Technological Transformation

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INTRODUCTION

Understanding the impact of technological advancements on engineering firms and their workforce pre and post-COVID is significant in understanding humans and being more efficient with our work. Knowing what works, what doesn't, what saves time, and what boosts productivity will help us as a society move forward.

OBJECTIVES

To analyze industry reports, social media trends, and employee surveys to examine the technological shifts in engineering companies with a focus on identifying trends in different companies, seeing how company and employee use of technology has changed.

METHODS

Company websites were used to identify relevant research. Focus was put on 4 main areas, using a wide range of industry examples, as well as trends:

- Analyzing examples of digital transformation before and after COVID
- Comparing the evolution of remote work and collaboration tools before / after COVID, and their popularity
- Efficiency levels of major companies were observed before and after the AI revolution COVID brought about
- Analyzed and compared fail-safes and optimization of supply chains for withstanding disruption pre / post COVID.

Revenues from the artificial intelligence (AI) market worldwide, from 2016 to 2025 (in million U.S. dollars)

RESULTS

Accelerated Digital Transformation

- **Pre-COVID: Many companies were gradually adopting digital technologies**
- **Post-COVID: Firms have rapidly digitized customer interactions, supply chains, and internal operations by three to four years . The share of digital or digitally specifically enabled products in portfolios essentially has surged shockingly over the past 7 years.**
- **Impact: Increased efficiency, streamlined processes, and improved collaboration.**

Remote Work and Collaboration Tools

- **Pre-COVID: Remote work was a growing trend, but it became essential during the pandemic.**
- **Post-COVID: Companies adopted tools like video conferencing, project management software, and virtual collaboration platforms.**
- **Impact: Enhanced communication, reduced travel costs, and improved work-life balance.**

Automation and AI

- **Pre-COVID: Automation slowly on the rise, but its adoption varied subtly.**
- **Post-COVID: Firms embraced automation for repetitive tasks, data analysis, and decision-making.**
- **Impact: Increased productivity, reduced errors, and optimized resource allocation, which improved efficiency.**

Resilience and Supply Chain Optimization

- **Pre-COVID: Supply chains faced challenges, but resilience wasn't a top priority in the grand scheme of things.**
- **Post-COVID: Companies focused on diversifying suppliers, using predictive analytics, and ensuring continuity.**
- **Impact: Reduced disruptions, better risk management, and improved agility in a major way.**

Figure 1: Supply Chain Pressures, 2015-2022
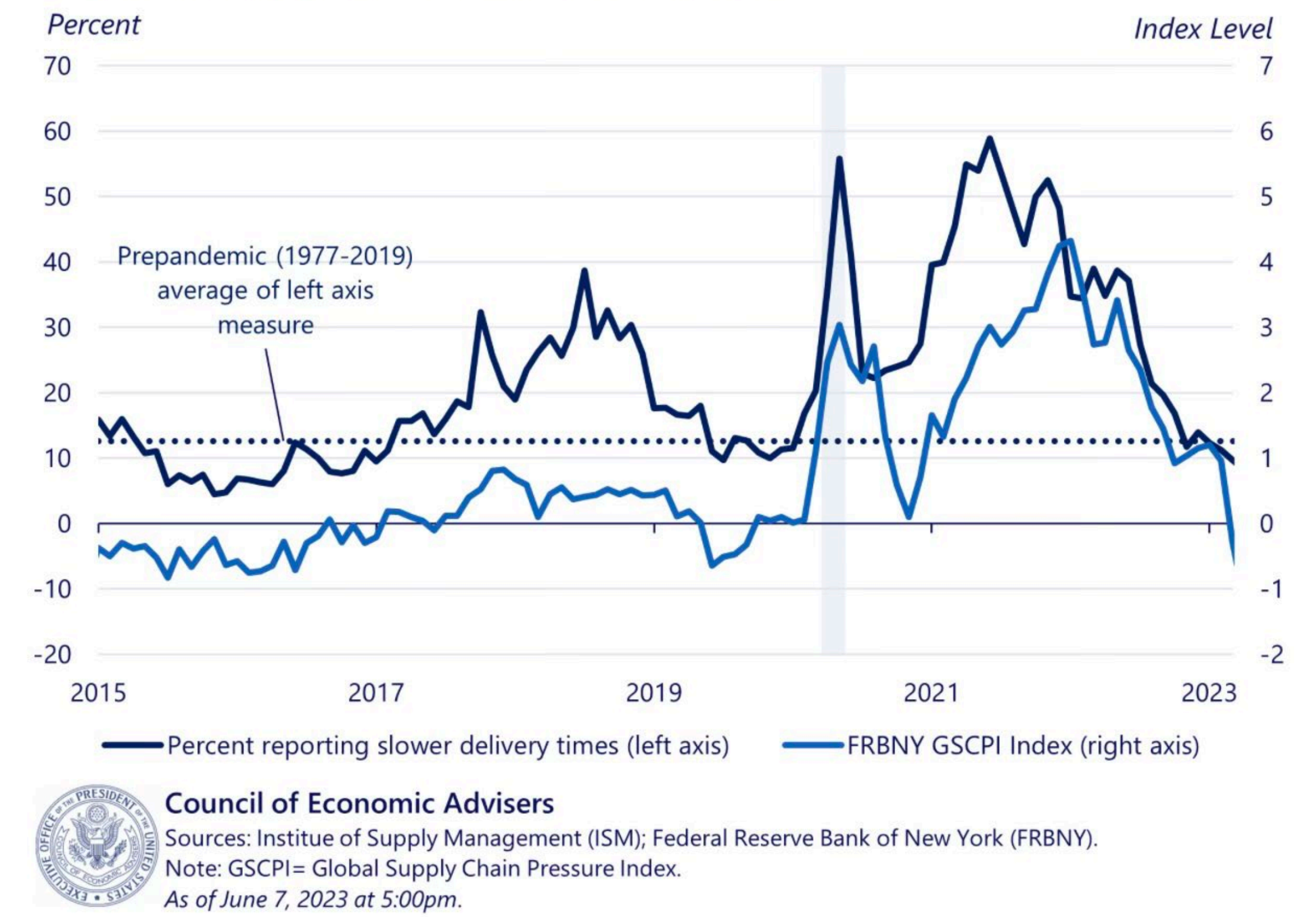
Change in remote work trends due to COVID-19 in the United States in 2020
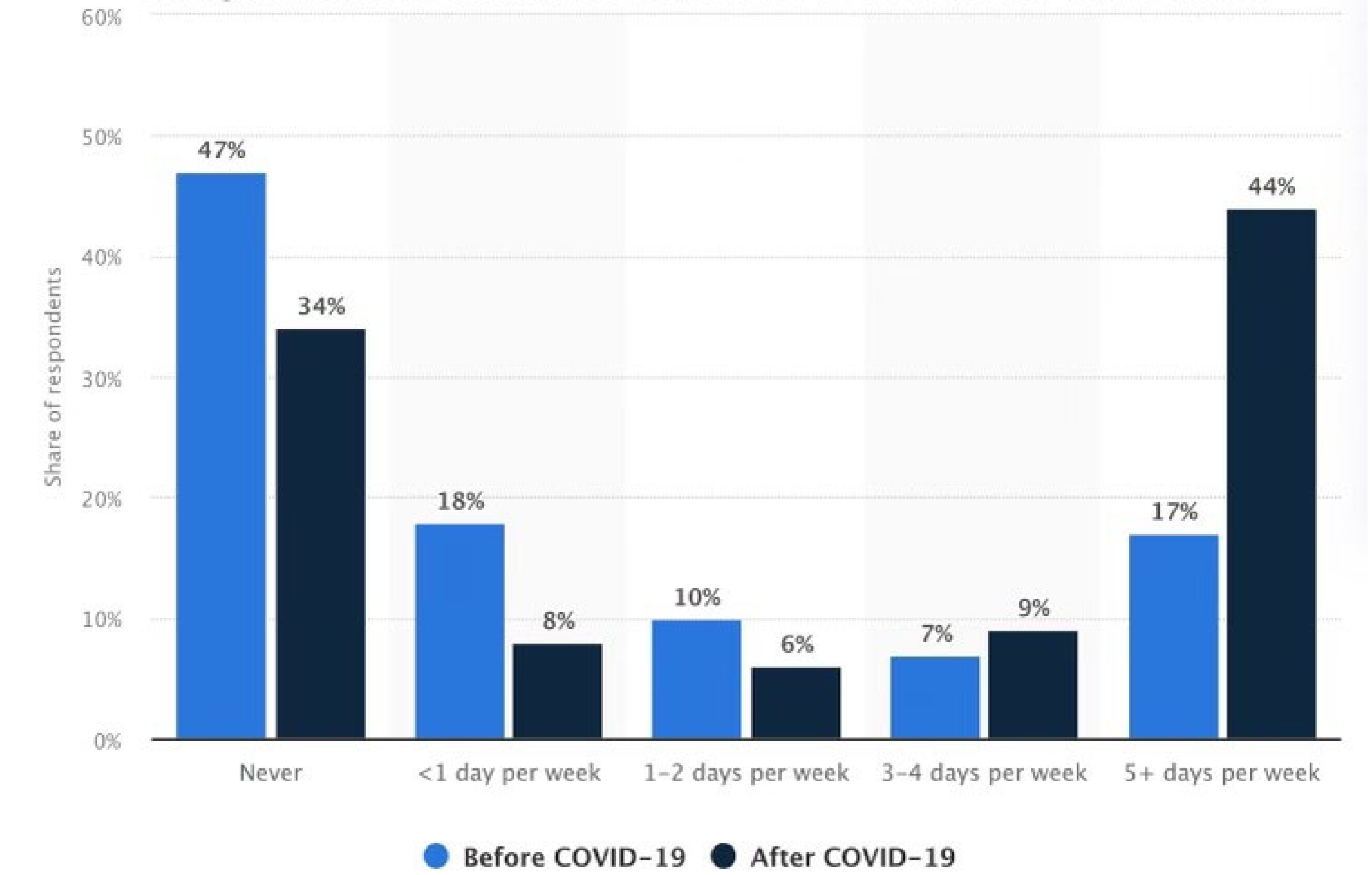
CONCLUSIONS

Overall, the pandemic drastically changed our lives, but companies found a way to engineer solutions to increase efficiency, resilience, and collaboration. We conclude that companies were able to evolve and overcome problems.

FUTURE WORK

We would like to see the long-term impacts of these studies especially whether the digital adaptations and the flexibility in the supply chain/education will continue to remain in the engineering field. We hope to see that the progress made in many of these areas continue to provide support to many companies as time goes on.

References

statista.com
whitehouse.gov