

Three overlapping rounded rectangles in shades of yellow and orange, arranged in a staggered, ascending pattern from left to right.

Introduction to business intelligence in public statistics (Power BI)

Webinar hosted by European Statistical Training System (ESTP) and Statistics Norway (SSB)

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About us



Øyvind Bruer-Skarsbø

*Senior Advisor
Division of Social Statistics
Labour Market and Wage Statistics
Statistics Norway*



Carl Franklin Corneil

*Advisor
Division of Social Statistics
Labour Market and Wage Statistics
Statistics Norway*

Aim of this course

The aim of this course is to give the participants an understanding of how a business intelligence tool like Power BI can be usefull in the production of official statistics, and show how to build basic dashboards using Power BI Desktop.

About this course

- All resources available at the [course website](#)
- We assume that you have installed [Power BI Desktop](#)!
- We are a big group (35 participants)
- Lets divide into 7 groups with 5 each for discussions

What is Business intelligence (BI)?

- Tools to ~~easy~~ extract and communicate insights from data
- Response to the growing amount of data in all organizations
- Make an organisation less dependent on its IT-departement
- An answer to the "webbrowser-takeover"
- A javascript-free life 😊



Why Power BI?



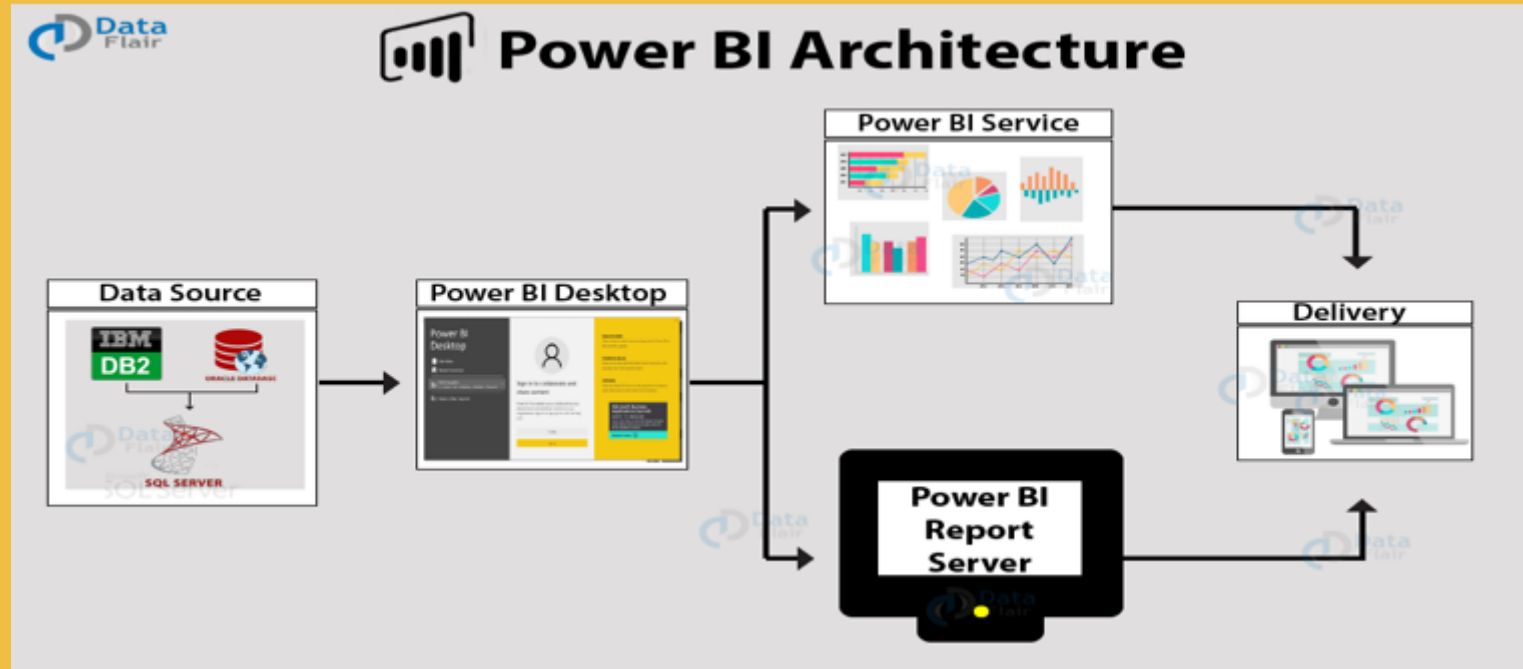
I web, therefore I am ~~spiderman~~

Yihui Xie, RStudio

Fundamentals of Power BI

- Microsoft product
- Very well integrated with the rest of Microsoft 365
- "*cradle to grave*" solution (from source-data to embeddable link)
- Tool for (mostly) descriptive statistics
- You **can** use it without code
- Desktop-version is free, and the rest costs
- Can handle most data sources...even big data!
- can do webscraping, text-analyzes, machine-learning

Basic PBI pipeline



Breaktime!!

Group discussions

How?

- 5 in each group
- 15 minutes
- select 1 group leader

What?

- How are you gonna use PBI ?
- Power BI service implemented?
- Why did your boss send you here?

Main parts of Power BI

1. Report window

- Visualizing
- Data model
- Publishing

2. Power Query

- Extract/import data
- Transform data
- Load data

Lets open Power BI!

Task 1: Importing (more) data

- **Import** and **append** the the rest of the csv-files. Remember to do the same transformations as we did with with the first dataset!

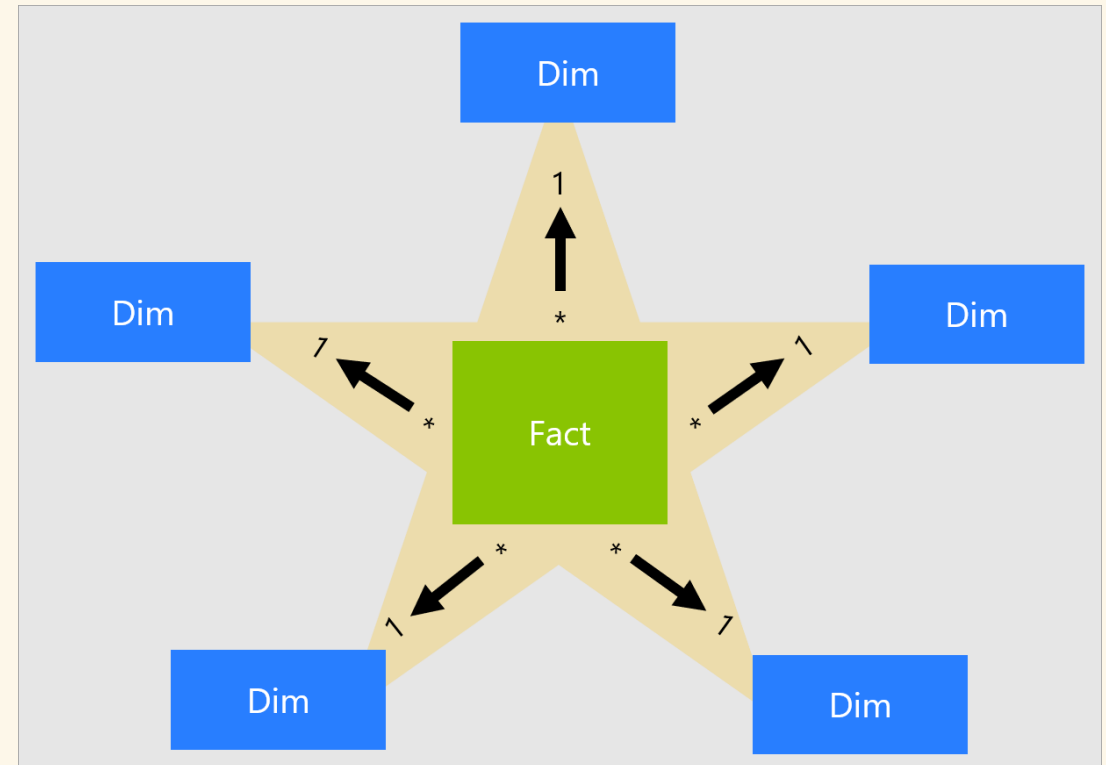
*Hint: There are many ways to do this, but remember the trick of duplicating queries in Power Query.

- After youre done importing data, check that data types and other things have not changed.
- Load the data into the report-window.
- Create a line chart with date on the x-axis and the number of people on the y-axis.

Building a data model

Star schema

- fundamental part the PBI-workflow
- 1 table that has all the variables to be aggregated
- all other information separated out to other tables
- requires some experience to set up if the data is large and you want to track changes within units over time (slowly changing dimensions)
- Dont worry! 😊 Only simple examples in this course..



Lets open Power BI!

Task 2: Adding datasets to the model

- Import the file *sn07.dim.csv* (Standard Industrial Classification 2007)
- Clean the data so that we can connect it to our main table
- Load data from Power Query to report page
- Connect it to the main dataset
- Create a matrix-visual that allows the user easily drill up and down from 1-digit to 5-digit NACE2007. The drilling should happen by the NACE-name and not the NACE-code!

Extra-task:

- Manually create a dimension-table for gender and connect it to the main dataset. Create a slicer that lets the user select which sex is displayed in the matrix.

DAX

- DAX is the "programming language" of the report window. [See documentation](#)
- DAX is used to create measures, calculated columns and calculated tables.

Measures are dynamic calculation formulas where the results change depending on context.

- Measures are by far the most important and the focus in this course.
- Organize your Measures in a separate table

Basic DAX

Syntax

MeasureName =

Function('TableName'[Column])

for example

People = COUNT('factable'[pid])

counts the number of rows in the column **pid**
in the table **factable**.

Important functions

- SUM
- COUNT
- DISTINCTCOUNT
- CALCULATE
- FILTER
- SELECTEDVALUE

DAX Operators

Comparison operators

You can compare two values with the following operators. When two values are compared by using these operators, the result is a logical value, either TRUE or FALSE.

Comparison operator	Meaning	Example
=	Equal to	[Region] = "USA"
==	Strict equal to	[Region] == "USA"
>	Greater than	[Sales Date] > "Jan 2009"
<	Less than	[Sales Date] < "Jan 1 2009"
>=	Greater than or equal to	[Amount] >= 20000
<=	Less than or equal to	[Amount] <= 100
<>	Not equal to	[Region] <> "USA"

Lets write
some DAX!!

Task 3: Write more DAX

- Create a visual that in some way shows the number of workers in each region.
- Insert a slicer that lets the "user" filter by year.
- Create a measures that shows the count of working people last year relative to the chosen year. Copy-paste the visual from [1] and replace the measure with the new measure.

Project for day 2

- Pick a data source that is relevant to you and your work (API, database, csv, web, etc.)
- Think about what you want to display
- Build a data model with the data
- Use dax to calculate measures
- Use company colors and logos to beatify your report
- Do a project that lets finish in a day (dont be over-ambitious...)
- Send us pdf-copy at the end of the day
- On day 3 you show it to the group and discuss

GOOD LUCK 😊