

Covid-19 Statistics Dashboard for Realtime Analysis

¹B.T.D. Praveen Varma, Product Manager-R&D, Eruvaka Technologies Pvt Ltd, Vijayawada, India

²B. Sri Charani, M. Tech Scholar, Department of IT, S.R.K.R Engineering College, Bhimavaram, India

³M. Krishna Satya Varma, Assistant Professor, Department of IT, S.R.K.R Engineering College, Bhimavaram, India

¹btdpraveen247@gmail.com, ²sricharani186@gmail.com, ³varmamantena@srkrec.ac.in

Abstract Data Visualization is a process of representing the Data in graphical format. Now-a-days Visualization based applications are getting enormous popularity due to its flexibility to customize anything according to our requirements. To help the user, instead of table format we came up with an idea to represent the COVID-19 Countries data in the horizontal bar graph, so that it helps the user to grasp the specific country statistics easily. Using this interface, every user can interact with application to view the specific Country statistics in graphical format with information like Cases, Recovered, Active, Deaths, Tests Per One Million, Cases Per One Million, Today Cases, Deaths Per One Million, Today Deaths and Critical. All the data is sorted from highest value to lowest value. The main advantage of this application is that the user can get the statistics in graphical format for better understanding and can compare the recovery rates effectively.

Keywords — HTM, CSS, JAVASCRIPT, JQUERY, PHP

I. INTRODUCTION

Covid-19 is an unexpected Pandemic which affected most of the world Development including population, Industries and employment. This Application gives an overview of each country covid-19 statistics. Each Country statistics gives an updates cases with respect to last server update. Each update is categorized to Cases, Recovered, Active, Deaths, Tests Per One Million, Critical, Cases per One Million, Today Cases, Deaths Per one Million, Today Deaths.

A. System Architecture

The system architecture specifies the overview of the project as follows. The user selects the option to view the statistics of the country. As we know the data is regularly updated with respect to different country conditions and status. When the user loads the page, the data need to be retrieved from an API. As the data is received in JSON format and it's difficult to view the data in objects and arrays format. It is not appropriate way to identify the countries condition as it may confuse with large numbers. So the data visualization techniques help in receiving the data and present it in the graphical format [3].

The incoming data is huge and it is difficult to represent all at once due to space/View constrains in the web browser. To solve this, select option is provided to the user to select the specific country which they want to view. From the option the data is filtered and shown only the specific country data. To compare the recovery rate the data is ordered from highest to lowest values.

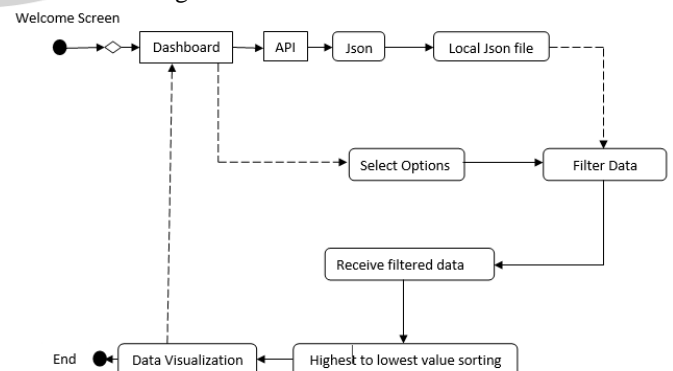


Fig -1: System Architecture

B. Class Diagram

A class diagram shows a set of classes, interfaces, and collaborations and their relationships. These diagrams are the most common diagrams found in modeling object-oriented systems.

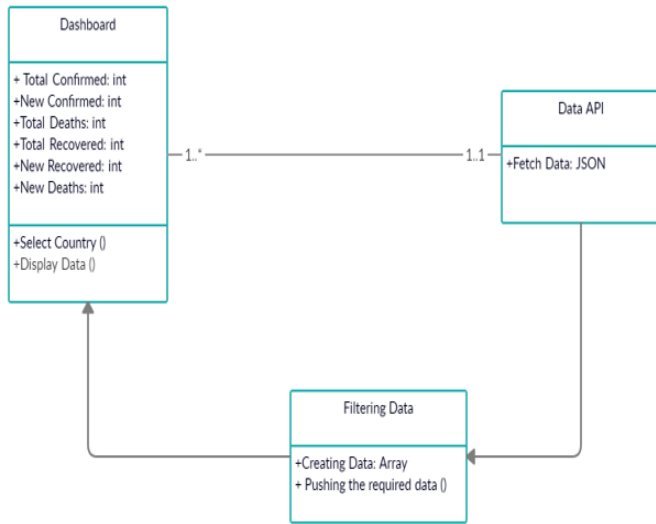


Fig -2: Class Diagram

C. Use Case Diagram

A use case diagram shows a set of use cases and actors and their relationships. Use case diagrams address the static use case view of a system. These diagrams are especially important in organizing and modeling the behaviors of a system.

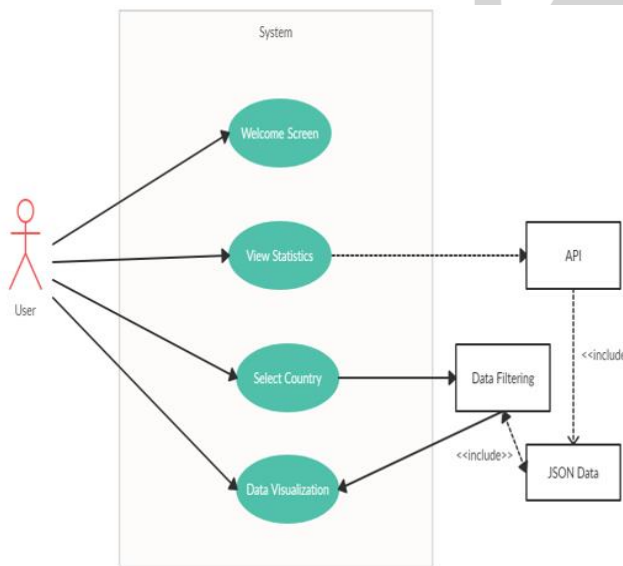


Fig -3: Use Case Diagram

D. Sequence Diagram

A sequence diagram is an interaction diagram that emphasizes the time ordering of messages. It's consisting of a set of objects and their relationships, including the messages that may be dispatched among them. Sequence diagrams address the dynamic view of a system.

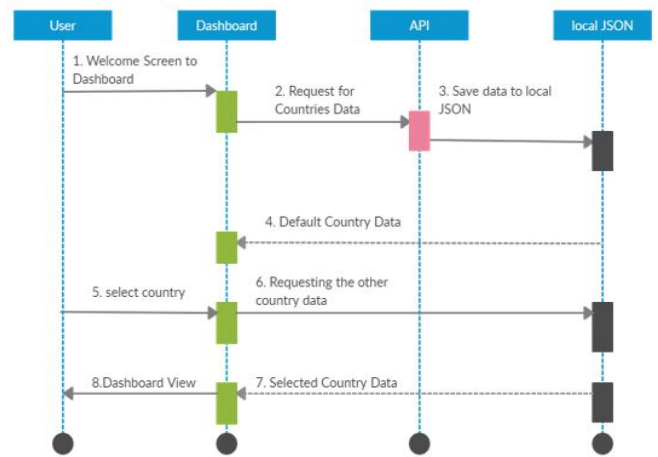


Fig -4: Sequence Diagram

E. Activity Diagram

An activity diagram is a special kind of a state chart diagram that shows the flow from activity to activity within a system. Activity diagrams address the dynamic view of a system. They are especially important in modeling the function the function of a system and emphasize the flow of control among objects.

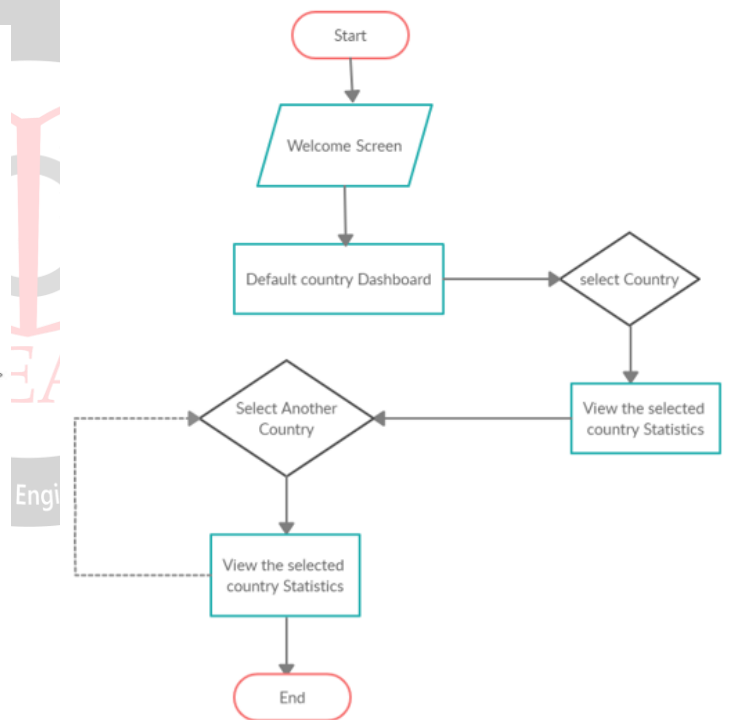


Fig -5: Activity Diagram

F. State chart Diagram

It gives an information about the state flow of the process from starting to ending.

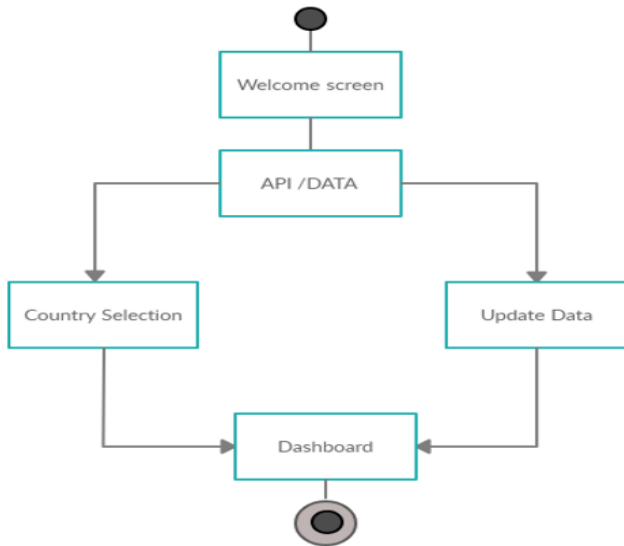


Fig -6: State Chart Diagram

II. SYSTEM IMPLEMENTATION

In this application we are performing the data visualization representation of COVID-19 countries data statistics with respect to selected options as a filter. Every data is updated according to latest API refresh. Visualization will be sorted according to highest number with respect to Cases, Recovered, Active, Deaths, Tests Per One Million, Cases Per One Million, Today Cases, Deaths Per One Million, Today Deaths and Critical.

A. Module Programming

Modular programming is a software design technique that emphasizes separating the functionality of a program into independent, interchangeable modules, such that each contains everything necessary to execute only one aspect of the desired functionality.

- Welcome Screen:**
 It is the screen with info about the Dashboard and with button to redirect the user to Dashboard.
- Dashboard:**
 Dashboard to display the statistical data with respect to the user selected country.
- API:**
 API is used to fetch the data for the latest updated data.
- API JSON:**
 It is the output from the API where data is obtained in arrays and objects.
- Local JSON:**
 The obtained API JSON data is saved locally for offline use.
- Filtering the Data:**
 Data is filtered according to user selected country from the JSON
- Sorting:**

Data is sorted from highest value to the lowest values to display the graph

- Data Visualization:**
 D3.js is used for representing the sorted data in graphical format.
- Statistical analysis:**
 The result can be used for gaining present status of each country with respect to covid and its effect on societies.

B. Home Page Actions

Action	Description	Expected Result
Load the page	Load the initial page to check the components	Background image need to be loaded, Button and Dashboard heading need to be visible
Click on View statistics button	On click of button. It should redirect to Dashboard	Need to be redirected from home page to Dashboard

Table -1: Home Page Action list

C. Dash Board Actions

Action/View	Description	Expected Result
Load the Dash Board page	Load the initial page to check the components	Check loading the page is done or not
Default Selection to India statistics	Check the default value in select box i.e. India	Default selection should be India in select box
View the bar Graph	Check the Horizontal Bar graph visibility	Horizontal Bar graph should be Visible according to value
Value display on graph	Value should be displayed on each graph	Each bar should display the respective numbers
Option to select other country	Options should display on click of select box	Countries option should display in select box.
On select of other country	select the specific country to view the results	It should display the Results of selected country.
Sorting Values on Graph	Check the order of graphs	Graph should display from highest value to lowest value.
Graphs view in lower end screens	Need to view with window resize horizontal as vertical is fixed.	Graph should resize on horizontal variation of screen size.
Mobile View	View the result in mobile	Bars should be responsive on mobile screen horizontally.
Bar colors	Bar Colors should be uniform and unique	Each bar color should be unique from one other

Table -2: Dash Board Action list

D. Sample Json format from API

The below json is a sample taken from an API. So, it may vary from time to time with latest values.

```

{
  {
    "country": "World",
  }
}
  
```

```

"cases": 33058750,
"todayCases": 11683,
"deaths": 998747,
"todayDeaths": 462,
"recovered": 24411772,
"active": 7648231,
"critical": 65312,
"casesPerOneMillion": 4241,
"deathsPerOneMillion": 128,
"totalTests": 0,
"testsPerOneMillion": 0
},
{
"country": "USA",
"cases": 7287593,
"todayCases": 32,
"deaths": 209177,
"todayDeaths": 0,
"recovered": 4524108,
"active": 2554308,
"critical": 14096,
"casesPerOneMillion": 21986,
"deathsPerOneMillion": 631,
"totalTests": 103575764,
"testsPerOneMillion": 312476
},
{
"country": "India",
"cases": 5992532,
"todayCases": 1951,
"deaths": 94534,
"todayDeaths": 0,
"recovered": 4941627,
"active": 956371,
"critical": 8944,
"casesPerOneMillion": 4332,
"deathsPerOneMillion": 68,
"totalTests": 71257836,
"testsPerOneMillion": 51515
}
]

```

III.RESULTS

A. Steps for viewing the statistical report

Action	Description
Load the page	Load the initial page to check the components
Click on View the statistics button	On click of button. It will redirect to Dashboard
Load the Dash Board page	Load the initial page to check the components
Default Selection to India statistics	default value will be in select box i.e., India statistics

View the bar Graph	View the Horizontal Bar graph with Indian statistics.
Value display on graph	Value will be displayed on each graph
Option to select other country	Options will display on click of select box country
On select of other country	select the specific country to view the results
Sorting Values on Graph	Order of graphs will be higher to lower values
Graphs view in lower end screens	Need to view with window resize horizontal as vertical is fixed.
Mobile View	Results can be viewed in Mobile view.
Bar colors	Bar Colors will be uniform and unique

Table -1: step by step process for Result info

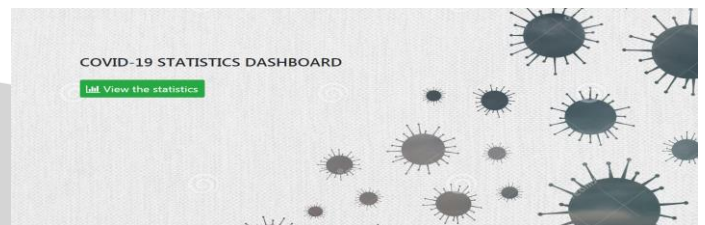


Fig -7: Welcome Screen

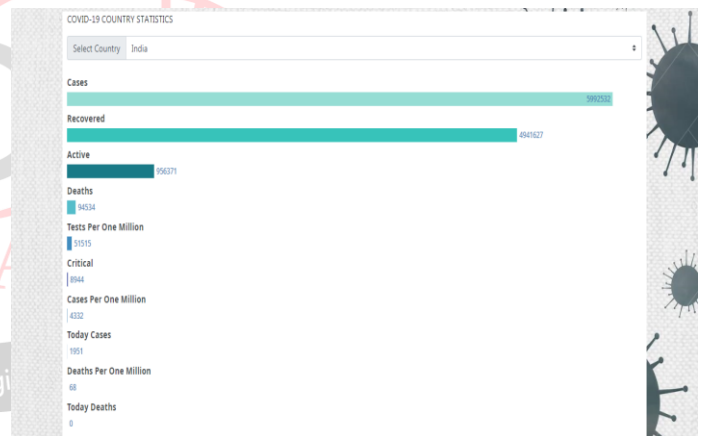


Fig -8: Default country statistics (India)

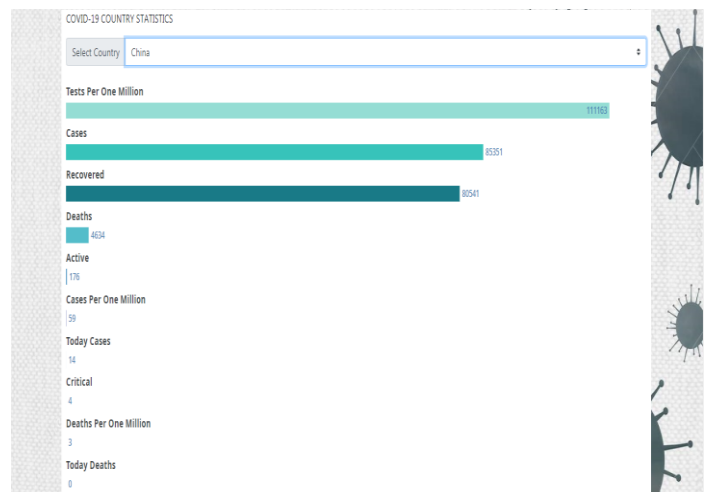


Fig -9: Other country statistics

IV. CONCLUSION

The Dashboard successfully gives a statistic with an updated data on everyday basis. With this report user can have idea on most effected parts of the world with respect to Cases, Recovered, Active, Deaths, Tests Per One Million, Cases Per One Million, Today Cases, Deaths Per One Million, Today Deaths and Critical.

The proposed work is successfully implemented with all features mentioned in the software requirements specification using JavaScript through php and tested on web; it found that the result is satisfactory

REFERENCES

- [1] Z. Y. Zu, M.D. Jiang, P. P. Xu, W. Chen, Q. Q. Ni, G. M. Lu, L. J. Zhang, "Coronavirus Disease 2019 (COVID-19): A Perspective from China," vol. 2019, 2019.
- [2] T. P. Velavan and C. G. Meyer, "The COVID-19 epidemic," Trop. Med. Int. Heal., vol. 25, no. 3, pp. 278–280, 2020
- [3] J. R. Hageman, "The Coronavirus Disease 2019 (COVID-19).," Pediatr. Ann., vol. 49, no. 3, pp. e99–e100, 2020.
- [4] Q. Li, X. Guan, P. Wu, X. Wang, L. Zhou, Y. Tong, R. Ren, K. S. Leung, E. H. Lau, J. Y. Wong, X. Xing,
- [5] M. N. Mohammed, S. F. Desyansah, S. Al-Zubaidi, E. Yusuf, An internet of things-based smart homes and healthcare monitoring and management system, Journal of Physics: Conference Series 1450, 012079
- [6] Hopkins CSSE by Kyle :
<https://documenter.getpostman.com/view/10808728/SzS8rjbc>
- [7] WHO (COVID-19) pandemic:
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- [8] Corona Tracker for COVID-19 Statistics:
<https://www.coronatracker.com/>
- [9] COVID-19 India Statistics:
<https://www.covid19india.org/>
- [10] Heroku Application for COVID-19:
<https://coronavirus-19-api.herokuapp.com/countries>
- [11] Statistics and Research COVID-19 Pandemic:
<https://ourworldindata.org/coronavirus>