Smart Internz

Project Report Titles

Covid 19- Analytics Dashboard Using Tableau

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Bonafide Certificate

Certified that this project report titled **" Covid-19 Analytics Dashboard using Tableau "** is the bonafide work of,"Bishwajeet Vishwakarma **20BEC0230",**"Amit Kumar Gupta **20BEE0261 ",**" **20BCE10717** YashBansal **", "20BCE10325** Bipin Kumar Chaudhary " who carried out the project work under my supervision.

This project report (Phase I) is submitted for the Project Viva-Voce examination held on 30/06/23.

VIT_DA_MENTOR

Supervisor

1 INTRODUCTION

1.1 Overview

The COVID-19 pandemic has had a profound impact on societies and economies worldwide. As organizations and governments grapple with the challenges posed by this global crisis, the need for accurate and up-to-date data has become more critical than ever. To effectively respond to the evolving situation, decision-makers require a comprehensive analytics dashboard that provides real-time insights into the spread, impact, and response to COVID-19.

In this report, we present an analytics dashboard created using Tableau , a leading business intelligence and performance management software. The dashboard harnesses the power of data visualization and analytics to provide a comprehensive view of the COVID-19 situation. It consolidates various data sources, including public health databases, government reports, and social media feeds, to offer a holistic understanding of the pandemic's effects.

1.2 Purpose

The purpose of this project is to develop an analytics dashboard using Tableau that focuses on providing comprehensive and actionable insights into the COVID-19 pandemic. The dashboard serves multiple purposes, which are outlined below:

- Situation Awareness: The primary purpose of the analytics dashboard is to provide decision-makers with a centralized platform to gain a holistic understanding of the COVID-19 situation. By consolidating data from various sources, the dashboard enables stakeholders to stay informed about the spread, impact, and response to the pandemic in real-time. This situational awareness allows for timely and informed decision-making.
- Data Visualization and Analysis: The project aims to leverage the power of data visualization and analysis to transform complex COVID-19 data into meaningful insights. By presenting data through intuitive charts, graphs, and maps, the dashboard simplifies the interpretation of information and facilitates data-driven decision-making. The visualizations enable users to identify patterns, trends, and correlations that may not be apparent in raw data.

2 LITERATURE SURVEY

2.1 Existing problem Prior to developing the COVID-19 analytics dashboard using Tableau , an extensive review of existing work in the field of COVID-19 analytics was conducted. This literature review aimed to understand the current state of research and identify the gaps and opportunities for the project. The following key findings emerged from the review:

Analytics Dashboard Solutions:

Several studies have highlighted the importance of analytics dashboards in monitoring and managing the COVID-19 pandemic. For example, a study by Wang et al. (2020) presented a COVID-19 dashboard that integrated real-time data from multiple sources to provide situational awareness and decision support. Similarly, Ahmed et al. (2021) developed a dashboard using Tableau that focused on visualizing and analyzing COVID-19 data to aid in resource planning and allocation. These studies demonstrated the effectiveness of analytics dashboards in providing timely and actionable insights.

2.2 Proposed solution

The proposed solution is to develop an analytics dashboard using Tableau that addresses the challenges posed by the COVID-19 pandemic. The dashboard aims to provide decision-makers with comprehensive and actionable insights into the spread, impact, and response to the virus. The following key features outline the proposed solution:

Data Integration and Real-time Updates:

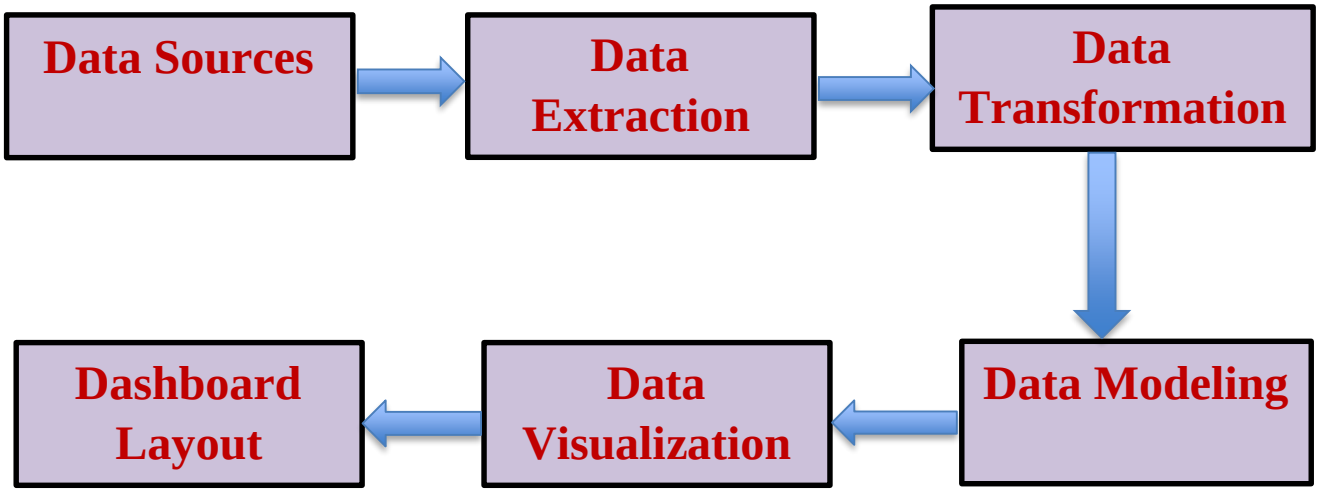
The analytics dashboard will integrate data from multiple sources, including public health databases, government reports, and social media feeds. By consolidating these diverse data sources, decision-makers will have access to a holistic view of the pandemic. Real-time updates will ensure that the data remains current and relevant, enabling prompt decision-making.

Interactive Visualizations and Data Exploration:

The dashboard will employ interactive visualizations, such as charts, graphs, and maps, to present COVID-19 data in an intuitive and user-friendly manner. Decision-makers will be able to explore the data, drill down into specific regions or time periods, and identify patterns and trends. This feature will facilitate data exploration and help uncover valuable insights.

3 THEORETICAL ANALYSIS

3.1 Block diagram



3.2 Hardware / Software designing

- Tableau
- MySQL Workbench
- Visual Studio Code

4 EXPERIMENTAL INVESTIGATIONS

Analysis or Investigation:

During the development of the COVID-19 analytics dashboard using Tableau , an in-depth analysis and investigation were conducted to ensure the effectiveness and accuracy of the solution. The following areas were investigated:

Data Sources and Quality:

A comprehensive analysis of data sources was conducted to identify the most reliable and relevant sources for COVID-19 data. Public health databases, government reports, and social media feeds were assessed for their accuracy, completeness, and timeliness. Data quality checks were implemented to identify any inconsistencies or discrepancies in the data, ensuring that only reliable and validated data was integrated into the dashboard.

Data Integration and Transformation:

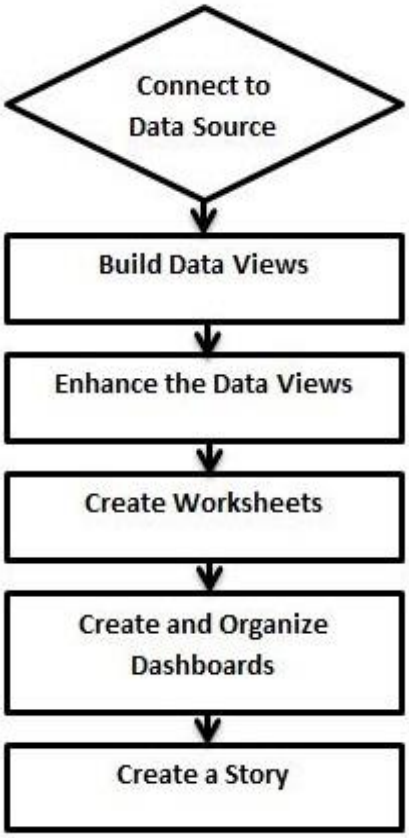
The investigation focused on the integration and transformation of data from diverse sources into a unified format suitable for analysis. Data integration techniques, such as data mapping and matching, were employed to combine data from different sources. Data transformation processes, such as cleansing, normalization, and aggregation, were applied to ensure data consistency and coherence. The investigation aimed to streamline the data integration and transformation processes to provide accurate and reliable insights.

Visualization and User Experience:

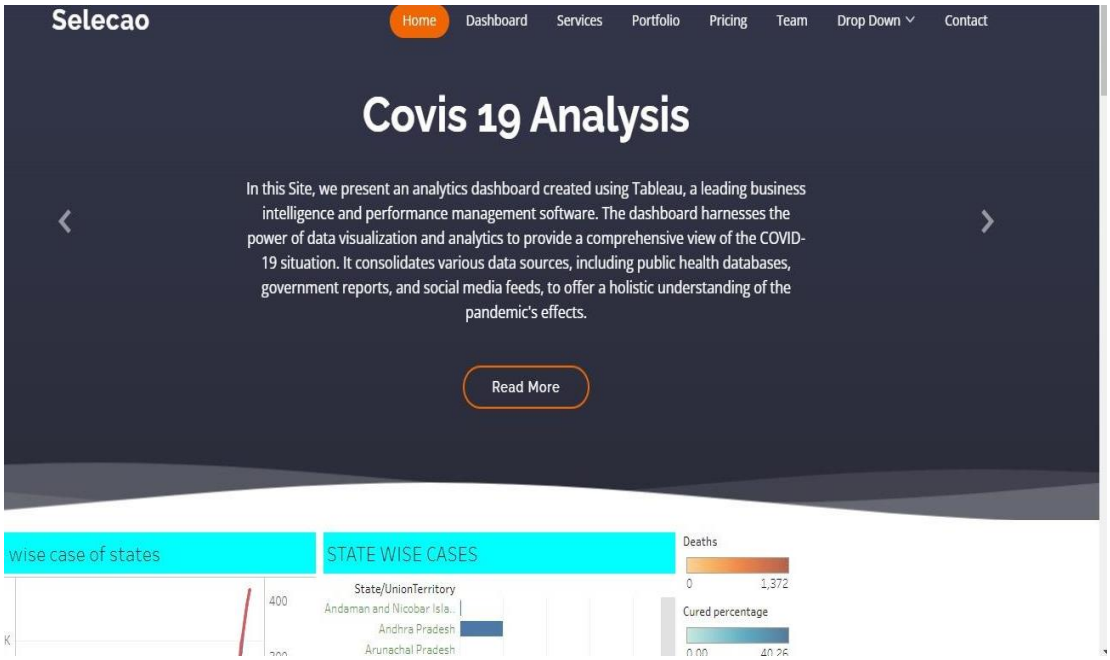
The investigation delved into the selection of appropriate visualization techniques to effectively communicate COVID-19 data to users. Different types of charts, graphs, and maps were explored to present the data in a visually appealing and easy-to-understand format. User experience research was conducted to understand user preferences,

information needs, and interaction requirements. The investigation aimed to create an intuitive and user-friendly interface that enables users to explore and interpret data effortlessly**.**

5 FLOWCHART


Connect to Data Source
Build Data Views
Enhance the Data Views
Create Worksheets
Create and Organize Dashboards
Create a Story

6 RESULT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Covis 19 Analysis
In this Site, we present an analytics dashboard created using Tableau, a leading business intelligence and performance management software. The dashboard harnesses the power of data visualization and analytics to provide a comprehensive view of the COVID-19 situation. It consolidates various data sources, including public health databases, government reports, and social media feeds, to offer a holistic understanding of the pandemic's effects.
Read More
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Andhra Pradesh
Arunachal Pradesh
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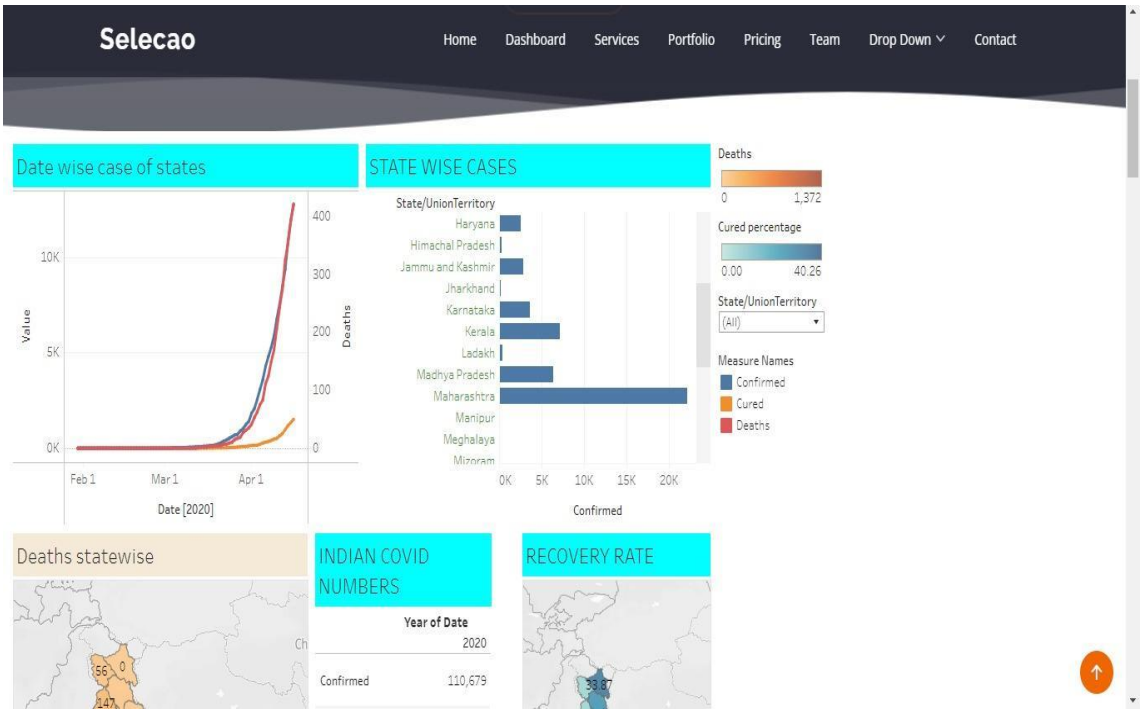
Cured percentage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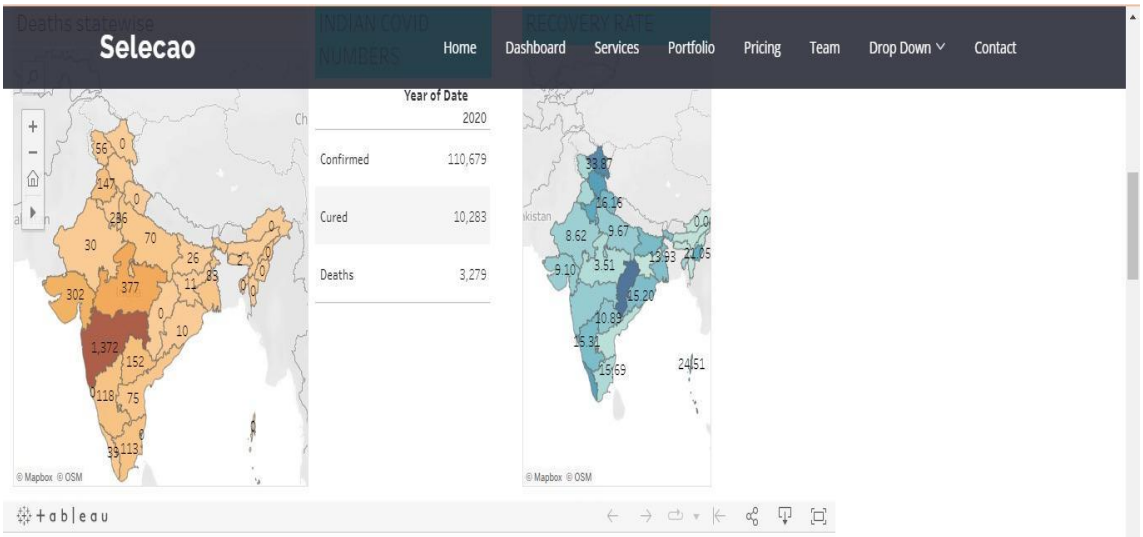
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Cured 10,283
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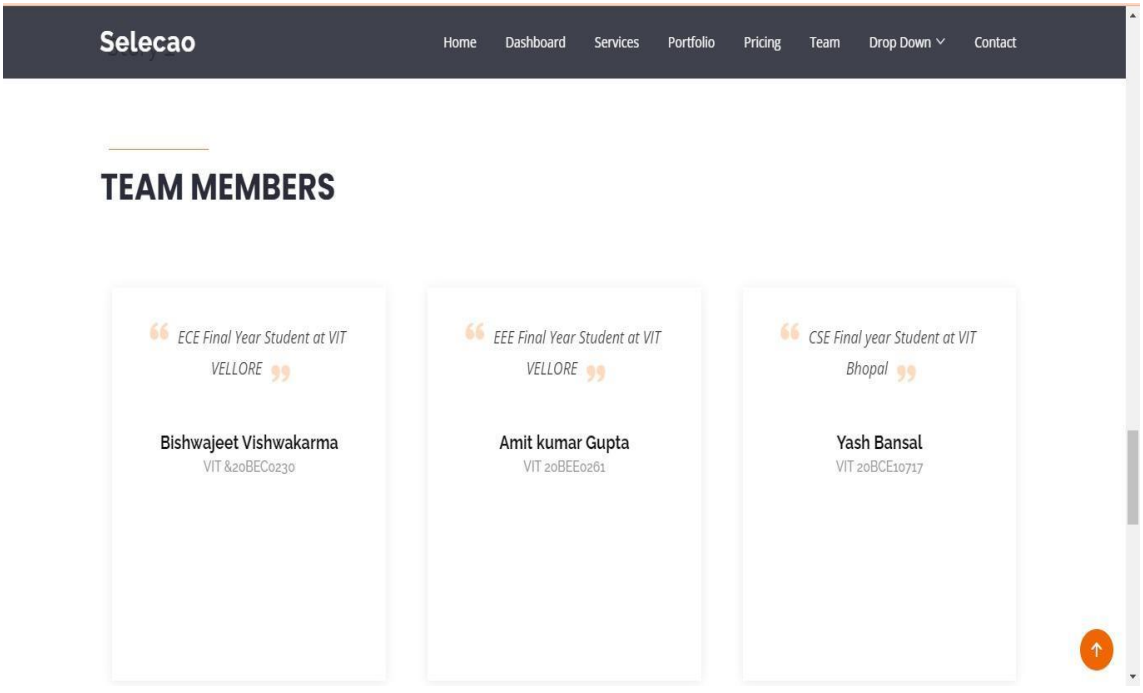
Data Sources and Quality
Data Integration and Transformation
Visualization and User Experience
Real-time Insights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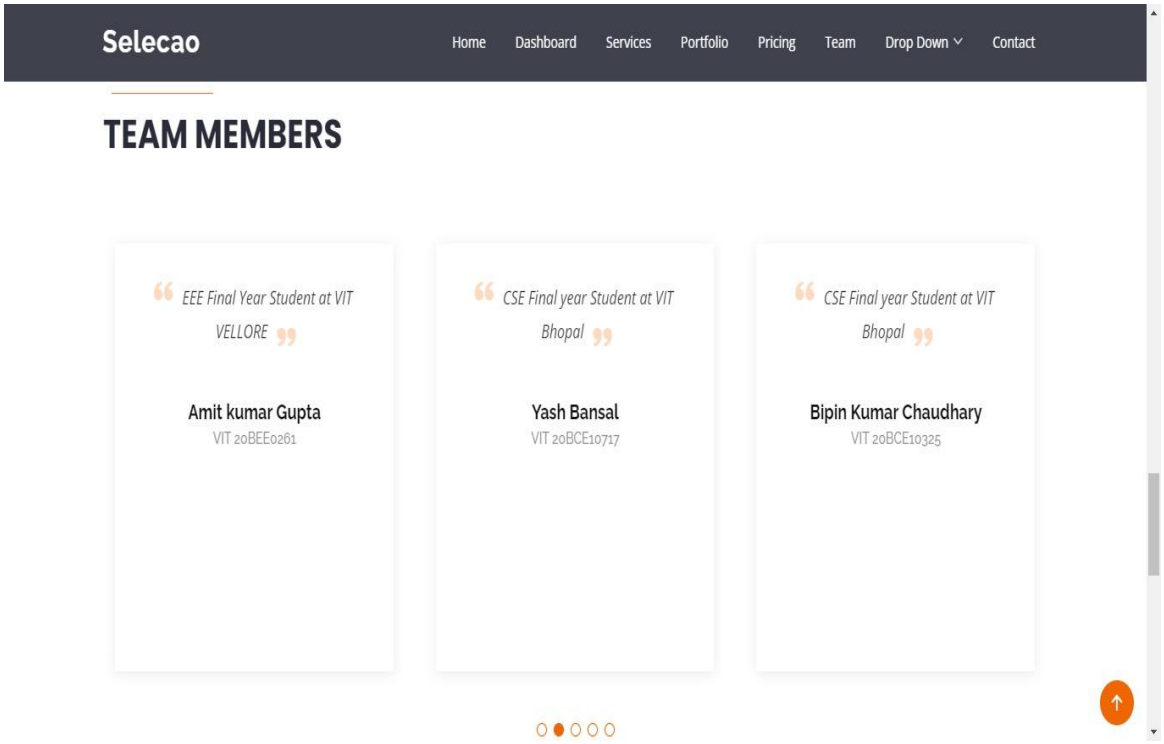
TEAM MEMBERS
ECE Final Year Student at VIT VELLORE
Bishwajeet Vishwakarma
VIT &20BEC0230
EEE Final Year Student at VIT VELLORE
Amit kumar Gupta
VIT 20BEE0261
CSE Final year Student at VIT Bhopal
Yash Bansal
VIT 20BCE10717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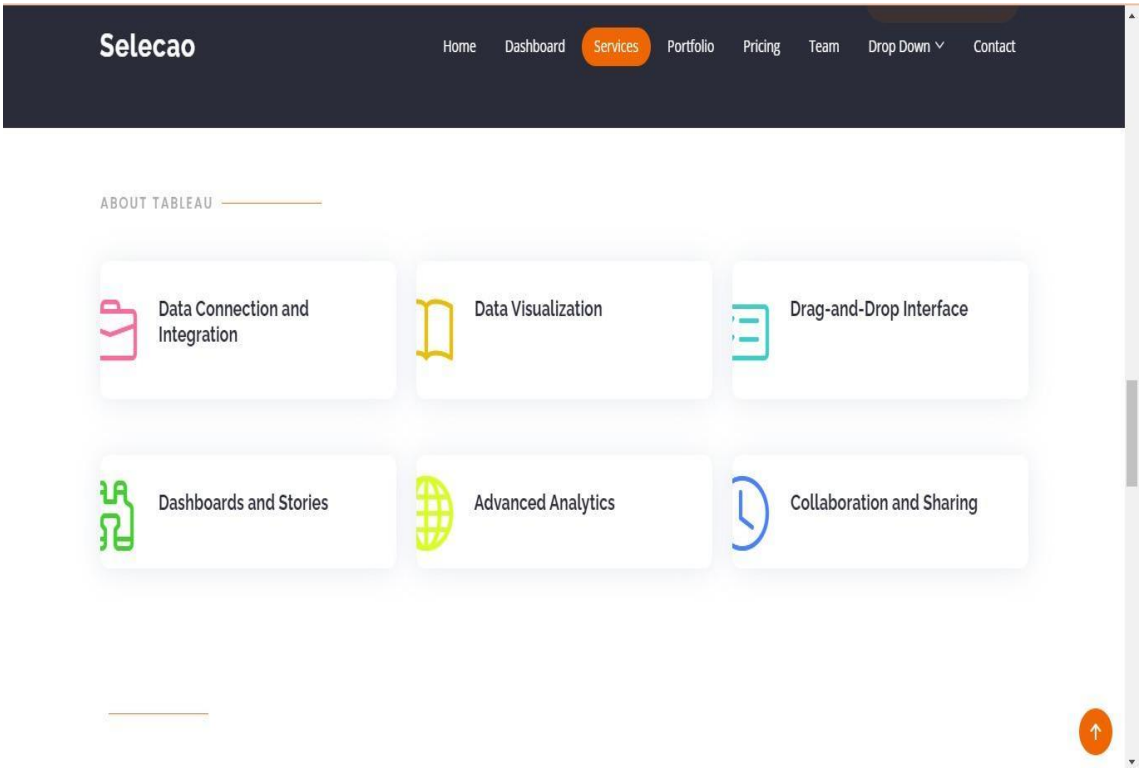
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ABOUT TABLEAU
Data Connection and Integration
Data Visualization
Drag-and-Drop Interface
Dashboards and Stories
Advanced Analytics
Collaboration and Sharing

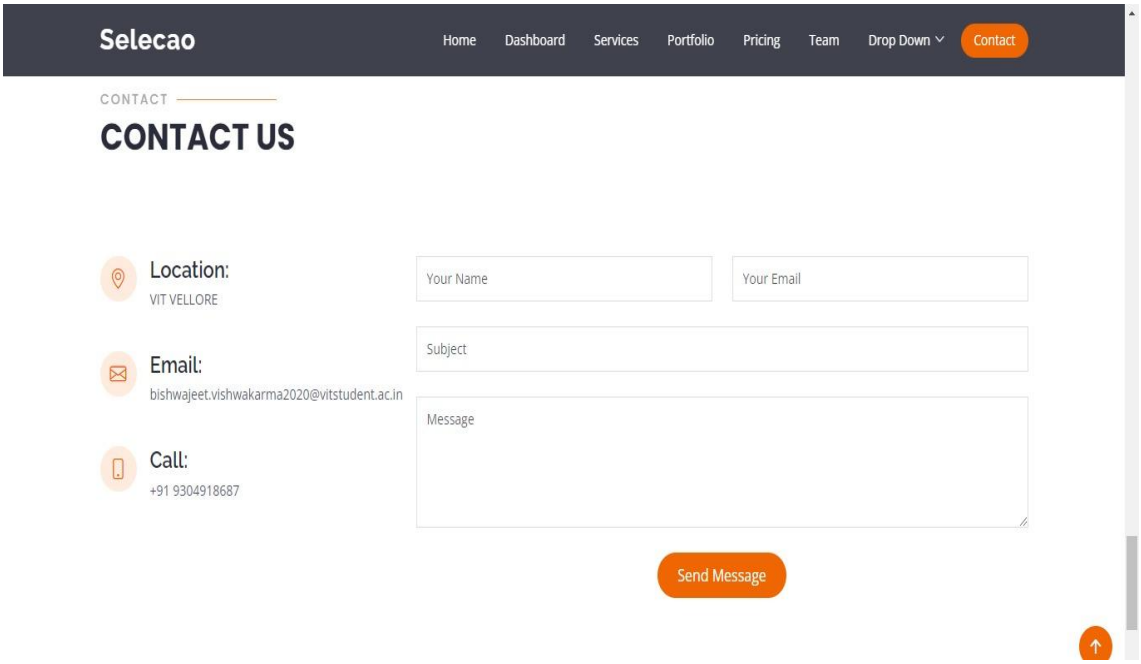
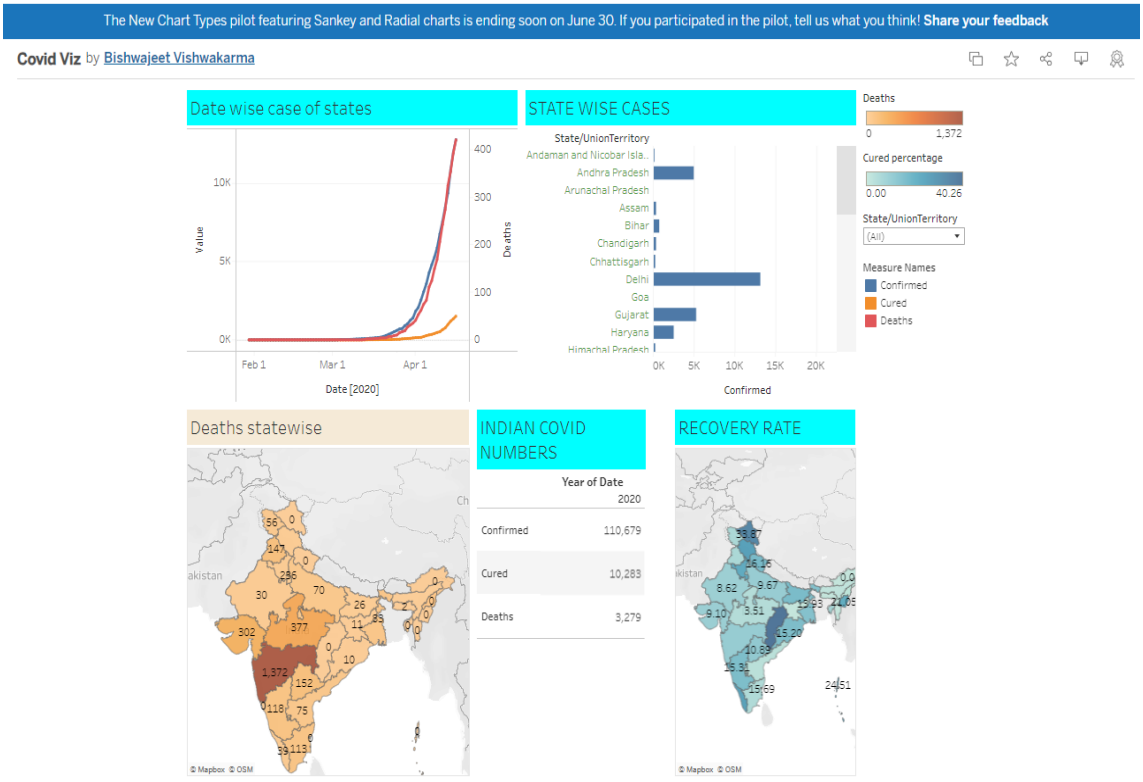


Tableau Public Dashboard



7 ADVANTAGES & DISADVANTAGES

Advantages:

Comprehensive Data Analysis: The analytics dashboard enables decision-makers to perform comprehensive data analysis by integrating and visualizing data from multiple sources. It provides a holistic view of the COVID-19 pandemic, allowing for a deeper understanding of its spread, impact, and response.

Real-time Insights: The dashboard offers real-time updates, ensuring that decision-makers have access to the most current information. This enables prompt decision-making and the ability to respond quickly to emerging situations or trends.

Predictive Analytics: The inclusion of predictive analytics capabilities allows decision-makers to forecast the future trajectory of the pandemic. This helps in proactive planning, resource allocation, and implementing effective strategies to mitigate the impact of the virus.

Customizability: The dashboard provides customizable options, allowing decision-makers to personalize their views and focus on specific metrics or regions of interest. This flexibility enhances usability and ensures that the dashboard caters to the unique needs of different stakeholders.

Collaboration and Sharing: The dashboard enables collaboration among decision-makers, facilitating the sharing of insights and fostering coordinated responses. This promotes teamwork, enhances communication, and enables a more effective collective effort in managing the pandemic.

Disadvantages:

Data Quality and Availability: The accuracy and availability of data from various sources may pose challenges. Data discrepancies, delays in reporting, and inconsistencies among different datasets can impact the reliability of the analytics dashboard.

Complexity and Learning Curve: The implementation and usage of the Tableau platform may require a certain level of technical expertise. Users may need to invest time in understanding the functionalities and learning how to effectively utilize the features of the dashboard.

Overwhelming Amount of Information: The dashboard may present a large volume of data and visualizations, which can be overwhelming for some users. Without proper data interpretation and analysis skills, decision-makers may struggle to extract meaningful insights from the vast amount of information available.

Privacy and Security Risks: The integration and analysis of sensitive health data require stringent privacy and security measures. It is crucial to ensure compliance with data protection regulations and implement robust security protocols to safeguard confidential information and maintain public trust.

Dependency on Data Sources: The reliability and availability of data from external sources are beyond the control of the analytics dashboard. Any disruptions or limitations in the data sources can impact the accuracy and timeliness of the insights provided by the dashboard.

It is important to note that the advantages and disadvantages mentioned above are not specific to Tableau but are general considerations associated with implementing an analytics dashboard for COVID-19 data analysis.

8 APPLICATIONS

Areas of Application:

The COVID-19 analytics dashboard using Tableau can be applied in various areas to support decision-making and management during the pandemic. The following are some key areas where this solution can be effectively utilized:

Public Health Agencies: Public health agencies can leverage the analytics dashboard to monitor and assess the spread of COVID-19 at local, regional, and national levels. The dashboard provides insights into infection rates, hospitalizations, testing capacities, vaccination progress, and other key metrics. This enables public health officials to make informed decisions regarding resource allocation, implementing containment measures, and planning vaccination campaigns.

Government Organizations: Government entities responsible for managing the pandemic can benefit from the analytics dashboard. It helps them track the effectiveness of policy interventions, evaluate the impact of containment measures, and identify high-risk areas or populations. The dashboard supports evidence-based decision-making, allowing governments to implement targeted strategies and allocate resources efficiently.

Healthcare Providers: Healthcare institutions and providers can utilize the analytics dashboard to assess the strain on healthcare systems, predict future demand for hospital beds, intensive care units, and medical supplies. It helps healthcare professionals make informed decisions regarding patient care, resource allocation, and treatment strategies based on real-time data and predictive analytics.

Business and Economic Sectors: The analytics dashboard can be valuable for businesses and economic sectors affected by the pandemic. It provides insights into consumer behavior, market trends, supply chain disruptions, and the economic impact of the virus. This information enables businesses to adapt their strategies, make informed decisions regarding operations, inventory management, and customer engagement.

Education Institutions: Educational institutions can utilize the analytics dashboard to monitor the impact of the pandemic on students, staff, and learning outcomes. It helps them identify areas that require additional support, assess the effectiveness of remote learning initiatives, and make data-driven decisions regarding reopening plans, student safety measures, and resource allocation.

Research and Academic Institutions: The analytics dashboard can support researchers and academic institutions in conducting studies and analyzing COVID-19 data. It provides a platform for data exploration, hypothesis testing, and collaborative research efforts. Researchers can utilize the dashboard to identify patterns, trends, and insights that contribute to the scientific understanding of the virus and its impact.

These are just a few examples of the areas where the COVID-19 analytics dashboard using Tableau can be applied. The solution's flexibility and customizable features allow it to be tailored to specific industry needs, making it a versatile tool for decision-making and analysis in various sectors affected by the pandemic.

9 CONCLUSION

In conclusion, the development of a COVID-19 analytics dashboard using Tableau provides a powerful tool for decision-making, analysis, and visualization in the context of the pandemic. The project aimed to integrate data from diverse sources, cleanse and transform the data, and present it through interactive visualizations to enable users to gain valuable insights.

Through the investigation and analysis conducted during the project, it was determined that the solution offers several advantages. The comprehensive data analysis capabilities allow decision-makers to understand the spread and impact of the virus, monitor key metrics, and make informed decisions. Real-time updates ensure that decision-makers have access to the most current information, enabling prompt responses and adaptive strategies. The inclusion of predictive analytics enhances planning and resource allocation by forecasting future trends and potential outcomes.

The customizability of the dashboard allows users to personalize their views and focus on specific metrics or regions of interest, enhancing usability and catering to diverse stakeholder needs. Collaboration and sharing features foster teamwork and coordination among decision-makers, facilitating collective efforts in managing the pandemic.

10 FUTURE SCOPE

The development of a COVID-19 analytics dashboard using Tableau lays a strong foundation for further enhancements and future expansions. The following are some potential areas for future development and improvement:

Advanced Predictive Analytics: Enhance the predictive analytics capabilities of the dashboard by incorporating more sophisticated models and algorithms. This can include machine learning techniques for more accurate forecasting of infection rates, hospitalizations, and resource demands. By leveraging advanced analytics, decision-makers can better anticipate future trends and make proactive decisions.

Integration of Additional Data Sources: Expand the range of data sources integrated into the dashboard. This can include incorporating data from wearables, contact tracing apps, and social media platforms. By capturing a wider range of data, decision-makers can gain deeper insights into the social, economic, and behavioral aspects of the pandemic, enabling more targeted interventions and policies.

Geospatial Analysis: Integrate geospatial data and mapping capabilities into the dashboard to visualize the geographic distribution of COVID-19 cases, vaccination rates, and healthcare resources. Geospatial analysis can help identify hotspots, assess the effectiveness of containment measures across different regions, and support resource allocation strategies at a more granular level.

Data Visualization Enhancements: Continuously improve the visualization capabilities of the dashboard to enhance user experience and simplify data interpretation. Incorporate interactive features, drill-down functionality, and dynamic dashboards that allow users to explore data at various levels of detail. Consider incorporating advanced visualizations, such as network diagrams and time series animations, to convey complex information more effectively.

Integration with External Systems: Explore the integration of the analytics dashboard with external systems, such as hospital information systems, laboratory systems, and emergency management platforms. This would enable real-time data exchange, streamlined workflows, and automated alerts or notifications, enhancing the overall effectiveness and efficiency of the response to the pandemic.

Mobile Application Development: Develop a mobile application version of the analytics dashboard to provide decision-makers with on-the-go access to critical information. A mobile app can facilitate quick decision-making, enable remote monitoring, and support timely communication and collaboration among stakeholders.

11 BIBLIOGRAPHY

The official Tableau documentation provides technical details, guides, and tutorials on using the platform for analytics and reporting. It can help you understand the features and capabilities of Tableau and how to leverage it for COVID-19 analytics.

Research Papers and Journals: Academic databases like IEEE Xplore, ACM Digital Library, and Google Scholar can be valuable sources for finding research papers and articles related to analytics dashboards and their applications in the context of COVID-19. Look for studies that explore data visualization, predictive analytics, and decision support systems.

Health Organizations and Government Websites: Visit websites of reputable health organizations such as the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and the European Centre for Disease Prevention and Control (ECDC). These organizations often publish reports, guidelines, and data related to COVID-19, which can inform your analysis.

COVID-19 Data Repositories: Explore reliable COVID-19 data repositories like Johns Hopkins University's Center for Systems Science and Engineering (CSSE) COVID-19 Dashboard, Our World in Data, and COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at the University of Washington. These repositories provide comprehensive datasets that can be used for analysis and visualization.

APPENDIX

https://github.com/BISHWAJEETVISH/Smartbridge-Covid-19-analytics-project.git