



# Visualizing Data for Non-Data Experts

Making Reports Accessible

Valerie Junk



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



# Accessibility

- **UX Design in general**
  - Simple but informative
  - Action driven
  - Visually pleasing
- **In combination with accessibility features**
  - Keyboard navigation
  - Screen reader compatibility
  - Alt text
  - Tab order



# 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

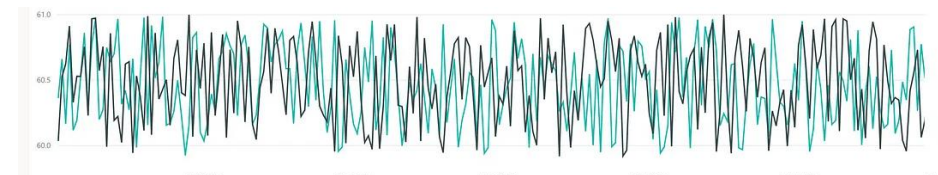
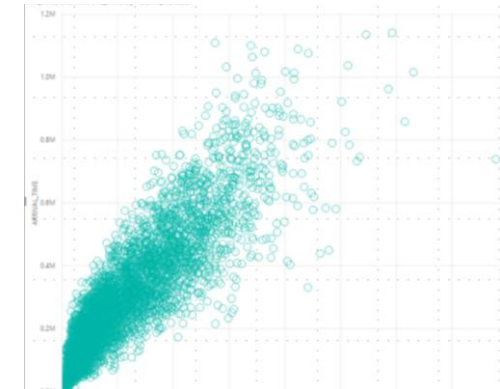
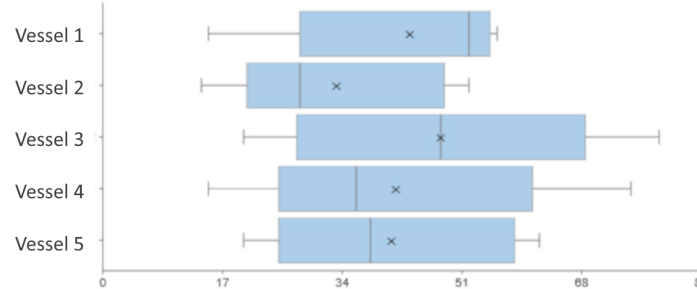
- GPS by second
- Vessel data
- Weather & current data
- Load/Unload data



Data Science to the rescue

# The result

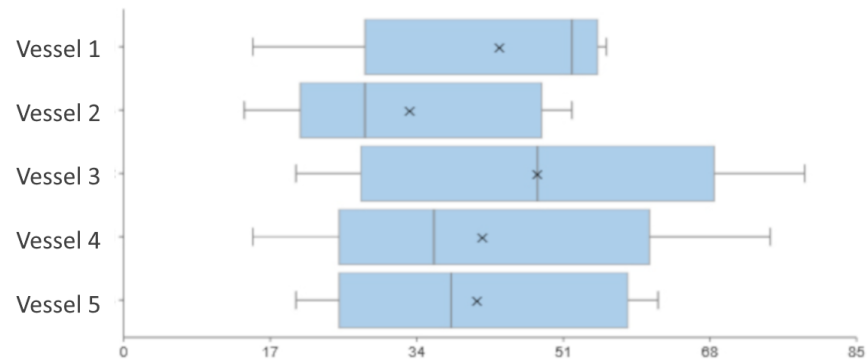
- 25-page report
- No titles and descriptions
- Up to 40 vessels in one visual
- Countless filters





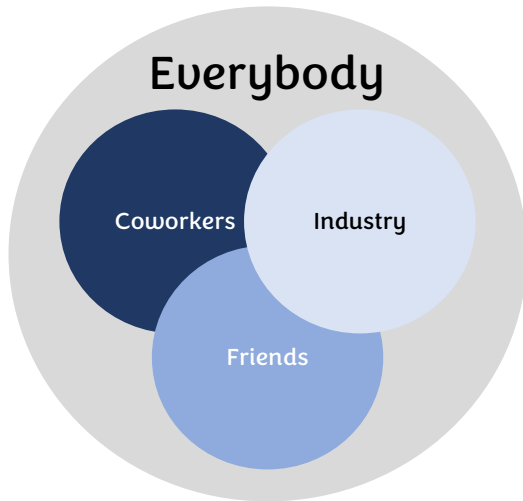
# The End-user

**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?
- Any impairments?



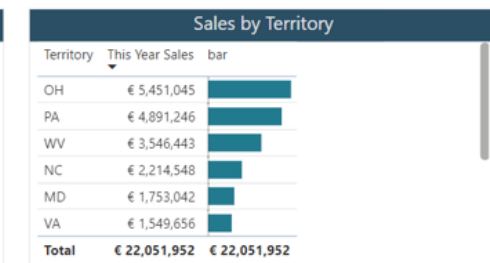
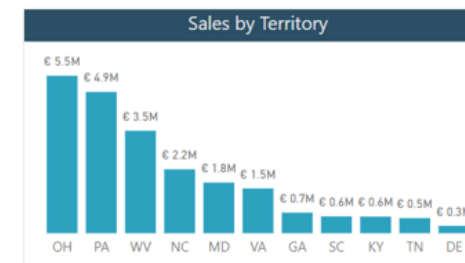
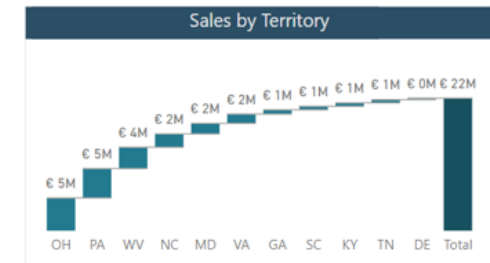
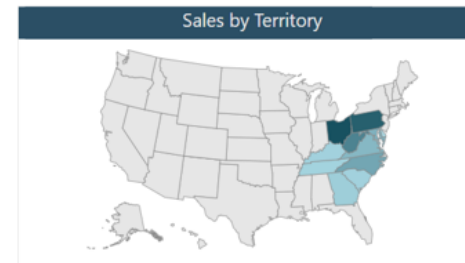
# Ask Questions

- Provide examples
- What do you see?
- Ask what actions they expect to be able to take
- Ask about prior experience (& check)



# Goal + end-user = visual

- Goal (actions to take) & end-user needs and experience determine the goal.
- 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				

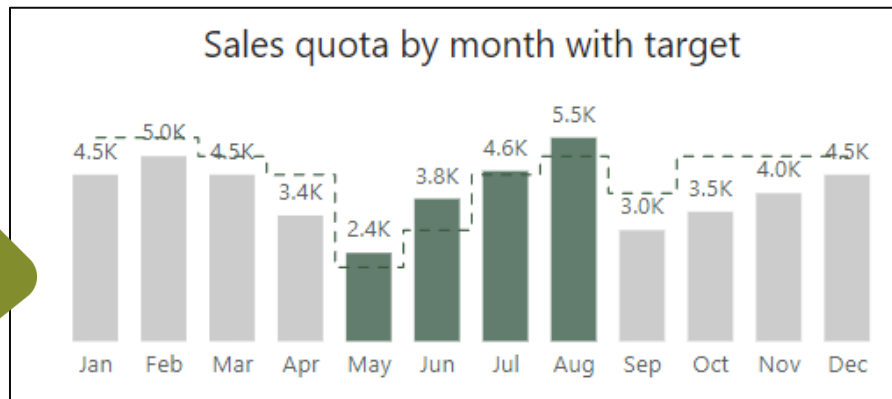
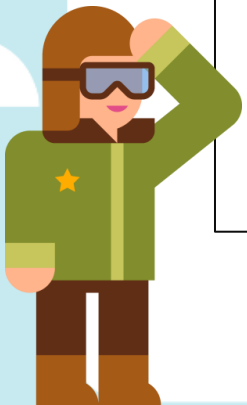
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# Add Context

(Sub)title, legend and colour coding



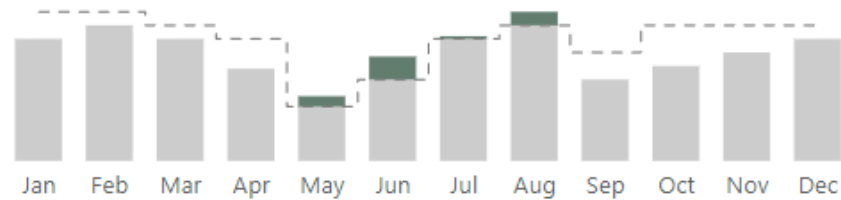


# Simplify

## Sales target hit 4 times in 2023

Achieving more than expected in may, june, july and august

● Below target ● Above target - - Target



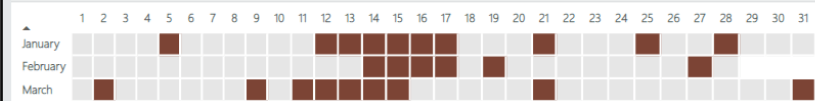
## Sales target hit 4 times in 2023

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec



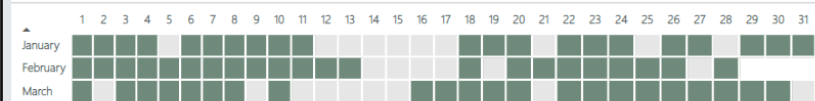
## Daily Overview - Target Missed

Dark red columns = missed daily target.



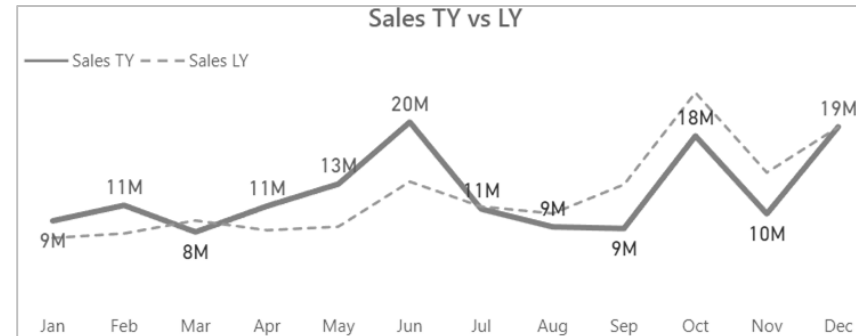
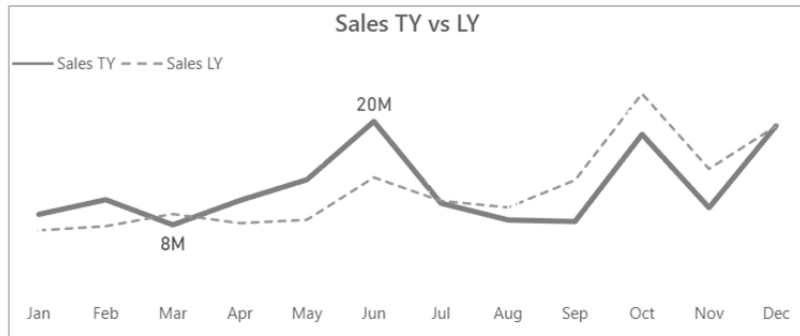
## Daily Overview - Target Hit

Dark green columns = hit daily target.



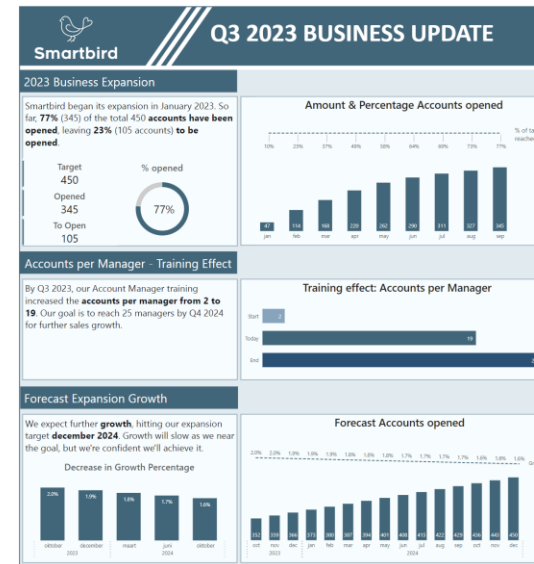
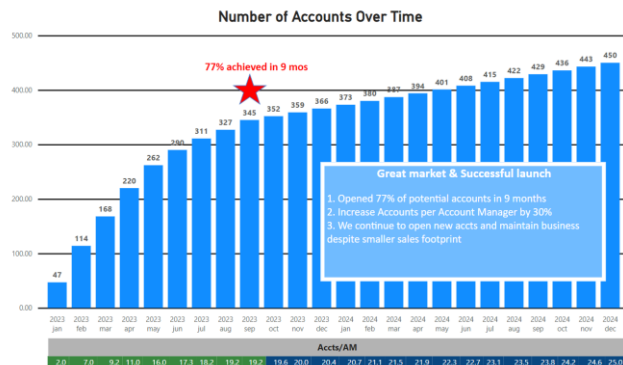
# Declutter & enrich

- Which information is really relevant?
- How much guidance is needed?



# Easy to use

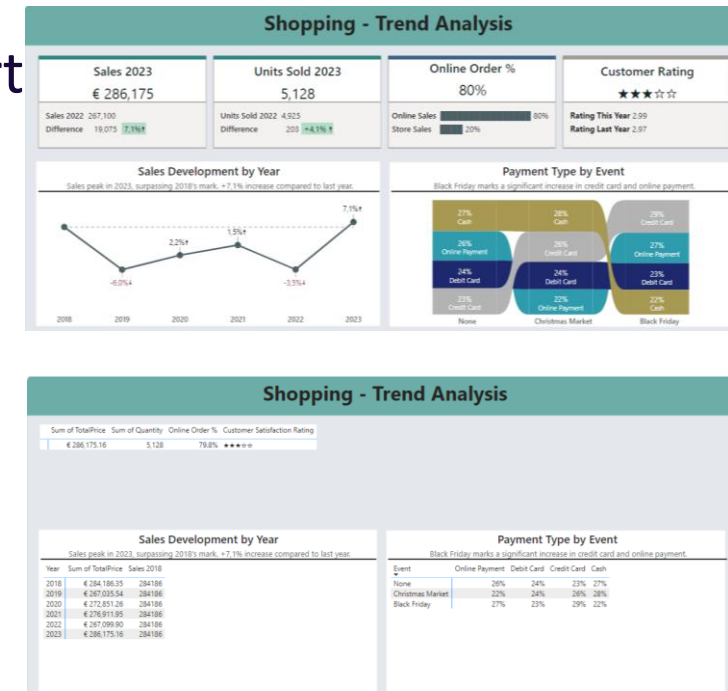
- Don't overestimate the time the users is willing to spend to find information
- Too complex = Frustration



# Keyboard navigation

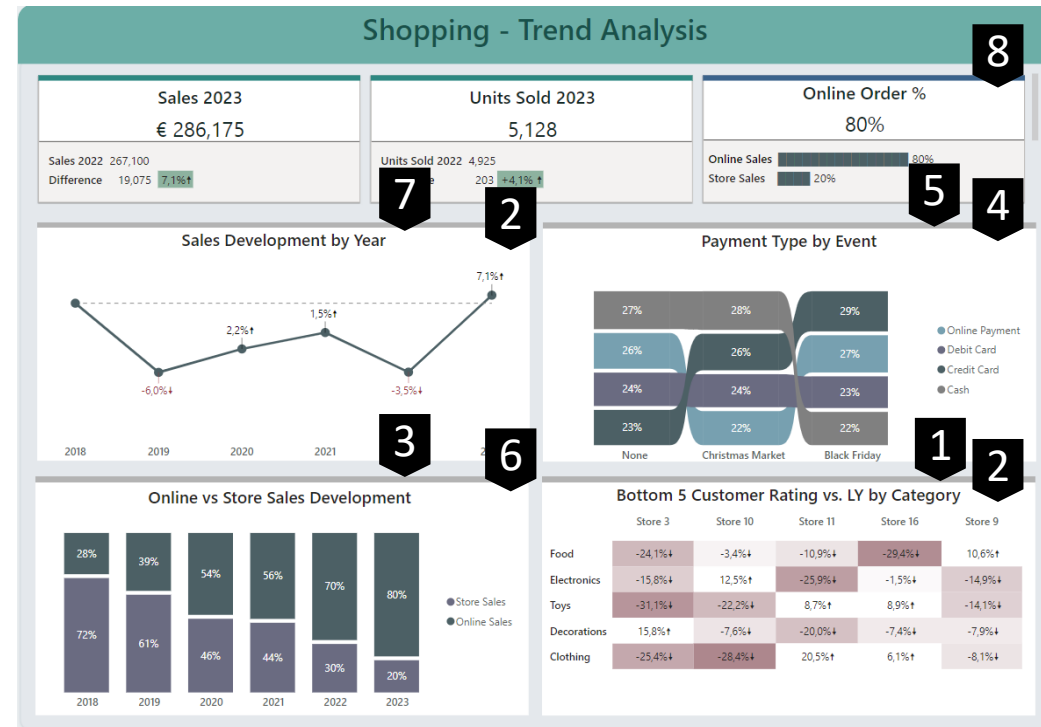
All elements can be navigated using keyboard shortcuts

- **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



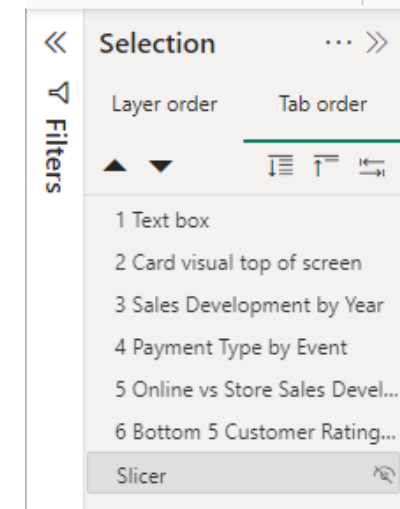
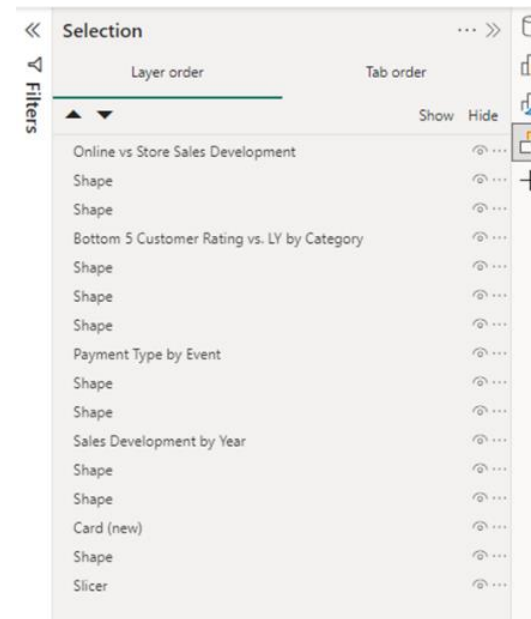
# Tab order

- Random (?) selection
- Shapes selected
- Title (text inside shape) not selected
  - Screen reader can't read it



# Changing the tab order

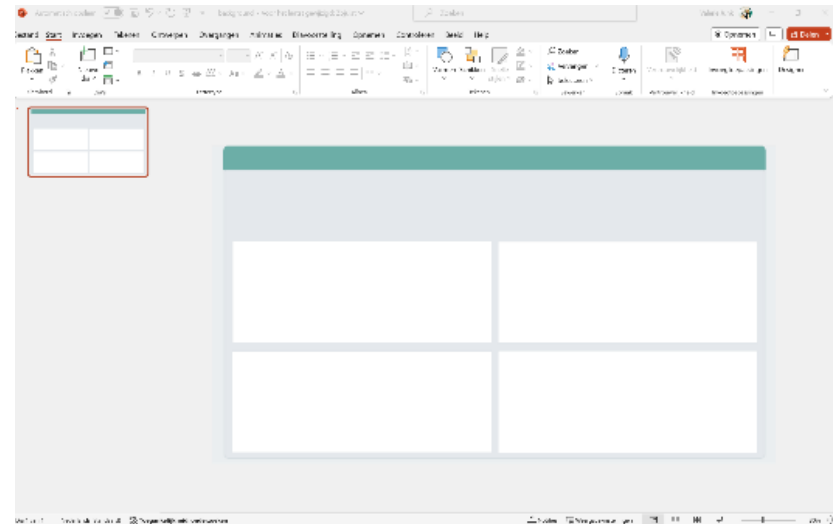
- View – Selection – Tab order
- Importance of naming elements
- Hide everything you don't want to use
- Beware of grouping
  - Screen reader issues



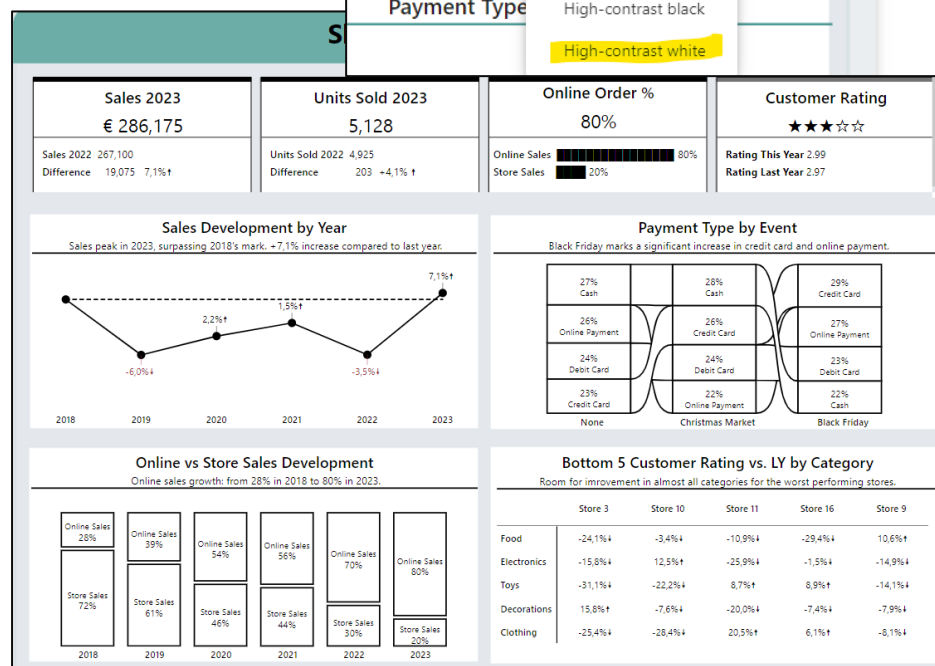
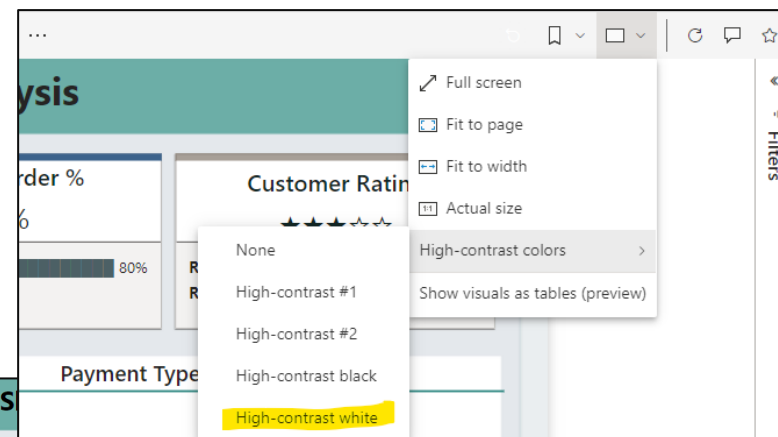


# Fixed background & ungrouping

- Fixed background (.svg, .bmp)
- No accidental moving
- No grouping
  - Screen reader: “3 items grouping”
- Remove elements (no hiding)

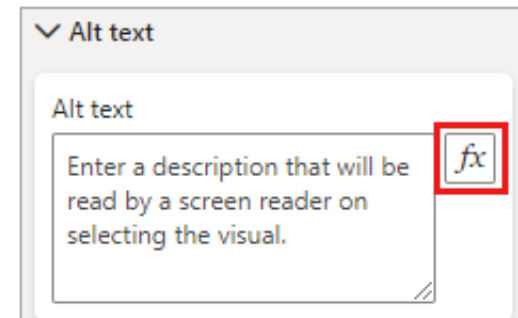


# High Contrast



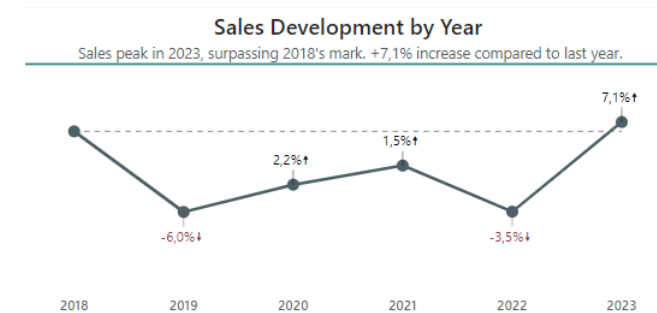
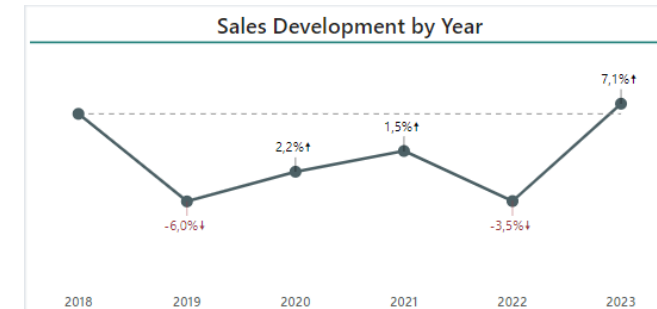
# Alt text

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

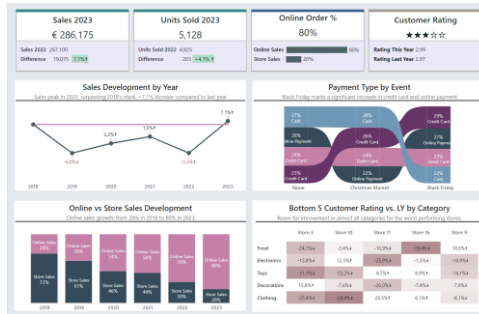


# Meaningful (Sub)titles

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



# Accessibility themes



Orchid



Tidal



City Park



Neutral



Default

# Vision test

- <https://www.color-blindness.com>
- Squint test
  - Turn down the brightness of screen
- Browser add-ons
- Check with the end-user

Drag and drop or paste your file in the area below or:  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](#)



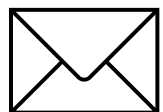


# Takeaway

- Consider & Design for the audience
- Provide context & meaning
- Accessibility is important
- Keep it simple



# Contact



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