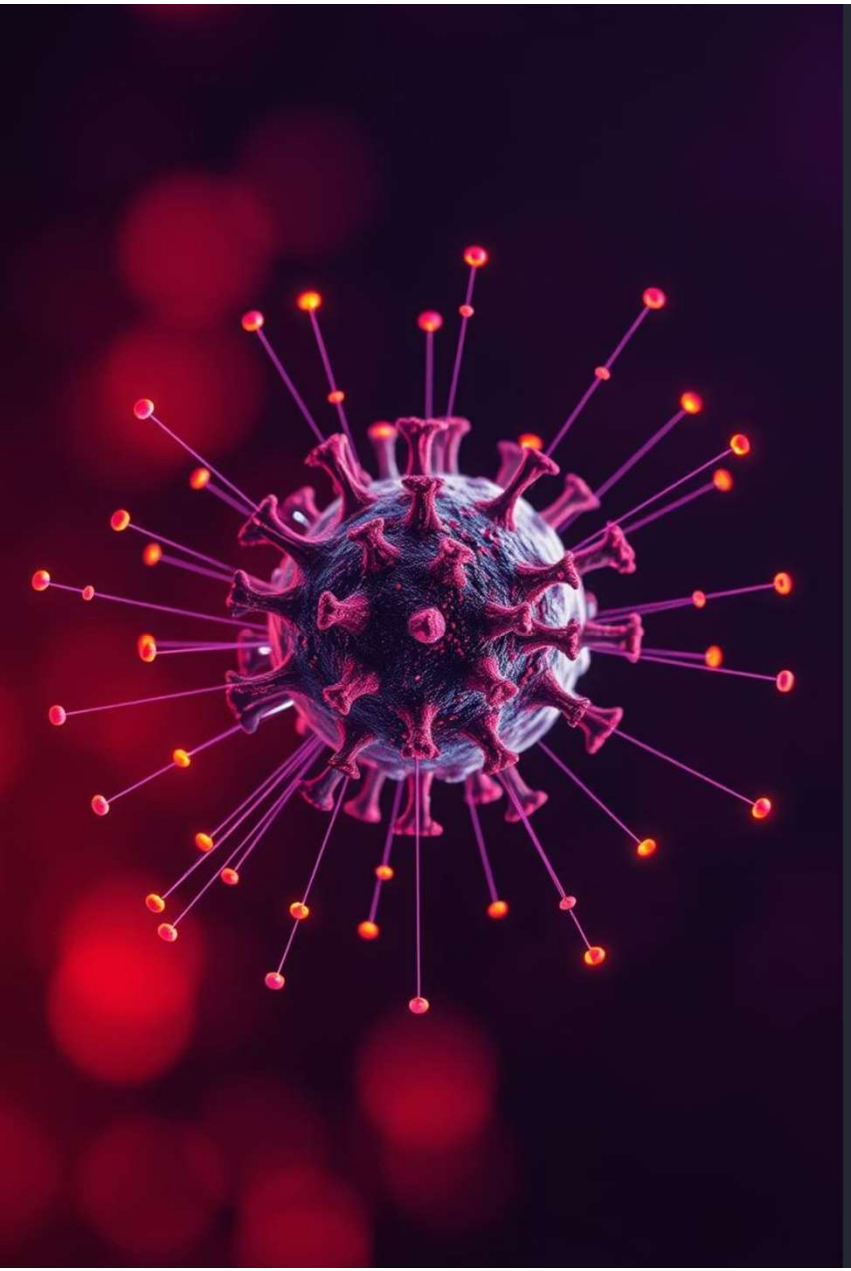


COVID-19 Dashboard Case Study

Developed by **Piyush Purushottam Kulkarni** during an internship at i2i Industry. This presentation highlights the journey of building a real-time, interactive COVID-19 data visualization dashboard.

Project Overview: Real-Time Pandemic Insights

Dashboard Development

Built a dynamic COVID-19 dashboard using Python and the Dash framework. Focused on real-time data visualization.

Global Data Visualization

Enabled interactive exploration of global and country-specific pandemic data, providing comprehensive insights.

Interactive Charts

Integrated Plotly Express for highly interactive and visually appealing charts, enhancing user experience.

i2i Industry Internship

Executed as a key project during an internship at i2i Industry, applying practical data science skills.

Core Objectives & Key Features

Global Impact via Pie Charts

Visualize total deaths and new cases by continent, offering a clear distribution of pandemic impact.

Top Countries Analysis

Identify and highlight the top 7 countries by total cases using insightful bar charts for quick comparison.

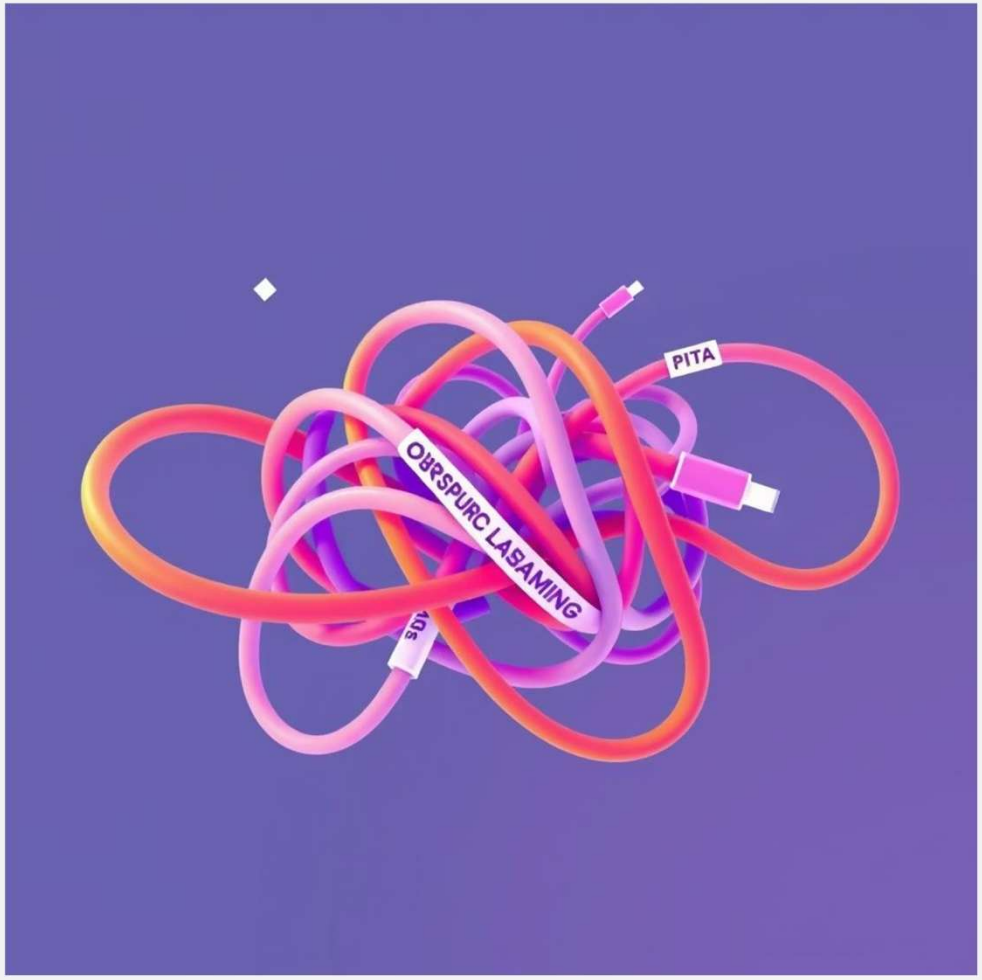
Trend Over Time

Illustrate pandemic progression with line charts for selected countries, showing trends and changes.

Demographic Insights

Analyze the median age by country using scatter plots, providing contextual demographic data.

Challenges Encountered



1 Large, Unstructured Data

Managing and cleaning a voluminous Excel dataset with inconsistent formats.

2 Data Integrity Issues

Addressing missing values and correcting invalid continent entries within the dataset.

3 Complex Chart Integration

Seamlessly integrating diverse chart types (pie, bar, line, scatter) within the Dash framework.

4 Time Series Handling

Accurately processing and visualizing time-series data, including date format conversions.

5 Local Deployment Limitations

Overcoming challenges associated with local server setup and running the Dash application.

Strategic Solutions & Implementation

Data Preprocessing with Pandas

Leveraged Pandas for robust data cleaning, transformation, and efficient management of large datasets.

Optimized Data Filtering

Implemented advanced filtering and grouping techniques to extract and present the most current and relevant records.

Dynamic Visualizations with Plotly

Utilized Plotly Express to generate aesthetically pleasing and highly interactive graphs, enhancing data readability.

Interactive Web Dashboard with Dash

Employed the Dash framework to construct and deploy the functional web dashboard, ensuring a seamless user experience.

Robust Error Handling

Incorporated try-except blocks to gracefully manage missing values and potential errors, ensuring dashboard stability.

Tools & Technologies Stack

Python

Core programming language for backend logic and data processing.

Dash

Web application framework by Plotly, enabling interactive dashboard creation.

Pandas

Powerful library for data manipulation, analysis, and cleaning.

Plotly Express

High-level API for creating complex, interactive statistical graphs.

Excel Dataset

Data sourced from Our World in Data, serving as the primary input.

VS Code

Integrated Development Environment (IDE) used for project coding.

Industry Research: Comparative Analysis

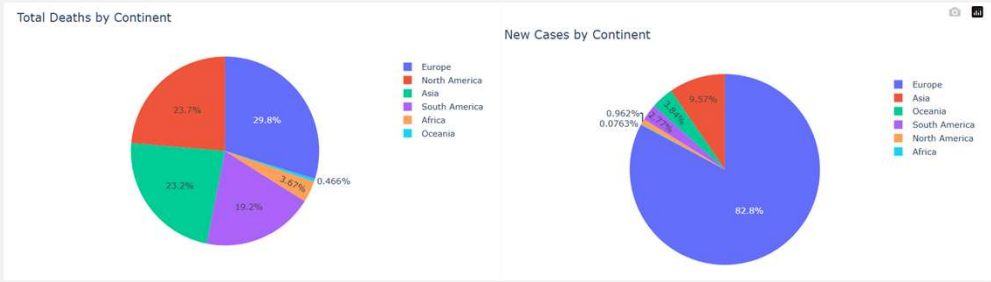
To contextualize the project, a comparative analysis of existing COVID-19 dashboards was conducted.

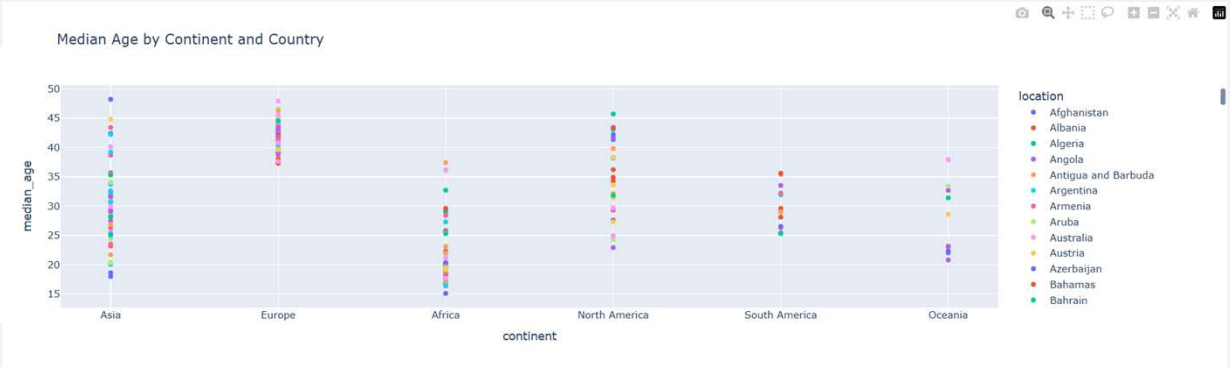
Company	Solution Offered
Johns Hopkins University	Pioneering COVID-19 ArcGIS Dashboard, providing comprehensive global tracking.
Microsoft Bing	Interactive COVID Map featuring real-time tracking, news, and related data.
Our World in Data	Extensive COVID-19 global data and research-backed charts, widely used as a data source.

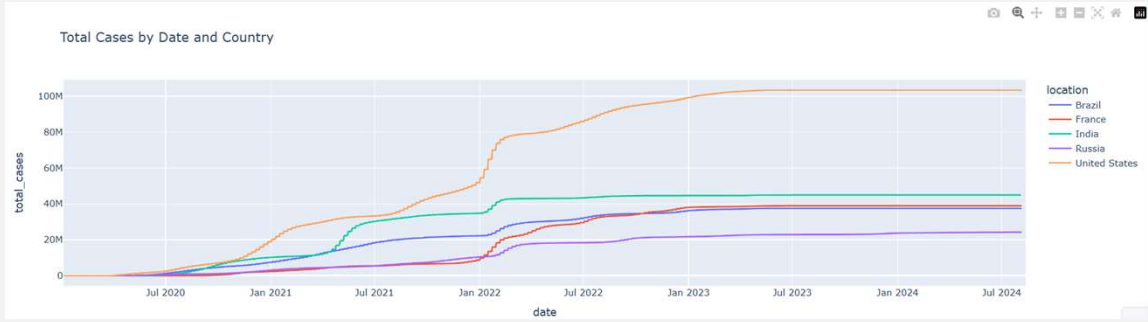
This research provided valuable insights into industry best practices for data visualization and real-time tracking.

Dashboard Visualizations: A Glimpse

The following visualizations demonstrate the dashboard's interactive capabilities and data presentation:







Project Workflow: From Data to Deployment

1. Data Ingestion

Loading the comprehensive Excel dataset.

2. Data Preprocessing

Cleaning and filtering data using Pandas for accuracy.

3. Visual Chart Creation

Developing interactive charts with Plotly.

4. Dashboard Layout

Arranging UI components and interactivity with Dash.

5. Local Deployment

Running the local server to display the functional dashboard.

Key Learnings & Outcomes

Real-World Data Proficiency

Gained hands-on experience with large, complex real-world datasets, enhancing practical skills.

Data Cleaning & Visualization

Mastered techniques to efficiently clean and visualize extensive data in Python, ensuring accuracy.

Web App Development

Significantly improved skills in building interactive web applications using the Dash framework.

Dashboard Structuring

Developed a deep understanding of structuring and optimizing real-time data dashboards.

Effective Data Communication

Learned to effectively communicate complex data insights through clear and engaging graphical representations.