**Building a Cloud-Based Data Dashboard in Azure**

# Learning Objectives

By the end of this activity, learners will:

* Use open data to source meaningful insights.
* Build a cloud-based data pipeline using Azure services.
* Create and publish a data dashboard using Azure-native tools.

# Tools & Services Used

* Azure Storage Account
* Azure Data Factory
* Azure SQL Database
* Power BI (connected to Azure SQL Database)
* Microsoft Open Data, data.gov.uk, Kaggle or other datasets

# Step 1: Choose and Download an Open Dataset

Begin by selecting a dataset that can offer interesting insights. Transport, health, and environment are usually accessible and rich.

* Go to [data.gov.uk](https://data.gov.uk/), [Microsoft Open Data](https://azure.microsoft.com/en-us/services/open-datasets/), or [kaggle.com/datasets](https://www.kaggle.com/datasets/).
* Download a CSV dataset (e.g., UK Road Safety Data or Public Health Statistics).
* Save it locally — they’ll upload it to Azure later.

# Step 2: Upload Data to Azure Blob Storage

This step familiarises you with object storage and cloud-based data access.

1. Sign in to [Azure Portal](https://portal.azure.com/)
2. Create a **Storage Account**:

* Go to *Create a resource* > *Storage* > *Storage account*
* Choose a unique name, region, and keep default settings

1. Navigate to the storage account > *Containers*
   * Create a new container (e.g., open-data) and set it to **Blob (anonymous read access)** for easy access
2. Upload the dataset CSV file to the container

**Guide**: [Quickstart: Upload, download, and list blobs with the Azure portal](https://learn.microsoft.com/en-us/azure/storage/blobs/storage-quickstart-blobs-portal)

# Step 3: Use Azure Data Factory to Load Data into Azure SQL

Use a low-code tool (Data Factory) to create pipelines.

1. In Azure, create an **Azure SQL Database**:
   * Select *Create a resource* > *Databases* > *SQL Database*
   * Use default values, but **create a new server** with a **login** and **password**
   * Make sure to make the Connection public, and Add Current Client IP Address to yes.

**Guide:** [Create a single database - Azure SQL Database](https://learn.microsoft.com/en-us/azure/azure-sql/database/single-database-create-quickstart?view=azuresql&tabs=azure-portal)

1. In Azure, create **Azure Data Factory**:
   * Create a *Data Factory* resource.
   * In the resource, open the Data Factory Studio
   * Once deployed, go to *Author & Monitor*
2. Create a new pipeline in ADF:
   * Set Blob Storage as the source (connect to the container with a linked service)
   * Set Azure SQL DB as the sink (use auto-table creation)
   * Map columns if needed and run the pipeline

**Guide**: [Copy data from Blob storage to SQL Database using Data Factory](https://learn.microsoft.com/en-us/azure/data-factory/tutorial-copy-data-portal)

# Step 4: Build a Dashboard in Power BI

Now it’s time to visualise. Connect to the cloud database and start building your dashboard.

1. Open [Power BI Desktop](https://powerbi.microsoft.com/en-us/desktop/)
2. Connect to **Azure SQL Database**:
   * Provide the server name and credentials
3. Load the imported data table
4. Create visuals:
   * Column/bar charts, slicers, KPIs, maps if data includes geolocation
5. Publish to the **Power BI Service** (optional):
   * Share the dashboard with peers or embed it in a website

**Guide**: [Azure SQL Database with DirectQuery](https://learn.microsoft.com/en-us/power-bi/connect-data/service-azure-sql-database-with-direct-connect)

Alternatively, use Streamlit or Dash to create an interactive dashboard.

**Guide:** Example repositories: [Streamlit Examples](https://github.com/streamlit/cloud-example-apps) or [Dash Sample Apps](https://github.com/plotly/dash-sample-apps)