



Visualizing Data for Non-Data Experts

Making Reports Accessible

Valerie Junk



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- Data Analytics & Visualization
- Data Storytelling
- Process Improvement
- BI Standardization



Accessibility

- **Design**
 - Simple but informative
 - Action driven
 - End-user oriented
- **In combination with accessibility features**
 - Keyboard navigation
 - Tab order
 - Screen reader
 - Alt text
 - Contrast & Colour blindness



Perfect report...

.. the audience just doesn't get it!



Not designing for the audience

A real example

Vessel tracking

- Loading time
- Start time
- Time of arrival
- Unloading

Need: Efficiency report



Not designing for the audience

A real example

Huge amounts of data

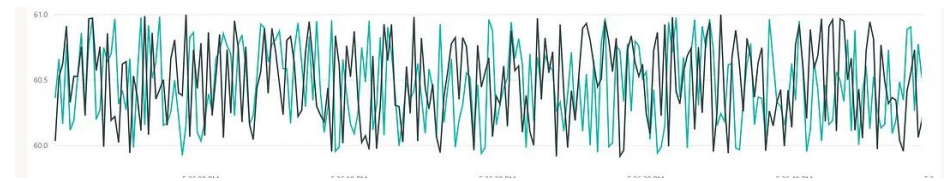
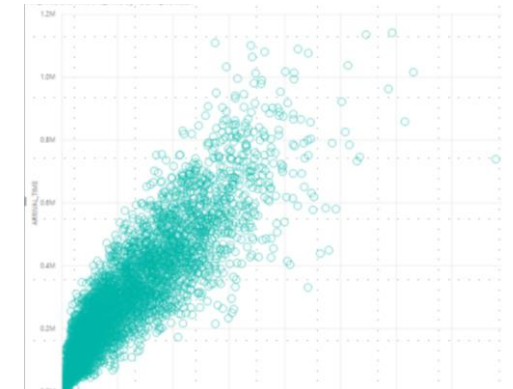
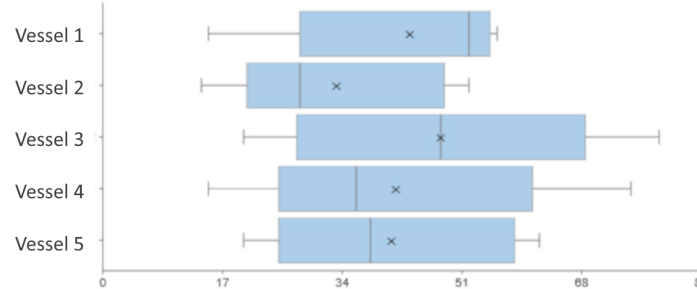
- GPS by second
- Vessel data
- Weather & current data
- Load/Unload data



Data Science to the rescue

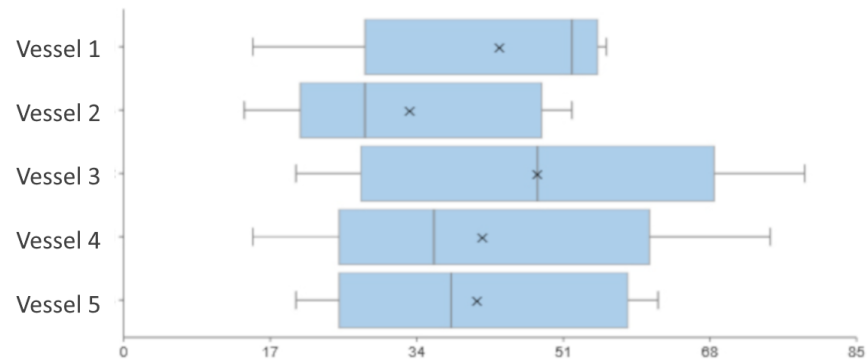
The result

- 25-page report
- No titles and descriptions
- Up to 40 vessels in one visual
- Countless filters

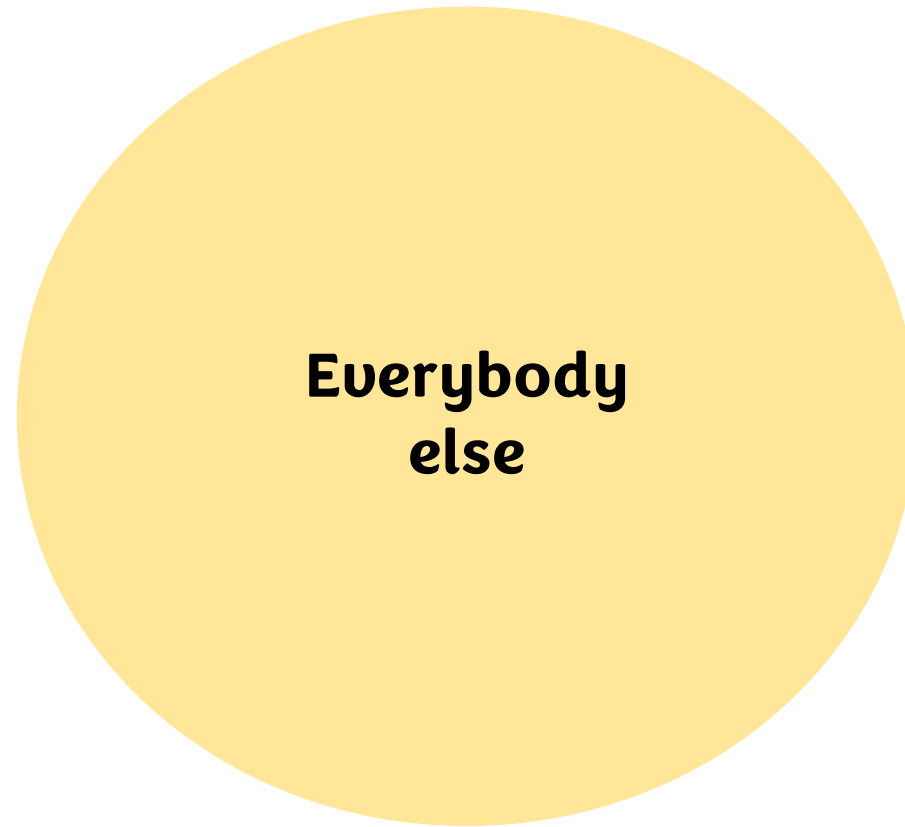
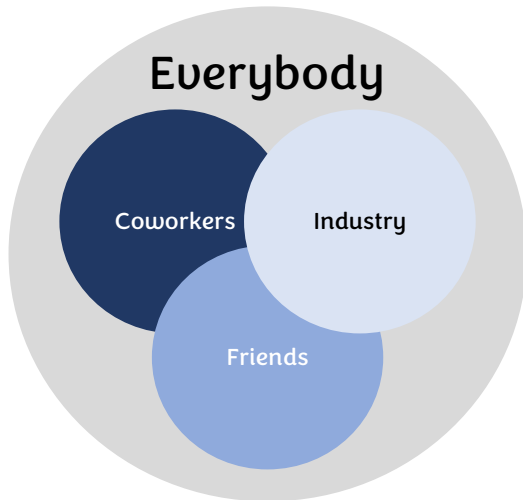


The End-user

Vessel 3 won!



Everybody knows fallacy



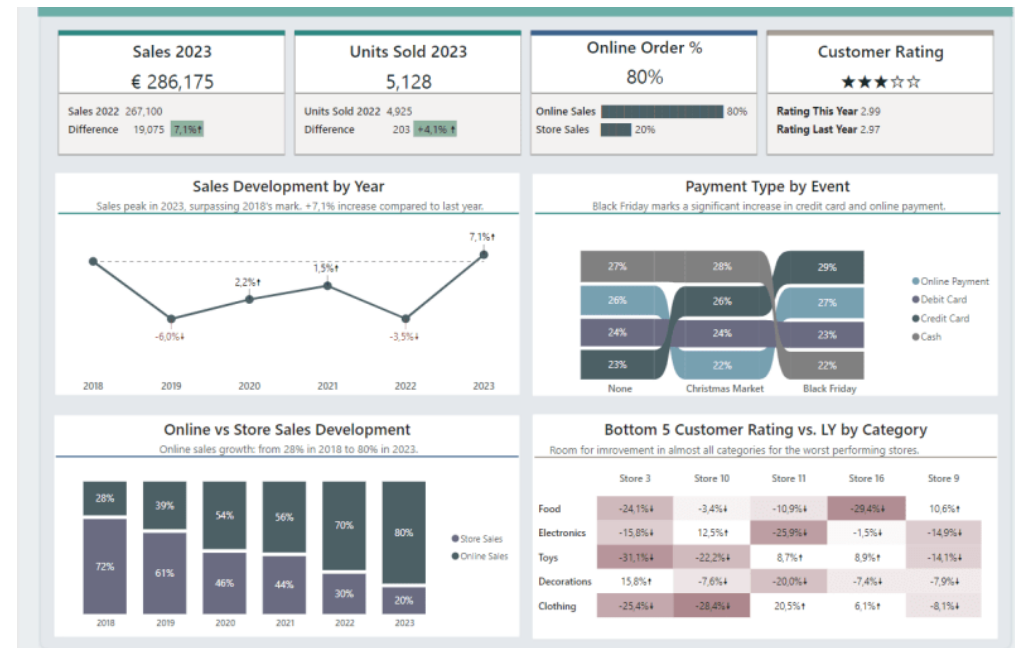
Design for the audience

- Who is the audience?
- What is their level of experience?
- How are they going to **use** the report?
- How much **detail** do they need (and understand)?
- What **actions** do they want to take?



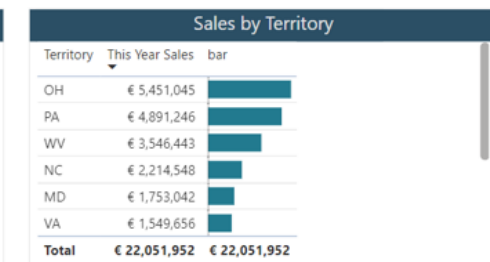
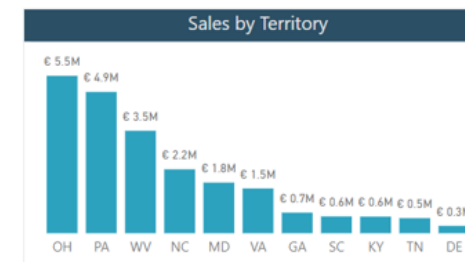
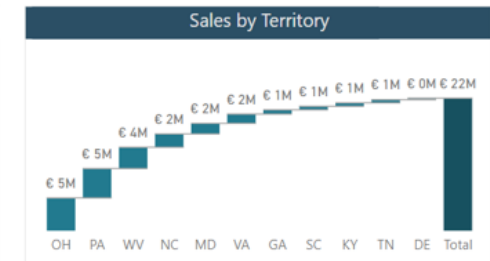
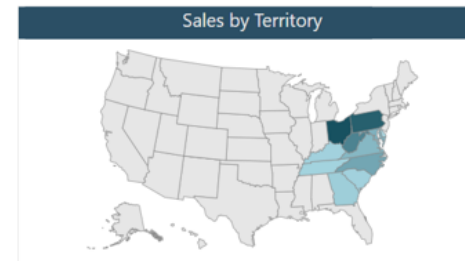
Asking Questions

- Provide examples
- Ask what actions they expect to be able to take
- Ask about prior experience (& check)



Visual = Goal + end-user

- Goal (actions to take) & end-user determine the visual.
- Same data can be visualized in different ways.



Small changes – huge effect

Sales Difference TY vs LY by Product				
Category	Gross Sales	Difference LY	Units Sold	Difference LY
Office Electronics				
Product 4	€ 15,468,394	-583,396.53	88,790	-31,303.00
Product 6	€ 12,043,158	1,804,151.16	40,983	-15,084.50
Product 5	€ 10,276,638	5,093,043.05	51,091	-2,640.50
Product 1	€ 7,302,443	-502,078.43	47,291	-8,067.50
Product 2	€ 7,082,499	-313,509.85	30,822	-10,722.00
Product 3	€ 5,204,885	-1,438,575.67	33,837	-16,389.00
Headphones				

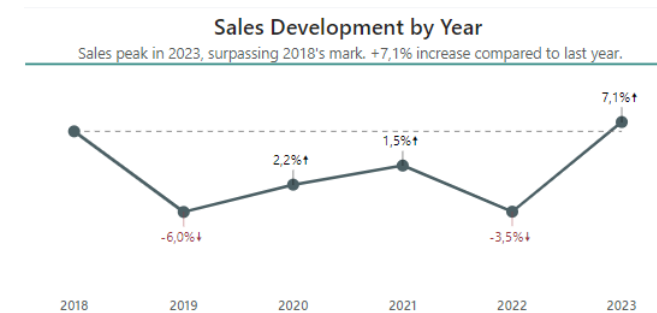
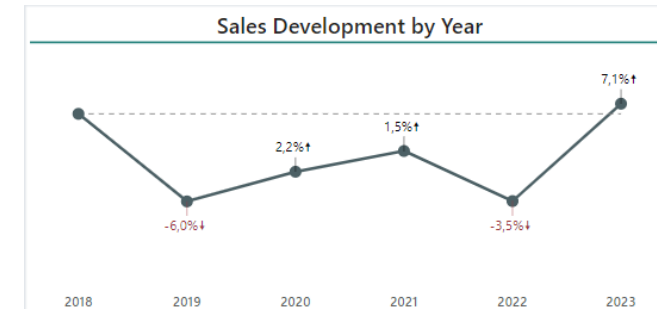
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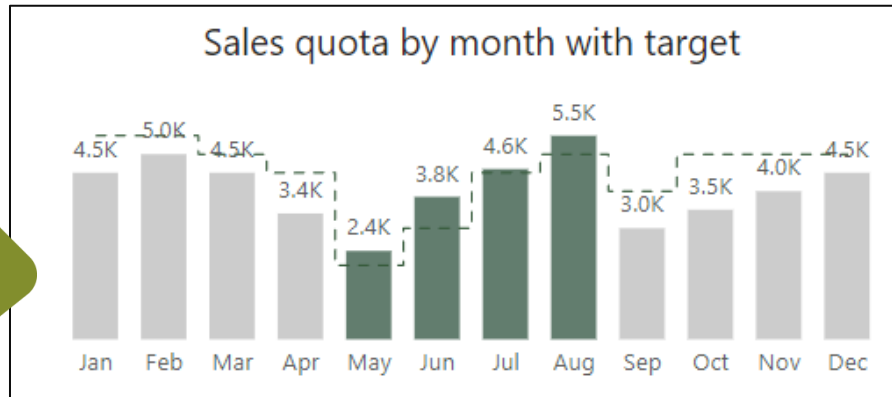
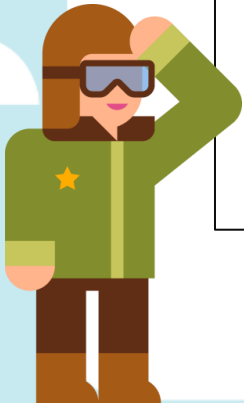
Meaningful (Sub)titles

- Provide context
- Provide first insights
- Guide the end-user
- End-users don't need to analyse themselves

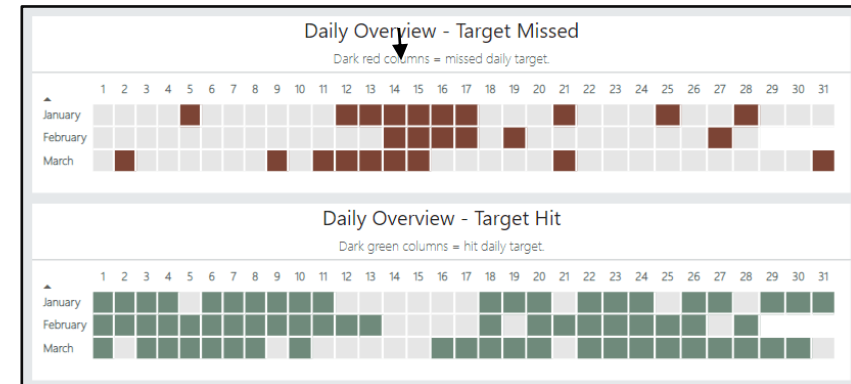
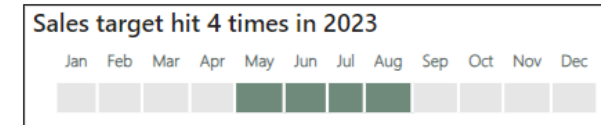


Adding Context

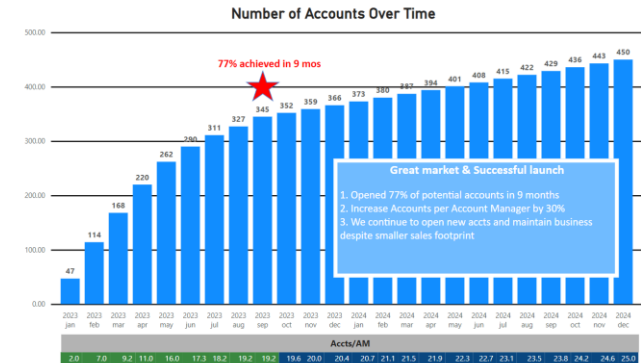
Legend and colour coding



Simplify



Don't overestimate the time the users is willing to spend to find information.



Accessibility

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 - Action driven
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- **In combination with accessibility features**
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 - Tab order
 - Screen reader
 - Alt text
 - Contrast & Colour blindness



Keyboard navigation

All elements can be navigated using keyboard shortcuts

- **Shift + ?** = Overview shortcuts
- **Ctrl + F6** = Move between sections
- **Ctrl + Shift + F11** = Show visuals as tables
- **Enter** = Enter/Exit a visual
- **Ctrl + Space** = Multi-select data points



Shopping - Trend Analysis

Sum of TotalPrice	Sum of Quantity	Online Order %	Customer Satisfaction Rating
€ 286,175.16	5,128	79.8%	★★★★☆

Sales Development by Year
Sales peak in 2023, surpassing 2019's mark. +7.1% increase compared to last year.

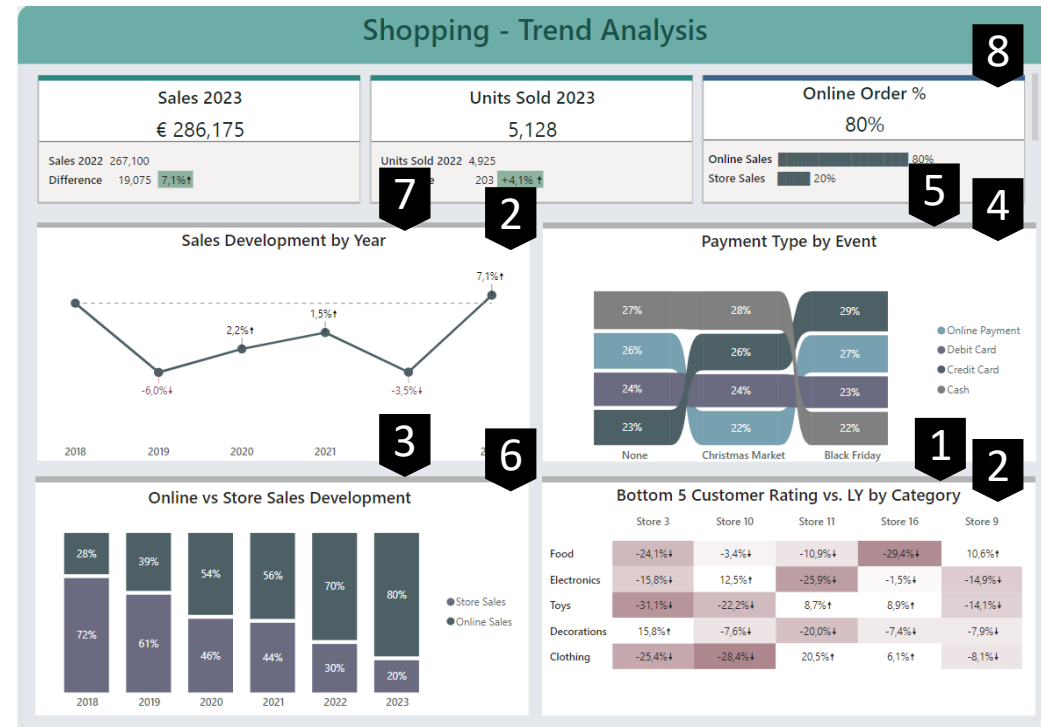
Year	Sum of TotalPrice	Sales 2018
2018	€ 264,166.37	284186
2019	€ 267,035.54	284186
2020	€ 272,851.26	284186
2021	€ 276,911.85	284186
2022	€ 267,099.90	284186
2023	€ 286,175.16	284186

Payment Type by Event
Black Friday marks a significant increase in credit card and online payment.

Event	Online Payment	Debit Card	Credit Card	Cash
None	29%	24%	23%	24%
Christmas Market	22%	24%	26%	28%
Black Friday	27%	23%	29%	22%

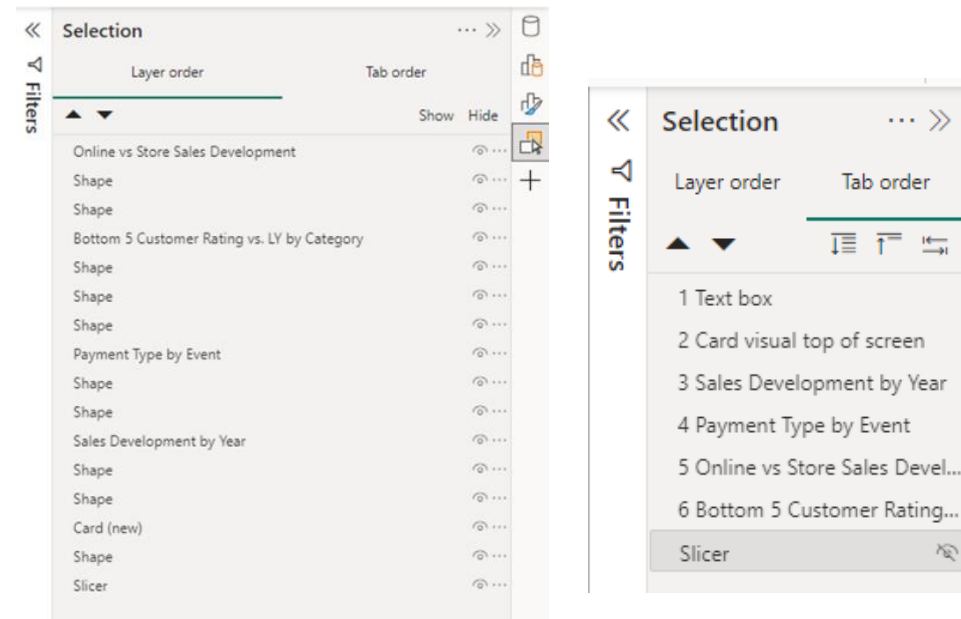
Tab order

- Seemed Random
- Shapes selected
- Title (text inside shape) not selected



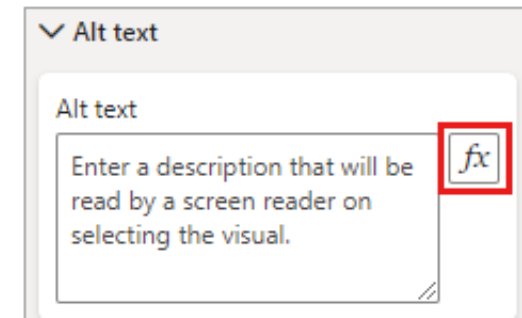
Changing the tab order

- View – Selection – Tab order
- Importance of naming elements
- Hide everything you don't want to use

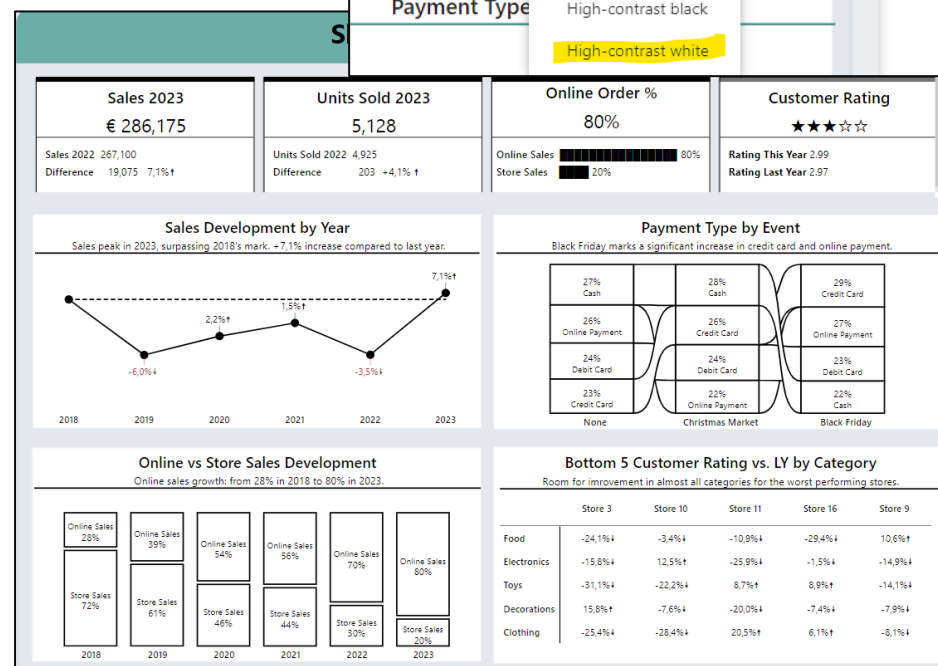
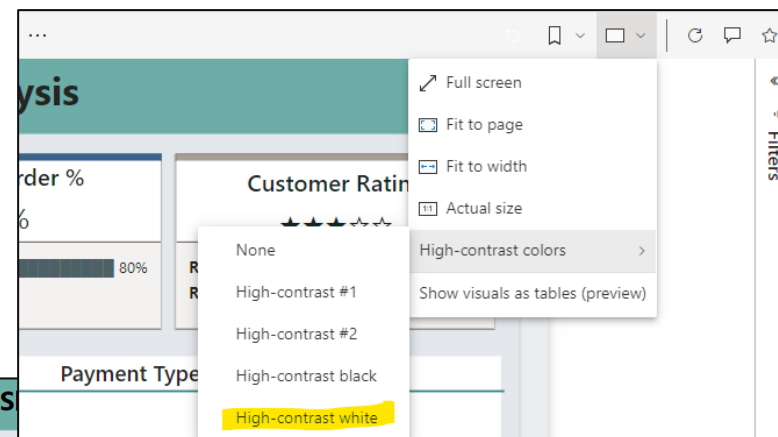


Screen Reader – Alt text

- For all elements
- Read by screen readers
- Meaningful information about the element
- Max 250 characters
- Use DAX to make it dynamic



High Contrast



Color check

- <https://www.color-blindness.com>
- Squint test
 - Turn down the brightness of screen
 - Do you still see the most important information?
- Check with the end-user

Drag and drop or paste your file in the area below or: [Choose File](#) Contrast im...ement 1 .png

Trichromatic view: Anomalous Trichromacy: Dichromatic view: Monochromatic view:

☐ Normal ☐ Red-Weak/Protanomaly ☐ Red-Blind/Protanopia ☒ Monochromacy/Achromatopsia

☐ Green-Weak/Deuteranomaly ☐ Green-Blind/Deuteranopia ☐ Blue Cone Monochromacy

☐ Blue-Weak/Tritanomaly ☐ Blue-Blind/Tritanopia

Use lens to compare with normal view: ☒ No Lens ☐ Normal Lens ☐ Inverse Lens

[Reset View](#) [Open simulated image in new window](#)

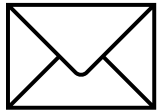


Takeaway

- Design for the audience
- Goal & End-user = Visual
- Provide context & meaning
- Accessibility is important
- Keep it simple



Contact & Feedback



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