TECHPOINT

To Whom it may concern,

My name is Al Carroll. The University Activation Senior Manager at TechPoint. This summer we put on the S.O.S. Challenge. The challenge was a 6 week experience that taught students how to build and evaluate entrepreneurial ventures. We instilled this knowledge by pairing students in multidisciplinary teams of 5-7 and asked them to create a solution to an issue faced by communities during the COVID-19 pandemic. Students were asked to build a product prototype and Go-to-market strategy for their solution.

Sudip Padhye worked on the TechPoint S.O.S. Challenge from 6/22/2020-7/24/2020. Sudip was a member of a team working in the COVID-19 Outbreak detection category. The category's primary charge was to improve forecasting or contact tracing methods. Sudip specifically worked on the team's forecasting model. His forecasts measure new cases, deaths, and tests to be conducted. It is clear to me that Sudip learned a lot from this experience. I'm confident this was a valuable experience for him.

Overall we were pleased with Sudip's contribution to the program. We are happy to recommend a satisfactory grade for Sudip and would be excited to welcome him back to TechPoint programs in the future.

Please forgive my inability to sign this letter directly. Please feel free to contact me if you have any questions. 317-287-4510 al@techpoint.org

THank you,

Al Carroll
University Activation Senior Manager
S.O.S. Program Supervisor

COVID Detection: POP App

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I.   <u>About Firm</u>

TechPoint is the growth accelerator for Indiana's tech ecosystem. It brings together Indiana's tech companies, philanthropies, government, universities, and talent to create opportunities. They're making Indy's tech ecosystem the strongest among mid-size cities and Indiana's the strongest among Midwest states.

TechPoint's S.O.S (Summer Opportunity for Students) Challenge was a 5-week program designed to address the job and internship opportunities lost due to COVID-19 by students attending Indiana colleges and universities. Teams of 5-7 students were assembled to work on projects focused on the theme of "addressing needs and identifying opportunities for communities amidst and post-COVID" sourced from government leaders, employers, and community organizations with relevant needs and ideas.

II.   <u>About Team</u>

My team consisted of 6 members (including me). The team was split into 2 subgroups: Go-to-market (ie. GO SQUAD) and Programmer (PRO SQUAD). The Go-squad would be responsible for analyzing customer markets & creating business models. On the other hand, Pro squad worked with building the product by making use of different technologies and data. I contributed to both Go and Pro squads. In my team, we had 2 product managers, 2 data scientists, and 2 software developers from different universities across Indiana state.

III.   <u>About Project</u>

Our project aimed to identify a solution to regularly test/monitor Indiana's citizens, quickly identify hotspots, and enable contact tracing and other measures to mitigate and limit further outbreaks. It consisted of "COVID DETECTION" activities and developing an app that serves as a one-stop & quick-access solution for a layman, covering the majority of the COVID-19 related contents, without searching on Google.

The main components of our app were – a) COVID cases, deaths, and test Forecasting Dashboard, b) Real-time Population Density tracker, c) US State-wise Policy Checker, d) COVID-19 Daily news, e) Miscellaneous (Nearest COVID Testing center, COVID symptoms, Developer's bio, Bug reporting).

IV.   <u>About Project Background</u>

Our project was based on addressing current pandemic COVID-19 using data and technology. Current solutions to identify COVID are one-off efforts lacking a vetted, trusted, and integrated approach. Some individual companies have an app or a service to address their own employees. Others do not have access and at best may rely on employees' own tracking mechanisms. Many

of these are neither robust nor credible from a science perspective. As such, efforts to implement COVID tracking lack adoption, transparency, and effectiveness.
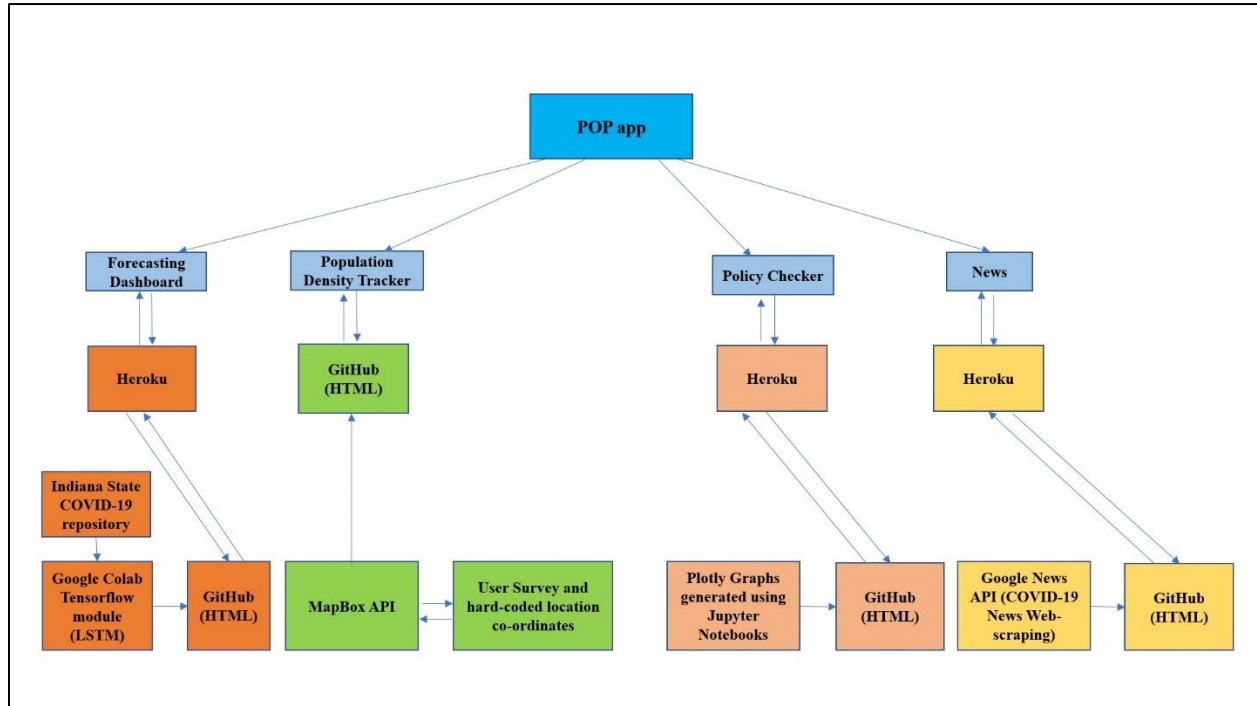
V.   Project Work Undertaken

Fig 5.1: Architecture Diagram

I was involved in building the COVID forecasting model and scraping of latest COVID news from web APIs. The forecasting dashboard component provides COVID-19 forecasts with respect to New cases, deaths, and tests that would be conducted (based on the new cases). The forecasts are done by analyzing the past county-wise statistical trends. I made use of the time-series model and implemented it using TensorFlow and LSTMs (Long-Short Term Memory).

These predictions depend on various input factors such as Past New COVID-19 Cases, past deaths due to COVID-19, past tests being conducted, the population of the county, Area of the county, and population-density of the county. I trained the model for 1500 epochs and have achieved an accuracy of ~95%.

Moreover, the COVID news section of the app updates daily and displays all the latest news related to COVID-19. The source of the news is Google News. The news is presented in the form of headlines along with the publishing date and the respective source URL for additional information.

GitHub Link: https://github.com/sudip-padhye/POP-COVID19-Detection-App

Devpost Link: https://devpost.com/software/pop-ztaf8h

VI.   <u>Conclusion</u>

I and my team created POP app to serve as a one-stop-shop for all things COVID-19, where we pull data from established sources and users alike to provide the best and most accurate information wherever and whenever others need it. POP consists of five primary features: the COVID-19 Forecasting Dashboard, the Population Density Tracker, the U.S. State-wise Policy Checker, the COVID-19 Daily News, and Help Resources. Using these tools, users can learn about the current safety of states, counties, and even businesses to inform their daily decisions.

VII. <u>Learnings</u>

From this project, I learned and developed both technical and soft skills. Being a Pro-squad member, I contributed to the project code and creating the statistical deep learning models. I learned how to perform Exploratory Data Analysis by weighing each contributing factor and design forecasting deep-learning model using a time-series approach. The model results were visualized to effectively communicate it to the end-users. I also learned how to perform web-scraping of news using python. This news were presented and integrated into the app using HTML and CSS.

On the other hand, as a Go-squad member, I learned effective communication, team coordination, organizing, and leading team meetings, and analyzing the market. I gained a piece of deeper knowledge about creating "Environment Analysis" by identifying key trends, market forces, industry forces, and macro-economic forces. I was also able to gauge the gains and pains of the product along with the cost structure.