UNIFIED MENTOR PVT LTD
Haryana, India, 125033

INTERNSHIP PROJECT REPORT ON

Data Governance and Security Dashboard

UNDER THE GUIDANCE OF
UNIFIED MENTOR PVT LTD
Haryana, India, 125033

Summer Internship Program:

Data Analytics
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1. Introduction

In today's digital economy, data is a critical asset. However, the true value of data lies in its governance and security—ensuring it is accurate, consistent, accessible, and protected. Organizations and governments alike face increasing pressure to manage data responsibly, not only for operational efficiency but also for compliance, trust, and strategic decision-making. As global expectations for transparency and accountability rise, particularly in the context of environmental, social, and governance (ESG) frameworks, the importance of effective data governance and security has never been more apparent.

The **Data Governance and Security Dashboard** project was conceptualized as part of an internship initiative to explore, analyze, and visualize key governance indicators across multiple countries using real-world ESG data. Governance, being one of the core pillars of ESG, encapsulates aspects such as political stability, rule of law, regulatory quality, government effectiveness, and control of corruption. These metrics are vital for understanding how well a country or organization manages its data and decision-making processes.

The project makes use of datasets that contain governance-related indicators over time and across different regions. These include datasets like ESGCountry.csv, ESGSeries.csv, and ESGData.csv, which together provide a rich basis for time-series and cross-sectional analysis. The primary objective is to extract meaningful insights from these datasets to assess and compare the governance quality of various countries.

To achieve this, a combination of tools was employed:

- **Excel** was used for data cleaning, formatting, and initial exploration.
- **SQL** enabled efficient querying and joining of large datasets to derive structured and relevant subsets of information.
- **Tableau Desktop** was used to design an interactive, dynamic dashboard that allows users to explore ESG governance metrics through intuitive visualizations.

The result is a visually engaging and informative dashboard that supports better understanding of governance trends and security practices through data. It enables users to filter by country, year, or specific governance indicators, offering a user-friendly tool for policy makers, researchers, and analysts alike.

This report presents the entire lifecycle of the project—from problem identification and data preparation to dashboard development and insights—highlighting how data governance can be improved through analytical storytelling and visualization.

2. Objectives

The primary aim of the **Data Governance and Security Dashboard** project is to transform complex governance-related ESG datasets into an insightful and interactive visual dashboard. The dashboard is designed to support informed decision-making, policy

evaluation, and comparative governance analysis across countries. To accomplish this, the project was guided by the following key objectives:

2.1 To Understand and Analyze Governance Indicators

- Studied ESG datasets to identify and extract governance-specific metrics such as government effectiveness, control of corruption, regulatory quality, and rule of law.
- Explore how these indicators vary across countries and evolve over time.

2.2 To Clean and Prepare Data for Visualization

- Used **Excel** for initial preprocessing including data formatting, null value treatment, and column filtering.
- Used **SQL** to perform data joins, aggregations, and filtering of relevant fields to create structured tables ready for analysis.

2.3 To Develop an Interactive Dashboard Using Tableau Desktop

- Created visual components such as bar charts, line graphs, maps, filters, and KPI cards to represent governance indicators clearly.
- Enabled interactivity so users can dynamically select countries, years, or indicators for detailed comparisons.

2.4 To Provide Insightful Visual Reporting on Data Governance Trends

- Highlighted patterns, trends, and anomalies in governance data to support strategic insights.
- Used visual storytelling to present comparative analysis between countries or regions.

2.5 To Demonstrate the Importance of Data Governance and Security in Modern Analytics

- Emphasized how clean, well-governed data leads to better analysis and decision-making.
- Showcased how secure handling of public governance data can foster transparency, accountability, and trust in data systems.

3. Data Description

The data used in this project is derived from publicly available ESG (Environmental, Social, and Governance) datasets, with a primary focus on the **Governance** dimension. These datasets provide a structured, multi-country view of governance performance indicators across multiple years. They are stored in CSV format and were processed using **Excel** and **SQL** before being visualized in **Tableau Desktop**.

3.1 Datasets Used

Three primary CSV files formed the core of the analysis:

ESGCountry.csv

- Contains metadata and names of countries included in the ESG dataset.
- Key fields:
    - Country Name
    - Country Code
    - Region
    - Income Group

ESGSeries.csv

- Lists the governance indicators available in the dataset.
- Key fields:
    - Series Code
    - Series Name (e.g., *Government Effectiveness*, *Control of Corruption*)
    - Description of the indicator

ESGData.csv

- The main data file with time-series values of governance metrics for each country.
- Key fields:
    - Country Code
    - Series Code
    - Year columns (e.g., 2000 to 2022)
    - Numeric values representing governance scores or indices

3.2 Data Preprocessing Steps

Before visualization, the data was cleaned and restructured using **Excel** and **SQL**:

In Excel:

- Removed empty or irrelevant columns.
- Renamed headers for better readability.
- Checked for missing values and ensured numeric consistency.

In SQL:

- Joined ESGCountry, ESGSeries, and ESGData based on shared keys (Country Code and Series Code).
- Transformed year-wise data from wide format (many year columns) into long format (rows by year) using UNPIVOT techniques.
- Filtered data to focus only on Governance-related series.

3.3 Final Data Structure

After preprocessing, the final dataset used in Tableau included the following fields:

- Country
- Region
- Indicator Name
- Year
- Governance Score

This structure allowed for efficient filtering and visualization across dimensions like time, country, and governance indicator.

4. Tools Used

To successfully carry out this data-driven project, a combination of widely used industry-standard tools was employed. Each tool played a critical role in different phases of the data lifecycle—from cleaning and transformation to analysis and visualization.

4.1 Microsoft Excel

- **Purpose**: Initial data exploration, cleaning, and formatting.
- **Key Tasks**:
    - Identified missing or inconsistent values.
    - Renamed and organized column headers.
    - Removed nulls and irrelevant rows.
    - Prepared datasets for SQL import and dashboard development.

4.2 SQL (Structured Query Language)

- **Purpose**: Data transformation, joining, and querying.
- **Key Tasks**:

- Joined the primary datasets (ESGCountry, ESGSeries, and ESGData) based on keys like Country Code and Series Code.
- Filtered governance-specific indicators.
- Converted wide-form year-based data into long-form for efficient visualization.
- Created structured queries to generate clean, analysis-ready tables.

4.3 Tableau Desktop

- **Purpose**: Dashboard development and data visualization.
- **Key Tasks**:
  - Designed a user-friendly interactive dashboard.
  - Implemented various visualizations such as bar charts, time series plots, maps, and filters.
  - Enabled filtering by country, year, and governance indicator.
  - Integrated calculated fields and KPI indicators for richer insights.

Each tool complemented the other and ensured a smooth data pipeline from raw CSV files to polished, interactive dashboards. This multi-tool approach helped build a comprehensive and reliable Data Governance and Security Dashboard capable of supporting strategic analysis and reporting.

Tableau Code and Calculated Fields for ESG Dashboard

1. ESG Indicator Count by Country

```
// ESG Indicator Count
COUNTD([SeriesCode])
```

2. ESG Indicator Count by Series Code

```
// Total Number of Countries Reporting a Series Code
COUNTD([Country])
```

3. Filter Logic – Only Valid ESG Indicators

```
// Valid ESG Records Only
IF CONTAINS([SeriesCode], "EG.") OR
  CONTAINS([SeriesCode], "EN.") OR
  CONTAINS([SeriesCode], "SP.") THEN "Valid"
```

```
ELSE "Other"
END
```

4. Custom Label for Tooltip or Bar Chart

```
// Label for Display
[SeriesCode] + " (" + STR(COUNTD([Country])) + " countries)"
```

5. Color Coding by Count Range (for Map or Bars)

```
// Category for Map Coloring
IF [Count of ESG by Series] >= 180 THEN "Very High"
ELSEIF [Count of ESG by Series] >= 150 THEN "High"
ELSEIF [Count of ESG by Series] >= 100 THEN "Medium"
ELSE "Low"
END
```

6. Dynamic Title or KPI Summary

```
// Dashboard KPI Summary Text
"Total Series Codes: " + STR(COUNTD([SeriesCode])) +
", Total Countries: " + STR(COUNTD([Country]))
```

7.ESG Coverage Score (Weighted)

```
// ESG Coverage Score (if weights available)
SUM([IndicatorWeight] * [IndicatorPresence]) / SUM([IndicatorWeight])
```

5. Dashboard Features

The heart of this project lies in the **interactive dashboard** created using **Tableau Desktop**, which serves as a visual interface for exploring governance-related data across countries and years. The dashboard was designed with clarity, interactivity, and usability in mind, enabling stakeholders to derive insights quickly and effectively.

Below are the key features and components of the dashboard:

5.1 Country-Level Governance Comparison

- Allows users to **select one or more countries** and compare their governance scores side-by-side.
- Visualized using **bar charts** and **line graphs** for year-over-year trends.

- Helps identify which countries show consistent performance or notable fluctuations over time.

5.2 Governance Indicator Filter

- Users can choose specific **governance indicators** such as:
    - Government Effectiveness
    - Control of Corruption
    - Regulatory Quality
    - Rule of Law
- Upon selection, all visuals dynamically update to reflect the chosen indicator.
- Enables focused analysis on individual dimensions of governance.

5.3 Time Series Analysis

- A **line chart** shows governance trends over a time range (e.g., 2000–2022).
- Helps users observe the **progression or regression** of governance scores for selected countries or regions.
- Supports year-wise analysis to correlate governance performance with external events or policy changes.

5.4 Geographical Map Visualization

- Displays countries on a world map shaded based on governance scores.
- Provides a **global perspective** on how governance quality varies by region.
- Interactive tooltips display the score and selected indicator on hover.

5.5 KPI Cards / Summary Panels

- Key metrics are summarized at the top of the dashboard using **KPI cards**, including:
    - Highest and lowest scoring countries.
    - Average governance score across all countries.
    - Selected year and indicator.

5.6 Dynamic Filters and Parameters

- Filters include:
    - Country Selector
    - Year Range Slider
    - Indicator Dropdown

- These filters offer **real-time interactivity**, giving users control over the data they wish to view.

5.7 Clean, Responsive Layout

- Designed using **Tableau best practices**:
    - Proper use of colors and legends.
    - Readable fonts and labels.
    - Consistent layout across devices and screen sizes.

This comprehensive set of dashboard features ensures that users—from policy analysts to academic researchers—can explore governance performance data in an insightful, flexible, and visually engaging manner.

6. Key Insights or Findings

After analyzing and visualizing the governance-related ESG data through the developed dashboard, several important insights were derived. These findings highlight governance trends across countries and regions and offer a data-driven perspective on the effectiveness of public institutions over time.

6.1 Consistently High-Performing Countries

- Countries such as **Denmark**, **Switzerland**, **Finland**, and **Singapore** consistently ranked high across most governance indicators.
- These nations scored especially well in **Control of Corruption**, **Government Effectiveness**, and **Rule of Law**, indicating strong institutional frameworks and transparency.

6.2 Countries with Improving Governance Trends

- Some developing countries, including **India**, **Vietnam**, and **Rwanda**, showed gradual improvement in indicators like **Regulatory Quality** and **Government Effectiveness** over the last decade.
- These improvements suggest successful governance reforms and better policy implementation.

6.3 Regions with Persistent Governance Challenges

- Several countries in **Sub-Saharan Africa** and parts of **South Asia** showed lower scores in **Political Stability** and **Control of Corruption**.
- These regions faced frequent fluctuations, highlighting the impact of political instability and weaker institutional structures.

6.4 Post-Crisis Declines

- Countries affected by political or economic crises—such as **Venezuela**, **Afghanistan**, and **Syria**—showed a significant drop in governance indicators post-crisis.
- This pattern reinforces the relationship between governance breakdown and national crises.

6.5 Disparities Between Indicators

- Some countries performed well in **Regulatory Quality** but lagged in **Rule of Law** or **Political Stability**, indicating imbalanced governance structures.
- These disparities offer insights into specific areas that require focused reform.

6.6 Global Governance Trends

- Global governance scores saw a **slight decline** during the years around major global events (e.g., the COVID-19 pandemic, economic slowdowns).
- This trend was especially visible in **Political Stability** and **Government Effectiveness**, reflecting the stress on public institutions during global disruptions.

These insights underscore the importance of data governance in policy analysis, risk assessment, and international development planning. The dashboard provides a strong foundation for continuous monitoring and comparative evaluation of governance performance across the world.

7. Challenges Faced

During the development of the **Data Governance and Security Dashboard**, several challenges were encountered across the stages of data handling, transformation, and visualization. These challenges required careful problem-solving and tool-based optimization to ensure the dashboard was accurate, responsive, and user-friendly.

7.1 Handling Unstructured and Wide Data

- The ESGData.csv file stored year-wise data in a wide format, with each year as a separate column.
- This structure was not suitable for visualization and had to be converted into a **long format** using SQL UNPIVOT or manual reshaping in Excel, which was time-consuming and prone to error.

7.2 Missing and Incomplete Data

- Several countries had **missing values** for some governance indicators or certain years.
- These gaps caused inconsistencies in visualizations and had to be handled by either excluding those records or interpolating where meaningful.

7.3 Data Integration Across Multiple Files

- Combining three datasets (ESGCountry, ESGSeries, and ESGData) required careful **joining using primary keys** such as Country Code and Series Code.
- Ensuring referential integrity and consistent matching across files was a manual effort initially and required verification through test queries in SQL.

7.4 Filtering and Isolating Governance Indicators

- The original ESG dataset also included environmental and social data.
- Identifying and extracting only **governance-related indicators** demanded a deep understanding of the indicator descriptions and required additional filtering logic in SQL.

7.5 Learning Curve in Tableau

- Developing a dynamic and visually compelling dashboard in **Tableau Desktop** involved learning advanced features such as:
    - **Parameter controls**
    - **Dynamic filters**
    - **Map visualizations**
- Initial designs had usability issues which were improved through iterative testing.

7.6 Balancing Detail and Simplicity

- A challenge was to provide **comprehensive insights** without overloading the dashboard with too many visual elements.
- Achieving a balance between **interactivity, readability, and analytical depth** took several design revisions.

Despite these challenges, careful planning, iterative testing, and the effective use of Excel, SQL, and Tableau helped overcome hurdles and resulted in a robust and informative dashboard.

8. Conclusion

The **Data Governance and Security Dashboard** project successfully demonstrates how structured data, when cleaned, transformed, and visualized effectively, can provide deep insights into complex global governance issues. Using tools like **Excel**, **SQL**, and **Tableau Desktop**, the project transitioned from raw ESG datasets to an interactive, user-friendly dashboard capable of informing data-driven decisions.

Through the analysis of key governance indicators—such as Government Effectiveness, Control of Corruption, and Rule of Law—this project highlights significant disparities, trends, and patterns in institutional performance across countries and over time. It also showcases how data governance is not just about managing data efficiently but also about **enhancing transparency, accountability, and policy-making** through data-informed insights.

The dashboard allows policymakers, analysts, and researchers to explore governance trends, identify strengths and weaknesses, and track the evolution of governance indicators globally. It serves as a starting point for more detailed and targeted analysis in domains such as international development, public administration, and socio-political research.

9. Screenshot of the Dashboard