



## WEEK 3 — POWER PIVOT

Power Pivot and the data model bring big datasets and database-like modelling capability to Excel.

### ENABLE THE POWER PIVOT ADDIN

Power Pivot comes with recent versions of Excel but is not enabled by default. To enable it, go to **File** ► **Options** ► **Add-ins**. In the **Manage** drop-down box, select **COM Add-ins**, and click **Go**. Tick **Microsoft Power Pivot for Excel**. Click OK. You should see a new **Power Pivot** ribbon tab.

### THE DATA MODEL

The Data Model is where Excel stores big data and tables with relationships. Add data by clicking into your table then going to **Power Pivot** ► **Add to Data Model**, or in Power Query when you load the query: **Load To** ► **Add this data to the Data Model**.

### DATA AND DIAGRAM VIEWS

In Power Pivot on the **Home** tab, you can switch between the **Data** and **Diagram** views. The **Data** view looks like a normal Excel workbook and is where you define calculated columns and measures. The **Diagram** view is where you define relationships between tables.

### WORKING WITH RELATIONSHIPS

Excel may offer to auto-detect relationships or you can add them yourself. In the **Diagram** view, click on the field in one table that you want to link and drag to the field in the other table. Hover over a link to see which fields are related or double-click to see a detailed view. To delete, select the link and press **Delete**, or right-click and select **Delete**. Auto-detection will only work if the field names match.

### HIERARCHIES

Hierarchies occur when a field is nested within another one. For example, day within month within year, or city within state within country. In the **Diagram** view, click **Create Hierarchy** at the top-right of a table panel. Drag columns into this to create levels in the hierarchy. Use as normal in a PivotTable. The **Expand** and **Collapse** buttons show more levels while **Drill Down** goes into the current level.

### CALCULATED COLUMNS AND MEASURES

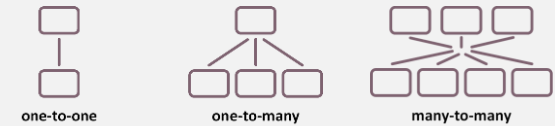
Both calculated columns and measures are created using DAX, but calculated columns add a new column to the dataset whereas measures are used when the table is summarised, for example in a PivotTable.

*Implicit* measures are used when you add a field to a PivotTable. Measures that you create are *explicit* measures and you have more control over how they are calculated and displayed.

### DATE TABLES

If you want to do more complicated calculations with dates, for example if you want to use the DAX time intelligence functions, you will need a date table. Tools for working with these in Power Pivot are on the **Design** tab under **Date Table**. **New** will create one that you can then modify, or you can import one that you have already created.

### TYPES OF RELATIONSHIPS



There are 3 main ways that data fields can relate to each other.

**One-to-one**: each UN representative country has 1 vote in the UN General Assembly.

**One-to-many**: one company can have many branch offices.

**Many-to-many**: a book can have many authors and an author can write many books.

When we are linking tables, generally we create one-to-many relationships. The field that is used to link between tables is called the *key*. In the “one” table this is the *primary key*, in the “many” table it is a *foreign key*.

### DAX vs M

**DAX** (data analysis expression) is used in Power Pivot and Power BI to create calculated columns and measures. These calculations look like Excel workbook functions in tables, but the available functions are different.

**M** is used in Power Query and Power BI to filter and combine data from multiple sources. It does not look anything like Excel workbook functions.