Data Sources and Logic

Topics

- Adding data sources
  - Connection types
  - Service example
- How do I decide which data source to use?
  - Excel
    - Static
    - Dynamic (cloud)
  - SharePoint
  - Azure SQL database
  - Dataverse

- The On-Premises Data Gateway
- What is delegation?
  - Delegable data sources
  - Delegation warnings
  - Row limit for non-delegable queries

Adding data sources

- Plug your apps into a wide-range of connections
- Over 345 data sources and services are available
- **View** > **Data sources** > **Add data source** > **New connection**

  - Preview – *New and might change*

  - Premium – *Requires premium plans*

Connection types

Services

- Services that can provide functionality like:
  - Microsoft Translator
  - Text Analytics
  - Face API
  - MSN Weather
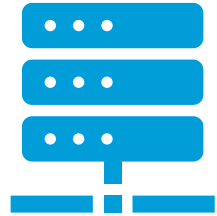
Data storage

- Tables to store and retrieve data such as:
  - Excel
  - Google Sheets
  - SharePoint
  - SQL
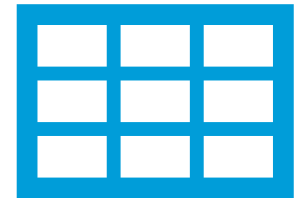
Service example - translation

- To add a connection to a service, click **View** > **Data sources**, then click **Add data source**
- Click **New connection**
- To add translate services click **Microsoft Translator** Microsoft Translator
- Translation formulas are now available to use in the app
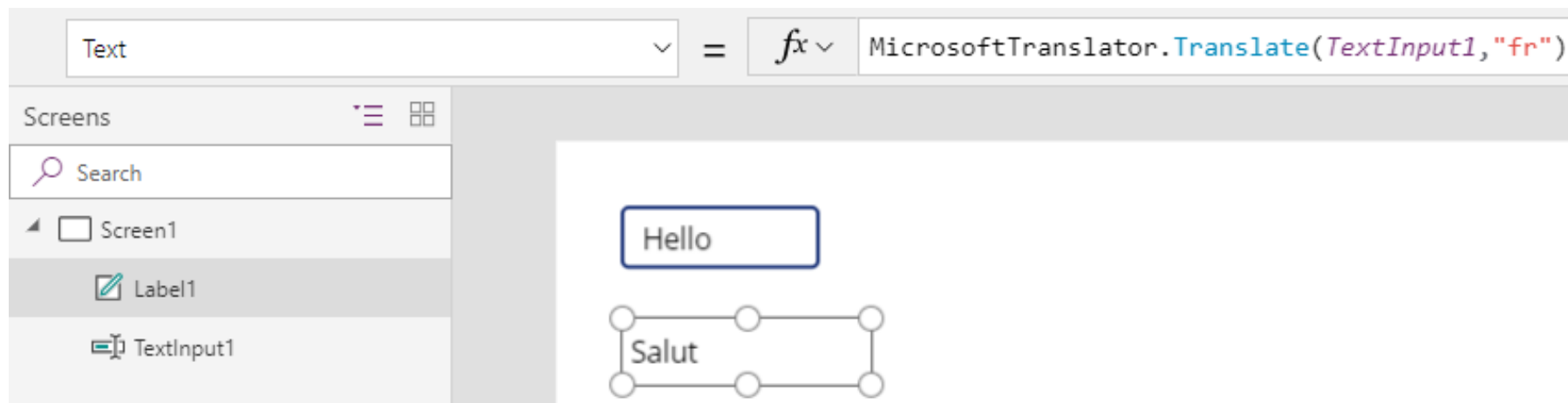
How do I decide which data source to use?

	Cost of database	License required	Difficulty	Volume of data	Delegated formulas
Excel	FREE	None	Easy	Default of 500 rows	None
SharePoint	FREE	None	Easy	Large	Limited
SQL Azure	£30.20 per user/month Or £7.50 per user/app/month + Cost of SQL	Premium Licenses	Hard	Large	All
Dataverse	£30.20 per user/month Or £7.50 per user/app/month	Premium Licenses	Easy	Large	Limited

Excel

- Can be a quick Starting point as you may already have the data
- Connecting to an app adds a column to Excel called _Power AppsId_
- Excel is great for testing but some consideration is required if this app is an essential business solution:
  - Excel data must be stored in personal cloud storage like OneDrive, which is risky if the data source is business critical
  - A users OneDrive is purged if a user leaves the business
  - If the data source is essential, the table can be converted into a SharePoint list
- As well as connecting and updating a cloud hosted spreadsheet, you can also import a **static** spreadsheet using the connection **Import from Excel**
- This is useful if you need the data for presenting information offline

SharePoint

- Power Apps can be used with SharePoint to
  - Create an app
  - Customise data entry forms
- To create an app you can start the process from within SharePoint or from Power Apps
- To Edit a SharePoint data entry form you will need to start the process from SharePoint
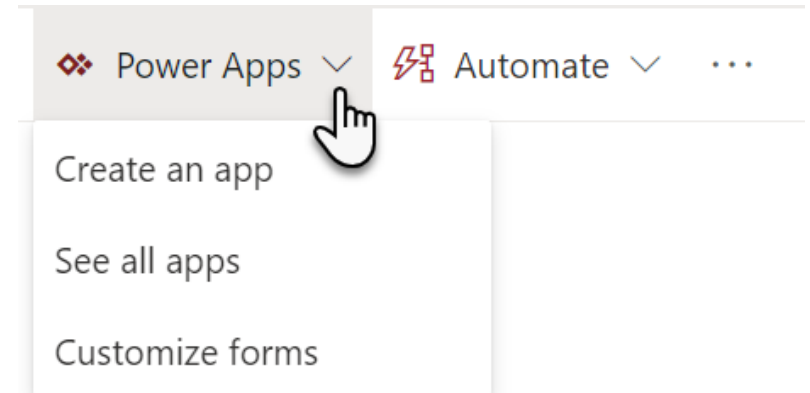
Azure SQL database

- Connecting an app to a database offers many benefits
- For apps that submit data, databases offer the best solution for growth
- Azure SQL databases are cloud hosted making them highly available
- Credentials used to access the database are included in the connection
- This means that people who you share the app with are using those credentials to interact with the database
- Where as other data sources like SharePoint or Excel will require you to authorise access to both the app (by sharing it) and also the data source

Dataverse

- Formerly called the Common Data Service or CDS
- Dataverse is a database hosted in Microsoft 365
- It is great for those who may want to create a new database quickly
- It is managed through a web interface and allows you to create columns, tables, relationships and rules
- Microsoft database designed specifically for use with the power platform
- It is required for Portal apps and Model-Driven apps
- There are two variations of Dataverse which are
  - Dataverse – full database capabilities however requires a premium Power App license
  - Dataverse for Teams – a more limited database but it is free (as part of the Microsoft Teams license) as long as your app is consumed directly from Teams

On-premises Gateways

- It is still common that an IT department will host business critical solutions on their own servers
- The on-premises data gateway offers the power platform a secure means to access data held on local servers
- The gateway will allow you to access:
  - SQL Server
  - SharePoint
  - Oracle
  - Informix
  - Filesystem
  - DB2

⦿ Connect directly (cloud services)

◯ Connect using on-premises data gateway

On-Premises Data Gateway
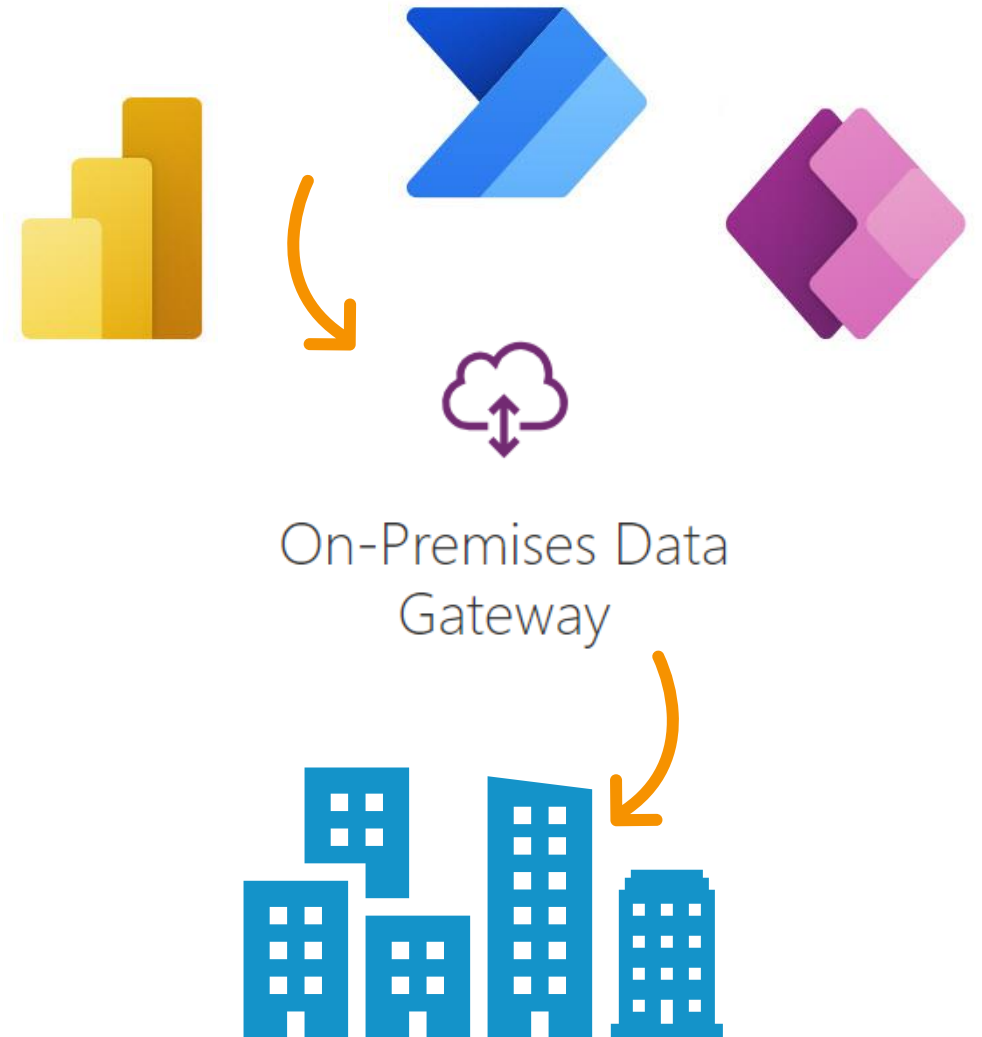
What is delegation?

- Delegation refers to how your data source handles formulas
- A formula can be:
  - Delegated to a data source which performs the calculation
  - Can not be delegated and must be calculated by the app

- Based on the competency of the data source you may return partial results for a calculation e.g. **a sum of Q2 sales**
  - SQL supports delegation in full, it performs the sum calculation on the server and returns the correct total for every row in the table
  - Excel does not support delegation for the SUM formula, so by default the calculation happens within the app against the first 500 rows from the table that are already loaded into the app
  - This means that if the Excel table has over 500 records, data is missed out of the calculation

What is the sum of sales for Q2 this year?

500

Delegable data sources

- Although various data sources support delegation, some offer more support than others
- The following data sources offer delegation:
  - Dataverse - **Yes**
  - SharePoint - **Yes** →
  - SQL Server - **Yes (all)**
  - Dynamics 365 - **Yes**
  - Salesforce - **Yes**
- Microsoft's page for delegable data sources
  - https://docs.microsoft.com/en-us/powerapps/maker/canvas-apps/delegation-list/

	SharePoint
Average	No
Filter	Yes
LookUp	Yes
Max	No
Min	No
Search	No
Sort	Yes
SortByColumns	Yes
Sum	No

Delegation warnings ⚠️

- You will be notified if your formula can not be delegated to the data source

  Delegation warning. The "Filter" part of this formula might not work correctly on large data sets. The data source might not be able to process the formula and might return an incomplete data set. Your application might not return correct results or behave correctly if the data set is incomplete.
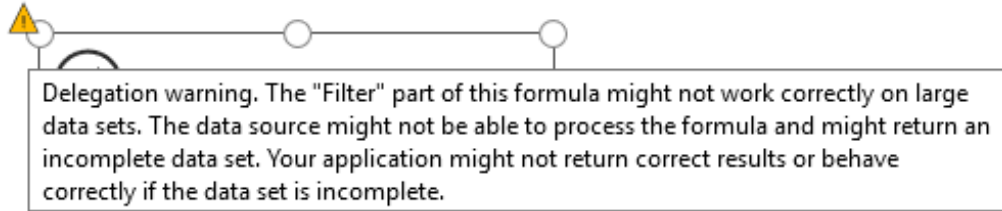
- Delegation warnings show as warning triangles

- Your app can still be saved, published and shared

- Are there any solutions to a delegation warning?
  - Ignore the error if you have a small data set of less than 500 items
  - Change the data source, e.g. from Excel to SharePoint or SQL
  - Use a different formula if possible
  - Increase the limit! 💪

Row limit for non-delegable queries

- You may choose to manually increase the row limit for non-delegable queries
- This is achieved in the settings for the app
  - **File** > **Settings** > **Advanced settings**
  - The default set to 500
  - It may be increased to 2000

Data row limit for non-delegable queries

Set how many rows are retrieved from server-based connections where delegation is not supported.

Value:

500

Lab 5 – Translation app

- Module 9: Page 51 to 56   [20 Mins]
- Exercise 1 – Create a new blank app
- Exercise 2 – Design a translation app using a selection of controls
- Exercise 3 – Use a button control to moderate the translation

Hello my name is Chris

Finnish

Translate to Finnish

Hei nimeni on Chris

Key Points

- Connections are one of the most important tools in Power Apps
- They allow your app to:
  - Connect to a wide range of data sources (not just SharePoint and Excel)
  - Call services to extend the functionality of Power Apps
- Some connections are risky (preview) or have a financial cost (premium)
- You can connect an app to several different connections
- Data sources have limits when it comes to formulas, check which formulas are delegable