Trends and Policy Impacts in UK Study and Work Visa Sponsorships: A Data-Driven Analysis Using SQL Server and Power BI.

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Acknowledgement

We hereby declare that the work presented in this report titled **" Trends and Policy Impacts in UK Study and Work Visa Sponsorships: A Data-Driven Analysis Using SQL Server and Power BI"** is entirely our own, except where otherwise stated.

The SQL scripts, data cleaning procedures, analyses, visualizations, and interpretations contained herein were conducted independently using the dataset provided. We confirm that we have not engaged in any form of plagiarism or academic misconduct in the preparation and submission of this assignment.

We understand that any violation of the university's academic integrity policies may result in disciplinary actions, including potential failure of this assignment or course.

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Abstract

The aim of this project is to look behind such stories and get our heads around where migration does occur, at what scale exactly and in which directions using two main datasets: Study Sponsorship and Work Sponsorship. The main goal is to clean messy/disorganized data and convert those into the most accurate & consistent set of analytical structure/models for decisions making and insight generation. Datasets were initially cleaned and preprocessed in SQL Server by uniformly fixing erroneous data types, missing entries, duplicate records, and inconsistent category names. All metadata rows, null records were eliminated to increase the analytical accuracy.

After data cleansing, the data was connected to Power BI in both Import mode and Direct Query mode; your queries ran seamlessly against SQL Server data. In the Power Query Editor, further transformations were performed—unpivoting year fields, renaming attributes to be more meaningful for users, grouping categories, and filtering out irrelevant columns. In order to facilitate trend analysis, make comparisons and produce more complex visuals new calculated fields as well as DAX measures were defined.

A multi-page dashboard which is more interactive in nature was then developed. Key persuasive information was presented on items such as student visa applications, work visa sponsorship pattern, geographical variations, seasonal variations, and top-level KPIs. The changes over time and differences across nationality, application type, institution type, and sector were illustrated using visuals such as line charts, clustered bar charts and decomposition trees as well as comparative trend graphs.

Overall, this study demonstrates a complete end-to-end data analytics workflow—from **data cleaning in SQL**, through **ETL processes in Power BI**, to **insightful visual reporting**—providing a robust foundation for understanding UK migration dynamics. The final dashboard supports policymakers, researchers, and stakeholders by offering a clear, data-driven view of historical trends and emerging patterns across study and work sponsorship categories.

Table of Contents

Table of Figures

1. Introduction.

In recent years, international mobility for education and employment has increased steadily, leading to a growing demand for transparent, data-driven insights into immigration trends. Governments, universities, and private organizations rely on accurate sponsorship data to evaluate policy effectiveness, allocate resources, and understand changes in application volumes over time. Data-driven dashboards have become an essential tool for analyzing migration patterns, enabling users to identify trends, compare categories, and make informed decisions.

This project aims to design a comprehensive Power BI dashboard by using two key datasets—**Study Sponsorship** and **Work Sponsorship**—imported into SQL Server. After performing data cleaning, data type corrections, and removal of null or redundant rows, the refined datasets were transformed into meaningful visual analytics. The dashboard combines time-series views, category-wise comparisons, and advanced visuals supported by Power BI DAX measures. This report documents the technical workflow followed from data preparation to dashboard development and interpretive insights.

1.1 Background.

Migration plays an important role in supporting both The UK labor market and education sectors, specifically in relation to university education. The UK Government publishes detailed statistics regarding international mobility and visa sponsorship for work and student visa routes for both work and non-work-related international mobility. These datasets also help to identify trends from international mobility, including which sectors are best suited for growth, sponsor performance, the overall issuance of the visa and ultimately the 'migration behavior' of those using these routes over time.

This report will focus on two datasets sourced from official UK Home Office Migration Statistics that relate specifically to 'Sponsorship' dataset series within the overall dataset. These datasets are:

- Migration Work Sponsorship Dataset
- Migration Study Sponsorship Dataset

These datasets are available as public statistics and are commonly used to analyze policy and academic research in supporting operational planning.

The analytical process for this report consists of identifying sponsorship behaviors relevant to both work and study, by evaluating the datasets through Power BI dashboards.

1.2 Problem Statement.

Because of its complexity and size, interpreting any UK Home Office migration data requires appropriate analysis and visualization — enabling stakeholders to answer the following questions:

- Which education providers and/or sectors are experiencing the highest levels of sponsorship activity?
- How are there differences in approval/refusal patterns for study vs work visa routes?
- Are any particular sponsorship categories growing or declining over time?
- Which trends might provide policymakers (or institutions) insight for planning purposes in the future?

This report responds to these questions through the application of structured data analysis methodology and creating Power BI-based dashboards that convert the data into user-friendly, analytical insights.

2. Objectives.

The goal of this project is to review the historical UK Study and Work visa sponsorship trends by analyzing real-world datasets that were published by the UK Home Office. By connecting the data from SQL Server with that from Power Bi, this project will convert the government raw data into actionable insights that will enable us to understand how migration patterns have changed over time.

2.1 General Objectives.

The overall goal of this investigation is to analyze the long-term trend of UK Study and Work visa sponsorships by obtaining, preparing, modeling, and visualizing the official Managed Migration - Historic datasets. Specifically, to examine how changes in policy impacted migration patterns and to determine what segments of the applicant population received approval for sponsorship and how migration behavior has changed for each of these visa types.

2.2 Specific Objectives.

A primary focus will be for the researcher to obtain and store all of the datasets in a structured environment, such as SQL Server, specifically for this project. The first step will be to extract the Study and Work Sponsorship datasets, develop a dedicated database, and to correctly import all tables to have access to all pertinent information, ensuring that each column has a defined corresponding column type to support analysis.

Another specific focus will be to cleanse and prepare all of the datasets to be appropriate for use. This will include the renaming of variables to indicate their intended use, remedying any missing or inconsistent values, and filtering or reorganizing the data via SQL prior to loading into the Power Bi application.

Build a sophisticated data model in Power BI by establishing relationships between your tables, performing transformations in Power Query and creating calculated fields and DAX measures to enable you to perform useful analysis such as approval/rejection rates and total number of sponsorships.

Two interactive dashboards (one for Study Sponsorship and another for Work Sponsorship) will be developed with trend over time, nationality analysis, outcomes comparison and the extension pattern of sponsorships. Each dashboard will have slicers,/bookmarks/drill-down/drill-through/tooltips.

The project will also address the interpretation of results and reflective analysis on the analytical process. The report will cover challenges that were faced during data import, data cleaning and modelling and describe how Power BI has been used to maximize the benefits of the analysis and summarize the key learnings that were gained through comparison of Study and Work sponsorship data.

3. Dataset Overview.

3.1 Dataset Description.

The Managed Migration Program (MMP) series is comprised of two official data sets created by the UK Home Office. These data sets contain detailed historical record information regarding the MMP's sponsorship activities involving both the Study Visa Route and the Work Visa Route. The datasets include Applications for visas and extensions of stay for study using sponsor acceptances, by education sector and nationality and Applications for visas and extensions of stay for work using sponsorship certificates, by tier and country of nationality and an annualization of the data over the years. Both datasets were extracted from the **UK Government official open data platform** and contain structured tabular data suitable for SQL-based storage and analysis. The two datasets are:

- **The Study Visa Sponsorship Dataset**.

The Study Sponsorship dataset contains immigration information related to applications submitted for educational purposes. It includes fields such as **Year, Quarter, Type of Application, Institution Type Group, Nationality, *and* Applications.** This dataset provides a multi-dimensional view of how student visa applications vary over time and across geographic, institutional, and demographic categories. The dataset allows examination of patterns such as peak application periods, growth or decline by nationality, and variations across institution types.

Before analysis, the dataset required significant cleaning in SQL Server due to issues such as incorrect data types, presence of NULL rows (especially the first row), inconsistent formatting, and categorical values requiring standardization. After transformation, the data served as the foundation for visualizing trends in global study-related migration.

- **The Work Visa Sponsorship Dataset**.

The Work Sponsorship dataset contains records of immigration applications for employment, capturing details such as **Year, Quarter, Sector, Occupation Type, Region, *and* Number of Applications**. It provides insight into labor market demand, regional workforce shortages, and the sectors most dependent on international talent. The dataset is useful for analyzing economic drivers behind work-related migration and identifying long-term patterns in workforce mobility.

Similar to the Study dataset, the Work Sponsorship dataset also contained missing values, redundant rows, inconsistent text fields, and data type mismatches (e.g., numeric values stored as text). SQL-based cleaning ensured data accuracy, enabling meaningful Power BI transformations and deep-dive comparisons across sectors and time periods.

3.2 Data Source.

The datasets were sourced from:

- **UK Government Open Data Portal (Data.gov.uk)**
- Dataset Series: **Managed Migration – Historic Datasets**
- Publisher: **UK Home Office**
- Data Accessibility: Public, open-licence datasets
- Format: CSV

3.3 Variables and Data Types.

While the exact variables may differ slightly between the **Study** and **Work** datasets, they generally include:

Variable Name	Description	Data Type
Year	Year of application	INT
Quarter	Reporting quarter (Q1 – Q2)	Varchar (20)
Type of Applications	Type of study and work visa application	Varchar (200)
Institution Type group	Type of Institution Group	Varchar (200)
Institution type	Type of the Institution	Varchar (200)
Geographical region	Region of application	Varchar (200)
Nationality	Nationality of applicant	Varchar (200)
Applications	Number of applications	INT
Category of leave	Leaving Category	Varchar (200)
industry	Type of different industries	Varchar (200)

Figure 1. Variables and Data Types

4. Methodology.

4.1 Download and import the data.

First go to the link below and search for the two datasets that you need.

Link - https://data.gov.uk

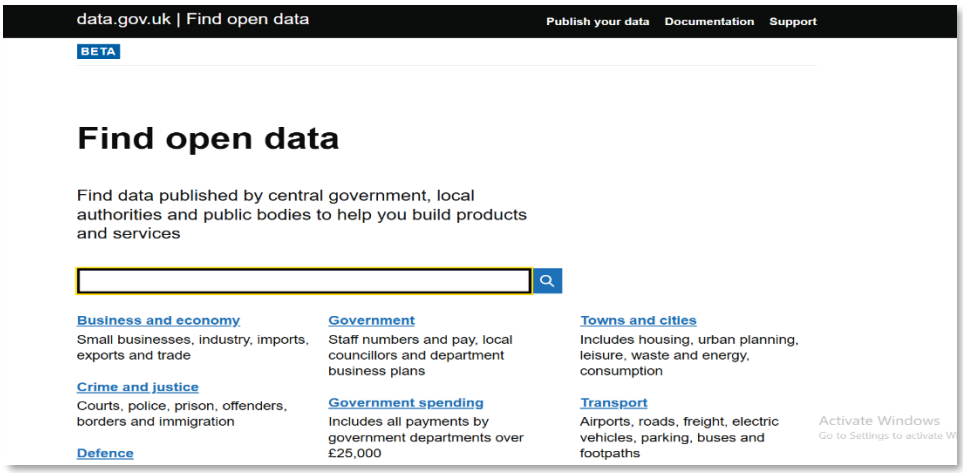

Figure 2. data.gov.uk website

Search for "Managed migration - Historic datasets". Then Download the following 2 datasets.

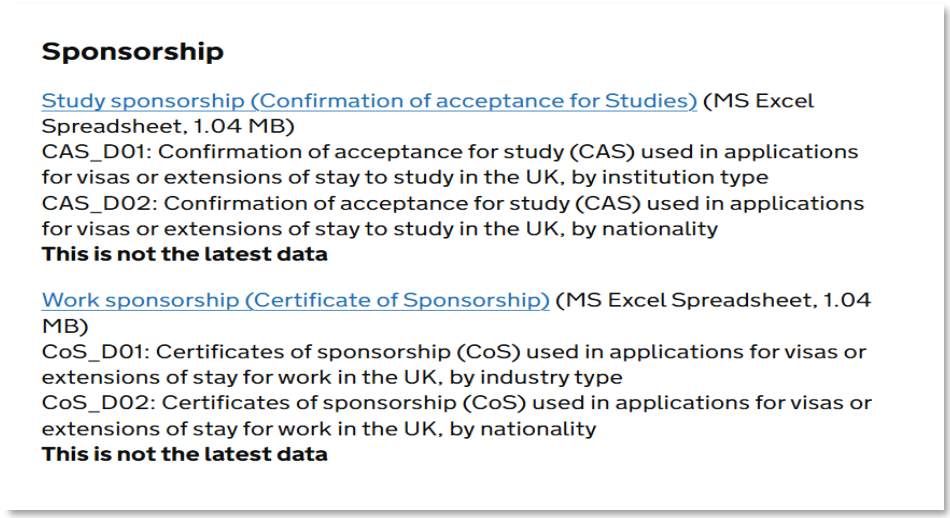

Figure 3Managed migration - Historic datasets

The downloaded two datasets are as follows. Before stored in SQL server database download the above two datasets in CSV or Excel format. And before importing to SQL database get clear ideas about the datasets. In here, the datasets shows information of study sponsorship by sector and region and nationality separately as well as information of work sponsorship by industry and country of nationality separately. So, there are 4 csv files used to create UK IMMIGRATION database.

Applications for visas and extensions of stay for study using sponsor acceptances, by education sector, 2010 to 2023 Q1					
Year	Quarter	Type of application	Institution type group	Institution type	Applicatio
2010	2010 Q1	Visa	Higher Education institution	Russell Group Universities	364
2010	2010 Q1	Visa	Higher Education institution	Non Russell Group Universities	741
2010	2010 Q1	Visa	All other institutions	Tertiary, Further education or other colleges	2,645
2010	2010 Q1	Visa	All other institutions	English language school	2,632
2010	2010 Q1	Visa	All other institutions	Independent school	325
2010	2010 Q1	Visa	All other institutions	Other	388
2010	2010 Q1	Extensions of stay	Higher Education institution	Russell Group Universities	211
2010	2010 Q1	Extensions of stay	Higher Education institution	Non Russell Group Universities	450
2010	2010 Q1	Extensions of stay	All other institutions	Tertiary, Further education or other colleges	677
2010	2010 Q1	Extensions of stay	All other institutions	English language school	345
2010	2010 Q1	Extensions of stay	All other institutions	Independent school	55
2010	2010 Q1	Extensions of stay	All other institutions	Other	38
2010	2010 Q2	Visa	Higher Education institution	Russell Group Universities	4,735
2010	2010 Q2	Visa	Higher Education institution	Non Russell Group Universities	8,751
2010	2010 Q2	Visa	All other institutions	Tertiary, Further education or other colleges	11,042
2010	2010 Q2	Visa	All other institutions	English language school	4,879
2010	2010 Q2	Visa	All other institutions	Independent school	2,132
2010	2010 Q2	Visa	All other institutions	Other	1,818
2010	2010 Q2	Extensions of stay	Higher Education institution	Russell Group Universities	1,122
2010	2010 Q2	Extensions of stay	Higher Education institution	Non Russell Group Universities	3,951
2010	2010 Q2	Extensions of stay	All other institutions	Tertiary, Further education or other colleges	7,909
2010	2010 Q2	Extensions of stay	All other institutions	English language school	2,032
2010	2010 Q2	Extensions of stay	All other institutions	Independent school	315
2010	2010 Q2	Extensions of stay	All other institutions	Other	622
2010	2010 Q3	Visa	Higher Education institution	Russell Group Universities	45,776
2010	2010 Q3	Visa	Higher Education institution	Non Russell Group Universities	67,467
2010	2010 Q3	Visa	All other institutions	Tertiary, Further education or other colleges	28,307

Figure 4. Study Sponsorship Dataset

Applications for visas and extensions of stay for work using sponsorship certificates, by tier and industry type, 2010 to 2023 Q1					
Year	Quarter	Type of application	Category of leave	Industry	Applicatio
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Agriculture, Forestry and Fishing	16
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Mining and Quarrying	181
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Manufacturing	528
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Electricity, gas, steam and air conditioning supply	32
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Water supply; sewerage, waste management and remediation activities	3
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Construction	104
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Wholesale and retail trade; repair of motor vehicles and motorcycles	171
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Transportation and Storage	94
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Accommodation and Food Service Activities	506
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Information and Communications	4,264
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Financial and Insurance Activities	1,446
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Real estate activities	8
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Professional, Scientific and Technical Activities	1,757
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Administrative and support service activities	121
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Public administration and defence; compulsory social security	55
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Education	355
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Human Health and Social Work Activities	882
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Arts, Entertainment and Recreation	169
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Other Service Activities	86
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Activities of households as employers; production activities of household for own use	4
2010	2010 Q1	Visa	Worker (Previously Tier 2)	Activities of extraterritorial organisations and bodies	3
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Agriculture, Forestry and Fishing	14
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Manufacturing	24
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Construction	10
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Wholesale and retail trade; repair of motor vehicles and motorcycles	18
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Accommodation and Food Service Activities	105
2010	2010 Q1	Visa	Temporary Worker (Previously Tier 5)	Information and Communications	151

Figure 5. Work Sponsorship Dataset

4.2 Database design.

- create a new database.

a. Open SSMS and connect to SQL server instance.

b. Create a new database called “UK_IMMIGRATION”.

c. Open New Query > CREATE DATABASE “UK_IMMIGRATION” > Execute.

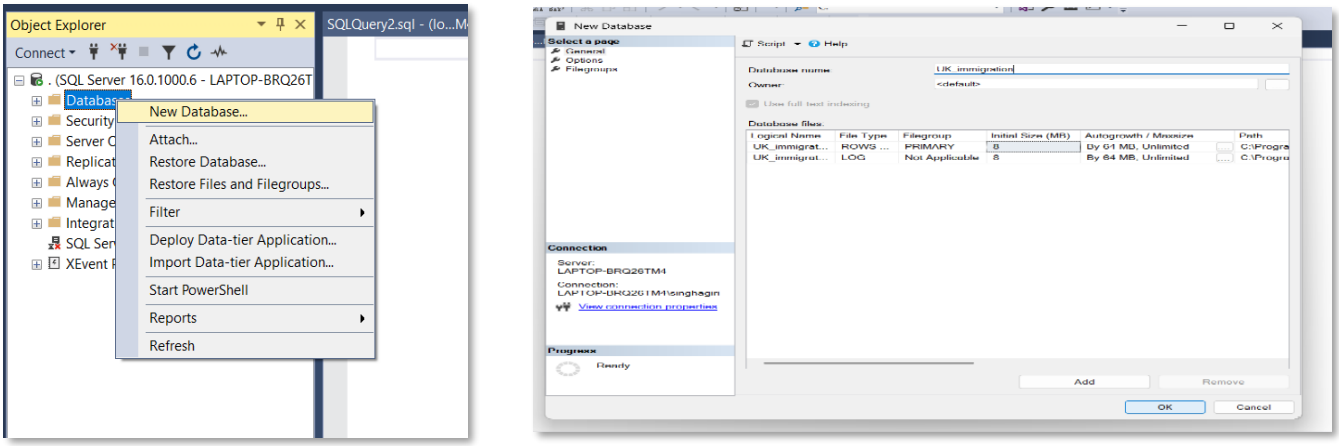

Figure 6. Create new database

- Import Dataset.

Import the dataset CSV file to the SQL server database “UK_IMMIGRATION”.

a) Right-click the “UK_IMMIGRATION” database.

b) Select Tasks → Import flat file.

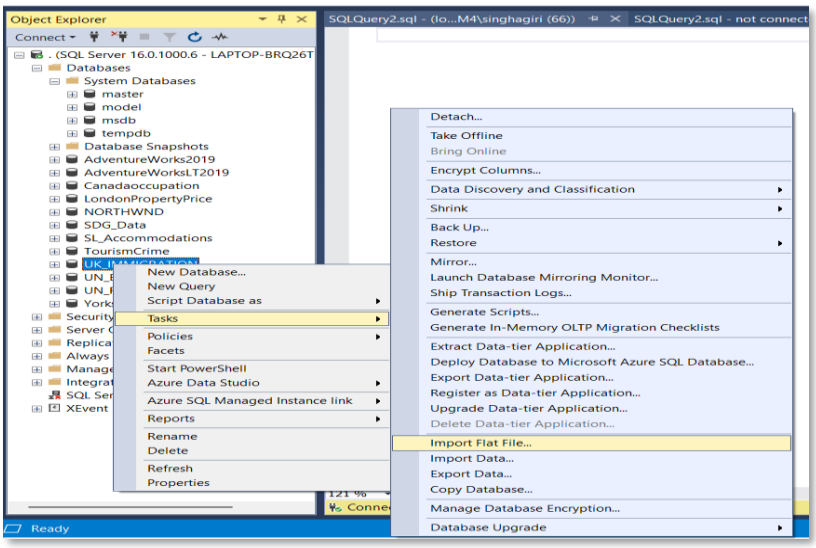

Figure 7. Import Dataset

c) Then click ‘NEXT’

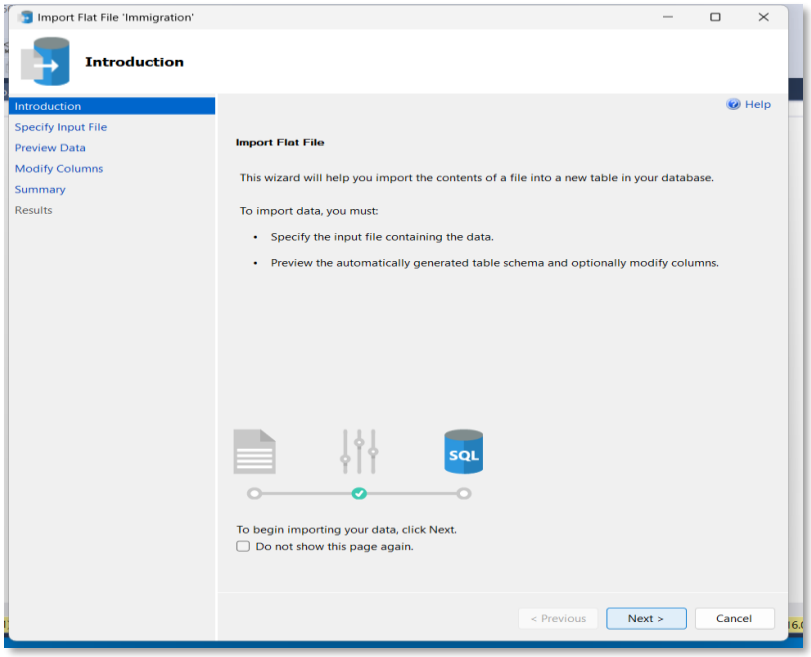

Figure 8. Import Flat File

d) Then click on Browse.

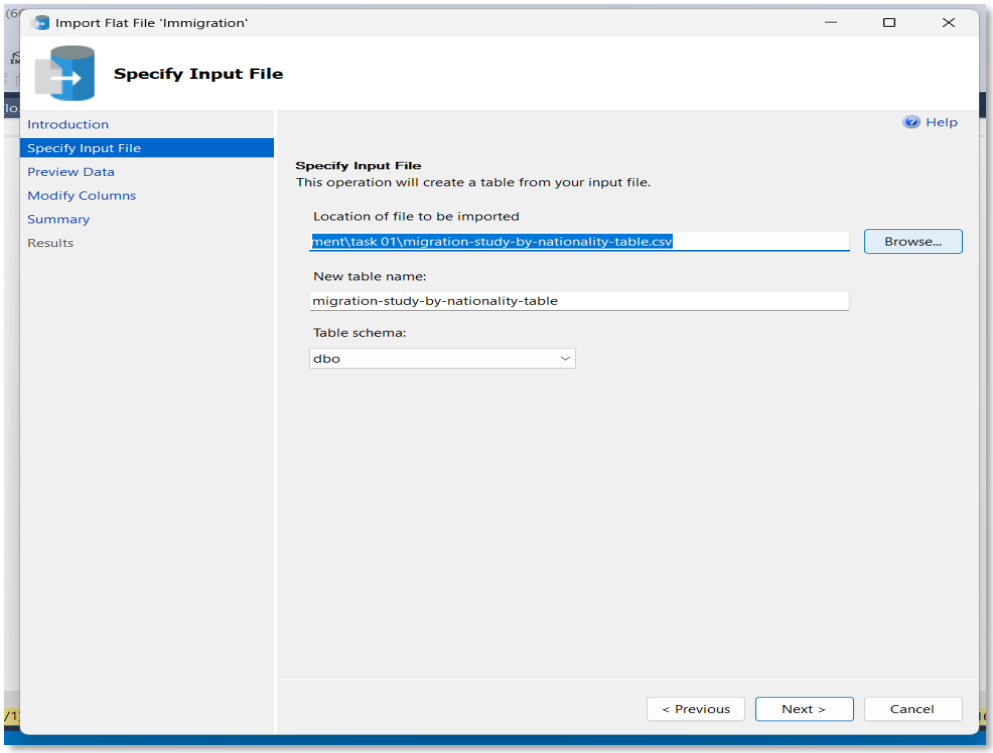

Figure 9. Specify Input File

e) Click ‘NEXT’

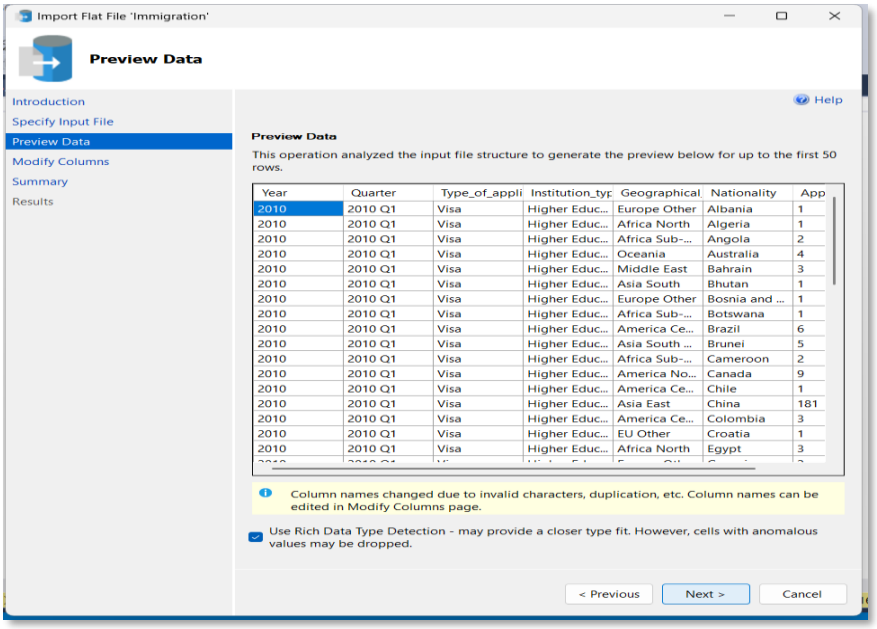

Figure 10. Preview Data

f) modify columns.

change the data type and then Allow nulls for all data. Then click ‘NEXT’.

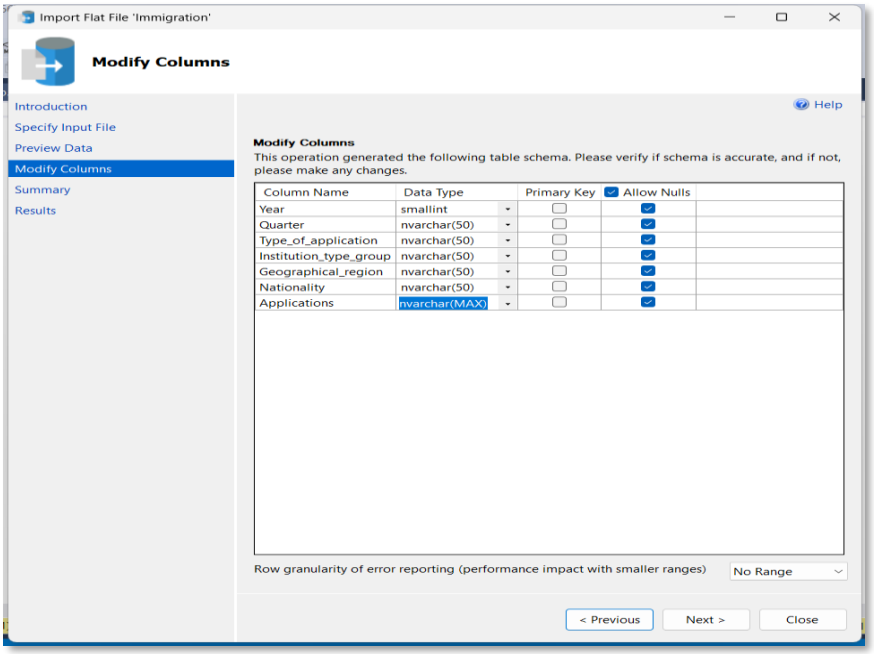

Figure 11. Modify Columns

g) Summary and Result.

Click finish and import the datasets to SQL database successfully. If there is an error the dataset doesn't import then click previous and correct the error.

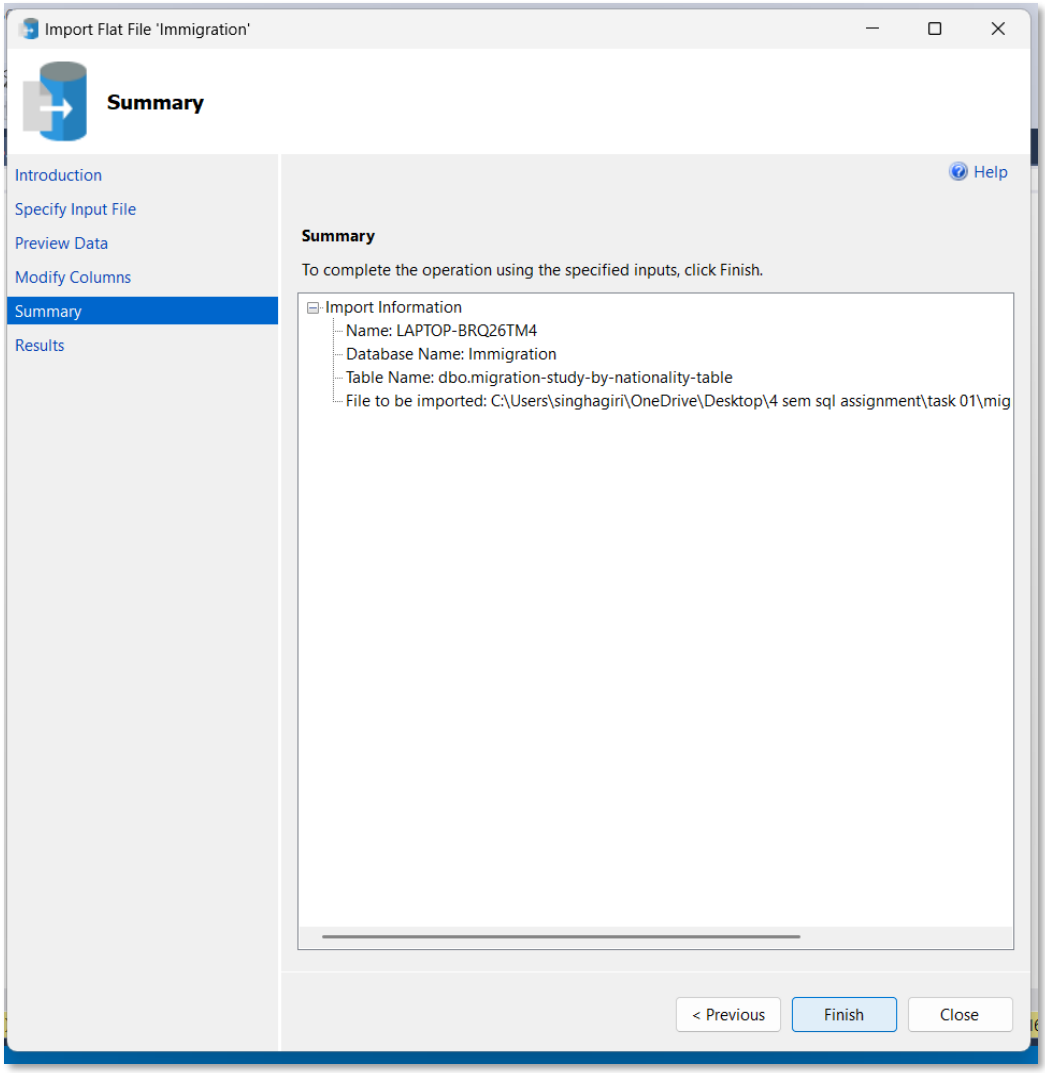

Figure 12. Summary

4.3 SQL Cleaning.

Open SQL Query and clean the import datasets by using following codes.

- Ensure correct data types.

Step 1 - Remove non-numeric characters from numeric fields.

The numeric column "Application" and "Year" shows non-numeric characters so first remove non-numeric characters and clean the 'Application' column and 'Year' column. In here first it applies to application column. There are four tables in UK IMMIGRATION database so repeat following codes for all four tables.

1. **STEP 1A — Clean the "Applications" column (remove non-numeric values)**

In UK IMMIGRATION database Each table contains a column called **Applications**, which should contain **numeric** values (counts of visa applications). The following codes used to find all rows where **Applications contains text, symbols, spaces, or anything that is NOT a number**. Examples of values removed: **'N/A', '--', 'abc', 'unknown', ' ' (spaces), '12A', '1,200' (comma makes it non-numeric),'0 ' (trailing space).** Trim Spaces; This removes **leading or trailing spaces** so Power BI and SQL won't misread values. Finally converts Non-Numeric entries to null; This does: If Applications = empty string '' → convert it to **NULL,** If Applications had non-numeric data → convert to **NULL,** If Applications had only spaces → convert to **NULL.**

Without this cleaning: You cannot SUM() the Applications field, Power BI will treat the column as TEXT → causing errors, Joins fail, Visualizations break, DAX measures produce incorrect results. After this code, everything becomes structurally correct.

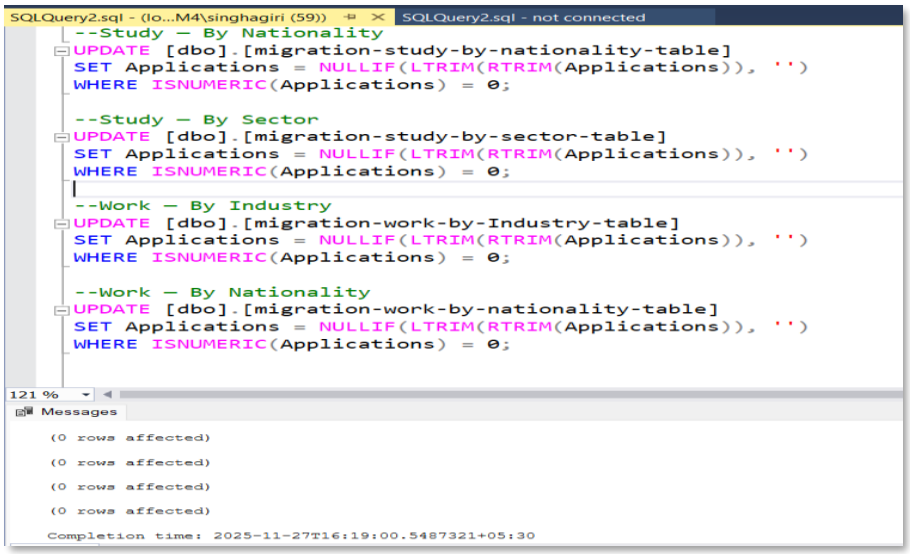

Figure 13. Clean the "Applications" column

2. STEP 1B — Clean the "Year" column (remove invalid years)

These following steps identifies rows where the **Year** column contains **non-numeric values.** If the Year column contains **letters, symbols, blanks, spaces**, or **anything not a number**, SQL identifies it as invalid and replaces those values with **NULL**. This ensures the **Year column will only contain valid numeric years** before you use it in Power BI or calculations.

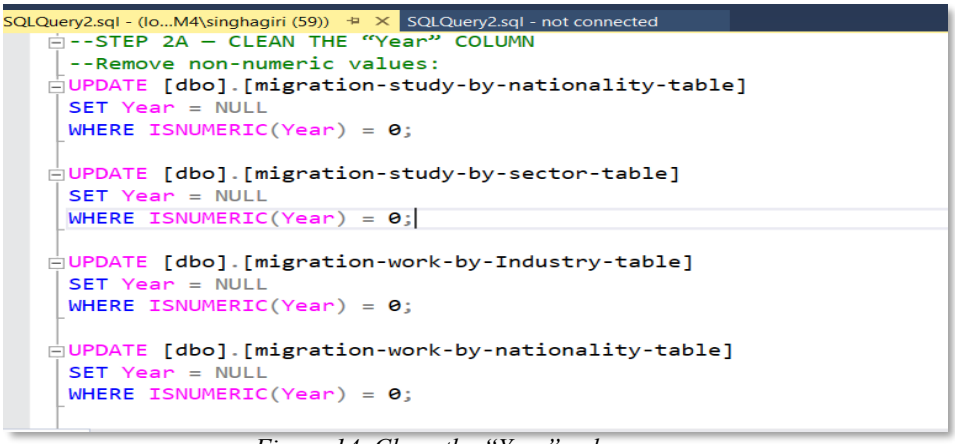

Figure 14. Clean the "Year" column

3. STEP 1C — Remove commas (thousand separators)

These following codes represents If the Year column contains: text (e.g., "Year", "Unknown", "N/A""), symbols (e.g., "--", "?"), blanks it converts those rows into **NULL**. This is important as Power BI cannot sort or filter properly if Year contains invalid values.

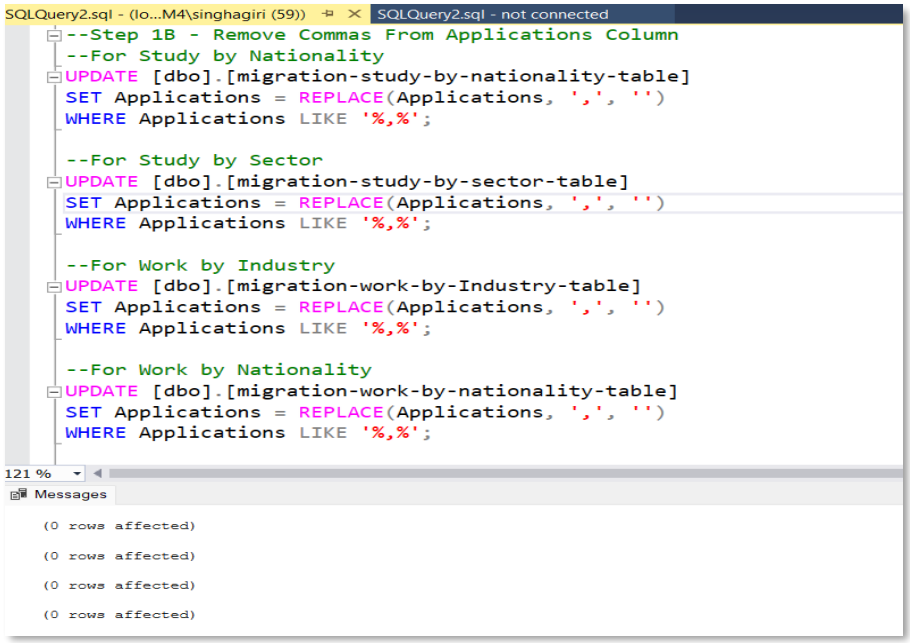

Figure 15. Remove commas

4. **Step 1D — Convert Empty Strings to NULL.**

This step ensures clean and consistent handling of missing values in the *Applications* column across all four datasets. This is important When importing data from Excel or CSV into SQL Server Some numeric cells may appear as **empty strings ('')** instead of NULL.SQL Server treats '' (empty text) **differently from NULL**.Empty strings in a numeric field cause:**Conversion errors** ,**Incorrect aggregations and averages**, **Wrong filtering results**, **Power BI misinterpreting missing values.** Therefore, this step replaces all empty strings with **SQL NULL**, which represents "no value". After this step, Applications can be safely converted to: INT, FLOAT, NUMERIC.

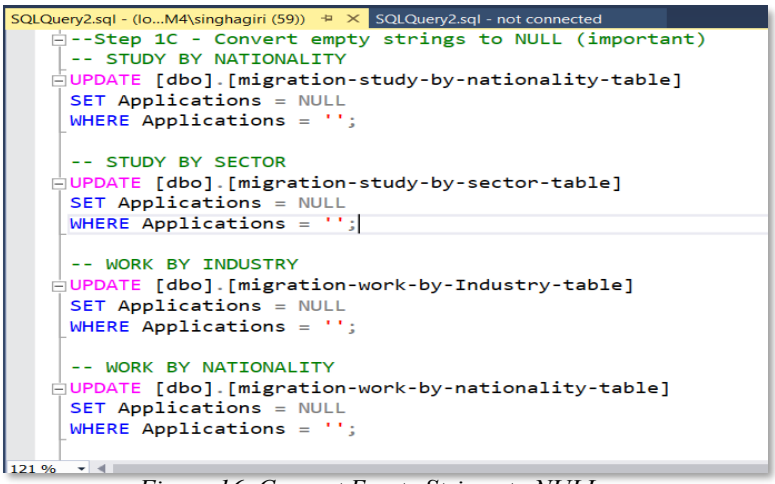

Figure 16. Convert Empty Strings to NULL.

Step 2 – Convert numeric columns to INT

1. **Step 2A - "application" column to INT**

In here You are converting the **Applications** column in all four tables from text (NVARCHAR) into a **proper integer (INT)** data type. This step converts the *Applications* column in all four migration datasets from NVARCHAR to INT. After cleaning the data (removing commas, non-numeric characters, and empty strings), the column is safe to convert. Converting it to INT enables correct numeric analysis, aggregation, and calculations in SQL and Power BI.

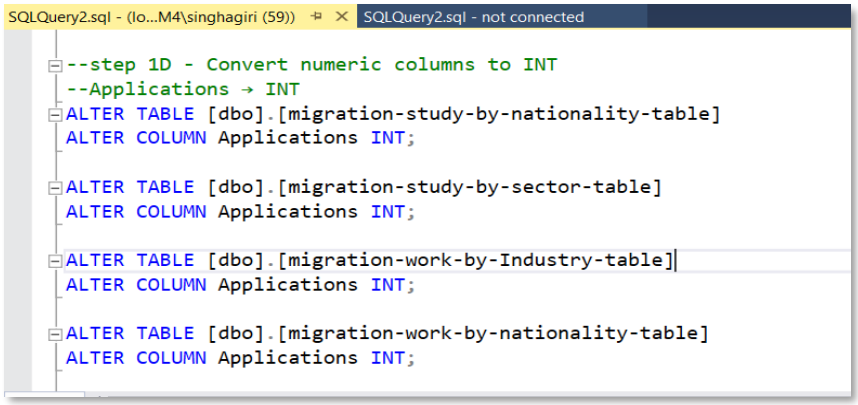

Figure 17. Convert numeric columns to INT

2. Step 2B - “Year” column to INT

This step converts the *Year* column from text to integer after removing invalid year values. This ensures that the Year field is recognized as a numeric time dimension, improving sorting, filtering, and time-series analysis in Power BI.

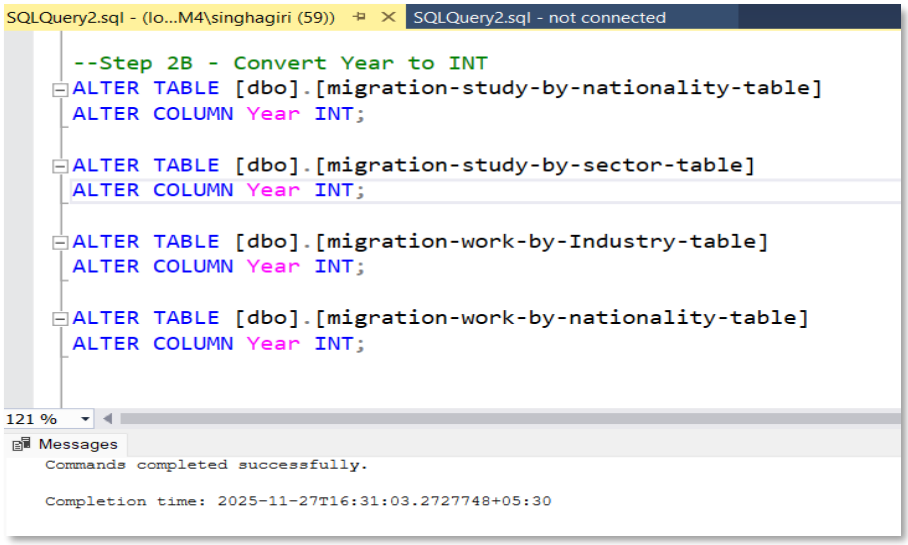

Figure 18. “Year” column to INT

3. Convert Data Types of other columns.

These SQL commands modify the data types of each column in all four tables to ensure the data is stored correctly, consistently, and efficiently for analysis and Power BI. Following codes convert data types according to the mention in Variables and data types topic.

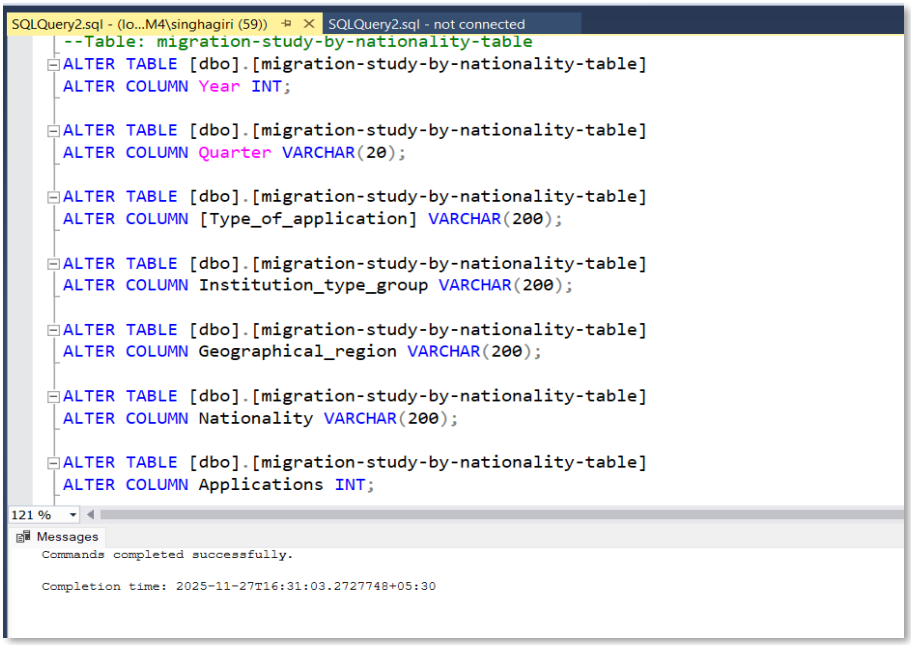

Figure 19. Convert Data Types of other columns

- **Handling Missing or Inconsistent data.**

Step 1 – Check Missing Values

This query is used to **identify missing values** (NULL values) across all four migration datasets *after cleaning and data-type conversion*. This step is essential before loading the data into **Power BI**, because missing values can break relationships, measures, and visualizations. Tepeat this step for all the tables.

```
--Handle Missing or Inconsistent Data
--1. CHECK Missing Values in All 4 Tables
SELECT *
FROM [dbo].[migration-study-by-nationality-table]
WHERE
    Year IS NULL OR
    Quarter IS NULL OR
    Type_of_application IS NULL OR
    Institution_type_group IS NULL OR
    Geographical_region IS NULL OR
    Nationality IS NULL OR
    Applications IS NULL;
```

Figure 20. Check Missing Values

Step 2 – Replace missing numbers with Zero

This block of SQL updates values in four migration datasets and replaces NULL values in the Applications column with 0. This step is important to avoid calculation errors, makes the dataset consistent, helps with visualizations. This ensures: Clean, fully numeric dataset, Smooth Power BI modeling, Accurate dashboard insights, No errors in DAX, visuals, or calculations.

SQLQuery2.sql - (lo...M4\singhagiri (59)) | SQLQuery2.sql - not connected

```
--2. Replace missing numbers with 0
UPDATE [dbo].[migration-study-by-sector-table]
SET Applications = 0
WHERE Applications IS NULL;

UPDATE [dbo].[migration-study-by-nationality-table]
SET Applications = 0
WHERE Applications IS NULL;

UPDATE [dbo].[migration-work-by-industry-table]
SET Applications = 0
WHERE Applications IS NULL;

UPDATE [dbo].[migration-work-by-nationality-table]
SET Applications = 0
WHERE Applications IS NULL;
```

Figure 21. Replace missing numbers with Zero

- **Rename columns for readability**

This section of SQL code uses the stored procedure sp_rename to rename columns in the tables of UK IMMIGRATION database. The purpose of this step is to improve: Readability, Consistency, Understanding during analysis, Ease of use in Power BI. It does not change the data—only the column *labels*. The following lines emphasize these things;

1. **EXEC sp_rename**

This is a built-in SQL Server procedure used to **rename database objects** (columns, tables, indexes, etc.).

2. **'[table_name].[old_column_name]'**

This tells SQL Server **which column** you want to rename.

3. **'new_column_name'**

This is the **new name** you want to give the column.

4. **'COLUMN'**

This tells SQL Server that the object you are renaming is a **column** (not a table or index)

But in here the new names look the same as the old names, this code ensures: Column names are consistent, No accidental spaces, invisible characters, extra underscores, Fixes any formatting issues from Excel import, Prepares the table for Power BI modeling. Sometimes SQL Server imports column names with hidden characters or different casing, so renaming ensures **clean and standard names**.

```
--Rename columns for readability
--1. Rename Columns – migration-study-by-nationality-table
-- STUDY BY NATIONALITY TABLE
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Year]', 'Year', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Quarter]', 'Quarter', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Type_of_application]', 'Type_of_application', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Institution_Type_Group]', 'Institution_Type_Group', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Geographical_Region]', 'Geographical_Region', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Nationality]', 'Nationality', 'COLUMN';
EXEC sp_rename '[dbo].[migration-study-by-nationality-table].[Applications]', 'Applications', 'COLUMN';
```

```
121 %
Messages
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.
  Caution: Changing any part of an object name could break scripts and stored procedures.

  Completion time: 2025-11-27T17:07:10.3132226+05:30
```

Figure 22. Rename columns for readability

4.4 Aggregation views

Before connecting the cleaned SQL database to Power BI, aggregation views were created to improve performance, reduce computation time, and simplify analysis. Using views ensures that Power BI loads only the required aggregated records instead of scanning the full dataset repeatedly.

- **Visa Application Trends Over Time.**

Study Trends;

This SQL view combines data from the two different study-related datasets**; migration-study-by-nationality-table, migration-study-by-sector-table** and aggregates the total number of visa applications per year. Both tables contain annual visa application counts but represent different dimensions. The **SUM()** function calculates the total applications for each year. **CAST()** ensures the Applications column is treated as an integer. **UNION ALL** merges both tables without removing duplicates to maintain full data volume.

This view simplifies the raw datasets into a single yearly trend table, making it easier for Power BI to create visuals like **line charts**, **forecasting graphs**, and **time-series dashboards**.

SQLQuery2.sql - (lo...M4\singhagiri (59)) | SQLQuery2.sql - not connected

```
--PART 1 – AGGREGATION VIEWS
--A. VISA APPLICATION TRENDS OVER TIME
--Study Trends (Nationality + Sector)
CREATE VIEW vw_Study_Trends AS
SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Study_Applications
FROM [dbo].[migration-study-by-nationality-table]
GROUP BY Year

UNION ALL

SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Study_Applications
FROM [dbo].[migration-study-by-sector-table]
GROUP BY Year;
```

Figure 23. Visa Application Trends Over Time

Work Trends.

This view aggregates work visa applications by year, combining data from **Work by Industry** and **Work by Nationality** into a single unified format. Power BI can use this view to compare **study vs work trends**, build **yearly dashboards**, and perform **trend analysis** without repeatedly processing large tables.

```
--Work Trends (Industry + Nationality)
CREATE VIEW vw_Work_Trends AS
SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Work_Applications
FROM [dbo].[migration-work-by-Industry-table]
GROUP BY Year

UNION ALL

SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Work_Applications
FROM [dbo].[migration-work-by-Industry-table]
GROUP BY Year;
```

Figure 24. Work Trends

- **Top 10 Natonalities for sponsored Visas.**

This query identifies the **top 10 nationalities** applying for study visas by ranking them from highest to lowest based on total application counts. Useful for **bar charts**, **ranking visuals**, and **policy trend insights**. Helps highlight the **most common countries applying for work sponsorships**, supporting workforce planning insights.

```
--B. TOP 10 NATIONALITIES (Study + Work)
--1. Study – Top 10 Nationalities
CREATE VIEW vw_Study_Top10_Nationalities AS
SELECT TOP 10
    Nationality,
    SUM(CAST(Applications AS INT)) AS TotalApplications
FROM [dbo].[migration-study-by-nationality-table]
GROUP BY Nationality
ORDER BY TotalApplications DESC;

--2. Work – Top 10 Nationalities
CREATE VIEW vw_Work_Top10_Nationalities AS
SELECT TOP 10
    Nationality,
    SUM(CAST(Applications AS INT)) AS TotalApplications
FROM [dbo].[migration-work-by-nationality-table]
GROUP BY Nationality
ORDER BY TotalApplications DESC;
```

Figure 25. Top 10 Nationalities for sponsored Visas

- **Application Outcomes**

This view groups data by **type of application** (e.g., Approved, Refused, Withdrawn) and year. It calculates the total volume for each category annually.

Used for Power BI **stacked bar charts**, **approval vs refusal rates**, and **KPI indicators**. Helps compare decision outcomes for work visas year-by-year.

```
SQLQuery2.sql - (lo...M4\singhagiri (59))   SQLQuery2.sql - not connected

--C. APPLICATION OUTCOMES (Approval, Refusal, Withdrawn)
--STUDY – Outcomes
CREATE VIEW vw_Study_Application_Outcomes AS
SELECT
    Type_of_application,
    Year,
    SUM(CAST(Applications AS INT)) AS Total
FROM [dbo].[migration-study-by-nationality-table]
GROUP BY Type_of_application, Year;


--WORK – Outcomes
CREATE VIEW vw_Work_Application_Outcomes AS
SELECT
    Type_of_application,
    Year,
    SUM(CAST(Applications AS INT)) AS Total
FROM [dbo].[migration-work-by-nationality-table]
GROUP BY Type_of_application, Year;
```

Figure 26. Application Outcomes

- **Extensions and Repeat Sponsorships**

This view filters only applications labeled as **extensions**, which indicate repeat visa requests. Useful for analyzing trends in **renewals**, dependency on sponsorship, and changes in demand.

```
SQLQuery2.sql - (lo...M4\singhagiri (59))   SQLQuery2.sql - not connected

--D. EXTENSIONS (repeat sponsorships)
CREATE VIEW vw_Study_Extensions AS
SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Extensions
FROM [dbo].[migration-study-by-nationality-table]
WHERE Type_of_application LIKE '%Extension%'
GROUP BY Year;

CREATE VIEW vw_Work_Extensions AS
SELECT
    Year,
    SUM(CAST(Applications AS INT)) AS Total_Extensions
FROM [dbo].[migration-work-by-nationality-table]
WHERE Type_of_application LIKE '%Extension%'
GROUP BY Year;
```

Figure 27. Extensions and Repeat Sponsorships

- **Combined Clean Views**

Study view combined;

This combines **Study-by-Sector** and **Study-by-Nationality** into one standardized dataset. Since both tables have different columns, missing fields are filled with **NULL** to maintain structure. Creates a **single unified study dataset** for Power BI, enabling:

- filtering by multiple dimensions (sector / nationality)
- combining visual insights
- simplifying the data model

```
SQLQuery2.sql - (lo...M4\singhagiri (59))   SQLQuery2.sql - not connected
--E. CLEAN COMBINED VIEWS (for Power BI)
--Study – Combined
CREATE VIEW vw_Study_ALL AS
SELECT
    Year,
    Quarter,
    Type_of_application,
    Institution_type_group,
    Institution_type,
    NULL AS Geographical_region,
    NULL AS Nationality,
    Applications
FROM [dbo].[migration-study-by-sector-table]

UNION ALL

SELECT
    Year,
    Quarter,
    Type_of_application,
    Institution_type_group,
    NULL AS Institution_type,
    Geographical_region,
    Nationality,
    Applications
FROM [dbo].[migration-study-by-nationality-table];
```

Figure 28. Combined Clean Views

Work view combined.

This merges two work datasets into one standardized structure, inserting NULLs where columns do not exist. This view is essential for:

- **Power BI star-schema modelling**
- unified analysis of work visa applications
- dynamic comparison across industry vs nationality

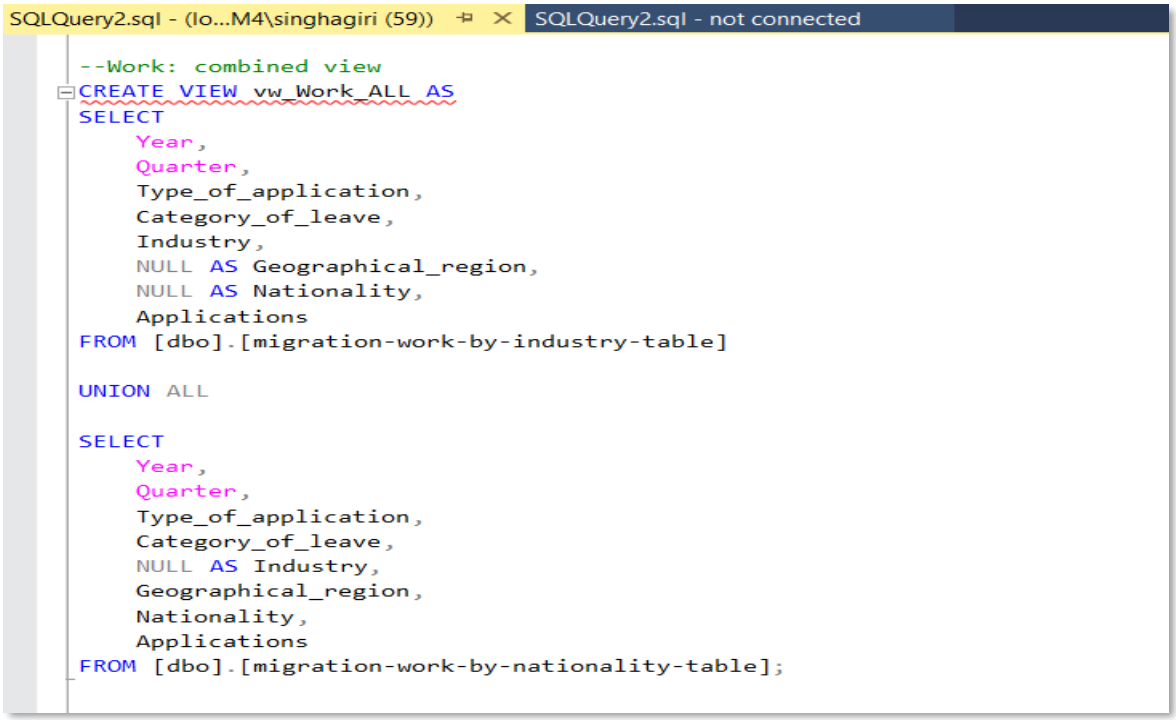

Figure 29. Work view combined

4.5 Power BI Dashboard design and implementation

- Import Data into Power BI

1. Open Power BI and click import Data from SQL server.

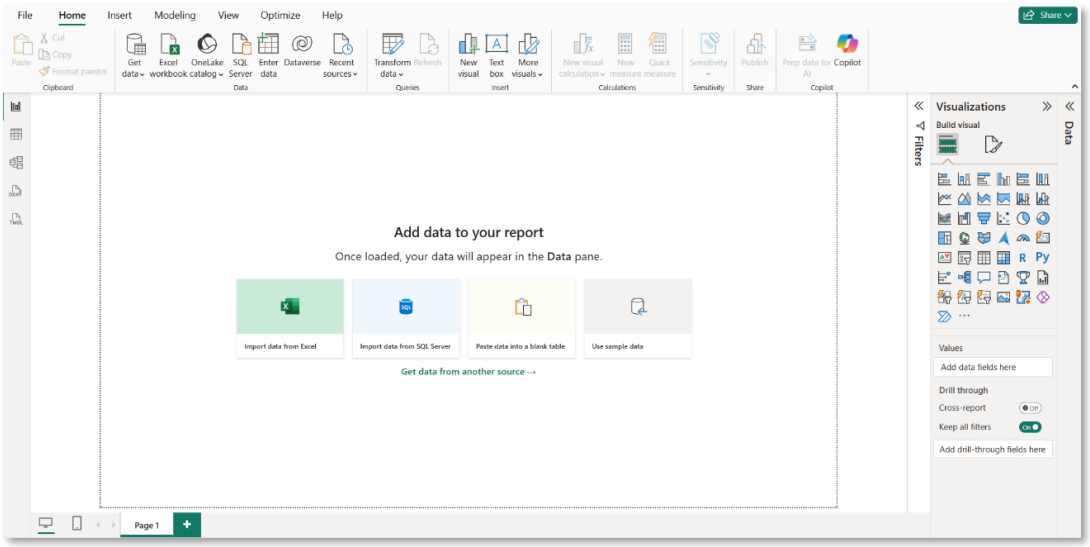

Figure 30. Open Power BI

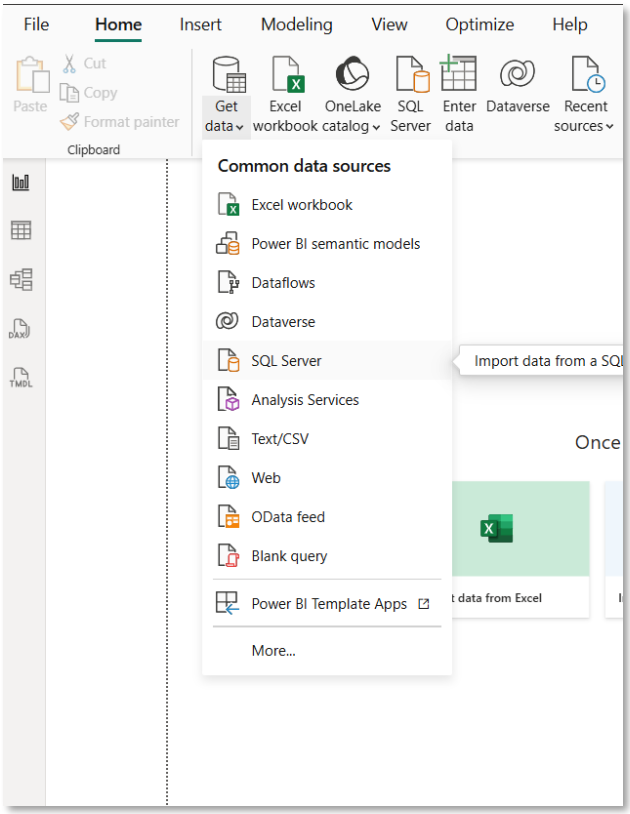

Figure 31. Getting Data from SQL

2. Connect SQL Server database named UK_IMMIGRATION and load

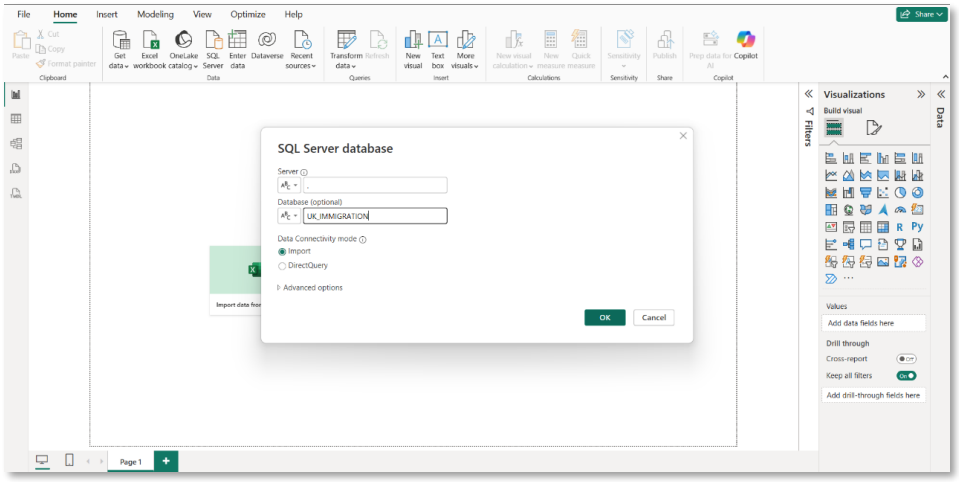

Figure 32. Connect SQL Server database

3. Navigator window, you selected the table: migration-study-by-sector-table and Previewed columns

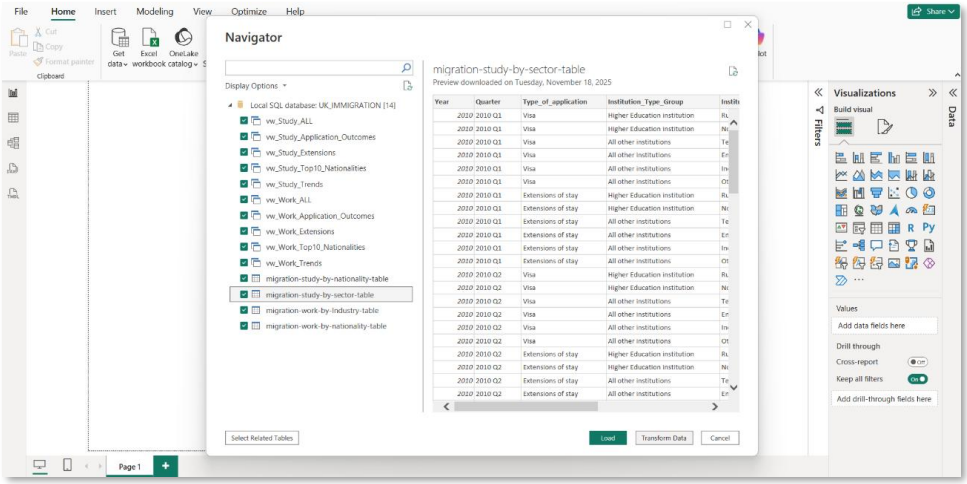

Figure 33. Previewed columns and load the data

4. Data loaded into Power Query.

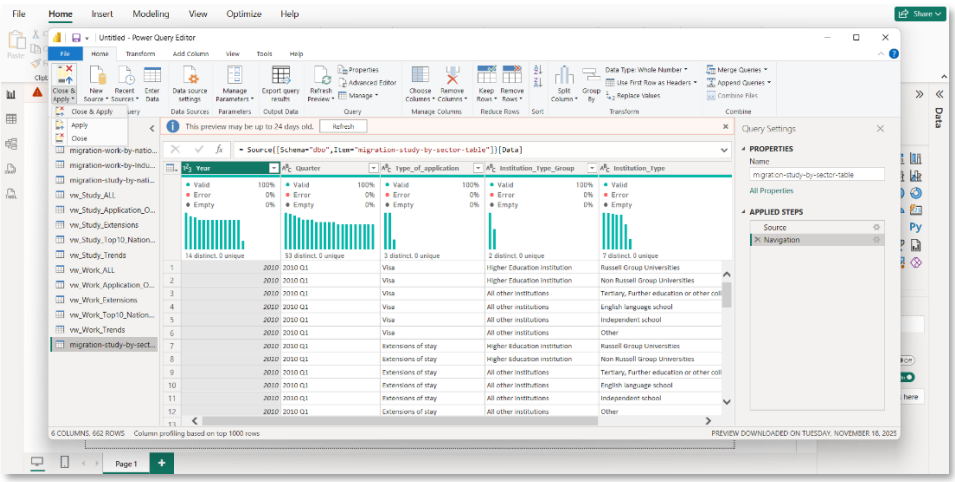

Figure 34. Data loaded into Power Query

5. Results and Visual Analysis

5.1 Study Sponsorship Dashboard Analysis.

This section presents a detailed analysis of the UK Study Sponsorship dashboard, which visualises key patterns in historic study-related migration using the migration-study-sponsorship-datasets-mar-2023.xlsx dataset. Each chart highlights a different dimension of student mobility, including application trends, nationality distributions, sector-level contributions, visa extensions, and application outcomes. Together, these visuals provide a comprehensive overview of how international study migration has evolved in the UK.

Figure 35. Study sponsorship dashboard

- **KPI Cards**

Total Study Applications;

What it shows:

- Displays the total number of study visa applications (8M).

How to create it:

- Go to Visualizations → Card.
- Drag the sum of 'vw_Study_Trends(Total_Study_Applications)' into Fields.

The total number of applications (8 million) indicates the total number of study visa applications made to the UK between 2010 and 2023. This indicates the scale of international student demand for UK education.

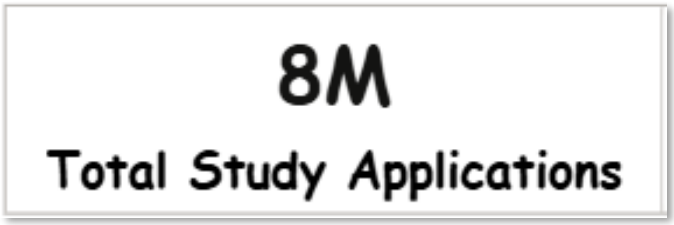

Figure 36. Total Study Applications

Total Study Extensions;

What it shows:

- Shows the total number of study visa extensions (740K).

How to create:

- Go to Visualizations→ Card
- Drag the sum of 'vw_Study_Extentions (Total_Extensions)' into Fields.

The total number of extensions (740,000) represents the total number of applications for extension of stay made by students. This indicates a considerable number of students are studying on longer-term pathways, such as the Graduate Route or other Post-study Work Options.

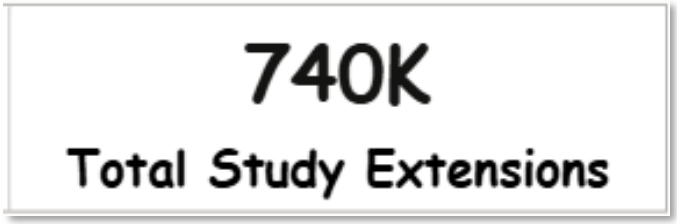

Figure 37. Total Study Extensions

- **Slicers: Nationality, Year, Type of Institution.**

With interactive slicers, the user can filter the dashboard data by year, nationality, or type of institution.

How to create:

1. Visualization > Build Visual > Slicer>Field > Nationality
2. Visualization > Build Visual > Slicer>Field > Year
3. Visualization > Build Visual > Slicer>Field > Institustion_Type
4. Change slicer style to Dropdown under Format.

These controls can help to improve analytical power behind the dashboard and allow drill-down analysis and exploring trends, industry-specific distributions, and demographic variations. The slicers help to bring in flexible and user-driven insights, which makes the dashboard a dynamic tool for stakeholders.

Figure 38. Slicers: Nationality, Year, Type of Institution.

- **Study Visa Application Trends Over Time.**

What it shows:

- The trend of total study applications from 2010–2023.

How to create it:

1. Go to Visualizations → Line Chart.
2. Drag Year → X-axis
3. Drag vw_Study_Trends(Total_Study_Applications) → Y-axis
4. Turn on Markers under Format for better visibility.

The chart illustrates the number of individuals applying for study visas between 2010-2023 on an annual basis. The following are some major highlights:

- 2010-2018: The number of individuals applying for study visas was generally consistent over this period, with only moderate fluctuation.
- 2019-2022: Application numbers increased significantly, particularly during 2019-2020 as a result of the Covid-19 pandemic followed by the UK's exit from the EU and changes in visa policies that encouraged international students to apply for visas (i.e., introduction of the Graduate Route in 2021).
- 2023: Although the number of individuals applying for a study visa declined in 2023, the decline may be associated with new Policy changes (e.g., the implementation of more stringent requirements regarding an individual's ability to bring family members to the UK on dependent visas).

This chart highlights how global events and policy changes directly influence UK student migration patterns.

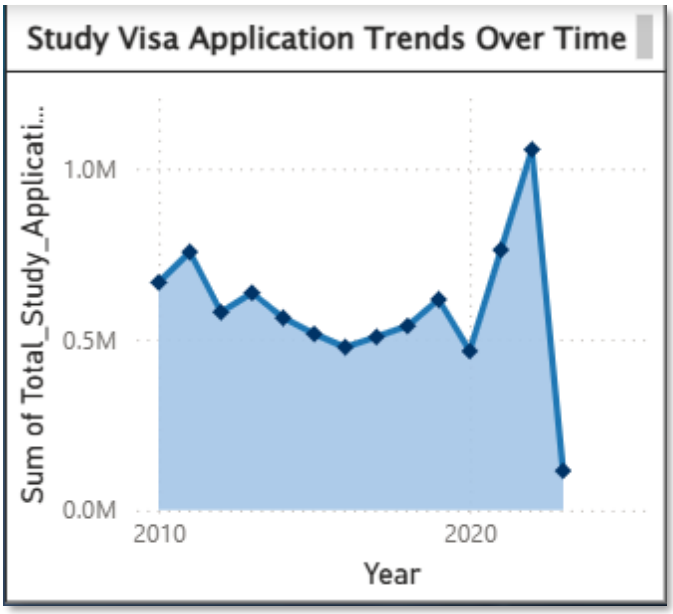

Figure 39. Study Visa Application Trends Over Time

- **Study Visa Extensions.**

What it shows:

- Year-wise number of study visa extensions.

Steps:

1. Go to Column Chart visual.
2. Add Year → X-axis.
3. Add vw_Study_Extentions (Total_Extensions) → Y-axis.

The bar graph represents the total number of study visa applications that were extended on a year basis. X-axis indicates the year and the Y-axis indicates the total number of extensions.

The following observations are noted:

- Between 2012-2014, applicants requesting an extension of their study visa reached levels of over 100,000 per year.
- Following 2015, the number of students seeking an extension declined because of the implementation of stricter pathways to gaining permanent residency and reduced options for post-study work.
- After 2020, applications for extensions again began to increase due to the students' continuation of their studies that were disrupted because of the COVID-19 pandemic and an increased number of students transferring to a new programme of study.
- In 2023, a decline in the number of extensions is likely to have occurred as a result of stricter rules for requesting family members to come to the UK on dependent visas.

This chart gives visibility into continuation patterns and how long students remain in the UK education system.

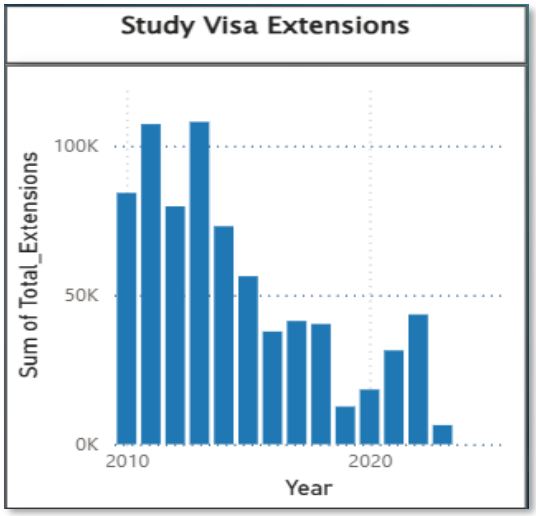

Figure 40. Study Visa Extensions

- **Study Application Outcomes.**

Shows proportion of outcomes (Visa granted, Extensions, Unknown) by year.

Steps:

1. Select 100% Stacked Column Chart.
2. Add Year → X-axis.
3. Add Total → Y-axis (or number of applications).
4. Add Outcome_Type → Legend.
5. Turn Data labels On (optional).

The Applications Stacked bar chart distinguishes the types of application into three categories:

- Visa Granted (Blue)
- Extensions of Stay (Red)
- Unknown/Other Outcomes (Orange)

The X-axis is the year and the Y-axis is the total outcomes expressed as a percentage and a legend to differentiate between the type of outcomes.

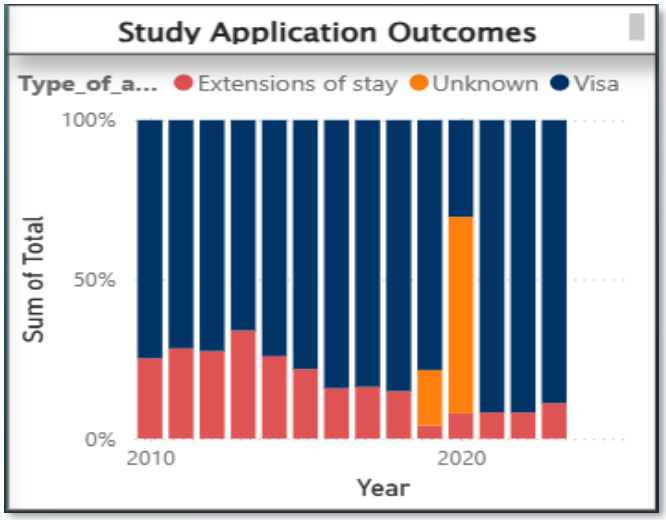

Figure 41. Study Application Outcomes

Interpretation:

- The overall interpretation of the Applications Stacked Chart is that Visa Granted Applications predominate throughout the majority of the years, indicating a strong level of approved visas for application to study in the UK.
- The red bars representing Extensions of Stay closely relate to the earlier Extension Chart shown above, reinforcing the periods of high numbers of successful Applications leading to further study applications in the UK.
- There is a significant spike in Unknown/Other Outcomes (Orange) in the years 2021 and 2022, which most likely arises from delays in the processing of visa applications and/or extraordinary measures due to and immediately following of the COVID-19 pandemic.

This visual helps understand the efficiency and behaviour of visa outcomes over time.

- **Study Applications by Sector**

What it shows:

  - Shows which institution categories have the highest number of study sponsorships.

Steps:

1. Go to Treemap visual.
2. Add Institution_Type → Category.
3. Add the sum of 'migation_study_by_sector_tables (Applications)' → Values.

The TreeMap represents the frequency of the study visa applications at various types of academic institutions such as:

- Russell Group universities
- non-Russell Group universities
- further education colleges
- tertiary colleges
- English-language schools
- others.

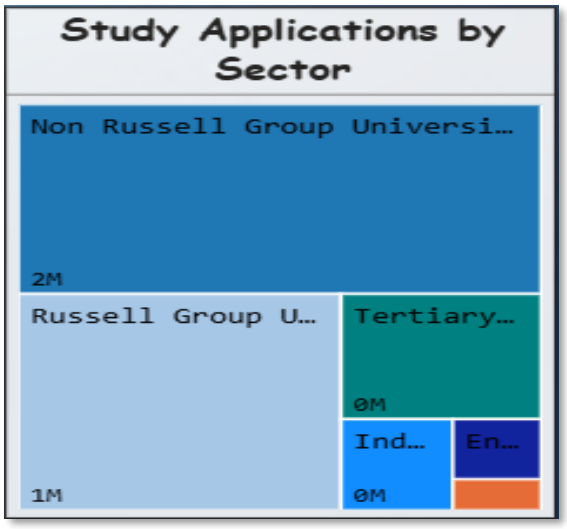

Figure 42. Study Applications by Sector

From the dashboard:

- Non-Russell Group Universities have the largest category of Study Applications. This is consistent with the data, as they are representative of a much larger number of UK Institutes of Higher Education.
- Russell Group Universities have a very significant number of Study Applications; however, they form only the second largest category of Study Applications.
- Tertiary, further education, and English-language providers contribute smaller shares, indicating more specialized but important pathways.

Overall, the data in the Application Treemap practices demonstrate that there are many different types of International Demand, not only from elite Universities.

- **Study Visa Distribution by Nationality**

What it shows:

- Top nationalities with the most study visa applications.

Steps:

1. Select Bar Chart (Clustered Bar).
2. Add Nationality → Y-axis.
3. Add the sum of 'vw_Study_Top10_Nationalities (TotalApplications)' → X-axis.

This bar chart indicates all applications made in the study visa by the nationalities with the X-axis of the total applications and the Y-axis of the list of countries. From the dashboard:

- China continues to be the country with the highest number of applications, with over 1 million applications during the entire dataset period.
- India had the second highest number of applications and demonstrated explosive growth from 2018 onwards.
- Additional notable countries include Nigeria, Pakistan, United States, Malaysia, Bangladesh, and Saudi Arabia.

The chart will help us better understand the global origins of international student mobility and help designate areas to focus admissions, marketing, and policy-making efforts.

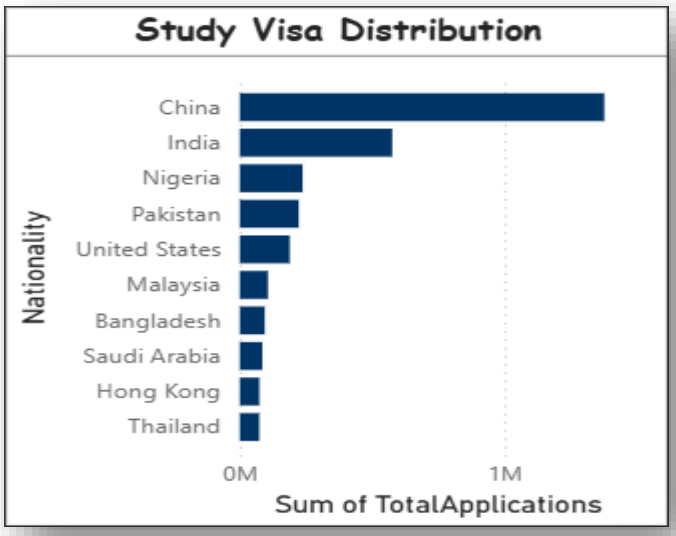

Figure 43. Study Visa Distribution by Nationality

- **Summary of the Study Dashboard.**

The Study Sponsorship Dashboard shows: The continued growth and increased demand for UK Study Visas throughout the last 10 years. Rapid Growth (sharp increases) in application volumes due to improvements in sponsoring policies and the recovery from the effects of COVID. China and India remain the two largest source countries for international students. The sectoral breakdown of institutions shows widespread participation by UK institutions in attracting international students. The data related to extensions of visas and outcomes provides an understanding of how policy has historically impacted and will be positively impacted by external growth disruptions.

The multi-visualization provided by this dashboard creates an evidence-based way to gain insight into student mobility trends, supporting decision-making for policy development, recruitment and educational planning.

5.2 Work Sponsorship Dashboard Analysis

The Work Sponsorship dashboard provides a thorough investigation into the historical patterns of work sponsorship in the UK through the migration-work-sponsorship-datasets-mar-2023.xlsx file published by the Home Office.

The data presented on the dashboard represents the changing patterns of employer-sponsored migration over time across various visa types, occupational sectors, countries of origin and application streams. In aggregate, these visualizations present an overview of the evolution of UK labour-market-driven migration.

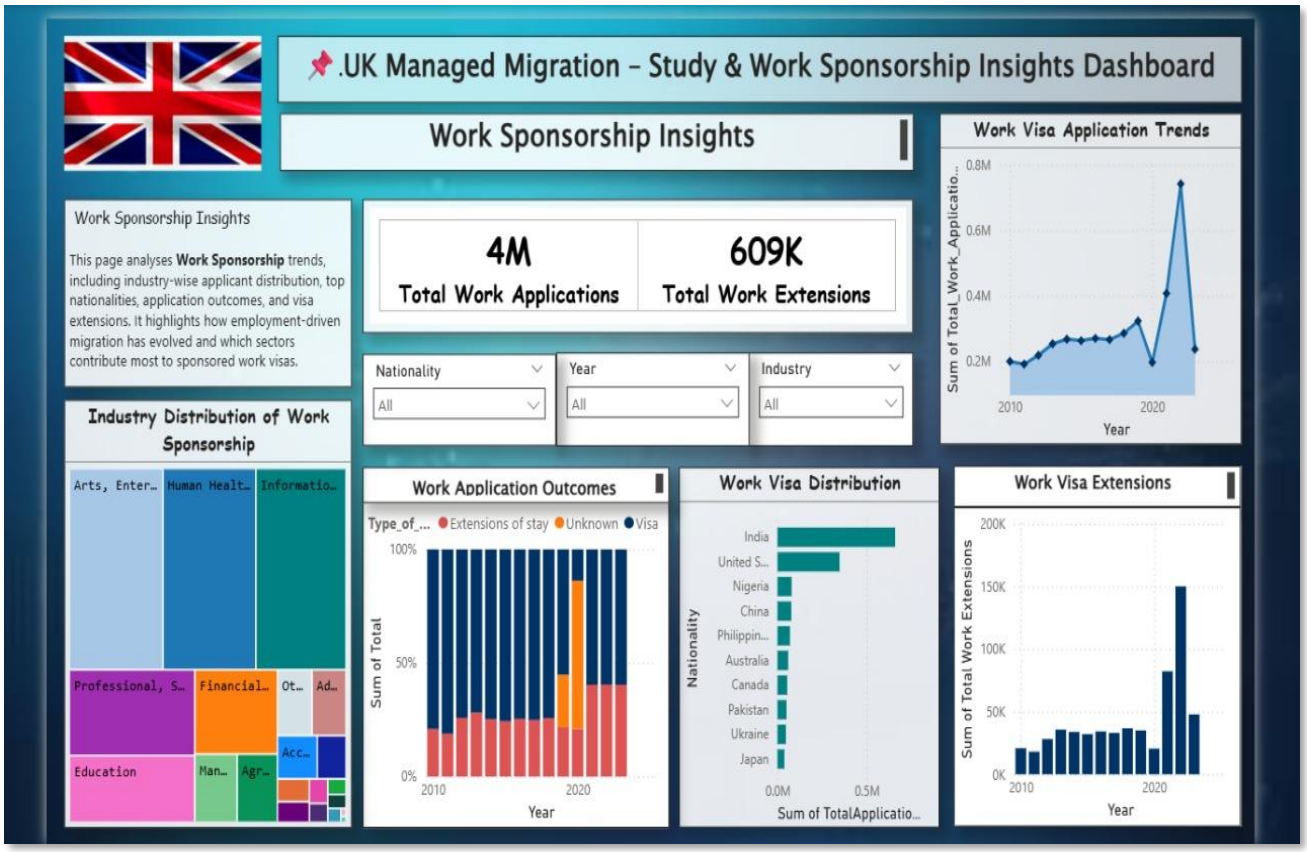

Figure 44. Work Sponsorship Dashboard

- **KPI Cards.**

Total work Applications and Extensions;

What is shows:

- Shows total work visa applications (4M).
- Shows total number of work visa extensions (609K).

Steps:

1. Insert Card.
2. Add the sum of 'vw_Work_Trends (Total_Work_Applications) into Fields.
3. Add another **Card**.
4. Drag the sum of 'vw_Work_Extensions (Total_Work_Extensions**)'** into Field**.**

The two KPI Cards outline, in terms of total volume, the total volume of work-related migration recorded in the data.

- 4 million total work applications.
- 609,000 total work extensions.

The volume of these two KPIs over a period of over a decade provides insight into the extensive role sponsored employment plays within the migration framework in the UK, and allows for the identification of new entrants vs. those that are continuing to work in the UK; i.e., separate Records of Applications for Entry into the UK and Records of Extensions.

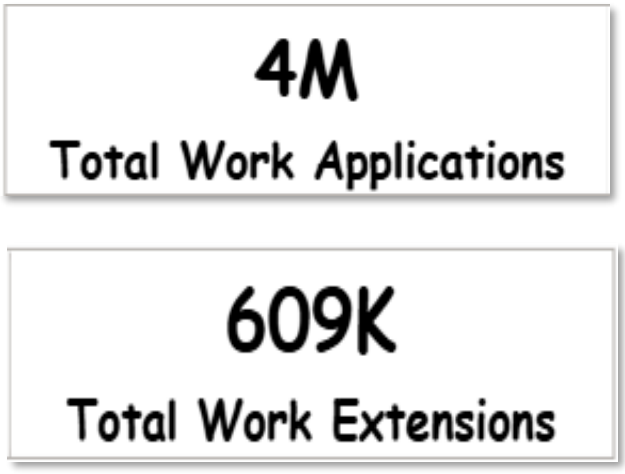

Figure 45. Total work Applications and Extensions

- **Dashboard Interactivity and Filters.**

What is shows:

- Filters visuals based on applicant nationality.
- Filters visuals by year.
- Filters work applications by sponsoring industry.

Steps (same for all slicers):

1. Insert Slicer.
2. Drag the field (Nationality / Year / Industry).
3. Choose Dropdown style.

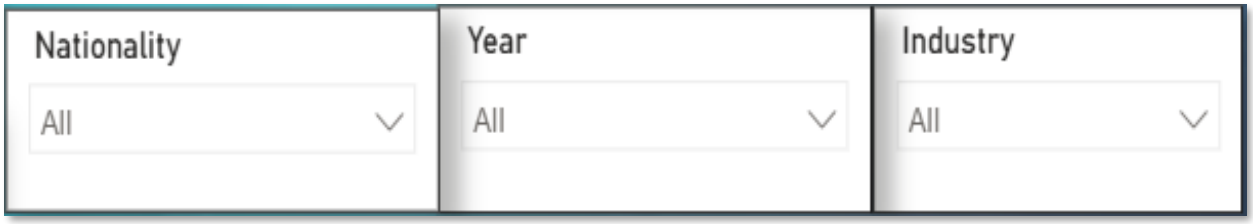

Figure 46. Dashboard Interactivity and Filters

The dashboard includes slicers for **nationality**, **year**, and **industry**, enabling stakeholders to tailor the visual analysis. This functionality supports drill-down examinations such as:

- How did healthcare applications change after 2020?
- Which nationalities contributed most to ICT roles?
- What were the application outcomes for a specific year?

- **Work Visa Application Trends (Line Chart)**

What is shows:

- This shows the trend of work visa application Trends across years.

Steps:

1. Choose Line Chart.
2. Add Year → X-axis.
3. Add the sum of 'vw_Work_Trends (Total_Work_Applications)' → Y-axis.
4. Turn on Shaded area in Format.

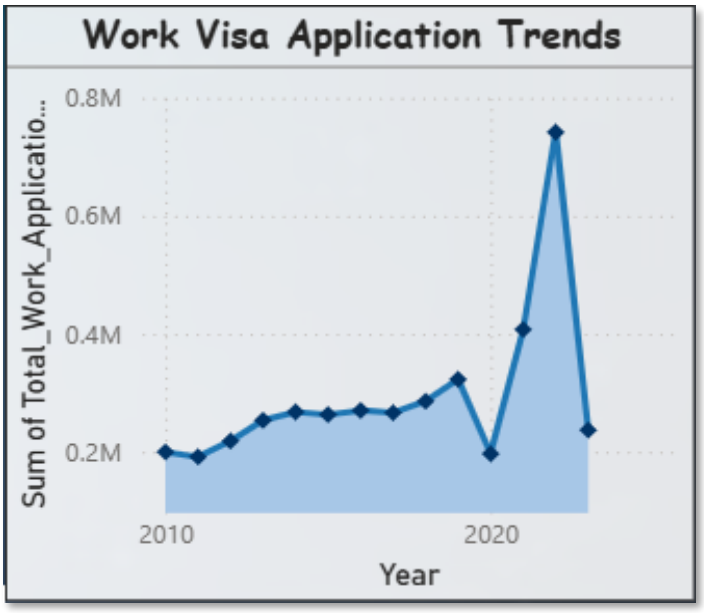

Figure 47. Work Visa Application Trends

This line chart visualizes historical trends in work visa applications for every year from 2010-2018, with the X-axis representing years and the Y-axis showing total applications. The increase in volumes of applications during this time indicates constant demand for sponsored employment, with a clear dip in 2020 due to the COVID-19 pandemic and the various restrictions on travel imposed during the pandemic.

Following a sharp rise in the post-2020 peak due in large part to significant policy changes pertaining to work visas in the UK (Skilled Worker Visa route) and the competing demand for workers in key sectors, as well as labour shortages and public health restrictions, has directly impacted the volume of Work Applications submitted during this time frame.

- **Work Visa Extensions Over Time (Column chart).**

What is shows:

- Shows year-wise total work visa extensions.

Steps:

1. Insert Column Chart.
2. Add Year → X-axis.
3. Add the sum of 'vw_Work_Extensions (**Total_Work_Extensions)'** → Y-axis.

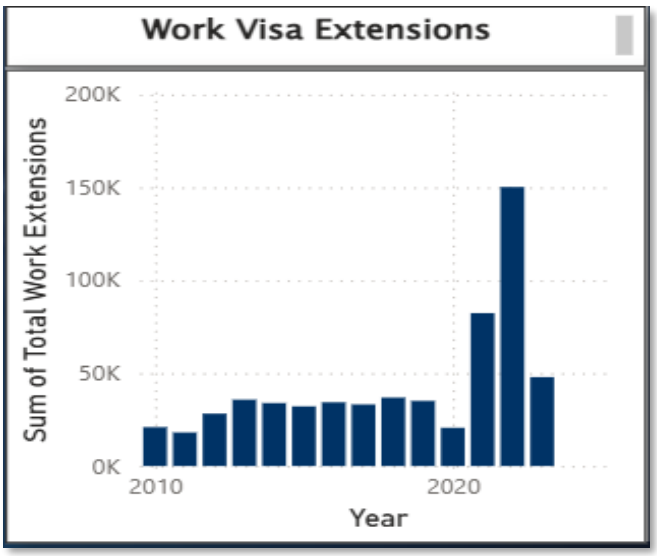

Figure 48. Work Visa Extensions Over

The clustered column graph illustrates the annual count of work visa extensions requested by workers who had previously been approved for a work visa, and subsequently wanted to extend their stay while in the UK.

The trend of this graph is reflective of the trend for applications:

- A low but consistent number of work visa extensions issued in previous years.
- In 2020 there was a dip in work visa extensions due to worldwide events.
- By 2022 there was an increase in the number of work visa extensions issued over 150,000.

The increase in work visa extensions observed is in line with labour shortages needing to be addressed and the requirement to continue support from their employer once the worker's employment has finished with a particular employer. The clustered column graph clearly supports the observation that a large number of sponsored workers are working long term rather than for short-term employment purposes.

- **Industry Distribution of Work Sponsorship (Tree map).**

What is shows:

- Shows which industries sponsor the most work visas.

Steps:

1. Insert Treemap.
2. Add Industry → Category.
3. Add the sum of 'migration-work-by-Industry-Table (Applications)' → Values.

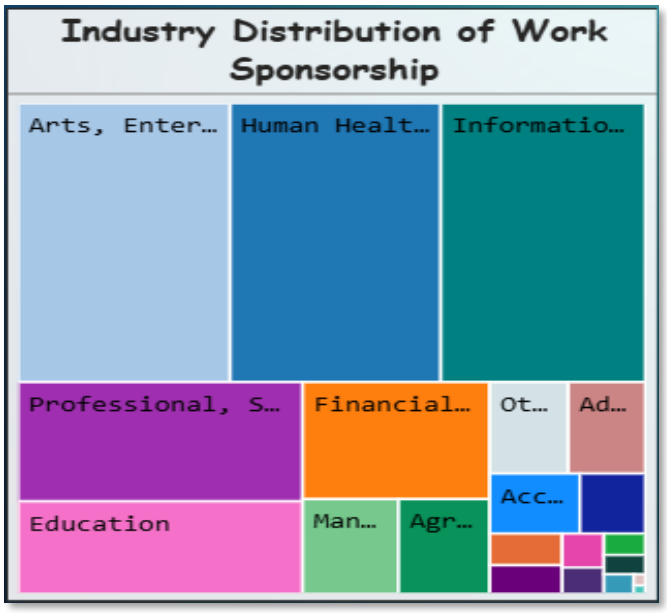

Figure 49. Industry Distribution of Work Sponsorship

The treemap of the work sponsored employment data displays the breakdown of work sponsored employment by industry sector including healthcare, information technology, finance, education, hospitality, manufacturing, and agriculture. The largest blocks represent those industries which had the highest volume of applications for sponsorship.

Industries that accounted for the highest volume of sponsored employment applications were:

- Health & Social Care
- Information & Communications
- Professional, Scientific and Technical Services
- Arts, Entertainment and
- Recreation

The predominant sector was Health & Social Care, which can be attributed to the current shortages in the National Health Service (NHS) and the increased reliance on international skilled workers. As such, it is likely that as the digital economy continues to grow, related industries will experience an increasing demand for skilled workers. While the numbers of sponsored employees in smaller industry sectors (i.e., Agriculture, Education and Manufacturing) are also considerable, their total is much lower than the designated larger industry categories. The treemap clearly highlights that the majority of employer-sponsored immigration is to be found within the industry sectors currently struggling with ongoing shortages.

- **Work Application Outcomes (Stacked Bar Chart)**

What it shows:

- Shows the distribution of application outcomes by year.

Steps:

1. Select 100% Stacked Column Chart.
2. Add Year → X-axis.
3. Add Total Applications → Y-axis.
4. Add Outcome_Type (Visa, Extension, Unknown) → Legend.

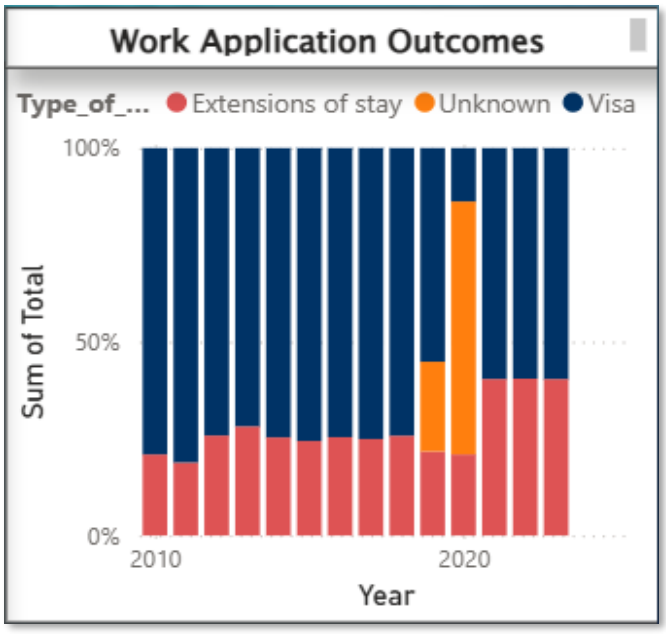

Figure 50. Work Application Outcomes

The stacked column graph shows the yearly outcome statistics for work-related visa applications split into the following categories:

- Permitted to work
- Applications rejected
- Stay extensions
- Other/Unknown

Throughout the majority of years displayed, the majority of decisions made regarding the permitted to work status of applications were favourable, indicating that most hired visa applications have been properly supported with employer documentation. The percentage of rejections varies from year to year but has consistently remained relatively low in comparison to other outcomes.

A substantial increase in Stay Extensions over the final years of the graph is also reflected in visuals regarding extensions and represents workers who may be moving into a more prolonged position of employment based upon the continuously changing visa path with which they achieved employment (ie: Tier 2 Visa moving to Skilled Worker Visa).

- **Work Visa Distribution by Nationality (Horizontal Bar Chart).**

What is shows:

  - Compares total work visa applications by nationality.

Steps:

1. Choose Clustered Bar Chart.
2. Add Nationality → Y-axis.
3. Add the sum of 'vw_Work_Top10_nationalities (TotalApplications) → X-axis.

Figure 51. Work Visa Distribution by Nationality

This chart showing the distribution of work visa applications by nationality ranks the top 5 countries from where applications were made in descending order; these were India, USA, Nigeria, China and the Philippines. These five nationalities indicate a reflection of the worldwide pool of skilled workers available and the continued effort of the UK to attract workers from health professions, Information technology, Engineering and research.

The large number of different nationalities represented on the graph reflects both the fact that the UK is viewed as an international hub for labour and the broad range of workers worldwide who now take part in the Sponsored Work Pathways to the UK.

- Summary of the Work Dashboard

The Work Sponsorship dashboard highlights key trends in UK employer-sponsored migration. It reports **4 million work visa applications** and **609,000 extension applications**, emphasizing the continued importance of international labour to the UK economy. Although applications dipped in 2020 due to COVID-19, they rebounded sharply in 2021–2022 as businesses faced post-pandemic skill shortages and adopted new Skilled Worker routes.Industry analysis shows sponsorship is heavily concentrated in **Healthcare**, **ICT**, and **Professional, Scientific & Technical Services**, reflecting ongoing shortages in Health and STEM fields. By nationality, **India** remains the largest source of applicants, followed by the **USA**, **Nigeria**, **China**, and the **Philippines**, indicating strong global interest in UK employment.

Most work visa and extension applications are approved, showing sustained employer reliance on overseas workers. Overall, the findings suggest that UK work visa patterns are shaped by **sectoral labour demand**, **policy changes**, and **wider global mobility trends**, reinforcing the employer-driven nature of skilled migration.

5.3 Compare & Contrast: Study vs Work Sponsorship Insights.

This section compares key patterns observed in the Study and Work sponsorship dashboards, highlighting how migration for education and employment differs in scale, purpose, nationality trends, sectoral distribution, and temporal behavior.

- **Overall volume of applications submitted and application extensions granted.**

Study sponsorship volumes are significantly higher, with **8 million applications** and **740,000 extensions**, compared to **4 million work applications** and **609,000 work extensions**. This reflects the strong global demand for UK education and the more stable, employer-driven nature of work migration.

- **Application trends by year**

Study applications show steady long-term growth, with sharp rises in 2021–2022 due to post-COVID recovery and enhanced university recruitment. Work visa applications show greater volatility, with large increases in 2021–2022 driven by economic recovery and new employer sponsorship routes. This contrast reflects academic-cycle consistency versus economic and policy-driven work migration.

- **Patterns of Nationality**

Study visas mainly attract applicants from **China**, **India**, and other Asian/African countries. Work visas are dominated by **India**, followed by the USA, Nigeria, China, and the Philippines. Study migration has a broad international base, whereas work migration is concentrated among countries with strong professional pipelines to the UK.

- **Differences Between Sectors and Industries**

Study sponsorship is organized by education sectors, with **non-Russell Group institutions** receiving the highest volumes. Work sponsorship is industry-driven, led by **Health/Social Care**, **ICT**, and **Professional/Technical** services. This reflects the different drivers behind study migration (education demand) versus work migration (labour market shortages).

- **Application Outcomes**

Both study and work visas show high approval rates. Study outcomes remain stable across years, while work visa outcomes fluctuate more prominently, especially during 2020–2022. Study applications follow a predictable cycle; work applications are more sensitive to economic and policy changes.

- **Application for Extensions**

Study extensions (740K) exceed work extensions (609K). Study extensions declined after 2016 but are recovering post-2019 as more students pursue higher-level qualifications. Work extensions have risen rapidly due to employers retaining skilled staff in high-demand sectors.

- Summary

Study and work sponsorships reflect two distinct migration patterns. Study migration is driven by global education demand and follows predictable academic cycles, while work migration is smaller in volume but highly sensitive to labor market shortages and policy changes. Both show strong approval rates, indicating continued demand for international talent in both education and workforce sectors.

6. Discussion.

- **Analytical Approach Overview**

This task integrated SQL Server for data storage and transformation with Power BI for interactive visualization. Migrating the two Managed Migration – Historic datasets into SQL Server enabled efficient cleaning, type standardization, and filtering, which improved the modelling workflow in Power BI. The dashboards that were created for both the Study Sponsorship and Work Sponsorship have provided the ability to review in detail the trends, outcomes and behavior of both migration streams.

- **Insights from the Study Sponsorship Dashboard**

The Study Dashboard revealed that study-related applications are significantly higher in volume than work visas, exceeding 8 million total applications. The fact that most applications were submitted from inside China shows that there continues to be a high demand for access to the UK's Higher Education System from abroad. There are a number of stable or predictable trends over the past several years; these have been shown to vary consistently in accordance with the academic calendar(s) and the recruitment strategies of the Higher Education Institutions and by the increasing number of students studying abroad.

Visa Approval rates have remained consistently high, along with the number of visa extensions, which shows a steady increase in the number of international students applying for study pathways of longer duration. The treemaps of sponsorship show that the most academically and internationally respected Higher Education Institutions are not Russell Group institutions and therefore are able to accept many more international students, showcasing the UK as a growing destination for students of all backgrounds.

- **Insights from the Work Sponsorship Dashboard**

While the Work Dashboard reports lower levels of total applications (approx. 4 million), it also shows that work sponsorship is more volatile. This volatility corresponds to fluctuations in the labour market and employment shortages, as well as changes to the Skilled Worker route after the pandemic's impact.

Differences in nationality patterns for work sponsorship and study memberships are apparent; with Indian nationals holding the highest proportion of work-sponsored applications because of its large base of skilled professionals in IT, healthcare, and engineering.

Accordingly, the tree map illustration indicates that migration patterns are sector-based and that there are persistently high shortages of healthcare and IT workers in particular. Approval rates overall for work sponsorship remain high but, unlike approval rates in study sponsorship, can fluctuate from year to year based upon changes in the economic situation or reforms to the policies governing sponsoring employers.

- **Comparison of Trends between Study and Work Sponsorship Dashboards**

While both dashboards suggest that secondary migration may take place as a natural consequence of the different drivers behind the two sponsorships, the trends between study and work sponsorships are fundamentally different. Whereas study sponsorship is primarily driven by institutions and has a cyclical, global distribution; work sponsorship, on the other hand, is driven by economics and industries, is specific to certain areas of the economy and is much more sensitive to changes in policy and labour market conditions. The differences between the sponsorships are most clearly illustrated by the prevalence of Chinese nationals applying for study, while Indians are the dominant nationality applying for work-sponsored jobs.

- **Technical and Analytical Insights**

Data quality has improved since SQL Server was introduced to Power BI to standardise data types and lessen the amount of transformation work needed for modelling. The interactivity of Power BI has provided the user with many features to perform more complex analyses of trends, such as drill-through reports, custom tooltips, slicers, and DAX measures for analysis and comparison of trends.

The challenges encountered were related to managing missing/inconsistent data, standardising the visa sub-category definitions, developing logical DAX functions for trend comparisons, and finally. Working through these challenges provided the framework for a clear and interpretable analysis that reflects the actual trends in migration behaviour and the impact of asylum policies

7. Recommendations

• **Strengthen Workforce Planning:**
Use work visa trend data to identify future skills shortages, especially in Healthcare, ICT, and STEM, and increase targeted global recruitment.

• **Support International Students Transitioning to Work:**
Since study visa volumes are high, policies could help graduates move into work routes to fill UK skill shortages.

• **Improve Extension Processing Capacity:**
Rising extension applications - especially for work visas - require better operational planning to reduce delays.

• **Monitor Nationality Patterns:**
As most work and study applicants come from a small set of countries, diversification strategies can make the system more resilient.

• **Use Data Dashboards in Policy Review:**
Continuously update and monitor dashboards to support evidence-based decision-making.

8. Limitations.

- **Data Gaps:**
  Some tables had missing values, non-numeric data, or inconsistent formats that required cleaning and may affect accuracy.
- **No Applicant-Level Details:**
  The dataset is aggregated, so individual reasons for application outcomes cannot be examined.
- **Limited Variables:**
  The tables only include basic fields (Year, Quarter, Nationality, Type of Application) without socio-economic details.
- **Time Lag:**
  Recent years may be incomplete; trends can change quickly due to policy updates.
- **COVID-19 Effects:**
  Pandemic-related disruptions create unusual spikes/drops that may distort long-term trend interpretation.

9. Conclusion.

The study and work sponsorship dashboards demonstrate two distinctly different migration patterns in the UK. Study sponsorship is consistently high and driven mainly by academic cycles and global demand for UK education, while work sponsorship is more volatile and strongly influenced by skill shortages, economic conditions, and policy changes. Nationality trends show that study routes attract a wide range of countries, whereas work routes are concentrated in specific high-skill migration corridors such as India, Nigeria, and the USA. Both categories show high approval rates, but work visa trends fluctuate more dramatically due to labour market pressures. Overall, the dashboards provide valuable insights for strengthening workforce planning, improving migration policy decisions, and understanding how study and work routes together shape the UK's migration landscape.