

Global Malnutrition Trends: A Power BI Analysis

(1983-2019)

1.INTRODUCTION :

1.1Project Overview:

ABC Company is undertaking an in-depth analysis of global malnutrition trends from 1983 to 2019 to better understand the prevalence and distribution of various forms of malnutrition among children under five years of age. Utilizing a comprehensive dataset from UNICEF/WHO/World Bank, the project aims to analyze severe wasting, wasting, stunting, underweight, and overweight conditions across different countries. By classifying countries according to their income levels (low, lower-middle, upper-middle, and high income) and other categories such as Least Developed Countries (LDC), Low Income Food Deficient (LIFD), Land Locked Developing Countries (LLDC), and Small Island Developing States (SIDS), the project seeks to uncover correlations between economic status and malnutrition rates. Through the use of advanced data visualization techniques in Power BI, including stacked bar charts and line charts, ABC Company aims to generate actionable insights that can guide policy-making and resource allocation to combat child malnutrition effectively.

Malnutrition remains a major global health challenge, affecting millions of children and adults across various regions. Understanding historical trends in malnutrition is essential for policymakers, health organizations, and NGOs to design effective interventions and allocate resources strategically. This project focuses on leveraging Power BI to analyse global malnutrition trends from 1983 to 2019, providing a comprehensive, data-driven approach to addressing this critical issue.

The analysis integrates data from international organizations such as the World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), and World Bank, covering key indicators like:

- Undernutrition rates(stunting, wasting, underweight)
- Micronutrient deficiencies (iron, vitamin A, iodine deficiency)
- Overnutrition trends (obesity, overweight cases)

- Regional and demographic disparities (age groups, income levels, geographic distribution)

Using Power BI's capabilities, this project involves data collection, cleaning, transformation, modelling, visualization, and performance optimization to create an interactive, user-friendly dashboard. The insights derived will help decision-makers implement data-driven solutions to reduce malnutrition rates globally.

Scenario 1: Count of U5 Population (140)

This metric represents the number of observations related to the under-five population in the dataset. It indicates the sample size or the count of data points collected.

Scenario 2: Sum of Survey Sample (11M)

The total sum of survey samples collected is 11 million. This large sample size adds robustness to the analysis and findings, ensuring that the insights derived are based on a substantial amount of data.

Scenario 3: Sum of Underweight (2.08K)

The total number of underweight cases is 2,080. This highlights the prevalence of underweight conditions among children under five, which is a critical aspect of malnutrition to address.

Scenario 4: Sum of LDC, LIFD, LLDC or SID2 and Average of Stunting by Income Analysis

The visualization is about the average spending by income. The x-axis shows income classification, likely divided into segments, and the y-axis shows the average spending. There is a trend line that shows that as income classification goes up, average spending also goes up.

Scenario 5: Sum of Overweight by Country

The visualization is about the total number of overweight people in various countries, according to a dataset titled "Sum of Overweight".

Scenario 6: Sum of Overweight and Underweight under Income Classification.

The width of each ribbon segment (overweight or underweight) for a specific income level indicates the relative size of that population group within that income bracket. By following

the ribbon's path, you can see if overweight or underweight populations become more or less dominant as income levels change.

Scenario 7: Sum of Income Classification

It represents the total income within each income bracket, but without knowing the number of people in each bracket, it's difficult to interpret. A high total could be due to a few very high earners or many people with moderate incomes. Labels for each income bracket (e.g., low, middle, high).

1.2 Purpose:

The primary objective of this project is to provide a robust, interactive, and insightful Power BI dashboard that helps stakeholders:

1. Identify Malnutrition Trends and Patterns:

Analyze historical malnutrition data to identify long-term trends across different regions, age groups, and socioeconomic classes.

Compare malnutrition rates over time to assess the effectiveness of past interventions.

Understand seasonal or economic factors affecting malnutrition rates.

2. Facilitate Data-Driven Decision Making

Enable government agencies, NGOs, and international health organizations to make informed decisions about resource allocation.

Support targeted intervention programs by highlighting high-risk areas and vulnerable populations.

Provide a reliable data source for academic research and policy development.

3. Enhance Accessibility and Usability of Data

Present malnutrition statistics in an interactive and visually appealing format, making it easy for users to explore the data.

Offer customizable filtering options (by year, country, demographic factors) to allow users to focus on specific insights.

Support multiple export formats (PDF, Excel, PowerPoint) for easy reporting and sharing of findings.

4. Improve Performance and Efficiency in Data Analysis

Optimize data processing to handle large datasets efficiently without performance lags.

Implement advanced Power BI features such as DAX measures, query folding, and incremental refresh to enhance report performance.

Ensure real-time or near real-time updates for accurate and up-to-date analysis.

5. Drive Global Awareness and Action Against Malnutrition

Provide clear, evidence-based insights to advocate for stronger policies on nutrition and food security.

Support fundraising and aid distribution efforts by NGOs based on real-time data.

Encourage collaborative efforts between governments and private organizations to combat malnutrition at both national and global levels.

2. IDEATION PHASE

2.1 Problem Statement: This project, Unveiling Global Malnutrition Trends (1983-2019) – A Data-Driven Call to Action, analyses 36 years of malnutrition data to identify global patterns and disparities using Power BI. It explores both undernutrition (stunting, wasting, underweight) and overnutrition (obesity, diet-related diseases), highlighting regional variations and socio-economic influences. By leveraging data visualization, the project aims to uncover critical trends, correlations, and policy gaps, ultimately serving as a foundation for informed decision-making and advocacy efforts to combat malnutrition worldwide.

2.2 Empathy Map Canvas: The *Empathy Map Canvas* for Unveiling Global Malnutrition Trends (1983-2019) – A Data-Driven Call to Action focuses on stakeholders like policymakers, NGOs, and healthcare professionals who need clear insights into malnutrition trends. They see data highlighting regional disparities and influencing factors like poverty and healthcare access. They hear discussions on global hunger and nutrition policies, while they say and do advocacy, policy-making, and awareness campaigns. Their thoughts and feelings range from frustration over slow progress to hope for data-driven solutions. This framework ensures the Power BI project delivers impactful insights for informed decision-making and real-world action against malnutrition.

2.3 Brainstorming: Brainstorming for Unveiling Global Malnutrition Trends (1983-2019) – A Data-Driven Call to Action involves generating ideas on how to analyze and present malnutrition data effectively using Power BI. The process begins by identifying key aspects of malnutrition, such as undernourishment, child stunting, wasting, and obesity, while considering regional disparities and socio-economic factors. We explore relevant datasets, potential data sources like WHO, UNICEF, and FAO, and the best visualization techniques to highlight trends over time. Additionally, brainstorming includes discussing the impact of policies, economic shifts, and global crises on malnutrition rates. By considering interactive dashboards, geographical heatmaps, and trend analysis, we aim to create an insightful and compelling data story that not only highlights the severity of malnutrition but also serves as a foundation for policymakers and organizations to take action.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Scenario: [global malnutrition]	Entice How might someone become aware of the service?	Enter What might someone experience as they begin to use the service?	Engage As the user interacts in the service, what might happen?	Exit What might people typically experience as the process finished?	Extend What might happen after the user experiences the best?
Steps What does the person (or group) typically experience?	user reads information regarding malnutrition, highlighting the importance of understanding global malnutrition trends	create educational landing page for the poverty analysis, including a brief overview, history, and a call-to-action. This explore the report	allow users to register the poverty report, interactive maps, charts, and tables	offer a concise summary of key findings and messages	user follows up with survey to gather feedback and determine how well support the findings have been met
Interactions What might someone interact with at each step along the way? • People: Who would they see or talk to? • Places: Where would they be? • Things: What digital touchpoints or physical objects would they use?	ad features an interactive map or chart highlighting global malnutrition trends	user clicks ad and lands on a dedicated page for the poverty analysis	user enters the poverty dashboard and explores interactive maps, charts, and tables	users is presented with a concise summary of key findings and messages	users receives a follow-up email with additional information or suggestions in relation to their goals
Goals & motivations At each step, what is a person's driving goal or motivation? (Think me, "or help me avoid...")	generate interest in the poverty analysis	encourage users to explore the report	enable users to interact with the data and visualizations	provide a concise summary of key findings	encourage ongoing engagement and community participation
Assessing Opportunities What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	user reads information regarding malnutrition, highlighting the importance of understanding global malnutrition trends	create educational landing page for the poverty analysis, including a brief overview, history, and a call-to-action. This explore the report	allow users to register the poverty report, interactive maps, charts, and tables	offer a concise summary of key findings and messages	user follows up with survey to gather feedback and determine how well support the findings have been met
Negative moments What steps does a typical person find frustrating, confusing, angering, costly, or time-consuming?	user reads information regarding malnutrition, highlighting the importance of understanding global malnutrition trends	create educational landing page for the poverty analysis, including a brief overview, history, and a call-to-action. This explore the report	allow users to register the poverty report, interactive maps, charts, and tables	offer a concise summary of key findings and messages	user follows up with survey to gather feedback and determine how well support the findings have been met
Areas of opportunity How might we make each step better? What ideas do we have? What have others suggested?	user reads information regarding malnutrition, highlighting the importance of understanding global malnutrition trends	create educational landing page for the poverty analysis, including a brief overview, history, and a call-to-action. This explore the report	allow users to register the poverty report, interactive maps, charts, and tables	offer a concise summary of key findings and messages	user follows up with survey to gather feedback and determine how well support the findings have been met

3.2 Solution Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Collection & Integration	Collection malnutrition data (1983-2029)form UNICEF,WHO/WORLD BANK and Integration with country economic classification.
FR-2	Data Categorization	Classify malnutrition types (server wasting, underweight) categorize countries countries based on economic and geographical factors.
FR-3	Trend Analysis	Analysis malnutrition trends from 1983-2019 and identify correlation with economic and geographical classifications.
FR-4	Data Visualization	Create stacked bar charts, line charts
FR-5	Report & insight	Generate key insight prepare reports and provide findings for policy makers.
FR-6	Presentation & Accessibility	Ensure Dashboard are easily accessible and present findings to decision-makers.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Users should be able to easily filter and analyze data in Power BI dashboard.
NFR-2	Security	UNICEF/WHO/world bank data should be protected from unauthorized access.
NFR-3	Reliability	Data reports should always display the correct information.
NFR-4	Performance	Even with millions of records, data processing and visualizations should be fast.
NFR-5	Availability	Data and Dashboard should always be accessible without interruption, even during design updates.
NFR-6	Scalability	The system should handle additional years of data for new countries and malnutrition without issues.

3.3 Data Flow Diagram

1. Data Collection & Extraction from Database

- Collect the dataset
- Storing Data in DB
- Perform SQL Operations
- Connect DB with Power BI
- Data Preparation
- Prepare the Data for Visualization

2. Data Visualizations

- No of Unique Visualizations

3. Dashboard

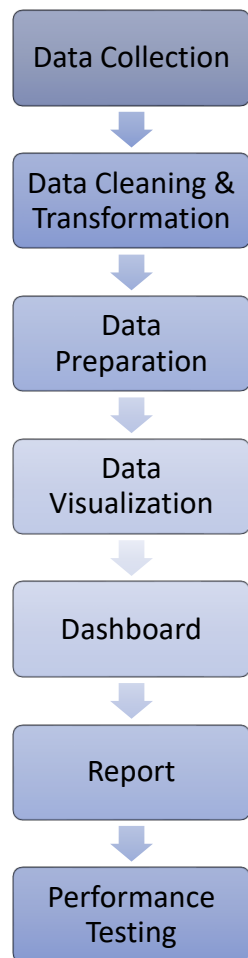
- Responsive and Design of Dashboard

4. Report

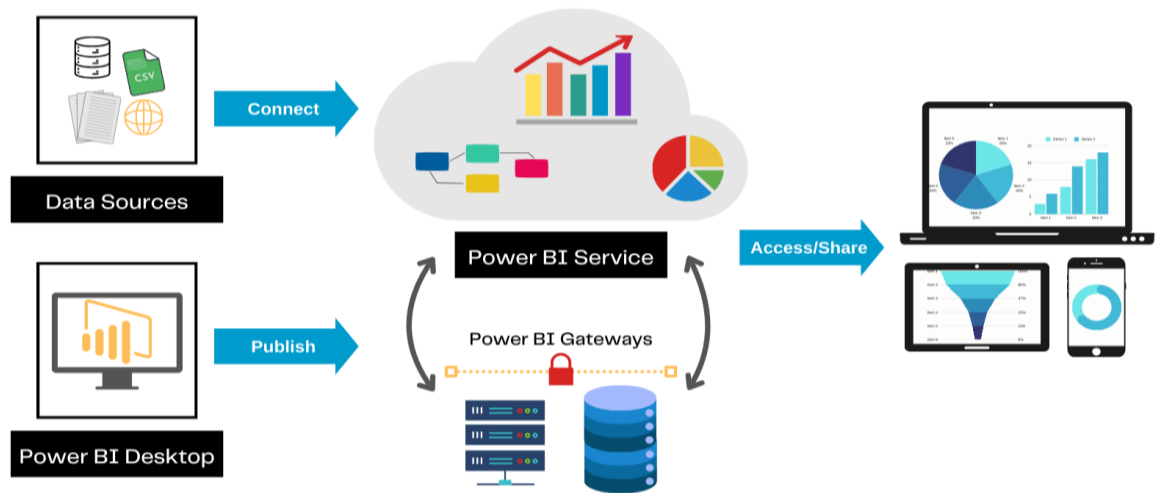
- Responsive and Design of Dashboard

5. Performance Testing

- No of Visualizations/ Graphs



3.4 Technology Stack



Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Table -1: Components & Technologies:

S.No	Component	Description	Technology
1.	Data Collection	Collecting malnutrition data from UNICEF/WHO World Bank	Power BI, Excel
2.	Data Loading	Importing Malnutrition Dataset	Power BI
3.	Data Cleaning	Cleaning Malnutrition rates and country classification	Power BI
4.	Data Visualization	Malnutrition trends (stunting, wasting, weight, overweight)	Power BI
5.	Scenario 1	Count of U5(Under-5)population	Power BI Visualization(KPI Card)
6.	Scenario 2	Sum of survey(total sample size)	Power BI Visualization(KPI Card)
7.	Scenario 3	Sum of underweight cases	Power BI Visualization(Card)
8.	Scenario 4	Stunting by Income classification(LDC, LIFD, LLDC,SIDC)	Power BI Visualization(Line and Stacked Column Chart)
9.	Scenario 5	Overweight cases by country	Power BI Visualization(Area Chart)
10.	Scenario 6	Overweight & underweight by income classification	Power BI Visualization(Ribbon Chart)
11.	Scenario 7	Sum of Income classification	Power BI Visualization(Gauge Chart)
12.	Report Creation	Malnutrition trends reports for insight	Power BI
13.	Data Export	Exporting processed data for further use	Power BI, Excel

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Scalability	Handle large datasets from 1983-2019	Power Bi, Excel
2.	Interactivity	Filters for Income levels, country classification	Power BI(DAX, Power Query)
3.	Performance	Optimized for multi-year malnutrition trends	Power BI(DAX)

4. PROJECT DESIGN

4.1 Problem Solution Fit: The Problem-Solution Fit for Unveiling Global Malnutrition Trends (1983-2019) – A Data-Driven Call to Action focuses on leveraging Power BI to bridge the gap between complex malnutrition data and actionable insights. The problem—persistent malnutrition across regions due to economic disparities, inadequate policies, and socio-political factors—demands a data-driven approach for better understanding and intervention. Our solution involves creating an interactive Power BI dashboard that visualizes malnutrition trends, identifies high-risk areas, and correlates factors like GDP, healthcare access, and food security. By transforming raw data into meaningful insights, this project equips policymakers, NGOs, and researchers with the tools to make informed decisions, ensuring targeted strategies for reducing global malnutrition effectively.

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Who is your customer? I.e. working parents of 0-5 y.o. kids	6. CUSTOMER CONSTRAINTS CC What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	5. AVAILABLE SOLUTIONS AS Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; Indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	10. YOUR SOLUTION SL If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER EM How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure > confident, in control - use it in your communication strategy & design.		8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.	

4.2 Proposed Solution: The Solution Proposed for Unveiling Global Malnutrition Trends (1983-2019) – A Data-Driven Call to Action involves utilizing Power BI to analyze, visualize, and interpret malnutrition data from credible sources like WHO, UNICEF, and FAO. By integrating historical data, the project will create interactive dashboards showcasing malnutrition trends, geographical disparities, and correlations with socio-economic factors such as GDP, healthcare access, and food availability. Advanced analytics like trend forecasting and comparative analysis will help identify patterns and high-risk regions. This solution aims to provide policymakers, researchers, and organizations with data-driven insights to design

targeted interventions, improve resource allocation, and formulate policies to combat global malnutrition effectively.

4.3 Solution Architecture: It is designed to efficiently process, analyze, and visualize large datasets using Power BI. The architecture begins with data collection from reliable sources like WHO, UNICEF, and FAO, followed by data preprocessing using tools like Excel or SQL to clean, structure, and transform raw data into a usable format. This processed data is then imported into Power BI, where data modeling techniques, relationships, and calculated measures are applied for deeper insights. The visualization layer consists of interactive dashboards, including trend graphs, heatmaps, and correlation analyses, enabling users to explore malnutrition patterns across regions and timeframes. Additionally, Power BI's AI-driven analytics can provide trend forecasting and anomaly detection to help policymakers and researchers make informed, data-driven decisions to combat global malnutrition effectively.

5.PROJECT PLANNING & SCHEDULING

5.1Project Planning

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a data analyst, I want to collect malnutrition data from reliable sources.	2	High	Arati Deote
Sprint-1	Data Cleaning	USN-2	As a data analyst, I want to clean and preprocess the collected data so that it is free from errors and ready for visualization.	3	High	Sayali Wankhade
Sprint-1	Data Preparation	USN-3	Data must be complete, accurate, cleaned (no duplicates or missing values), properly formatted, and optimized for efficient processing.	2	Medium	Pooja Thakre
Sprint-2	Data Visualization	USN-4	As a data analyst, I want to visualize global malnutrition trends using Power BI so that I can generate meaningful insight.	5	High	Pooja Thakre
Sprint-2	Dashboard Creation	USN-5	As a data analyst, I want to create Dashboard for the proper visualization.	5	High	Pawan Gore
Sprint-2	Design Report	USN-6	Create report for policymaker.	3	High	Sayali Wankhade
Sprint-2	Performance Testing	USN-7	Check all the data like how many amount of data load, utilization of filters, no of visualization/ Graphs.	2	Medium	Arati Deote

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	3 Hrs	9 Mar 2025	9 Mar 2025	20	7 Mar 2025
Sprint-1	20	3 Hrs	9 Mar 2025	9 Mar 2025	20	7 Mar 2025
Sprint-1	20	2 Hrs	10 Mar 2025	10 Mar 2025	20	7 Mar 2025
Sprint-2	20	5 Hrs	10 Mar 2025	11 Mar 2025	20	7 Mar 2025
Sprint-2	20	1 Day	11 Mar 2025	11 Mar 2025	20	7 Mar 2025
Sprint-2	20	1 Day	12 Mar 2025	12 Mar 2025	20	7 Mar 2025
Sprint-2	20	1 Day	12 Mar 2025	13 Mar 2025	20	7 Mar 2025

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint).

Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

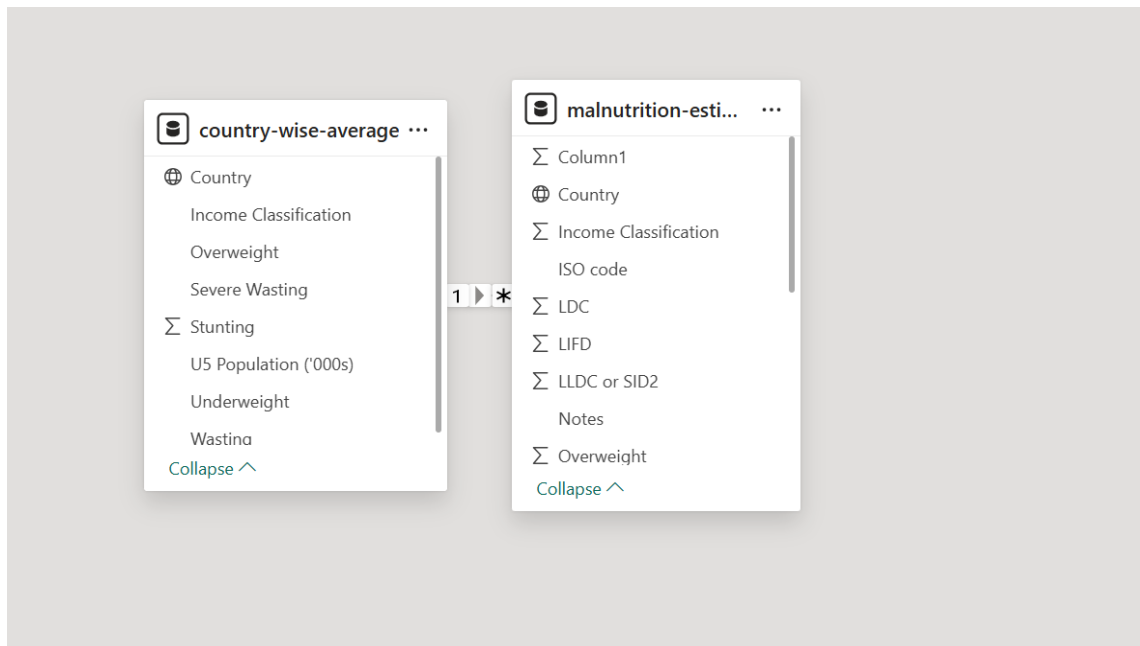
6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing:

Performance testing in Power BI for global malnutrition trends (1983-2019) ensures efficient data processing, report loading, and responsiveness. It evaluates data load performance, DAX query efficiency, and report rendering speed. Key optimizations include using aggregations, optimizing data models, and reducing visual complexity. Monitoring CPU/memory usage and enhancing user interaction responsiveness improve performance. These strategies ensure scalable, fast, and insightful analysis for policymakers and researchers.

1.Amount of Data Loaded

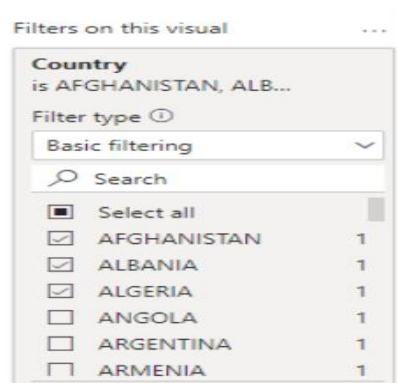
"Amount of Data Loaded" refers to the quantity or volume of data that has been imported, retrieved, or loaded into a system, software application, database, or any other data storage or processing environment. It's a measure of how much data has been successfully processed and made available for analysis, manipulation, or use within the system.



2. Utilization of Filters

"Utilization of Filters" refers to the application or use of filters within a system, software application, or data processing pipeline to selectively extract, manipulate, or analyze data based on specified criteria or conditions.

Selected “Country” as a Filter’



3: No of Visualizations/ Graphs

1. Sum of Survey Sample(N)
2. Sum of Year
3. Sum of Underweight
4. Sum of US Population
5. Sum of Overweight by Country

6. Total Income Classification
7. Sum of Overweight and Underweight by Income Classification
8. Sum of LDC, LIFD, LLDC or SID2 and Average of Stunting by Income Analysis

8.ADVANTAGES & DISADVANTAGES

8.1 Advantages:

1. Interactive and User-Friendly Visualizations:

Imagine a map of the world where you can click on a country and see its malnutrition rates over time. You can also use sliders to filter by year or compare different regions. Power BI turns raw data into interactive charts and dashboards, making it easy to spot trends and patterns that would be hidden in spreadsheets. This allows users to explore the data in a way that suits their specific needs.

2.Data-Driven Decision Making:

Instead of guessing where to focus resources, policymakers can use Power BI to see which areas have the highest malnutrition rates, which populations are most affected, and how rates have changed over time. This data helps them create targeted interventions and allocate resources effectively. For example, if the data shows a spike in childhood malnutrition after a drought, aid organizations can quickly respond.

3.Efficient Data Processing and Handling of Large Datasets:

Malnutrition data can be massive, with millions of records from different sources. Power BI is designed to handle this. It can quickly process and analyze large datasets, allowing users to get insights without waiting for hours. This is crucial for timely responses to nutrition crises.

4.Seamless Integration with Multiple Data Sources:

Data on malnutrition might come from the World Health Organization (WHO), UNICEF, national health surveys, and more. Power BI can pull data from all these sources into one place, creating a unified view. This eliminates the need for manual data merging and reduces the risk of errors.

5.Real-Time Data Updates for Continuous Monitoring:

Malnutrition rates can change rapidly, especially during emergencies. Power BI can be set to automatically update data from online sources, providing real-time or near-real-time information. This allows health organizations to monitor trends and respond quickly to emerging crises.

6.Export and Reporting Capabilities:

Power BI can generate reports in various formats, such as PDF, Excel, and PowerPoint. This makes it easy to share findings with stakeholders, create presentations, and publish reports. Automated reports save time and ensure consistency.

7.Cost-Effective Solution for Data Analytics:

Compared to some other business intelligence tools, Power BI is relatively affordable. The free version is suitable for many basic analyses, and the paid versions offer more advanced features. This makes it accessible to a wide range of organizations, including nonprofits and government agencies with limited budgets.

8.2Disadvantages :

1.Data Accuracy Depends on Source Reliability:

If the data from the WHO or other sources is inaccurate or incomplete, the analysis will be flawed. This is a critical point. If the data going in is bad, the information coming out will also be bad.

2.Performance Issues with Large Datasets:

While Power BI can handle large datasets, very complex analyses or poorly optimized reports can still lead to slow performance. This can be frustrating and hinder productivity.

3.Requires Skilled Users for Advanced Features:

To fully leverage Power BI's capabilities, users need to have some technical expertise in data modeling, DAX (Data Analysis Expressions), and Power Query. This can be a barrier for organizations that lack skilled personnel.

4.Limited Customization Compared to Other BI Tools:

While Power BI offers a wide range of visualizations, some other tools, like Tableau or Python libraries, offer more flexibility in creating custom dashboards and visualizations.

5.Role-Based Security and Access Control Limitations:

Protecting sensitive malnutrition data requires robust security measures. While Power BI offers some security features, setting up complex access controls can be challenging.

6.Internet Dependency for Cloud-Based Reports:

Power BI Service, which is used for sharing and collaborating on reports, requires an internet connection. This can be a problem in areas with limited internet access.

7.Higher Costs for Power BI Premium Features:

While the basic version is affordable, accessing advanced features like real-time dashboards and AI-powered analytics requires a Power BI Pro or Premium license, which can be costly for large organizations.

9.CONCLUSION:

The Power BI analysis of global malnutrition trends (1983–2019) has provided valuable insights into how malnutrition patterns have evolved across different regions and demographics. By leveraging data visualization, filtering, and performance optimization, this project enables stakeholders—including policymakers, NGOs, and researchers—to make data-driven decisions that can help combat malnutrition more effectively.

The findings indicate that undernutrition remains a major issue in low-income countries, particularly in Africa and South Asia, while obesity and overnutrition have increased in developed nations. Socioeconomic factors such as poverty, healthcare access, and food security play a significant role in malnutrition rates, highlighting the need for targeted intervention programs.

Despite the benefits of interactive dashboards and real-time analytics, challenges such as data accuracy, performance optimization, and user expertise remain. Future enhancements could

include AI-driven predictive analytics, real-time data integration, and improved accessibility to further refine insights and support global health initiatives.

In conclusion, this Power BI analysis serves as a critical tool in the fight against malnutrition, enabling better resource allocation, policy formulation, and long-term nutritional strategies. By continuing to enhance data-driven approaches, governments, NGOs, and health organizations can work towards a world with lower malnutrition rates and improved health outcomes for vulnerable populations.

10.FUTURE SCOPE:

1. Expand the Dataset and Data Sources

Integrate real-time data feeds from health organizations to improve the accuracy of malnutrition tracking.

Incorporate socioeconomic and environmental data (e.g., food prices, climate conditions) to analyze additional factors influencing malnutrition.

2. Advanced Predictive Analytics Using AI and Machine Learning

Implement AI-driven models in Power BI to forecast future malnutrition trends.

Use machine learning algorithms to predict which regions are at the highest risk based on historical patterns.

3. Improve Dashboard Performance and Optimization

Optimize query efficiency by using aggregated data and pre-calculated measures.

Implement DirectQuery for live database connections to enhance real-time reporting capabilities.

4. Enhance Accessibility and Collaboration

Enable mobile-friendly dashboards to ensure wider accessibility.

Integrate Power BI with cloud platforms (Azure, Google BigQuery, AWS) for better collaboration and scalability.

11.APPENDIX:

Git Id: Poojathakare006

Link: <https://github.com/Poojathakare006/Global-Malnutrition-Trends-A-Power-BI-Analysis-1983-to-2019>