Project Document: Global Under-5 Malnutrition Trends Analysis (1G83-201G)

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1. Introduction

This document outlines the scope, objectives, methodology, and deliverables of the "Global Under-5 Malnutrition Trends Analysis (1983-2019)" project. The project aims to provide comprehensive insights into the patterns and prevalence of various forms of malnutrition (stunting, wasting, underweight, and overweight) in children under five years of age across different countries and income classifications over a significant time period. The primary output is an interactive Power BI dashboard and a detailed analytical report.

2. Project Objectives

The main objectives of this project are:

- To identify and visualize global trends in Under-5 malnutrition (stunting, wasting, underweight, and overweight) from 1983 to 2019.
- To analyze the relationship between income classification and malnutrition prevalence.
- To highlight countries with significant burdens of specific malnutrition types.
- To create an intuitive and interactive Power BI dashboard for stakeholders to explore malnutrition data.
- To generate a clear, narrative-driven report summarizing key findings and insights.
- To demonstrate a robust data analysis and visualization workflow using Power BI.

3. Scope

In-Scope:

- Analysis of malnutrition data for children under five years of age.
- Data time range: 1983-2019.
- Inclusion of malnutrition indicators: Stunting, Wasting, Underweight, Overweight.
- Analysis by country and income classification.
- Development of a Power BI dashboard (main overview page) and a detailed report page.
- Data extraction, transformation, and loading (ETL) within Power BI environment.

Out-of-Scope:

- Predictive modeling for future malnutrition trends.
- Analysis of malnutrition in age groups outside of Under-5.
- Collection of new primary data.
- Deployment of the Power BI report to Power BI Service (unless specified as a future phase).
- Detailed economic or policy recommendations beyond what can be directly inferred from the data.

4. Project Methodology s Phases

The project follows a structured agile-like methodology, broken down into distinct milestones and activities to ensure systematic progress and quality.

Phase 1: Planning s Architecture

- **Milestone 1: Technical Architecture s Project Flow Definition**
    - Defining the overall data pipeline, tools, and visual design strategy.
    - Establishing project milestones and activity breakdowns.

Phase 2: Data Management

- **Milestone 2: Data Collection s Extraction from Database**
    - Connecting to the source database.
    - Extracting raw data relevant to Under-5 malnutrition indicators and demographics (countries, income classifications, years 1983-2019).
- **Milestone 3: Data Preparation**
    - **Data Cleaning:** Handling missing values, inconsistencies, and errors.
    - **Data Transformation:** Reshaping data, creating calculated columns/measures (DAX) for metrics like rates, percentages, and totals.
    - **Data Modeling:** Establishing relationships between tables and optimizing data for performance within Power BI.

Phase 3: Analysis s Visualization

- **Milestone 4: Data Visualization s Dashboard Development**
    - **Activity 1: Responsive And Design Of Dashboard**
        - Designing the interactive dashboard page (Page 1) focusing on key metrics and high-level trends.

- Designing the detailed report page (Page 2) for in-depth analysis and narrative insights.
- Creating compelling and appropriate visualizations (maps, line charts, bar charts, cards, pages).
- Implementing interactive elements (slicers, cross-filtering, drill-through if applicable).

Phase 4: Reporting s Validation

- **Milestone 5: Report Generation**
  - Summarizing findings, insights, and conclusions in a structured textual format within the Power BI report page.
  - Ensuring the report narrative aligns with the visual data.
- **Milestone 6: Performance Testing s Quality Assurance**
  - Testing the dashboard's responsiveness and load times.
  - Validating data accuracy and consistency across all visuals and metrics.
  - Reviewing for visual clarity, user-friendliness, and adherence to design principles.

5. Deliverables

- **Power BI Desktop File (.pbix):** Containing the interactive dashboard and detailed report pages.
- **GitHub Repository:** Hosting the .pbix file, this Project Document, and a comprehensive README file.
- **Interactive Dashboard (Power BI Page 1):**
  - Key KPIs: Count of Under-5 Population, Sum of Survey Sample, Sum of Underweight.
  - Visualizations: Malnutrition by Income Classification (Stunting, Overweight, Underweight), Overweight by Country.
- **Detailed Report (Power BI Page 2):**
  - Dataset summary and key quantitative findings.
  - Narrative insights derived from charts (e.g., income impact on stunting, specific country overweight figures).

6. Technologies Used

- **Data Analysis s Visualization:** Microsoft Power BI Desktop

7. Key Findings s Insights (Based on Current Dashboards)

- The analysis covers 140 children under five years of age within the dataset, with a total of 317 million survey samples.
- A total of 10.34K underweight individuals were identified in the dataset.
- Higher income classifications consistently correspond to lower average stunting rates in Under-5 children, indicating a strong correlation between economic status and child health outcomes.
- The second income classification category accounts for the highest number of overweight individuals, with 1088 cases.
- Kuwait is identified as having the highest sum of overweight Under-5 individuals, exceeding 120 cases, warranting further investigation into this specific trend.