



Categorical Data II

Topics in this session

How to access features in the Power BI User Interface
Derived Calculations using Custom Data Columns

Categorical data visualizations

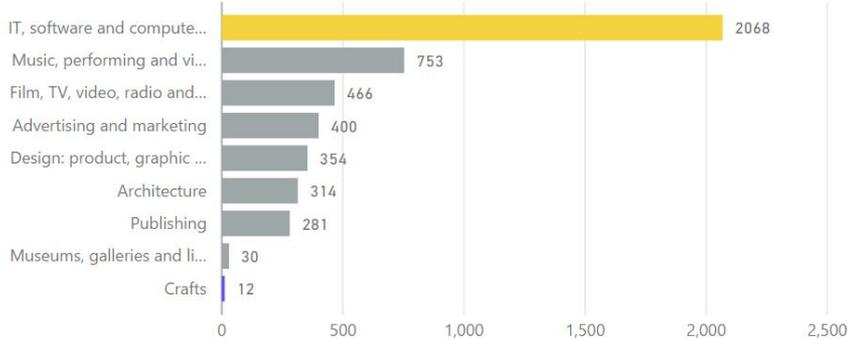
Pie Charts

Tree Maps

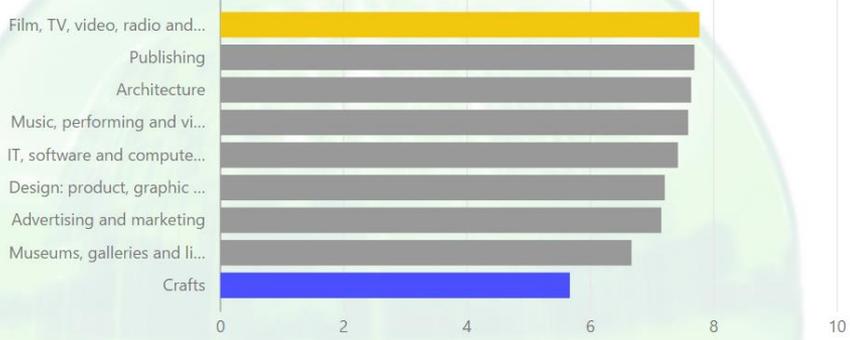
Adding calculated columns

Creative Digital IT (CDIT) Companies in North East England 2016-2017

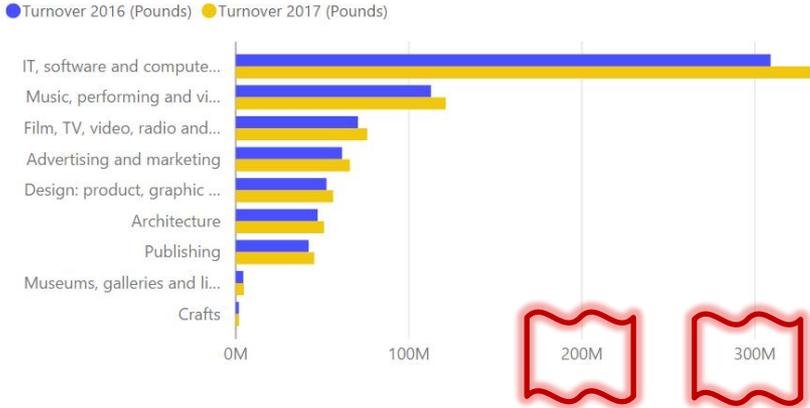
Count of companies by CDIT Sector



Average Percentage Growth 2016-2017 by CDIT Sector



Total turnover in 2016 and 2017 by CDIT Sector



Select CDIT sector(s) to view

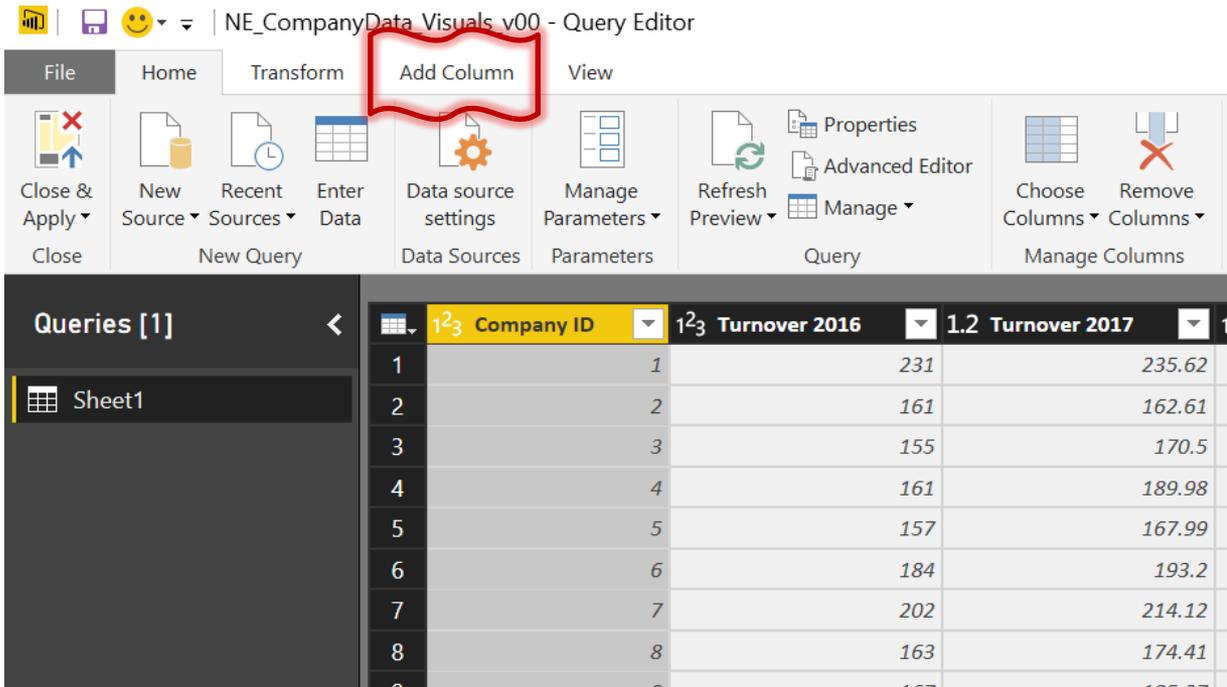
- Advertising and marketing
- Architecture
- Crafts
- Design: product, graphic and fashion design
- Film, TV, video, radio and photography
- IT, software and computer services
- Museums, galleries and libraries
- Music, performing and visual arts
- Publishing

Note: anonymous company identities with simulated turnover values.

Used a custom column to convert fields provided in thousands of pounds to whole pounds 3

Custom Columns

There are several ways to create derived data – we will look at just one in the Query Editor.



The screenshot shows the Microsoft Query Editor interface. The ribbon is set to the 'Transform' tab, and the 'Add Column' button is highlighted with a red hand-drawn box. Below the ribbon, a data table is visible with columns for 'Company ID', 'Turnover 2016', and 'Turnover 2017'. The table contains 9 rows of data.

	1.3 Company ID	1.2 Turnover 2016	1.2 Turnover 2017
1	1	231	235.62
2	2	161	162.61
3	3	155	170.5
4	4	161	189.98
5	5	157	167.99
6	6	184	193.2
7	7	202	214.12
8	8	163	174.41
9	9	167	185.07

Click on **Add Column** to show the options for creating new columns in the data table.

Custom Columns

NE_CompanyData_Visuals_v00 - Query Editor

File Home Transform Add Column View

Column From Example Custom Column Invoice Custom Function

Conditional Column Index Column Duplicate Column

Format Merge Columns Extract Parse

Statistics Standard Scientific Rounding Information

Date Time Duration

Queries [1] Sheet1

	1 ² Company ID	1 ² Turnover 2016	1.2 Turnover 2017	1 ² Percentage Growth	1 ² Main SIC4
1	1	231	235.62	2	8532
2	2	161	162.61	1	5811
3	3	155	170.5	10	5819
4	4	161	189.98	18	6201
5	5	157	167.99	7	9001
6	6	184	193.2	5	8552
7	7	202	214.12	6	9004

Click on **Custom Column** to enter the create column dialogue.

Custom Columns

Turnover 2016	1.2 Turnover 2017	1 ² 3 Percentage Growth	1 ² 3 Main SIC4	1 ² 3 SIC4 Opt1	1 ² 3 SIC4 Opt2	1 ² 3 SIC4 Opt3
231	235.62	2	8532	9004	null	
161	162.61	1	5811	null	null	
155	170.5	10	5819	null	null	
161	189.98	18	6201	null	null	
157	167.99	7	9001	null	null	
202	193.92	-4	5819	null	null	
228	250.8	10	9001	null	null	

Add Custom Column

New column name:

Custom column formula:
[Learn about Power BI Desktop formulas](#)

Available columns:
Company ID
Turnover 2016
Turnover 2017
Percentage Growth
Main SIC4
SIC4 Opt1
SIC4 Opt2
SIC4 Opt3

<< Insert

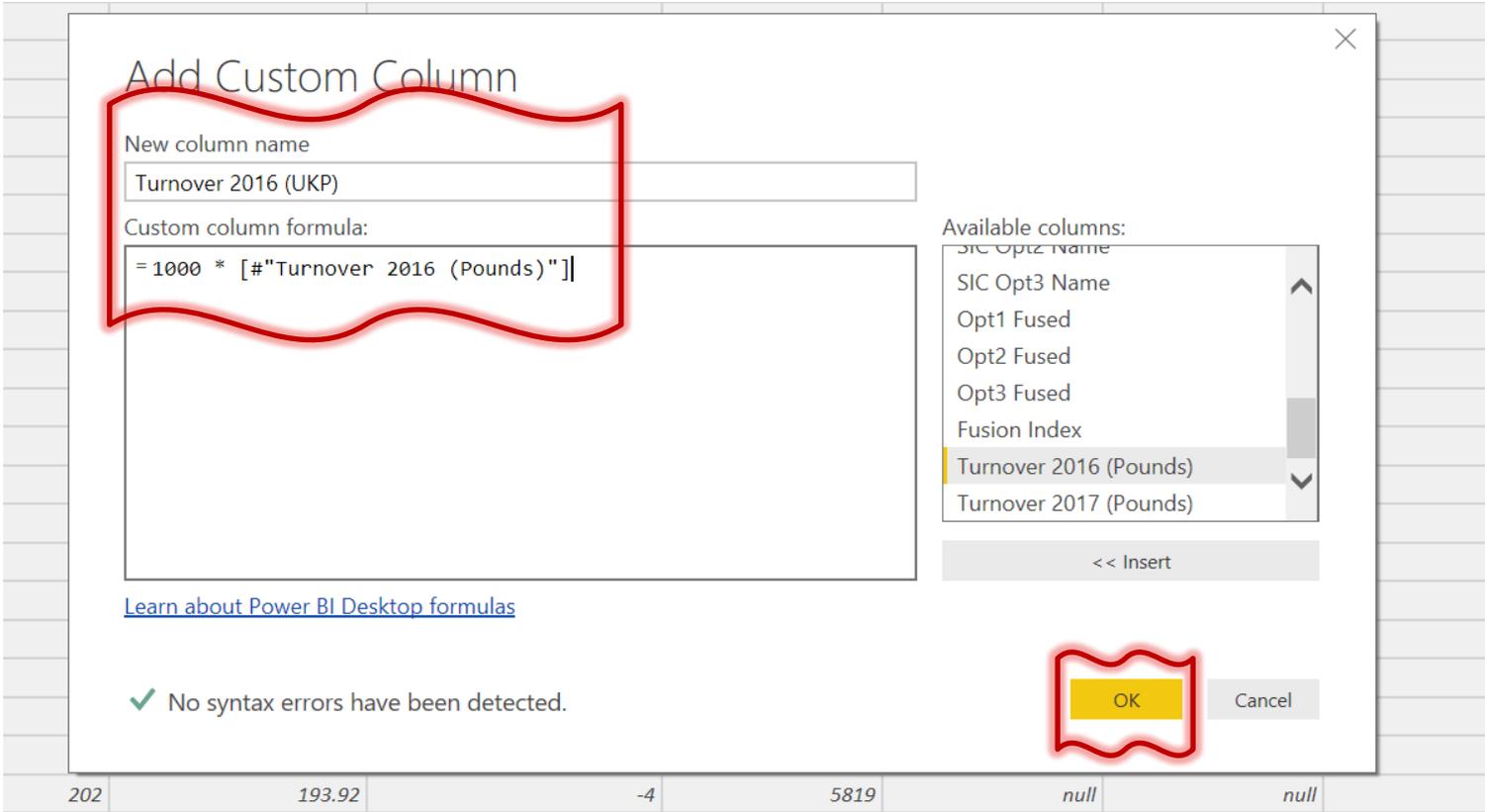
✓ No syntax errors have been detected.

OK Cancel

Now we can enter formula that manipulate data in the table to create new column values.

In this case we want to multiply the Turnover values for 2016 and 2017 by 1000 so they are in units of pounds rather than 1000's of pounds.

Custom Columns



Fill in the new column name **Turnover 2016 (UKP)**

Enter the expression relating current table values to the required value, select any existing column names you need from the list on the right, click **OK** to create the custom column. (This calculation is written in the language M – which is an ETL scripting language for PowerBI see M and DAX : <http://radacad.com/m-or-dax-that-is-the-question>)

Custom Columns

The new column is then added at the far right of the data table.

Repeat for 2017.

Click on **File** and then **Close and Apply** and then use the new columns in your visualization as below:.

Count of companies by CDIT Sector

CDIT Sector	Count
IT, software and computer services	2548
Music, performing and visual arts	753
Film, TV, video, radio and photography	464
Advertising and marketing	400
Design, product, graphic and fashion design	354
Architecture	314
Publishing	281
Museums, galleries and libraries	30
Crafts	12

Average Percentage Growth 2016-2017 by CDIT Sector

CDIT Sector	Average Percentage Growth
Film, TV, video, radio and photography	~8.5
Publishing	~7.5
Architecture	~7.0
Music, performing and visual arts	~6.5
IT, software and computer services	~6.0
Design, product, graphic and fashion design	~5.5
Advertising and marketing	~5.0
Museums, galleries and libraries	~4.5
Crafts	~3.5

Total turnover in 2016 and 2017 by CDIT Sector

CDIT Sector	Turnover 2016 (Pounds)	Turnover 2017 (Pounds)
Advertising and marketing	~50M	~60M
Architecture	~40M	~50M
Crafts	~10M	~15M
Design, product, graphic and fashion design	~30M	~40M
Film, TV, video, radio and photography	~20M	~30M
IT, software and computer services	~100M	~120M
Museums, galleries and libraries	~5M	~10M
Music, performing and visual arts	~15M	~20M
Publishing	~10M	~15M

Fields Pane:

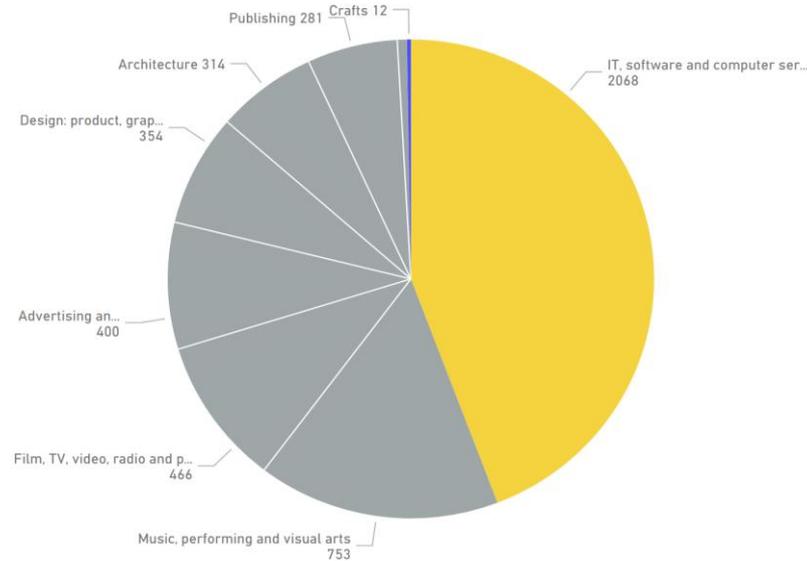
- Company ID
- Fusion Index
- Main SIC4
- Main SIC4 Name
- Opt1 Fused
- Opt2 Fused
- Opt3 Fused
- Percentage Growth
- SIC Opt1 Name
- SIC Opt2 Name
- SIC Opt3 Name
- SIC4 Opt1
- SIC4 Opt2
- SIC4 Opt3
- Turnover 2016
- Turnover 2016 (Pounds)
- Turnover 2017
- Turnover 2017 (Pounds)

ABC 123	Turnover 2016 (UKP)
	231000
	161000
	155000
	161000
	157000
	184000
	202000
	163000
	167000
	73000
	249000
	63000
	94000
	197000
	211000
	221000
	128000
	61000
	68000
	108000
	197000
	71000
	70000
	105000



Alternatives to Bar Charts

Pie Charts



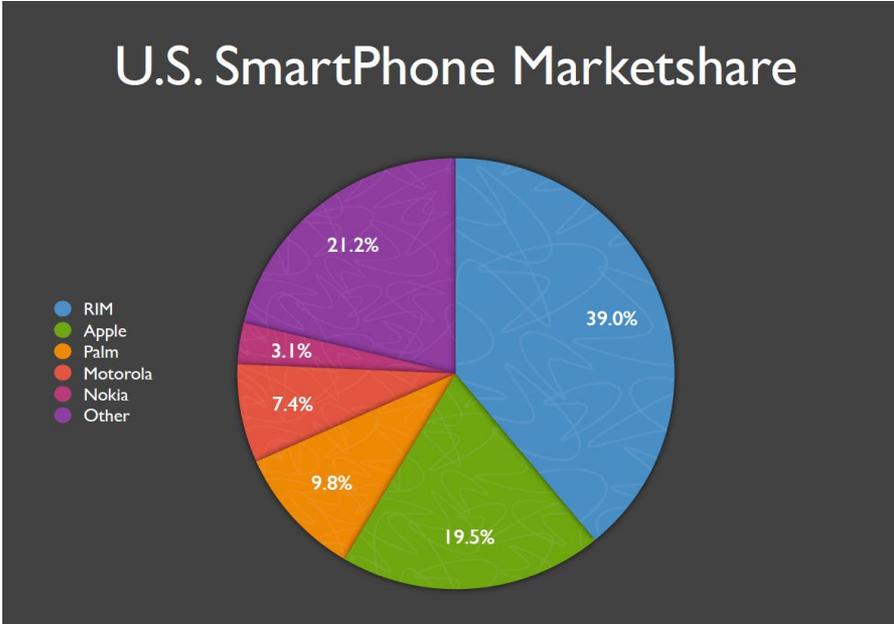
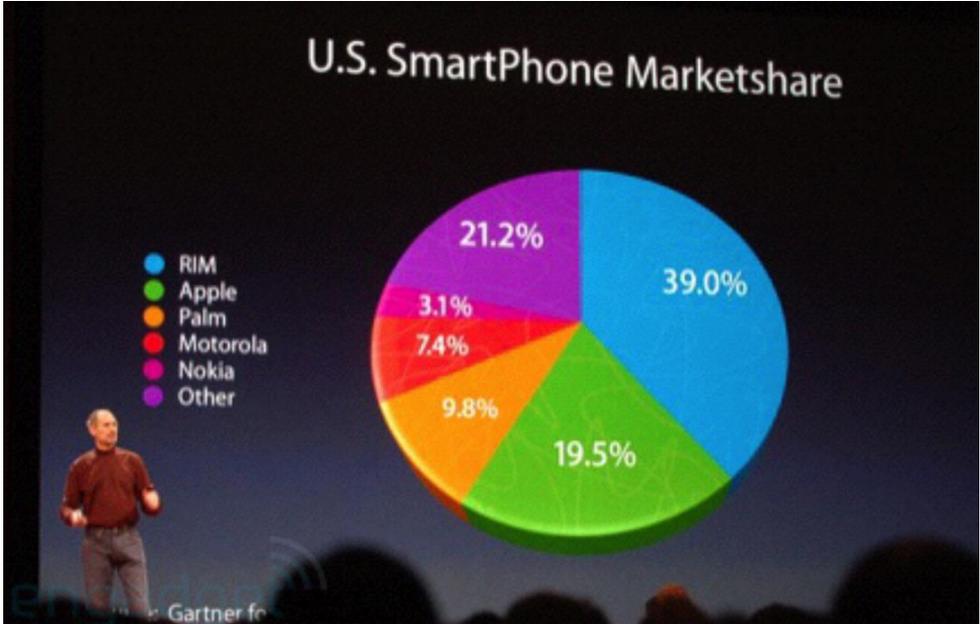
Very useful for certain types of data visualization
though ...some... experts seem to dislike them intensely .

Best used for judging part-to-whole relationships.

If possible sort the chart so that ranking is implicit in the order.
Don't rely on people to judge relative size unless it is very clear.

Present flat in 2D so you can judge the *angles* near the middle.

Pie Charts – abuse of....



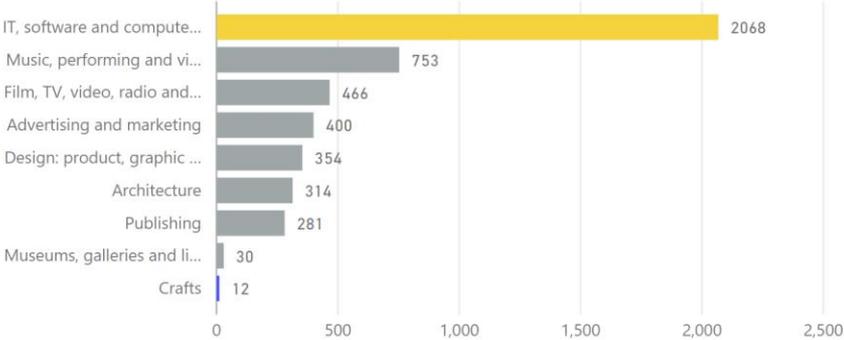
Steve jobs suggesting Apple have a bigger market share than other.

This is a well documented visual lie, and raises issues of ethics and responsibility in data visualization.

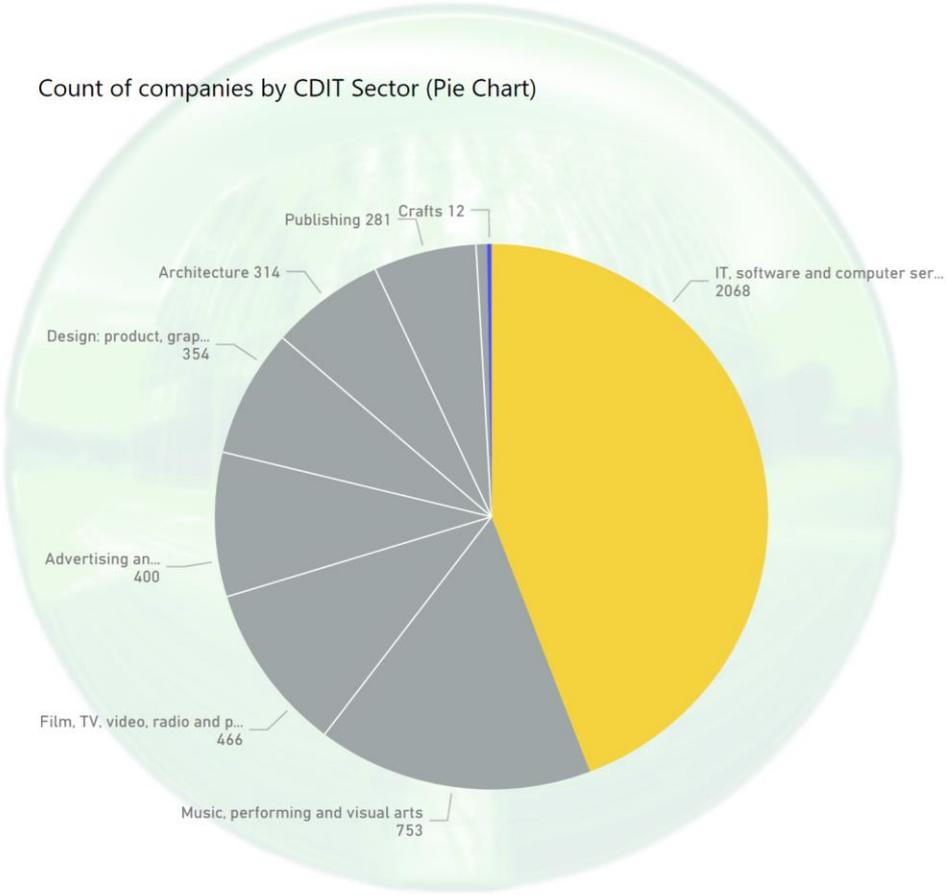
Bar Chart vs Pie Chart

Creative Digital IT (CDIT) Companies in North East England 2016-2017

Count of companies by CDIT Sector



Count of companies by CDIT Sector (Pie Chart)



Select CDIT sector(s) to view

- Advertising and marketing
- Architecture
- Crafts
- Design: product, graphic and fashion design
- Film, TV, video, radio and photography
- IT, software and computer services
- Museums, galleries and libraries
- Music, performing and visual arts
- Publishing

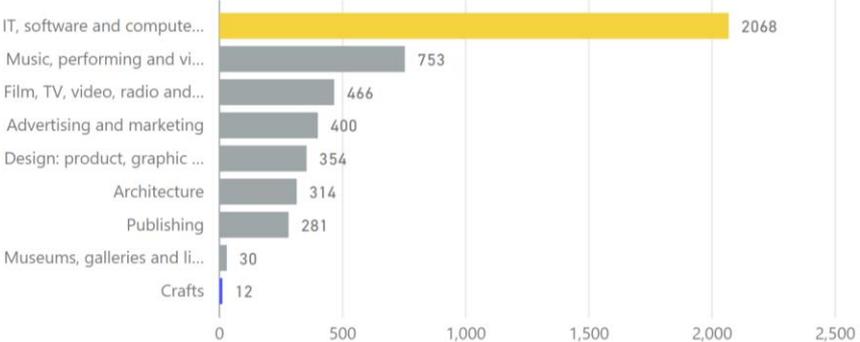
Note: anonymous company identities with simulated turnover values.

A good way to copy visual formatting in Power BI is to copy the bar chart and then select the new visualization type as a Pie Chart.

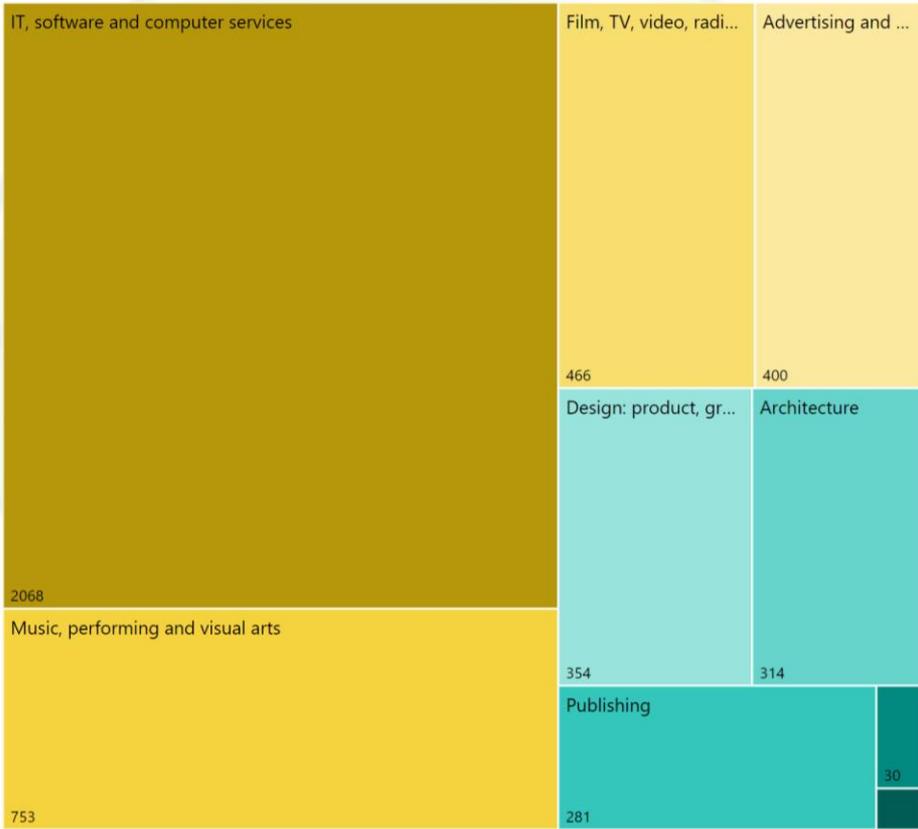
Bar Chart vs Tree Maps

Creative Digital IT (CDIT) Companies in North East England 2016-2017

Count of companies by CDIT Sector



Count of companies by CDIT Sector (Tree Map)



Select CDIT sector(s) to view

- Advertising and marketing
- Architecture
- Crafts
- Design: product, graphic and fashion design
- Film, TV, video, radio and photography
- IT, software and computer services
- Museums, galleries and libraries
- Music, performing and visual arts
- Publishing

Note: anonymous company identities with simulated turnover values.

Tree maps similarly allow comparative display of data, and provide a qualitative overview.