Opposing Viewpoints

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In 2019, a novel coronavirus emerged out of Wuhan, Hubei Provence, China and began to spread rapidly across the globe. SARS-CoV-2, the virus responsible for the respiratory condition COVID-19 is a highly contagious betacoronavirus with an R0 of 2.0 - 3.3 (Wu, Wu, Liu, & Yang, 2020). This means that each person who contracts the virus will be statistically likely to infect 2 to 3.3 other people. Research is ongoing into the development of a vaccine, it is thought that that, by using biochemical techniques in the labratory, that normal antibodies can be converted into catalytic monoclonal antibodies through the deletion of the PRO95 genetic sequence (Hifumi et al. 2020) (Usui et al. 2017). Much research currently is needed into what treatments might be possible using this technique. Specifically, research into viral protein folding potentialities is being conducted to exploit weaknesses in the virus’s genetic structure. Using machine learning algorithms and big data, researchers are able to discover associations and correlations within the viral genome that could lead to the development of a vaccine. Modern-day cloud service providers such as Google, Amazon, and Microsoft offer Infrastructure-as-a-Service (IaaS) solutions which are highly scalable and efficient resources to conduct such research. However, these resources are not free, and recently a disruptive solution of using distributed processing power volunteered by everyday Americans has shown to be capable of providing the computational power required to conduct research into the viral protein folding patterns. How many Americans would be needed to power this level of computation, and whether or not researchers are better off using existing commercial cloud providers is a topic of debate that is worthy of examination. Let us examine the stakeholders and their positions to understand various viewpoints surrounding this current event.

**Stakeholders and Positions**

The first stakeholders we should consider are American citizens who own computers. As of this publication, we are beginning to see a reduction in daily deaths, and people who have been isolating inside for the last month will be anxious to get back to regular life. With the White House health advisor Dr. Anthony Faucy stating in April that a vaccine could be 12 to 18 months away (Higgins-Dunn, 2020), American citizens can hasten this timeframe by donating their personal computer’s processing power to research into catalytic monoclonal antibodies.

Another stakeholder in viral antibody development is the researchers themselves. Although well funded for the pandemic, their resources are not infinite. These researchers could benefit from donated processing power contributed by American citizens. How much processing power is enough, and whether or not these researchers would be better off using established cloud IaaS resources is open for debate.

A third stakeholder would be the IaaS providers themselves who stand to profit from government grants to study the virus. These platforms can be invaluable in the fight against COVID-19 and most certainly have a part to play in the pandemic. Could use distributed computational resources impact the business model of these providers causing disruptions to their services, or are the factors involved nothing more than a blip on cloud infrastructure companies radar?

**Stakeholders Positions**

American citizens seem to wish to get out of isolation as soon as possible. This is at odds with the fact that the general population mostly has no immunity to SARS-CoV-2, and that a vaccine may be over a year away. If American citizens wish to end their confinement early, they should consider donating their computer’s processing power towards the fight against this virus. The web service Folding@Home is an existing Software-as-a-Service application that enables citizens of the world to donate their computer’s processing capabilities towards the fight against SARS-CoV-2 and other viral and bacterial contagions (Folding@Home, 2020).

The individuals researching this virus have personal and commercial interests in developing a vaccine. Although substantial, their resources are not infinite in magnitude and could be easily supplemented by American citizens donating their CPU and GPU chips towards research into viral protein foldings.

Large cloud service providers represent a third stakeholder in the fight against COVID-19. Their subscription-based IaaS model is a source of profitability for the hosting company, and what company wouldn’t want to try to take these government funds in pursuit of a vaccine? The cloud providers seem to be at odds with American citizens and researchers as their end goal of profitability stands in contrast to the goal of fighting the pandemic efficiently.

**Opinion on Similarities and Differences**

Based on the quality of evidence provided, and the benefits and drawbacks of different approaches. It is the opinion of this researcher that a distributed approach to computational requirements needed for addressing research into a vaccine for SARS-CoV-2 will be in the best interest to researchers and the American citizen’s interests, with accounts and subscriptions to existing IaaS providers to be used in an excess role when the computational resource availability is not sufficient to power such research.

**Confounding Issues**

Although the dominant cloud-based platforms operate on a for-profit model, this is not to imply that the companies behind such infrastructure do not wish to provide goodwill services toward the community outside of their business model. Whether or not these companies would be willing to provide needed services for free or reduced-cost is a topic that requires further research.

**Conclusion**

The fight against the SARS-CoV-2 coronavirus will require cooperation amongst all stakeholders involved. Perhaps this cooperation will imply reduced profitability for companies that provide IaaS support to researchers. It seems likely that the role of PRO95 in the inhibition of enzymatic catalysis is an area of research worth the resources required in pursuit of a vaccine for COVID-10. Researchers like Hifumi et al. could make use of the donated computational processing power of regular American citizens, however, this model is at odds with existing cloud IaaS providers. We must all come together in the fight against this pandemic even if it prescribes reduced profitability for large businesses.

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