

Sociotechnical Synthesis

My motivation for the STS research I have provided originated when the public intensely gravitated towards social media during the COVID-19 pandemic to learn new information about global events. After further research into the influx of social media users during the pandemic, it was clear that politicians extensively use free services like Instagram, Twitter, and Facebook to promote their political ads since they know that the user considers the platforms free. Eventually this type of information results in the spread of mass misinformation because propagandists twist the information to promote their own agenda.

On another note, my motivation for the technical project was to outline the benefits of an active-active failover system and provide a plan of action to build the system. Servers are integral to a business's daily transactions because they hold all the crucial data and to hedge against disaster scenarios (data breaches, server failures, disruptions at datacenter), failover systems must be implemented where a backup server is configured and prepared with a primary server's resources to maintain server uptime. By utilizing the mass computing power and different services of AWS as well as the knowledge I gained from my Computer Science classes at UVA, I created an active-active server configuration that allows an automatic server failover to maintain server uptime which will be explored more in depth in the technical part of this thesis.

Capital One, a banking firm headquartered in McLean, VA, decided to optimize its cross-region server failover system by replacing its active-passive configured manual failover with an automated process to significantly reduce data loss, increase revenue, and protect its reputation. I upgraded their manual system to make operations faster and more automatic by creating an active-active server configuration that allows the server failover to maintain server uptime and reduce

data loss with almost instantaneous cross-region database replication. By utilizing the mass computing power and various services of AWS (Amazon Web Services) I configured different AWS components such as DynamoDB, Route53, and ECS to interact with each other and a java executable which initiated the whole failover program. For next steps, other Capital One teams will be downloading the Docker base image and attaching it to their projects so that any system will have a cross-regional automatic failover process in place.

In the sphere of media, social networking platforms are an avenue for individuals to influence and connect with others while also promoting their own agenda. Throughout the progression of the COVID-19 pandemic, voters became more prominent in social media by disseminating current event information through Instagram and other media platforms and this was shown by the upsurge of the Black Lives Matter movement and the 2020 US national election. However, evidence suggests that the important information spread through social media during the pandemic was easily manipulated leading to a mass outbreak of misinformation resulting in public confusion (Khanday, 2020). This paper aims to analyze the socio-technical factors in the relationship between voters and social media and how these factors lead to misinformation that corrupts social media as well as voter manipulation which influences voting outcomes. Social media policies, published papers, and studies are utilized to gain insight on the interactions between social media and voters prior to and during the pandemic as well as the mass amount of misinformation spread through social media which was a result of those interactions. To support this research, the STS frameworks of actor-network theory and co-production were used to investigate how the factors in the relationship between voters and social media during the pandemic manipulated their voting outcomes. Results from this investigation should inform voters and social media platforms with findings that show the underlying

problems within the socio-technical relationship and provide the voters with the caution that current event information that is spread through social media should be acknowledged as the truth when the source is authenticated.

After working on both projects, I have learned that data is very valuable and must be protected with as much security as possible. I have also learned that data can be easily manipulated so there has to be an authentication factor to validate the data that is released. In the case of the STS project, the data is very personal to voters as it influences their voting decisions so misinformation must be checked before the public sees it. Additionally, in the case of the technical project, even though data is stored in servers, the data must be validated and protected with a backup in order to properly secure it for AWS consumers.