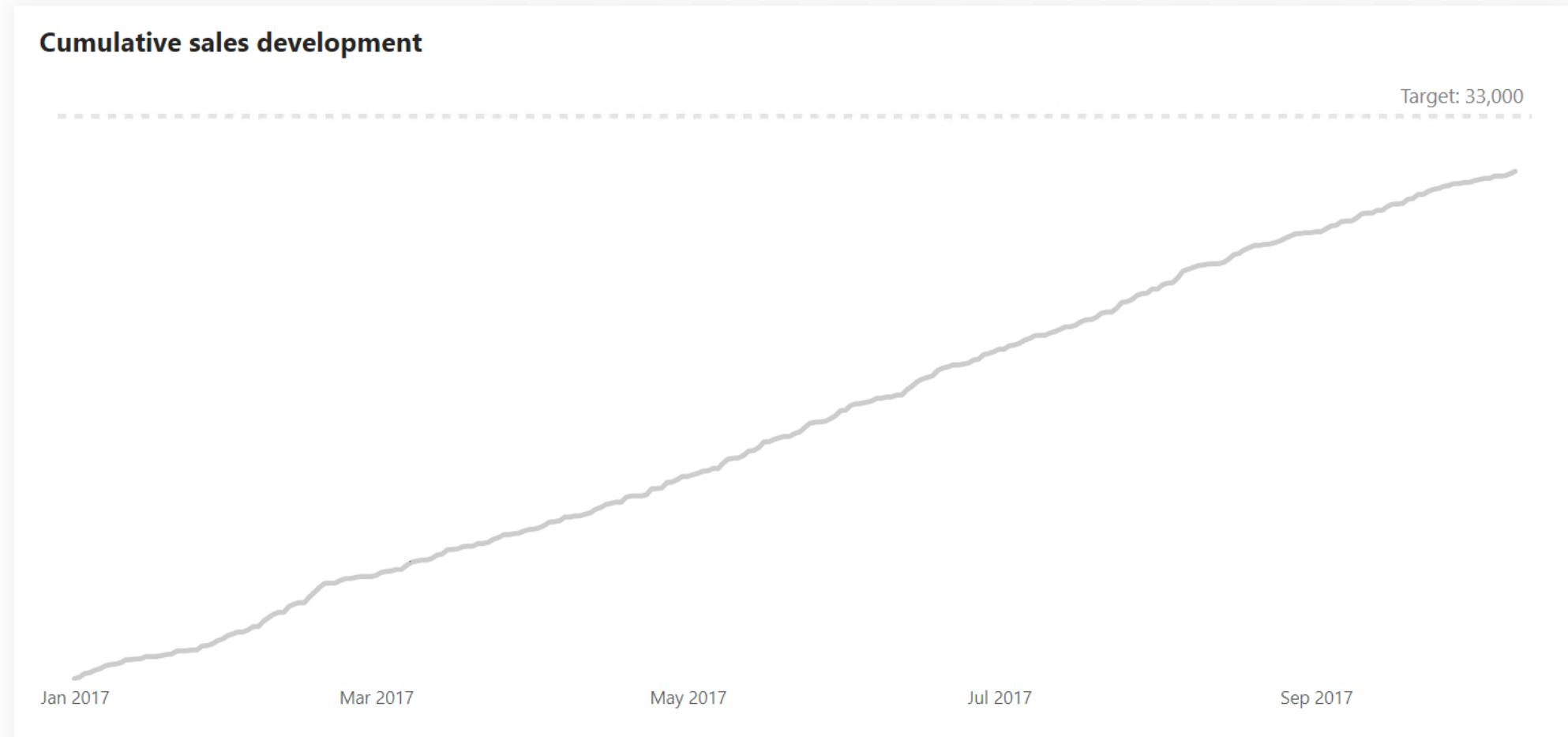


Finance and Controlling love development charts... (T12M, T6M, YTD,...)



# Previous state – Colors + Target = A bit of understanding

We know we are getting close! That's good to know... but then what?



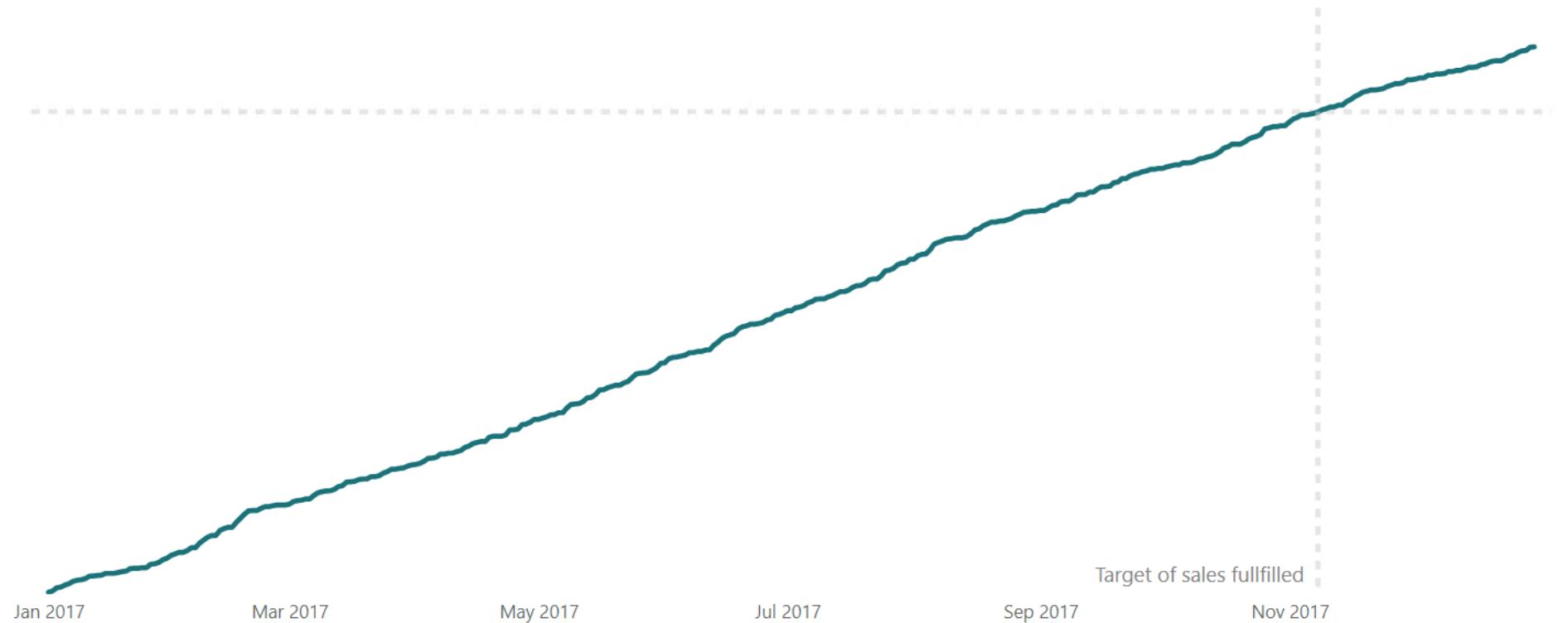
# After all, we don't end by fulfilling the goal!



The detail is in the subtitle, but it would be great if the chart supported it more!

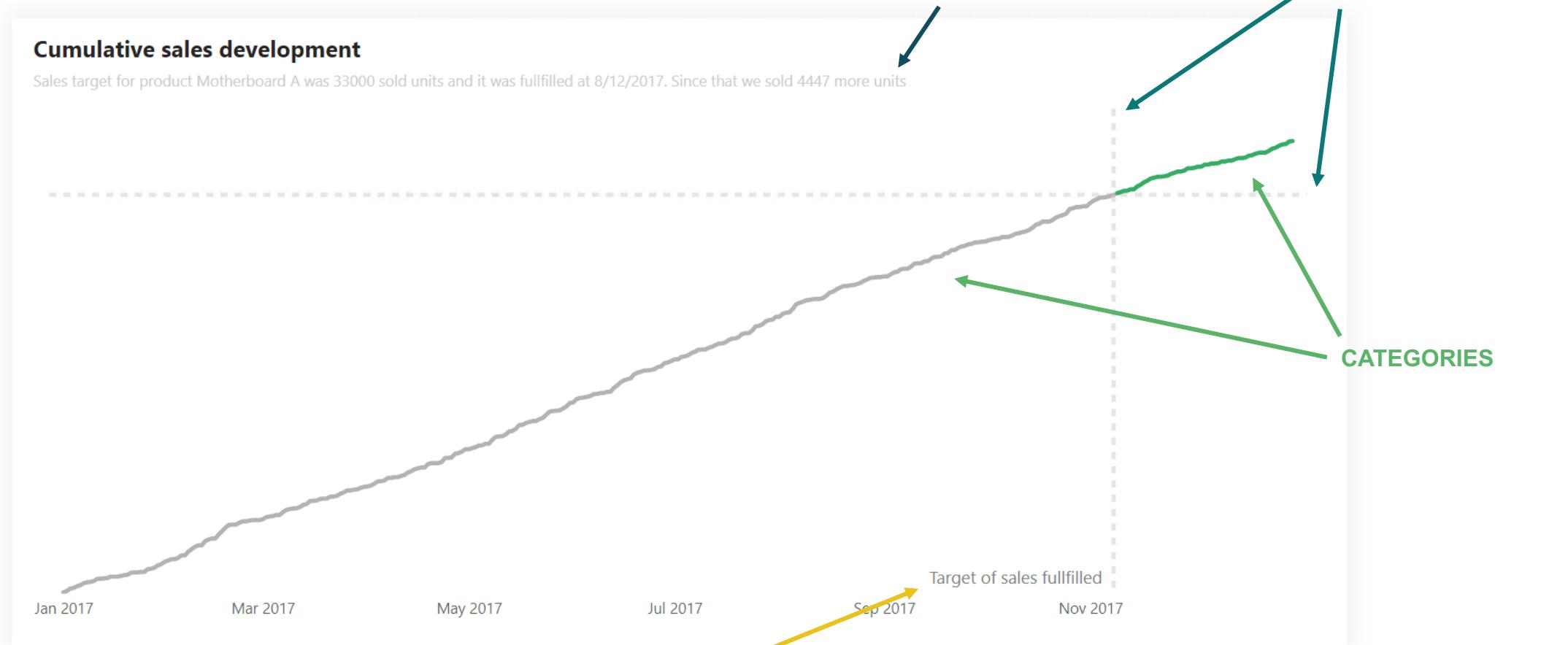
## Cumulative sales development

Sales target for product Motherboard A was 33000 sold units and it was fulfilled at 8/12/2017. Since that we sold 4447 more units



# Voila

Of course, exceeding goals does not always have to be positive or always negative.



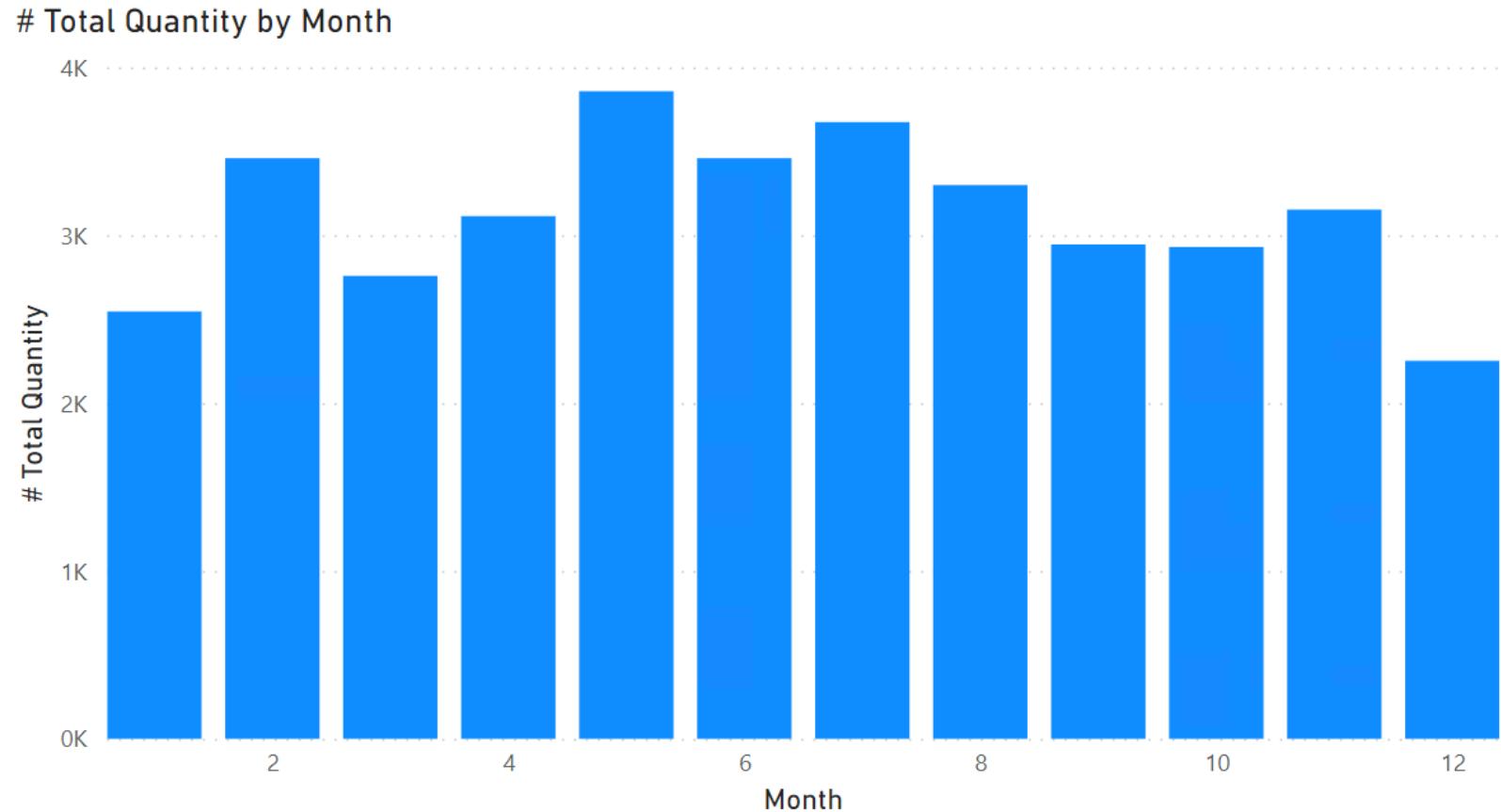


# **FULLFILLING THE SALES TARGET**



# Our springboard

We've seen this before, so we know what to expect

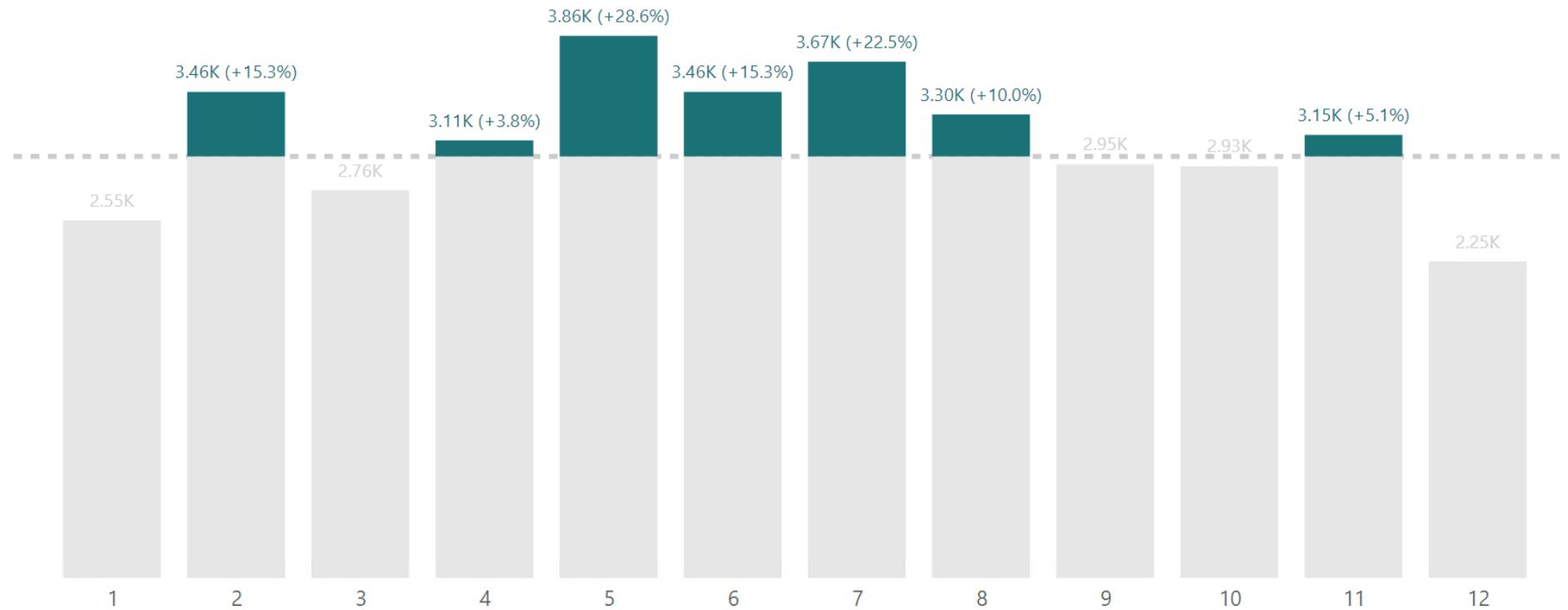


# Shiny result

The result is worth the effort!

## Fulfilling the sales target

We managed to get more 7,447 than the target was set. It means that we are over by 124.8%



# TOOLTIPS

# Default tooltip

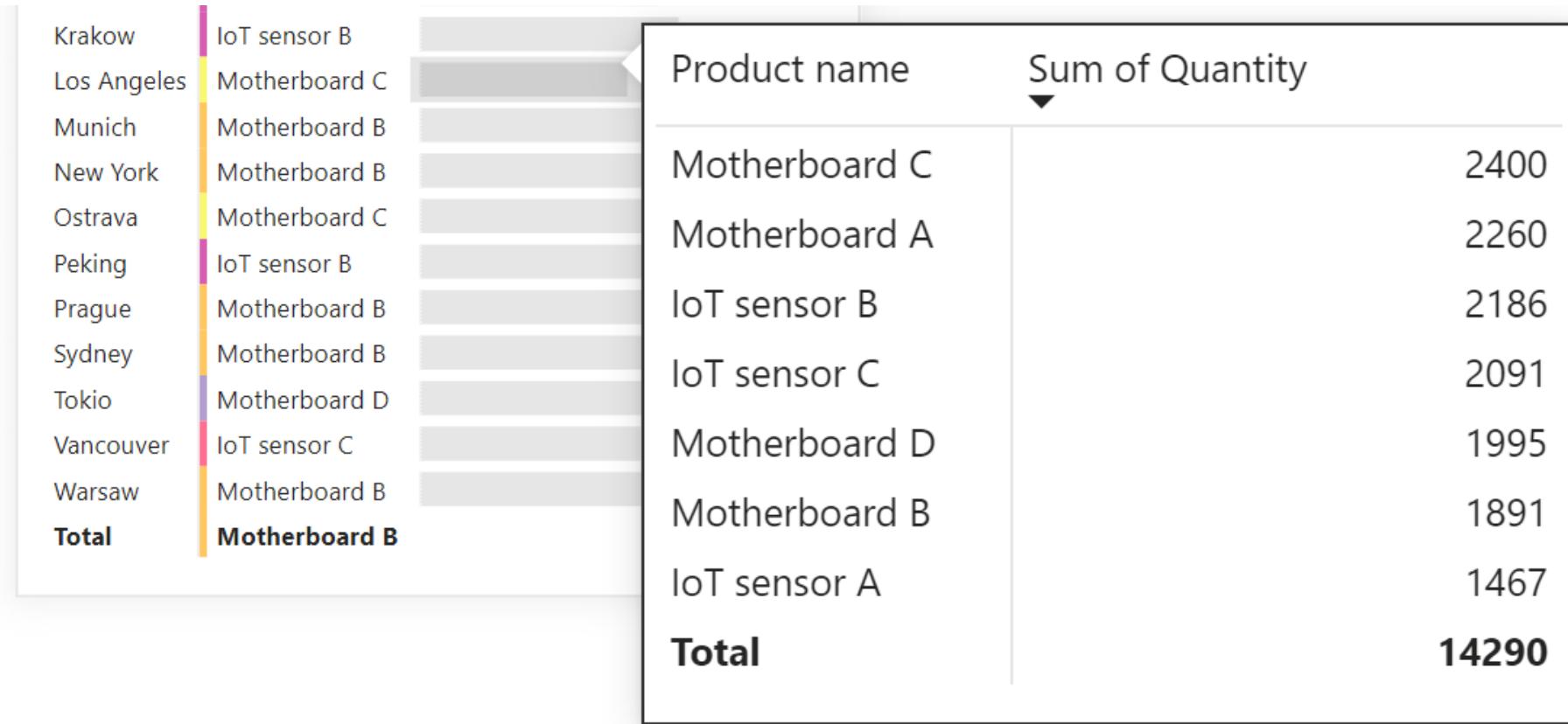


Quite clean but doesn't say anything extra!



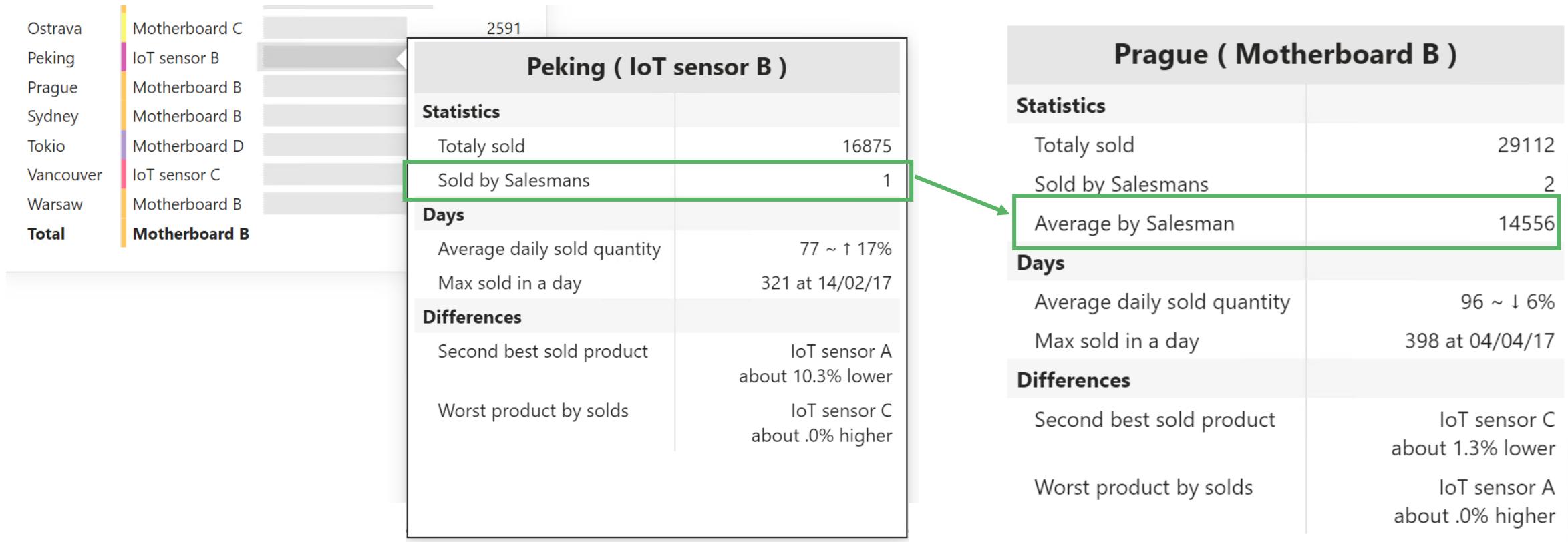
# Custom but still very simple

This is what only one point of view tells us



# Explanatory tooltip

Any detail we need! But you don't always have to show everything.



# Explanatory tooltip

Any detail we need! But you don't always have to show everything.

The diagram shows a tooltip card for a product named "Prague (Motherboard B)". The card is divided into sections: Statistics, Days, and Differences. It displays numerical values and descriptive text. Several annotations point to specific elements:

- TOOLTIP**: Points to the overall tooltip card.
- CATEGORIES**: Points to the section header "Prague (Motherboard B)".
- CARD WITH CATEGORY + TOP PRODUCT**: Points to the top section of the card.
- FORMAT STRING**: Points to the value "96 ~ ↓ 6%".
- VALUE COMBINATIONS**: Points to the value "398 at 04/04/17".

Prague ( Motherboard B )	
<b>Statistics</b>	
Totaly sold	29112
Sold by Salesmans	2
Average by Salesman	14556
<b>Days</b>	
Average daily sold quantity	96 ~ ↓ 6%
Max sold in a day	398 at 04/04/17
<b>Differences</b>	
Second best sold product	IoT sensor C about 1.3% lower
Worst product by solds	IoT sensor A about .0% higher

# SUMMARY

# SUMMARY



My selection of the most important information

- *Almost everything can be modified on visuals.*
- *The message that we want to convey in the report needs to be highlighted compared to the rest*
- *The first look at the report is to draw attention to the right place*
- *It is good to mark the differences / fluctuations.*
- *Make Calculation Groups, Field Parameters and Format Strings your friends*

# SUMMARY



My selection of the most important information

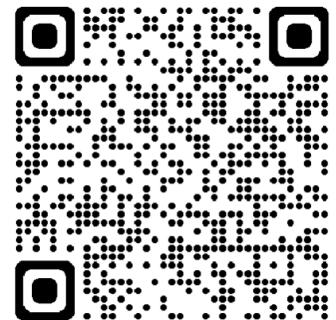
***Everything can be modified, message needs to be highlighted. Draw attention, mark differences / fluctuations. Make Calculation Groups, Field Parameters and Format Strings your friends***

# THANK YOU FOR THE ATTENTION

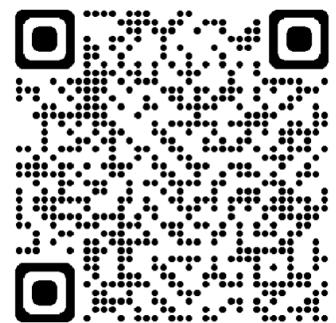


**ŠTĚPÁN REŠL**

**LINKEDIN**



**TWITTER**



**Data  
Brothers**



**JAK NA  
POWER BI**



**Power BI  
kafíčko**



**Data  
Meerkat**