

Real Time COVID-19 Tracker Using React JS

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Abstract: As we all know that during this tough time everyone is facing the summons because of this scary pandemic Covid19. More than 200 countries are affected due to this pandemic and the populace is uninformed when this drastic period will come to an end. How the rapid growth of this virus is going to be stopped, apart from vaccinations and medicare everyone needs to be much more aware about the dangerous situation and must follow the protocols and guidelines imposed by government in order to be safe or free from the scary virus. The main objective behind writing this paper is to present an idea that how knowledge to an emerging frontend technology like React JS can lead to a wonderful user interface that can serve as a data analyser web software for this deadly pandemic. The paper revolves around a project created with a bunch of features of React JS from exciting frontend components with Material UI to writing CSS, JSX and making API calls to collect worldwide data related to Corona virus. The major highlights of the project entitled in this paper are no page reloads, Responsiveness, body-parsing, API calls for data collection, JSX (HTML inside JS), sorting algorithms, dynamic data representation, REDUX, data representation in dynamic graphs/pie charts. In this a large number of npm packages like react, react-dom, [at]material-ui etc along with React JS and CSS library like Material UI has been used in order to code the website such that it results in an attractive, responsive and a beautiful project with a single technology that is JS. The web software entitled in this paper is a complete package of features of React JS integrated with some other frontend technologies like CSS and material UI going through which any user can analyse the data related to corona virus geographically as well as graphically. An web software which will be helpful in displaying all the data of Covid19 (such as number of total cases worldwide, number of active cases, etc). Getting real time data for anything is very beneficial for all the users, as we are displaying the data for covid19 so without going anywhere they can easily get to know their current place status for corona i. e. total number of covid19 cases in their country or city. This way of collecting data will be helpful as the users will not come in direct contact with anyone and hence, they do not get affected.

Keywords: API calls, JSX, Sorting Algorithms, NPM packages, JSON, Page Reloads, Library, components, Responsiveness, Dynamic data representation

1. Introduction

“COVID19 TRACKER” is a useful application with a bunch of exciting features that it offers to the users from no page reloads to all corona virus related data under a single web page. It covers all scenarios to achieve the requirements of any user searching for worldwide or country wise details regarding corona virus. This application is developed for serving its users to the fullest of it’s potential by providing them a platform where they can get the data and information about corona virus not only worldwide but also country wise and in graphical as well as geographical display. Though the application is based more on the frontend development but dynamic data is also given equal preference. The data is collected by asynchronous API calls to disease. sh that provides dynamic data depending on the endpoint used during the call. In simple words disease. sh acts as a server to which we make GET request to provided endpoint and according to endpoint it gives JSON data in response.

2. Related Works

Thomas Hale, Noam Angrist, Rafael Goldszmidt, Beatriz Kira, Anna Petherick, Toby Phillips, Samuel Webster, Emily Cameron-Blake, Laura Hallas, Saptarshi Majumdar and Helen Tatlow [1]elaborate the Oxford COVID-19 Government Response Tracker (OxCGRT), a dataset that addresses the need for continuously updated, readily usable and comparable information on policy measures. They presented two motivating applications of the data, highlighting patterns in the timing of policy adoption and subsequent policy easing and reimposition, and illustrating how the data can be combined with behavioural and epidemiological indicators. This database enables researchers and policymakers to explore the empirical effects of policy responses on the spread of COVID-19 cases

and deaths, as well as on economic and social welfare [1].

Dounia Marbouh, Tayaba Abbasi, Fatema Maasmi, Ilhaam A. Omar, Mazin S. Debe, Khaled Salah, Raja Jayaraman, Samer Ellahham [2] they review various blockchain applications and opportunities in combating the COVID-19 pandemic and develop a tracking system for the COVID-19 data collected from various external sources. They propose, implement, and evaluate a blockchain-based system using Ethereum smart contracts and oracles to track reported data related to the number of new cases, deaths, and recovered cases obtained from trusted sources. They present Consensus algorithm that capture the interactions between stakeholders in the network. They present security analysis and the cost incurred by the stakeholders, and highlight the challenges and future directions of work. There work demonstrates that the proposed solution is economically feasible and ensures data integrity, security, transparency, data traceability among stakeholders [2].

Asjad Naqv [3] state that this Tracker presents data on daily COVID-19 cases at the sub-national level for 26 European countries from January 2020 till present. Country-level data sources are identified and processed to form a homogenized panel at the NUTS 3 or NUTS 2 level, the two lowest standardized administrative units in Europe. The strengths and weaknesses of each country dataset are discussed in detail. The raw data, spatial layers, the code, and the final homogenized files are provided in an online repository for replication. The data highlights the spatial distribution of cases both within and across countries that can be utilized for a disaggregated analysis on the impacts of the pandemic. The Tracker is updated monthly to expand its coverage [3].

Jean Louis Pépin, Rosa Maria Bruno, Rui-Yi Yang, Vincent Vercamer, Paul Jouhaud, Pierre Escourrou, Pierre

Boutouyrie [4] elaborate that article used to determine whether wearable activity trackers could provide information regarding users' adherence to home confinement policies because of their capacity for seamless and continuous monitoring of individuals' natural activity patterns regardless of their location. They analyzed big data from individuals using activity trackers that count the wearer is average daily number of steps in a number of representative nations that adopted different modalities of restriction of citizens' activities [4].

React Js [11] is a web framework which was developed by Facebook. It is one of most used frameworks with other two being the Vue Js and Angular JS. React Js has a huge community and as a technology it provides a better approach to represent data. React Js is an open source Javascript library and can be used to develop both single-page web applications and mobile applications. React is very useful for building big web-applications as it divides the web pages into discrete components with each component giving a separate view which makes it easy to manage and enhances the overall readability of the code [11].

3. Methodology

During development phase of this software various steps are followed to represent COVID-19 related data in the best way possible. Such that meticulous data is served to a user in different formats including graphical and geographical representation. Steps followed while development of this project is as follows:

- 1) Basic structure of the application was created before implementation of any code.

The structure was designed in such a way the whole UI looks as a single web page and there are no too many instructions for the user to reach to a particular data.

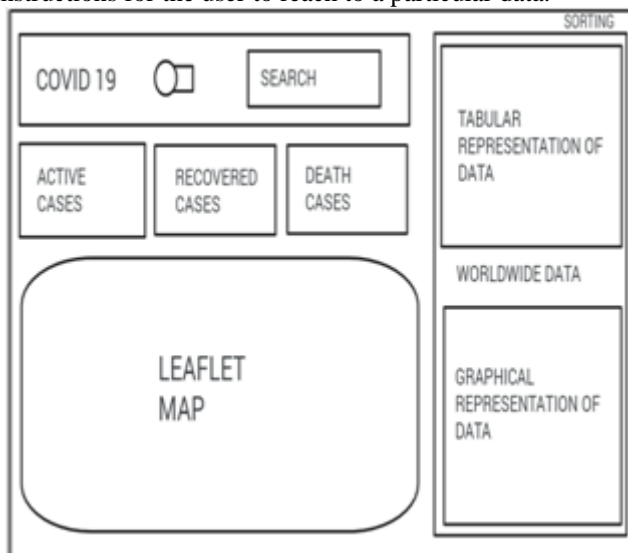


Figure 1: Basic Structure of application

- 2) Coding phase of the website started and was planned in a way that when a variable changes the component in the DOM associated with it is automatically changed.
- 3) For example: Map automatically changes as soon as you search.
- 4) The coding part is done so that the parent's components

are coded first then the child components giving it a hierarchical structure.

- 5) For Example: Parent Component: App Child Component: MAP, Search.
- 6) Separate components of model are built and are structured with various css techniques such as media queries and Flexbox giving the website a great structure and a simple UI which looks simple to the end users.
- 7) The separate components and fields are styled with the help of Material UI and some CSS styling techniques.
- 8) The data is fetched with the help of API named disease.sh which contains a lot of information regarding the ongoing coronavirus pandemic. GET requests were made to endpoints provided by disease.sh.
- 9) All data fetching calls were made under useEffect () hook provided by React JS that takes two parameters one as an async function describing what to do and second argument as when to run that function.
- 10) After the data is fetched from the API it is sent to various other components of the project where as required format for is X, Y coordinates.
- 11) After this the data from various components are rendered to the main.js file and is ready to use.
- 12) Two modes of web view are also provided for convenience of the user dark mode and light mode.

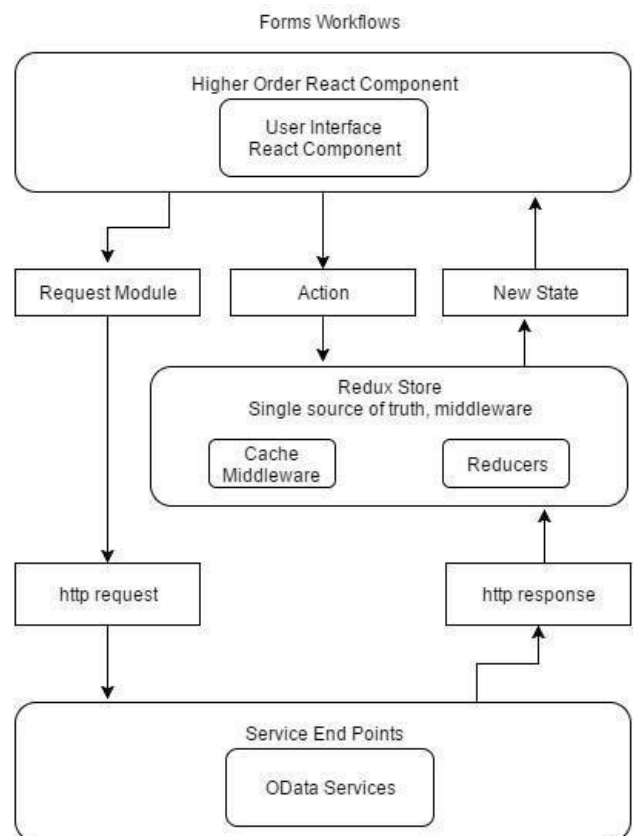


Figure 2: Architecture of React JS Application

4. Results

Accurate Data representation and real-time data updation is the main aim behind this website and it serves us the figures and data related to the COVID-19 pandemic.

The resulting web application produced, serves as a best example for a software created taken in care of all React JS

features and gives user best of UI to use. The data representation is correctly done in a precise manner and well managed and colour combinations used in project are well managed in both the modes dark and light. Even the search for various countries can be conducted with the help of

SELECT bar.

All these things contribute to making this web application easy to use and contribute in providing it a responsive and attractive UI.

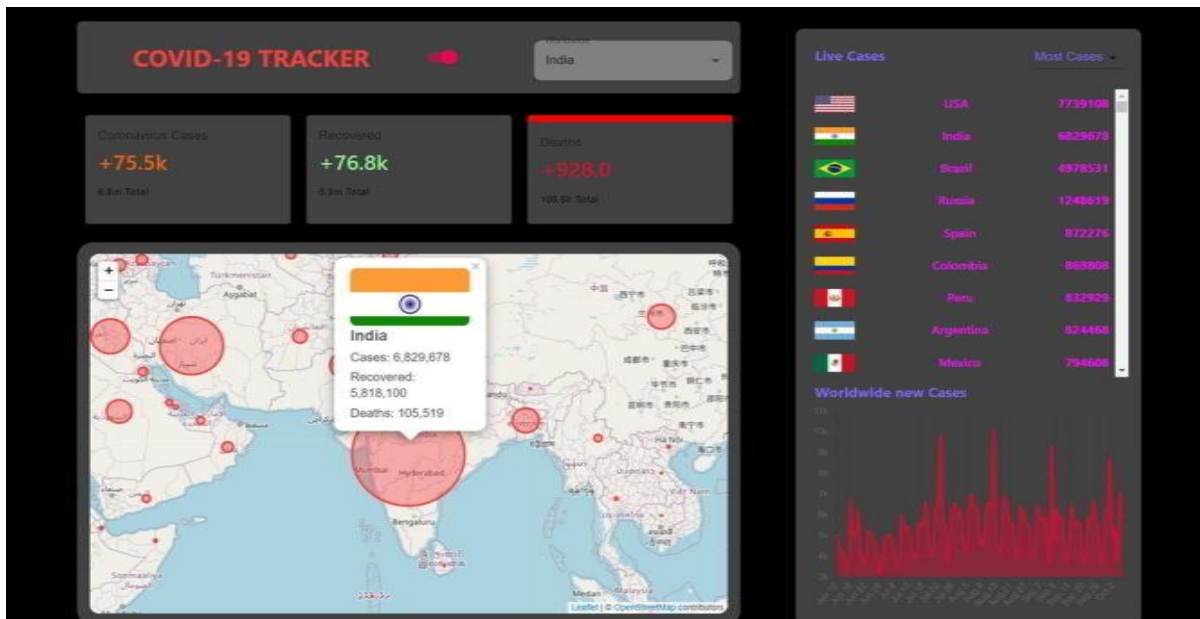


Figure 3: “COVID-19 TRACKER” Project snapshot in dark mode



Figure 4: “COVID-19 TRACKER” Project snapshot in light mode

As it is very clear from Figure 3 and 4 that whole application is created in components and each component is designed in such a way that a very less user interaction is required but the data represented is more. There is no need for user to search for data from different sources it is just available easily with very less interaction and that too under a single web.

5. Conclusion and Future Scope

Further implementation of some exciting features like disease prediction on the basis of symptoms and direction of further steps such as finding an appropriate doctor nearby user area would add wonders to this application. These will be helpful in understanding and developing new algorithms for finding doctor for users according to their area with Machine Learning and Deep Learning algorithms. This is a booming research topic which is still going on for

surveillance of large crowds in real time applications. From this application we conclude that how React JS and some basic concepts of frontend development can lead to such an exciting web application with a bunch of features. Though the application is a pretty basic for now but it has a great scope for further implementation of some advanced topics and some more technologies and for now the application is serving its aim to the fullest for which it is developed.

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