

MS in Business Analytics



Introduction to Data Visualization

Practice



Core Charts in Power BI

Bar Charts

Simple bar chart

Creating Bar chart #1

Create a horizontal bar chart that shows the count of IDs for each category!

1. Select the appropriate visual
2. Select ID as X axis value
3. Select Category as Y axis value
4. Set the summarization to Count
5. Format the fonts and axes

Creating Bar chart #1

The screenshot shows the Power BI Desktop interface with the title "Kickstarter-Bar-v1 - Power BI Desktop". The ribbon is visible at the top with the "Home" tab selected. On the left, there's a navigation pane with icons for Home, Insert, Modeling, View, Optimize, Help, External tools, Format, Data / Drill, and a clipboard section. The main area displays a horizontal bar chart with five bars of increasing length from left to right. The chart has a light gray background with vertical grid lines. To the right of the chart is the "Visualizations" pane, which lists various chart types like Bar, Line, and Map. Below the chart is the "Data" pane, which shows a hierarchical list of fields from a dataset named "kickstarter_projects". Fields include Backers, Category, Country, Deadline, Goal, ID, Launched, Name, Pledged, State, and Subcategory. The "Y-axis" and "X-axis" sections both have placeholder text "Add data fields here". The bottom of the screen shows the Windows taskbar with various pinned icons and the system tray.

Select the appropriate visual

Creating Bar chart #1

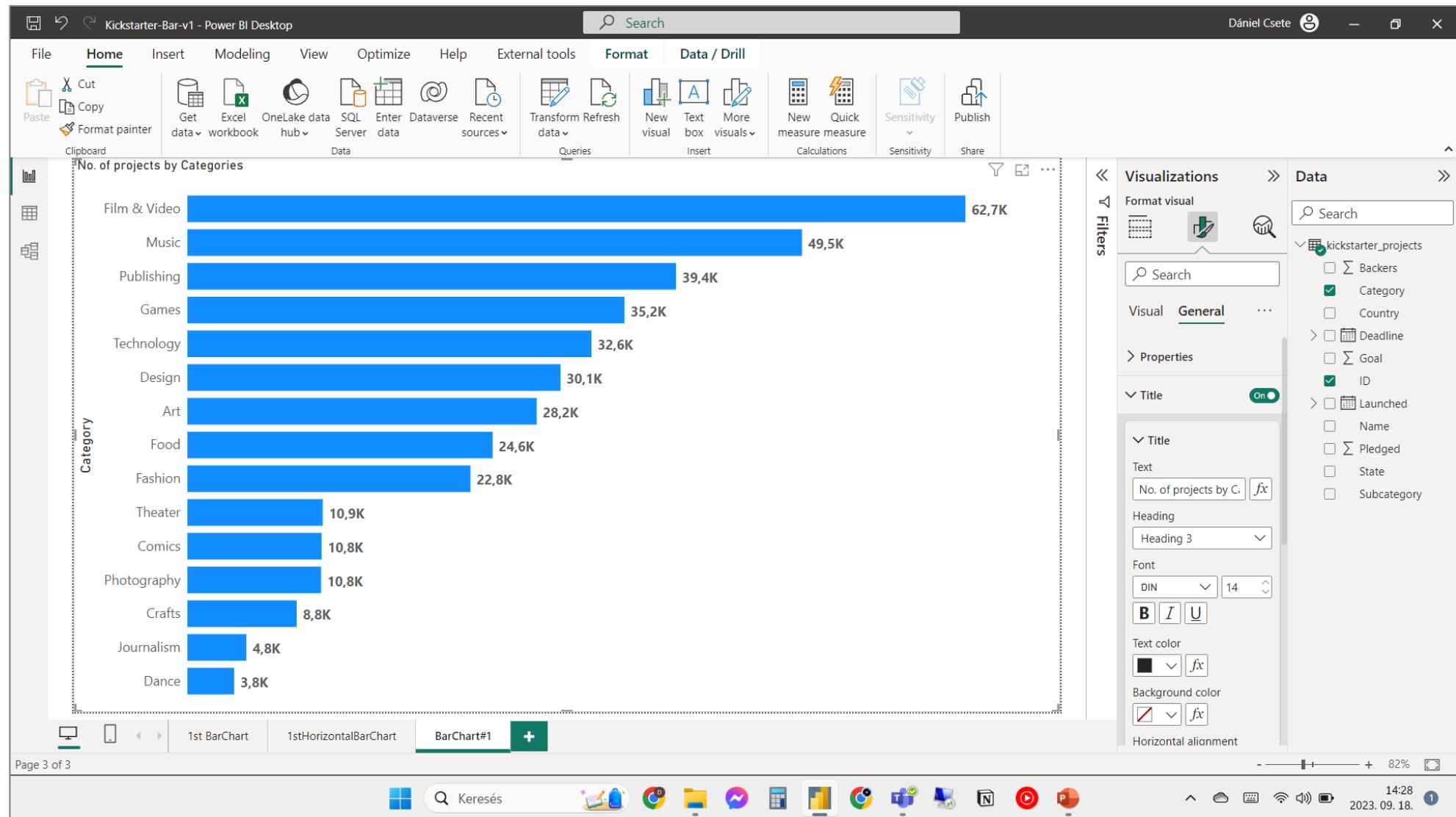
The screenshot shows the Power BI Desktop interface with a horizontal bar chart titled "Count of ID by Category". The chart displays the following data:

| Category | Count of ID |
|--------------|-------------|
| Film & Video | ~65K |
| Music | ~48K |
| Publishing | ~39K |
| Games | ~35K |
| Technology | ~32K |
| Design | ~30K |
| Art | ~28K |
| Food | ~25K |
| Fashion | ~23K |
| Theater | ~12K |
| Comics | ~12K |
| Photography | ~12K |
| Crafts | ~9K |
| Journalism | ~5K |
| Dance | ~3K |

The Power BI interface includes a ribbon with Home selected, a clipboard section, and a search bar. The Data pane on the right shows the data model with fields like Backers, Category, Country, Deadline, Goal, ID, Launched, Name, Pledged, State, and Subcategory. The visualization pane shows the current setup for the bar chart.

Add values to the fields

Creating Bar chart #1



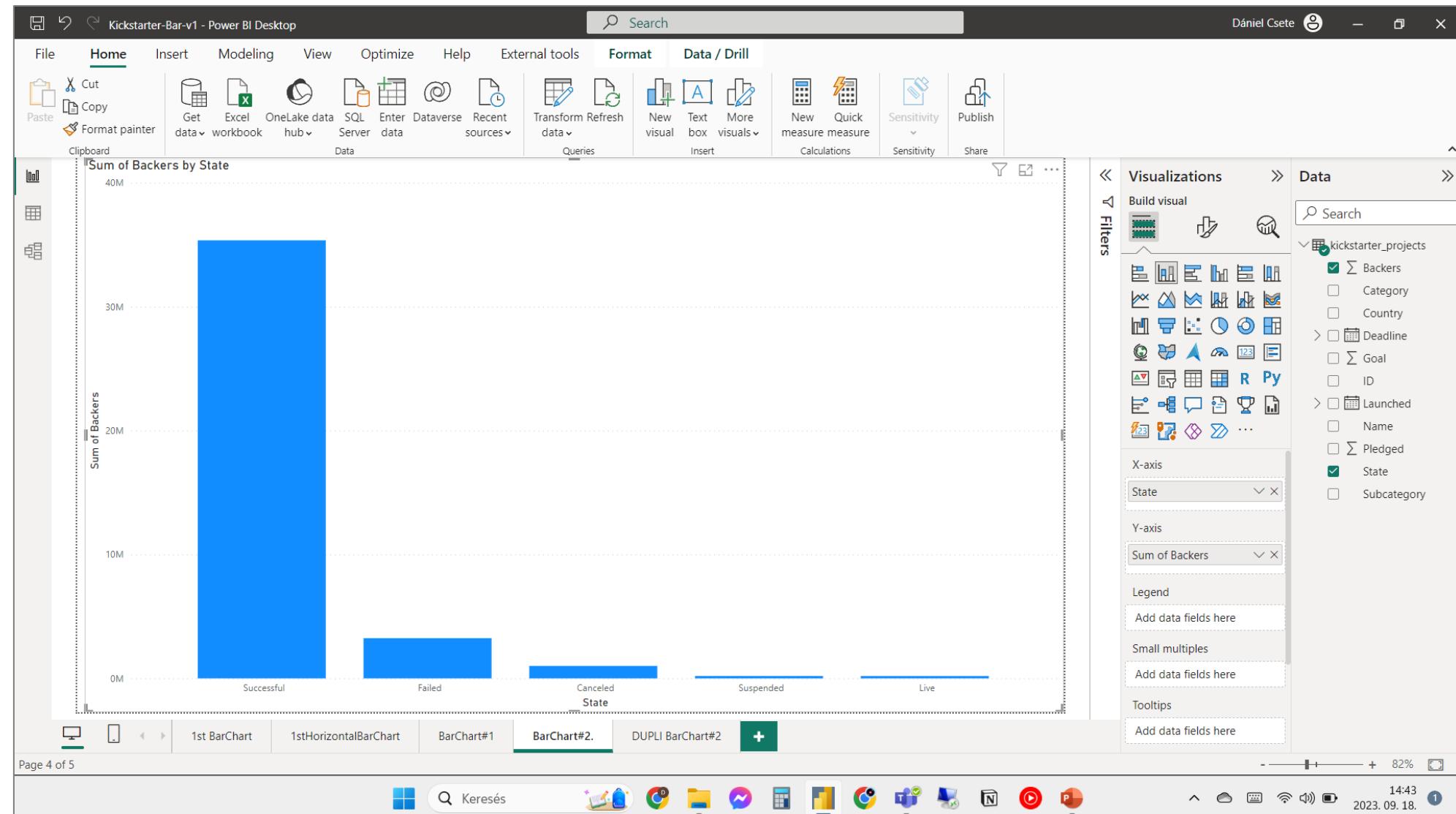
Final version after the formatting

Creating Bar chart #2

Create a vertical bar chart that shows the average Backers for each State!

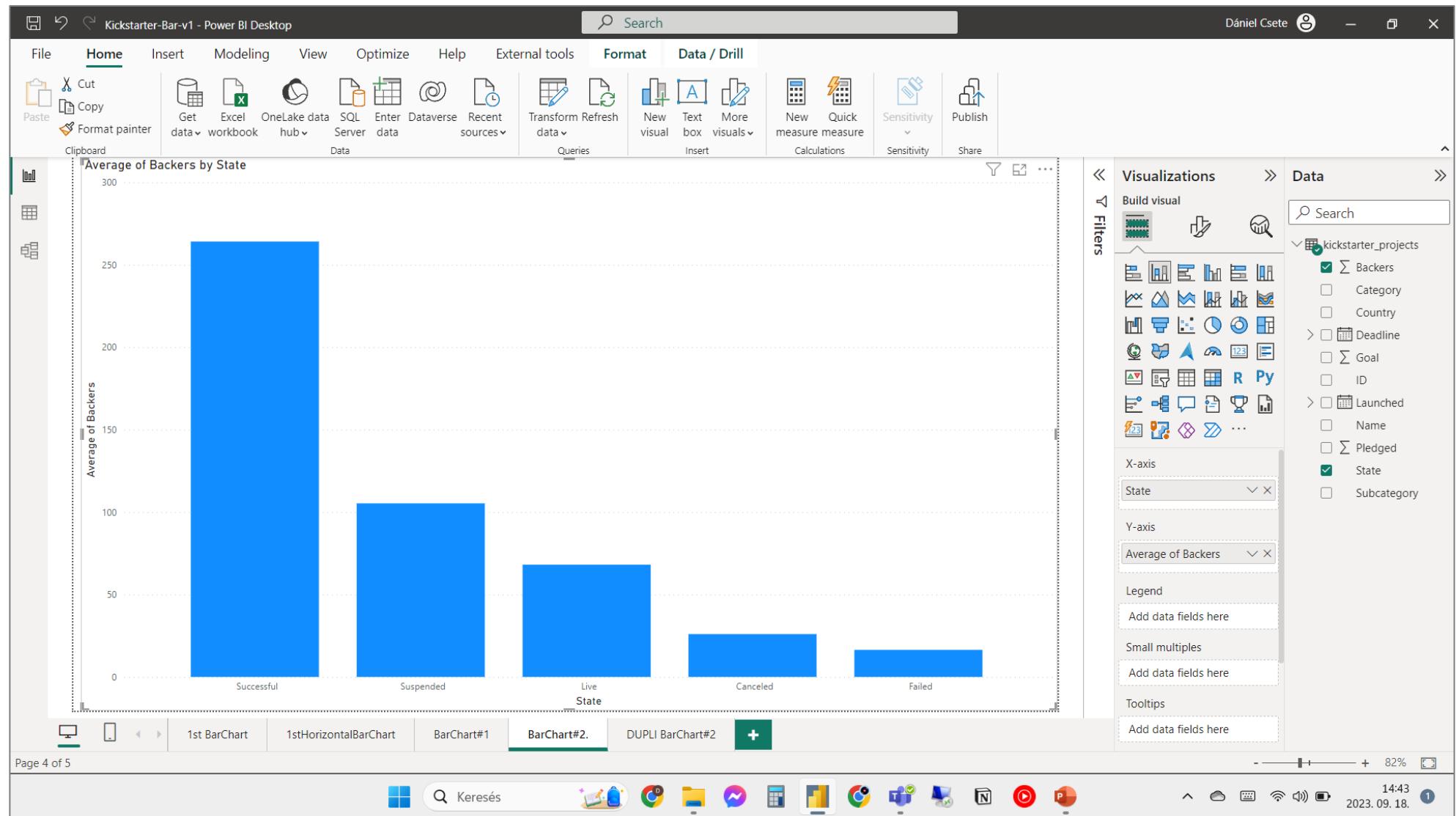
1. Select the appropriate visual
2. Select State as X axis value
3. Select Backers as Y axis value
4. Set the summarization to Average
5. Format the fonts and axes

Creating Bar chart #2



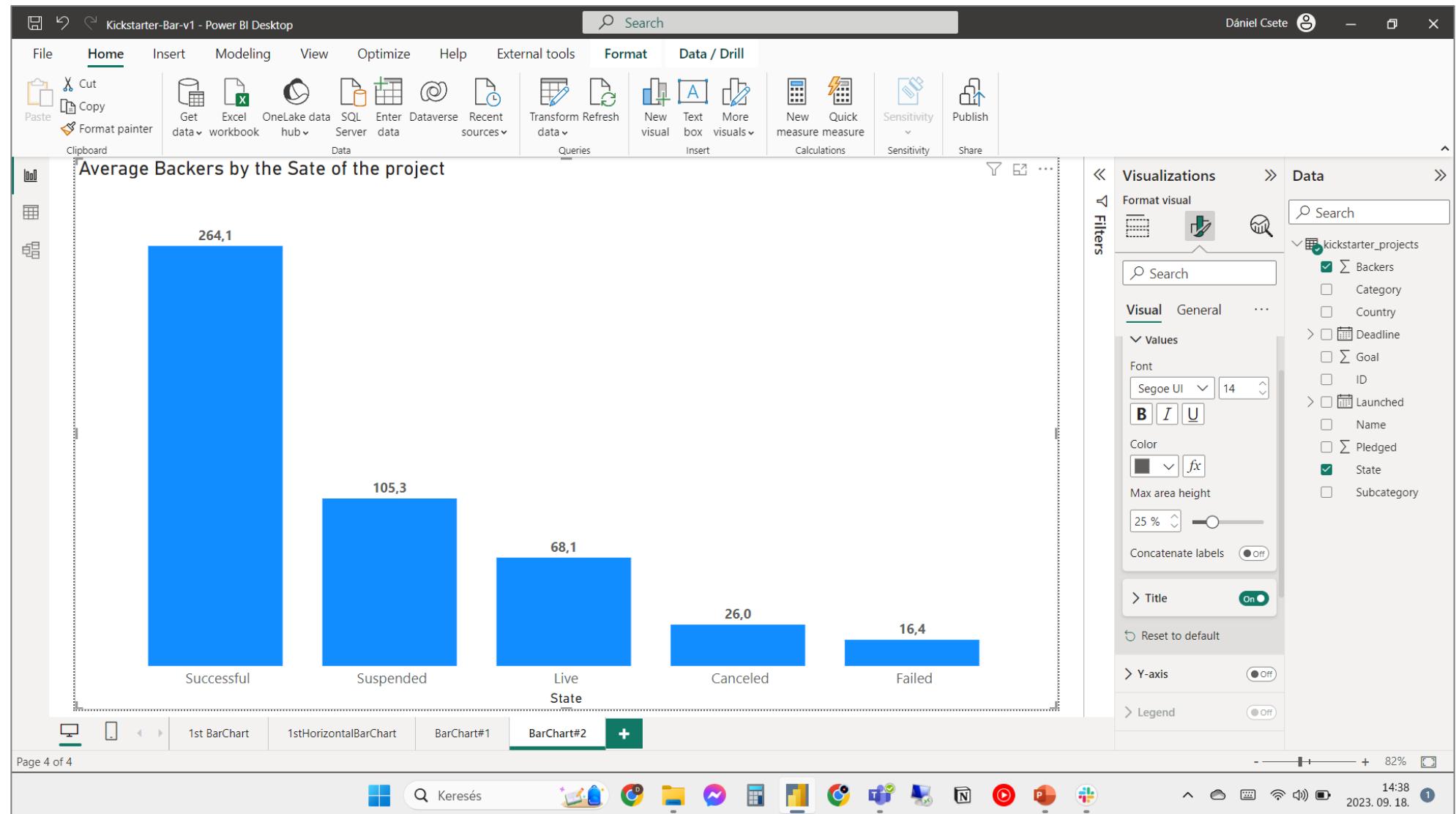
Add values to the fields

Creating Bar chart #2



Summarization is changed to Avg.

Creating Bar chart #2



Final version after the formatting

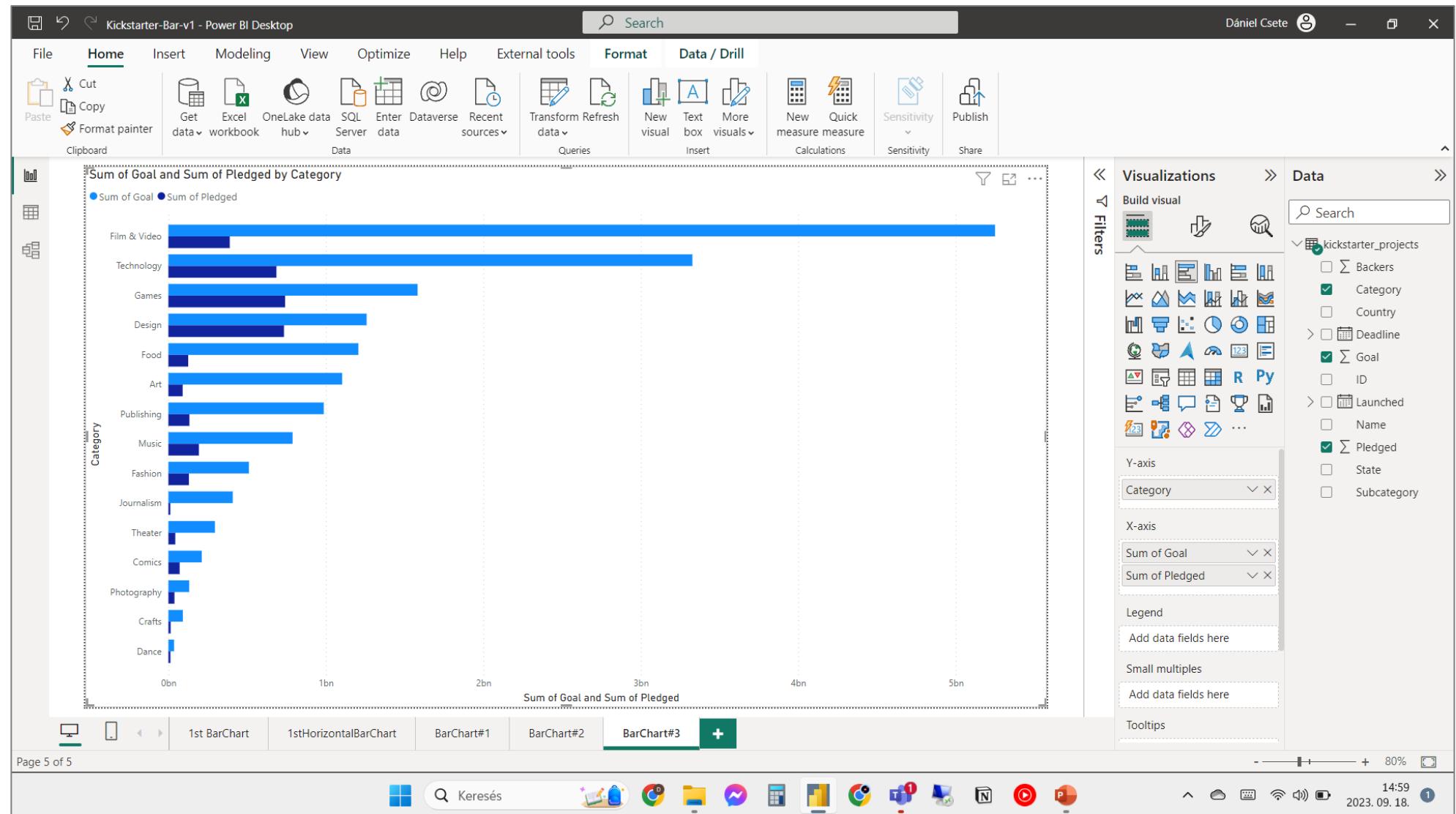
Multivariate bar chart

Creating Bar chart #3

Create a horizontal bar chart that shows the average Goals and average Pledged for each Category!

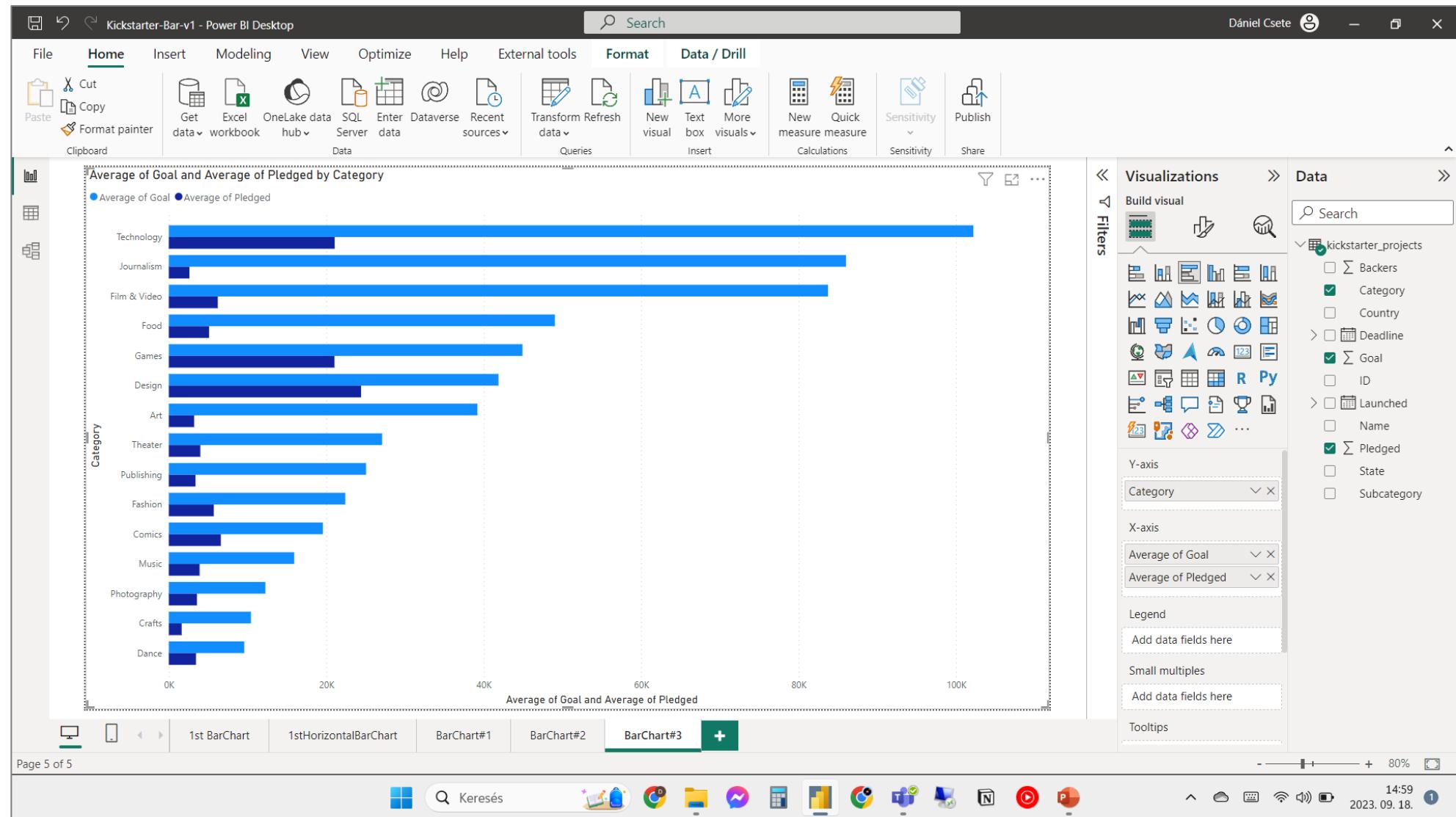
1. Select the appropriate visual
2. Select Goal and Pledged as X axis value
3. Select Category as Y axis value
4. Set the summarization to Average
5. Filter the Categories to top 7 by Avg. Goal
6. Format the fonts and axes

Creating Bar chart #3



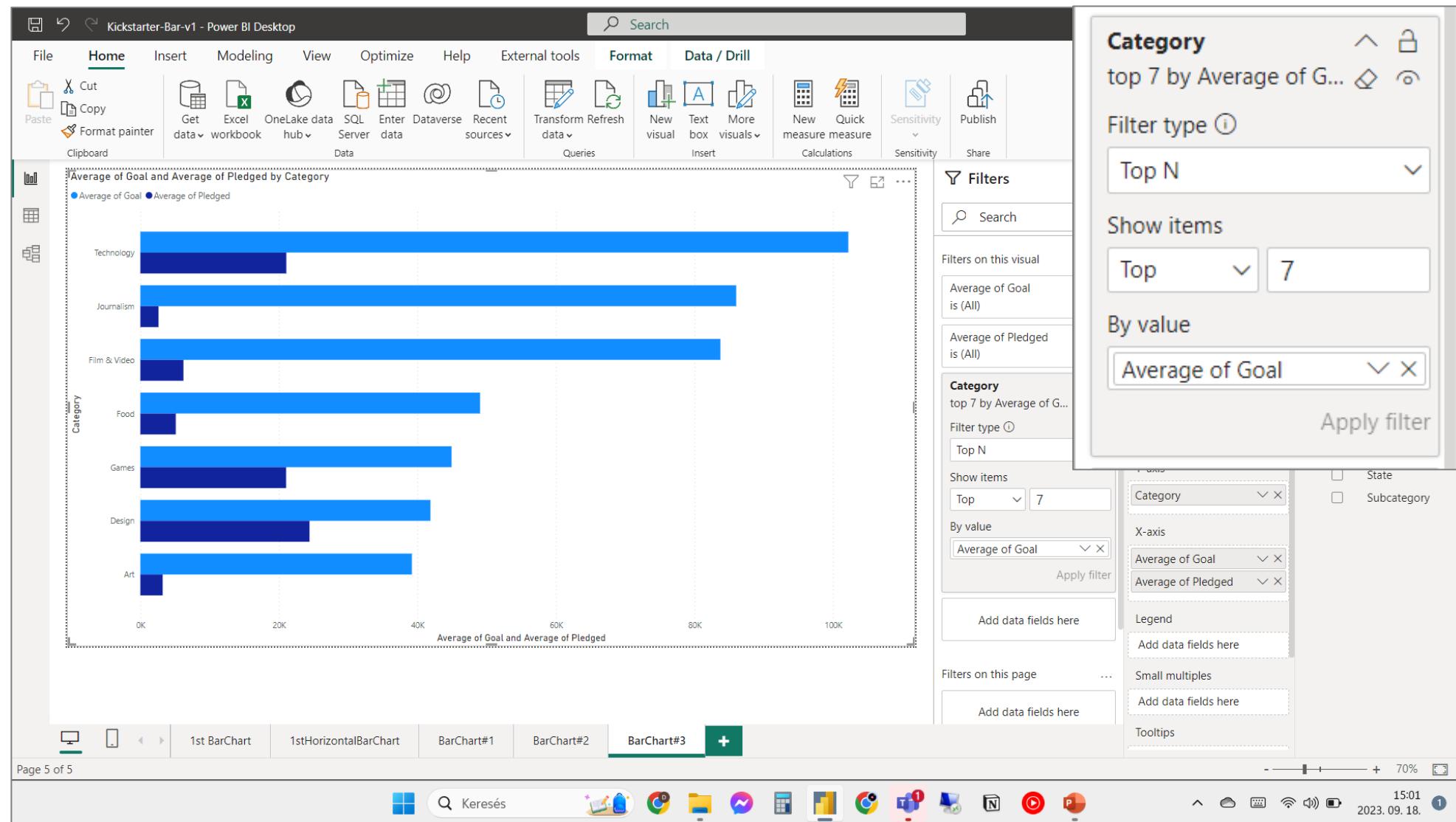
Add values to the fields

Creating Bar chart #3



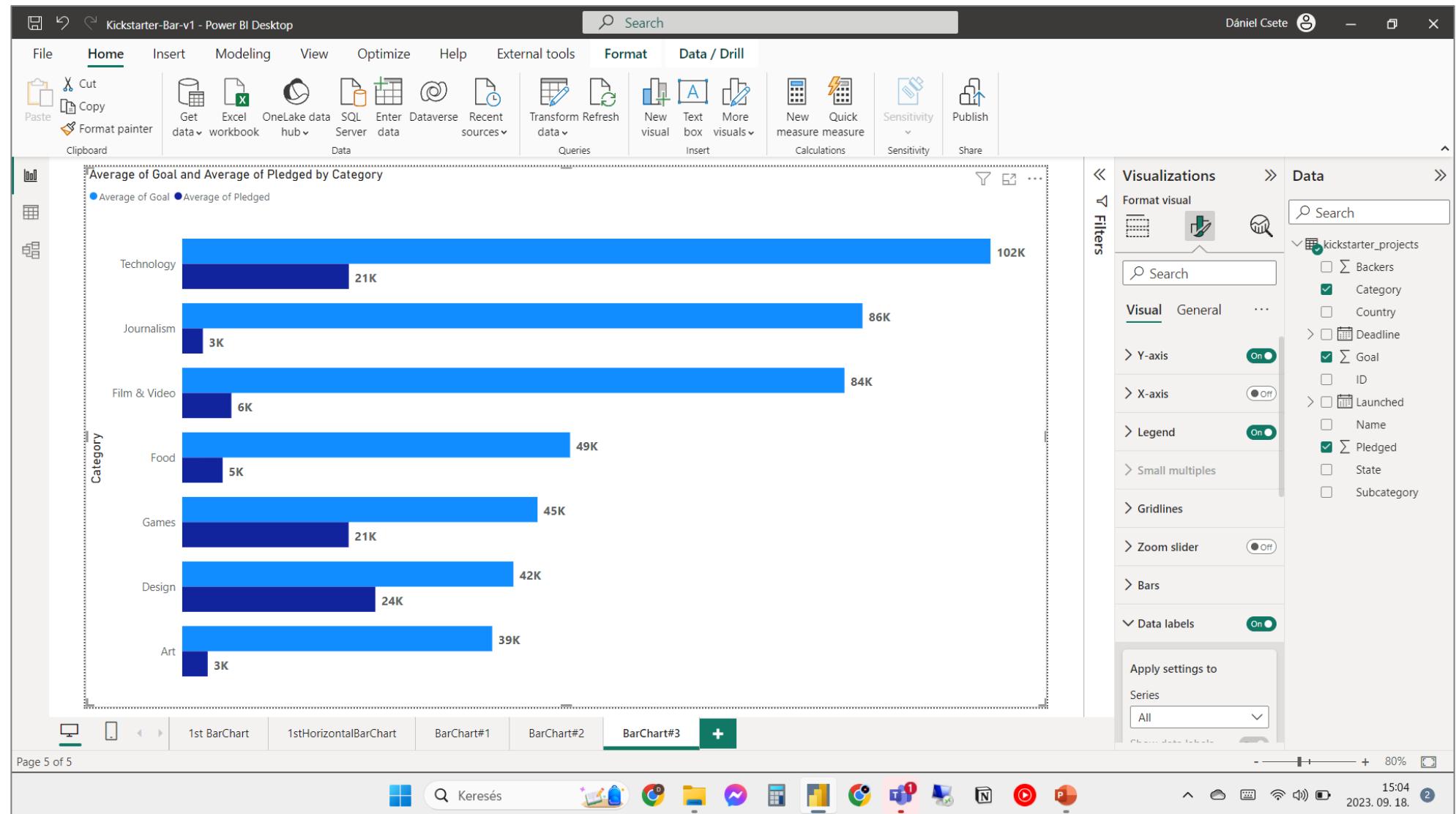
Summarization is set as Avg.

Creating Bar chart #3



Top 7 Filtering

Creating Bar chart #3



Final version after the formattings

Creating Bar chart #4

Create a vertical bar chart that shows the average Goals and average Pledged for each Country!

1. Select the appropriate visual
2. Select Country as X axis value
3. Select Goal and Pledged as Y axis value
4. Set the summarization to Average
5. Format the fonts and axes

Creating Bar chart #4

The screenshot shows a Power BI Desktop interface with a bar chart titled "Sum of Goal and Sum of Pledged by Country". The chart has two data series: "Sum of Goal" (dark blue bars) and "Sum of Pledged" (light blue bars). The Y-axis represents billions of dollars, ranging from 0bn to 14bn. The X-axis lists various countries. The visualization pane on the left shows the chart's structure, and the Fields pane on the right lists data fields like Country, Sum of Goal, and Sum of Pledged.

| Country | Sum of Goal | Sum of Pledged |
|----------------|-------------|----------------|
| United States | ~3.5bn | ~13.5bn |
| United Kingdom | ~1.5bn | ~1.5bn |
| Canada | ~0.5bn | ~0.5bn |
| Australia | ~0.5bn | ~0.5bn |
| Netherlands | ~0.5bn | ~0.5bn |
| Germany | ~0.5bn | ~0.5bn |
| France | ~0.5bn | ~0.5bn |
| Italy | ~0.5bn | ~0.5bn |
| Switzerland | ~0.5bn | ~0.5bn |
| Spain | ~0.5bn | ~0.5bn |
| Sweden | ~0.5bn | ~0.5bn |
| Norway | ~0.5bn | ~0.5bn |
| Denmark | ~0.5bn | ~0.5bn |
| Ireland | ~0.5bn | ~0.5bn |
| New Zealand | ~0.5bn | ~0.5bn |
| Austria | ~0.5bn | ~0.5bn |
| Mexico | ~0.5bn | ~0.5bn |
| Belgium | ~0.5bn | ~0.5bn |
| Hong Kong | ~0.5bn | ~0.5bn |
| Singapore | ~0.5bn | ~0.5bn |
| Luxembourg | ~0.5bn | ~0.5bn |
| Japan | ~0.5bn | ~0.5bn |

Add the data columns to the appropriate fields

Creating Bar chart #4

Kickstarter-Bar-v1 - Power BI Desktop

Dániel Csete

File Home Insert Modeling View Optimize Help External tools Format Data / Drill

Cut Copy Format painter Get data workbook OneLake data hub SQL Server Enter data Data Refresh data New visual Text box More visuals Insert New measure Quick measure Sensitivity Share

Average of Goal and Average of Pledged by Country

Average of Goal ● Average of Pledged

300K
250K
200K
150K
100K
50K
0K

Country

Switzerland Netherlands France Italy Germany Norway Australia Spain Ireland Austria Canada United States United Kingdom Sweden Belgium Denmark Luxembourg New Zealand Hong Kong Japan Singapore Mexico

Visualizations Build visual Filters

kickstarter_projects

- \sum Backers
- Category
- Country
- > Deadline
- \sum Goal
- ID
- > Launched
- Name
- \sum Pledged
- State
- Subcategory

X-axis

Country

Y-axis

Average of Goal
Average of Pledged

Legend

Add data fields here

Small multiples

Add data fields here

Tooltips

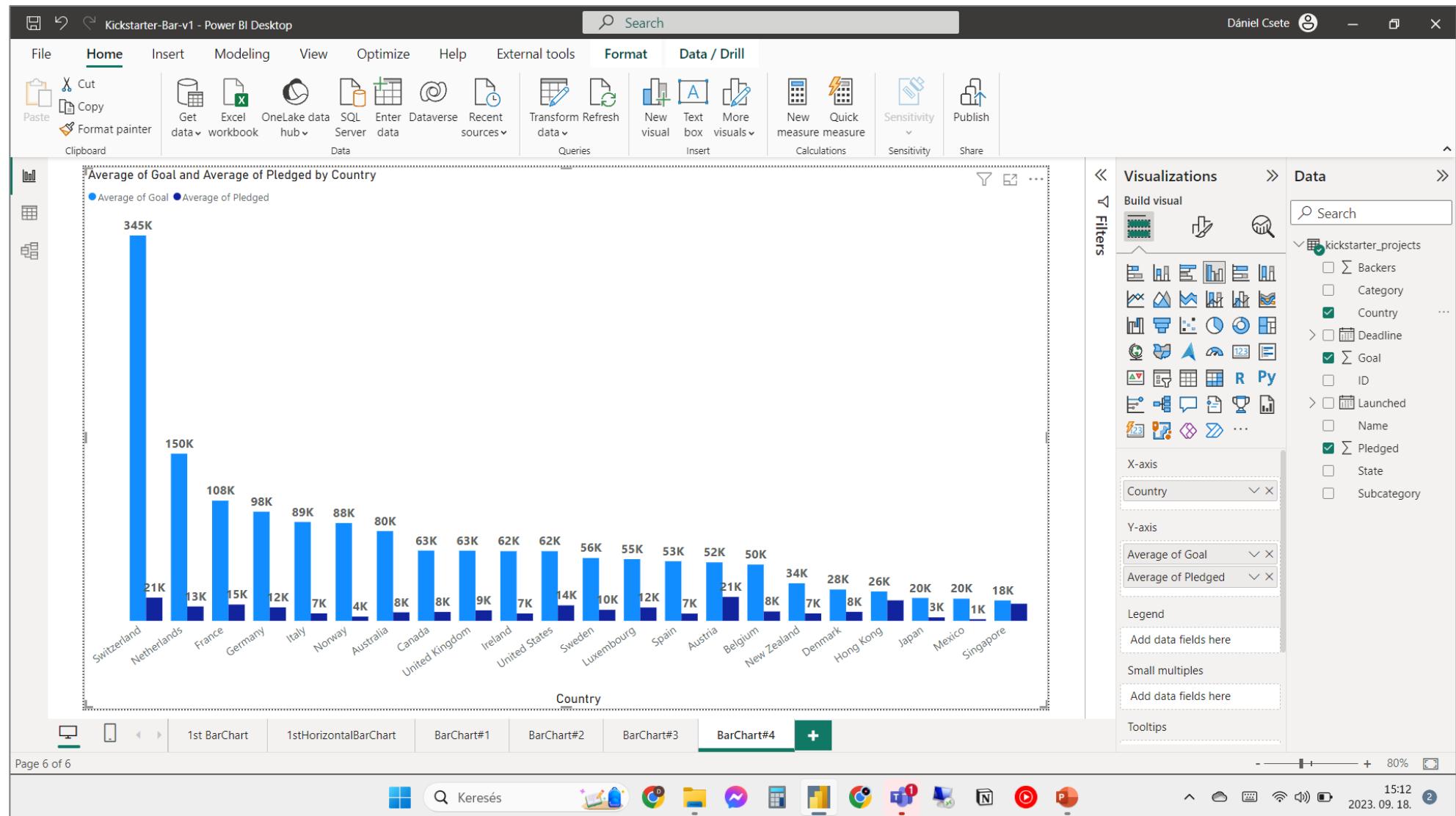
1st BarChart 1stHorizontalBarChart BarChart#1 BarChart#2 BarChart#3 BarChart#4 .BarChart#4 +

Page 7 of 7

15:18 2023. 09. 18.

Summarization is set to Avg.

Creating Bar chart #4



Final version after the formatting

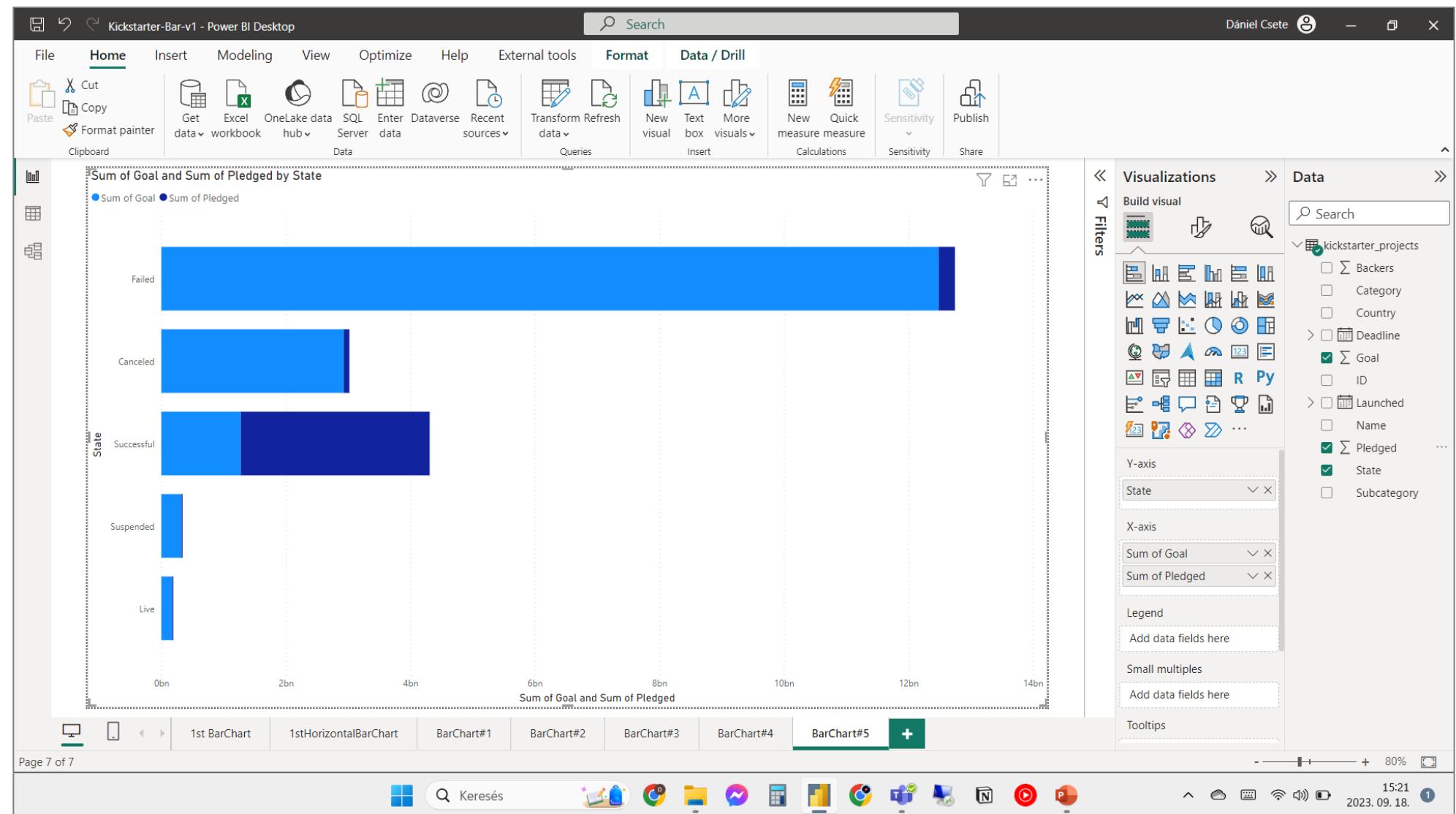
Stacked bar chart

Creating Bar chart #5

Create a 100% stacked horizontal bar chart that shows the sum Goals and sum Pledged for each State!

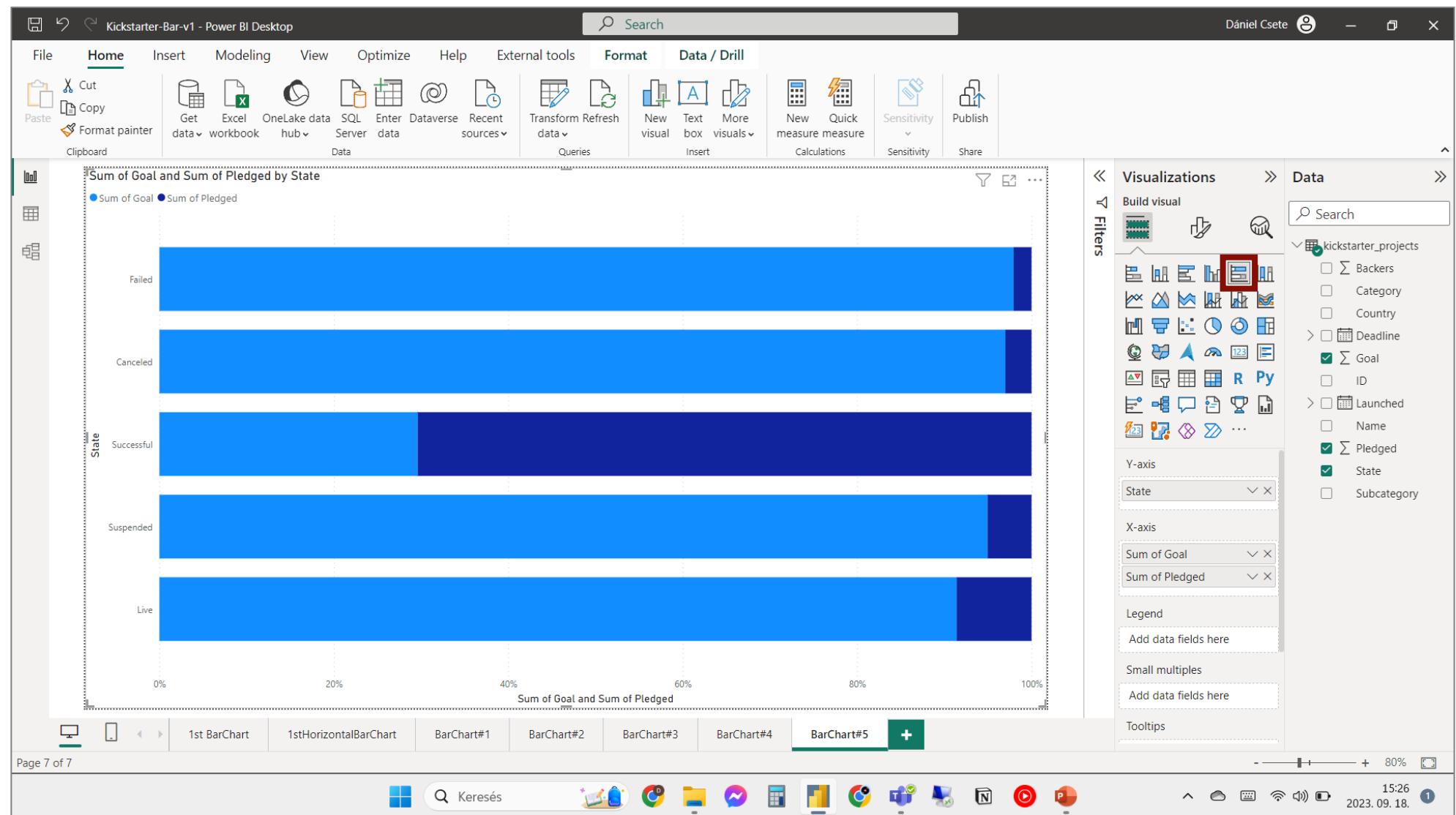
1. Select the stacked bar chart visualization type
2. Select Goal and Pledged as X axis value
3. Select State as Y axis value
4. Select the 100% stacked visualization type
5. Format the fonts and axes

Creating Bar chart #5



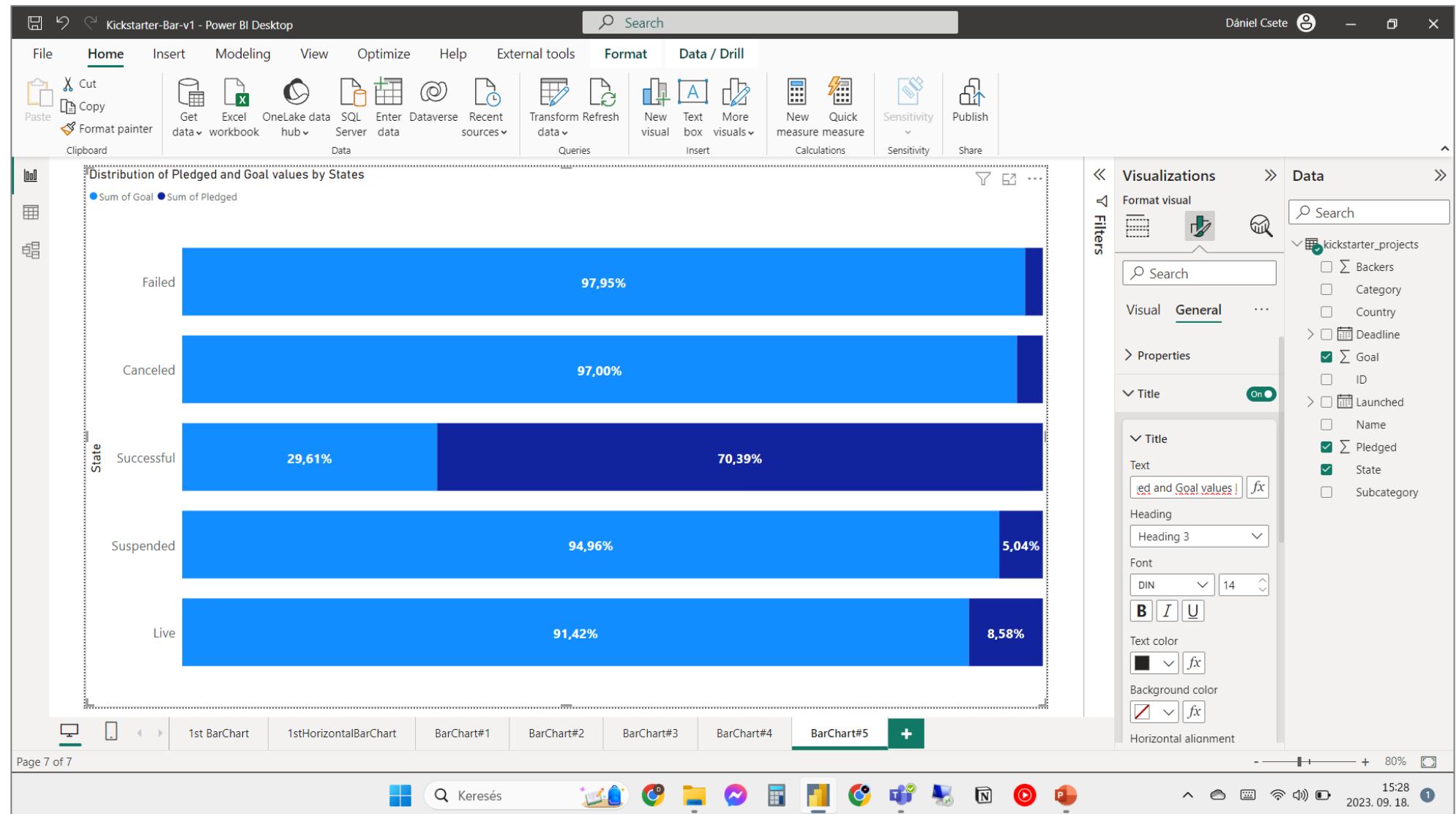
Add values to the fields

Creating Bar chart #5



Change visualization type to 100% stacked

Creating Bar chart #5



Final version after the formatting

Creating Bar chart #6

Create a 100% stacked vertical bar chart that shows no. Of Projects by State and by Category!

1. Select the stacked bar chart visualization type
2. Select Category as X axis value
3. Select ID as Y axis value
4. Set the summarization to Count ID
5. Add State to Legend
6. Select the 100% stacked visualization type
7. Format the fonts and axes

Creating Bar chart #6

Kickstarter-Bar-v1 - Power BI Desktop

File Home Insert Modeling View Optimize Help External tools Format Data / Drill

Cut Copy Format painter Paste Get data workbook OneLake data hub SQL Server Enter data Recent sources Transform data Refresh data New visual Text box More visuals Insert New measure Quick measure Calculations Sensitivity Share

Count of ID by Category and State

State: Canceled, Failed, Live, Successful, Suspended

70K

60K

50K

40K

30K

20K

10K

0K

Film & Video Music Publishing Games Technology Design Art Food Fashion Theater Comics Photography Crafts Journalism Dance

Category

Count of ID

Legend: State

Build visual

Filters

Visualizations

Data

Search

kickstarter_projects

- Backers
- Category
- Country

Deadline

- Goal
- ID

Launched

- Name
- Pledged
- State
- Subcategory

X-axis: Category

Y-axis: Count of ID

Legend: State

Small multiples: Add data fields here

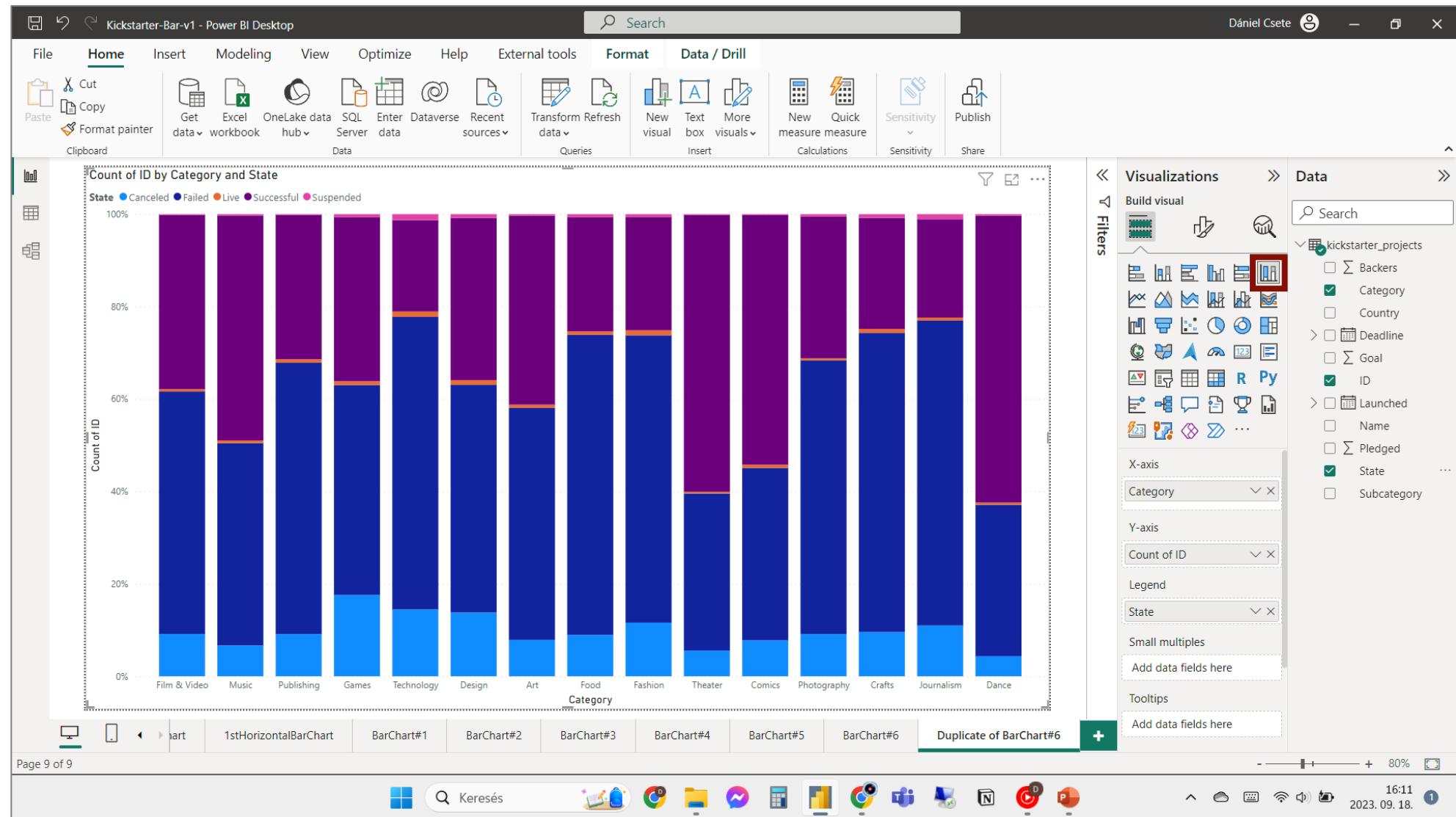
Tooltips: Add data fields here

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16:11 2023. 09. 18.

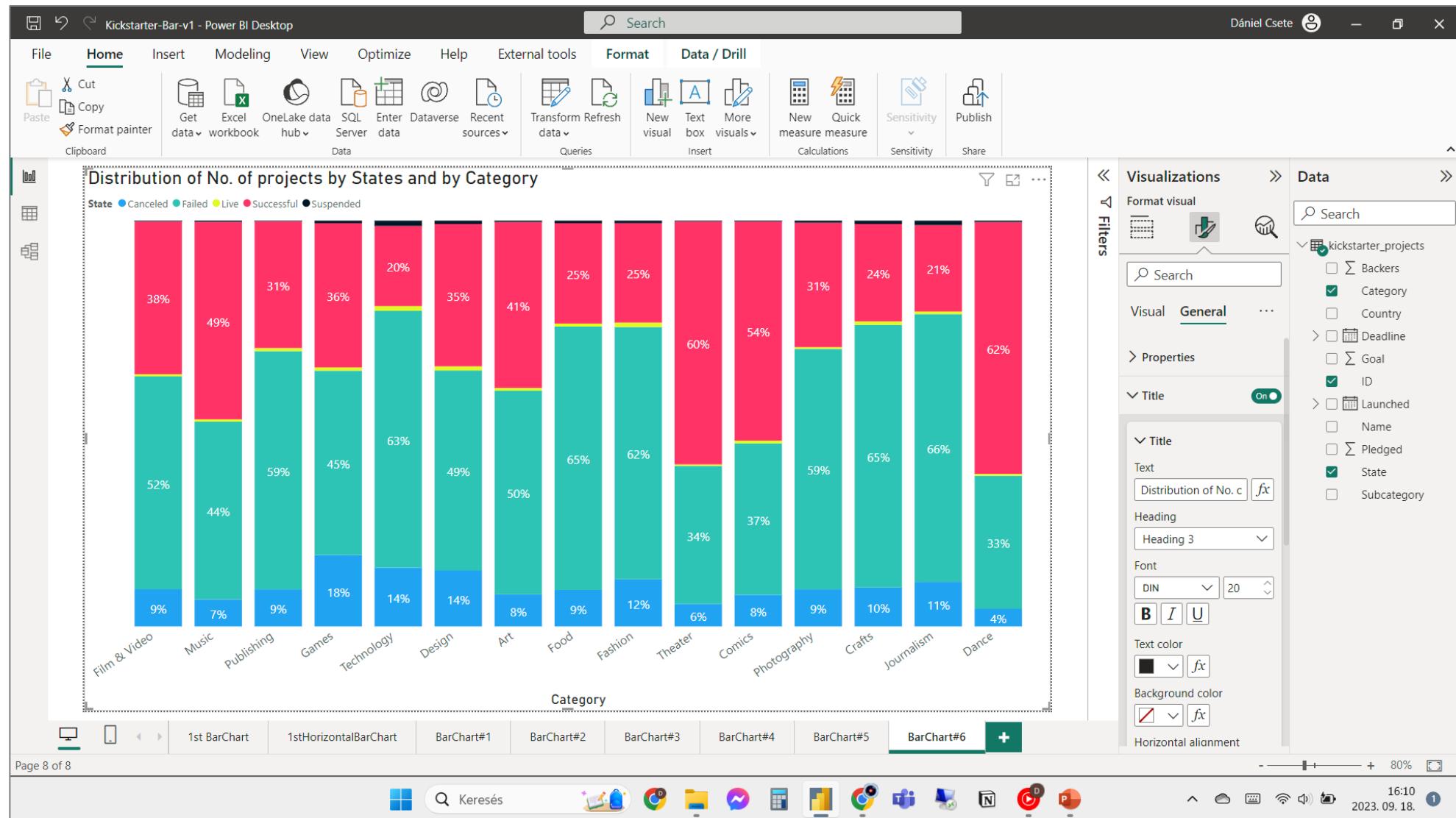
Add values to the fields

Creating Bar chart #6



Change visualization type to 100% stacked bar chart

Creating Bar chart #6



Final version after the formatting

Summary

Lessons learned:

- Creating different types of Bar charts
(Simple, Multivariate, Stacked, 100% Stacked)
- Changing summarization types
- Changing orderings
- Changing coloring of the bars
- Adding data labels
- Adding filters

Line charts

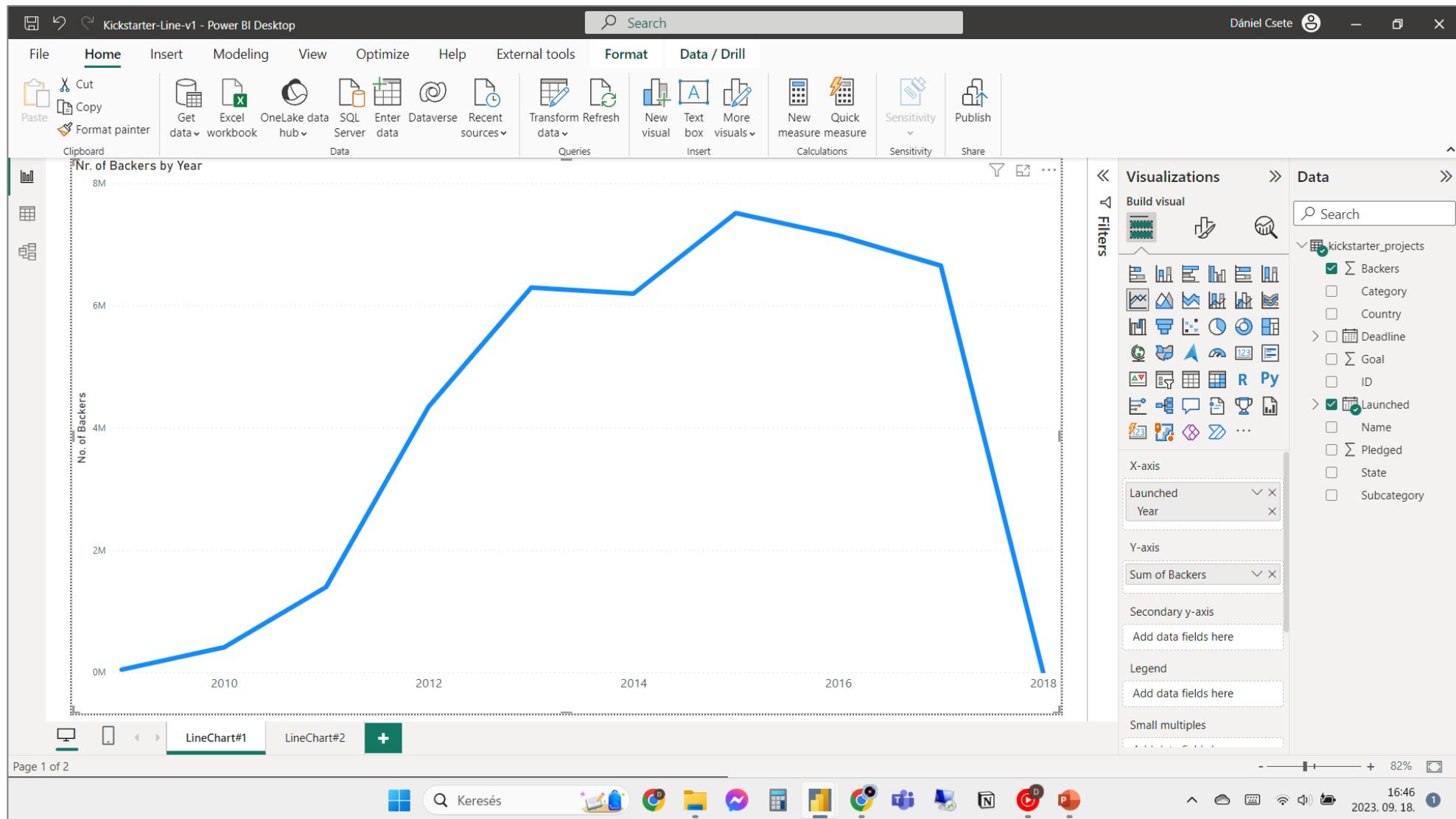
Simple line chart

Creating Line chart #1

Create a line chart that shows the sum Backers for each Year!

1. Select the appropriate visual
2. Select Launched as X axis value (remove days)
3. Select Backers as Y axis value
4. Set the summarization to Sum
5. Format the fonts and axes

Creating Line chart #1



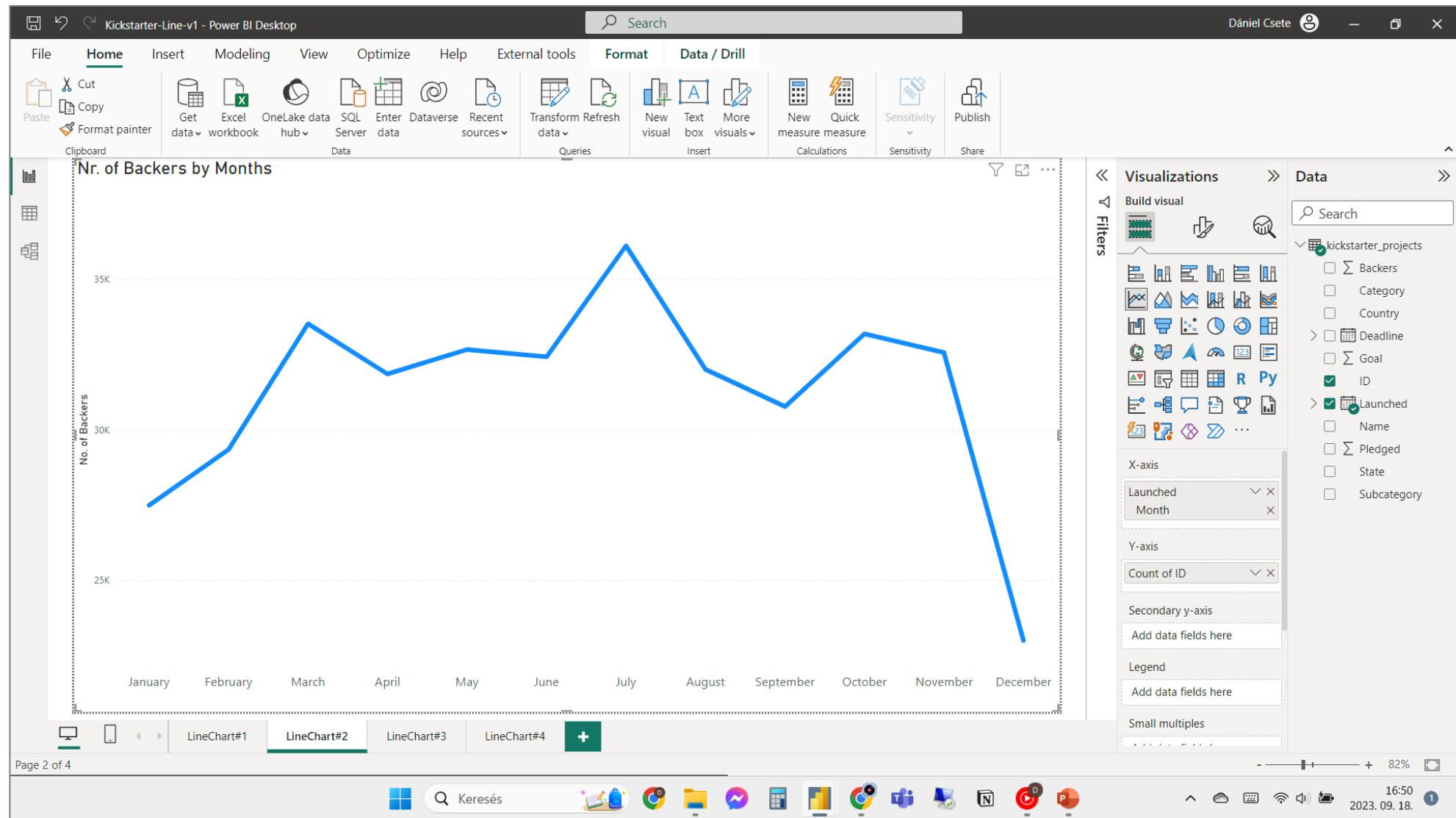
Final format of our first line chart

Creating Line chart #2

Create a line chart that shows the number of projects for each Month!

1. Select the appropriate visual
2. Select Launched as X axis value (remove days)
3. Select ID as Y axis value
4. Set the summarization to Count
5. Format the fonts and axes

Creating Line chart #2



This way it shows total values for the whole period

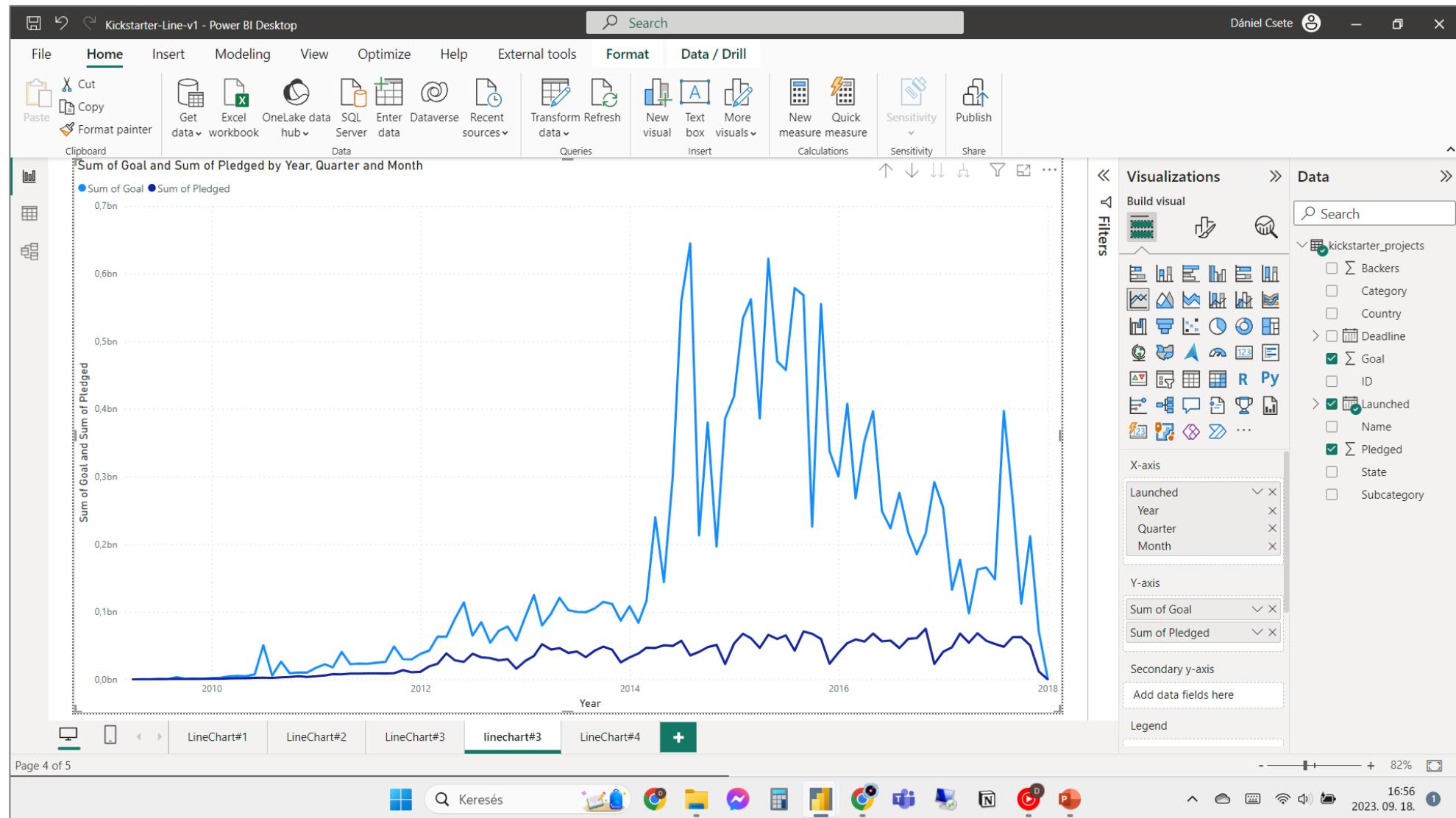
Multivariate Line chart

Creating Line chart #3

Create a line chart that shows the total Goals and total Pledged for every Year-Months!

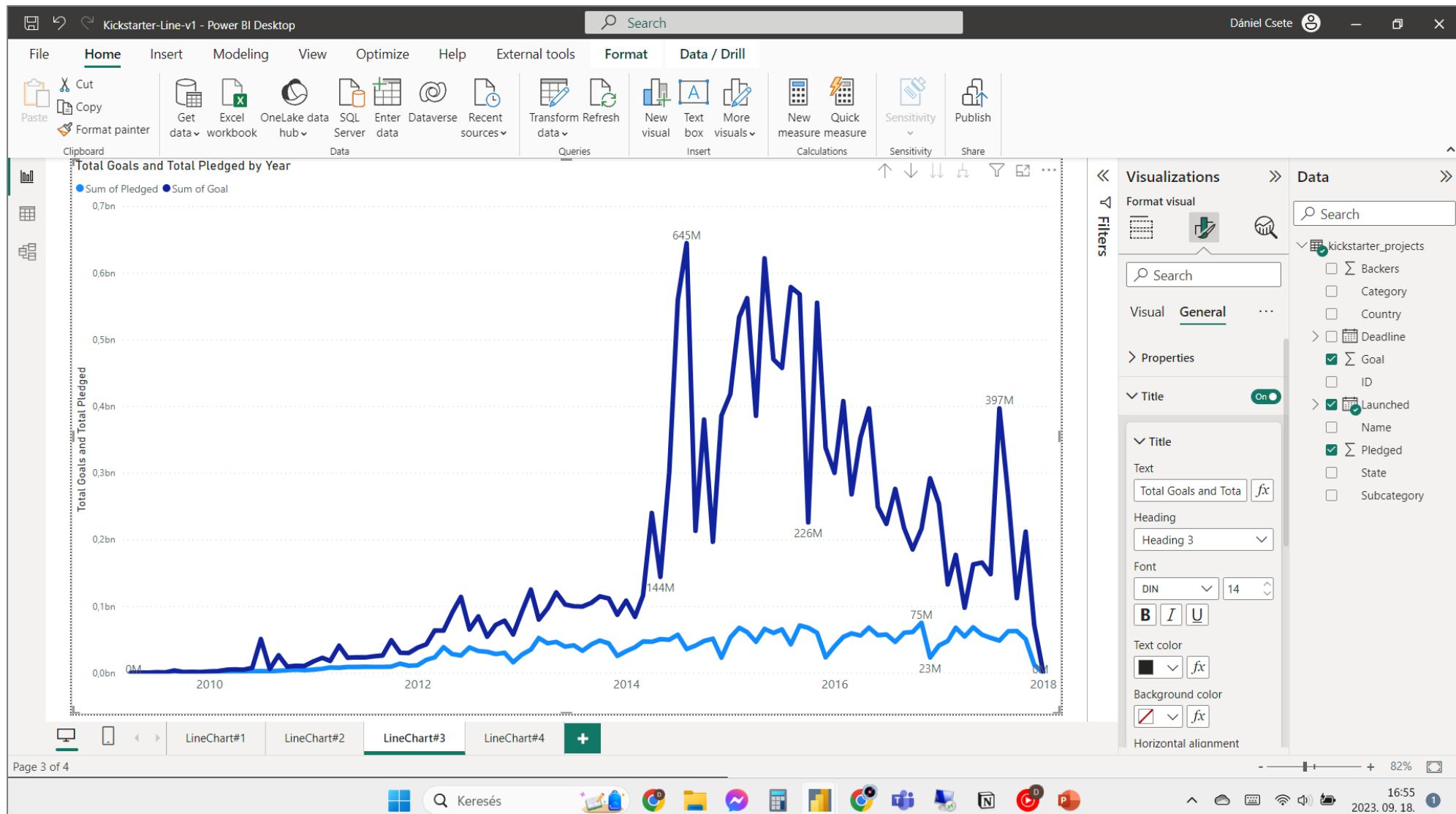
1. Select the appropriate visual
2. Select Launched as X axis value (remove days)
3. Select Goal, Pledged as Y axis value
4. Set the summarization to Sum
5. Format the fonts and axes

Creating Line chart #3



Visual type is set and Fields are added

Creating Line chart #3



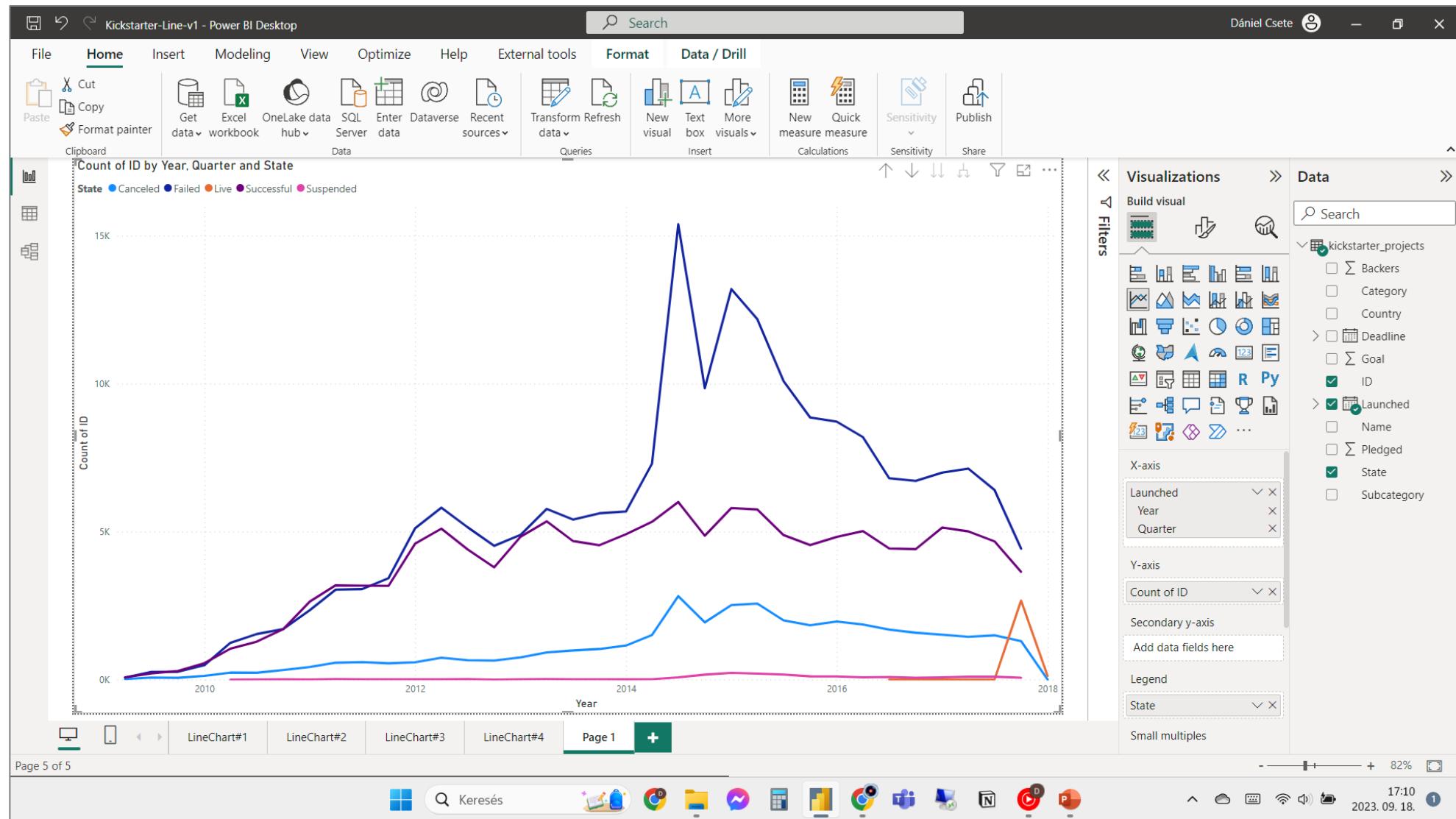
Formatted, labeled final look

Creating Line chart #4

Create a line chart that shows the number of Projects by States for every Year-Quarters!

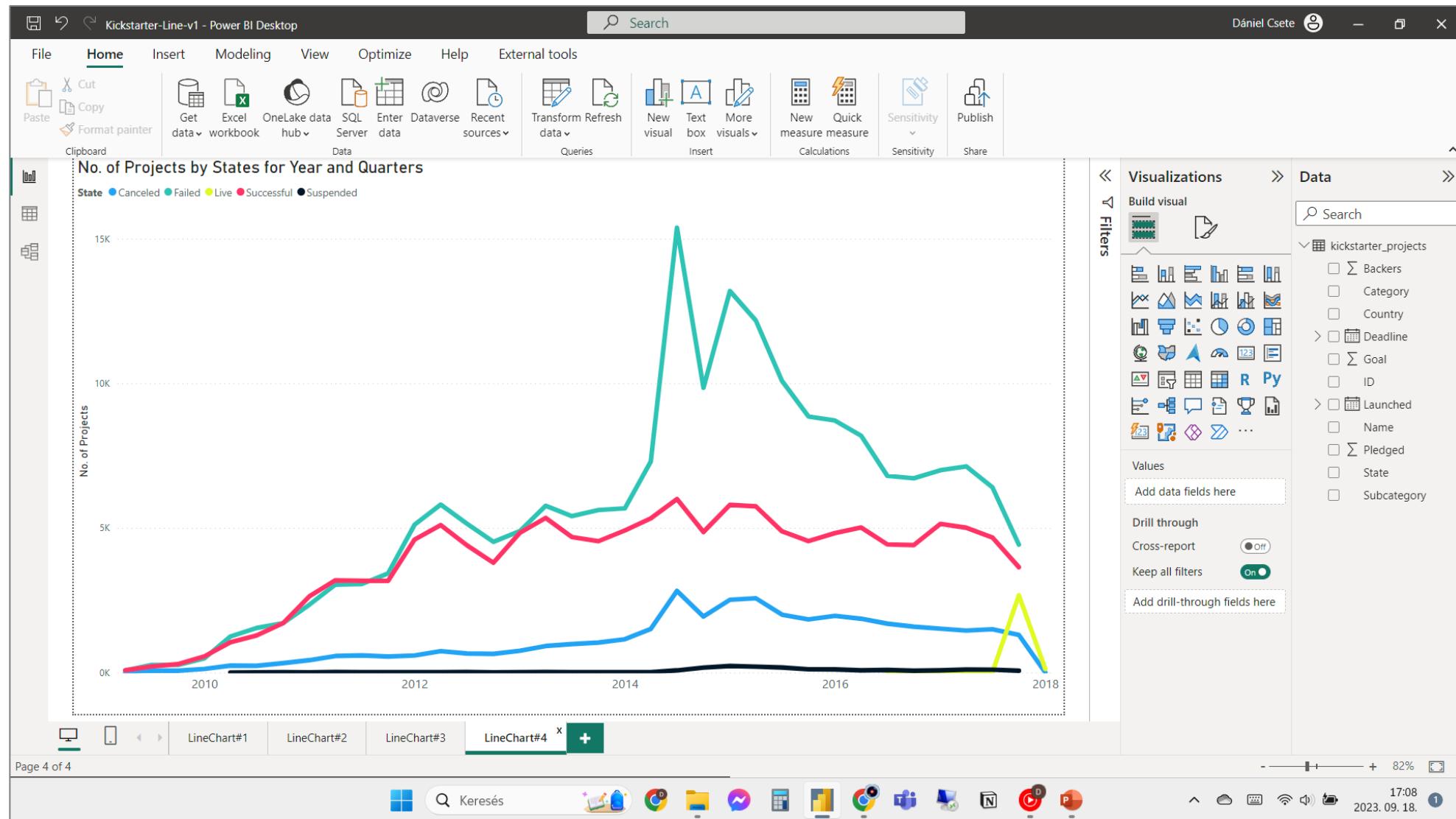
1. Select the appropriate visual
2. Select Launched as X axis value (remove days, months)
3. Select ID as Y axis value
4. Set the summarization to Count
5. Add State to Legend
6. Format the fonts and axes

Creating Line chart #4



The reporting requirements are fulfilled

Creating Line chart #4



A re-formatted version

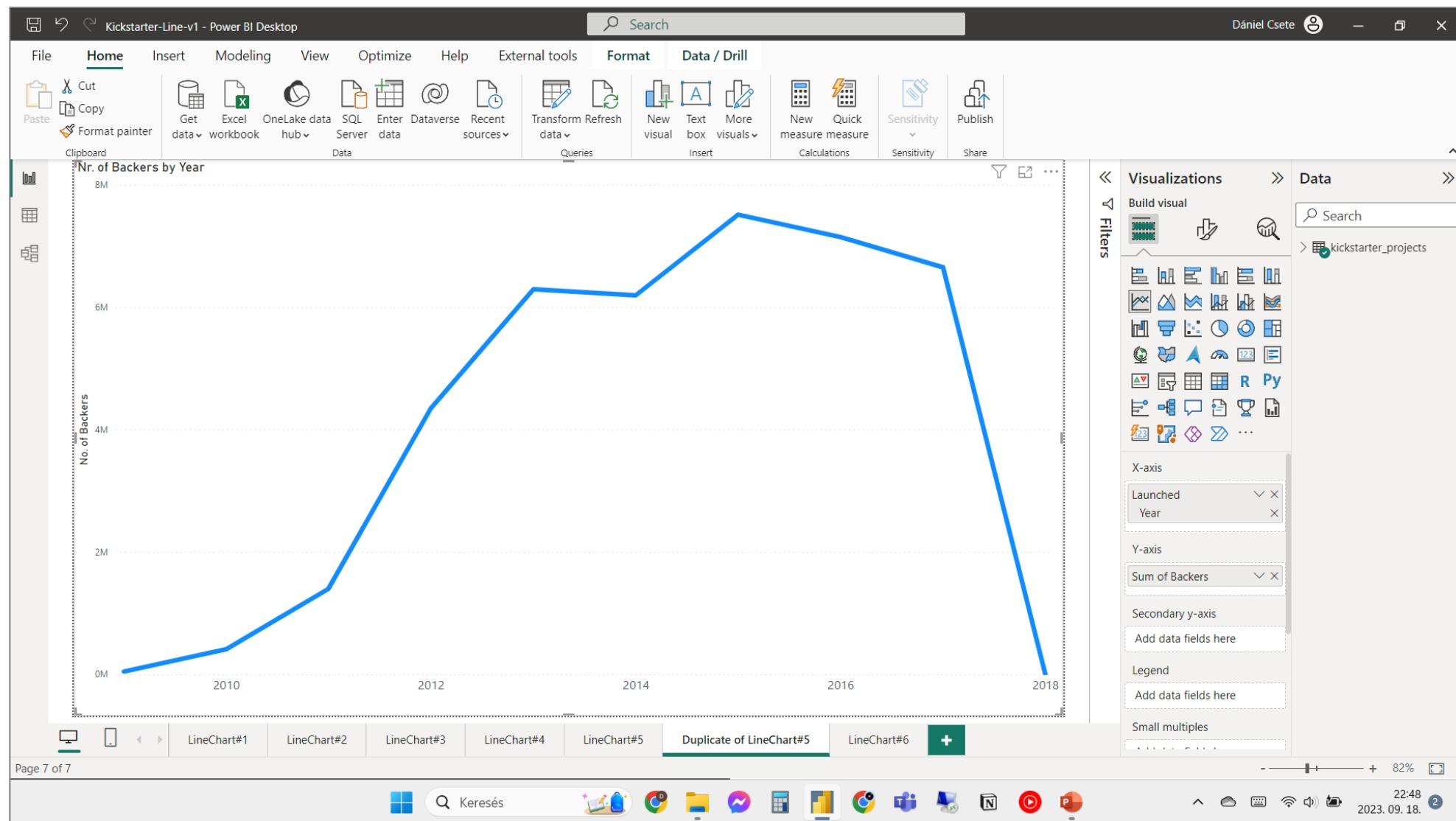
Small multiples

Creating Line chart #5

Create a small multiples line chart that shows the number of projects for each Month and multiplied by Categories!

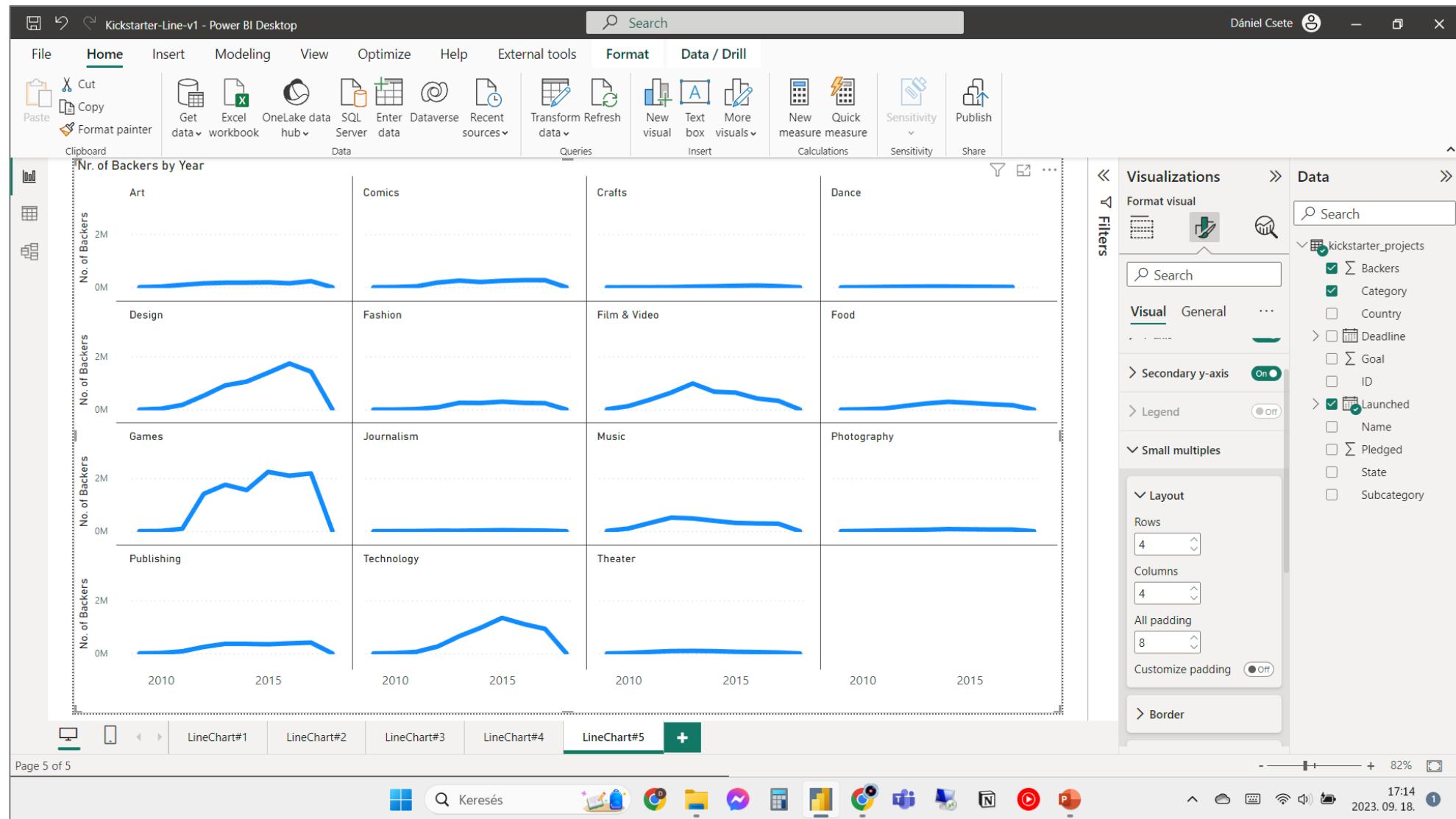
1. Duplicate the #1 Line chart
2. Add Category to Small Multiples
3. Format the fonts and axes
4. Set the Shared y-axis OFF and set Scale to fit ON

Creating Line chart #5



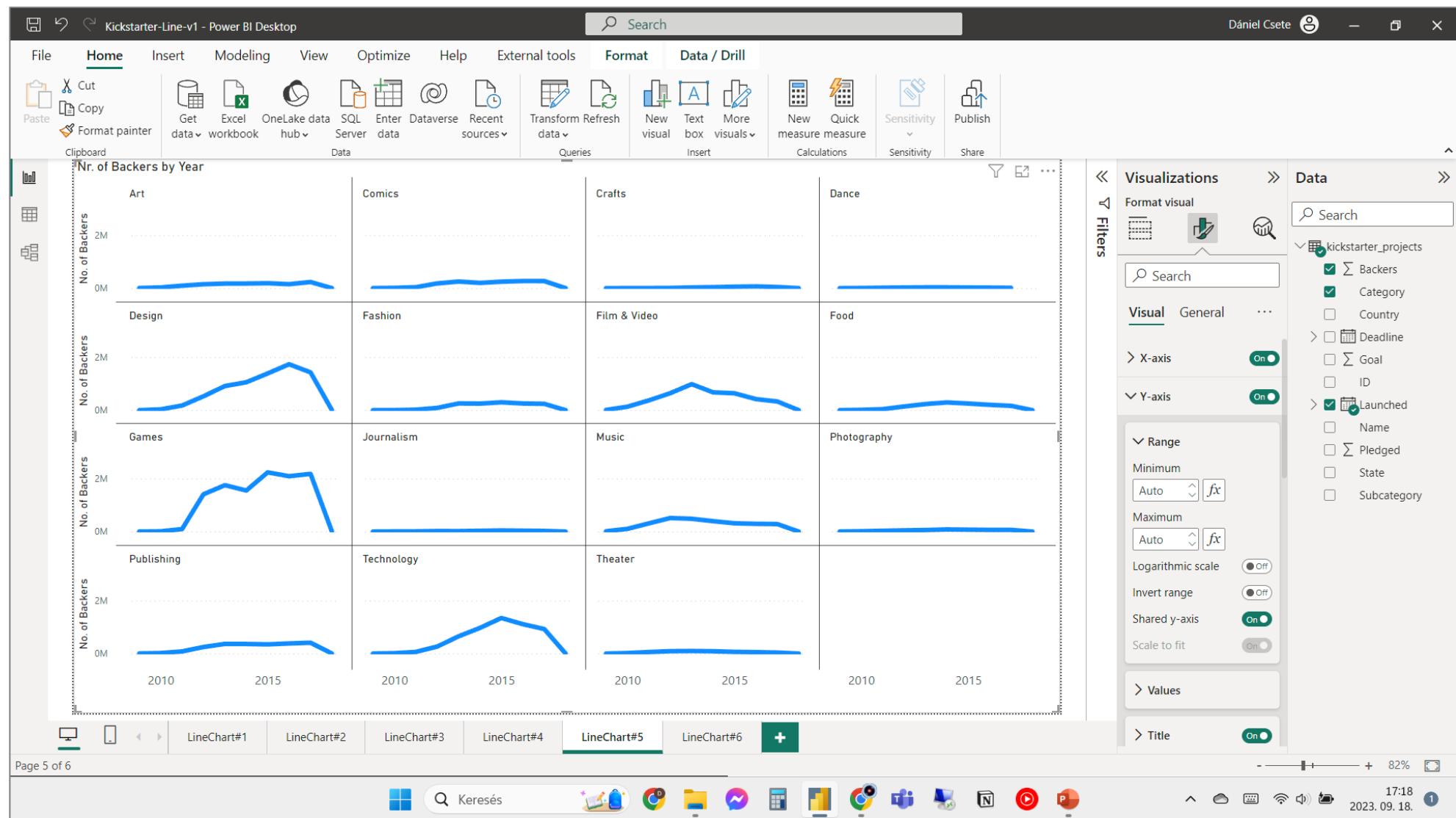
Create a standard line chart then add Category to the Small Multiples field

Creating Line chart #5

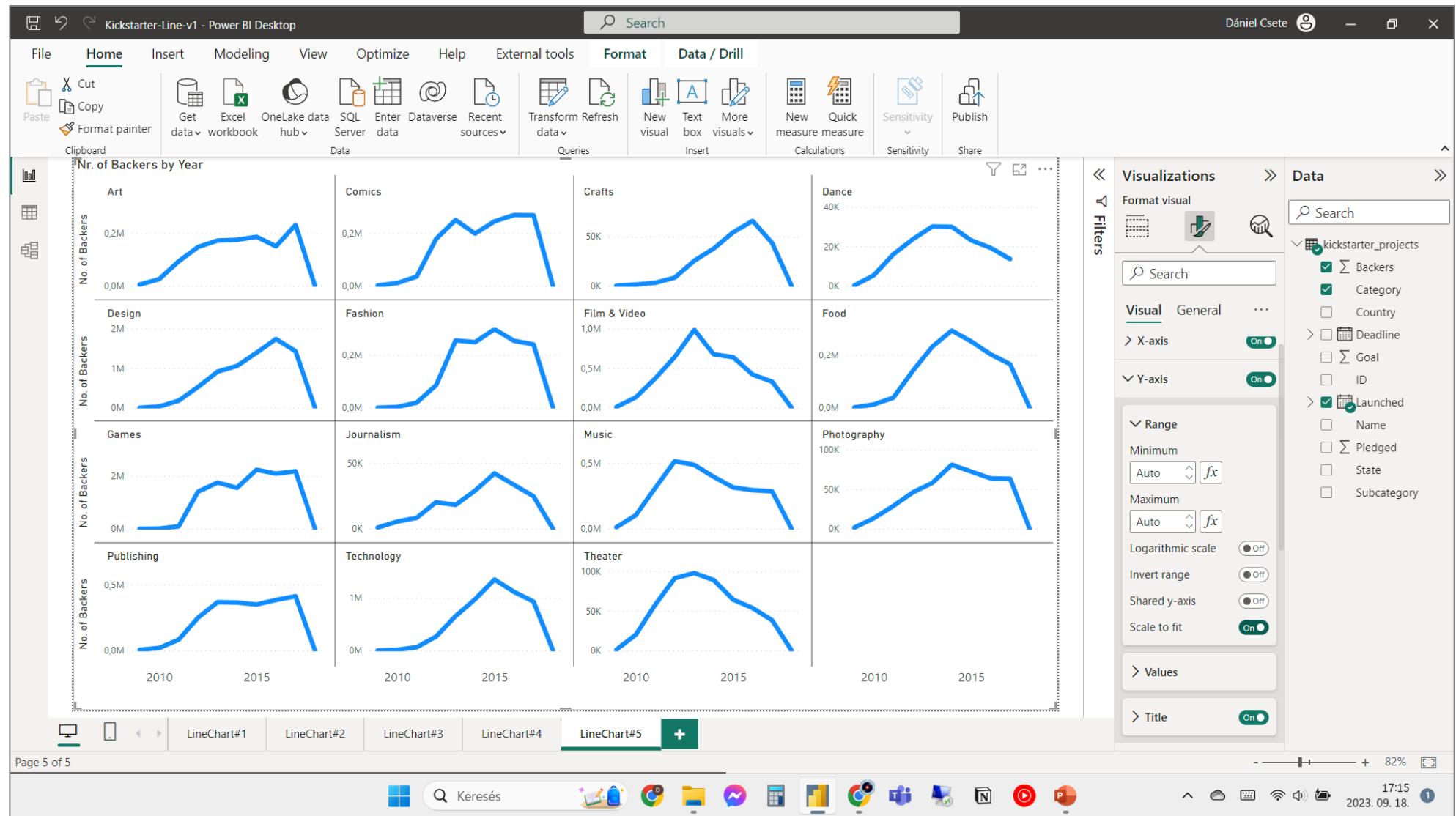


The grid size can be customized in the Format Visual pane

Creating Line chart #5



Default setting: Shared y-axis ON (good for comparison, but may hide unique trends)



Set Shared y-axis OFF and turn Scale to fit ON (harder to compare, but easier to spot patterns)

Summary

Lessons learned:

- Creating Different types of Line charts
(Simple, Multivariate)
- Using Small multiples for displaying many series together
- Customizing the Small multiples settings (grid, synchronized y-axis)

Area charts

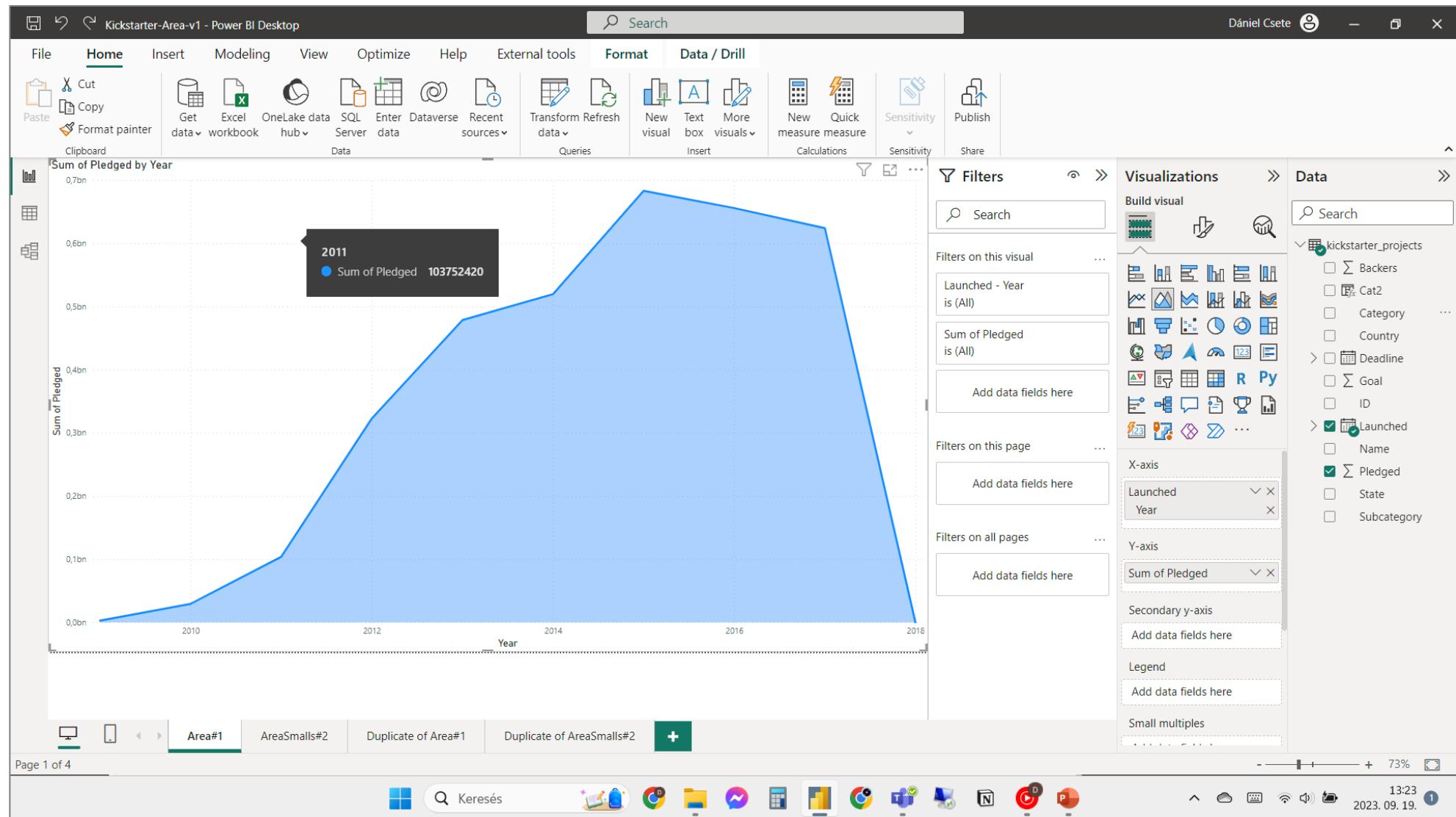
Simple Area chart

Creating Area chart #1

Create an area chart that shows the sum of Pledged values by Categories for each Year!

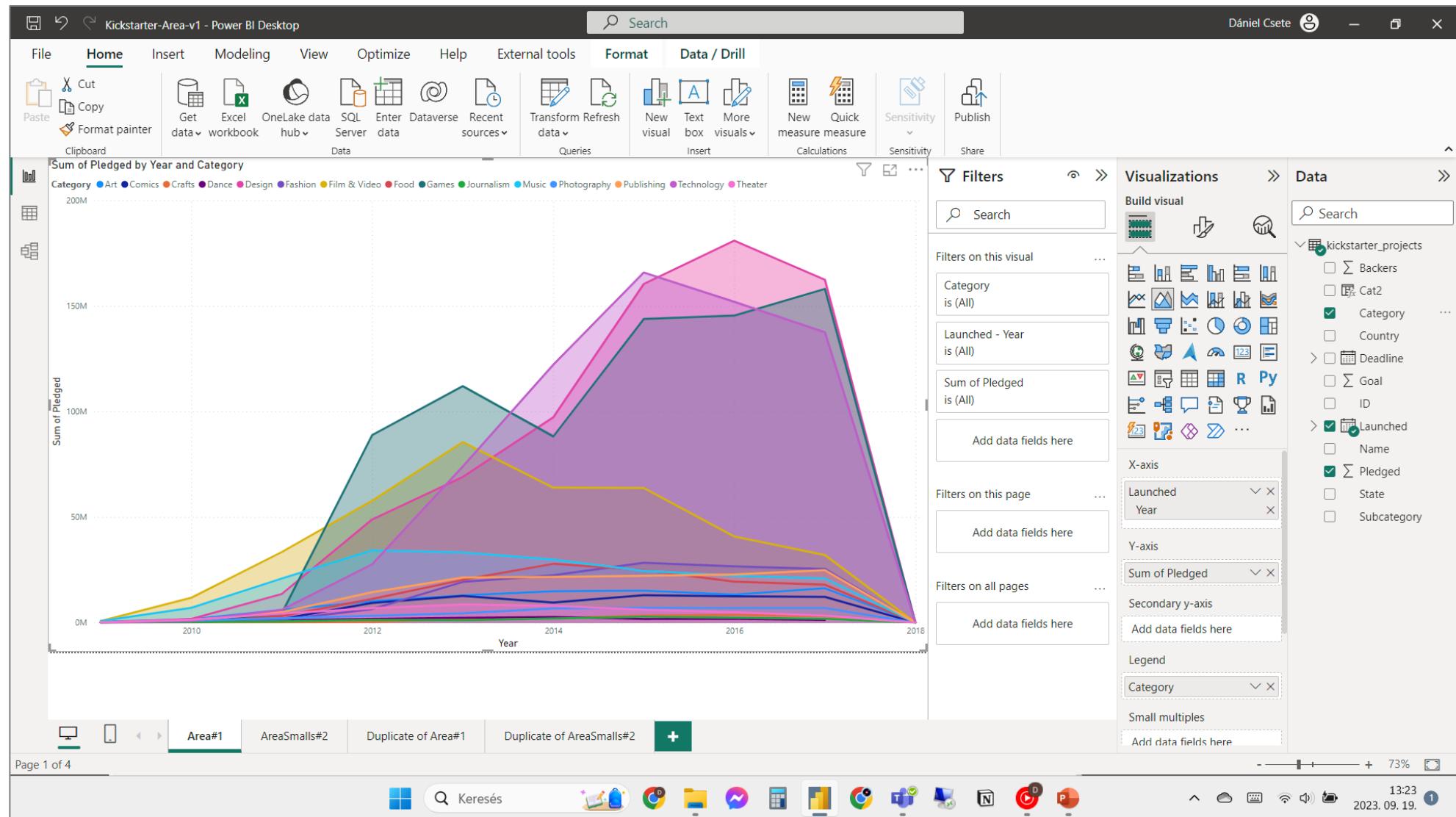
1. Select the appropriate visual
2. Select Launched as X axis value (years only)
3. Select Pledged as Y axis value, as Sum
4. Add Category to Legend
5. Format the fonts and axes, turn on Markers
6. Add Category as a slicer as well
7. Compare two Category

Creating Area chart #1



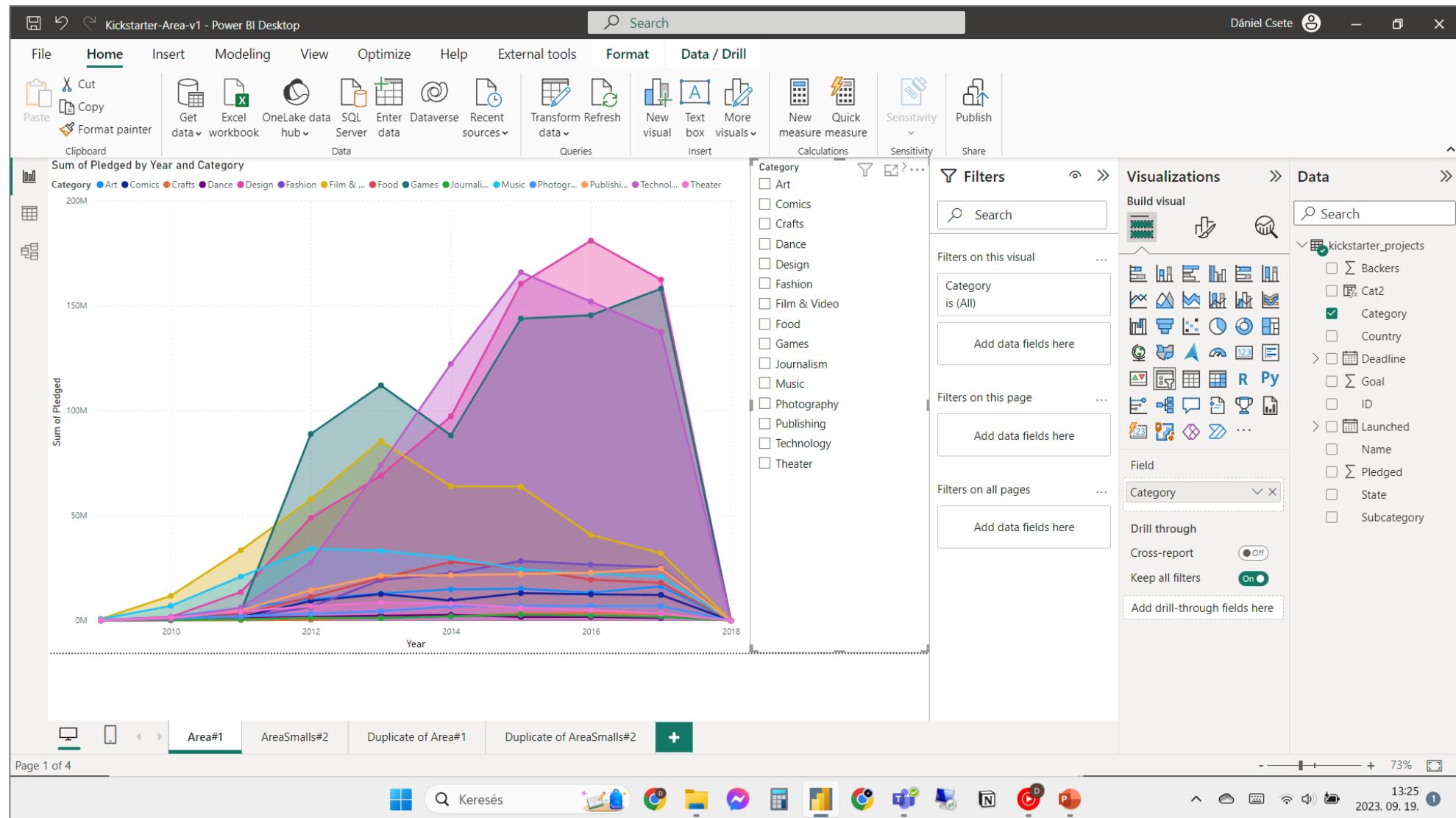
Basic area chart without Legends

Creating Area chart #1



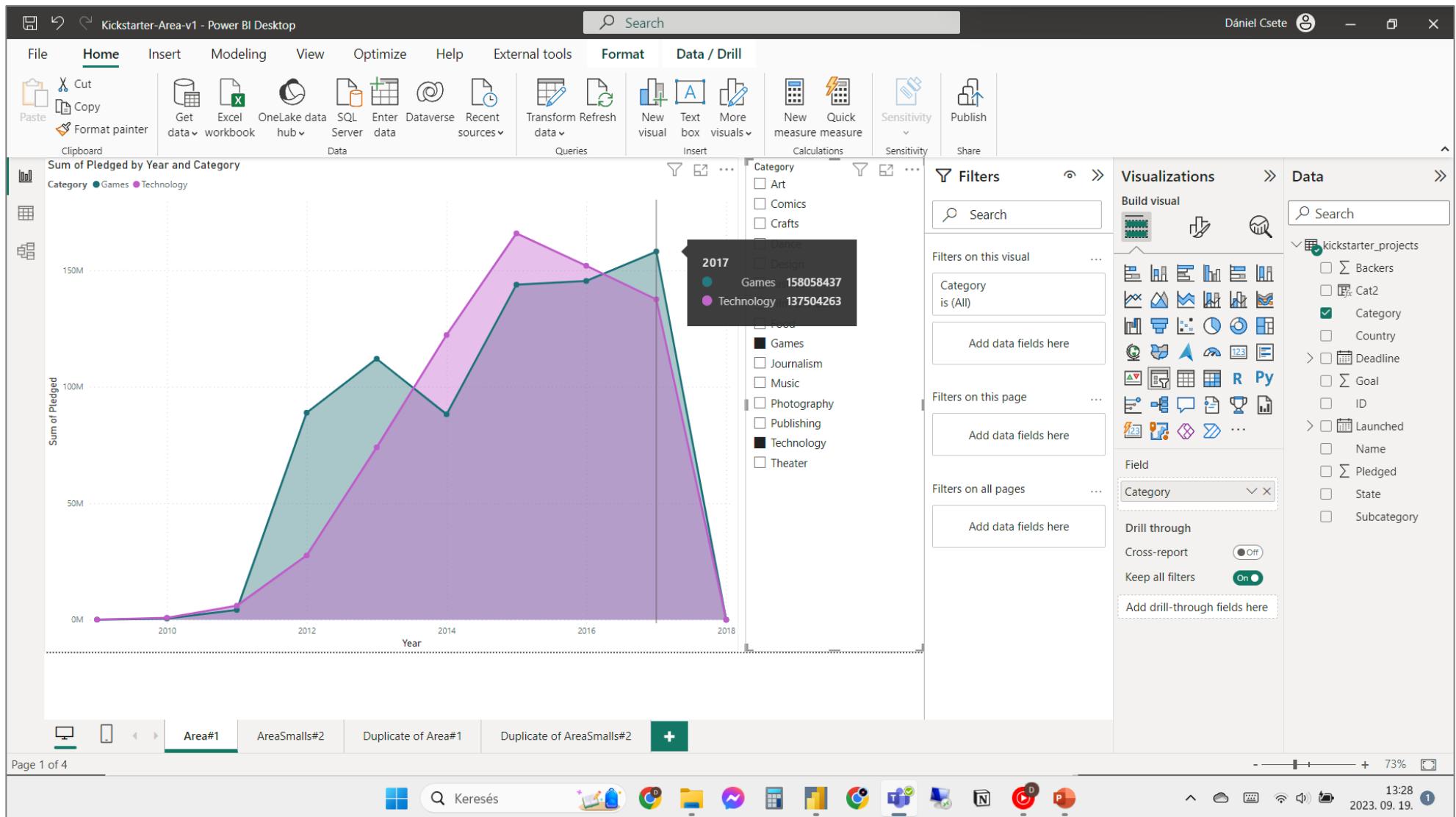
Multiple area charts splitted by Categories

Creating Area chart #1



Some formatting + Add a Slicer visual

Creating Area chart #1



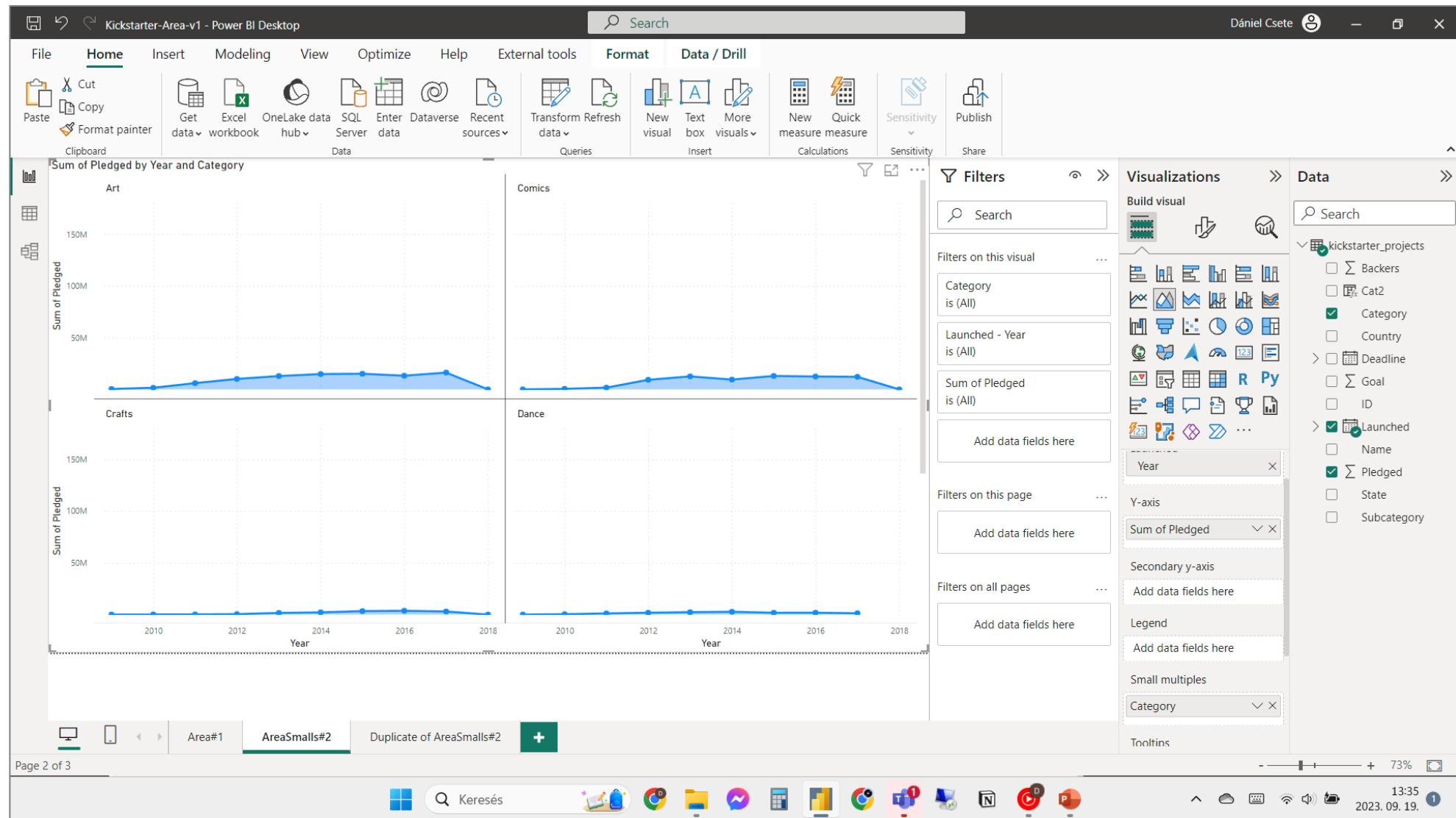
Select two distinct category to compare them (multiselect: Ctrl+click)

Creating Area chart #2

Create a small multiple area chart that shows the sum of Pledged values by Categories for each Year!

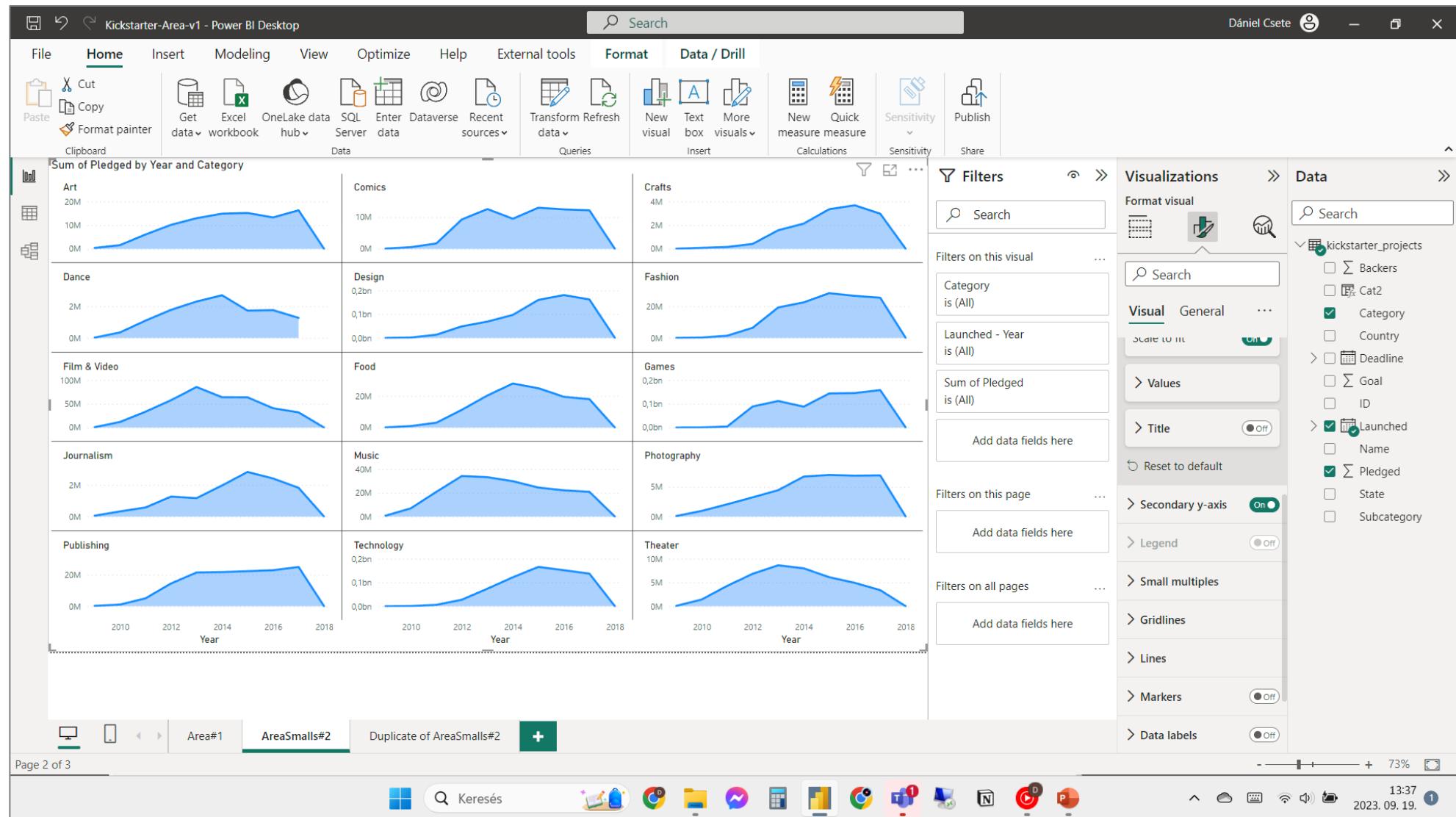
1. Select the appropriate visual
2. Select Launched as X axis value (years only)
3. Select Pledged as Y axis value, as Sum
4. Add Category to Small Multiples
5. Set the grid 5 rows by 3 columns
6. Format the fonts and axes, add a new column for coloring

Creating Area chart #2



Default area chart with Small multiples by Categories

Creating Area chart #2



Appropriate grid size for this example

Creating Area chart #2

The screenshot shows the Power BI Desktop interface with a grid of 15 area charts titled "Pledged Amount by Category". Each chart tracks the total pledged amount for a specific category from 2010 to 2018. The categories include Art, Comics, Crafts, Dance, Design, Fashion, Film & Video, Food, Games, Journalism, Music, Photography, Publishing, Technology, and Theater. The "New table" icon in the ribbon is highlighted with a red box. The "kickstarter_projects" table is selected in the Data pane, also highlighted with a red box.

Table tools

kickstarter_projects

Pledged Amount by Category

Visualizations

Data

kickstarter_projects

Filters

Visualizations

Data

kickstarter_projects

Category

Launched - Year

Sum of Pledged

Add data fields here

X-axis

Launched - Year

Y-axis

Sum of Pledged

Secondary y-axis

Legend

Add data fields here

Small multiples

Area#1

AreaSmalls#2

Duplicate of AreaSmalls#2

Page 2 of 3

13:38 2023. 09. 19.

Select the table, then New Column to add a Calculated Column

Creating Area chart #2

The screenshot shows the Power BI Desktop interface with the title "Kickstarter-Area-v1 - Power BI Desktop". The ribbon is visible at the top with tabs like File, Home, Insert, Modeling, View, Optimize, Help, External tools, Format, Data / Drill, Table tools, and Column tools. The Column tools tab is selected.

A calculated column named "Cat2" is being defined in the top-left corner:

```
1 Cat2 = kickstarter_projects[Category]
```

The main area displays a 4x3 grid of area charts, each representing a different project category over time from 2010 to 2018. The categories are: Dance, Design, Fashion, Film & Video, Food, Games, Journalism, Music, Photography, Publishing, Technology, and Theater. The Y-axis for most charts ranges from 0M to 20M, except for Technology which ranges from 0,0bn to 0,2bn.

The Power BI visualizations pane on the right shows the data source "kickstarter_projects" and its fields:

- Backers
- Category (selected)
- Country
- Deadline
- Goal
- ID
- Launched (selected)
- Name
- Pledged (selected)
- State
- Subcategory

The X-axis filter is set to "Launched Year". The Y-axis filter is set to "Sum of Pledged".

The bottom navigation bar includes icons for desktop, mobile, and browser, and tabs for "Area#1" (selected), "AreaSmalls#2", and "Duplicate of AreaSmalls#2". The status bar at the bottom right shows the date and time: 13:39, 2023.09.19.

Define the Calculated Column: `Cat2=kickstarter_projects[Category]`

Creating Area chart #2

The screenshot shows the Power BI Desktop interface with the following details:

- Title:** Kickstarter-Area-v1 - Power BI Desktop
- Column tools tab:** Active.
- Visual:** A trellis visualization titled "Pledged Amount by Category". It displays 15 area charts, each representing a different category over time from 2010 to 2018. The categories are: Art, Comics, Crafts, Dance, Design, Fashion, Film & Video, Food, Games, Journalism, Music, Photography, Publishing, Technology, and Theater.
- Legend:** Located in the bottom right corner of the visualization area, it shows a color-coded legend for the categories: Cat2 (blue), Category (purple), Launched (yellow), Goal (orange), ID (green), Name (red), Pledged (pink), State (brown), and Subcategory (grey).
- Filters:** Located in the top right pane, it includes filters for "Cat2" (selected), "Category", "Launched - Year", "Sum of Pledged", "X-axis" (set to "Launched Year"), "Y-axis" (set to "Sum of Pledged"), and "Legend" (set to "Cat2").
- Data pane:** Located on the right side, it shows the data source "kickstarter_projects" and its fields: Backers, Cat2 (selected), Category, Country, Deadline, Goal, ID, Launched (selected), Name, Pledged (selected), State, and Subcategory.
- Bottom navigation:** Shows tabs for "Area#1" (selected), "AreaSmalls#2", and "Duplicate of AreaSmalls#2".
- Bottom status bar:** Shows the date and time (13:39, 2023.09.19) and a battery icon.

Add Cat2 to Legends to allow different coloring for each trellis

Summary

Lessons learned:

- Creating Different types of Area charts
(Simple, Multivariate, Small multiples)
- Adding slicer visuals to filter the data
- Creating duplicate columns to drive the color using the same column already used for Small multiples

Thank You

