

**A Systems Approach to Understanding Disruption Of Global Food Supply Due To The
War In Ukraine**
(Technical Paper)

How The COVID-19 Pandemic Has Affected Everyday Social Skills
(STS Paper)

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Bachelor of Science in Systems Engineering

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

Zoom and similar companies are some of the most polarizing media to surface in the 21st century. Pre-pandemic in October of 2019, Zoom logged 97 billion meeting minutes across all of their users, a seemingly large number. By the time that the pandemic became a reality, in April of 2020, that number jumped to 2.6 trillion Meeting Minutes, and revenue numbers in 2022 have continued to climb (Dean, 2022). All of this is to say that while Zoom was a necessity during the pandemic, it is here to stay, for better or for worse. For the better, Zoom and more broadly Work From Home (WFH) have provided far more time and locational flexibility, which allows for far more freedom and a better work-life balance (Babapour, Hultberg, Bozic, 2021). For the worse, many people who are in need of social development and social interaction are suffering as a result of the replacement of face-to-face interactions. Specifically in a pedagogical context, many children in Primary and Secondary school were forced to adapt to a hybrid learning environment; one with minimal social opportunities with classmates, and one that left many students with feelings of isolation (Chan, Bista, Allen, 2021). As people who attempted to work and learn over Zoom and throughout the pandemic are beginning to advance further in their careers and their lives, it is important to recognize and understand the possible implications, positive and negative, of a technologically hybrid society.

In the technical portion of this paper, the impact of the Russian Invasion into Ukraine on the Global Supply Chain will also be discussed. Just as the pandemic was a disruption to global everyday life, the Russian invasion of Ukraine drastically affected the Supply Chain and the way that goods and services are delivered. In countries and regions of the world that do not have vast financial resources, what happens when these global events lead to a shift in food supply? For example, specifically low-income countries, have had to shift from grain-based diets to rice-

based diets, and as a result there is a trend towards a rice shortage in much of the world as well (Strubenhoff, 2021). The pandemic and the conflict in Ukraine are two unfortunate opportunities to learn about where the global supply chain is resilient and in what spots within the system work can be done to make sure that people around the world consistently have food available for consumption. Both the COVID-19 pandemic and the Russian conflict in Ukraine are major global events that have and will continue to cause major ripple effects across the globe, and it is important to be able to diagnose and react to the changes accordingly.

Technical

The Global Supply Chain is an incredibly complex system that relies on many processes, both conspicuous and invisible, in order to bring goods and services from creation to consumers. As such, any disruption in the Global Supply Chain has lasting and drastic effects on the lives of people around the world. These disruptions could be as small as a container ship wedging itself in the Suez Canal, a main trade way between the continents of Europe and Asia, or as large as a global pandemic or the Russia-Ukraine conflict. When the COVID-19 pandemic changed the world in 2020, the Supply Chain was not left unaffected. Many vulnerabilities and weaknesses were identified, and excessive pressure was applied on every segment of the Supply Chain as it became harder to find workers and maintain production. There were many lessons learned from the necessitation of shifting to a hybrid and even-more so computer-based world. One of which was the creation and sustaining of Work From Home infrastructure; another was the revamping of many of the former manual laborious positions that helped support Global Supply Chain. Since the pandemic, many manufacturing and logistical companies have shifted to Artificial Intelligence and are utilizing the Internet of Things to rid their Supply Chain of the

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vulnerabilities that cost them valuable efficiency during the pandemic and have assuredly made the Global Supply Chain more resilient across the board (Harapko, 2021).

The pandemic is a great example of a global event that caused a massive disruption to the supply chain. And just as the world was beginning to recover from a food, goods, service, and merchandise supply chain perspective, Russia invaded the country of Ukraine. This act of war set off a different but conceptually similar series of events to the pandemic. Unbeknownst to many, Ukraine and Russia are the world's top two exporters of fertilizer, a key ingredient in the agricultural process; the two countries also account for 33% of the world's grain production (Strubenhoff, 2021). Ukraine is also among the world leaders in production and exporting of wheat and cooking oils (*Briefing The Food Crisis, 2021*). As a result, food prices are through the roof, up almost 10% from June 2021 to June 2022 (*Consumer Food Prices, 2022*). Countries around the world that are experiencing grain shortages are moving to more rice-based diets, only to experience a rice shortage soon after. Also, a part of the chain reaction, the stress on the food supply chain has exposed vulnerabilities in the Energy Grid, creating an Energy Crisis on top of the Food Crisis (Levy & Molnar, 2022). The Russian conflict in Ukraine has caused ripple effects all around the world, and there is little precedent (beyond the COVID-19 pandemic) available to see the future possible shortages; the world is forced to be reactive as opposed to proactive in many cases.

The goal of the technology being researched is to be able to more accurately predict the global ramifications of a war, a pandemic, or another massive catastrophe. This particular project is divided into two major phases: research and data analysis. In the research phase, being conducted in the Fall of 2022, there is an extensive gathering of resources that fall into 6 categories to try and paint a picture of how each entity is affected by a global conflict or affects

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the other categories entirely. The 6 categories consist of the COVID-19 pandemic, War, Energy Crises, International Trade, Foreign Effects, and the Environment. While this research will help put together a qualitative analysis of the large-scale ramifications of the Russian conflict in Ukraine, the data analysis in the second semester will bring a much more quantitative point of view to the discussion. The final report, to be written in the Spring of 2023 will marry the work done in each of the phases to bring a comprehensive actionable takeaway that possibly can be applied to future global conflicts.

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STS Topic

The COVID-19 pandemic struck the world by surprise and caused everyone to completely uproot their lives at the drop of a hat. Through stories of tragedy and triumph, society has begun to emerge from the other side of the pandemic and try to find a “new normal.” One of the most glaring takeaways from being sheltered in a single room or household for months on end is the rise in prominence of online meeting platforms, and the increased infrastructure for hybrid and/or virtual work. During the pandemic in October of 2020, 71% of people that could do work from home, did so. Nearly 18 months later in January of 2022, that number fell to only 59% (Parker, Horowitz, Minkin, 2022). People are still working from home, interacting with people, whom they would get coffee or lunch with every day, exclusively over the computer. The quality of these interactions independently could be judged as positive or negative; what is not up for debate, though, is that a video call is different from a handshake. The argument can be had then, that the increased popularity of hybrid and remote work could be lessening or worsening the social skills of all people. This paper will analyze how the social skills of people have changed since the pandemic began.

There are far more contexts at play than an office-work environment, however. Not only did the pandemic necessitate that working professionals no longer interact with people in a traditional setting, but school aged children were forced to do the same. Schoolchildren, many in preschool when social development is crucial, were rightfully barred from playdates and playgrounds with friends (*Social Development*, 2021). Modern society is filled with a short news cycle and a shorter attention span. Soon enough, school children are going to be unable to rightfully attribute the pandemic as an impetus for a stunting of social growth as they continue to grow into adults and working people. As that growth occurs, it is important to understand just how the pandemic has affected them, so that the potential negative social consequences are minimized.

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Looking at a different age group, it could be difficult to maintain communication with the technically-challenged older generations, even pre-pandemic. Forced isolation made this task incredibly more difficult. Even within the same families, keeping in touch with loved ones was at its most challenging. Older generations and people who have not grown up with technology in the same way that did Millennials and Generation Z were under an excess of pressure to be able to navigate smart phones and laptops, just to maintain some kind of communication with their families (Godfrey, 2020). Communication among generations was never more difficult than when it was forced to be undertaken through a medium such as Zoom or Facetime. An extension of that is the tribulations faced by the technology-challenged in a professional work environment; in other words, it may be frustrating to only see the top of a grandparent's face on a FaceTime call, but it could be seriously professionally problematic for people to struggle with Zoom or Teams (Farrell, 2020). During the pandemic, if people were not at least capable of

using a meeting platform, let alone accustomed to giving full-fledged presentations/briefings on such software, then business would struggle to proceed (Strawser, Smith, & Rubenking, 2020).

The nature of this research question lies in the forced changing of day-to-day life of many members of society, and the potential ramifications of such an alteration. As such, I will frame this paper as a paradigm shift. A paradigm shift is a foundational change in the way that a particular field of thought is treated in society (Kuhn, 2015). Sometimes a stimulus is not necessary to set off a paradigm shift. For example, the gradual development and advancement of mobile phone technology has caused paradigm shifts in the way society communicates with each other, the way society entertains itself, and the way society educates itself, just to name a few. Before virtually every person had a supercomputer in their pocket, a conversation was face to face; a game was with cards or imagination; a research question was answered through encyclopediae that weighed too much to be carried around, not a lazy 10-second Google search. The development of mobile technology caused a paradigm shift in the way that these, among other, everyday activities were carried out.

In the context of this research, though, the COVID-19 pandemic does serve as a stimulus, a massive jolt given to society that forced people to change the way we look at professional work, education, and—again—basic day-to-day communication. Framing the rise in hybrid work technology as a paradigm shift has the potential to accurately describe and observe the before-and-after effect inherent in the pandemic. This framework is not without drawbacks, however. An important concept in the paradigm shift school of thought is the idea that paradigm shifts cannot be measured independently; their impact and significance can only be related to another paradigm shift of the same time. Surely the COVID-19 pandemic had other impacts on society other than skyrocketing Zoom and other like online meeting platforms, but this framework limits

the impact evaluation to the other paradigm shifts that occurred during the pandemic (Bird, 2018).

Methodologies

This paper will analyze the effects that the COVID-19 pandemic and the related rise in popularity of hybrid/virtual work and Work From Home have had on the everyday social skills of people in a post-pandemic society. As of this writing, the most direct research method that will be used to help answer this research question is Documentary Research Methods. Some of the specific key terms that I am searching for are “hybrid work,” “Work From Home,” “changing social skills,” “communicating across generations,” and “Zoom and the educational system.” These keywords best encapsulate the breadth that I will aim to analyze during my research. As the phenomena of lockdown and the prescriptions used to mitigate the isolation affected almost every person in the world, there are many different accounts and perspectives to analyze. I will be using a combination of primary and secondary sources to support my analysis. There is some valuable insight to be gleaned from the experiences of, to use previous examples, schoolchildren and members of the workforce from the older generations, along with the people who have worked with them to improve communication and alleviate technical barriers. The research that will go into the paper will be organized by topic and theme. I will be analyzing the professional workplace along with academia, and thus my research will be broken into those two main groups, along with the subgroups that exist within them.

Conclusion

During the technical portion of this research, a research paper will be created that will analyze the consequences of major world disruptions, such as the COVID-19 pandemic and the Russian Conflict in Ukraine, have on the global supply chain. The hope is that by the end of that

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project, we can develop a better understanding of the vulnerabilities and pivot points that exist across agriculture, energy, and the environment. The proposed research paper will tie in some of the takeaways of the effects that COVID-19 specifically had on society, but through a lens of how people are communicating and interacting differently now than they were pre-pandemic.

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