Global Population Analytics Dashboard

Project Documentation

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Tools

Power BI, Excel/CSV, DAX

Year

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1. Executive Summary

This project presents a comprehensive Business Intelligence (BI) solution for analyzing global population trends from 1960 to 2050 using official demographic datasets. The dashboard provides insights into historical growth, regional distribution, demographic composition, and long-term projections. The goal is to transform raw demographic data into decision-ready insights using professional data modelling, DAX measures, and interactive visual analytics in Power BI.

2. Business Problem Statement

Governments, researchers, NGOs, and policy makers require accurate population intelligence to plan infrastructure, healthcare, education, employment, and economic policies. Raw datasets are large, complex, and not decision-friendly. This project solves the problem by building an interactive analytics system that answers questions such as: Which regions are growing fastest? Which countries dominate population share? How is the demographic structure changing? What will the world look like in 2050?

3. Project Objectives

• Build a clean, scalable star-schema data model

• Create reliable DAX measures for population, growth, ranking, and projections

• Visualize historical and forecasted trends from 1960–2050

• Analyze regional, income-group, and age-structure differences

• Provide interactive drill-down and comparison capabilities

• Deliver a portfolio-quality BI solution

4. Dataset Description

The dataset is sourced from a World Bank-style demographic database covering more than 200 economies. It includes:

• Population estimates by country and year

• Series metadata (indicators)

• Country metadata (region, income group)

• Footnotes and classifications Time range: 1960–2050 (historical + projections).

5. Data Model Architecture

The solution uses a star schema design:

• **Fact_Population:** Contains yearly population values

• **Dim_Country:** Country name, code, region, income group

• **Dim_Series:** Indicator definitions

• **Dim_Calendar:** Time intelligence (Year, Decade, Projection flag)

This design ensures high performance, clean filtering, and correct time-intelligence calculations.

6. Data Cleaning & Transformation

Power Query was used to:

• Remove empty and irrelevant columns

• Standardize column names and data types

• Filter unusable aggregates and invalid entities

• Separate dimensions from fact tables

• Create a clean calendar dimension

• Ensure all keys and relationships are consistent

7. Key DAX Measures

• Total Population

• Population (Selected Year)

• YoY Growth %

• CAGR

• Population Share % of World

• Population Rank

• Population 0-14, 15-64, 65+

• Largest Population Country

• Fastest Growing Country

• 2050 Population Projection

These measures enable advanced analytics and dynamic ranking.

8. Dashboard Pages Overview

8.1 Page 1 — Global Overview

High-level KPIs, world population trend, top countries, growth indicators, and global distribution maps. This page answers: What is happening in the world at a glance?

8.2 Page 2 — Country Comparison

Compare countries by population size, rank, income group, and region. Includes top-N analysis, ranking tables, and distribution analysis.

8.3 Page 3 — Projections & Time Series

Shows historical trends and future projections up to 2050 using area charts, time slicers, and animated scatter plots. Highlights where history ends and projections begin.

8.4 Page 4 — Demographics

Focuses on age structure using decomposition trees, donut/treemap visuals, and demographic breakdowns by region and income group.

8.5 Page 5 — Country Profile (Drillthrough)

A detailed per-country view showing population trend, growth rate, age distribution, and global rank.

9. Business & Policy Insights

• Asia and Africa will dominate global growth by 2050

• Developed regions show aging populations

• Some countries have explosive growth rates requiring infrastructure planning

• Demographic structure is shifting toward older populations globally

• Population concentration remains highly uneven across the world

10. Technical Challenges & Solutions

• Handling mixed aggregates and real countries

• Fixing time-intelligence issues with a proper calendar table

• Correctly filtering World and income groups

• Managing very large numeric values

• Ensuring ranking and growth measures behave correctly with slicers

11. Performance & BI Best Practices

• Star schema modelling

• Measure-driven calculations

• Minimal calculated columns

• Proper use of ALL, ALLSELECTED, REMOVEFILTERS

• Clean slicer interactions

• Optimized visuals and formatting

12. Conclusion

This project demonstrates a full end-to-end BI workflow: data cleaning, modelling, DAX engineering, and professional dashboard design. It is suitable for academic submission, portfolio presentation, and professional interviews.