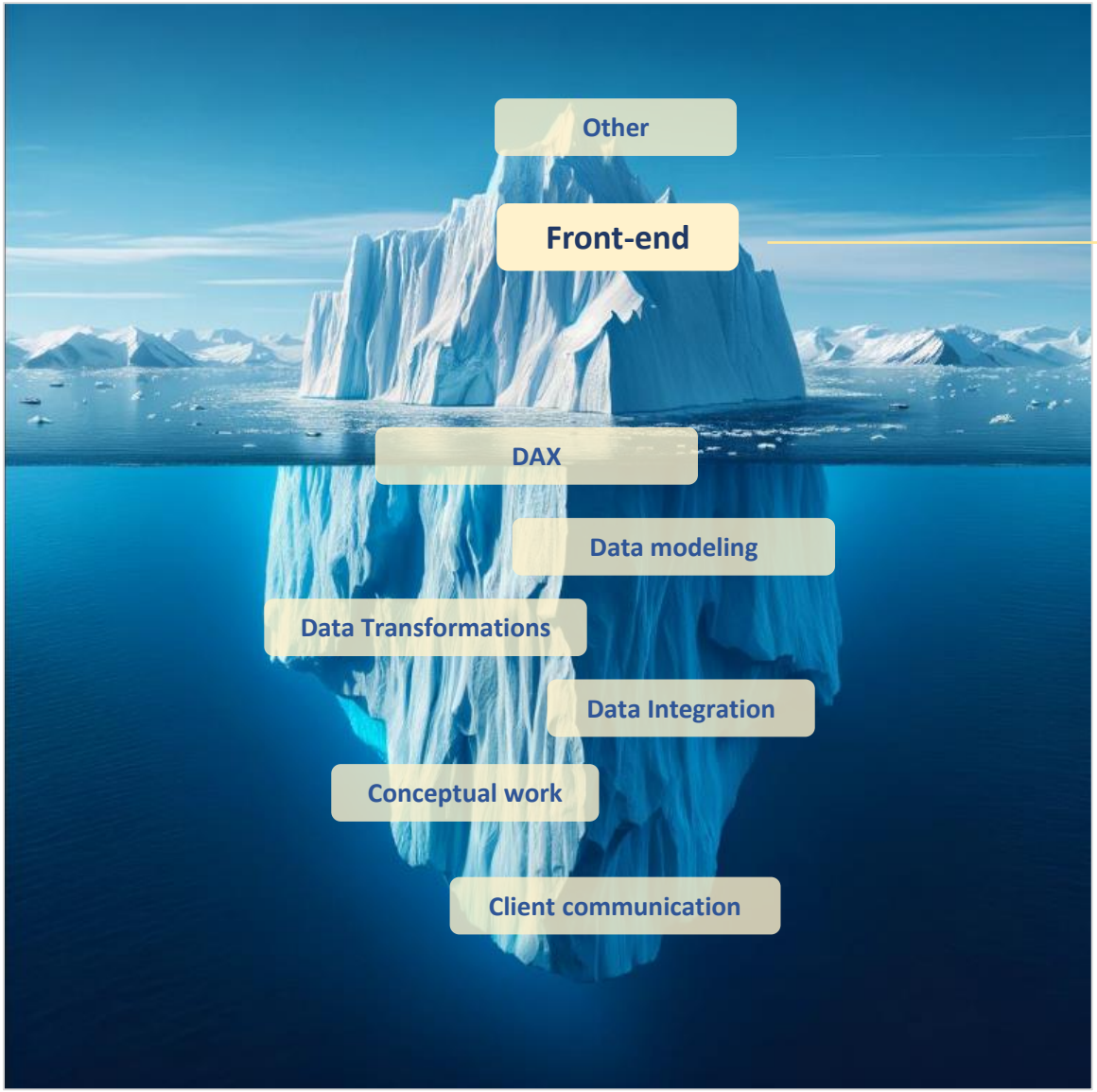
Data Visualization Techniques for Enhancing Effective Dashboard Creation

Prepared by:
Gustaw Dudek, March 2024

Introduction



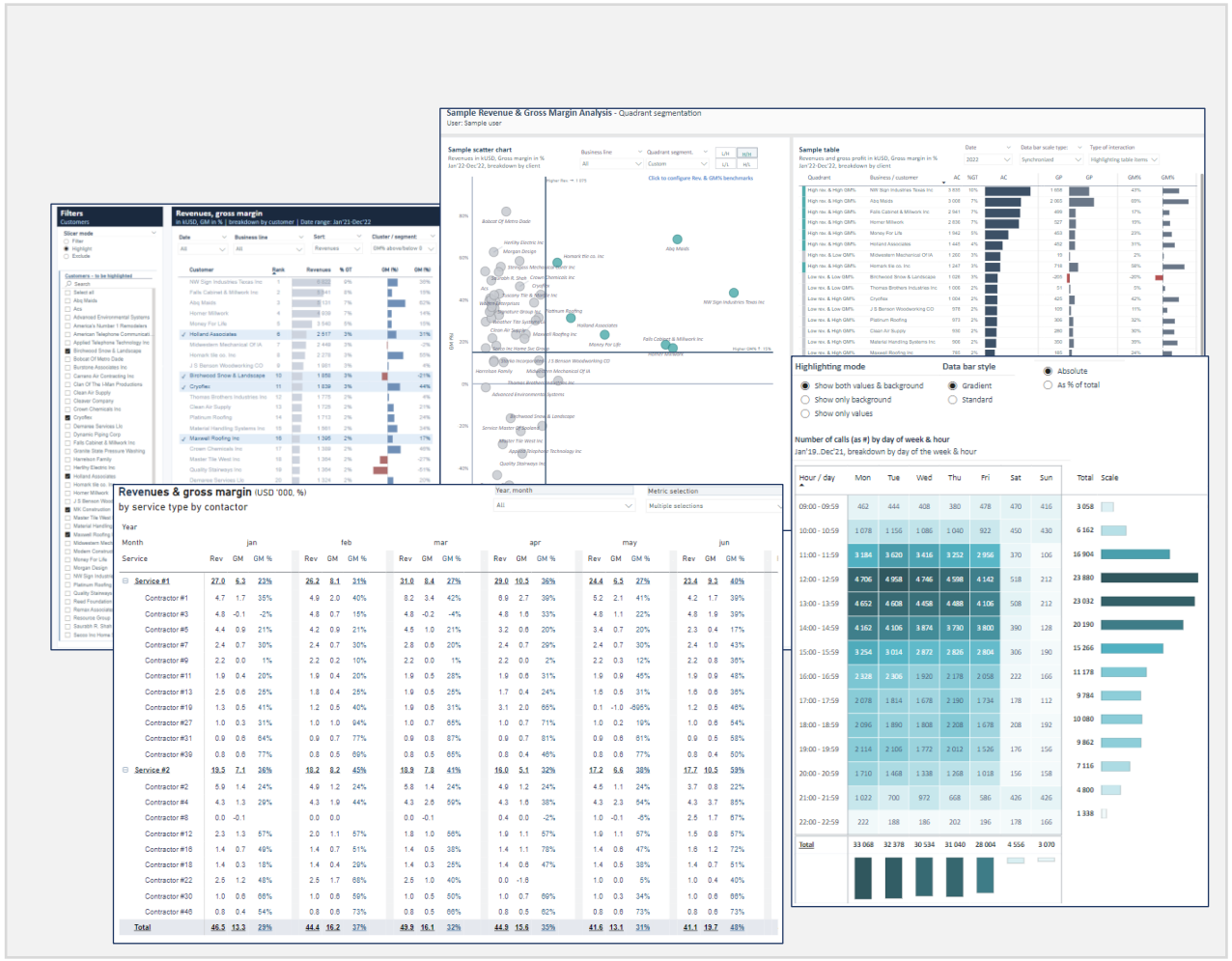
- Report structure
- Chart selection, general sample rules
- Selected functionalitites
- Other (incl. interactive reports)

Introduction

Dashboards

Managerial / Executive Dashboards

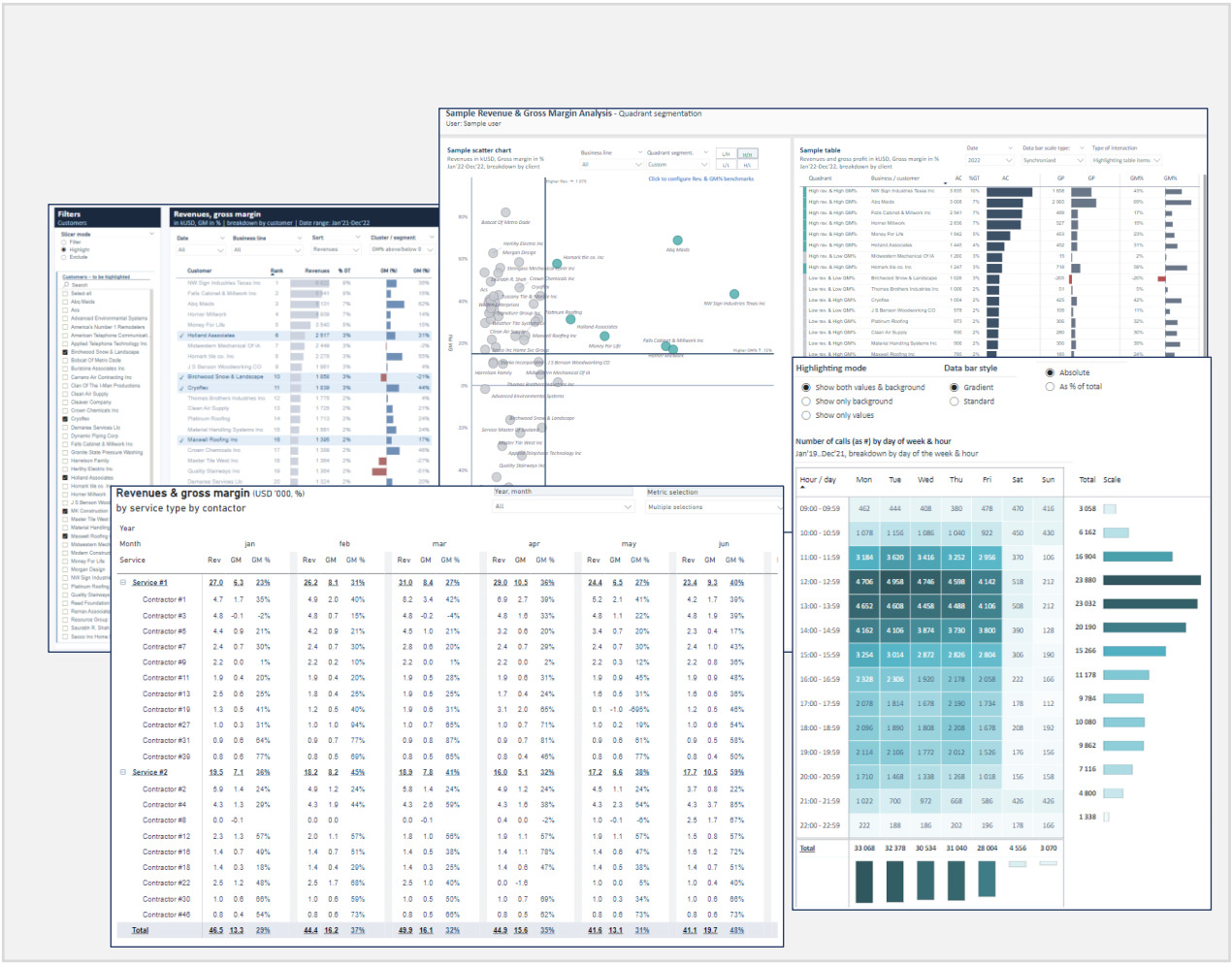
Analytical Dashboards



Own work by Gustaw Dudek / Enterium | Some visualizations were created based on inspiration from IBCS and Zebra BI. However, these visualizations are neither endorsed nor verified by IBCS or Zebra BI, and may differ in form from the principles they present.

Analytical Dashboards

- Focuses on **in-depth data exploration**
- Contains **detailed analyses**
- Includes greater range of chart diversification, may **contain complex visualizations** (heat maps, scatter charts and others)
- Provides greater range of customization and **interactive features with extended filtering capabilitites**
- Includes various level of data aggregations



Managerial Dashboards

- Focuses on summarized data (**trends, performance against objectives**) to support strategic decision-making
- Contains **high-level summaries**
- Utilizes simple visualizations
- Includes **limited amount of interactive features**, with strategically selected interactive elements such as slicers, drill-through
- includes strategically **aggregated data** (oftenly from various departments) focusing on overall performance

Introduction

Dashboards

Circuit	Location	Nof races (rang)	Nof races	length. (km)	Length (miles)	Best lap time (seconds)	Add. info (url)
Autodromo Nazionale di Monza	Monza	1	70	5.79	3.60	81.046	
Circuit de Monaco	Monte-Carlo	2	67	3.34	2.07	72.909	
Silverstone Circuit	Silverstone	3	55	5.89	3.66	78.739	
Circuit de Spa-Francorchamps	Spa	4	53	6.98	4.33	105.108	
Nürburgring	Nürburgring	5	41	5.15	3.20	88.139	
Circuit Gilles Villeneuve	Montreal	6	40	4.36	2.71	73.078	
Autódromo José Carlos Pace	Sao Paulo	7	37	4.31	2.68	70.540	
Hockenheimring	Hockenheim	7	37	4.57	2.84	73.780	
Hungaroring	Budapest	8	35	4.38	2.72	76.627	
Circuit de Barcelona-Catalunya	Montmeló	9	31	4.68	2.90	75.641	

[Click here to open the interactive report]

Sample title | Sample subtitle | sample additional description

Additional subtitle or/and sample selection (optionally)

Last data refresh: 2024-01-01 | 08:00

Filtered date range: 2023

Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Clear

Section title

Section title

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Section title

Section title

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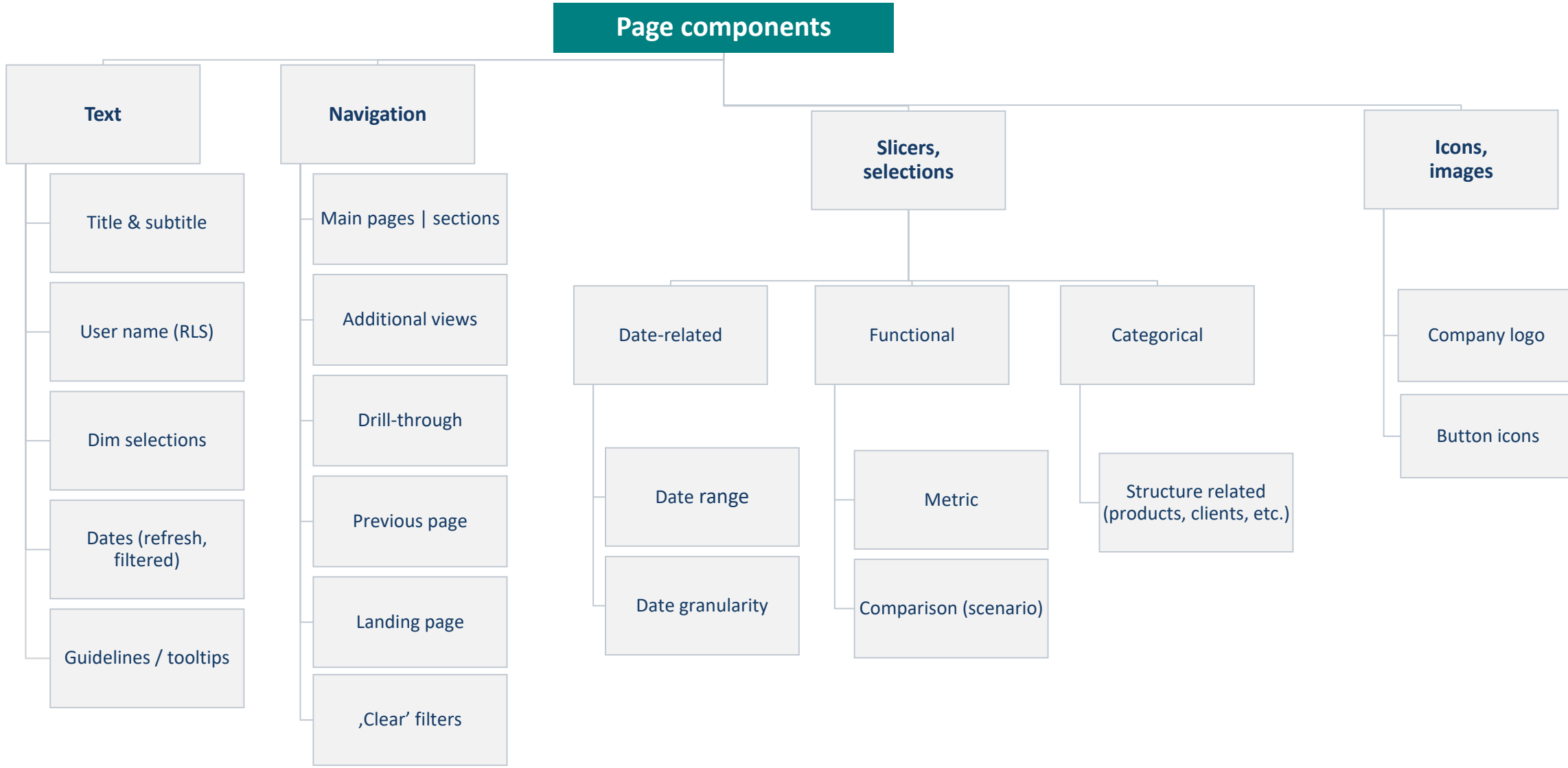

Sample title | Sample subtitle | sample additional description

Additional subtitle or/and sample selection (optionally)

Last data refresh:
2023-11-10

Slicer (selection)

Slicer (selection)

Slicer (selection)

Clear filters

Click here to open corresponding Linkedin post **„Applying different color-filled panes”**

Click here to open corresponding Linkedin post **„Report makeover – reducing the visual noise”**

Sample layout

(alternative approach: navigation on the top)

Sample title | Sample subtitle | sample additional description

Additional subtitle or/and sample selection (optionally)

Last data refresh: 2024-01-01 | 08:00

Filtered date range: 2023

Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Clear

Revenues (in kUSD)

2022, AC and BU and ΔBU, breakdown by business line

Business line v2 (full name)	BUD	AC	%CT	AC	ΔBU	ΔBU	ΔBU%	ΔBU%
Web and App Developm...	**14 961**	**17 810**	**57%**		**+2 849**		**+19%**	
DigitalHub	4 409	5 625	18%		+1 216		+28%	
SmartBiz	2 161	2 911	9%		+750		+35%	
InnovateConnect	2 659	2 770	9%		+111		+4%	
CodeCraft	1 495	1 764	6%		+269		+18%	
TechSolutions	1 495	1 599	5%		+105		+7%	
AppXcelerate	684	847	3%		+163		+24%	
DigitalTransform	727	794	3%		+67		+9%	
Connectify	735	756	2%		+22		+3%	
DataTrackr	378	515	2%		+137		+36%	
UXFlow	219	229	1%		+10		+5%	
E-commerce Solutions	**9 461**	**9 535**	**31%**		**+74**		**+1%**	
CustomerXcel	4 636	4 613	15%		-23		-0%	
FulfillXpress	2 105	2 029	6%		-77		-4%	
PromoBoost	1 180	1 288	4%		+108		+9%	
StoreFront360	807	828	3%		+21		+3%	
InventoryWise	315	339	1%		+24		+8%	
OmniCart	234	240	1%		+6		+3%	
Insightify	185	199	1%		+14		+7%	
Mobile applications	**2 434**	**3 239**	**10%**		**+804**		**+33%**	
HealthQuest	2 434	3 239	10%		+804		+33%	
General	**585**	**639**	**2%**		**+54**		**+9%**	
Other	585	639	2%		+54		+9%	
Total	**27 442**	**31 223**	**100%**		**+3 781**		**+14%**	

Revenues (in kUSD)

2022, AC and ΔBU, ΔBU%, breakdown by project

Sample title | Sample subtitle | sample additional description

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Last data refresh: 2024-01-01 | 08:00

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Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Clear

Sample layout

Sections added as a layout within the graphic tools (in PPT, Figma or other)

Sample title | Sample subtitle | sample additional description

Additional subtitle or/and sample selection (optionally)

Last data refresh: 2024-01-01 | 08:00

Filtered date range: 2023

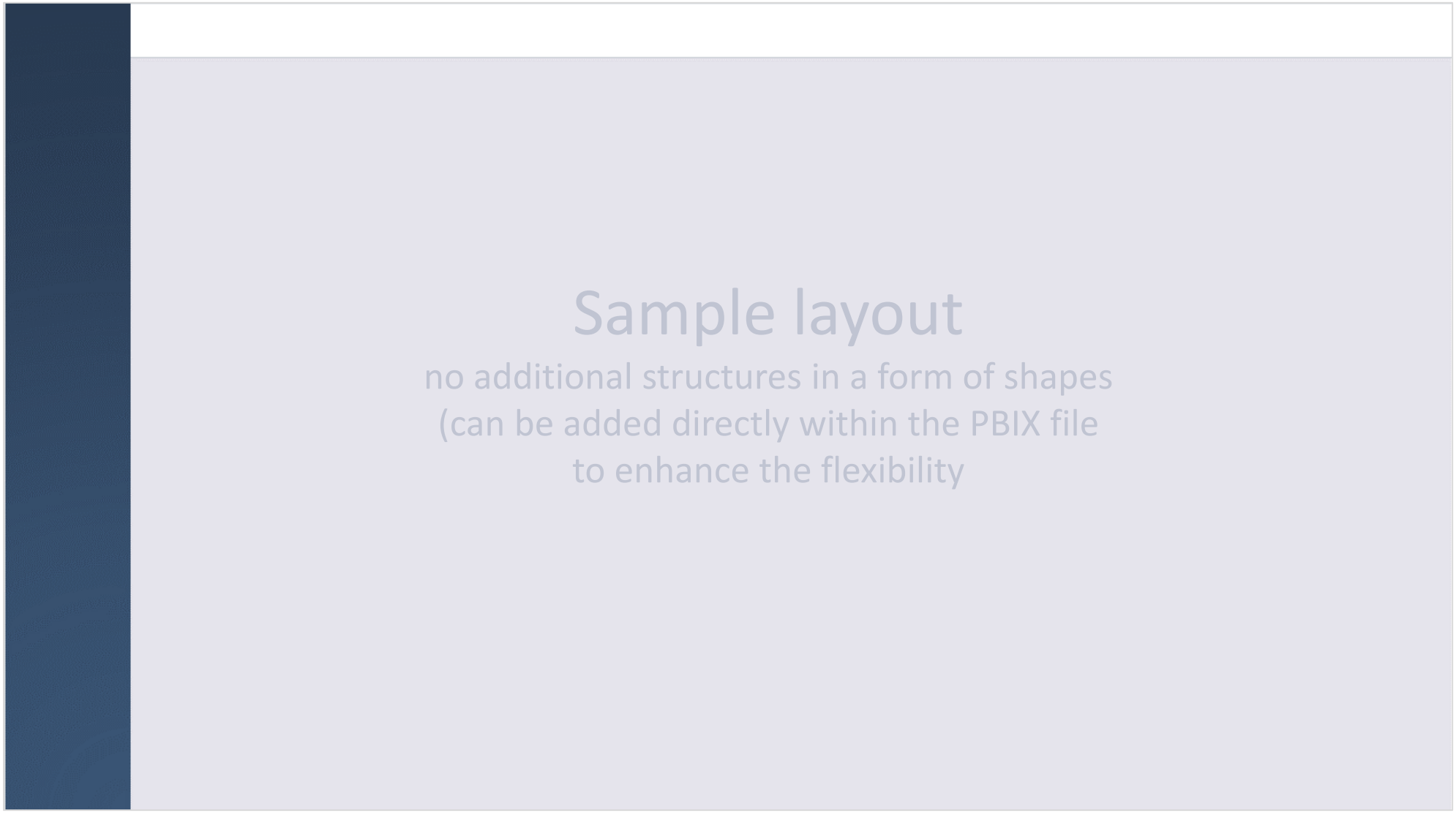
Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Slicer (selection) | Clear

Sample layout

no additional structures in a form of shapes (can be added directly within the PBIX file to enhance the flexibility

Sample layout

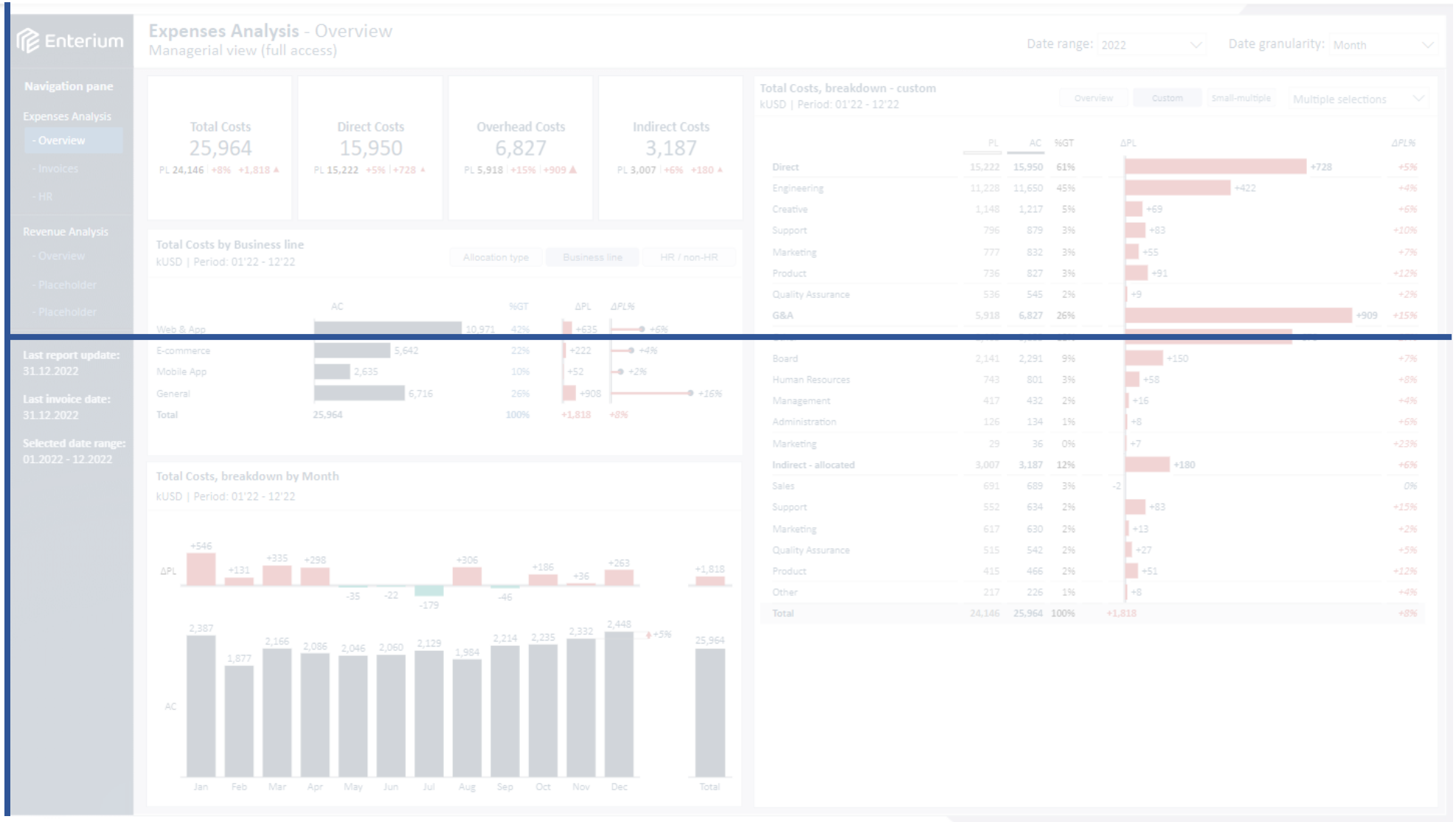
Filled background



Sample page settings

Canvas Size

1080 px (default: 720px)

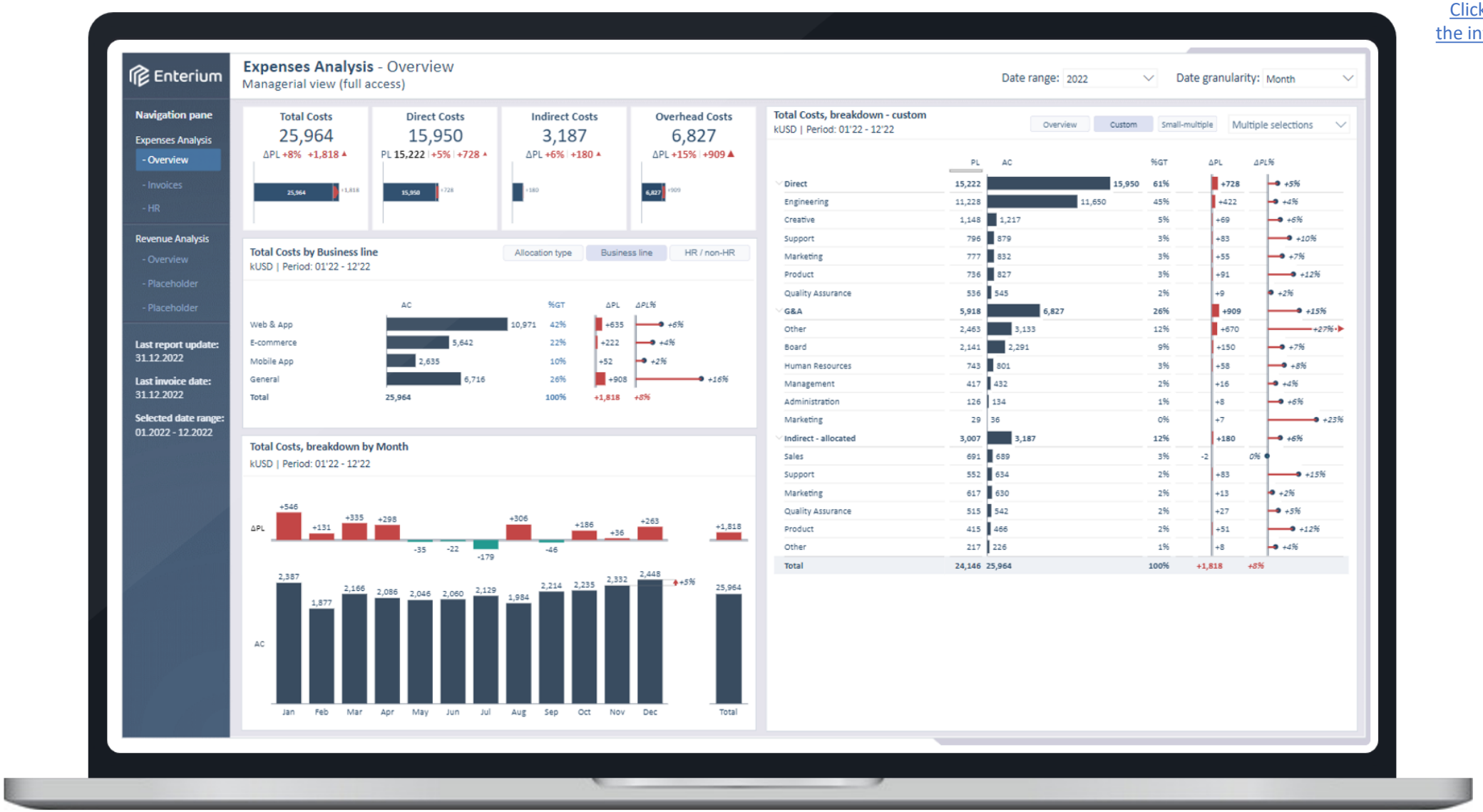


1920 px
(default: 1280 px)

Sample report

Expense Analysis, report created in collaboration with Mateusz Sochor

[Click here to open the interactive report](#)



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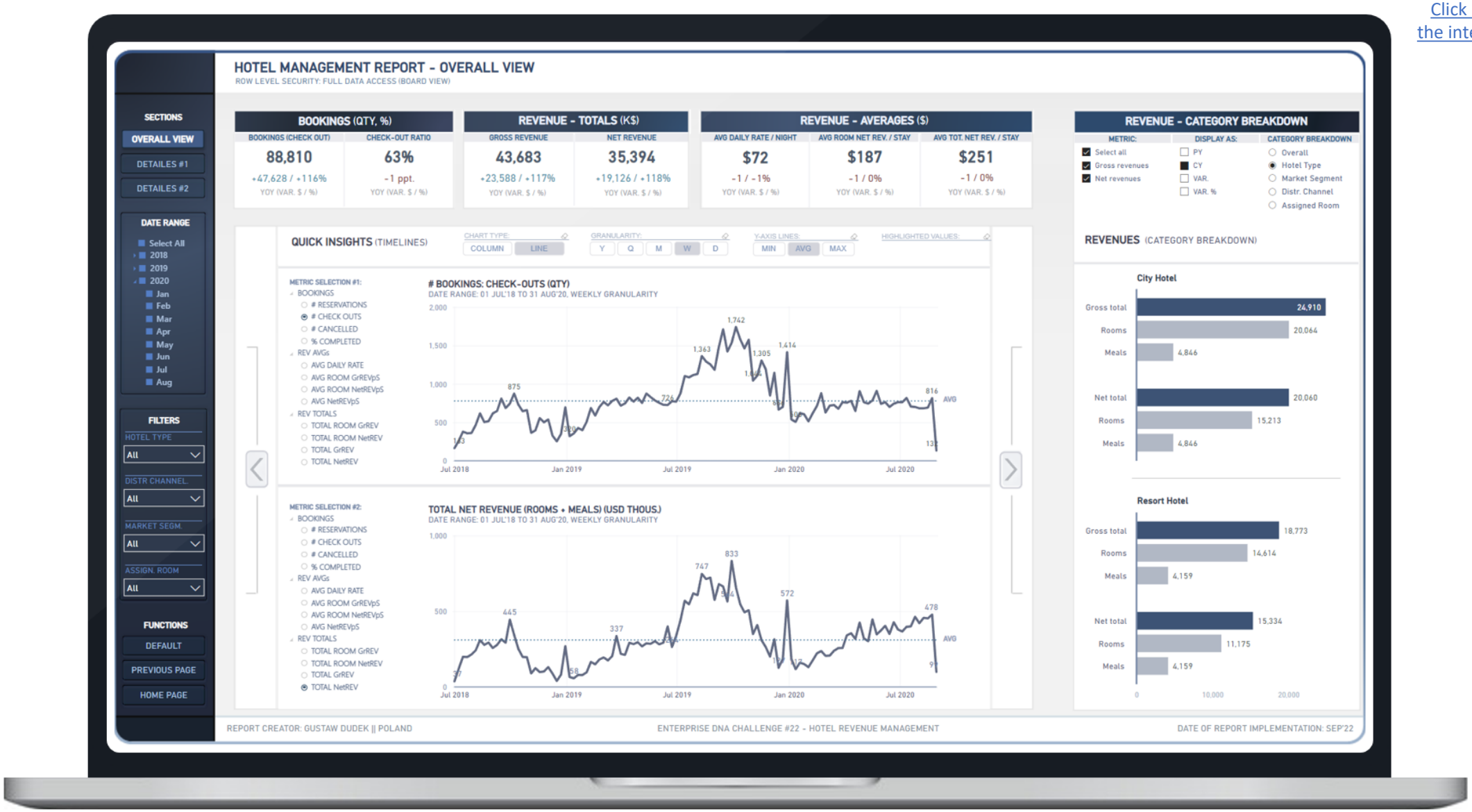
Sample report

Hotel revenue management



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Sample report

Healthcare Dashboard, created in collaboration with Brian Julius

[Click here to open the interactive report](#)

Introduction - IBCS

Additional subtitle or/and sample selection (optionally)

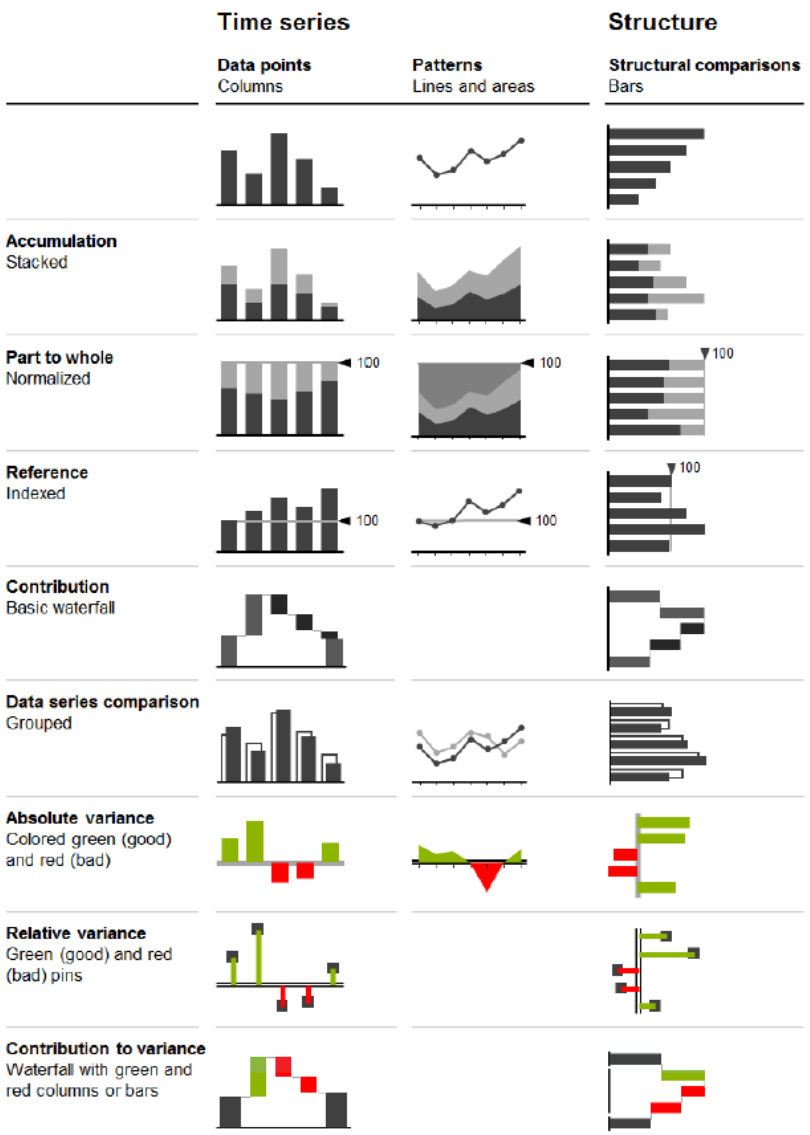
DR. ROLF HICHERT, PROF

DR. JÜRGEN FAISST

INTERNATIONAL BUSINESS COMMUNICATION STANDARDS

Source: IBCS© International Business Communication Standards, Version 1.1 (2017), by Dr. Rolf Hichert, Prof., Dr. Jürgen Faisst

Sample IBCS guideline – chart selection



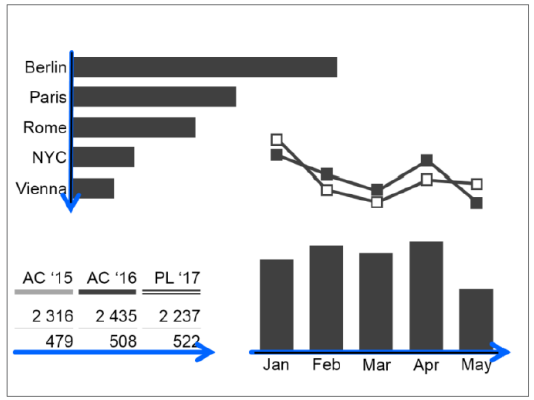


Figure UN 3.3-1: Visualization of time vs. structure (examples)

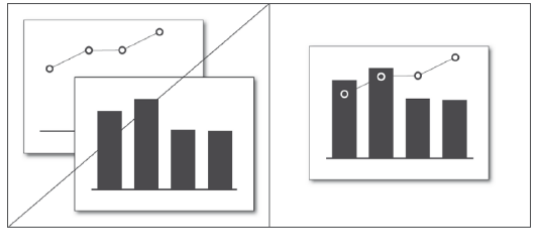


Figure CO 4.1: Show overlay charts

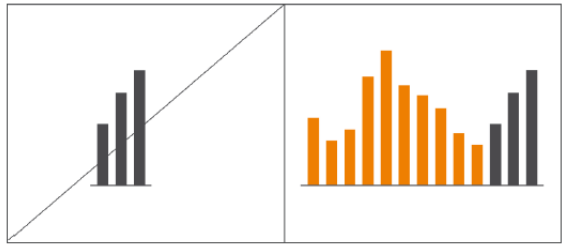


Figure CO 3.1: Add data points

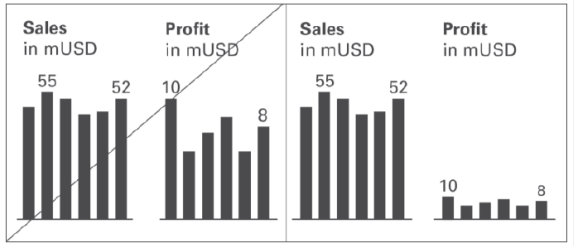


Figure CH 4.1: Use identical scale for the same unit

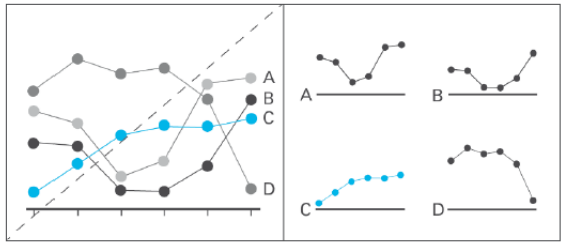


Figure EX 2.4: Replace spaghetti charts

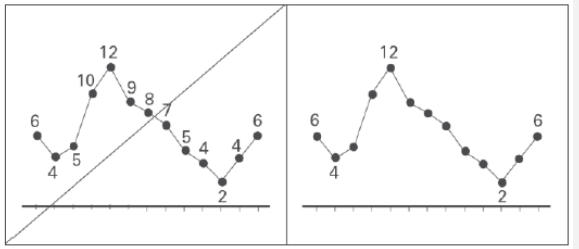


Figure SI 5.3: Avoid unnecessary labels

Source: IBCS© International Business Communication Standards, Version 1.1 (2017), by Dr. Rolf Hichert, Prof., Dr. Jürgen Faisst

TRENDS: Chart selection general direction / guideline

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Figure CO 4.1: Show overlay charts

Figure CO 3.1: Add data points

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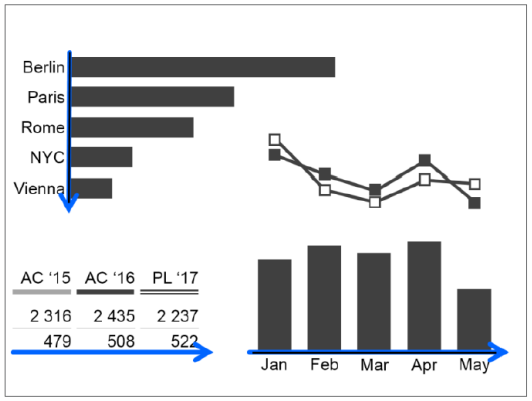

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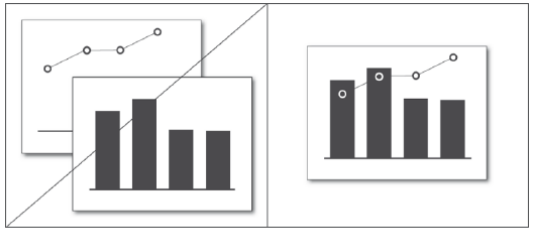

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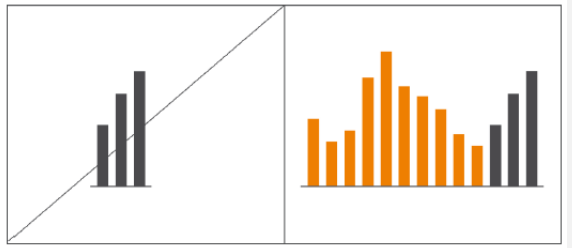

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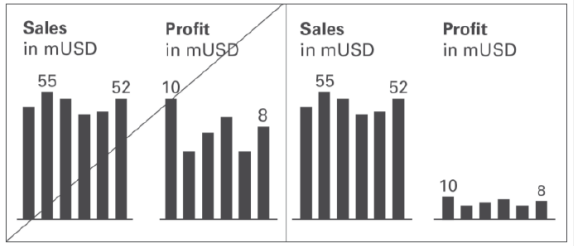

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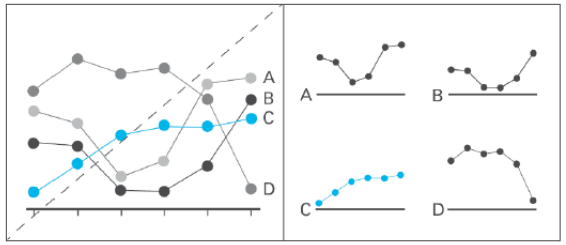

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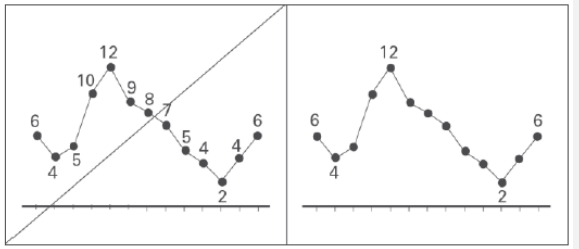

Figure SI 5.3: Avoid unnecessary labels

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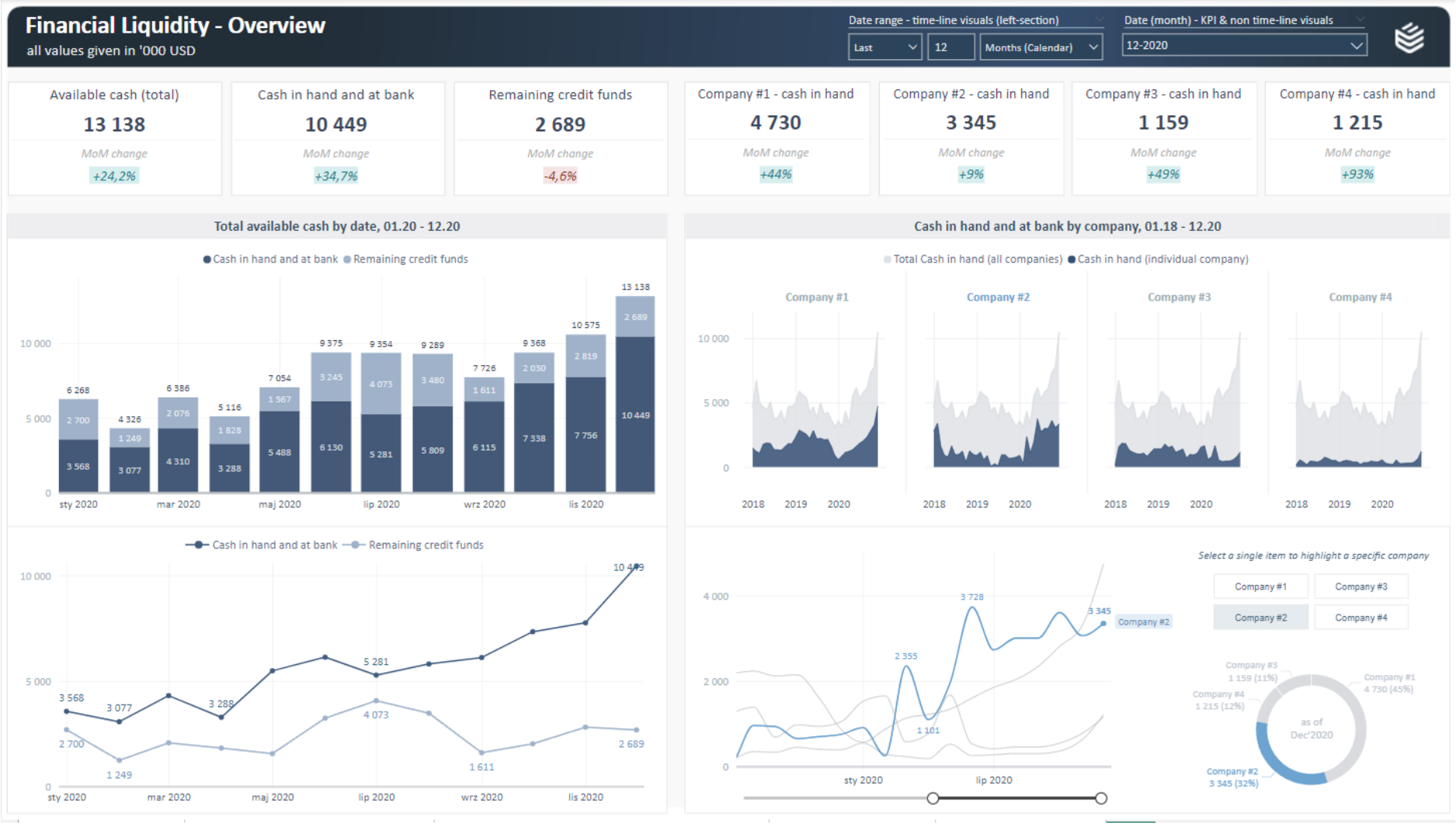
TRENDS: Sample use case

Financial luquidity



[Click here to open the interactive report]

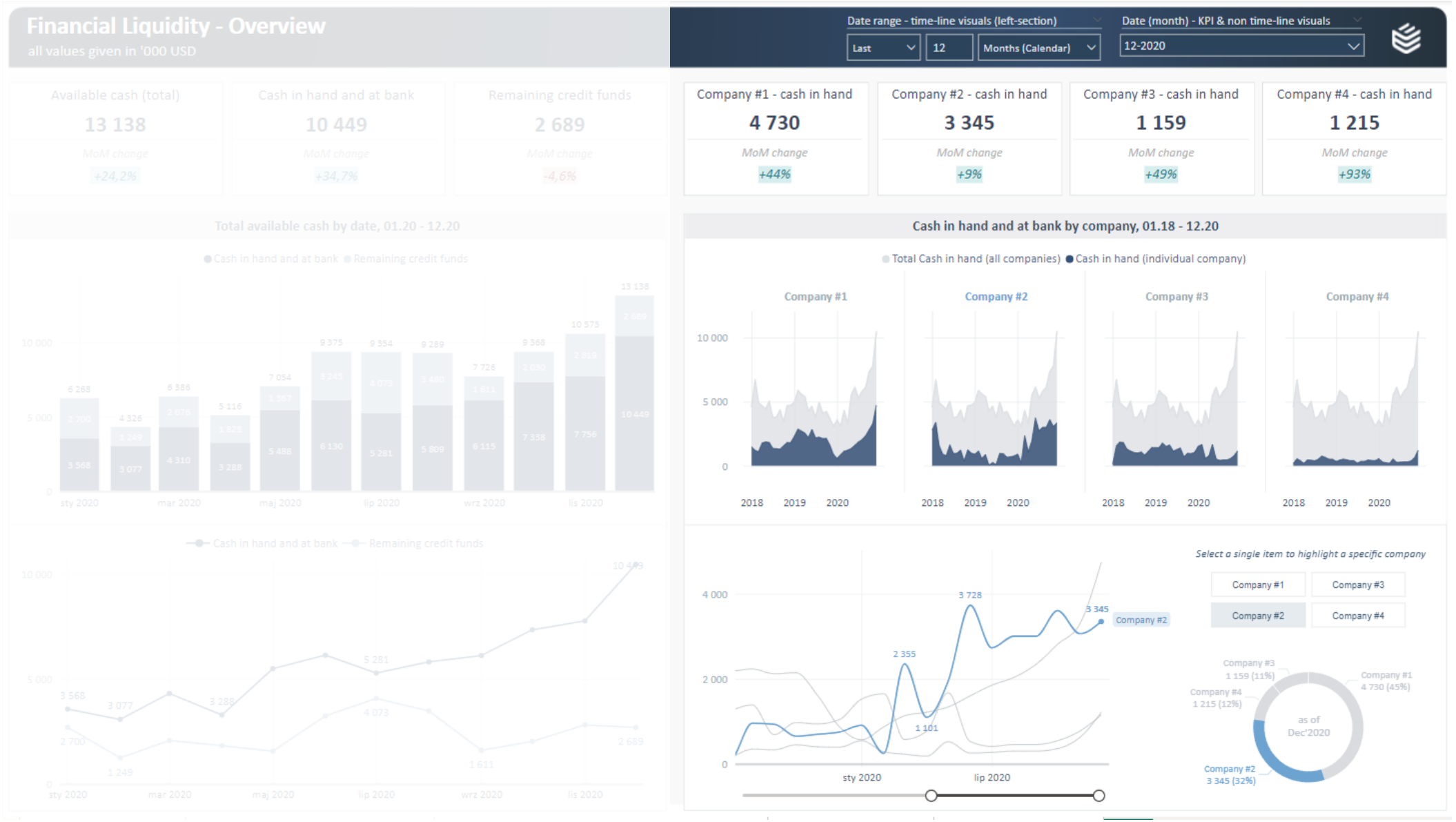
[Click here to open corresponding Linkedin post **„Conditional formatting in a ring chart"**]

TRENDS: Sample use case

Financial luquidity

TRENDS: Sample use case

Financial luquidity



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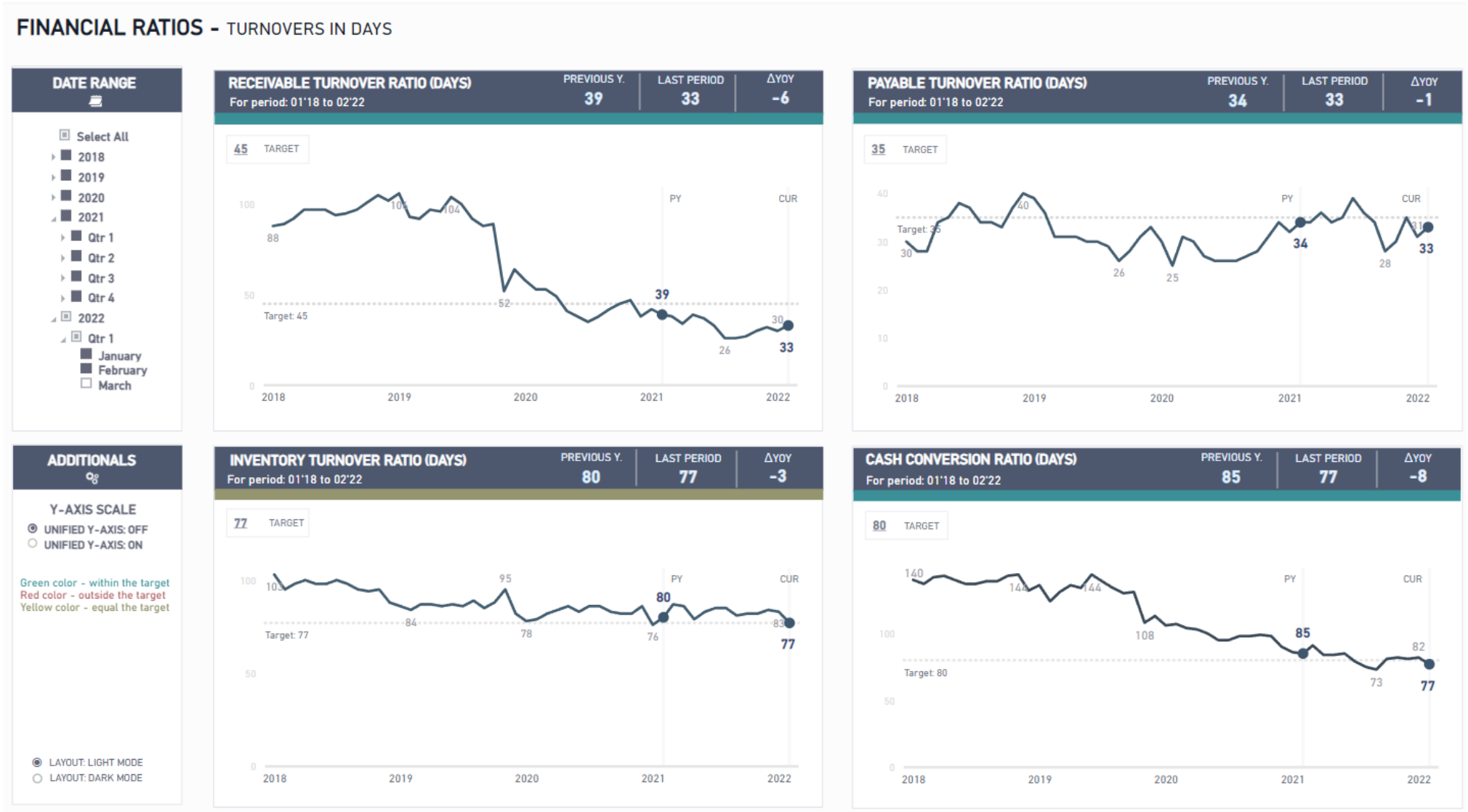
TRENDS: Sample use-case

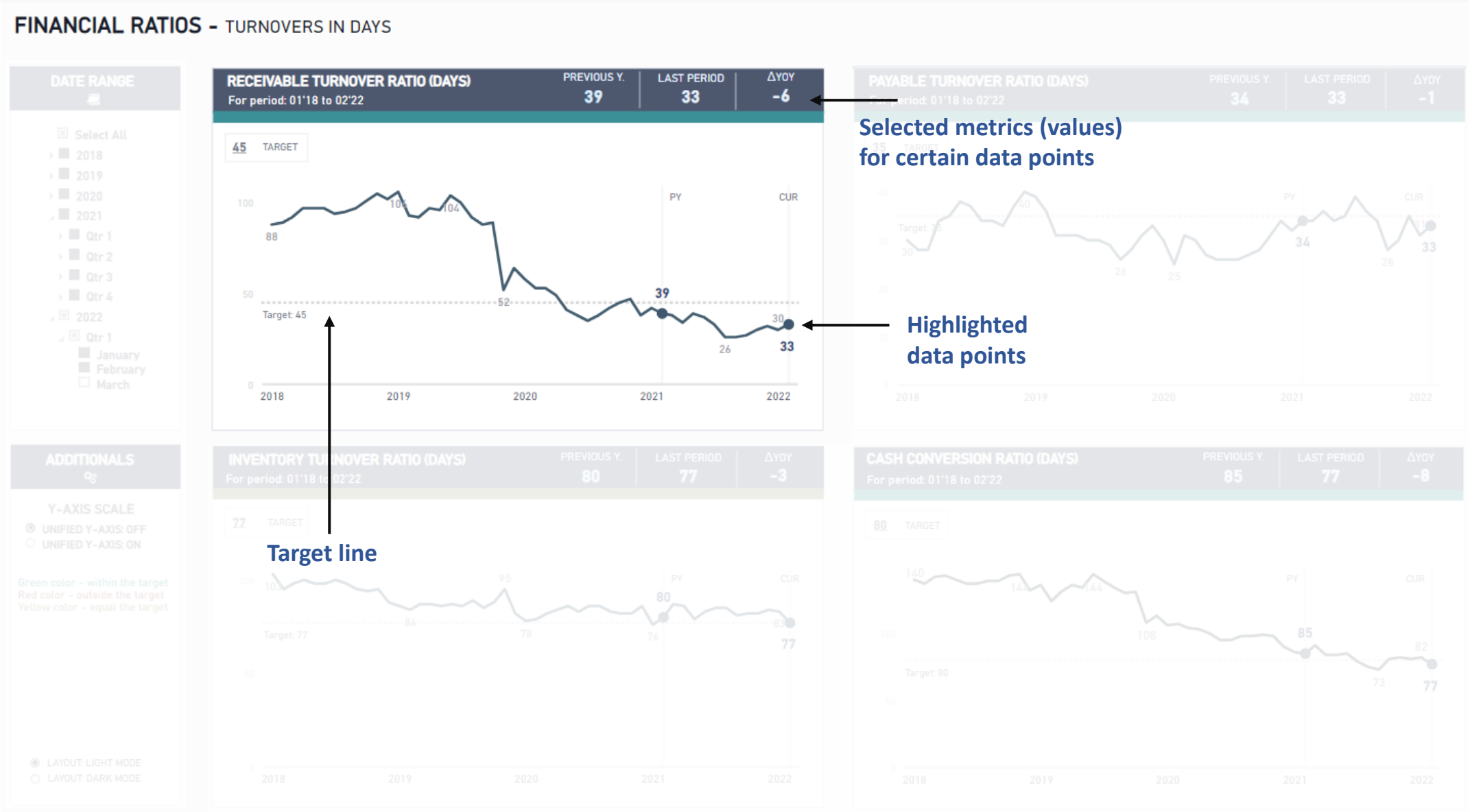
Financial ratios

[Click here to open the interactive report]



TRENDS: Sample use-case

Financial ratios



TRENDS: Sample use-case

Financial ratios – scale unification

FINANCIAL RATIOS - TURNOVERS IN DAYS

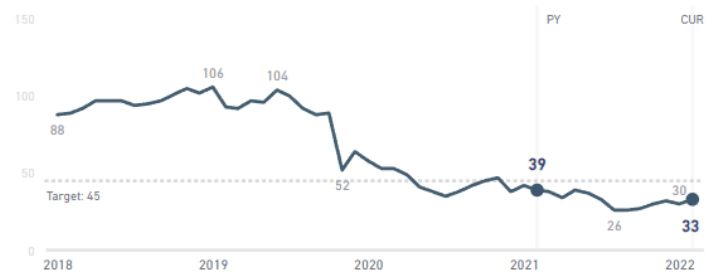
DATE RANGE

- Select All
- 2018
- 2019
- 2020
- 2021
  - Qtr 1
  - Qtr 2
  - Qtr 3
  - Qtr 4
- 2022
  - Qtr 1
    - January
    - February
    - March

RECEIVABLE TURNOVER RATIO (DAYS) — For period: 01'18 to 02'22

PREVIOUS Y.	LAST PERIOD	ΔYOY
39	33	-6

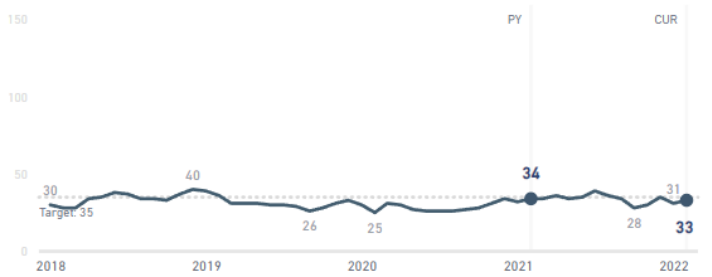
45 TARGET



PAYABLE TURNOVER RATIO (DAYS) — For period: 01'18 to 02'22

PREVIOUS Y.	LAST PERIOD	ΔYOY
34	33	-1

35 TARGET



ADDITIONALS

Y-AXIS SCALE

- UNIFIED Y-AXIS: OFF
- UNIFIED Y-AXIS: ON

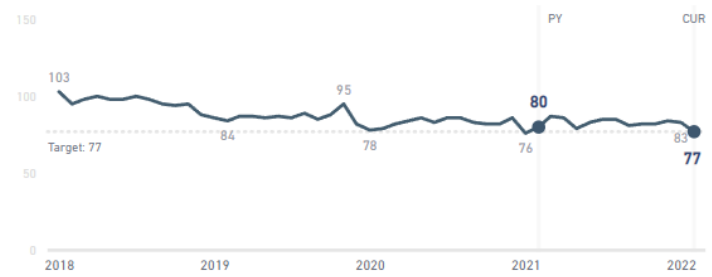
Green color - within the target
Red color - outside the target
Yellow color - equal the target

- LAYOUT: LIGHT MODE
- LAYOUT: DARK MODE

INVENTORY TURNOVER RATIO (DAYS) — For period: 01'18 to 02'22

PREVIOUS Y.	LAST PERIOD	ΔYOY
80	77	-3

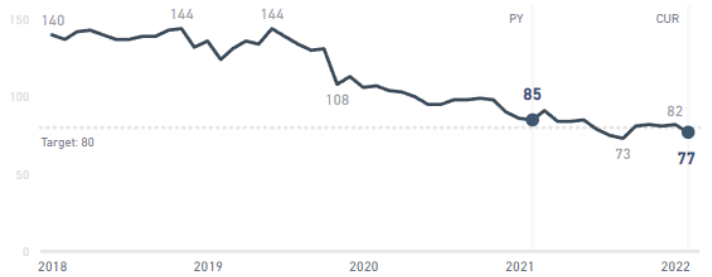
77 TARGET



CASH CONVERSION RATIO (DAYS) — For period: 01'18 to 02'22

PREVIOUS Y.	LAST PERIOD	ΔYOY
85	77	-8

80 TARGET



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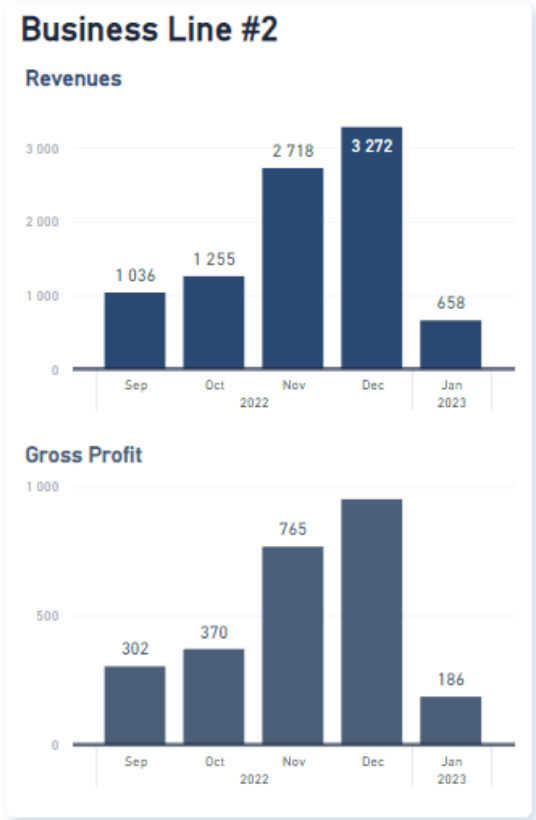
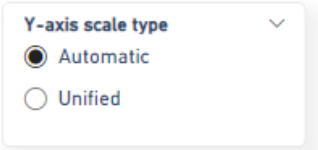
TRENDS: Sample use-case

Financial ratios – scale unification





TRENDS: Sample use-case

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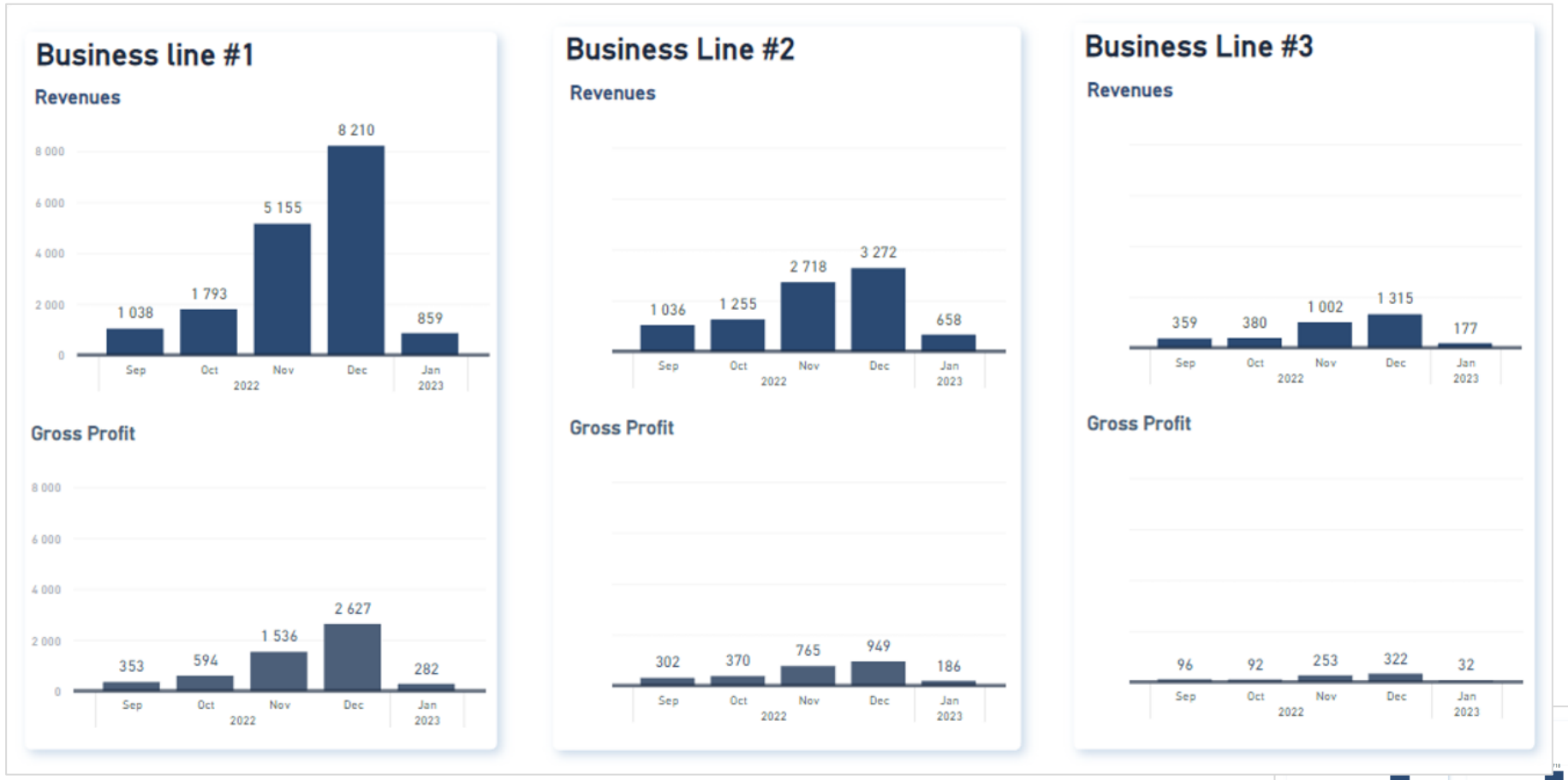

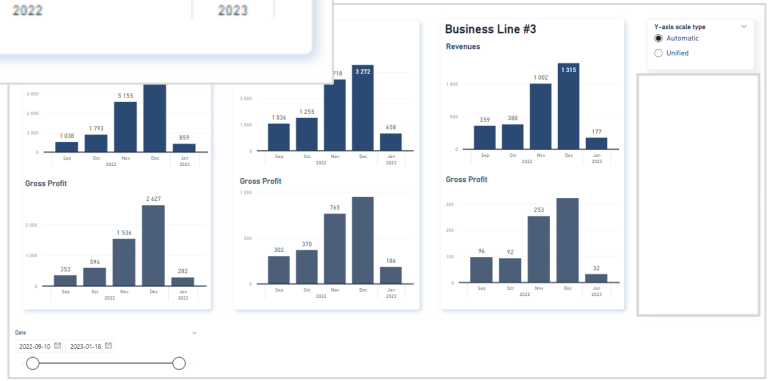

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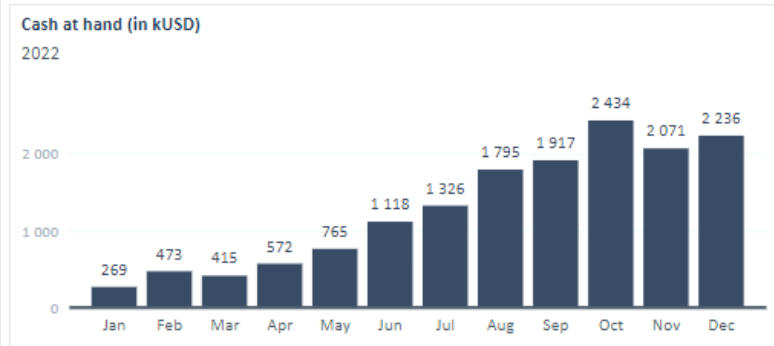
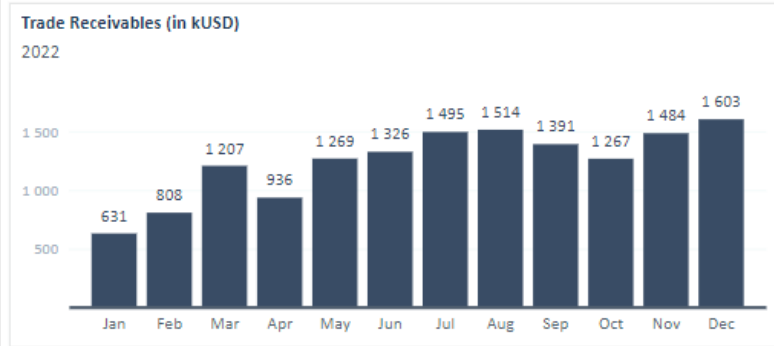
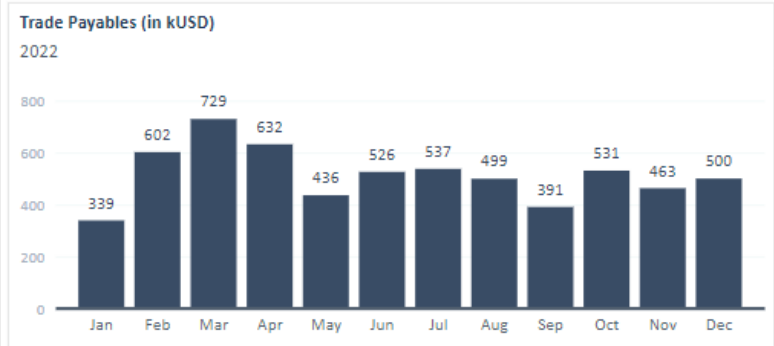
TRENDS: Sample use-case

Financial ratios – scale unification

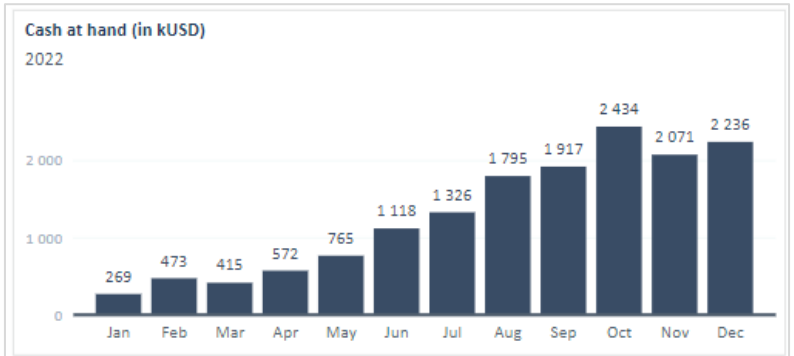
Not unified

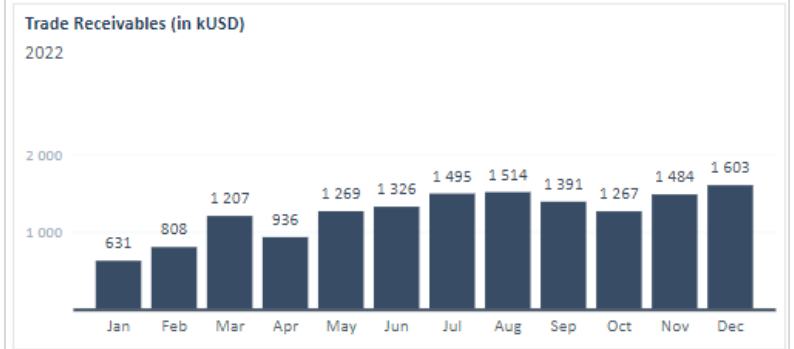


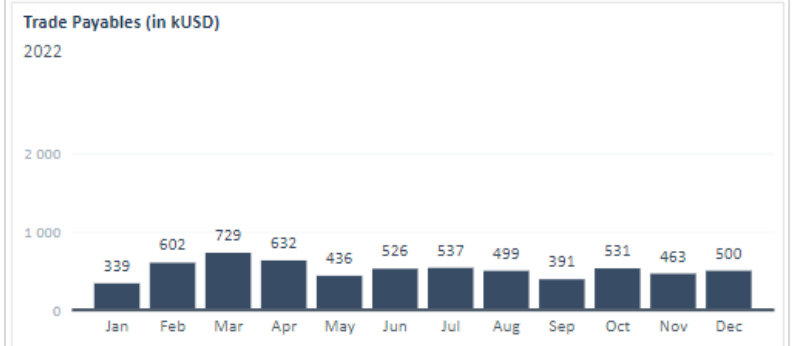




Unified

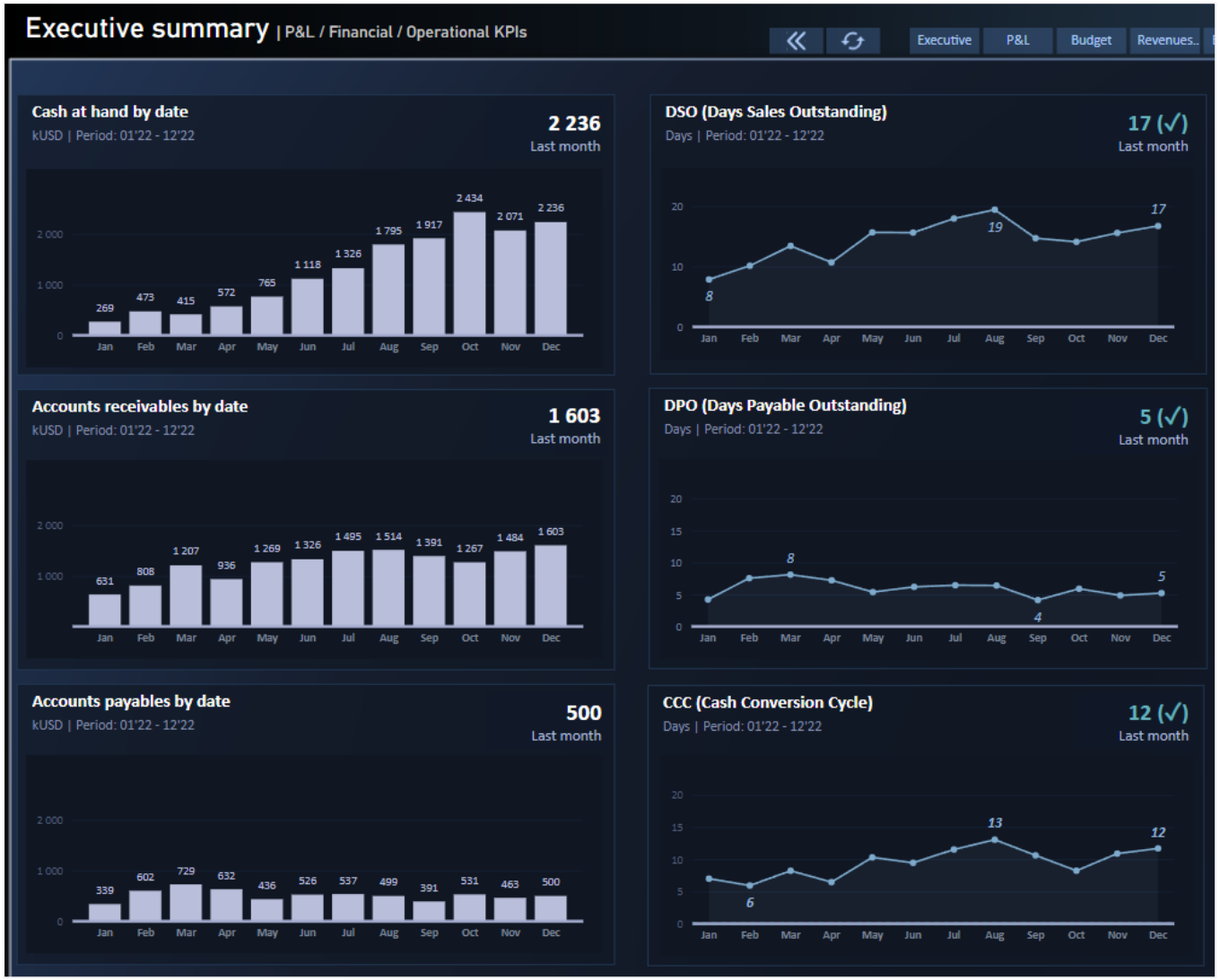






TRENDS: Sample use-case

Financial ratios – scale unification



Important functionalities:

- Y-axis scale unification (DAX-based)
- Decreased label density (in line charts, DAX-based)

TRENDS: Sample use-case

Financial ratios – scale unification

Click here to open corresponding Linkedin post with detailed PDF breakdown: **„Two approaches to unify Y-axis scale part. 2”**

Click here to open corresponding Linkedin post with detailed PDF breakdown: **„Two approaches to unify Y-axis scale part. 1”**

1. We can retrieve the max monthly value (looking at where the highest value appear)

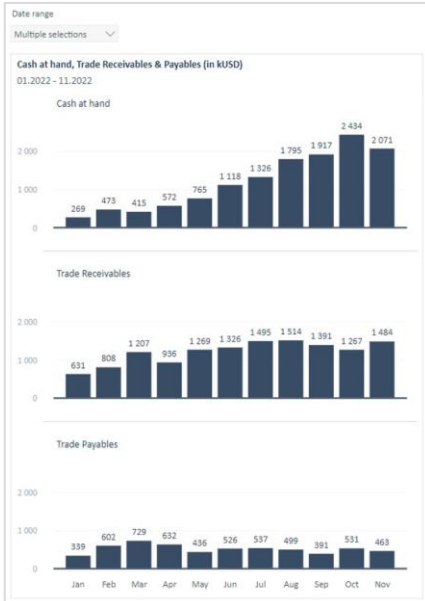
```
04. Y-axis max value v2 =

var __Max_Cash =  MAXX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[01. Cash at hand])      // Max monthly value for metric #1
var __Max_TR =    MAXX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[02. Trade Receivables]) // Max monthly value for metric #2
var __Max_TP =    MAXX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[03. Trade Payables])    // Max montly value for metric #3

var __Max =       {__max_Cash,__max_TR,__max_TP}                                          // Max monthly value (all metrics considered)

Var __Result =
        MAXX(__Max,[Value]) *1.2                                                          // Max monthly value multiplied by x.x to raise the top "ceiling"

Return
    __Result
```

2. We can retrieve the min monthly value (looking at where the highest value appear).
In some cases it can be manually fixed as 0 value. In different analysis – where values below 0 can ocure, then finding the min can be necessary

```
04. Y-axis min value v2 =

var __Min_Cash =  MINX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[01. Cash at hand])      // Min monthly value for metric #1
var __Min_TR =    MINX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[02. Trade Receivables]) // Min monthly value for metric #2
var __Min_TP =    MINX(VALUES('DIM: Kalendarz_Data'[mmm'yy ENG]),[03. Trade Payables])    // Min monthly value for metric #3

var __Min =       {__Min_Cash,__Min_TR,__Min_TP, 0}                                       // Min monthly value (all metrics considered)

Var __Result =
        MINX(__Min,[Value]) * 1.2                                                         // Min monthly value multiplied by x.x to lower the bottom "ceiling"

Return
    __Result
```

3. We can apply min and max value respectively using (fx) button using formatting pane -> Visual -> Y-axis -> Range -> Minimum (fx) and Maximum (fx) -> Field value -> our abovementioned metrics.

Multiplying our Max and Min value is an optional step. It’s not crucial, but in some cases might positively impact the data label visibility



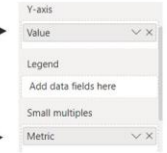
1. We can create a single disconnected table

	ID	Metric
1	1	Cash at hand
2	2	Trade Receivables
3	3	Trade Payables

„Metric” column should be sorter by „ID” column as a further step, to provide adequate sorting order for our categories within the small multiple chart

2. We can create a single measure based on SWITCH function (that way we will retrieve different metrics depending on current item from „Metric switch table” which is shown above)

```
04. Metric Switch =

VAR __Metric = SELECTEDVALUE('001  Table: Metric switch'[ID])

VAR __Result =
    SWITCH(
        __Metric,
            1,[01. Cash at hand],
            2,[02. Trade Receivables],
            3,[03. Trade Payables]
    )

RETURN
    __Result
```



3. We create a single column chart (or line chart, if needed), place our „switch metric” as Y-axis field and our „Metric” column from our disconnectd table as „Small multiple” field.

From there – we can make visual adjustments related with small multiples settings – padding / borders / title etc.

If some data labels are „covered” and not optimally visible, we can use (fx) in the Y-axis field and apply additional measure to raise the y-axis scale (if needed).

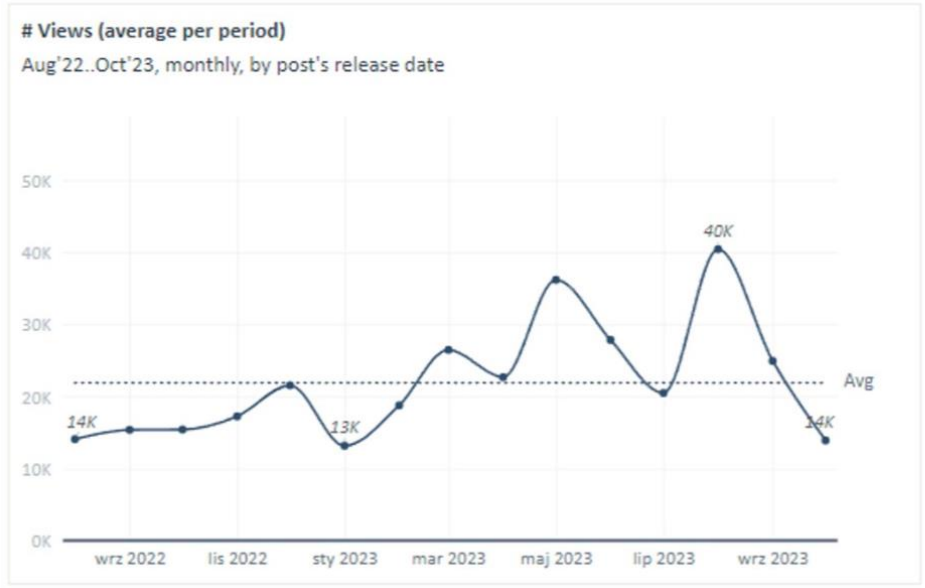
TRENDS: Sample use-case

Label density

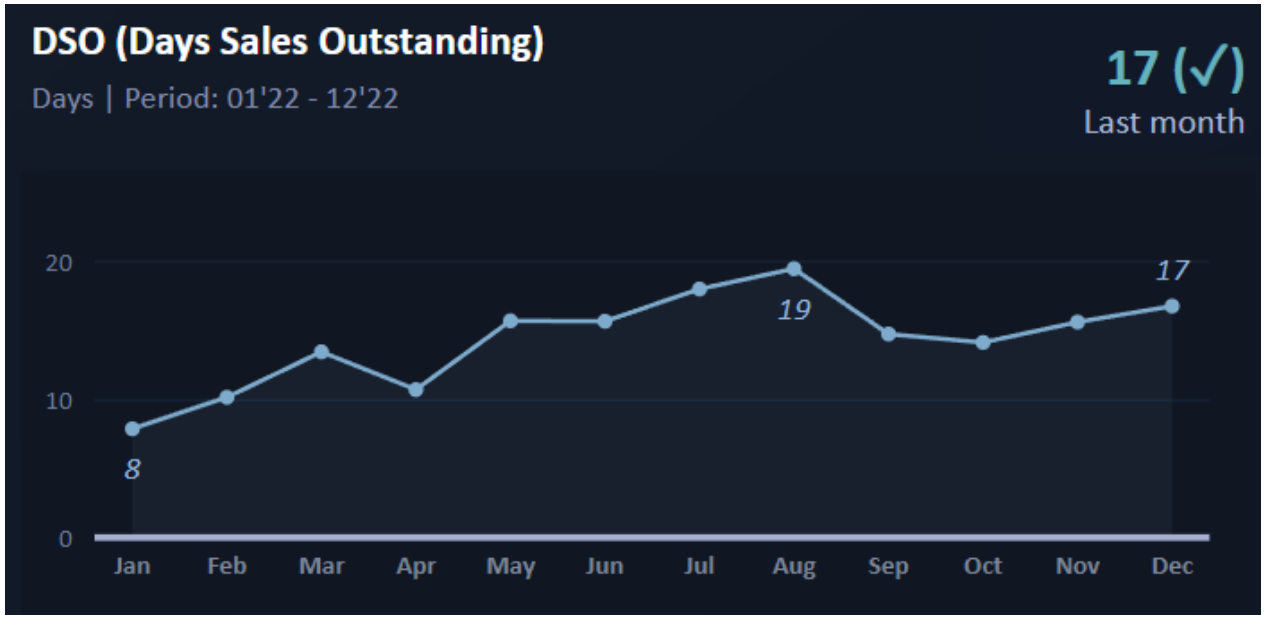
X-axis category

We can use date type column and select continuous type of x-axis (instead of categorical one)

That way we can unlock ‚Label density' option and pick a % between 0 and 100.



[Click here to open corresponding Linkedin post with detailed PDF breakdown: **„5 sample ways to impact the label density"**]



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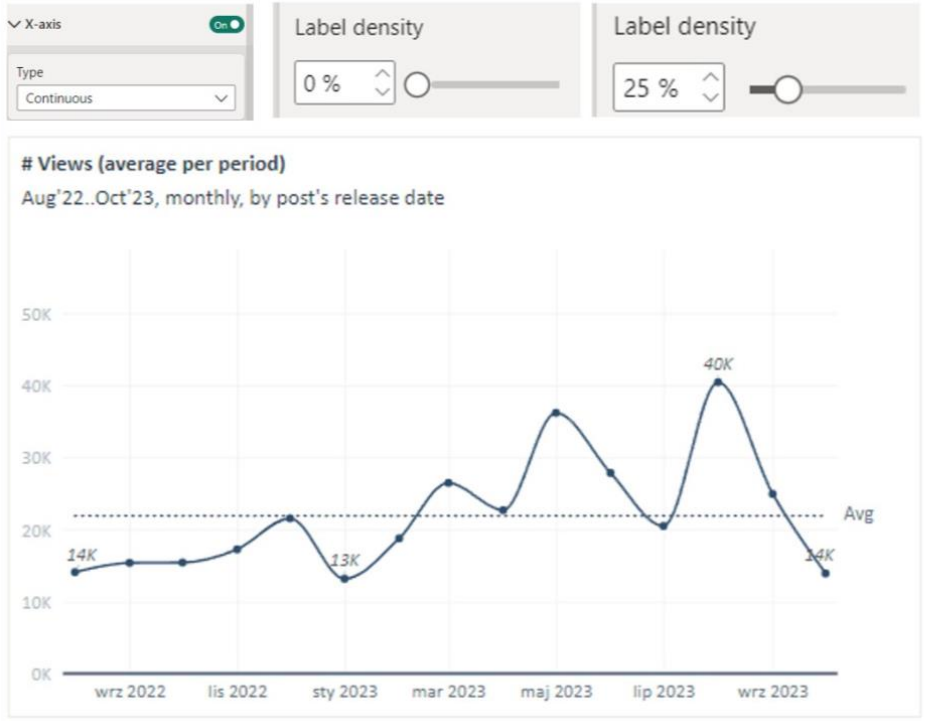

Additional measure that displays only certain data points

We can apply supplemental measure that only retrieves certain points (than be displayed as data labels, markers, or both)

```
CP: 008: Views - markers =

VAR __Min_Date =        CALCULATE ( MIN ('DIM: Date'[Start of Month]), ALLSELECTED() )
VAR __Max_Date =        CALCULATE ( MAX ('DIM: Date'[Start of Month]), ALLSELECTED() )

VAR __Min_views =       CALCULATE(
                            MINX (
                                FILTER ( VALUES ('DIM: Date'[Start of Month]), [CP: 005: # views (average)] > 0 ),[CP: 005: # views (average)] ),
                            ALLSELECTED()
                        )
VAR __Max_views =       CALCULATE(
                            MAXX (
                                VALUES ('DIM: Date'[Start of Month]), [CP: 005: # views (average)] ),
                            ALLSELECTED()
                        )

VAR __Result =
                SWITCH(
                    TRUE(),
                        SELECTEDVALUE ('DIM: Date'[Start of Month]) = __Min_Date ||
                        SELECTEDVALUE ('DIM: Date'[Start of Month]) = __Max_Date ||
                        [CP: 005: # views (average)] = __Min_views ||
                        [CP: 005: # views (average)] = __Max_views,
                        [CP: 005: # views (average)],
                        BLANK()
                )

RETURN
    __Result
```

Sample formula check min (greater than 0) & max value and first & last point. Conditions can be adjusted

To prevent unexpected behaviours – we can set the line width to 0 for additional measure

TRENDS: Sample use-case

Label density

X-axis category

We can use date type column and select continuous type of x-axis (instead of categorical one)

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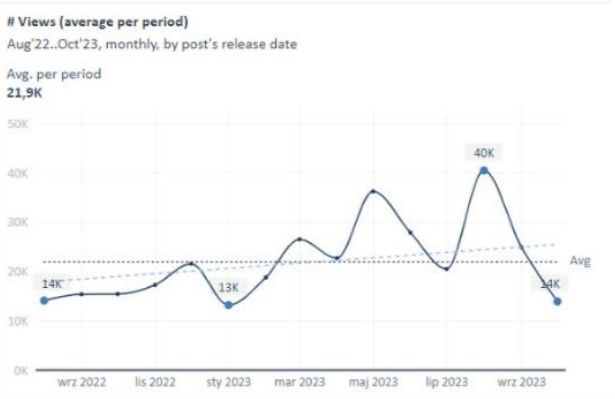
```
CP: 008: Views - markers =

VAR __Min_Date =        CALCULATE ( MIN ('DIM: Date'[Start of Month]), ALLSELECTED() )
VAR __Max_Date =        CALCULATE ( MAX ('DIM: Date'[Start of Month]), ALLSELECTED() )

VAR __Min_views =       CALCULATE(
                            MINX (
                                FILTER ( VALUES ('DIM: Date'[Start of Month]), [CP: 005: # views (average)] > 0 ),[CP: 005: # views (average)] ),
                            ALLSELECTED()
                        )
VAR __Max_views =       CALCULATE(
                            MAXX (
                                VALUES ('DIM: Date'[Start of Month]), [CP: 005: # views (average)] ),
                            ALLSELECTED()
                        )

VAR __Result =
                SWITCH(
                    TRUE(),
                        SELECTEDVALUE ('DIM: Date'[Start of Month]) = __Min_Date ||
                        SELECTEDVALUE ('DIM: Date'[Start of Month]) = __Max_Date ||
                        [CP: 005: # views (average)] = __Min_views ||
                        [CP: 005: # views (average)] = __Max_views,
                        [CP: 005: # views (average)],
                        BLANK()
                )

RETURN
    __Result
```

Sample formula check min (greater than 0) & max value and first & last point. Conditions can be adjusted

To prevent unexpected behaviours – we can set the line width to 0 for additional measure



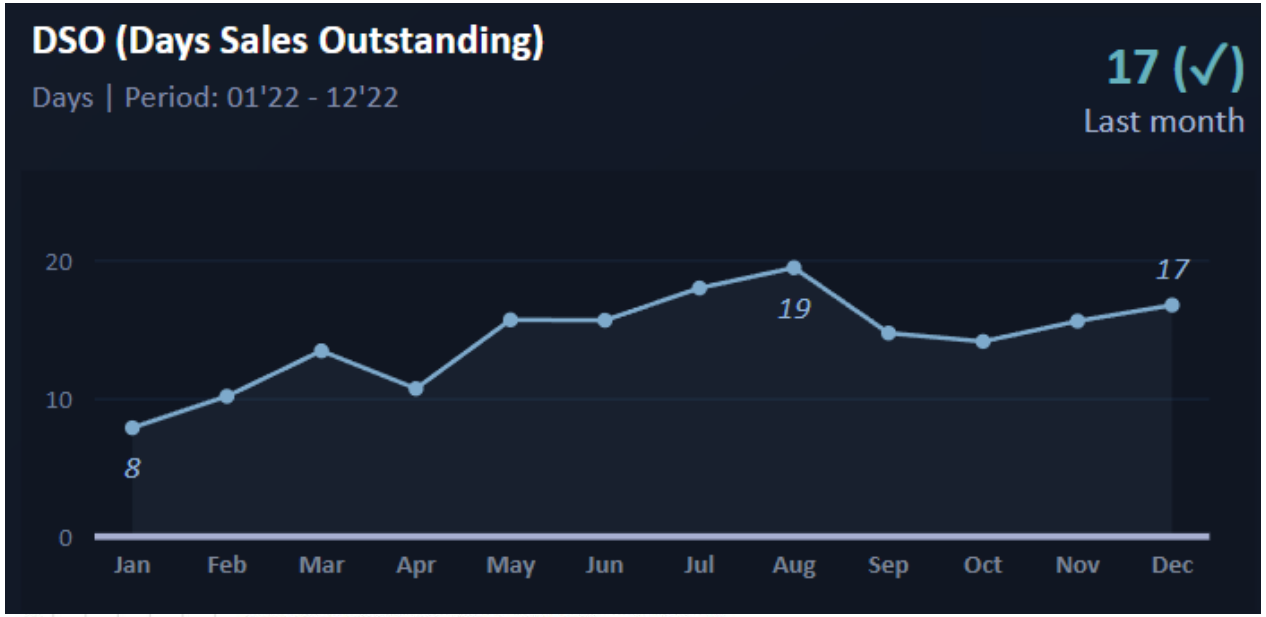
TRENDS: Sample use-case

Label density

X-axis category

We can use date type column and select continuous type of x-axis (instead of categorical one)

That way we can unlock ‚Label density' option and pick a % between 0 and 100.



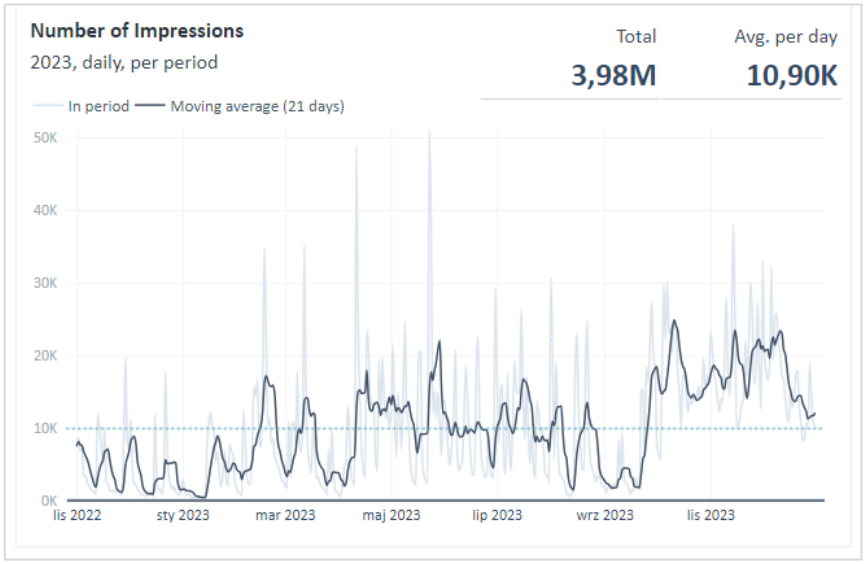

```
SELECTEDVALUE ('DIM: Date'[Start of Month]) = __Max_Date ||
[CP: 005: # views (average)] = __Min_views ||
[CP: 005: # views (average)] = __Max_views,
[CP: 005: # views (average)],
BLANK()
)

RETURN
    __Result
```

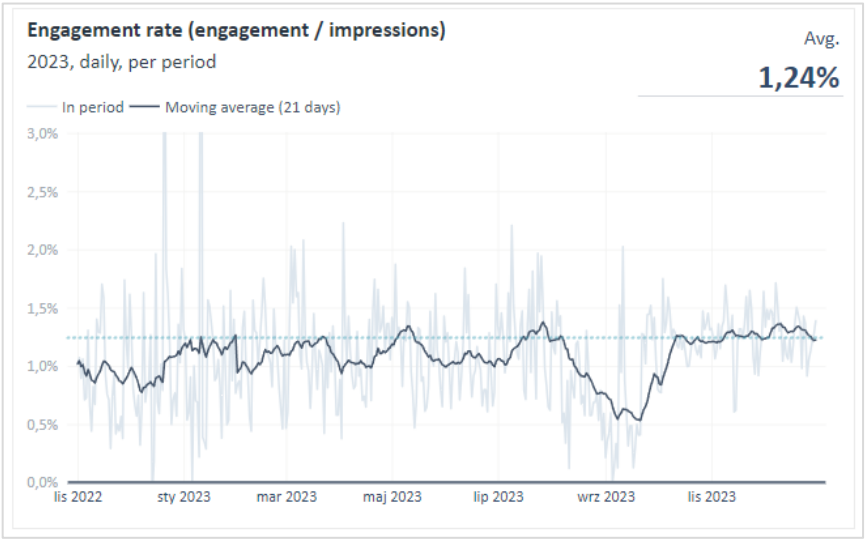
Sample formula check min (greater than 0) & max value and first & last point. Conditions can be adjusted

To prevent unexpected behaviours – we can set the line width to 0 for additional measure

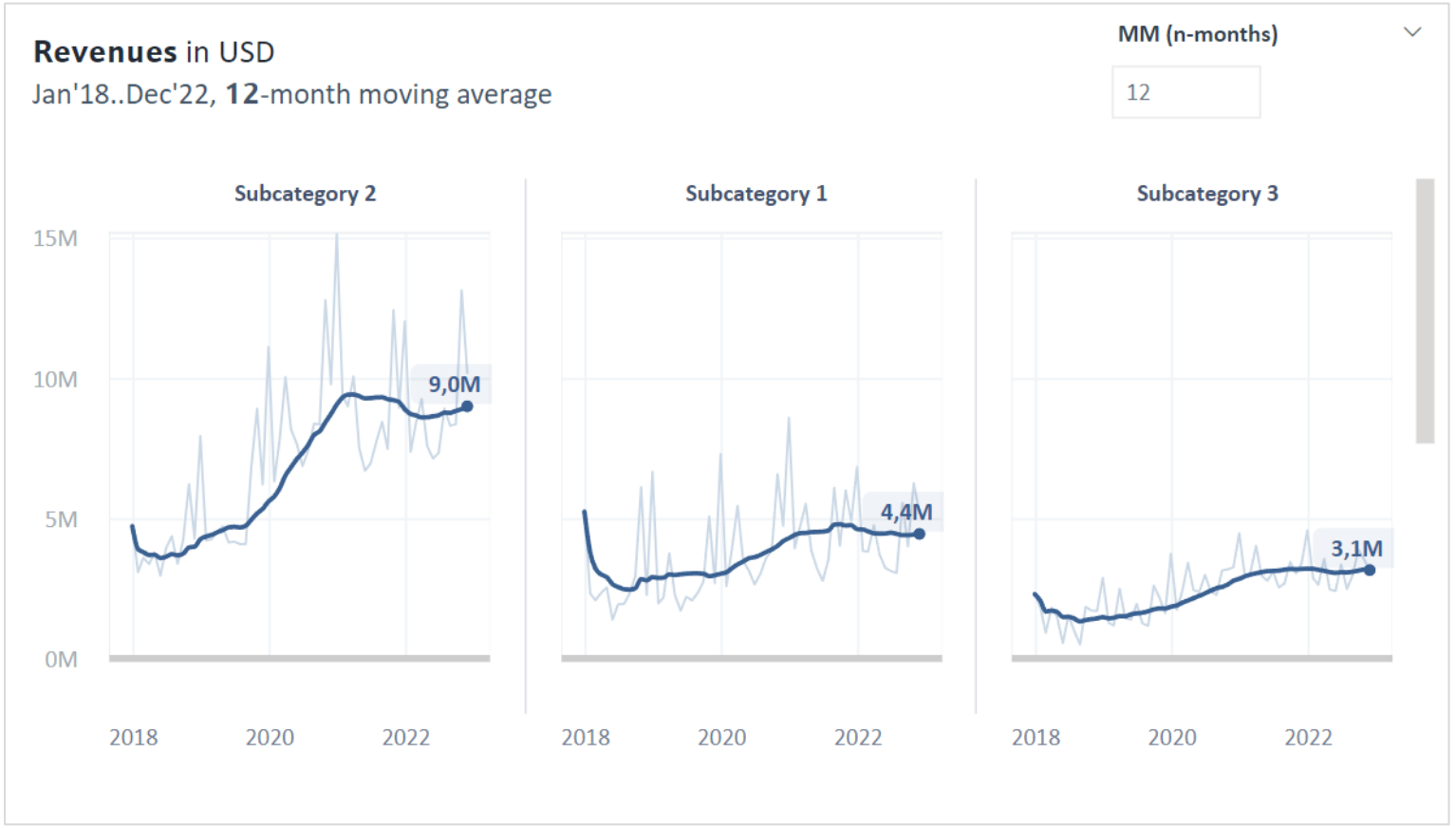
TRENDS: Sample use-case

Moving averages, small multiples



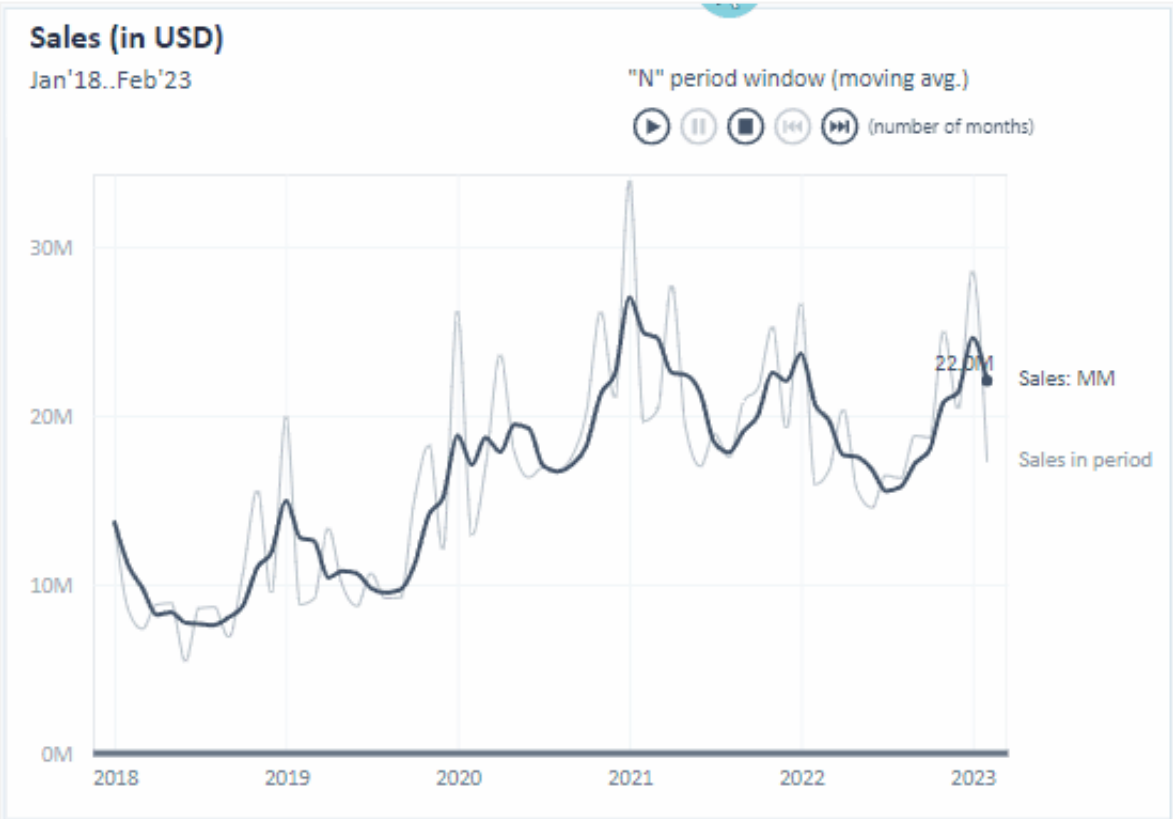


Click here to open corresponding Linkedin post **„Moving average"**



TRENDS: Sample use-case

Moving averages, small multiples

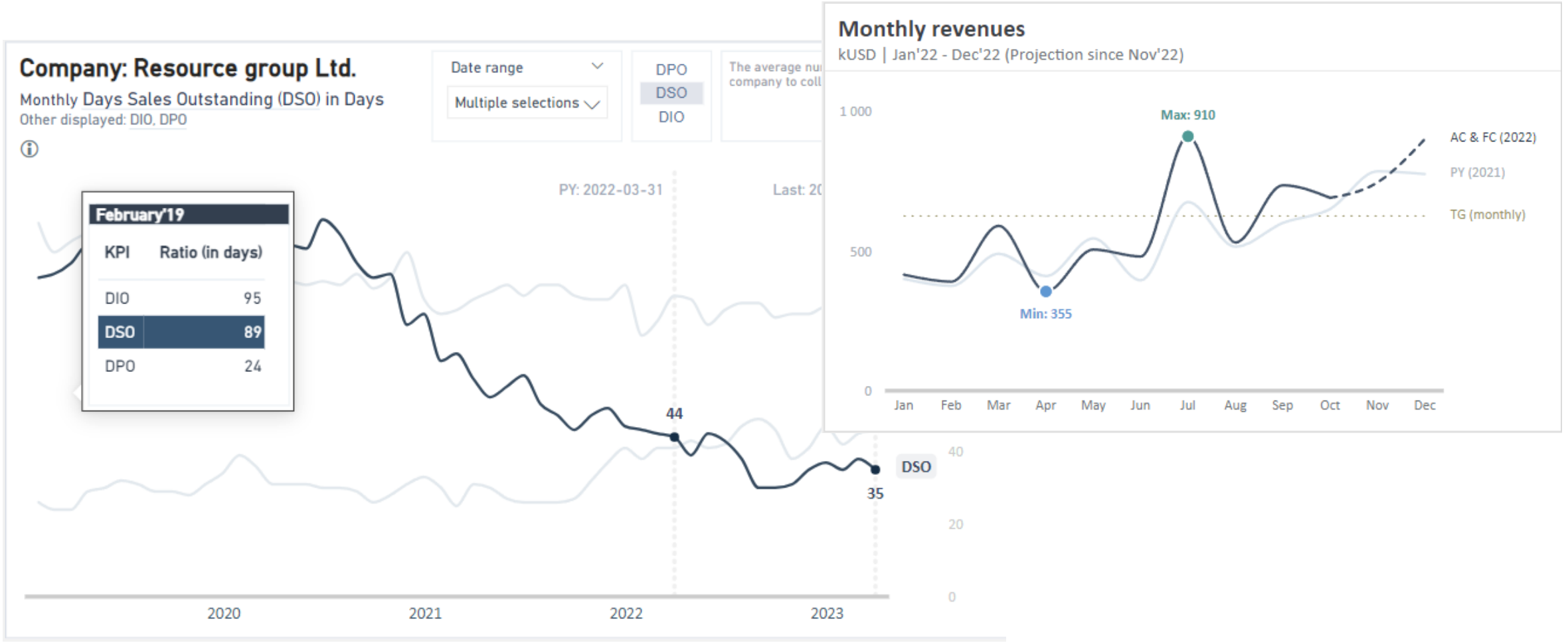



```
Sales: Rolling average - DM =
VAR __Number_of_periods =   [Parameter: Rolling average Value]
VAR __Last_Selected_Date =  MAX ( 'DIM: Date'[Date] )

VAR __Period_monthly =
    DATESINPERIOD ( 'DIM: Date'[Date], __Last_Selected_Date, -__Number_of_periods, MONTH )


VAR __Result =
CALCULATE (
    AVERAGEX (
        VALUES( 'DIM: Date'[MonthnYear] ),
        [001. Sales]
    ),
    __Period_monthly
)

VAR Last_Date_With_Sale =  MAX ( '999: FCT_table: Supplemental'[Date] )
VAR First_Visible_Date =   MIN ( 'DIM: Date'[Date] )

RETURN
   SWITCH(
        TRUE(),
            First_Visible_Date <= Last_Date_With_Sale, __Result
   )

```

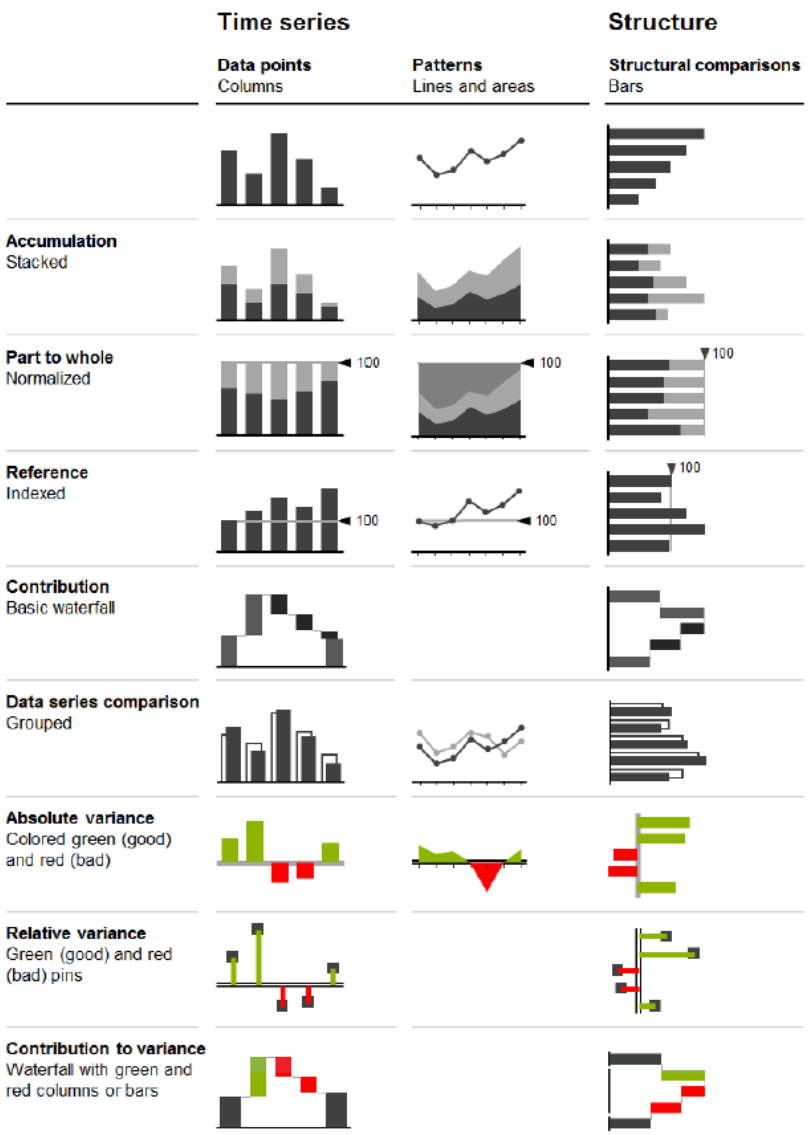
TRENDS: Sample use-case

Alternative desings

Click here to open
Enterprise DNA Workout (financial KPIs)



Benchmarks, comparisons
Sample guideline



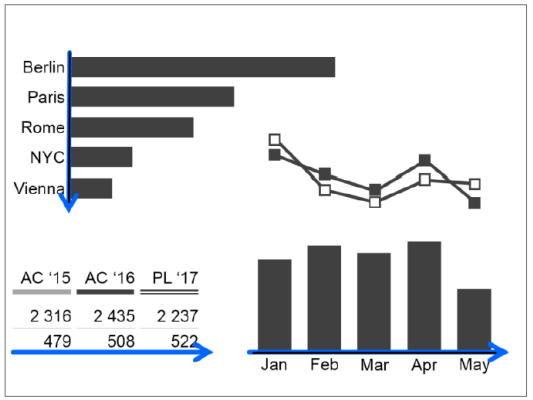


Figure UN 3.3-1: Visualization of time vs. structure (examples)

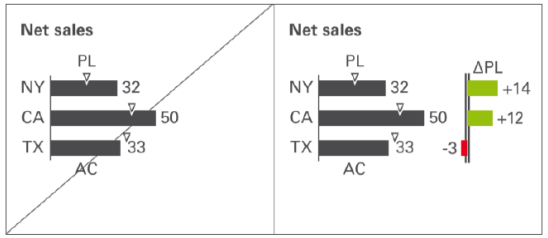


Figure EX 4.2: Add variances

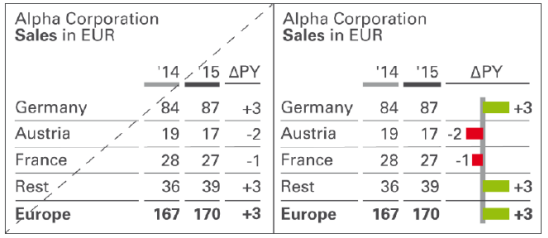


Figure CO 4.4: Embed chart elements in tables

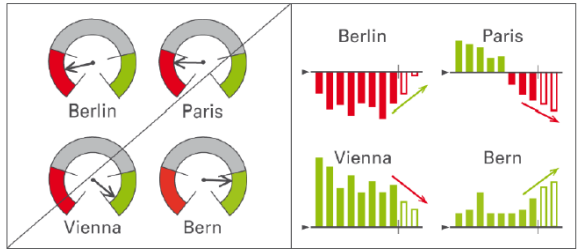


Figure EX 2.2: Replace gauges, speedometers

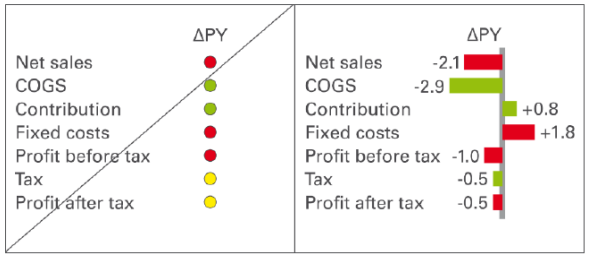


Figure EX 2.5: Replace traffic lights

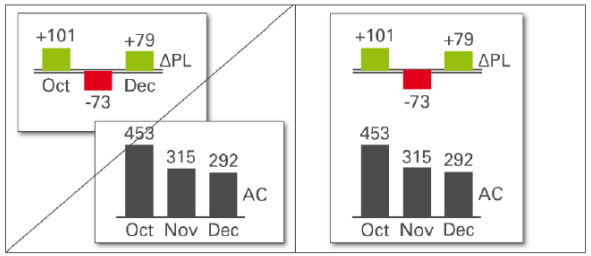


Figure CO 4.2: Show multi-tier charts

Benchmarks, comparisons

Sample guideline

Figure UN 3.3-1: Visualization of time vs. structure (examples)

Figure EX 4.2: Add variances

Figure CO 4.4: Embed chart elements in tables

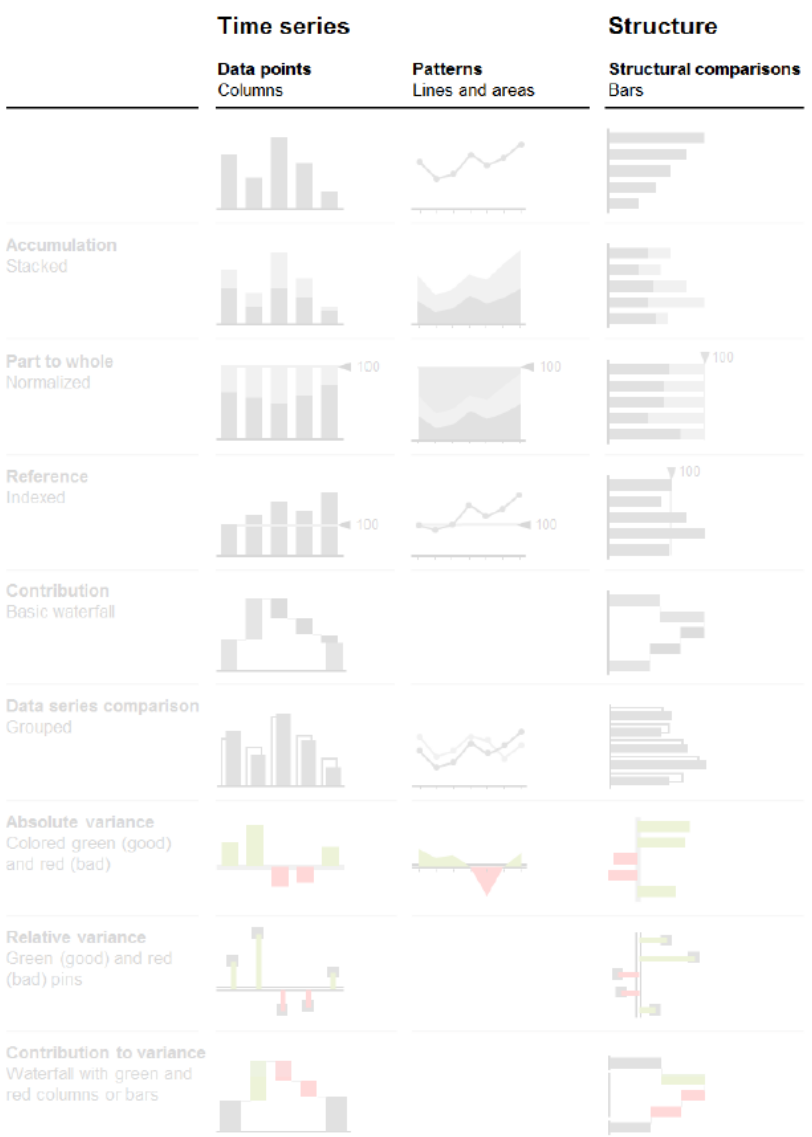
Figure EX 2.2: Replace gauges, speedometers

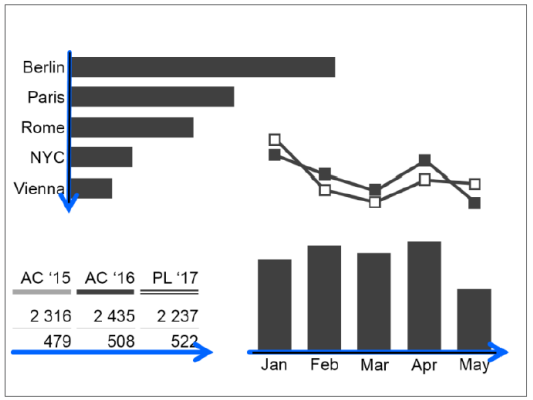
Figure EX 2.5: Replace traffic lights

Figure CO 4.2: Show multi-tier charts

Benchmarks, comparisons

Sample guideline





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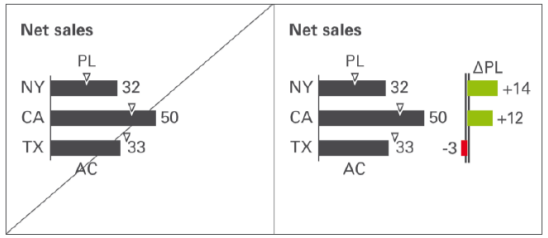

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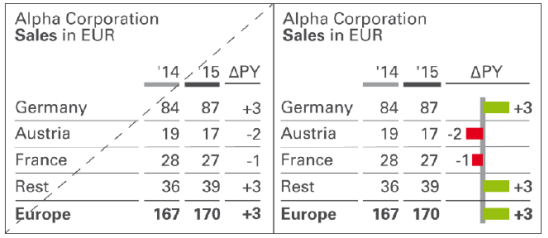

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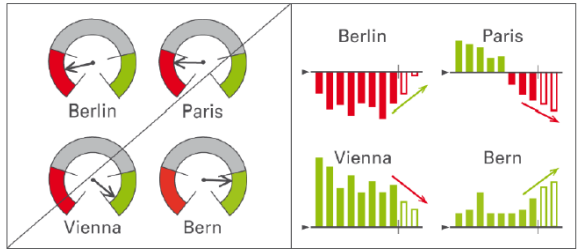

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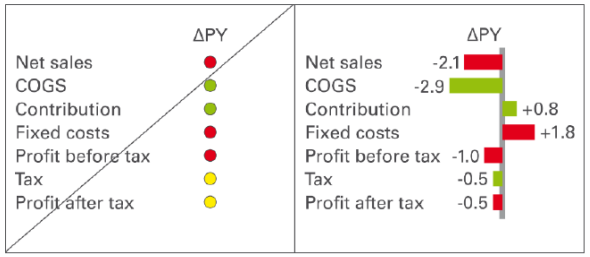

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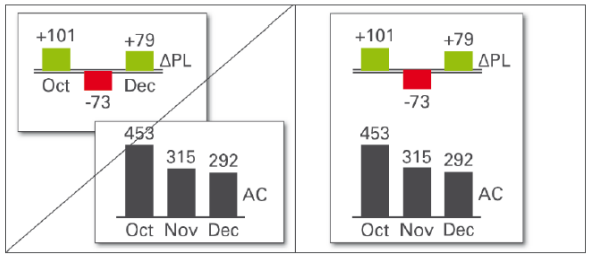


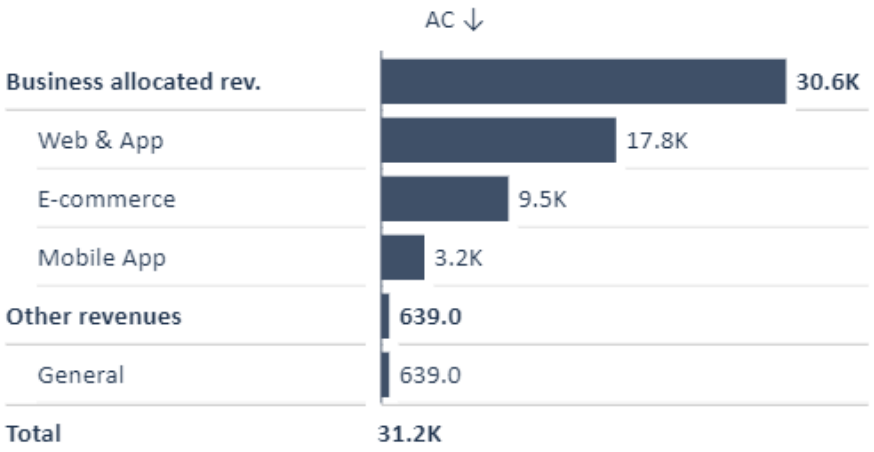
Figure CO 4.2: Show multi-tier charts

Benchmarks, comparisons

Context

Revenues, breakdown by business line

kUSD | Period: 01'22 - 12'22



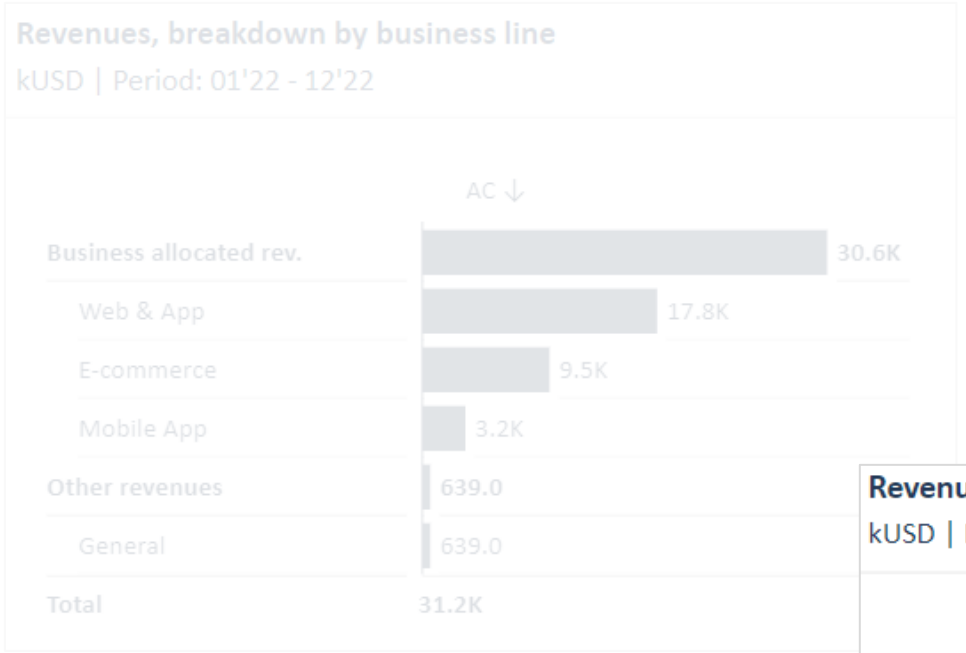
ues, breakdown by business line

Period: 01'22 - 12'22

	PL	AC % GT	AC ↓	ΔPL	ΔPL%
Business allocated rev.	26.9K	98%	30.6K	+3.7K	+13.9
Web & App	15.0K	57%	17.8K	+2.8K	+19.0
E-commerce	9.5K	31%	9.5K	+74.0	+0.8
Mobile App	2.4K	10%	3.2K	+804.2	+33.0
Other revenues	585.1	2%	639.0	+54.0	+9.2
General	585.1	2%	639.0	+54.0	+9.2
Total	27.4K	100%	31.2K	+3.8K	+13.8

Benchmarks, comparisons

Context (adding metrics)



Revenues, breakdown by business line

kUSD | Period: 01'22 - 12'22

	PL	AC % GT	AC ↓	ΔPL	ΔPL%
Business allocated rev.	**26.9K**	**98%**	30.6K	**+3.7K**	***+13.9***
Web & App	15.0K	57%	17.8K	+2.8K	*+19.0*
E-commerce	9.5K	31%	9.5K	+74.0	*+0.8*
Mobile App	2.4K	10%	3.2K	+804.2	*+33.0*
Other revenues	**585.1**	**2%**	**639.0**	**+54.0**	***+9.2***
General	585.1	2%	639.0	+54.0	*+9.2*
Total	**27.4K**	**100%**	**31.2K**	**+3.8K**	***+13.8***

Benchmarks, comparisons

Context (adding structure)

Rows:
Can be based on field parameter (enabling greater level of customization) e.g. project or customer etc.

Columns:
Possibly with use of supressed empty columns (if available)

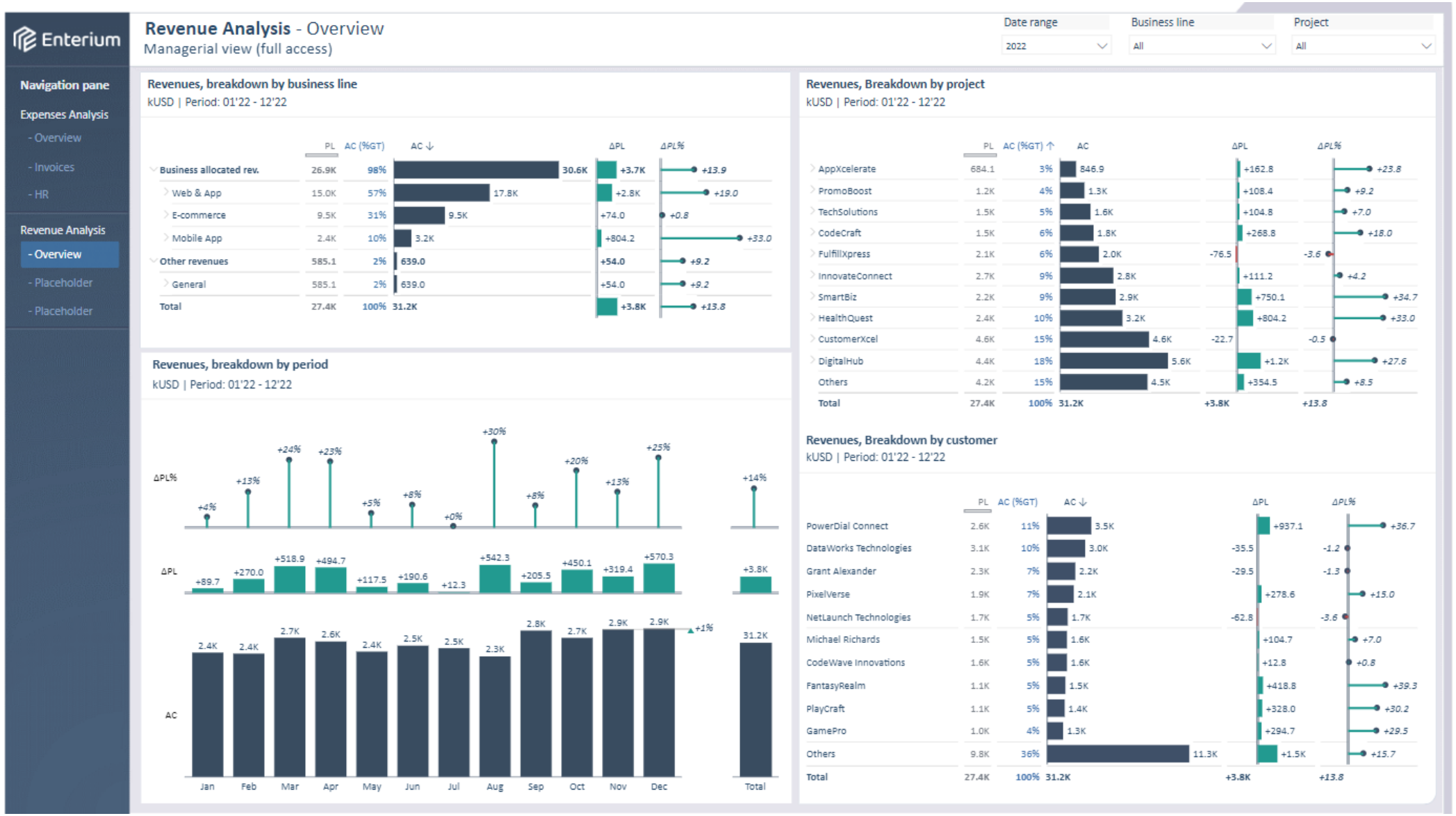
Revenues, breakdown by business line

kUSD | Period: 01'22 - 12'22

	PL	AC % GT	AC ↓	ΔPL	ΔPL%
Business allocated rev.	**26.9K**	**98%**	**30.6K**	**+3.7K**	***+13.9***
Web & App	**15.0K**	**57%**	**17.8K**	**+2.8K**	***+19.0***
DigitalHub	4.4K	18%	5.6K	+1.2K	*+27.6*
SmartBiz	2.2K	9%	2.9K	+750.1	*+34.7*
InnovateConnect	2.7K	9%	2.8K	+111.2	*+4.2*
CodeCraft	1.5K	6%	1.8K	+268.8	*+18.0*
TechSolutions	1.5K	5%	1.6K	+104.8	*+7.0*
AppXcelerate	684.1	3%	846.9	+162.8	*+23.8*
DigitalTransform	727.0	3%	794.0	+67.0	*+9.2*
Connectify	734.6	2%	756.4	+21.8	*+3.0*
DataTrackr	378.3	2%	515.2	+136.9	*+36.2*
UXFlow	218.7	1%	228.7	+10.0	*+4.6*
E-commerce	**9.5K**	**31%**	**9.5K**	**+74.0**	***+0.8***
Mobile App	**2.4K**	**10%**	**3.2K**	**+804.2**	***+33.0***
Other revenues	**585.1**	**2%**	**639.0**	**+54.0**	***+9.2***
General	**585.1**	**2%**	**639.0**	**+54.0**	***+9.2***
Other	585.1	2%	639.0	+54.0	*+9.2*
Total	**27.4K**	**100%**	**31.2K**	**+3.8K**	***+13.8***

Benchmarks, comparisons

Context (adding breakdowns and timelines)



[Click here to open the interactive report](#)

Benchmarks, comparisons

Context (adding breakdowns and timelines)

Revenues (in kUSD)

2022, AC and BU and ΔBU, breakdown by project

Project	BUD	AC	AC	ΔBU, ΔBU%
DigitalHub	4 409	5 625		▲ +1 216 | +28%
CustomerXcel	4 636	4 613		▼ -23 | 0%
HealthQuest	2 434	3 239		▲ +804 | +33%
SmartBiz	2 161	2 911		▲ +750 | +35%
InnovateConnect	2 659	2 770		▲ +111 | +4%
FulfillXpress	2 105	2 029		▼ -77 | -4%
Total	**27 442**	**31 223**		**▲ +3 781 | +14%**

Concatenated lables in BU variance:
Not recommended (more difficult co compare values vertically)

Revenues (in kUSD)

2022, AC and BU and ΔBU, breakdown by project

Project	BUD	AC	AC	ΔBU	ΔBU%
DigitalHub	4 409	5 625		+1 216	+28%
CustomerXcel	4 636	4 613		-23	-0%
HealthQuest	2 434	3 239		+804	+33%
SmartBiz	2 161	2 911		+750	+35%
InnovateConnect	2 659	2 770		+111	+4%
FulfillXpress	2 105	2 029		-77	-4%
Total	**27 442**	**31 223**		**+3 781**	**+14%**

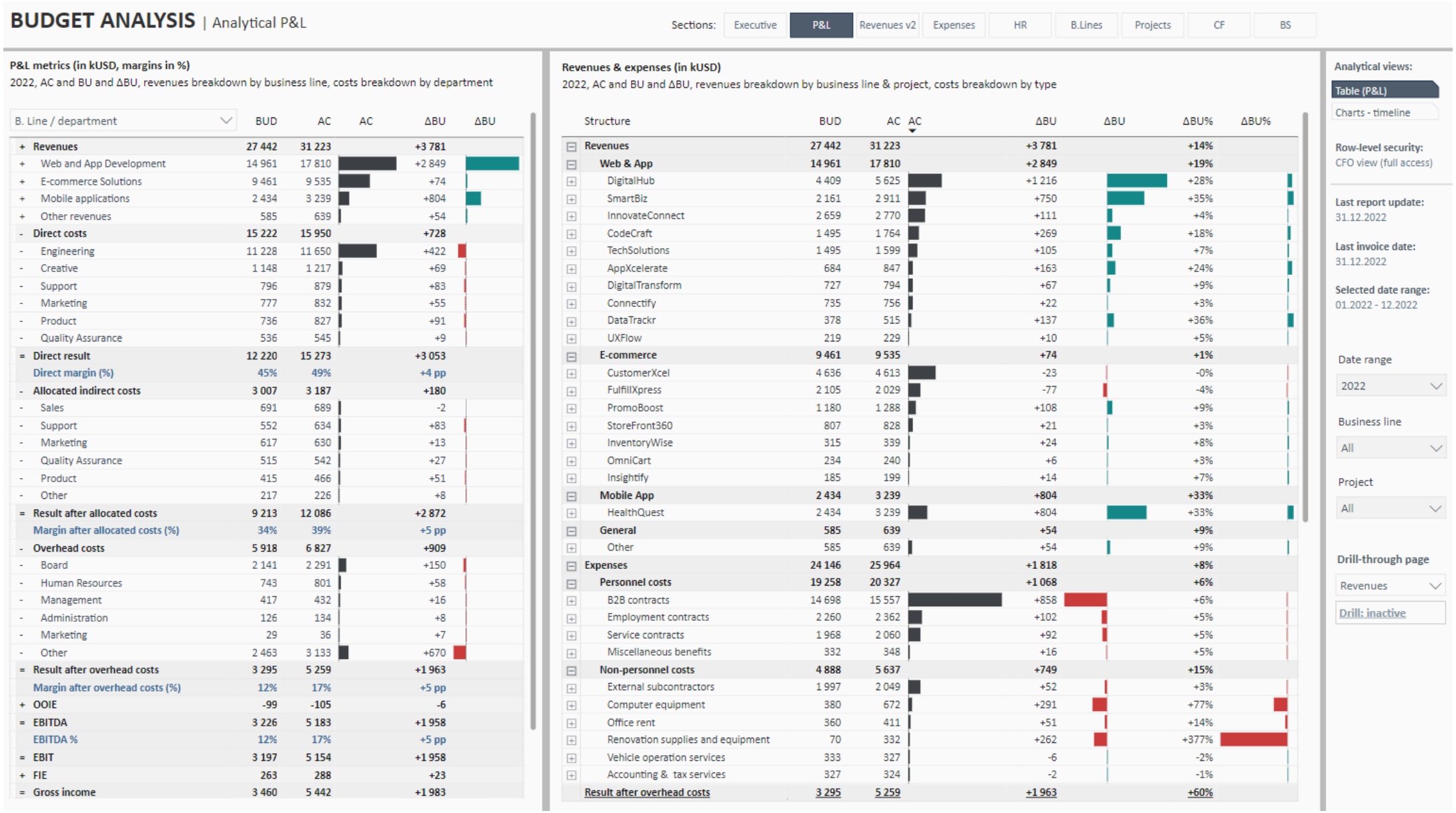
wn by project

		AC	AC	ΔBU	ΔBU	ΔBU%	ΔBU%
DigitalHub	4 409	5 625		+1 216		+28%	
CustomerXcel	4 636	4 613		-23		-0%	
HealthQuest	2 434	3 239		+804		+33%	
SmartBiz	2 161	2 911		+750		+35%	
InnovateConnect	2 659	2 770		+111		+4%	
FulfillXpress	2 105	2 029		-77		-4%	
CodeCraft	1 495	1 764		+269		+18%	
TechSolutions	1 495	1 599		+105		+7%	
Total	**27 442**	**31 223**		**+3 781**		**+14%**	

Click here to open corresponding Linkedin post with details:
„Different styles of displaying variances"

Benchmarks, comparisons

Context (adding breakdowns and timelines)



BUDGET ANALYSIS | Analytical P&L

Sections: Executive | P&L | Revenues v2 | Expenses | HR | B.Lines | Projects | CF | BS

P&L metrics (in kUSD, margins in %)

2022, AC and BU and ΔBU, revenues breakdown by business line, costs breakdown by department

B. Line / department	BUD	AC	AC	ΔBU	ΔBU
+ **Revenues**	**27 442**	**31 223**		**+3 781**	
+ Web and App Development	14 961	17 810		+2 849	
+ E-commerce Solutions	9 461	9 535		+74	
+ Mobile applications	2 434	3 239		+804	
+ Other revenues	585	639		+54	
- **Direct costs**	**15 222**	**15 950**		**+728**	
- Engineering	11 228	11 650		+422	
- Creative	1 148	1 217		+69	
- Support	796	879		+83	
- Marketing	777	832		+55	
- Product	736	827		+91	
- Quality Assurance	536	545		+9	
= **Direct result**	**12 220**	**15 273**		**+3 053**	
Direct margin (%)	45%	49%		+4 pp	
- **Allocated indirect costs**	**3 007**	**3 187**		**+180**	
- Sales	691	689		-2	
- Support	552	634		+83	
- Marketing	617	630		+13	
- Quality Assurance	515	542		+27	
- Product	415	466		+51	
- Other	217	226		+8	
= **Result after allocated costs**	**9 213**	**12 086**		**+2 872**	
Margin after allocated costs (%)	34%	39%		+5 pp	
- **Overhead costs**	**5 918**	**6 827**		**+909**	
- Board	2 141	2 291		+150	
- Human Resources	743	801		+58	
- Management	417	432		+16	
- Administration	126	134		+8	
- Marketing	29	36		+7	
- Other	2 463	3 133		+670	
= **Result after overhead costs**	**3 295**	**5 259**		**+1 963**	
Margin after overhead costs (%)	12%	17%		+5 pp	
+ **OOIE**	**-99**	**-105**		**-6**	
= **EBITDA**	**3 226**	**5 183**		**+1 958**	
EBITDA %	12%	17%		+5 pp	
= **EBIT**	**3 197**	**5 154**		**+1 958**	
+ **FIE**	**263**	**288**		**+23**	
= **Gross income**	**3 460**	**5 442**		**+1 983**	

Revenues & expenses (in kUSD)

2022, AC and BU and ΔBU, revenues breakdown by business line & project, costs breakdown by type

Structure	BUD	AC	AC	ΔBU	ΔBU	ΔBU%	ΔBU%
Revenues	**27 442**	**31 223**		**+3 781**		**+14%**	
Web & App	**14 961**	**17 810**		**+2 849**		**+19%**	
DigitalHub	4 409	5 625		+1 216		+28%	
SmartBiz	2 161	2 911		+750		+35%	
InnovateConnect	2 659	2 770		+111		+4%	
CodeCraft	1 495	1 764		+269		+18%	
TechSolutions	1 495	1 599		+105		+7%	
AppXcelerate	684	847		+163		+24%	
DigitalTransform	727	794		+67		+9%	
Connectify	735	756		+22		+3%	
DataTrackr	378	515		+137		+36%	
UXFlow	219	229		+10		+5%	
E-commerce	**9 461**	**9 535**		**+74**		**+1%**	
CustomerXcel	4 636	4 613		-23		-0%	
FulfillXpress	2 105	2 029		-77		-4%	
PromoBoost	1 180	1 288		+108		+9%	
StoreFront360	807	828		+21		+3%	
InventoryWise	315	339		+24		+8%	
OmniCart	234	240		+6		+3%	
Insightify	185	199		+14		+7%	
Mobile App	**2 434**	**3 239**		**+804**		**+33%**	
HealthQuest	2 434	3 239		+804		+33%	
General	**585**	**639**		**+54**		**+9%**	
Other	585	639		+54		+9%	
Expenses	**24 146**	**25 964**		**+1 818**		**+8%**	
Personnel costs	**19 258**	**20 327**		**+1 068**		**+6%**	
B2B contracts	14 698	15 557		+858		+6%	
Employment contracts	2 260	2 362		+102		+5%	
Service contracts	1 968	2 060		+92		+5%	
Miscellaneous benefits	332	348		+16		+5%	
Non-personnel costs	**4 888**	**5 637**		**+749**		**+15%**	
External subcontractors	1 997	2 049		+52		+3%	
Computer equipment	380	672		+291		+77%	
Office rent	360	411		+51		+14%	
Renovation supplies and equipment	70	332		+262		+377%	
Vehicle operation services	333	327		-6		-2%	
Accounting & tax services	327	324		-2		-1%	
Result after overhead costs	3 295	5 259		+1 963		+60%	

Analytical views:

Table (P&L)

Charts - timeline

Row-level security:

CFO view (full access)

Last report update:

31.12.2022

Last invoice date:

31.12.2022

Selected date range:

01.2022 - 12.2022

Date range: 2022

Business line: All

Project: All

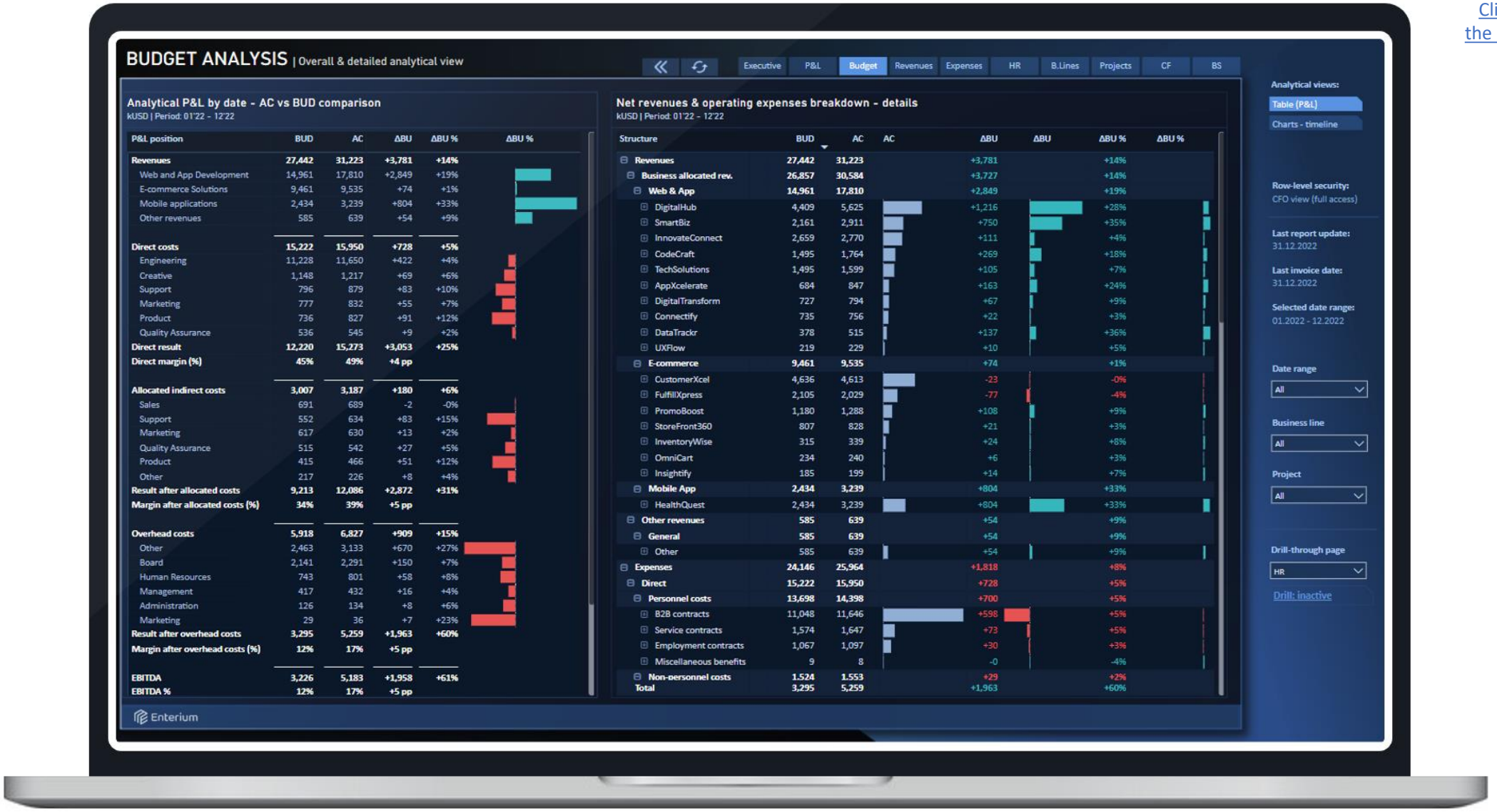
Drill-through page

Revenues

Drill: inactive

Benchmarks, comparisons

Sample report – dark-theme variant

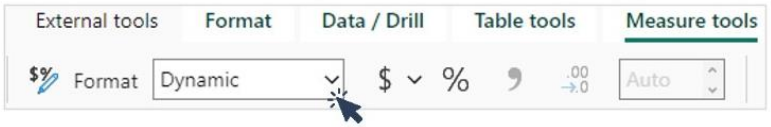


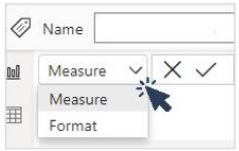
Click here to open the interactive report

Benchmarks, comparisons
Formats

P&L metrics (in kUSD, margins in %)
2022, AC and BU and ΔBU, revenues breakdown by business line, costs breakdown by department

	BUD	AC	AC	ΔBU	ΔBU	ΔBU%	ΔBU%
Revenues	**27 442**	**31 223**		**+3 781**		**+14%**	
Web and App Development	14 961	17 810		+2 849		+19%	
E-commerce Solutions	9 461	9 535		+74		+1%	
Mobile applications	2 434	3 239		+804		+33%	
Other revenues	585	639		+54		+9%	
Direct costs	**15 222**	**15 950**		**+728**		**+5%**	
Engineering	11 228	11 650		+422		+4%	
Creative	1 148	1 217		+69		+6%	
Support	796	879		+83		+10%	
Marketing	777	832		+55		+7%	
Product	736	827		+91		+12%	
Quality Assurance	536	545		+9		+2%	
Direct result	**12 220**	**15 273**		**+3 053**		**+25%**	
Direct margin (%)	45%	49%		+4 pp			
Allocated indirect costs	**3 007**	**3 187**		**+180**		**+6%**	
Sales	691	689		-2		-0%	
Support	552	634		+83		+15%	
Marketing	617	630		+13		+2%	
Quality Assurance	515	542		+27		+5%	
Product	415	466		+51		+12%	
Other	217	226		+8		+4%	
Result after allocated costs	**9 213**	**12 086**		**+2 872**		**+31%**	
Margin after allocated costs (%)	34%	39%		+5 pp			
Overhead costs	**5 918**	**6 827**		**+909**		**+15%**	
Board	2 141	2 291		+150		+7%	
Human Resources	743	801		+58		+8%	
Management	417	432		+16		+4%	
Administration	126	134		+8		+6%	
Marketing	29	36		+7		+23%	
Other	2 463	3 133		+670		+27%	
Result after overhead costs	**3 295**	**5 259**		**+1 963**		**+60%**	
Margin after overhead costs (%)	12%	17%		+5 pp			
OOIE	**-99**	**-105**		**-6**		**-6%**	
EBITDA	**3 226**	**5 183**		**+1 958**		**+61%**	
EBITDA %	12%	17%		+5 pp			
EBIT	**3 197**	**5 154**		**+1 958**		**+61%**	
FIE	**263**	**288**		**+23**		**+9%**	





Sample dynamic format for AC and comparative metrics (PY, BUD, FOR etc.)

```
VAR __Unit = SELECTEDVALUE('DIM_P&L_Structure'[Format ID])

VAR __Result =
        SWITCH(
            TRUE(),
                __Unit = 1,"#,0.0;-#,0.0;0",      // Records with values (P&L items, results)
                __Unit = 2,"+0.0%;-0.0%;0%",      // Records with % Margin
                __Unit = 3,";;;"                  // Records with blank space (optional)
        )

RETURN
    __Result
```

Sample dynamic format for Δ (absolute variances) // with added „+" sign and percentage points

```
VAR __Unit = SELECTEDVALUE('DIM_P&L_Structure'[Format ID])

VAR __Result =
        SWITCH(
            TRUE(),
                __Unit = 1,"+#,0.0;-#,0.0;0",       // Records with values (P&L items, results)
                __Unit = 2,"+0.0 pp;-0.0 pp;0 pp",  // Records with % Margin
                __Unit = 3,";;;"                    // Records with blank space (optional)
        )

RETURN
    __Result
```

Click here to open corresponding Linkedin post with details: **„Dynamic Formats in P&L"**

Click here to open corresponding Linkedin post with details: **„Dynamic Formats in charts"**

Benchmarks, comparisons

Sample tabular view

Company Services Ltd.

Expenses in kUSD | date range: Jan'21-Dec'21

Date: 2021

Comparison: PY / BU

Line: Select all, B2C, B2B, General costs

Line: Select all, Direct, Indirect - allocated, Indirect - unallocat...

Cost category: Select all, Administration, Amortization, External services, IT / R&D, Marketing, Project costs, Taxes and fees, Value of goods sold

Structure	PY	AC	% GT	AC	ΔPY	ΔPY	ΔPY %
B2B	4 651	4 721	41%		+70		+1%
Direct	3 322	3 439	30%		+117		+4%
External services	1 471	2 312	20%		+841		+57%
Project costs	1 189	585	5%		-604		-51%
Value of goods sold	132	204	2%		+72		+55%
Marketing & communications	85	169	1%		+84		+99%
Administration, customer service	440	103	1%		-338		-77%
IT / R&D	6	67	1%		+61		+982%
Indirect - allocated	1 329	1 282	11%		-47		-4%
Marketing & communications	527	648	6%		+122		+23%
Taxes and fees	202	303	3%		+101		+50%
Amortization	113	154	1%		+41		+37%
IT / R&D	248	116	1%		-132		-53%
Administration, customer service	239	60	1%		-178		-75%
B2C	3 109	3 686	32%		+577		+19%
Direct	1 660	2 248	19%		+588		+35%
External services	1 582	2 128	18%		+546		+35%
IT / R&D	73	113	1%		+39		+54%
Marketing & communications	5	7	0%		+2		+51%
Indirect - allocated	1 449	1 438	12%		-11		-1%
Amortization	725	731	6%		+6		+1%
Marketing & communications	311	327	3%		+16		+5%
Administration, customer service	195	187	2%		-9		-4%
Taxes and fees	176	144	1%		-33		-19%
Total	10 645	11 590	100%		+946		+9%

Click here to open corresponding Linkedin post with detailed PDF breakdown:
„How to connect (model) multiple field parameters"

Click here to open corresponding Linkedin post with detailed PDF breakdown:
„+20 sample applications of field parameters and SWITCH function"

Important functionalities:

- Field Parameter
- Conditional formatting (through field value)
- Conditional formatting (data bars)

Benchmarks, comparisons

Sample ‚Multi tier chart'

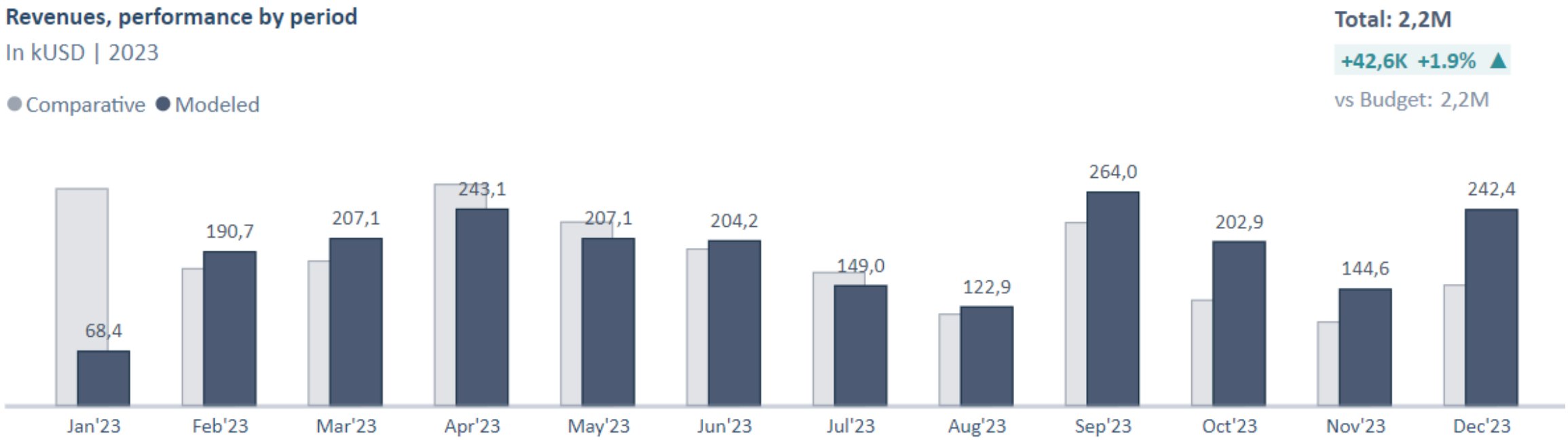
Benchmarks, comparisons

Sample overlayed (overlapped) column chart

Click here to open
corresponding Linkedin post with detailed PDF breakdown:
„Sample overlapped column charts and bar charts (with additional use of error bars part II"

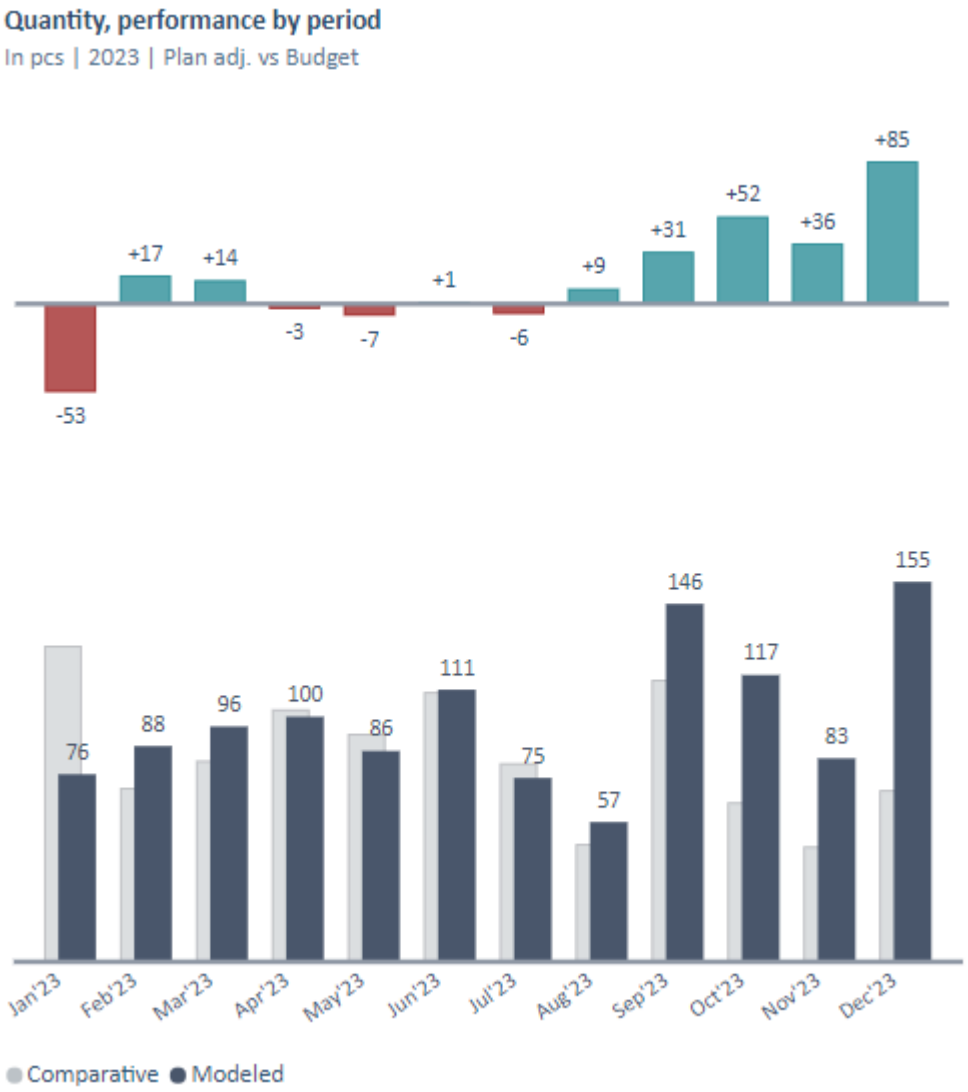
Click here to open
corresponding Linkedin post with detailed PDF breakdown:
„Sample overlapped column charts and bar charts (with additional use of error bars part I „

Click here to open
corresponding Linkedin post with detailed PDF breakdown:
„Sample overlapped column charts and bar"



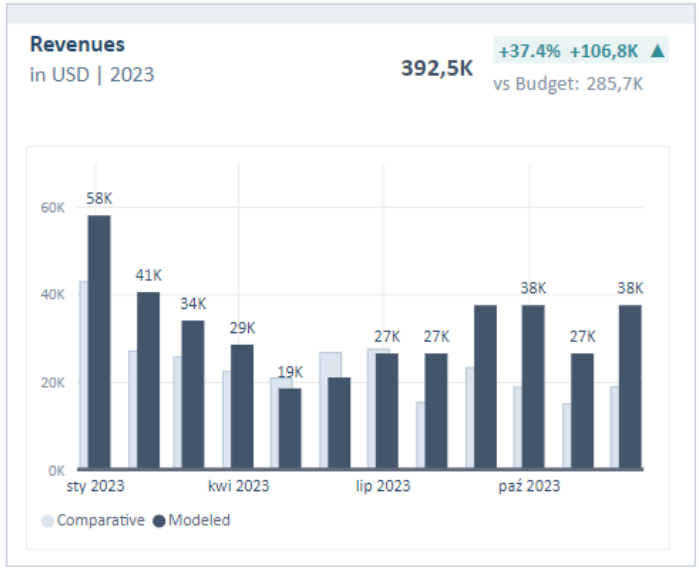
Benchmarks, comparisons

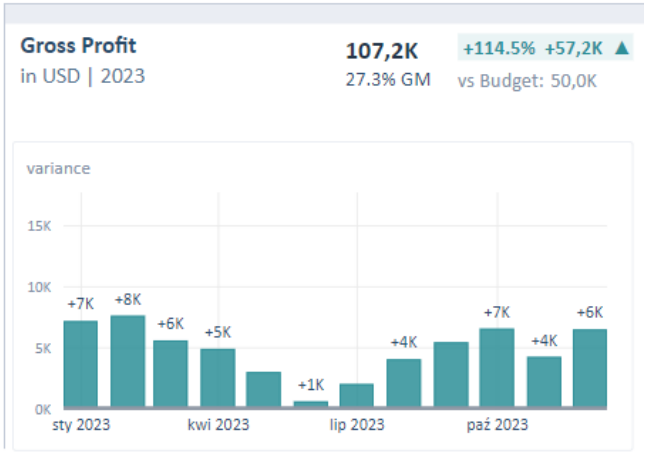
Sample multi-tier chart (native, using separate charts)

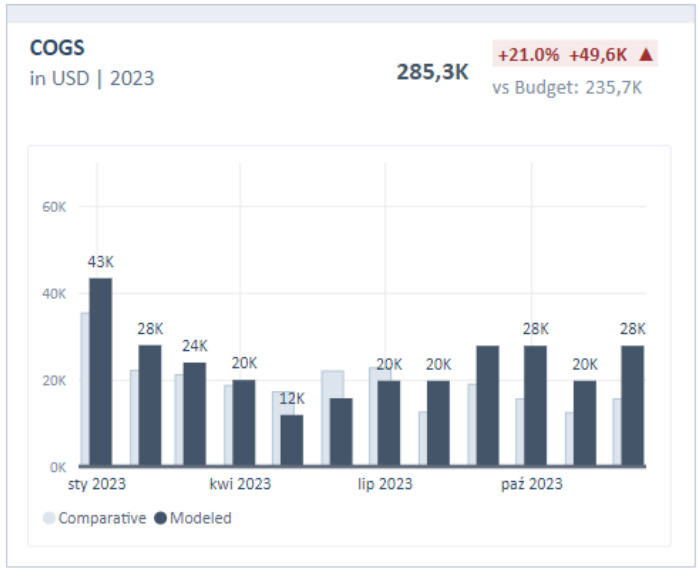


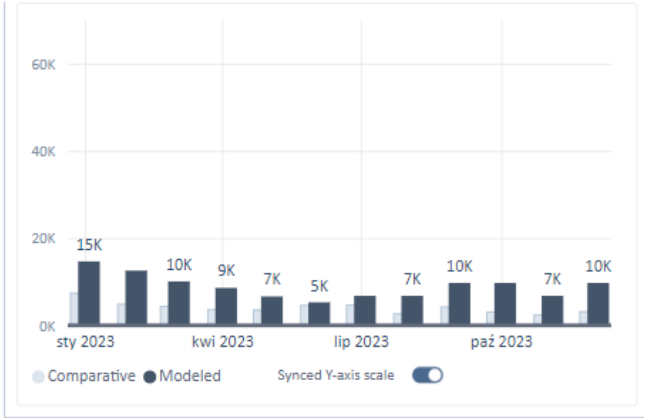
Benchmarks, comparisons

Sample charts with overlapped columns









Benchmarks, comparisons

KPI Cards – different styles, use of reference labels

Revenues
19,5M
PY: 15,0M ▲ +29.9% +4.5M
FC: 18,8M ▲ +3.7% +0.7M

Costs
13,8M
PY: 10,4M ↑ +32.7% +3.39M
FC: 14,3M ↓ -3.8% -0.54M

Gross profit
5,7M
PY: 4,6M ↑ +23.5% +1.09M
FC: 4,5M ↑ +27.8% +1.24M

Revenues
19,5M
PY: 15,0M ▲ *+29.9% +4.5M*
FC: 18,8M ▲ *+3.7% +0.7M*

Costs
13,8M
PY: 10,4M ↑ *+32.7% +3.39M*
FC: 14,3M ↓ *-3.8% -0.54M*

Gross profit
5,7M
PY: 4,6M ↑ *+23.5% +1.09M*
FC: 4,5M ↑ *+27.8% +1.24M*

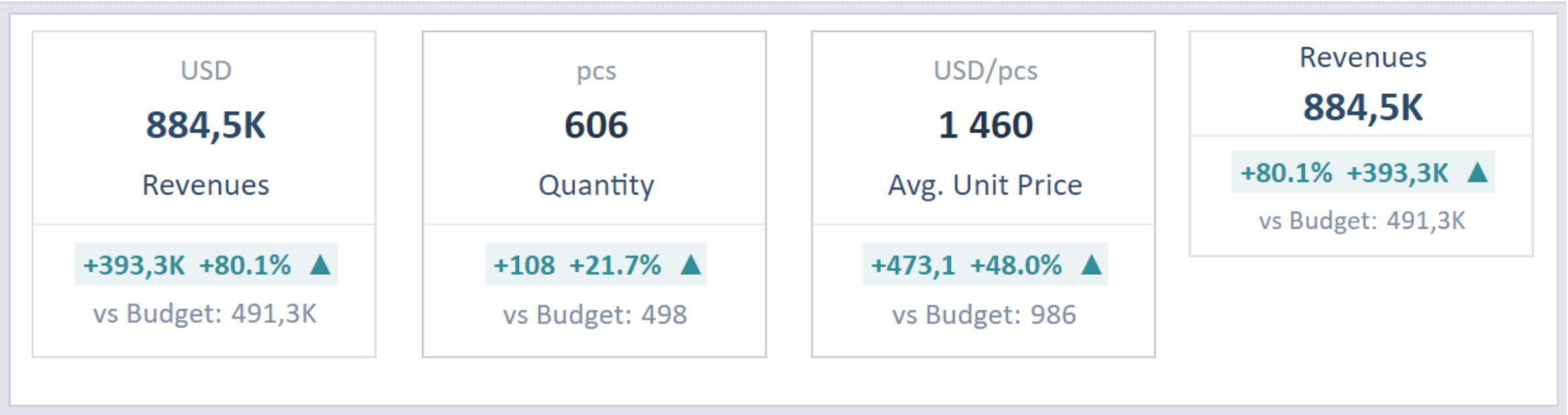
Metrics (in USD)
Jan'22..Jun'22

Revenues
34,2M

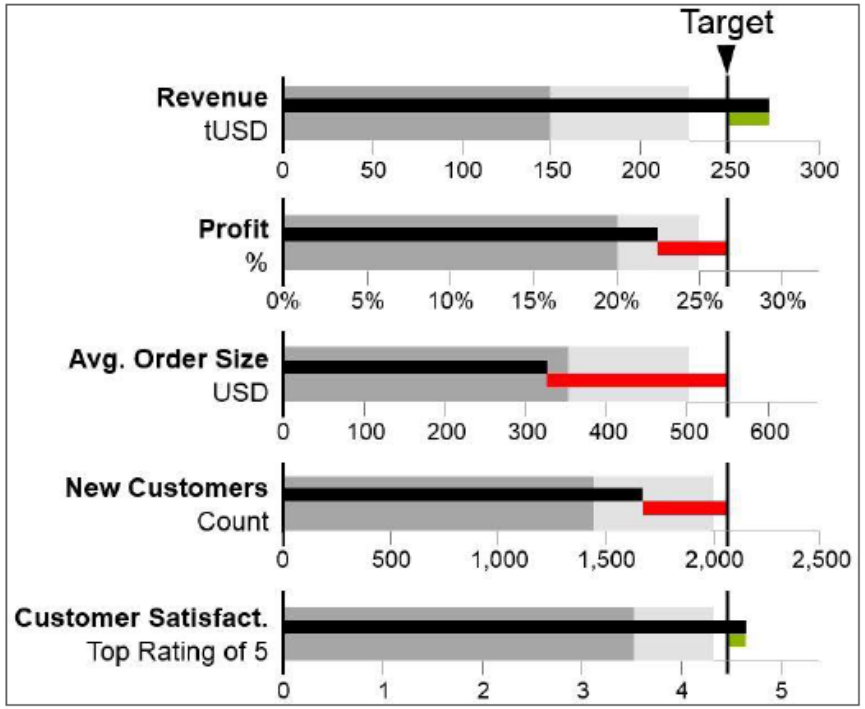
PY:	FC:
29,4M	34,1M
↑ +16.1% +4.75M	↑ +0.2% +63.0K

Benchmarks, comparisons

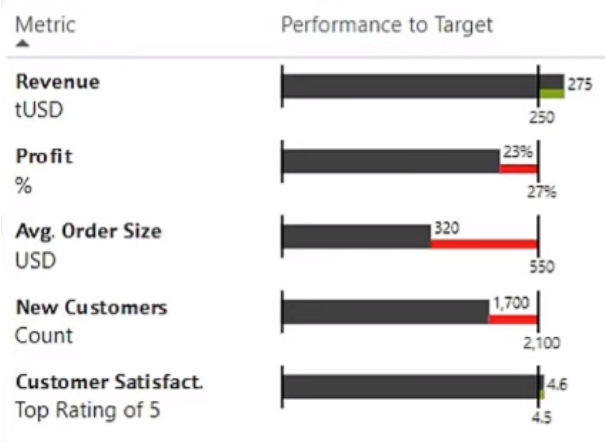
KPI Cards – different styles, use of reference labels



IBCS recommended improvements in bullet charts

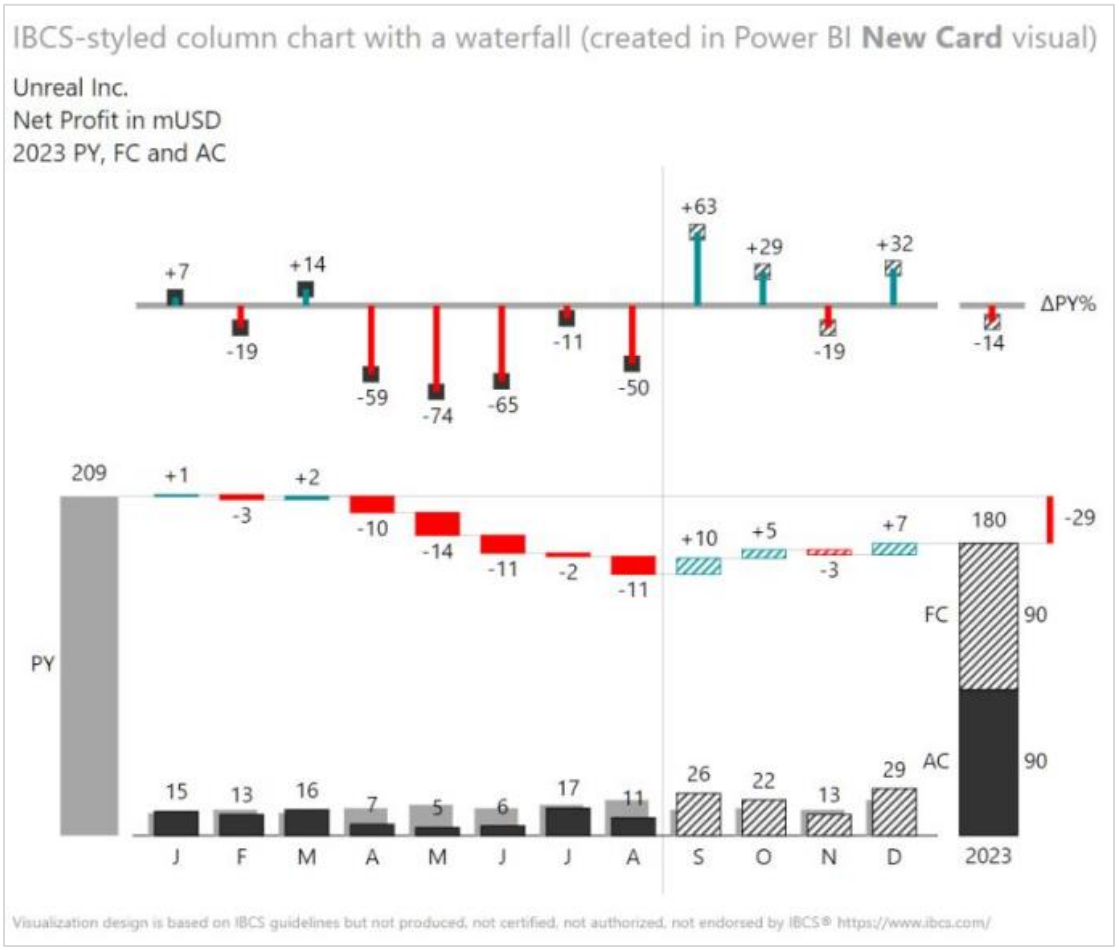


Daniel Marsh-Patrick: SVG-based implementation within native matrix



Andrzej Leszkiewicz:
SVG-based implementation within a native card (left image) and native table (right image)

IBCS-styled column chart with a waterfall (created in Power BI **New Card** visual)



IBCS-styled table with charts, created using built-in Power BI **Matrix** Visual

Unreal Inc.
Profit and loss statement in mUSD
2023 PY, AC and ΔPY

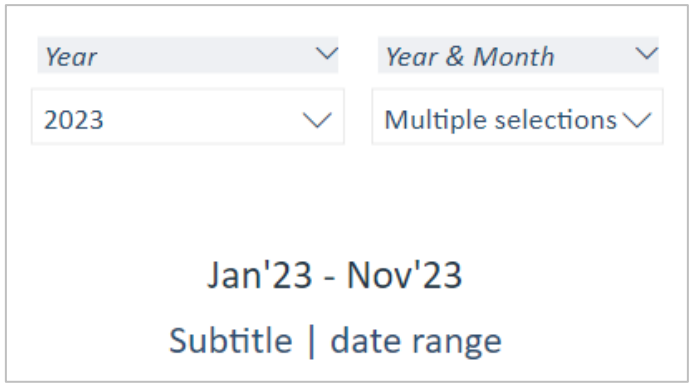
Collapse | Expand

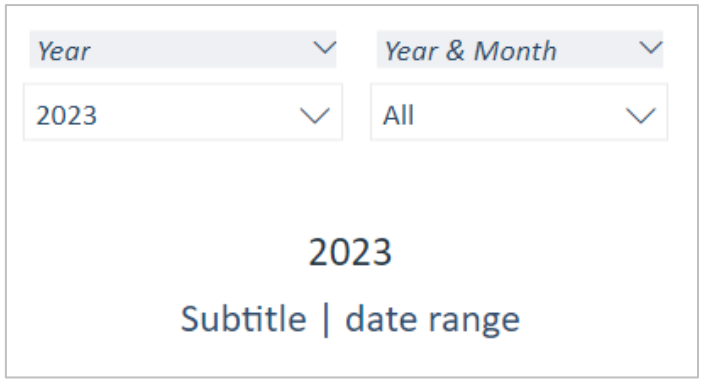
	PY	AC	ΔPY
+ Licences	713	896	+183
+ Consulting	72	90	+18
+ Maintenance	22	10	-12
+ Other revenue	6	65	+59
= Sales revenue	**813**	**1061**	**+248**
+ Other op. income	45	17	-28
- Purchases	344	379	+35
- Material expenses	11	54	+43
- Personnel expenses	76	127	+51
- Amortization	56	40	-16
- Other op. expenses	78	152	+74
= Operating result	**293**	**326**	**+33**
+ Investment income	43	53	+10
+ Financial income, net	73	66	-7
= Result before tax	**409**	**445**	**+36**
- Income tax	132	111	-21
= Result after tax	**277**	**334**	**+57**

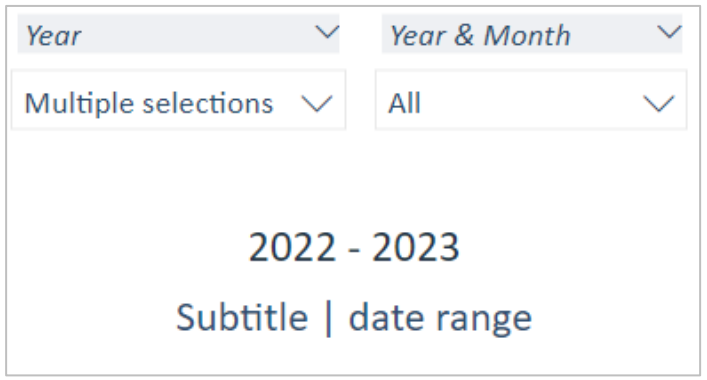
Power BI implementation: Andrzej Leszkiewicz, IBCS® Certified Analyst
Visualization design is based on IBCS guidelines but not produced, not certified, not authorized, not endorsed by IBCS®

Other functionalitites

Dax-based date range



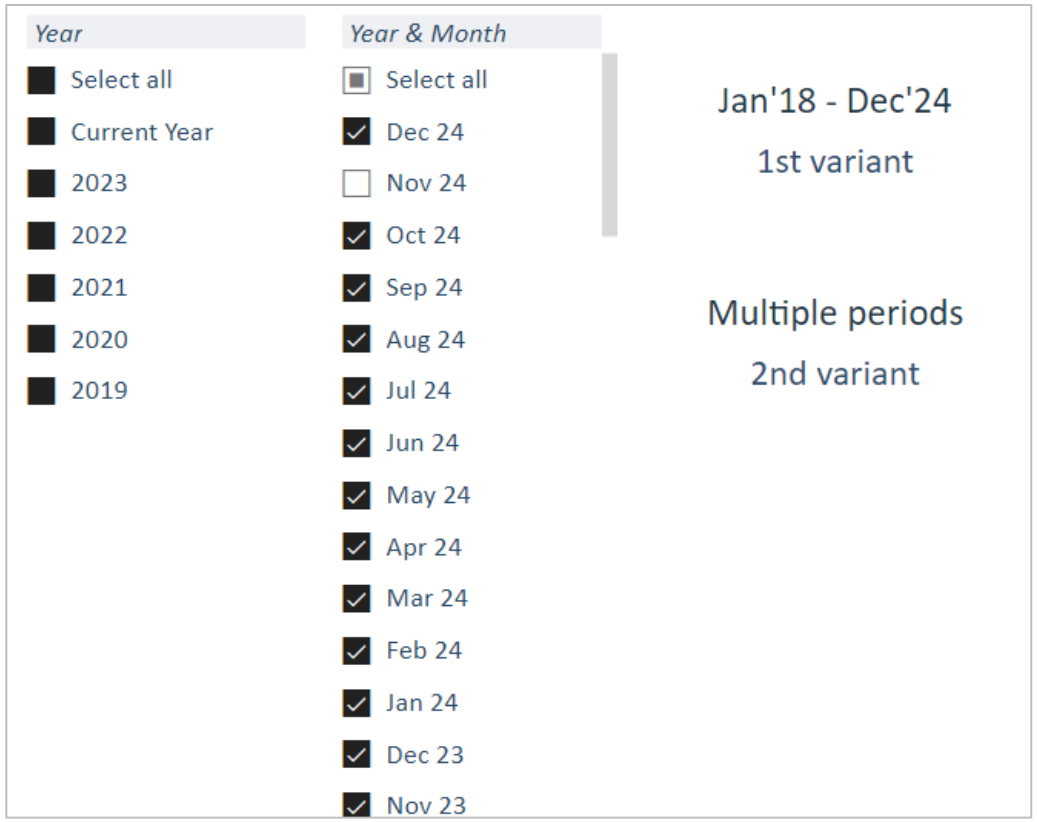





```
Subtitle | date range =

VAR __Min_Date =        FORMAT ( MIN  ( 'Calendar'[Date] ),"mmm'yy")
VAR __Max_Date =        FORMAT ( MAX ( 'Calendar'[Date]),"mmm'yy")
VAR __Min_year =        FORMAT ( MIN ( 'Calendar'[Year]),"0")
VAR __Max_year =        FORMAT ( MAX ( 'Calendar'[Year]),"0")
VAR __Distinct_months = DISTINCTCOUNT ( 'Calendar'[Year Month Number] )
VAR __Distinct_years =  DISTINCTCOUNT ( 'Calendar'[Year] )

VAR __Result =
        SWITCH(
            TRUE(),
                DIVIDE ( __Distinct_months, 12) = INT ( DIVIDE ( __Distinct_months, 12)) &&  __Distinct_years = 1, __Max_year,
                DIVIDE ( __Distinct_months, 12) = INT ( DIVIDE ( __Distinct_months, 12)) &&  __Distinct_years > 1, __Min_year & " - " & __Max_year,
                __Distinct_months = 1, __Min_date,
                __Min_date &" - "& __Max_date
        )

RETURN
    __Result
```

Other functionalitites

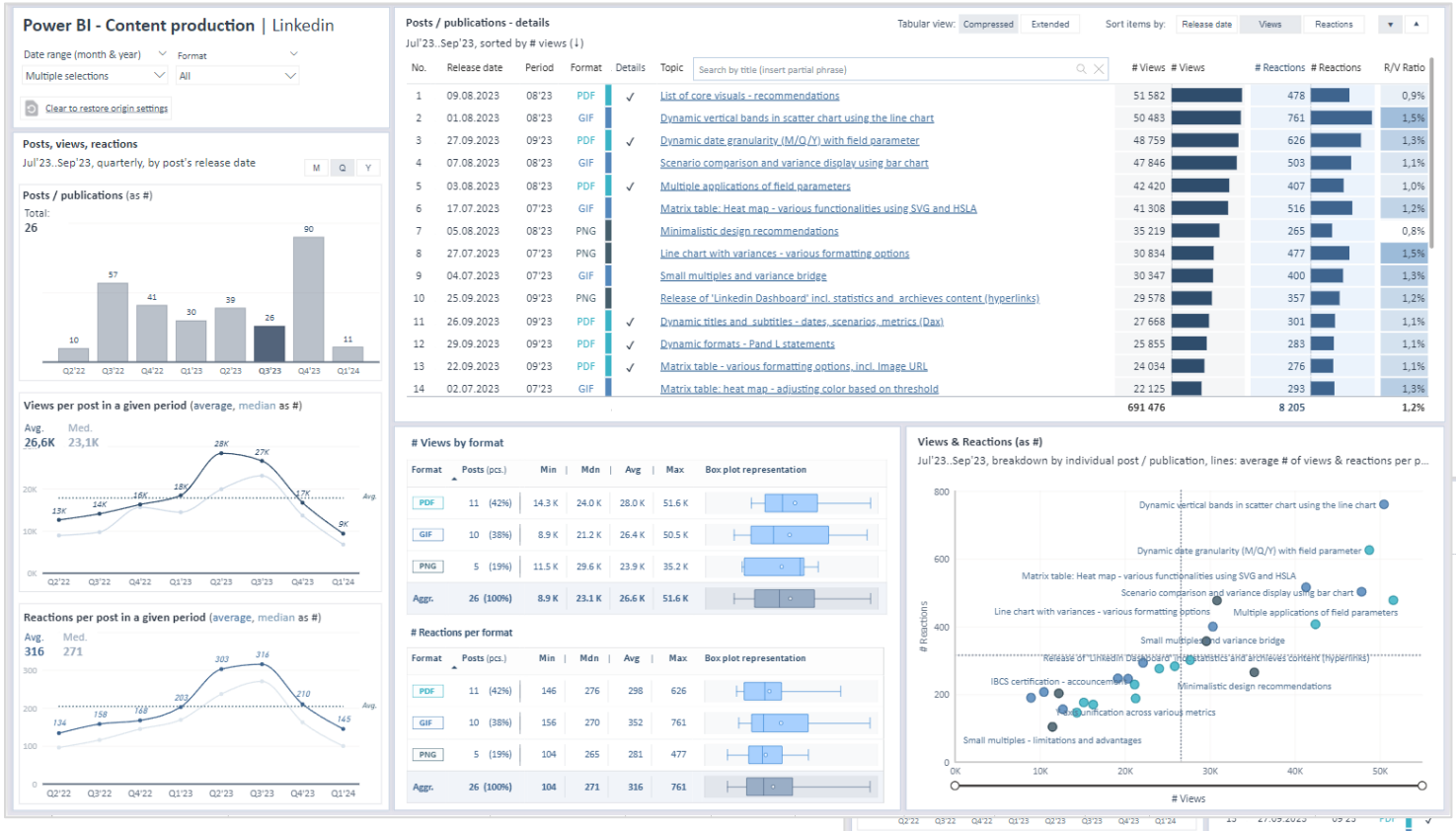
Dax-based date range




```
1  Date subtitle =
2  VAR __Min_date =                FORMAT ( MIN ('Calendar'[Date]), "mmm'yy")
3  VAR __Max_date =                FORMAT ( MAX ('Calendar'[Date]), "mmm'yy")
4
5  VAR __Min_date_2 =              MIN ('Calendar'[Date])
6  VAR __Max_date_2 =              MAX ('Calendar'[Date])
7  VAR __Total_months =            DATEDIFF ( __Min_date_2, __Max_date_2, MONTH) + 1
8  VAR __Selected_months_Count =   COUNTROWS ( VALUES ( 'Calendar'[Year Month] ) )
9
10 VAR __Result =
11         SWITCH(
12             TRUE(),
13                 __Max_date = __Min_date, __Max_date,
14                 __Total_months <> __Selected_months_Count, "Multiple periods",
15                 __Min_date & " - " & __Max_date
16         )
17 RETURN __Result
```

Linkedin post library (over 300 individual, personal, Power BI – related posts)

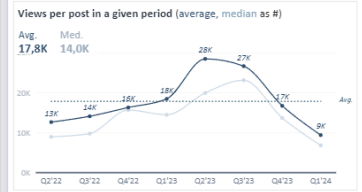
Various content (also with detailed PDF descriptions, if applicable)

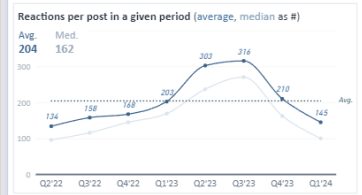


No.	Release date	Period	Format	Details	Topic	# Views	# Views	# Reactions	# Reactions	R/V Ratio
1	09.08.2023	08'23	PDF	✓	List of core visuals - recommendations	51 582		478		0,9%
2	01.08.2023	08'23	GIF		Dynamic vertical bands in scatter chart using the line chart	50 483		761		1,5%
3	27.09.2023	09'23	PDF	✓	Dynamic date granularity (M/Q/Y) with field parameter	48 759		626		1,3%
4	07.08.2023	08'23	GIF		Scenario comparison and variance display using bar chart	47 846		503		1,1%
5	03.08.2023	08'23	PDF	✓	Multiple applications of field parameters	42 420		407		1,0%
6	17.07.2023	07'23	GIF		Matrix table: Heat map - various functionalities using SVG and HSLA	41 308		516		1,2%
7	05.08.2023	08'23	PNG		Minimalistic design recommendations	35 219		265		0,8%
8	27.07.2023	07'23	PNG		Line chart with variances - various formatting options	30 834		477		1,5%
9	04.07.2023	07'23	GIF		Small multiples and variance bridge	30 347		400		1,3%
10	25.09.2023	09'23	PNG		Release of 'Linkedin Dashboard' incl. statistics and archieves content (hyperlinks)	29 578		357		1,2%
11	26.09.2023	09'23	PDF	✓	Dynamic titles and subtitles - dates, scenarios, metrics (Dax)	27 668		301		1,1%
12	29.09.2023	09'23	PDF	✓	Dynamic formats - Pand L statements	25 855		283		1,1%
13	22.09.2023	09'23	PDF	✓	Matrix table - various formatting options, incl. Image URL	24 034		276		1,1%
14	02.07.2023	07'23	GIF		Matrix table: heat map - adjusting color based on threshold	22 125		293		1,3%
						691 476		8 205		1,2%

Format	Posts (pcs.)	Min	Mdn	Avg	Max	Box plot representation
PDF	11 (42%)	14.3 K	24.0 K	28.0 K	51.6 K	
GIF	10 (38%)	8.9 K	21.2 K	26.4 K	50.5 K	
PNG	5 (19%)	11.5 K	29.6 K	23.9 K	35.2 K	
Aggr.	26 (100%)	8.9 K	23.1 K	26.6 K	51.6 K	

Format	Posts (pcs.)	Min	Mdn	Avg	Max	Box plot representation
PDF	11 (42%)	146	276	298	626	
GIF	10 (38%)	156	270	352	761	
PNG	5 (19%)	104	265	281	477	
Aggr.	26 (100%)	104	271	316	761	





Topic	# Views	# Views	# Reactions	# Reactions	R/V Ratio
Line chart with variance "bridge" between current and py points	149 302		1 561		1,0%
KPI card - formatting options	102 455		984		1,0%
Highlighting forecasted (future) periods in column and line chart (conditional formatting)	78 950		761		1,0%
Chart selection - comparison of six charts	69 340		804		1,2%
Dynamic heat-map formatting using HSLA coding	67 104		847		1,3%
Financial Liquidity - report presentation	62 284		567		0,9%
Dynamic TOPn (Table top + others)	62 118		719		1,2%
New native slicer and 'customized' calendar layout (dax-based)	60 711		711		1,2%
SVG implementation in native matrix table	51 608		455		0,9%
List of core visuals - recommendations	51 582		478		0,9%
Dynamic vertical bands in scatter chart using the line chart	50 483		761		1,5%
Grouping objects - simple way to speed bookmark functionality	50 416		511		1,0%
Dynamic date granularity (M/Q/Y) with field parameter	48 759		626		1,3%
Scenario comparison and variance display using bar chart	47 846		503		1,1%
Simple waterfall custom visual	45 616		441		1,0%
Counter of active (applied filters)	42 898		718		1,7%
Multiple applications of field parameters	42 420		407		1,0%
EDNA workout 012 - scatter chart: dynamic quadrants and error bands	42 344		470		1,1%
Dynamic dax-based heat map using HSLA, SVG and numeric parameter	42 190		647		1,5%
KPI cards - using smart narratives (breakdown)	42 148		406		1,0%
Matrix table: Heat map - various functionalities using SVG and HSLA	41 308		516		1,2%
EDNA workout 007 (TOPN analysis)	38 444		408		1,1%
EDNA workout 013 (Dynamic TOPN + other segmentation)	38 440		396		1,0%
Report for client (IBCS) vs Demo/challenge (unlimited possibilites, based on Formula 1 Analys...	36 365		399		1,1%
Moving average and trends over time	35 310		535		1,5%
Minimalistic design recommendations	35 219		265		0,8%
New native slicer and 'customized' calendar layout (dax-based) - breakdown	35 124		355		1,0%
EDNA workout 004 (revenues / scenarios) - general information	34 810		359		1,0%
Field parameter without "collapsing" effect in matrix table	34 032		415		1,2%
Various metrics and visual types (IBCS charts)	33 803		338		1,0%
		5 550 934		63 802	1,1%

[Click here to open the interactive report](#)

Credits to data wizards

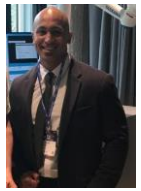













PBI general	Data Vis	Deneb / SVG / Custom	Dax	PQ
Brian Julius	Miguel Myers	Daniel Marsh-Patrick	SQLBI (Marco Russo, Alberto Ferrari)	Melissa de Korte
Mateusz Kulawik	Alexandru Badiu	Greg Philps	Brian Julius	Chandeep Chhabra
Injae Park	Carlos Barboza	Andrzej Leszkiewicz	Greg Deckler	Rick de Groot
Reid Havens	Claudio Trombini	Madison Giammaria	Chandeep Chhabra	
KnowledgeBank	Gerard Duggan	Ben Ferry	Antriksh Sharma	
Kurt Buhler	Sean Chandler		Rick de Groot	
	Nick Desbarats			
	Creative solutions:			
	Said Gamal Sayed Mohamed			





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