UVA CS Department Cybersecurity Focal Path: A Different Approach

Cybersecurity in a Quantum Realm: Persuasive Language

and Analogies in Academic Papers

By

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A World Dependent on Technology, Covid-19's Effect on the Digital Divide, and how it has Affected Low Income Communities

Overview:

This project researches how the Covid-19 pandemic worsened and widened the digital divide in America as a consequence of new societal norms and expectations that were put in place to mitigate the spread of the virus. It researches the digital divide before the Covid-19 pandemic and after, when all schools, stores, and restaurants changed their policies and required technological tools to use their services. Solutions that were put in place to help the divide will be discussed specifically their effects, outcomes, and the next steps to those solutions.

Positionality:

Having lived through and experienced online schooling for my first year of college, I faced the immediate effects of the dependency on technology for my classes. I would not have been able to continue with my studies without my computer. But, I was fortunate enough to have the resources and equipment to easily transition to the new schooling system and complete my coursework. This is not the case for everyone and that is the problem this project hopes to address.

Problematization:

Technology and smart devices in American society are a necessity. In the post-Covid-19 quarantine era, most education, social settings, cultural events, medicine practices, news outlets, and necessary resources require some form of smart device more than ever. These measures were put in place to reduce the risk of spreading the virus, but has led to many economic and societal consequences for many households who do not have the means to keep up. Examples of these measures include: restaurants requiring customers to scan a QR code with a smart device to look at the menu or are going cash free to reduce physical contact, or schools and universities during nationwide quarantine switching to the zoom class format, which requires a computer and stable wifi that is not guaranteed to be available for every student. About a third of adults whose household income is less than $30K, do not own a smartphone and more than a fourth do not have a stable home wifi service or a computer (Anderson & Kumar, 2019). This creates an even larger class divide. People who do not have the means to use these new technologies that are becoming more widely societal norms are being suppressed.

Guiding Question:

What are ways to mitigate and stop the widening of the digital divide and the dependency on smart devices for those who do not have access to them?

Projected Outcomes:

These solutions would allow for better universal education and access to technology for low income communities. Though, more access to the technology would not fix the root of the

problem, it would help ease the ones who are the most affected by it. Better solutions would need to include better systems in place and resources available so those people are not so reliant on expensive tools to obtain their education and do their job to make a livelihood.

Technical Project Description:

The technical project proposed is an outreach and fundraising web application to raise money for low-income schools and students in impoverished areas around the country to raise money for those schools.

Preliminary Literature Review & Findings:

Even before the Covid-19 pandemic, the phenomenon known as the digital divide was more than present and has been around for decades. The digital divide refers to difficulty to use the internet by certain communities. It is related to the availability of and access to the smart hardware required to engage in activities like telehealth, schooling, and work, such as computers, laptops, tablets, and smartphones. Broadband infrastructure is the biggest obstacle to mitigate the digital divide. Broadband is what smart devices use to transmit messages and access the internet. Basically, lack of broadband means lack of connectivity to wifi and other devices. According to the Federal Communications Commision, 22% of American rural areas of Americans in rural areas and 28% of Americans in tribal lands lack broadband coverage - as opposed to the 1.5% of Americans in urban areas. Communities most affected by the digital divide include women, the elderly, people with disabilities, poor people, people of color, immigrants, those with low tech literacy, and those who live in rural areas (Mishori, 2020). 40% of low income households don't own a smartphone. Technology and infrastructure is the main issue for the lack of broadband access. Many government resources are also online, job listings, applications to colleges and universities, SAT testing. So many societal systems require a wifi connection for them to be accessed.

Some of the big issues that this project would specifically address are how during the Covid-19 quarantine, schools received government funding so students could continue their education and how those low-income people were either laid off which financially risked them or had retail jobs where they were most at risk of the virus. These people are usually low income people of color.

STS Project Proposal:

This STS project focuses on the economic, social, and political effects modern American society's dependence on smart technology and the digital divide has on low-income communities after the societal effects of the Covid-19 pandemic. The Covid-19 pandemic made technology even more necessary in all communities to mitigate the spread of the virus. This has multiple unintended consequences on the low-income communities who did not have the means to buy or obtain that technology either due to lack of money or resources.

This STS problem can address many different intersections. As stated before, communities most affected by the digital divide include women, the elderly, people with disabilities, poor people, people of color, immigrants, those with low tech literacy, and those who

live in rural areas (Mishori, 2020). This project specifically researches and discusses the class division that has been affected, which includes topics such as wealth and racial disparities. These low-income households do not have the means to buy smart devices needed to succeed in this modern American society, which is the main problem this project hopes to address. Systemic racism is at the root of this project and will be heavily considered and researched. The societal systems that were enacted to require technology in everyday society were established to keep low-income classes low and to keep people of color from acquiring means to keep up in the white American society.The intersectionality of the digital divide is also an important phenomenon to touch on.

This STS research will be completed through thorough research of existing literature, survey analysis, local interviews, and socio-technical systems analysis. Specifically, research will be conducted to compare the effects the Covid-19 pandemic had on students' schooling and employees' work from home life. The methodology for students will include examining students' learning intake and grades before and after the quarantine era and how the technology used or not used facilitated their learning. For employees', research on technology dependency and subsequent job loss due to technology being inaccessible for some communities will be investigated. More research will be conducted to analyze the economic state and how the economy suffered during this time due to the lack of technology accessibility. This proposed methodology aligns with the research question as it is able to support the research through highlighting the problem when it comes to the lack of internet access for people during the pandemic.

Barriers & Boons:

The project's limitations include the time restrictions and lack of access to direct contact to those actually affected by the digital gap during the pandemic for interviews. Also, as per the immense recentness of the pandemic, the limited resources available about the effects, though present, are not as plentiful as they will be in the future.

Also, this STS project might be too broad to approach and needs to be narrowed down to complete the specific and unique research that is different from examining other papers of already conducted research. The technical report might be subject to change due to lack of research and information needed to allow for such a project to occur. Ideas for that need to be brainstormed and submitted for this project to continue.

References

Anderson, M., & Kumar, M. (2020, May 30). Digital divide persists even as lower-income Americans make gains in tech adoption. Pew. https://www.pewresearch.org/facttank/2019/05/07/digital-divide-persists-even-as-lower-income-americans-make-gains-intech-adoption/.

Bernard, Evan. *Visualizing and Communicating COVID-19 Data Effectively; The Struggle to Reduce the Digital Divide In the United States.* University of Virginia, School of Engineering and Applied Science, BS (Bachelor of Science), 2021, 2021, doi.org/10.18130/qwkm-4d05.

Francis DV, Weller CE. Economic Inequality, the Digital Divide, and Remote Learning During COVID-19. Rev Black Polit Econ. 2022 Mar; 49(1):41-60. doi: 10.1177/00346446211017797. PMID: 35291320; PMCID: PMC8914302. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8914302/.

Mishori, Ranit MD, MHS, FAAFP; Antono, Brian MD, MPH. Telehealth, Rural America, and the Digital Divide. Journal of Ambulatory Care Management 43(4):p 319-322, October/December 2020. | DOI: 10.1097/JAC.0000000000000348 https://journals.lww.com/ambulatorycaremanagement/Fulltext/2020/10000/Telehealth_Rural_America_and_the_Digital_Divide.12.aspx.

Rachfal, Colby Leigh. *The Digital Divide: What Is It, Where Is It, and Federal Assistance Programs.* Library of Congress public ed. Congressional Research Service, 2020.