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Data Visualization for Corona Patients Globally using Real-Time APIs

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***Abstract*— All the nations' administrative units are concerned about the COVID-19 outbreak in different regions of the world. India is also trying to control the spread of the virus with strict measures and has managed to slow down its growth rate. The administration of each country faces the challenge of maintaining records of corona patients. To address this challenge, this work builds a website from scratch using real-time APIs for data visualization. The website provides information on the number of active cases, death cases, recovery cases, and total cases of COVID-19 patients in each country. The data can be visualized using graphs, making it easier to compare the situation in different countries. The website allows for monitoring which country has a higher number of deaths, patients, favorable recovery rates, and a large number of active cases. The COVID-19 status regarding patients can be analyzed through graphical representation using real-time data.**

Keywords— Visualize, Covid-19, Active, Recovered, Death, Patient's Data, Analyze, Real-time Data.

I. INTRODUCTION

In past due December 2019, Chinese fitness government stated a virus of pneumonia of unknown starting place in Wuhan, Hube. Later it can be known as novel corona virus was provisionally named 19-NCOV or SARS-COV2. All the administrative subdivisions of the respective nations are deeply concerned about the COVID-19 outbreak occurring in different places of the world. India is likewise struggling to contain the viral spread and has restricted its expansion rate by taking certain faces major challenges. The website will be constructed from the ground up utilizing some real-time API. This will allow for the viewing of a country's patient details, including active cases, death cases, recovered cases, and total cases. Data visualization of patients from each country can be achieved through graphs. Comparison of each country's data can be made with ease. The ability to monitor which country has a higher number of deaths, patients, favorable recovery rates, and a large number of active cases is available.

[3] Carlos et al. build a website from scratch by using some real time APIs in their website through this see the patients details of each country like patients Active Cases, Death Cases, Recover Cases and Total Cases. More importantly, their evaluation may be used as a foundation for devising not unusual place requirements and recommendations for Web API improvement and API granularity and authentication detail.

[4] Maria Maleshkova et al. Currently, the improvement of Web APIs is as a substitute autonomous, guided with the aid of using no mounted requirements or rules, and Web API documentation is typically now no longer primarily based totally on an interface description language consisting of WSDL, however is as a substitute given at once in HTML as a part of an internet page. Additionally, using the information that is presently available from the ICMR considering COVID-19 patients in India and an enhanced version of the SIR epidemic model known as the Outbreak's Intensity in India, scientists were able to forecast the greatest amount of confirmed cases of COVID-19 found in a day (Peak Value) as well as the cumulative number of deaths that would result from the spread in India.

[2] Sanja Delcev et al. JavaScript is the language that gives a dynamic internet web page which actively communicates with users. JavaScript is utilized in today's internet programs as a purchaser script language and at the server side. All 4 frameworks are primarily based totally on MVC or comparable architecture. In this paper, the blessings and downsides of every framework, the effect on software speed, the approaches of checking out such JS programs and approaches to enhance code protection are presented.

[7] They created COVID-19 as a specialized, entirely based on freely accessible datasets like those in the Kaggle repository. Numerous elements of COVID-19 are covered by data analytics, such as the symptoms of the disease and how COVID-19 differs from those other illnesses like swine flu, Middle East respiratory syndrome, and severe acute syndrome (SARS). Based entirely on the datasets, the impact of temperature on COVID-19's spread is also addressed. Furthermore, data processing is given at the comparisons of infections in men/women, which suggests that males and older people are more at risk for this illness. Based on the data, it is established that the sample within the burst of occurrences shown has the properties of an exponential curve. Finally, information visualization is used to demonstrate the relative number of showed, recovered, and dying occurrences in characteristics that lead.

[9] They propose an additive linear regression with understandable parameters that can be simply balanced by specialists with in-depth understanding of the time series.

The focus is on international statistics starting from January 22nd, 2020, until April 26th, 2020. Dynamic map visualization of Covid-19 growth globally is achieved through date-sensitive methods and predicts the spread of the virus in all countries and continents. The main benefits of these works involve accurate estimate of country-sensible as well as province- or state-sensible shown cases, recovered cases, deaths, and forecasting of pandemic viral attacks and the rate at which it's far expanding globally.

[10] They describe our manner for immediate growing and circulating dashboard visualizations to assist telehealth operations. They used a 5- step manner to advantage fiefdom knowledge, become aware of doper musts, become aware of records sources, layout and broaden visualizations, and iteratively increase those visualizations. Through this manner they correlated three wonderful stakeholder companies and designed and advanced visualization dashboards to satisfy their musts. Feedback from druggies verified the dashboard's assist state of affairs eye and knowledgeable crucial stay determinations.

II. METHODOLOGY

The Aim of this research is to Build a Website where people can visualize the covid-19 patient's data of each country and each state of India by using graph, chart and Map through some real time API we can get real time Covid-19 Patients data though that API's in the JSON format. The Domain of this work is a Web Development where we are going to build a Full Stack Web Development project to visualize the covid-19 patient's data by using some API's of Covid-19 data and API's for google map to Visualize through map. Front End of this work, used HTML, CSS, Bootstrap, JavaScript, ReactJS, Material UI and for Backend, Node JS and NPM are used.

The website aims to provide a comprehensive and up-to-date view of the COVID-19 situation, helping to track the spread of the virus and monitor its impact on different countries. This information is critical for healthcare professionals, researchers, and policymakers in making informed decisions. By utilizing real-time API, the website can retrieve accurate data on the number of active cases, death cases, recovery cases, and total cases in each country, which can be visualized through graphs. This allows for easy comparison between different countries and helps to see trends and patterns in the spread of the virus. The visual representation of the data provides a clearer and more understandable view of the situation, allowing users to better understand the impact of COVID-19 on each country.

The methodology of this project involves dividing it into three parts. The first part is the creation of the homepage using HTML, CSS, Bootstrap, and JavaScript. Interactivity is added to the homepage through the use of JavaScript for some actions and images. The second part involves the use of the React Js framework, along with the NPM (Node Package Manager) for the installation of React Chart-Js for data visualization. React Axios is used to fetch JSON data from the API, and React Material-UI, which is also installed through NPM. The third part of the project involves using NODE JS as the backend, allowing for the use of real-time data to visualize it through charts and maps. The Google Map API is utilized in NODE JS to visualize Covid-19 data.

A. *Description*

In the current system, Covid-19 patient data can be viewed on some websites. However, if a map visualization is desired, a separate website must be used. The proposed system of this project is the creation of a Covid-19 data visualization website that displays real-time data on active, recovered, and death cases of Covid-19 patients. The data can be visualized through charts, graphs, and maps.

B. *Software Specification*

- Node Js
- Gitlab
- VS CODE EDITOR
- Notepad
- Chrome or any Browser
- Git Bash
- Bootstrap 4

C. *Architecture*

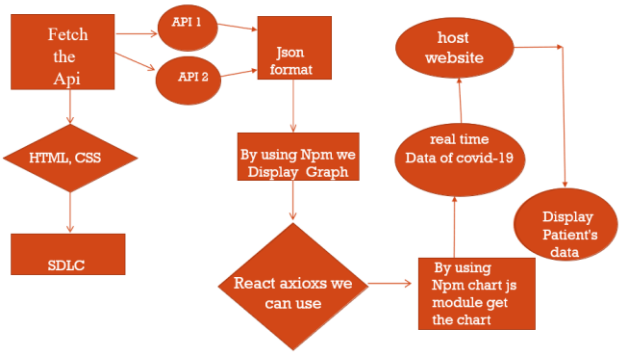

Fig.1. Architecture Diagram

Figure Figure 1.0 depicts the architectural diagram of the project after its planning, design, and requirements have been defined. The homepage of the web page was created using HTML and CSS, which serves as the front-end interface for users. To retrieve and analyze real-time COVID-19 data, React Axios was utilized to link the homepage with the real-time API. React Axios retrieves the data from the API and generates the necessary charts for visual representation of the COVID-19 data. This design ensures that users can access the most up-to-date information about the COVID-19 pandemic and understand the situation in different regions through data visualization.

D. *COVID19-India API*

This work utilized an API to retrieve information on COVID-19 patients. The API was available for free from the URL https://github.com/covid19india/api. However, as of August 13th, this repository and its associated URL api.covid19india.org were no longer available. The URL api.covid19india.org was redirected to information.covid19india.org to provide access to updated information. The aggregated data on the district and state levels can be accessed through CSV formatted sheets, providing a comprehensive overview of the situation. The latest information, with a delay of 10-20 minutes, can be accessed through the latest endpoint, which uses data from Google sheets. This helps to ensure that the information is up-to-date and accurate.

E. C V4 JSON endpoints

The website is built on the data provided by these API endpoints, which are specifically designed to work with the V4JSON format. By using these endpoints, the website is able to access real-time updates and provide accurate and up-to-date information to users. The API links and descriptions listed in Table 1.0 are considered to be the most comprehensive and reliable sources of data for the purpose of this project.

Table 1.0 API Links and Description

Link to API	Description
https://api.covid19india.org/v4/min/timeseries.min.json	Daily totals for C, R, D, and Tested by state (historical data).
https://api.covid19india.org/v4/min/data.min.json	State and district current day numbers.
https://api.covid19india.org/v4/min/data-all.min.json	Do not overlook the use of timeseries in this region when calculating daily figures across districts and states. This lengthy document contains both timeseries and data. min.json

F. Aggregated Sheets (CSV)

Table 2.0 Aggregated Sheets (CSV) Links and Description

Sheet Name	Link to CSV	Description
case_time _SERIES	https://api.covid19india.org/csv/latest/case_time_series.csv	India level timeseries for cases that have been confirmed, recovered, and dead
states	https://api.covid19india.org/csv/latest/states.csv	Confirmed, Recovered, and Deceased number state-by-state timeseries.
districts	https://api.covid19india.org/csv/latest/districts.csv	Confirmed, Recovered, and Deceased numbers time involved by district.
state_wise	https://api.covid19india.org/csv/latest/state_wise.csv	State-by-state totals up to date
district_wise	https://api.covid19india.org/csv/latest/district_wise.csv	Cumulative districts
tested_numbers _icmr_data	https://api.covid19india.org/csv/latest/tested_numbers_icmr_data.csv	ICMR's reported test count
icmr_labs _statewise	https://api.covid19india.org/csv/latest/icmr_labs_statewise.csv	Each state's lab count according to the ICMR

Table 2.0 gives the latest data from the google sheet (10-20 minutes delayed) is available through the latest end-point.

III. RESULTS

The proposed system offers improved efficiency by allowing users to manage and view data on Covid-19 cases, including recovered, death, and active cases. The data can be easily visualized through charts, maps, and graphs, providing a clearer understanding of past and present trends. In comparison to existing systems, this proposed system not only provides data, but also allows for interactive visualization of the data through maps, making it easier to see the details of each country and its Covid-19 situation in real-time. This enhances the overall efficiency of the system and provides a more comprehensive view of the Covid-19 situation globally.

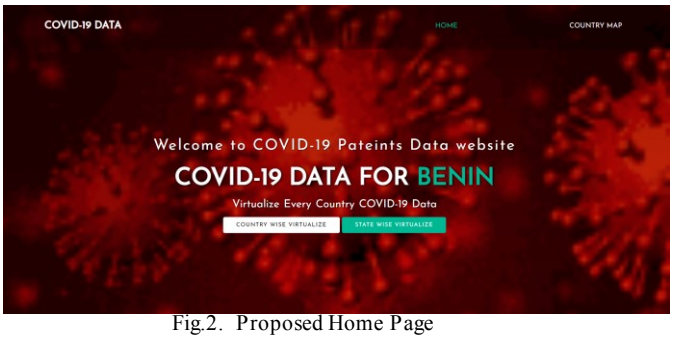

Fig.2. Proposed Home Page

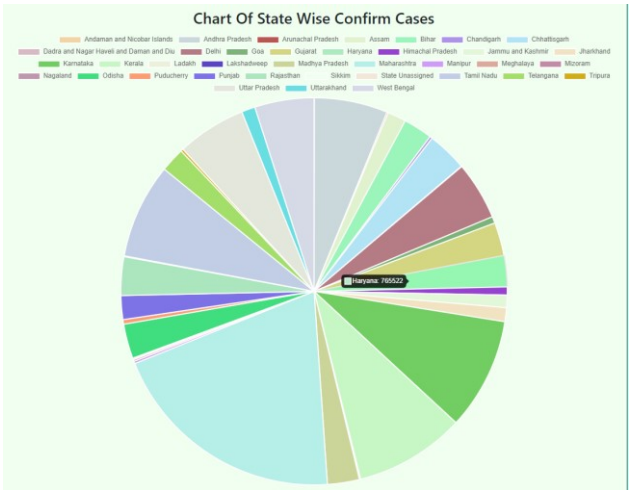

Fig.3. State data through chart

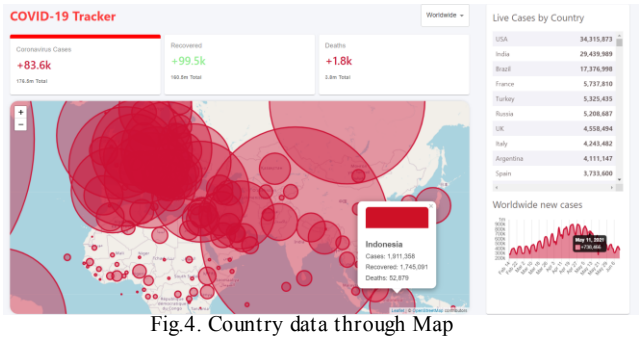

Fig.4. Country data through Map

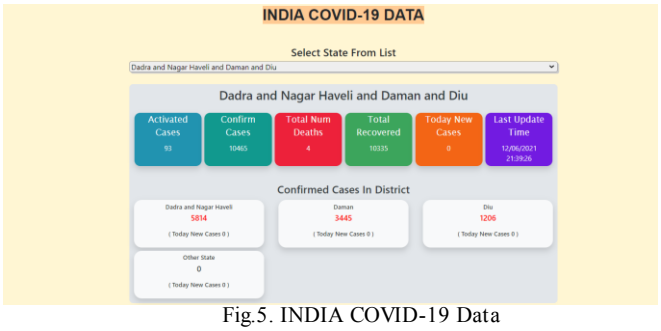

Fig.5. INDIA COVID-19 Data

Figure 2,3,4 and 5 shows the visualization of Corona Patients Globally Using Real-Time APIs.

IV. CONCLUSION

This study aims to provide a comprehensive and updated view of the COVID-19 pandemic. By utilizing APIs, the website allows for easy access to information on the current status of the virus, including the number of active cases, death cases, recovery cases, and total cases in different countries. The data can be visualized in a clear and understandable manner, allowing users to compare and understand the situation in different regions. The use of graphs and other visualization tools makes it easier to see trends and patterns in the spread of the virus. This information can be useful for healthcare professionals, researchers, and policymakers in making informed decisions. In the future, the project could be improved further by incorporating machine learning algorithms that would automatically determine the location of COVID-19 patients based on their coordinates, thereby providing an even more accurate and up-to-date view of the situation.

Additionally, this study could also consider integrating more APIs and data sources to provide a more comprehensive view of the pandemic. For example, information on the availability of resources like hospital beds, vaccines, and personal protective equipment could be incorporated to provide a more holistic view of the situation. Another potential enhancement would be to incorporate predictive analytics to forecast the spread of the virus and its impact on different regions. By incorporating these and other cutting-edge technologies, the project could further enhance its ability to provide a comprehensive and up-to-date view of the COVID-19 pandemic and help in decision-making and response efforts.

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