2024

The Impact of COVID-19 on the IT Services Industry

Shekynah AnneMarie Haworth
University of Northern Iowa

THE IMPACT OF COVID-19 ON THE IT SERVICES INDUSTRY

A Thesis Submitted
in Partial Fulfillment
of the Requirements for the Designation
University Honors

Shekynah AnneMarie Haworth
University of Northern Iowa
May 2024

This Study by: Shekynah A Haworth
Entitled: The Impact of COVID-19 on the IT Services Industry

has been approved as meeting the thesis or project requirement for the Designation University Honors

Approved by:
Dr. Andrew Berns, Honors Thesis Advisor
Dr. Jessica Moon Asa, Director, University Honors Program

I. Purpose

The COVID-19 pandemic has caused significant disruptions across industries worldwide, and the information technology (IT) industry has been no exception. As IT professionals continue to face unprecedented challenges due to the pandemic, it is essential to understand the current effects of COVID-19 on the IT services sector and what the future may hold. This study aims to provide an up-to-date understanding of how the pandemic has influenced the IT services sector by conducting an in-depth survey among IT professionals. The research will primarily focus on the persistent challenges faced by IT professionals during the pandemic and what changes have occurred in the IT industry's technological landscape and work culture. By identifying the changes occurring in the IT industry, this study will provide valuable insights for organizations' future strategies to thrive in our ever-evolving world.

II. Literature Review

A common theme throughout my research was that IT played a vital role in mitigating the effects of the COVID-19 pandemic. However, more research is needed to determine how that continues to affect the industry today. My research aimed to discover how much the IT services sector changed throughout the pandemic, what that looks like within our state, and what new technology was developed by the IT services industry.

The most common development discussed concerning COVID and IT is advancements made in the field of artificial intelligence (AI). One article summarized it nicely when it said,

> In all, AI is used to identify, track, and forecast outbreaks, it is helping in diagnosing the virus. It is used in processing healthcare claims. The drones and robots are used to deliver food and medicine supplies as well as in sterilizing public

> places. AI is helping to develop drugs and coronavirus vaccines using supercomputers (Kumar et al., 2020, pg 570).

This quick adaptation showed the industry's capabilities to develop new things in response to unexpected challenges. Several studies also discussed the use of smart thermometers and wearable devices. These were vital in tracking outbreaks and detecting early symptoms. It is hard to imagine how much more severe the impact of the pandemic could have been without these advancements. One article written mid-pandemic stated, "The technological advances of IT are serving as one of the pivotal tools to combat the current scenario where humans are at high risk of acquiring the infection" (Nadikattu, 2020, pg 3). There was and continues to be no doubt that IT played a vital role in combatting the pandemic.

One widespread impact of COVID-19 was the quick and mass transition to remote work across many industries. The part that most people do not consider is the adaptations the networks underwent to support this. IT had to help majorly increase access on the networks, "Our remote access infrastructure was expanded 10x for virtual private network bandwidth and backend capacity scaled by 4x to support the increase in concurrent connected remote users." (Shankar, 2020, pg 1). Without this, many people would have been left on slow networks, which would have hindered the ability of individuals to work effectively from home. The network adaptations led to relatively smooth transitions and pleasant shifts to remote work. One 2020 study showed that over two-thirds of people surveyed now preferred working from home (Singh et al., 2020). This same study showed that more women with young children can now work from home because they can still be with their kids, and companies have expanded their talent pool to more than the cities where they have offices.

With all of the technology used through COVID-19, people became worried about where this data was going and who had access to it. This led to the emergence of blockchain, “an emerging technology that helps in storing data in the form of immutable blocks” (Chamola et al., 2020, pg 21). Blockchain’s immutable data storage and decentralized network structure offer enhanced data protection. The article also addressed the potential of blockchain to help stop future supply chain issues we faced in the pandemic and improve the visibility of data by providing tamper-proof ledgers of transactions so all members can have access to the same data.

Though the literature I reviewed was not recently created, it did bring up valuable insights about the future. “Improving the IT technologies in remote areas that are yet to get connected to the world daily, especially in developing countries, is essential. The world needs to connect with IT tools to prevent such outbreaks in the near future” (Nadikattu, 2020, pg 6). The text anticipates a future model of hybrid remote working where a significant percentage of employees may continue to work remotely, as discussed in Shankar (2020). We have seen a continuance of people working remotely, but many workplaces have also gone back to in-person. We know the advancements made during COVID-19 changed the IT industry forever. My research will provide answers on what these changes looked like on a more local scale and what the changes continue to look like today.

Research Question(s) to Be Answered:

RQ1: How has the COVID-19 pandemic impacted the demand and need for IT Services?

RQ2: What changes have occurred in the work culture and technological landscape of the IT Services industry as a result of the pandemic?

RQ3: In what ways is the IT Services industry adapting to the ongoing influence of the COVID-19 pandemic?

IV. Methodology

Survey Design: A multifaceted methodology was employed, emphasizing a widespread survey approach among IT professionals and analyzing the research with a robust data collection, analysis, and interpretation framework. The survey was carefully developed, drawing on best practices in survey design, with particular attention to question clarity, validity, and reliability. This study aimed to comprehend the evolving landscape of the IT Services industry amid the COVID-19 pandemic and its implications for professionals in this field. The survey was relatively short (17 questions) and was meant to encourage more people to participate. The questions were a combination of short answers and multiple-choice questions.

Data Collection: The primary data collection method was a survey distributed among IT professionals. The initial target group was the University of Northern Iowa IT professionals (this included 20 staff members). I then expanded the survey to include IT professionals in Iowa, identified through mutual connections and their colleagues (this included 15 more people). Thirty people is not the largest pool of participants, limiting my results' generalizability. I found getting responses from some IT professionals difficult since they

all lead hectic lives. The results of the UNI participants represent public colleges in Iowa. In my aim to reach IT professionals outside of UNI, I hoped to find a variety of backgrounds that lead to results that are representative of Iowa IT. After the initial survey, participants had the option to have a follow-up Zoom interview with me. The interview was not recorded to protect their privacy, but I took notes of their responses.

Ethical Considerations: This research adhered to ethical standards, particularly in preserving the privacy and confidentiality of survey respondents. The Institutional Review Board (IRB) has reviewed and approved the survey to ensure all ethical norms were carefully followed. This process guarantees that the rights and well-being of participants are protected.

Survey Deployment: The survey was distributed online via email to facilitate ease of response. Respondents had the option to participate voluntarily, and their anonymity was maintained if that was their preference. The follow-up interview included more personalized questions and went into more depth on their survey answers.

V. Survey Results

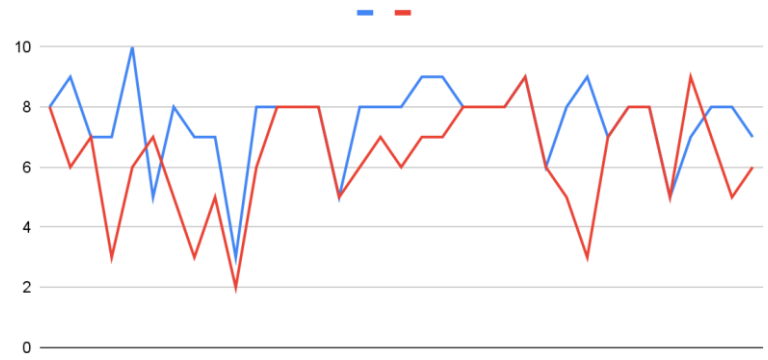
One of the first things I decided to include in my survey was a question about how people would rate their comradery with their coworkers before and after the pandemic. The graph shows a statistically significant difference between how participants rated their comradery with their coworkers before and after the pandemic. The average rating before the pandemic was 7.4, while after the pandemic, it was 6.3. You can see in Figure 1 where the blue line represents the pre-pandemic ratings, the red line

represents post-pandemic ratings, and the red line is trending lower than the blue. This lack of comradery means that people within IT are now more isolated, less close to their coworkers, and likely missing out on some semblance of teamwork. This trend is likely attributed to an increase in remote work.

During the pandemic, most teams worked entirely remotely, as did many people across all types of work. Remarkably, few companies have remained fully remote since

Comradery with Coworkers Pre and Post Pandemic

Figure 1



the pandemic. As noted in non-qualitative questions, 80% of these employees did not work remotely before the pandemic or only in exigent circumstances. In Figure 2, the blue dots represent the percentage of their IT staff that was working remotely during the pandemic, and the red represents the current status. Each number actually represents a range, 0-10,10-20,20-30,30-40,40-50,50-60,60-70,70-10,80+. All companies represented now still work remotely to some extent, and all but two were more than 80% remote during the pandemic.

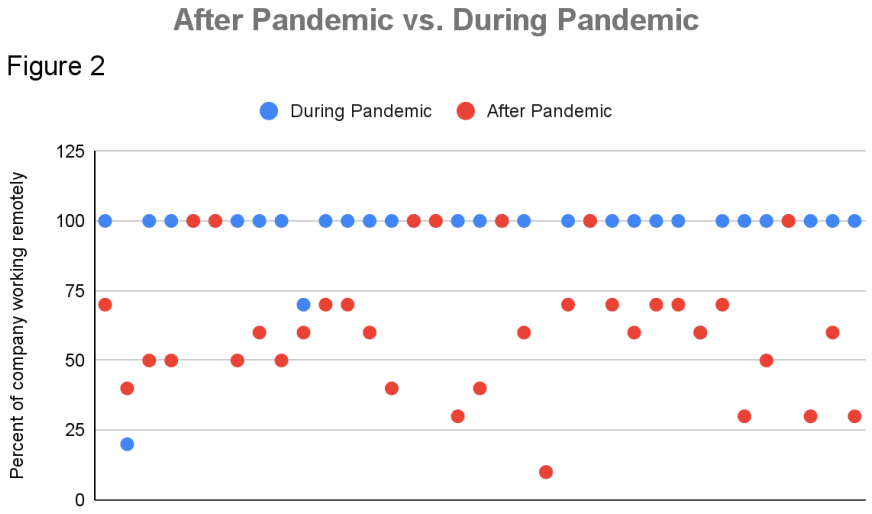


Figure 2

Most of what I have heard about how the pandemic was handled seems negative. So, when I got the results of my question on how well people think their company handled the pandemic, I was surprised. Most people believe their company did well, as seen in Figure 3. No one within the survey rated their company below a 5, with an average rating of 8.1. It is encouraging to see that IT companies have handled the transition to remote work well. If it were not for IT companies handling the transition

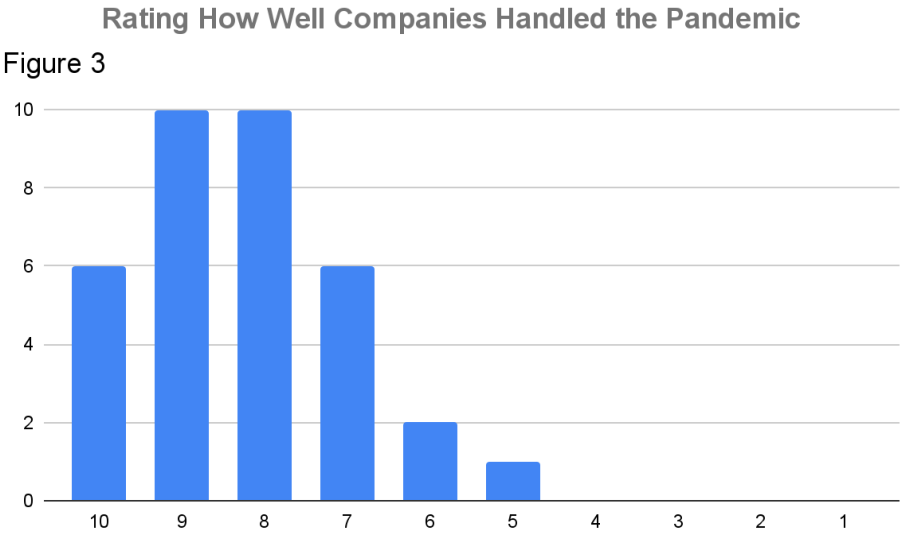
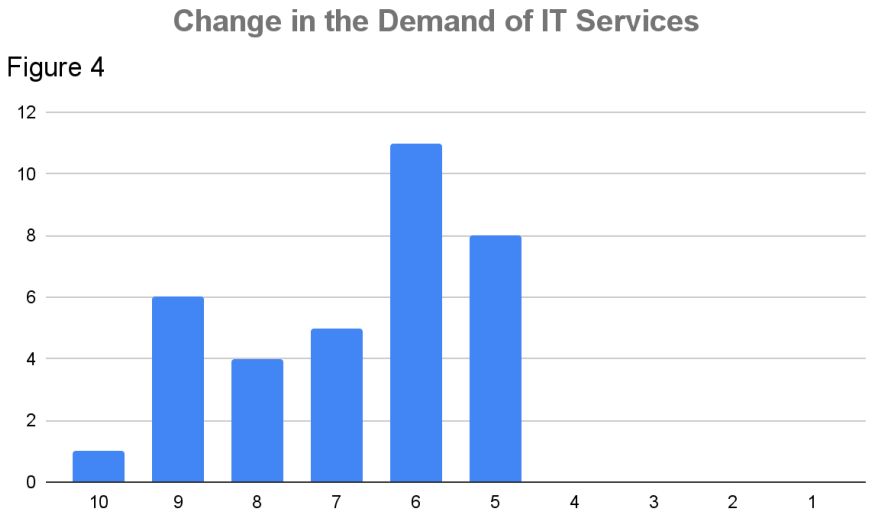


Figure 3

well, other companies would not have had the technical support to transition to remote work.

I had the participants rate the change in demand they have experienced since the pandemic, as seen in Figure 4. Ten indicated that the demand has significantly increased, while one would mean the demand has decreased dramatically. No participant's rating was below a five, which means none of these participants experienced a decrease. The average response was 7.06, and the mode was six. This means the majority of participants have experienced an increase in demand. Since remote work requires an increased amount of technology use, as well as the details of

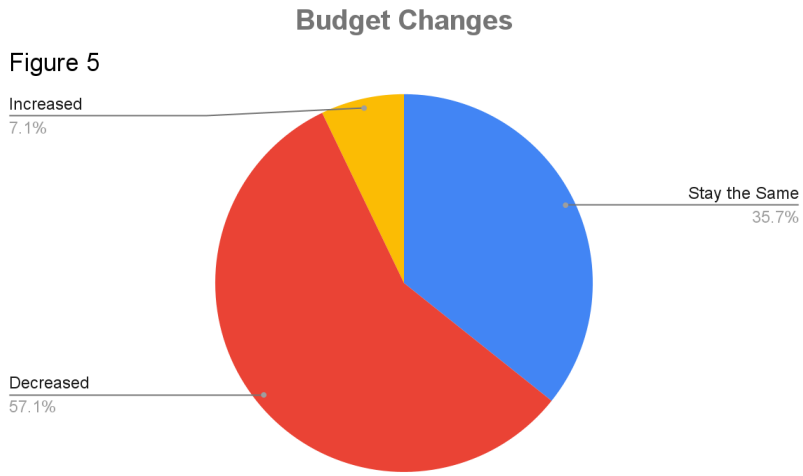
Figure 4



security, this result was expected. If people had a technical problem, they could not simply walk over in person and handle it or get help from the person in the office next to them. They relied on IT support to make any of their everyday work happen.

Did Covid impact the budgets of IT companies? 57.1% of participants indicated that their budgets have decreased, with 7.1% saying their budget has increased (Figure 5). This information, paired with Figure 4, is an interesting combination. Even though there has been an increase in demand for support, there has not been a matching general increase in budget. This is out of the control of most companies, but in reality, this means many employees are doing more work with the same budget. Within these budgets, the majority of participants indicated that their company made significant changes in their budgets when it came to how they used their money. Most of this

Figure 5



money went to software that was needed to improve remote work, such as Zoom licenses and Citrix. Citrix is a virtualization software that allows users to work remotely.

VI. Interview Results

Several participants expressed their willingness to participate in interviews and have their responses used for my research. Among those interested, I selected four individuals for interviews. These sessions allowed me to delve deeper into their personal experiences during the Covid-19 pandemic. Each interviewee came from diverse

backgrounds within the IT sector, providing various perspectives.

Firstly, I interviewed Tod Penn, who is currently serving as an assistant information technology specialist at UNI IT-Client Services. Tod's journey within the department is noteworthy as he transitioned from being a student employee during the COVID-19 pandemic to becoming a full-time staff member.

At UNI IT-Client Services, Tod's department oversees the operation of computer labs accessible to students across various campus buildings. The pandemic posed significant challenges, leading to the temporary closure of all these labs as students transitioned to remote learning. Initially comprising fifteen computer labs and approximately 40 computer kiosks, only two labs were reopened in the immediate aftermath of COVID-19. As these facilities gradually reopened, stringent sanitation measures had to be implemented. Presently, only seven computer labs remain operational, with all kiosks discontinued.

One of the primary challenges stemming from the pandemic was the disruption in the supply chain, significantly affecting Tod's department. The estimated times of arrival (ETAs) for computers and related materials extended from a few weeks to six months or more. This shortage exacerbated the need for laptops as the workforce transitioned to remote work, posing a significant challenge. It was not until the fall of 2021 that ETAs returned to a more manageable timeframe.

Next, I interviewed Anton Reiter, the Senior Learning Spaces Engineer at UNI IT Educational Technology and Media Services (ETMS). He has worked at UNI full-time in the same department since before the pandemic.

During the pandemic, their department faced significant budgetary challenges, as all funds were consolidated into a single pool, requiring them to request resources as needed. Given their responsibility for managing on-campus classrooms, the reduced use of these spaces during the pandemic led to a decreased workload while students were off campus. Initially, their tasks primarily revolved around assisting with Zoom meetings and webinars, including providing portable public address systems for recording Zoom lectures. Professors' reactions to Zoom varied widely, with some embracing it and others resistant, making it necessary for Anton's team to encourage its adoption.

As preparations were made for the return of students and staff to campus, modifications to classrooms became imperative. Many classrooms needed more adequate equipment due to the shift towards hybrid class options and the prevalence of recorded lectures. Approximately 30 classrooms required the addition of computers, and many classrooms needed equipment to allow staff to connect their laptops for use. Moreover, the absence of webcams prompted installing one in every classroom. Due to supply chain issues, they were unable to order their standard webcam and had to find a different one for this use.

Anton also highlighted several positive outcomes resulting from the pandemic. Firstly, Professors are now required to accommodate sick students by recording lectures or offering Zoom participation enhanced accessibility. Furthermore, the pandemic facilitated UNI's remote partnerships with community colleges, a possibility not previously explored. Lastly, the widespread adoption of remote work, pushed forward by the pandemic, created numerous employment opportunities that would not have been possible otherwise, such as being able to work for employers out of state.

Next, I had the opportunity to interview Eric Lukens, the Senior Information Assurance Architect at UNI IT Information Security. Eric has been a dedicated department member for several years, predating the pandemic.

Given the nature of his department, the initial focus during the pandemic shifted significantly towards enhancing security while ensuring ease of use for remote work setups. Although Virtual Private Networks (VPNs) and Citrix were available before the pandemic, they were not widely utilized. As staff transitioned to remote work, there was a surge in the demand for these tools, leading to significant investments in licensing. Interestingly, many software companies offered free licenses due to the overwhelming demand, with plans to reconcile the costs later to expedite the transition. They also shifted from primarily monitoring internal logs to external logs because of the excess of people accessing campus resources from off campus. In addition to VPNs, the widespread adoption of Always On VPN proved beneficial, providing continuous connectivity to campus resources for remote computers. This ensured that users remained updated and had access to network resources, preventing potential disruptions.

Despite efforts to facilitate remote work, challenges persisted, particularly regarding students' access to high-speed internet for Zoom lectures and Blackboard. Although internet access in Iowa has improved, more was needed for many students. To address this, a Wi-Fi spot was established in Hagemann Hall Dormitory that could be accessed from the parking lot, aiding local students. However, the issue persisted for a significant portion of the student population, impacting their ability to participate effectively in remote learning and cutting them off.

Eric also highlighted the negative impacts of remote work, noting a decline in

collaborative brainstorming and social interactions across departments. Previously, the office was a hub for socializing and idea-sharing, fostering a collaborative atmosphere. With remote work becoming more common, interactions have become compartmentalized within departments or limited to virtual platforms. Eric emphasized the loss of efficiency resulting from this shift, as individuals may spend hours on tasks that could be completed more efficiently with collaboration. While efforts have been made to have gatherings to foster relationships, Eric emphasized the irreplaceable teamwork that comes from sharing a workspace.

Lastly, I had the opportunity to interview Lori Seawel, a Senior Educational Technologist at UNI IT Educational Technology and Media Services (ETMS). She has dedicated many years to her role and is preparing for retirement this summer. Unlike other interviewees, Lori exclusively works remotely.

Following the pandemic, Lori's work arrangement was initially partially remote. However, as many of her colleagues transitioned to complete remote work and offices underwent changes, the office atmosphere shifted, initiating her decision to work entirely from home. Unlike some, Lori did not enjoy the new office environment and prefers the comfort and flexibility of her home workspace.

Lori's role primarily revolves around supporting Blackboard usage. Before the pandemic, only about half of the professors utilized eLearning, but nearly all rely on it now. Much of Lori's work during the pandemic involved assisting professors in mastering eLearning tools like Panopto, which facilitates lecture recording and uploading.

Passionate about remote work, Lori does not mourn the loss of camaraderie typically associated with office environments. Instead, she appreciates the efficiency

afforded by Zoom meetings and screen sharing. While she has offered in-person training sessions in the past, she finds that most individuals prefer Zoom options. Given the software-based nature of her job, working remotely is particularly well-suited to her role. She embraces the benefits of remote work and has not observed any adverse effects on her productivity or job satisfaction.

Though all interviewees agreed that remote work has significant benefits, Lori is the only one with a different view of the adverse effects. A big part of this comes from her specific job and lack of need for a team. The other participants noted the need for more comradery with their remote coworkers and the missed communication when they were not in the workplace together. Across the board, it is clear that the university underwent many changes as a whole, and the IT department specifically had many changes due to the pandemic.

VII. Discussion

RQ1: How has the COVID-19 pandemic impacted the demand and need for IT Services?

The pandemic has increased the demand and need for the IT service industry in various ways, resulting in an overall increase in demand for IT services. The rise of remote work has required an increase in the use of technology. Being able to work from home has been made possible due to the work of IT professionals and continues to be made possible by them.

The use of VPNs has increased because of the need to access networks outside of their homes, and there is a need for high bandwidth for at-home Wi-Fi. These have required widespread implementation through IT. Another change has been the increased

use of Zoom. Zoom itself has advanced, and it falls on IT to teach users how to use it. E-learning has also become common, and IT has had to allocate more resources to develop and teach users how to implement it. From a security standpoint, the kind of user logs they monitor has shifted as the network is more often accessed from off-campus.

There has also been a shift in the need for technology in classrooms on college campuses. Each classroom now needs a computer and/or a way for professors to connect their laptops. Classrooms also need webcams and microphones for recording lectures and offering Zoom options. Before the pandemic, it was not as common for professors to need this equipment.

As our world becomes increasingly technologically based, there is an ever-evolving need for IT support. Most jobs today can not function without technology, and there will inevitably be something wrong. Covid caused a significant push towards remote work, expediting how technology-based our daily lives have become.

RQ2: What changes have occurred in the IT Services industry's work culture and technological landscape as a result of the pandemic?

The work culture of the IT service industry has majorly changed from the pandemic due to the rise of remote work. Remote work has allowed for a new pool of employees that otherwise would not have been possible. It also allows for increased flexibility for workers. On the negative side, it takes away some of the positive effects of working in person. Remote work has led to a general decrease in coworkers' comradery and a lack of teamwork. Improving the teamwork and comradery of employees can help improve the overall efficiency of teams. When people are sharing ideas with one another and working

together, things generally are done better and often quicker. How these things balance out can depend on the company and the nature of the work. Some types of IT work require more of a teamwork atmosphere, while others do not.

RQ3: In what ways is the IT Services industry adapting to the ongoing influence of the COVID-19 pandemic?

Remote support of clients has increased in popularity because of the pandemic. While the technology needed for remote work existed pre-pandemic, it was not as commonly used. Now, the first option for fixing most technical issues is via remote support sessions. This is continued not for health reasons but because of increased efficiency. In a campus setting, it saves time from having to walk or drive across campus for simple issues. It is also helpful for supporting clients who work from home. This option saves clients from driving to campus, as some live far away.

Another adaptation has been the recent widespread implementation of Always-On VPN (AOVPN). This has solved the problem of devices not checking into the network they are made for and ultimately being deactivated. It also allows for access to file shares.

VII. Conclusions

In response to the profound disruptions caused by the COVID-19 pandemic, this study sought to investigate the impact on the IT services sector, examining changes in work culture and technological landscape. Through a comprehensive survey and insightful interviews with IT professionals, key findings emerged regarding the surge in

demand for IT services, the challenges and opportunities of remote work, and the imperative for ongoing adaptation within the industry.

Despite the invaluable contributions of IT professionals in facilitating remote operations and driving technological advancements, this study acknowledges certain limitations, including the relatively small sample size and the focus on a specific geographic region. Future research endeavors could explore the long-term effects of remote work on employee well-being and organizational performance and delve deeper into the evolving role of IT in addressing societal challenges beyond the pandemic.

This research holds significance for the IT services industry and beyond, shedding light on the critical role of technology in navigating unprecedented disruptions and driving innovation. By understanding the nuanced impacts of the pandemic on the IT sector, organizations can better prepare for future crises and harness technology's transformative potential to build a more resilient and connected world.

References

Chamola, V., Hassija, V., Gupta, V., & Guizani, M. (2020). A comprehensive review of the COVID-19 pandemic and the role of IoT, drones, AI, blockchain, and 5G in managing its impact. IEEE Access, 8, 90225-90265.

He, W., Zhang, Z. J., & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. International journal of information management, 57, 102287. https://doi.org/10.1016/j.ijinfomgt.2020.102287

Kumar, A., Gupta, P. K., & Srivastava, A. (2020). A review of modern technologies for tackling COVID-19 pandemic. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14(4), 569-573.

Nadikattu, Rahul Reddy. (2020). Information Technologies: Rebooting the World Activities during COVID-19. SSRN Electronic Journal. 10.2139/ssrn.3622733.

Shankar. (2020). The Impact of COVID-19 on IT Services Industry - Expected Transformations. British Journal of Management, 31(3), 450–452. https://doi.org/10.1111/1467-8551.12423

Singh, Mithilesh & Kumar, Vijay. (2020). Impact of Covid-19 Pandemic on Working Culture: An Exploratory Research Among Information Technology (IT) Professionals in Bengaluru, Karnataka (India).