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Topic Seven: History of BI Tools

INMT5526: Business Intelligence

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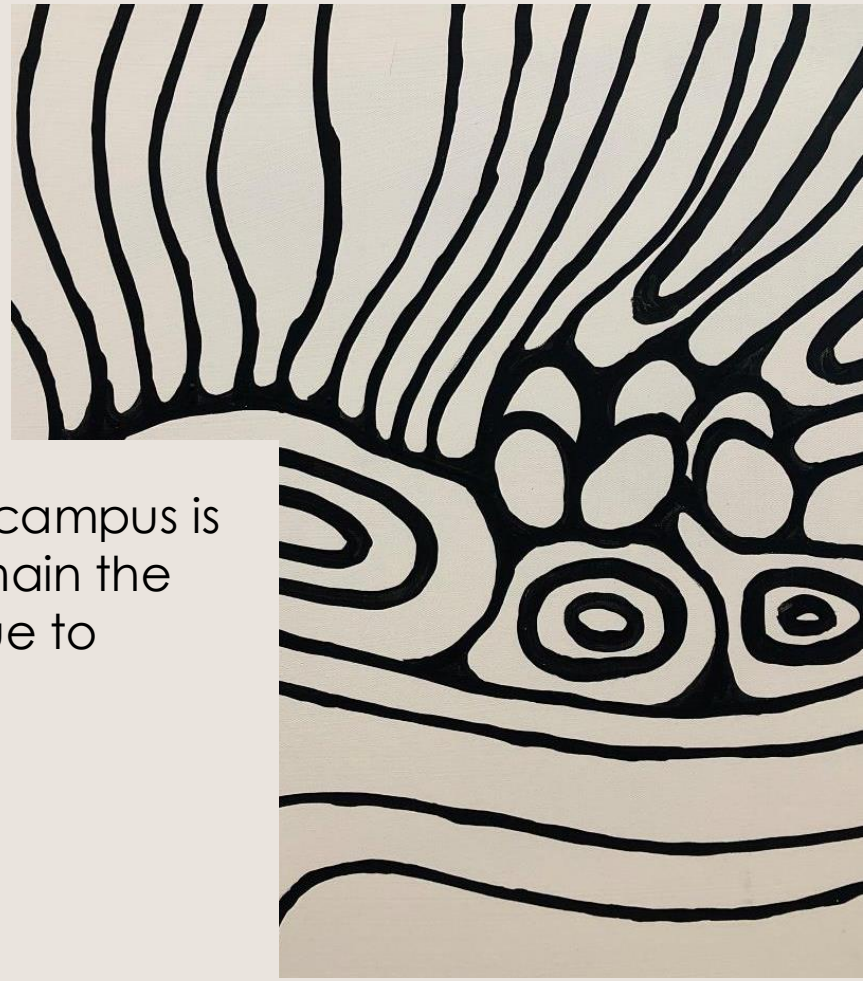
Acknowledgement of country

The University of Western Australia acknowledges that its campus is situated on Noongar land, and that Noongar people remain the spiritual and cultural custodians of their land, and continue to practise their values, languages, beliefs and knowledge.



Artist: Dr Richard Barry Walley OAM

Evolution of BI Tools

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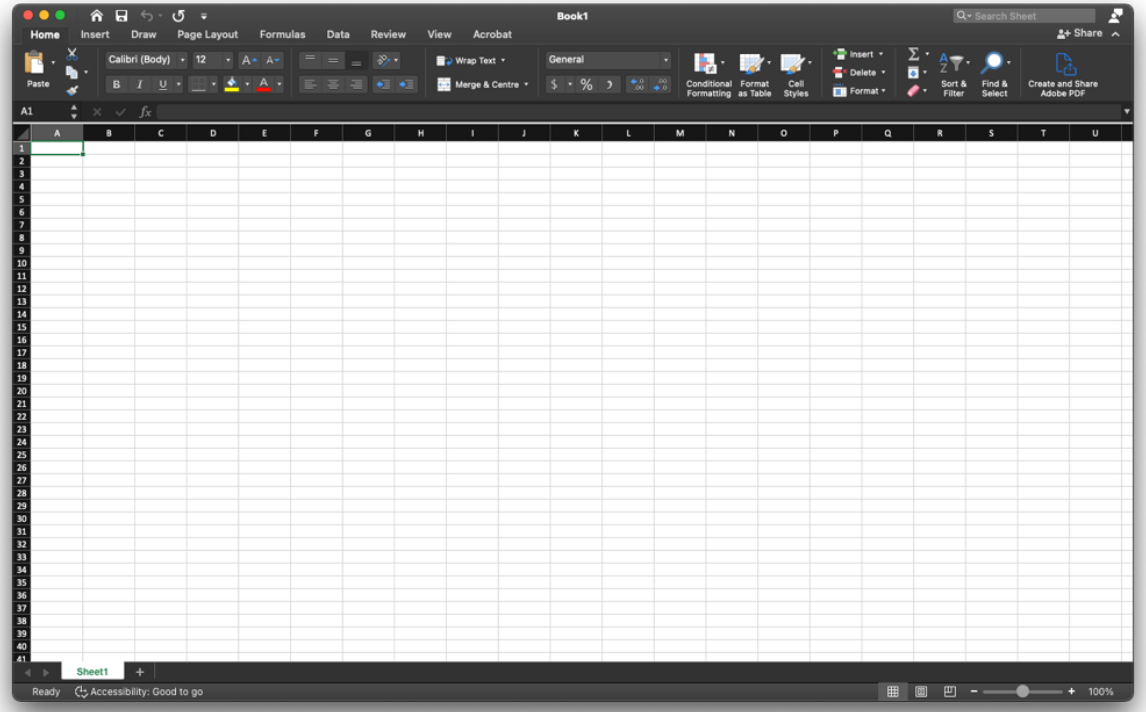
- In the beginning, there was Excel (well, not really).



Evolution of BI Tools

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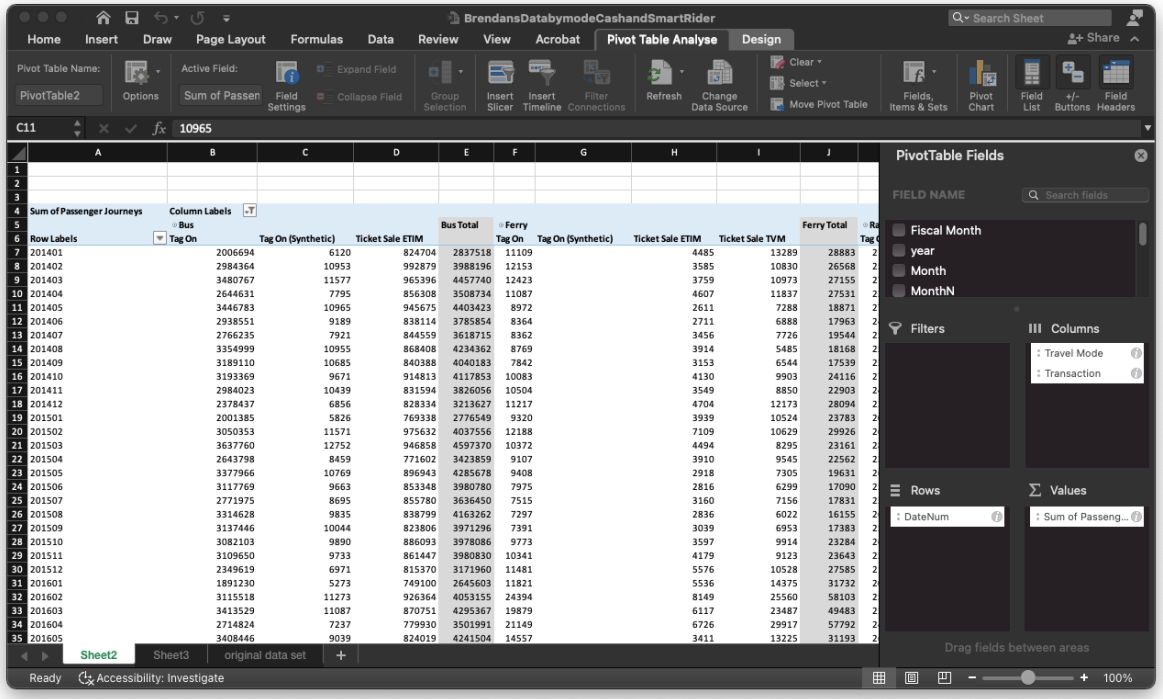
- Then, there were Pivot Tables (and Microsoft Access).



Evolution of BI Tools

- Now, there are many suites out there…
- Are there any others that you know of?

How do they work?

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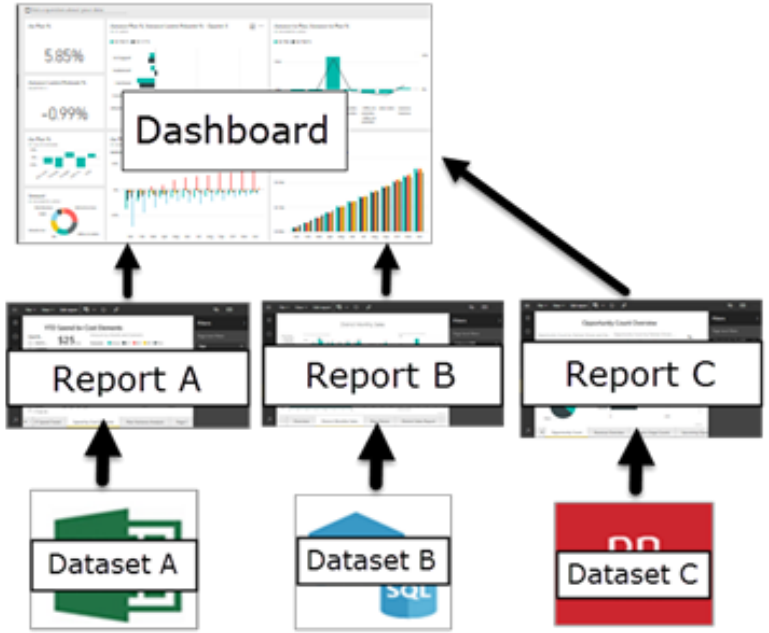
- Connect to data, including multiple data sources of different types and including real-time and online databases.
  - Make use of data models and queries to look at the data in a meaningful way.
  - Use the data models to create visualisations and reports or dashboards.
- Share insights either as files (e.g. **`.pbix`** for Power BI Desktop) or on the web (such as with Power BI Online).

How do they work?

- Generally, these tools will have an in-built suite of graphs and analytics, as well as mapping and other similar functionality.
  - Consider the Microsoft Excel 'Chart' feature – a more extensible version of it.
- In summary, business intelligence software aims to simplify the process of putting together scattered and disconnected data sources and assist in the design of repositories and (visual, graphical) reports.
  - First, data is collated, organised and modelled, before it is displayed as a report or collated into a dashboard.

Reports and Dashboards



- Recall (in BI) that a report is a view on a single dataset.
- A dashboard can be composed of multiple views (i.e. reports).
- A collection of reports and/or dashboards is called an App.
- Can you think of some issues with calling this package an App?

Microsoft. (2022). *Introduction to dashboards for Power BI designers– Power BI | Microsoft Learn*. [online]. Available from: https://learn.microsoft.com/en-us/power-bi/create-reports/service-dashboards.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Topic Seven: Intro to Power BI

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Power BI

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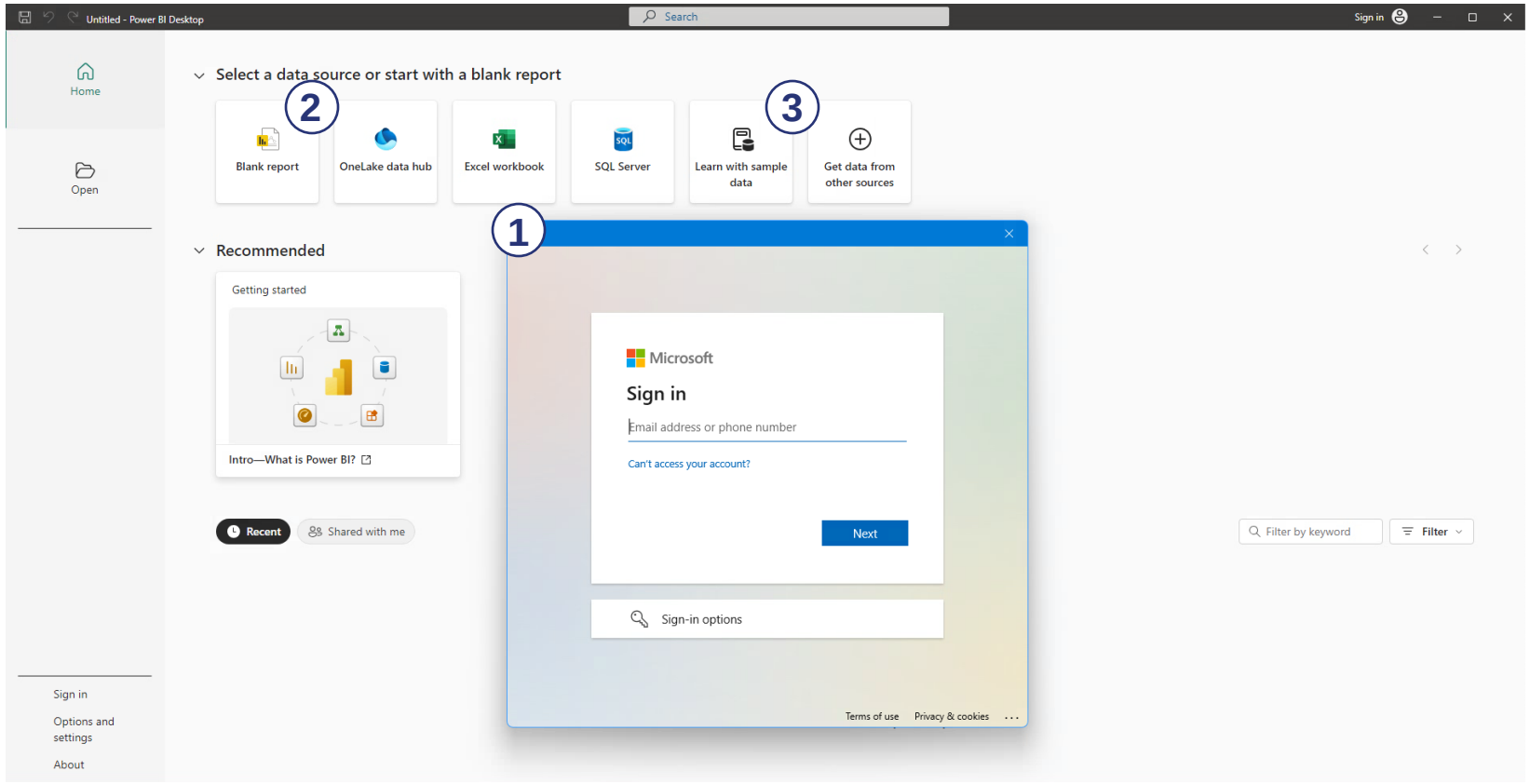
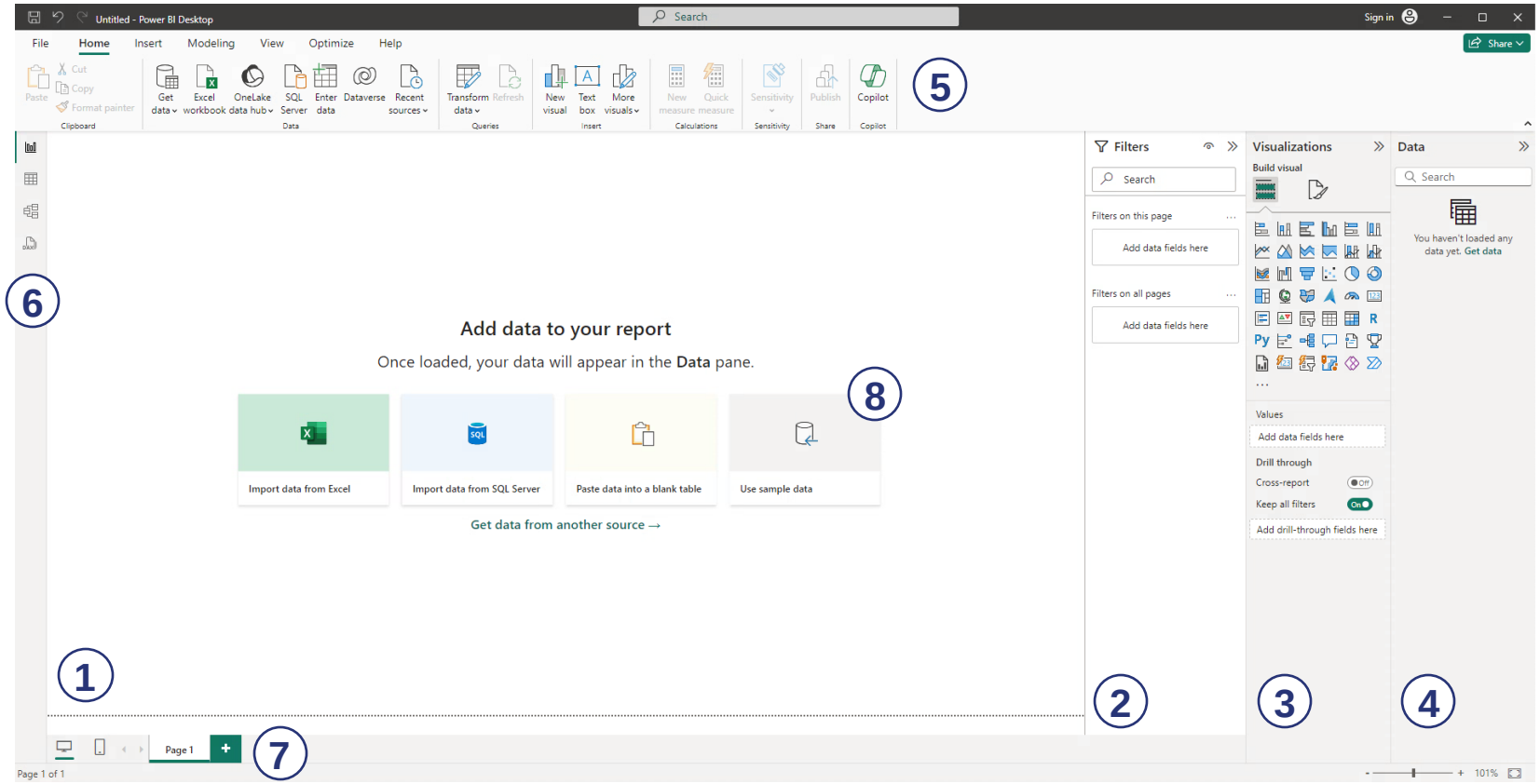
- Power BI is the name of a product suite of business intelligence tools (that can do what is described above) which is produced by Microsoft.
  - Power BI Desktop, as the name suggests, is a Windows (not available for macOS) application used to build dashboards and reports.
  - Power BI Online allows the building of limited dashboards and the sharing of them with others (as we saw earlier) from any web browser.
  - Power BI Desktop creates files with a **`.pbix`** extension.

Power BI Screenshot – Launch



Power BI Screenshot – Interface



Using Power BI

- Power BI is available on the lab computers on the UWA campus in Crawley, such as the Trading Room, with no installation needed.
  - Just search for 'Power BI' in the search box on UniApps – accessible from the desktop.
- If you are not on campus, you can use the UniApps remote desktop system to access Power BI, even on non-Windows PC's (at least those running macOS).
  - Log in at https://uniapps.uwa.edu.au/ with your UWA details.
  - Issues with other operating systems (macOS) should be ironed out from MySQL.

Using Power BI

- Issues with the UniApps system should be directed to UnilT, as it is not run or controlled at all by the Business School.
  - You can try running PowerBI Online (not recommended) or downloading it to your own machine as an alternative to this, if you have a Windows computer.
- The rest of our BI tool work will be spent exploring (the basics of) PowerBI Desktop.
  - We'll be going into further detail over the next three weeks.

What You'll Build

- Your manager wants to see a report on your latest sales figures. They've requested an executive summary of:
  - Which month and year had the most profit?
  - Where is the company seeing the most success (by country)?
  - Which product and segment should the company continue to invest in?

Microsoft. (2022). *Tutorial: From Excel workbook to stunning report in Power BI Desktop – Power BI | Microsoft Learn*. [online]. Available from: https://learn.microsoft.com/en-us/power-bi/create-reports/desktop-excel-stunning-report.

What You'll Build

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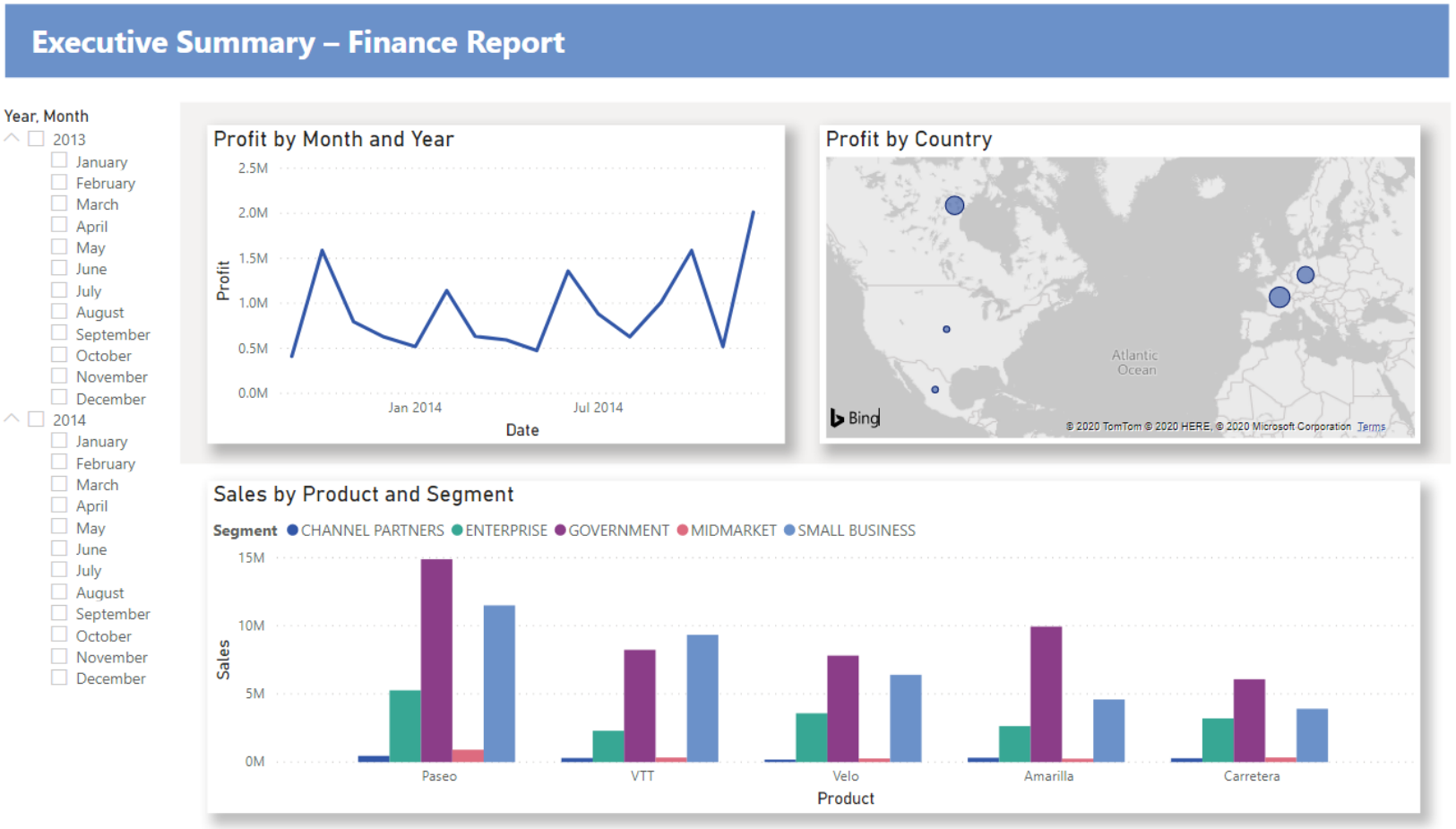

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Topic Seven: Your Power BI Task

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Creating the Dashboard

- Open up Power BI Desktop on your own or the lab machines.
  - Press the "X" button in the corner if a window appears asking for you to sign up.
  - Press the "X" button on the window that appears asking you to open a file (if present).
- On the screen that appears, don't select the option to "Learn with sample data".
  - Create a "Blank report". From here, select the option "Use sample data".
- If this does not work, download the data separately here.
  - Then, load in an "Excel workbook" file from "Data" under "Home".

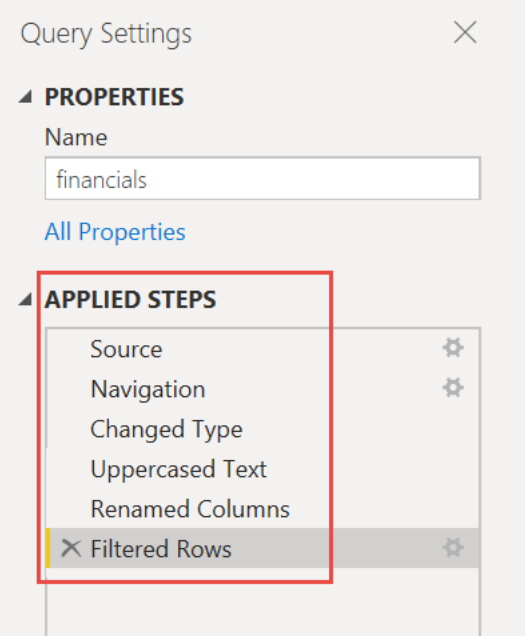
Transforming Data

- Often, we will need to transform our data before we can use it. This can take many forms of operations we can undertake:
  - Deriving one attribute from one or more attributes;
  - Adjusting the shape of the data ("rows and columns");
  - Adjusting the data type/data format of an element.
- We do this to ensure that the data is regular, in the most efficient and useful format and to ensure that the data follows the 'usual' ('relational') format – rows & cols.

Cleaning Data

- You will need to clean the data that you have imported.
  - Select the "Financials" table and then the option "Transform Data";
  - Select the "Units Sold" column and from the "Transform" tab, select the option "Data Type" and change it to "Whole Number", ensuring you replace current values;
  - Select the "Segment" column and in the same manner, adjust the "Format" of the column to be in "UPPERCASE" to make the data more regular;
  - Double-click the title of the "Month Name" column and rename it to "Month";
  - Click the arrow to the right of "Product" and de-select "Montana" as we are not interested in this product, so it can be removed.

See What You've Done



We can see in the sidebar on the right each of the steps we've taken.

We can then undo them, one-by-one.

Next, go to the "Home" tab and click "Close & Apply" to go back to the main editor in Power BI.

Data Formats in the Editor

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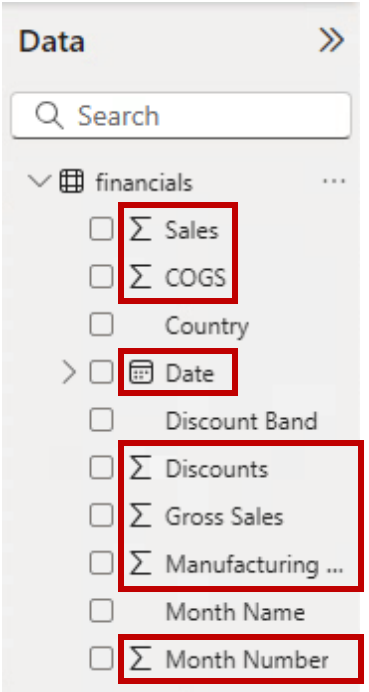
It can be seen that there are icons next to some (but not all) of the fields (attributes) in the editor.

- What does the "sigma" symbol mean?
- What about the one next to Date?
- What are the benefits of this to us?



DAX Language

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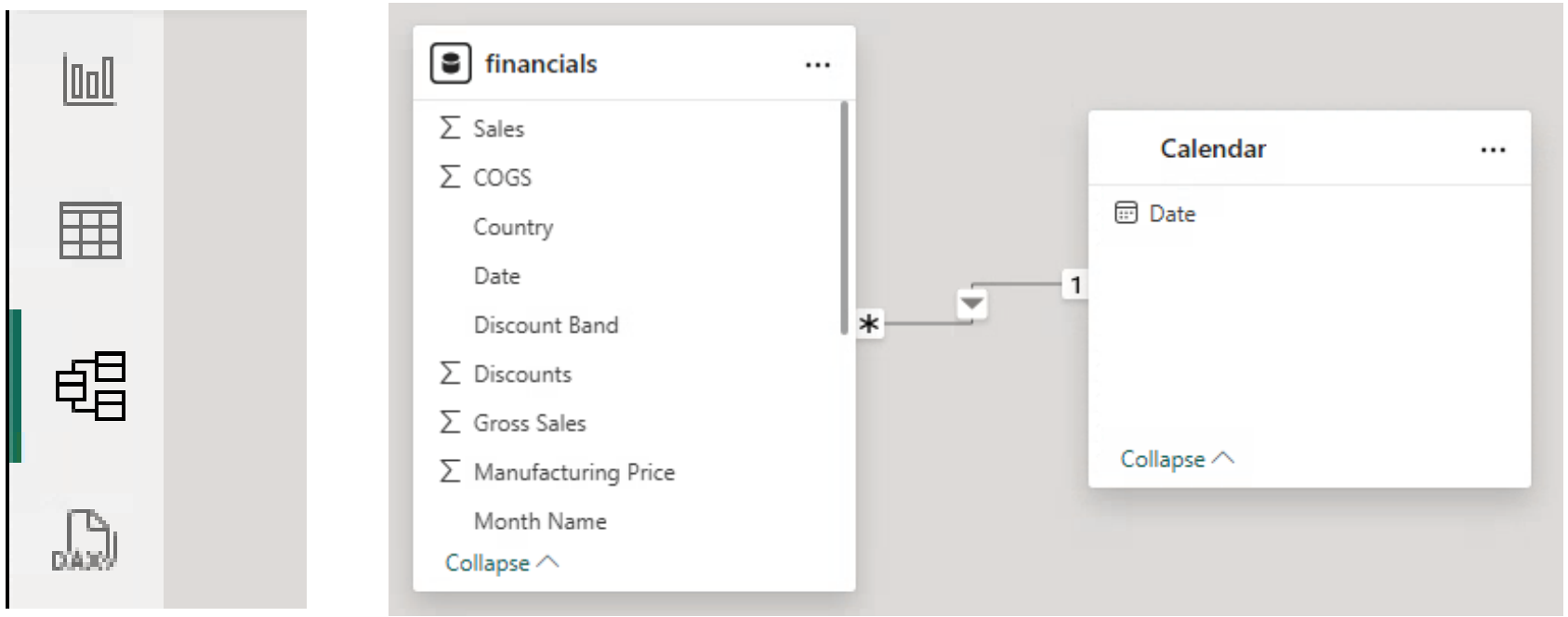
- We can write queries in the DAX language to create measures (values) and tables (no difference to usual) based upon functions applied to tables.
  - An Example: We can create a total of Gross Sales named "GrossTotal" with the following syntax: **`GrossTotal = SUM(financials[Gross Sales])`**.
  - The functions are fairly similar to what is available within Excel – otherwise it can be quite clearly seen how attributes and tables are referred to.
  - We can write these functions within Power BI to calculate the values "on the fly" (although limited by data) and utilise within visualisations.

Adding in a Measure & Table

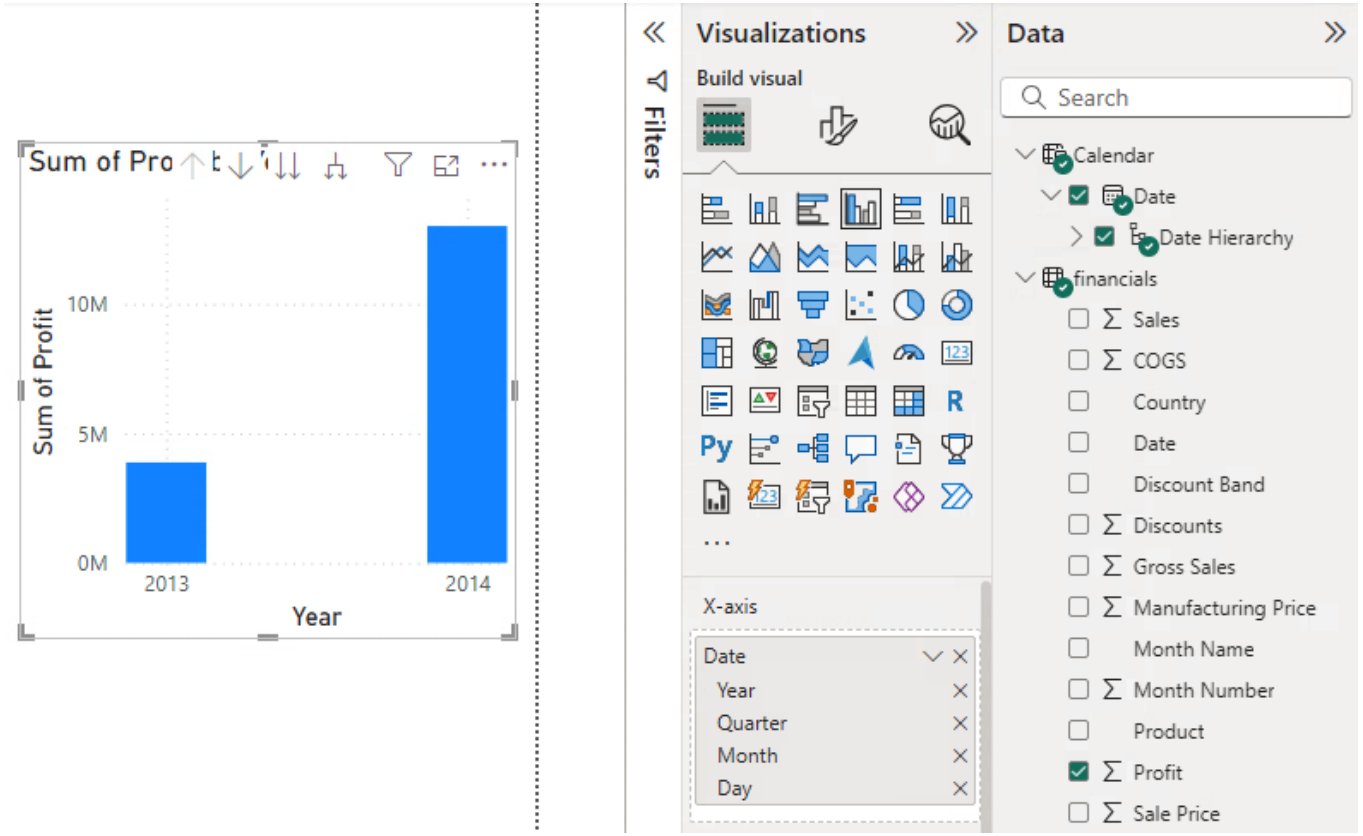
- From the “Home” ribbon, select the option to create a “New measure”.
  - Name the measure “Total Units Sold” within your DAX syntax.
  - The measure should contain the total number of units sold – a single number.
  - Once you have done this with the SUM function, click the check mark to confirm.
- From the ”Home” ribbon, create a new Table with the following DAX:
  - `Calendar = CALENDAR(DATE(2013,01,01), DATE(2014,12,31))`

Creating the Data Model



Creating the Visuals

Creating the Visuals



We can select a Visualisation from the Visualisations pane and drag it over to add it to the Report.

Selecting the Visualisation within the report, the fields can then be selected as seen on the right.

Additional options at the bottom.

The End: Thank You

Any Questions? Ask via email (tristan.reed@uwa.edu.au)