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JaCo - A Java & JavaFx based Covid-19 Cases Global Tracker

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Abstract

Novel Coronavirus (COVID -19) is a deadly pandemic which had a global outbreak, and it affected millions of lives (globally). This deadly virus originated from China (hence, it was initially named as the China – Virus). The Novel Coronavirus was the secondary variant of the initial SARS – COVID -1 Disease, which also broke out in China in the year 2003. Coronavirus disease 2019 (COVID -19), the highly contagious infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2), has a catastrophic effect on the world's demographics resulting in more than 2.9 million deaths worldwide, emerging as the most consequential global health crisis since the era of the influenza pandemic of 1918. This global crisis led to fear and confusion among people, and also the fake news and rumors about the Covid -19 count led to a global outrage. This led to the demand of a trustworthy and reliable source of information on the current global coronavirus count. So this project helps to ensure real-time, accurate data of the current global coronavirus count. The active cases, the total outbreak count, etc. For that we need a simple program which can run on a computer without caring about the platform where the system is running. So, it should be platform independent for that we use Java which it an platform independent programming language with help of its graphics library JavaFx we can create simple yet effective program which can track live covid-19 cases and show it to the user.

***Key Words*:** Java , JavaFx, Covid -19 tracker

1.INTRODUCTION

JaCo (JavaFX COVID-19) is a FOSS (Free and Open Source) desktop Application, built entirely in Java and JavaFX. The name JaCo, is derived from the initial letters of Java (Ja) and Covid-19 (Co). JaCo, being a desktop application, is a platform independent software. Meaning that it will run on Windows, macOS and Linux as well. The codename for this project is "Butter-Knife". JaCo is a desktop application, which will monitor and display real time data, right to the machine's screen. JaCo does not pick up data from every new source, but rather it relies on some valuable and trustworthy resources like: The Johns Hopkins University's GitHub database, etc. Covid -19 being the biggest pandemic hit, which not only affected millions of people but also changed their lives for their lifetime. JaCo, is an effort of the engineers of this younger generation, to bring up something new and useful, which can help this world in getting the right information, also making it safer and better for the future. As engineers, we have the responsibility on our shoulders, to bring out such a project, which is not just "a project", but a useful asset to the society

LITERATURE REVIEW

This section covers the research of other authors, as well as other developers and their applications on the Novel Coronavirus/ Covid – 19 Virus and its impact globally, in the form of a pandemic. To identify the approaches, problems and their methodology for tackling the different problems, researchers, and employing different approaches and methods.

TRACKER: MOBILE APPLICATION TO TRACK COVID-19 IN JAKARTA INDONESIA, Indonesia, decided to create an application called Tracker. The main functionality of the application was to constantly update the data about the COVID-19 pandemic, including the number of casualties, the number of infected people, the number of people who have recovered, and also other educational materials such as how to keep people safe from the virus, including important numbers that they can dial, etc. Furthermore, activities of the positive patient of COVID-19 will be traced through GPS in the past 2-3 weeks before the patient is proven to be positive against the novel - coronavirus. People with close relations with the patient, like family or people who interacted with the patient and location visited, will be watched thoroughly by GPS (Global Positioning System).***[11].***

The **Stop Covid France Application or TousAntiCovid** was **made by France**, and it has a "centralized" design. This application was designed with a smartphone log technique, to prevent second waves of infection and also reminds people if they are/were close or near to someone who has been diagnosed positive for COVID-19. They are not limited by 2 technological companies, such as restrictions to obtain data location. On the contrary, Latvia, Italy, and Switzerland created an application based on "decentralized" technology, that has been developed with the help of Apple and Google, by beholding that it is better to protect the anonymity and privacy of its users. ***[12].***

COVIDSafe is **an application made by the Australian government** which helps health officials understand and prevent the spread of Coronavirus (COVID-19). This app is based on the similar architecture of Singapore's TraceTogether app, utilizing "Bluetooth" technology to record data, when two mobile phones come within the defined proximity, specified for the app. It is the only application

which is authorized by the Australian government, as a contact tracing application, where this application helps to find direct contacts that happened near the recent COVID-19 case. Through this application, people who may be infected or exposed to COVID-19 can be immediately contacted by the state and territory health officials. The information from this application can be accessed by the ministry of health officials, if the user is already tested and the result is positive, then approval of their information on their phone will be uploaded.***[13].***

CoronApp was created when the government of Columbia decided to use technology and innovation to face the COVID-19 pandemic. So, they created this application with the help of the National Institute of Health (INS) to make it easy for healthcare authorities to help the people affected by the disease. This application provides a map that includes the affected population based on age, gender, location. And an epidemiological pattern in worst-affected areas, so that real-time decision making could be done. This application provides a self-diagnosing facility for people which help to detect the closest people who are diagnosed positive with COVID-19. This application also acts as an official source of information for COVID activity in that user region. ***[14]***

Aarogya Setu was created by the government of India. It is a contact tracing application to record details of all the people you may have come in contact with, as you go about your normal activities. If any one of them, at a later point in time, tests positive for COVID-19, you are immediately informed, and proactive medical intervention is arranged for you. And it also tells us about current covid cases in India. We can also book vaccines through this app. By early identification and prevention of potential risk of infection in you. The app helps the Govt. of India identify hotspots, hence aiding in curbing the spread of the infection. The more people use it, the more effective the app will be in chaining the pandemic. ***[15]***

covid19india.org/ is a full-fledged website that gives the information of current active cases, recovered cases etc. in an easy to read manner so that people will get updated. It is different from the MoHFW website because the MoHFW updates data at a scheduled time only but this website updates data from government official handles and other media resources which are generally more recent. The data is validated by a group of volunteers and published into a Google sheet and an API. So the idea is to provide the information through other sources such as tweets and news so the public gets more recent news and information of current covid cases.***[16]***

A Survey on the Global Deployment and Challenges faced by the various contact tracing applications across the globe and challenges faced during their use, such as deployment framework, i.e. centralized or decentralized. And their corresponding sensor technologies such as GPS, Bluetooth, QR code, thermal sensors etc. ***[17]***

Problem Statement

The Novel Coronavirus (Sars-Cov-2), also named Covid -19, is a global pandemic, which affected millions of lives globally. This disease started to spread from a seafood market in Wuhan (China), and later on, it became a global pandemic, killing and affecting millions of people physically as well as mentally.

At such a time of fear and confusion, much fake news about the Novel Coronavirus started to appear on the internet, globally and no such desktop application was/is built till date, which is platform-independent (Windows, Mac, Linux), robust, versatile, open-source (for everyone to help, develop and grow) and trustworthy for showing the exact state/ count of the global coronavirus cases, their country, as well as the global casualty and recovery rate.

Hence, a need for such a platform-independent desktop application has arrived, which not only shows the true global count of the Novel Coronavirus (Sars-Cov-2) cases but also is in time with the real-time data and secure as well.

Proposed Approach

As for the above-described problem, a robust cross-platform desktop application is required to fulfil the needs of such a problem. Hence, we need to work on a language that is secure, robust and platform independent.

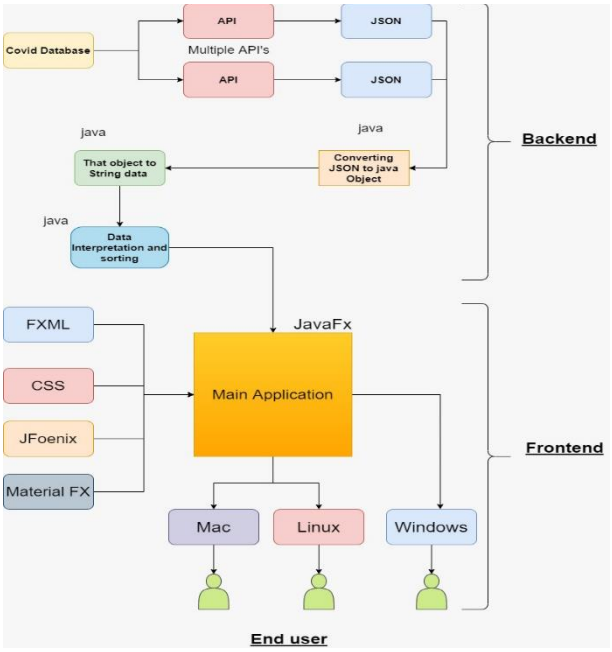
In such a scenario, we will need an OOP (Object Oriented Programming) based programming to deal with such problems and also that the language is secure and has good graphic support. In this case, the languages which come into sight are Java, C++, C#, and Python.

The power of platform independence is available in most all of them, except C++. Java is platform-independent from its birth, C# has a "mono" dependency for port, and python is also platform-independent. Now comes the problem of security and graphic support framework and libraries for cross-platform independence. In such a scenario, Java has a new graphic support platform named "Java Fx", which has robust support for cross-platform high-end graphic libraries, and Java is one of the most secure languages, available to date. For the data, a trustworthy source is needed, Hence, we will fetch the data from the GitHub repository of John Hopkins University.

Methodology

At first, we fetch data from the covid-19 database through provided API. Then, we convert that data in JSON format to the java object to perform some operations such as converting that object to a String object and then simply we use RegEx API present in java. util package which improves our fetch result and makes it easier to convert that data ready for frontend use

then we use FXML, CSS, JFoenix, and Material FX to build the frontend prettier and easy to understand for the user. And we have to create both separately for both Windows and Linux users because each of these software has a different graphic library.



Functional Requirements

The requirements are as follows:

Java (OpenJDK version 17+)**[6]**,

Operating Systems – Windows or Linux (Debian, Arch, etc.)

Conclusion

This report shows that COVID-19 is the newly discovered virus that affects the world in many countries and across the continents. The virus is very fast to infect someone and can be dangerous for anyone who has a critical disease before they get infected. The main medium of transmission from this virus is the infected cough or sneeze, that is why it is so important to practice social distancing and washing our hands regularly. That is why we want to introduce the Tracker application for people to keep providing accurate information about coronavirus updates.
Also, the feature in Tracker is hoped to be very useful for the paramedic team and government to prevent coronavirus infection and to stop the virus growth. The main reason for Tracker to be developed is to help as the epicenter to stop the dissemination and prevent the case from getting worse. Tracker provides the best method to trace and record COVID-19 growth by tracking the patients all across the globe. By using Tracker, COVID-19 is easier to be watched and prevented. Some unique features of this tracker is its being a desktop application and its nature cross–platform functionality. Being built using a WORA (Write Once Run Anywhere) technology, such as Java, and its splendid GUI (Graphical User Interface) framework – JavaFX. This application, being open source in nature (licensed under GNU GPL v 3.0), not only acts as a fair predictor but also acts as a

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FUTURE WORK

JaCo is currently being actively developed, after the development phase of this project, we will consult different developers and experts to discuss the limitations and further development of the future perspective of this project. This project, JaCo, is currently a global tracker for the cases of the Novel Coronavirus (Sars-Cov-2), across the globe. It helps to find the casualties, as well as the affected and recovered cases. The Future perspective of this project could be to develop it as a Swiss – Army – Knife, i.e., developing it into a full-fledged desktop application, which not only features the global COVID-19 cases but also monitors the vaccination rate and can predict the upcoming future cases of the Novel Coronavirus (Sars-Cov-2), by monitoring the vaccination trend and the present Coronavirus Cases. In this way, it will act as a future seeker as well as a fortune teller for the future COVID-19 cases. So that its users can be benefitted and be alerted before any such unforeseen tragedy/ infection can happen.

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