

**HOW COULD CENTRALIZED DATA SHARING MITIGATE THE EFFECTS OF  
COVID-19?**

**HOW DOES COVID-19 AFFECT THE PRODUCTIVITY OF REMOTE WORKERS?**

An Undergraduate Thesis Portfolio  
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By

Sung Joon Park

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## **A SOCIOTECHNICAL SYNTHESIS**

During this time of a global pandemic, COVID-19 has negatively impacted and affected the society that we live in today with over 200 affected countries and millions of cases worldwide. To combat the impacts of COVID-19, my technical research will involve creating a simple centralized COVID-19 dashboard that provides actionable information for the residents of Virginia to help create greater awareness of the pandemic activity within their vicinity. Another impact of COVID-19 has been the movement of the American workforce to remote work, which has shown to be more difficult as the detrimental effects of social isolation impact the productivity and emotional wellbeing in employees. To study this issue, the loosely coupled STS research studies the factors that affect the productivity of remote workers and formulating what actions could best be taken to alleviate the challenging effects of remote work. Both papers aim to mitigate the damaging effects of COVID-19.

Since the advent of COVID-19, online dashboards have become the main means for the public to better understand the global pandemic. However, after using the COVID-19 dashboard built by the Virginia Department of Health and several others, it has been shown that most COVID-19 dashboards are not built for the everyday user. One problem with existing dashboards is that they seek to display as much data as possible which may be too complex for the general public. Most modern dashboards also focus on larger scale data with few that attempt to show more localized data that may show more actionable information. This led to the technical Capstone research to develop a simple Virginia COVID-19 dashboard that delivers data on the state and county levels with the goal to provide more actionable information for Virginia users.

Using React and Express, both of which are front-end and back-end software libraries respectively, and an online API data source from COVID Act Now, the dashboard was created.

In doing so, our project solved two issues. One was simplicity and quick design as we noticed that many dashboards were cluttered and slow which could make it hard for users to understand and properly analyze the data to take appropriate actions. Another was smaller scope and greater actionable data as our project provided data from county to state level with greater scope of data such as hospital bed usage, vaccination numbers, and infection rate. Some future work of the project is inclusion of other states and counties and enabling mobile-friendly features. Through this simple COVID-19 dashboard, we hope that ordinary citizens of Virginia will be able to access data on the pandemic that is more applicable to them in a simpler way.

The STS research focuses on the impacts of remote work from COVID-19 and strives to answer the following research question: how to increase the productivity and wellbeing of remote workers? With this, the STS research led to the potential proposed solution for a hybrid remote work model which could help reap the benefits of both remote work and in-office work while minimizing the shortcomings of both. To get to this, the research studied how productivity could be quantified, which factor affected it the most, and studied the analysis behind remote work. In the end, a study comparing different work models helped lead to the proposed solution of a hybrid remote work.

One of the first findings was that productivity was best quantified by job satisfaction or emotional wellbeing as unhappiness was found to lead to lower motivation and cognitive performance. This led the research to find which factor affected emotional wellbeing the most which was found to be social interaction, a big factor that remote work lacked most strongly in. However, remote work was found to have its own advantages as well with easier talent recruitment and greater professional autonomy and flexible working hours. This led to the potential proposed solution of creating a hybrid remote working model in which the benefits of

both worlds could be reaped, where a good balance between social interaction and flexibility could be found. The hybrid remote work model was supported by various studies such as a survey that showed increases in productivity and wellbeing for the hybrid work model over the those of the other work models, concluding that it may be the optimum working condition as it offers flexibility that allows employees to do their jobs as they best see fit.

COVID-19 has impacted the world in various ways today, with increasing cases and deaths as well as creating difficulties with remote work. To combat these issues, the technical research involved creating a simple COVID-19 dashboard that provides a simpler and greater actionable information for the state of Virginia while the STS research studied the best actions to alleviate the challenging effects of remote work. With this, both of the researches aim to mitigate the damaging impacts of COVID-19.

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with Michael Chang and Sung Joon Park

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STS advisor: Catherine D. Baritaud, Department of Engineering and Society

### **PROSPECTUS**

Technical advisor: Aaron Bloomfield, Department of Computer Science;

STS advisor: Catherine D. Baritaud, Department of Engineering and Society