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RESEARCH ARTICLE

DATA VISUALIZATION OF COVID-19 DATA USING TABLEAU

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Abstract

The world generated 52 times the amount of data in 2010 and 76 times the number of information sources in 2022. The ability to use this data creates enormous opportunities, and in order to make these opportunities a reality, people must use data to solve problems. Unfortunately, in the midst of a global pandemic, when people all over the world seek reliable, trustworthy information about COVID-19 (Coronavirus). Tableau plays a key role in this scenario because it is an extremely powerful tool for quickly visualizing large amounts of data. It has a simple drag-and-drop interface. Beautiful infographics are simple to create and take little time. Tableau works with a wide variety of data sources. COVID-19 (Coronavirus) analytics with Tableau will allow you to create dashboards that will assist you. Tableau is a tool that deals with big data analytics and generates output in a visualization technique, making it more understandable and presentable. Data blending, real-time reporting, and data collaboration are one of its features. Ultimately, this paper provides a clear picture of the growing COVID19 (Coronavirus) data and the tools that can assist more effectively, accurately, and efficiently.

Keywords: Data Visualization, Tableau, Data Analysis, Covid-19 analysis, Covid-19 data

Introduction

At the present, data is generated on sites like YouTube, Tumblr, Reddit, Facebook, WhatsApp, Twitter, Instagram, Gmail, LinkedIn, and Academia. Understanding this information is necessary because it is a critical and important entity of an Organization, Nations, and Institutions. Big data refers to a collection of large and complex data sets that are difficult to manage with traditional data processing application software. Analyzing and visualizing data sets could provide new business trends, prevent diseases, and create models to forecast future paradigms and combat crime, among other things. Tableau is undoubtedly the most widely tool for data analytics and visualizations, as well as data discovery. Tableau is a rapidly growing business intelligence (BI) tool.

It is quick to deploy, simple to learn, and extremely useful to the user. Tableau is a piece of software[4]that allows users to create interactive visualizations to help them explore and understand their data. The software has the advantage of being able to work with almost any database and being simple to use by dragging and dropping to create an interactive visualization expressing the desired format. COVID-19 (Coronavirus) has proven to be a truly global pandemic, affecting people in nearly every country on the planet. Tableau's utility in COVID-19(Coronavirus) data analytics can be measured by its performance, user-friendliness, and speed. A tableau is a tool used for complex data visualization and simplification. It was created to assist users in creating visuals and graphics without the assistance of a programmer or prior programming knowledge.

This paper presents a method for interactively visualizing and analyzing COVID-19 (Coronavirus) data using Tableau as an intelligence tool. Tableau can acquire and process data by connecting to files, relational databases, and Big Data sources. The software enables data blending and real-time collaboration, making it quite unique. Tableau analyses data quickly and creates visual visualizations in the form of dashboards and worksheets. A Tableau dashboard displays multiple visualizations in a single view. It is frequently used to display only the most important information and is sometimes personally tailored. It continues to operate by connecting to data stored in various locations. It can obtain information from every source imaginable. Tableau can extract data from a simple excel sheet to a PDF to a complicated database like Oracle to the next level of cloud such as Amazon web service, Microsoft Azure SQL database, and Google Cloud SQL. As a result, we are introducing Tableau and demonstrating how to utilize it for the interactive presentation and analysis of COVID-19(Coronavirus) data to encourage its widespread adoption. Tableau is a cutting-edge data analytics and visualization tool that offers users flexibility and ease-of-use while providing a pleasant experience.

What is data visualization?

Data visualization is the presentation of data in a pictorial or graphical format. It enables decision makers to see analytics presented visually, so they can grasp difficult concepts or identify new patterns. With interactive visualization, you can take the concept a step further by using technology to drill down into charts and graphs for more detail, interactively changing what data you see and how it’s processed. Because of the way the human brain processes information, using charts or graphs to visualize large amounts of complex data is easier than poring over spreadsheets or reports. Data visualization is a quick, easy way to convey concepts in a universal manner – and you can experiment with different scenarios by making slight adjustments. That fact showcases the importance of data visualization. Its main goal is to distil large datasets into visual graphics to allow for easy understanding of complex relationships within the data. It is often used interchangeably with terms such as information graphics, statistical graphics, and information visualization. Data visualization is a huge field with many disciplines. It is precisely because of this interdisciplinary nature that the visualization field is full of vitality and opportunities.

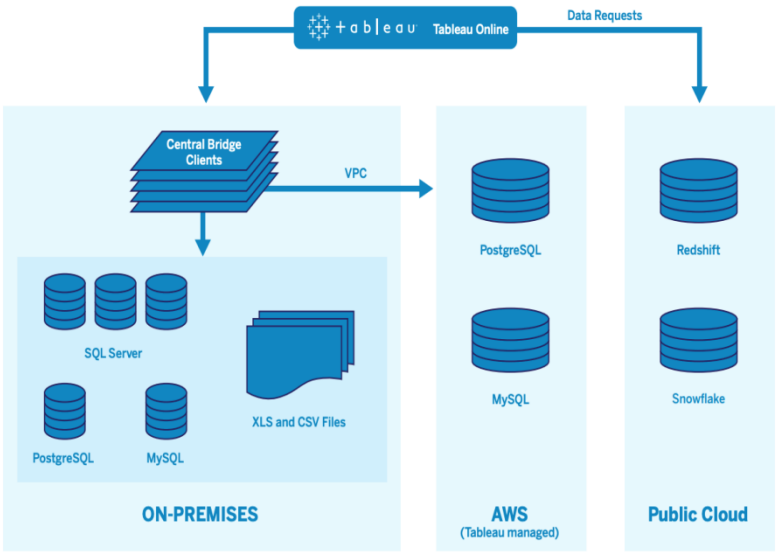
Need of data visualization in today's world

It's difficult to think of a professional industry it wouldn't benefit from making data easier to grasp. Understanding data improves every STEM sector, as well as fields such as government, finance, marketing, history, consumer products, service industries, education, sports, and so on. While we'll always wax poetic about data visualization (you're on the Tableau website, after all), there are irrefutable practical, real-world applications. And, because vision is so prevalent, it's also one of the most valuable professional abilities to cultivate. The more you can graphically explain your points, whether in a dashboard or a slide deck, the more effectively you can exploit that knowledge. The concept of the citizen data scientist is gaining popularity. Skill sets are evolving to meet the demands of a data-driven environment. Professionals who can utilize data to make decisions and use graphics to communicate stories about when data informs the who, what, when, where, and how are becoming increasingly valuable. While traditional education often draws a clear distinction between creative storytelling and technical analysis, the current professional world also honors people who can bridge the gap: data visualization lies squarely between analysis and visual storytelling.

Know about tableau

The COVID-19 pandemic has affected nearly every aspect of life around the world, and statisticians are working together to help individuals, scientists, governments, and businesses understand the scale and magnitude of the problem. In this case, the Tableau is an excellent tool. Because Tableau is a data analysis and visual tool that can connect to multiple data sources comfortably. The great advantage of the Tableau is its ability to create interactive dashboards. These dashboards can be created without much coding knowledge, using the visual interface of drag and drop. Tableau is very popular among organizations because of its ability to translate data into an intelligent visual dashboard. Tableau uses a combination of new applications such as the JavaScript API and a single login application to integrate Tableau stats into basic business applications consistently. The Tableau can create a sufficient display list to present the data jointly and display the data. It comes with tools that allow you to pull down data and see the impact in a visual format that can be easily understood by anyone. Here we discuss the various versions of tableau, it benefits and implementation. We will see how tableau is various from MS excel and other spreadsheet tools. Tableau is the most strong, safe and flexible end-to-end analytical platform for our information from connection via cooperation. It also enhances data power for people. Tableau is the only business intelligence platform designed for the individual but scaled for business that turns information into an insight which drives action. Tableau can manage millions of rows of data with ease. Different types of visualization can be created by the large amount of data without having another performance of the dashboards. Also, there is an option in Tableau where user can make live two connections to different data sources like SQL etc. There are, any different types of visualization options available in tableau which egregious the user experience. Lastly, Tableau is very easy to learn, anyone without having any knowledge of coding can easily learn Tableau.

Tableau data process



A key part of Tableau Architecture is data sources to which I can connect. It stores data in a repository, keeps user data secure, and performs many of the same important functions. Tableau can connect once. Tableau can connect data from various locations. The Tableau can work with all of these at once. Tableau provides some simple ways to update your data to speed up and respond with our faster memory data engine. It can combine data from multiple data sources. It can also create relationships between different types of data sources.

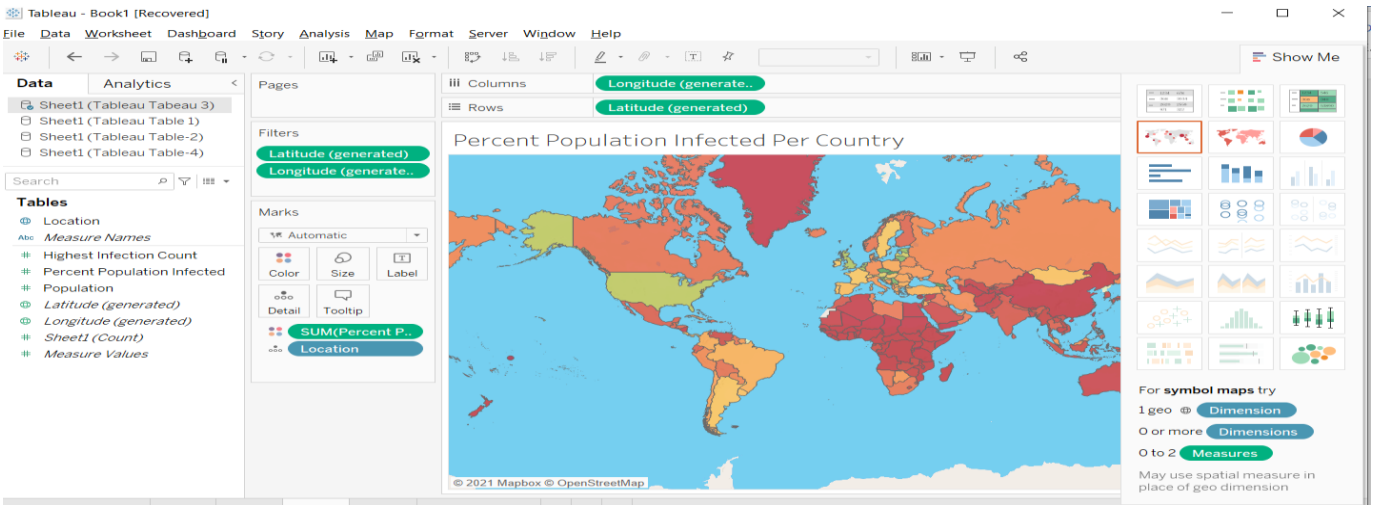
How tableau is useful for covid-19 data visualization

The ongoing spread of COVID-19 (coronavirus) is rapidly changing our daily lives, requiring data analysis and imagination. In this case, the Tableau is often used as a tool that helps to analyze data quickly and create visibility of worksheets and dashboards. Tableau enables us to create dashboards that provide possible information and spread the business quickly. Tableau products always work in visual areas when activated with the appropriate hardware and operating system. With Tableau, you can work with random data COVID-19 (coronavirus) and create a variety of views with the help of built-in features provided by Tableau. In addition, we will be able to gain a better context, a few ways to extract COVID-19 (coronavirus) data and analyze data within minutes. Tableau assists organizations in analyzing future data to multiple data sources. These data sources can be locally or remotely located. It can connect to a website, an excel file, and a web application all at

without any future targets mind. We examine the observations and look at COVID-19 (coronavirus) data from different pathways. With the visual perception and the feature of adding comparison and analysis components, we form the 'what-if' framework query and process data accordingly. An easy-to-use feature is the great power of the Tableau.

This feature demonstrates a person's ability to work without any technical knowledge or coding. As the Tableau offers many of its features in the form of drag and drop and each view is built-in and customizable. The reason why the Table should be added to the multi-business system is that COVID-19 (coronavirus) data can come from any source in today's data-driven world. This tool allows you to connect different data sources, data repositories, cloud files, big data, spreadsheet, unrelated data, and a few other types of data. Tableau can combine all types of data to help researcher COVID-19, organizations to produce attractive looks. Tableau can easily add new data sets that can be automatically integrated with Tableau using standard fields. Tableau allows you to work with random data and improve amazing visibility. We can do that while looking at data from several angles and paths.

Visualization in tableau software



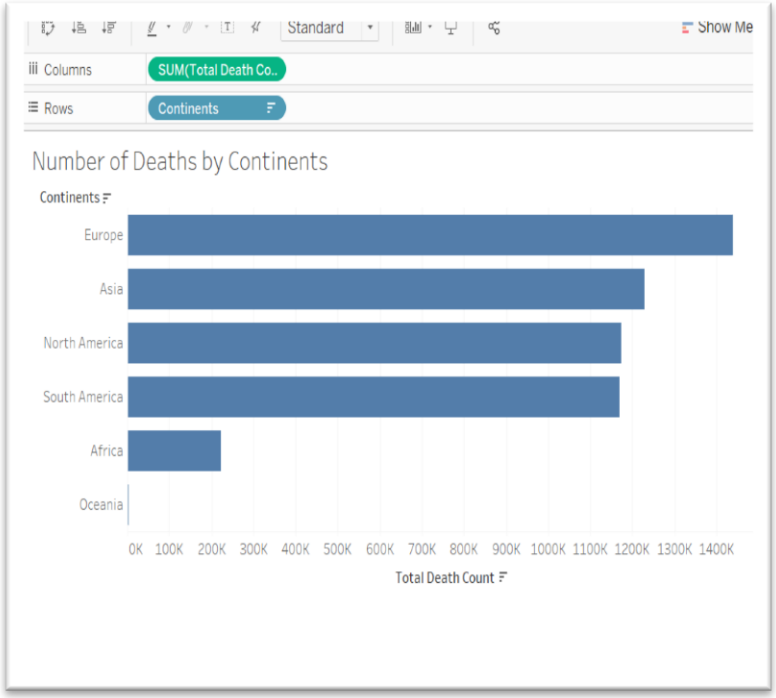
In this section, we discuss how to add trend lines, reference lines, and how your data is filtered and filtered. The Tableau statement is intended to help you identify and understand your data by enabling visual aid statistics. The software is designed to assist in the analysis of non-technical data consumers.

This is the concept behind the Tableau show button shown in Figure 5. Show me to be your professional assistant. Let me tell you which chart to use and why. It will also help us to create complex visuals quickly and with minimal effort.

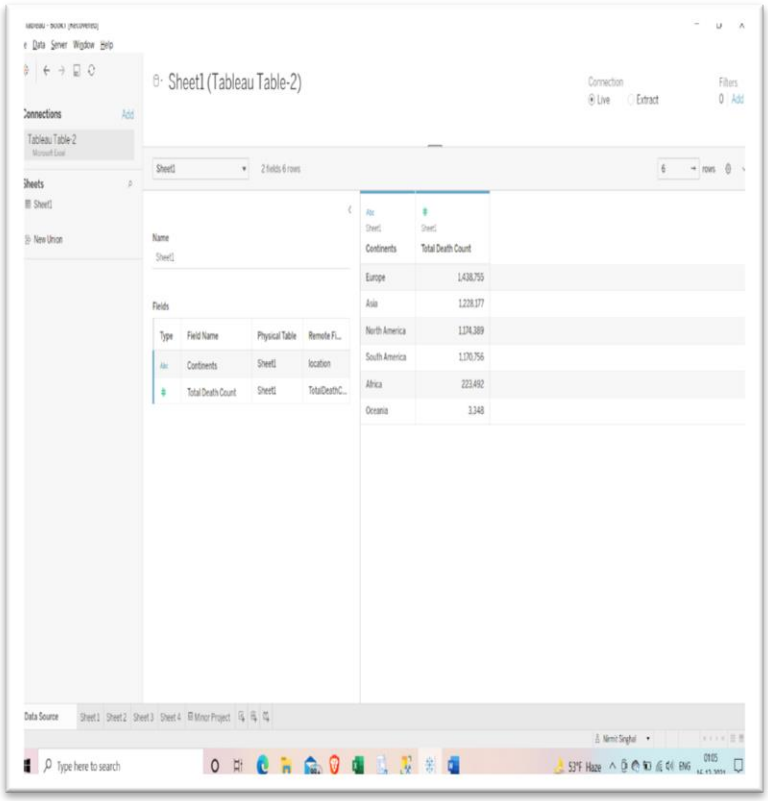
I showed it looking at a combination of selected dimensions and sizes and interpreting which types of charts are showing the most effective data. At the bottom of the show me site you also see more details about requirements needed to build any available chart. Time series chart requires one date, one measure, and zero or more sizes. Indicating other chart options in the Display menu changes the text at the bottom of the menu. This text provides guidance on the combination of data items required in the hypothetical chart. Clicking on any highlighted show me icons changes visibility on the worksheet.

How to sort data in tableau

Tableau software offers both basic and advanced filtering mechanisms, which are easily accessible via icons or menus. The simplest method of filtering is to use the toolbar menu's icons. The filter icons on the toolbar provide a one-time boost for descending species. Figure 7 is a bar chart that was manually manipulated using the toolbar icon. Tableau additionally has filtering and axis marking symbols next to titles. If the icon is not visible, move your cursor closer to the center and it will appear. Clicking on the filter icon to the right of the sub-category title displays ups and downs based on the product title tag text. Filter icons above and below the (bar) axis enable ascending and descending forms based on the values displayed on the mark, and data source order filtering is included.

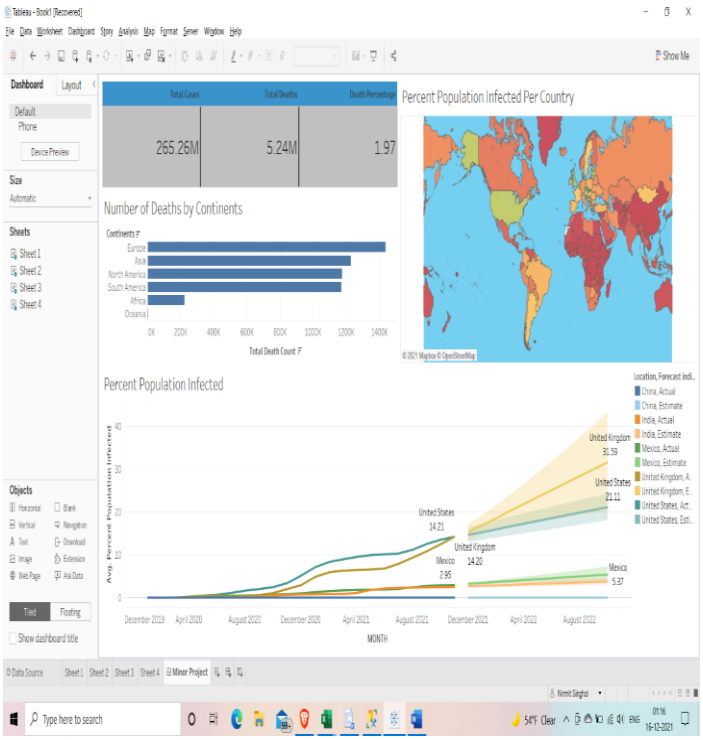


How to connect data



When you launch Tableau, you are transported to the home page, where you can simply navigate between previous workbooks, sample workbooks (Tableau Workbook files are the main file format created by Tableau to preserve your whole workbook), and saved data sources. We're also connecting to new data sources by using the connect to data option, as seen in Figure 2. Connecting to locally stored data or file-based data is an option in a file. If your database is not listed, consider another database connection (ODBC) that adheres to the Open Database Connectivity standard. On the right, we see a list of saved data sources. Saved data source files (.tds) can be found on your hard drive in the data sources directory under the "My Tableau repository."

Dahboards in tableau software



A dashboard is a centralized presentation of numerous worksheets and related information. It is used to compare and monitor a multitude of data at the same time. The many data views are all displayed at the same time. Dashboards are displayed as tabs at the bottom of the spreadsheet, and they are often updated with the most recent data from the data source. You can add views from any worksheet in the workbook, as well as various supporting objects such as text fields, web pages, and photos, when establishing a dashboard.

Each dashboard view you add is linked to its related spreadsheet. So when you change the worksheet, the dashboard is updated, and when you change the dashboard's view, the worksheet is updated.

What we can do with the use of tableau dashboard

The following are the various things for which users can use Tableau and indeed Tableau dashboard. Let us read each one by one.

- **Speed of Analysis of Data –** As it is quite easy to build a Tableau dashboard, and does not require any high level of expertise one can use it analysing of data. Not only it will help for analysing data but it also provides it in a rapid manner.
- **Self-Reliant** – As Tableau dashboard is self-reliant and does not require complex setup, hence dashboard could be easily customized so that it contains all the features needed to complete analysis of data
- **Visual Discovery –** Using the Tableau dashboard, the user can analyse the data and explore it. Users can add several visual tools like charts, graphs, trends, etc for better visualization of data. All features are available by simply dragging and dropping and hardly requires very little handling
- **Blending Diverse Data Sets –** Tableau Dashboard allows us to blend different raw data sources which may be semi-structured or different relational data without any expensive upfront integration costs. A user need not to know the inner detailing of data communication.
- **Centralized Data –** Since tableau follows a centralized data concept hence, we can

customize tableau dashboard to view all data in a centralized form.

Advantages of tableau dashboard

Below are the pros and cons of Tableau dashboard which are as follows:

- Centralized Data visualization
- Ease of Implementation
- Quickly create an interactive visualization
- Can show a large amount of data
- Mobile support
- Responsive dashboard
- Descriptive Texts
- KPI's (Key Performance Indicator) and metrics
- Multiple annotations
- Filters
- Sweet Action
- Multimedia

It is possible to enable a live website in a dashboard by dragging the web Page Dashboard object onto the canvas. We can add Dynamic Google Maps satellite images to the dashboard by choosing the dashboard file menu, click Actions Then add action button and choose URL. And adding YouTube videos to the dashboard (need a spreadsheet to add all the videos). We can add filters to the sheets available in the dashboard to be more interactive by selecting the drop-down options ->all data sources. Applying single filters to all sheets, Dashboard-> actions.

Conclusion

Data is currently at the heart of the majority of breakthrough technologies in the twenty-first century. The current spread of COVID-19 (Coronavirus) around the world has sparked a surge in interest in data analytics and visualisation. Everyone wants to see and understand how case counts are increasing, what type of impact the infection might have on themselves and their community, and what role they might play in limiting the spread. We use Tableau to produce high-impact visuals of typical data analysis to help us view and understand our data. We are using predictive analytics to improve optimal decision making for the dissemination of COVID-19 (Coronavirus). People, scientists, and researchers can use Tableau to easily get trustworthy information and even examine the data for themselves. Define discrete and continuous dates in Tableau and investigate when to use each to describe our data. Also, introduce mapping and investigate how Tableau can use different types of geographic data, how to connect to many data sources, and how to generate custom maps. Tableau is a data visualisation tool that allows us to connect to practically any database, plot our data, and gain insights to better understand the data. Using Tableau, we can construct dashboards, models, interactive visualisations, and compare Tableau allows you or key decision-makers to find COVID-19 data trends, such as COVID-19 pandemic behaviour, and match the results acquired through machine learning algorithms with Tableau visuals. In this presentation, we will go over the history and current situation of Tableau. Finally, Tableau's primary role is to integrate and extract information stored in many locations. It can collect data from any platform. Tableau can extract data from any Excel, PDF, Oracle, or Amazon Web Services database.

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