

## THE IMPACT OF COVID-19 ON THE IT SECTOR: WAS THE ADJUSTMENT AS EASY AS IT SEEMED? THE CASE OF CROATIA\*

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### Abstract

*The crisis caused by the Covid-19 pandemic affected almost all organizations, regardless of the industry in which they operate. The new working conditions created to protect the health of all employees required a new mindset and a 'switch' to more digitalized operations. Many organizations had to adapt or even completely change their business model in order to survive and save jobs. Since digitalized operations were already in place in the IT industry, it seemed that organizations within it had an easier adjustment process to the new pandemic conditions. But have IT companies survived the pandemic as unscathed as it seemed?*

*The purpose of this paper is to examine how Croatian IT companies mitigated the effects of Covid-19 and how they managed their employees during this crisis. This paper examines the impact of the pandemic on employees in the IT sector and analyzes how leaders managed to ensure the psychological safety of their employees under these uncertain conditions. In addition, this paper answers whether and to what extent IT companies had to adapt their business models and what other challenges (cybersecurity, new platforms, etc.) they had to respond to. Using questionnaires and semi-structured interviews, managers and employees of ten IT companies operating in Croatia were surveyed. It was found that most IT companies experienced a short-term decline in revenue during the pandemic. The results of the research showed that companies in the IT sector also organized remote work, but unlike other sectors, employees in the IT sector were more likely to permanently switch to remote work, as they were more satisfied, motivated and productive when working remotely. Moreover, adapting to the new working conditions led IT companies to accelerate digitalization and reduce operating costs without reducing the quality of services.*

*This research can serve as an example of good practice for all organizations looking to digitalize their business and respond to potential new, unexpected crises.*

**Keywords:** Covid-19, IT sector, remote work, managing employees, digitalization

**JEL:** D80

### 1. Introduction

At the beginning of 2020, the outbreak of the Covid-19 pandemic changed the daily lives of almost the entire world's population. According to Gregurec et al. (2021), the negative effects of the pandemic are visible in all areas of life and have social, economic, political and psychological consequences. The decline in consumption caused by months of quarantine and isolation led to the closure of many businesses and a decline in GDP of most economies. Some sectors were more affected and vulnerable to the pandemic than others. Economic sectors such as tourism, travel agencies, catering, aviation, retail, public entertainment, sports and education were the most affected by the pandemic, while other sectors such as pharmaceuticals, healthcare and information technology (IT) were more resilient to the effects of the pandemic. The purpose of this paper is to examine how the Covid-19 pandemic affected businesses in the IT sector in the Republic of Croatia, from two perspectives. The first perspective focuses on the impact of the pandemic on IT employees and the challenges they faced. The IT sector is one of the few sectors that implemented remote work\* before the pandemic, so such a working model was nothing new to them. However, is it really possible that employees did not feel the impact of the pandemic in the slightest? One of the main objectives of this paper is to answer this question and find out whether IT managers were able to provide psychological safety and a sense of job security to their employees. The second perspective focuses on how the pandemic affected the overall business, as well as business

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processes in the sector. According to the Croatian Chamber of Commerce (2020), the IT sector in Croatia has excelled in recent years in terms of revenue and employment growth and is considered the fastest growing part of GDP. This paper examines whether the business model of IT companies has changed and how they have dealt with other challenges, such as ensuring cybersecurity and using new platforms. The empirical research was conducted through semi-structured interviews with the owners and/or managers of IT companies in the Republic of Croatia, as well as the questionnaires completed by the employees of these companies.

## 2. Methodology

For this paper, a survey was conducted among ten small and medium-sized companies in the IT industry operating in the Republic of Croatia. This research is based on the collection and analysis of primary sources and data, i.e. a mixed method including qualitative (semi-structured interviews) and quantitative research methods (questionnaires), and on the analysis of secondary sources and data.

Questions from two sources were used to create the questionnaire for the employees. The first source was the Quantum Workplace Platform. Two questionnaires, "Working from Home Survey" and "Flexible Workplace Survey" were used to find out what is good or bad about the use of remote work, whether employees believe their managers made the right decisions during the Covid-19 pandemic, and what the companies' plans are regarding remote work for their employees after the pandemic. The second source was "Coronavirus survey template for leadership and HR", created by SurveyMonkey, the world's leading online survey software, which was used to explore the main challenges employees face, their motivation and productivity when working remotely. A questionnaire with a total of 19 questions was created. The questions were structured in the form of measurement scales using the Likert scale, where respondents were asked to indicate their level of agreement (from "strongly disagree" to "strongly agree") and as multiple-choice questions. The questions were related to employee attitudes and the survey was completely anonymous. The data were collected and analyzed through online survey

platform Survey Gismo. A total of 41 employees participated in the survey.

The second part of the research consisted of a mixture of semi-structured interviews and questionnaires with IT leaders/managers. This part of the research was based on the questionnaire "The Impact of the Corona Crisis on your Business Model" created by Ritter and Lund Pedersen (2020) to investigate whether the company's business model changed. To compare the perceptions of employees and their managers regarding the impact of the pandemic on employee motivation, productivity and challenges, similar questions based on the Coronavirus survey template for managers and HR were also given to managers. The purpose of the survey was to identify the challenges faced by managers when managing their employees during the Corona crisis. The semi-structured interviews were conducted both in person and online using the Zoom platform. The results of the survey are presented later in the paper.

## 3. Impact of the pandemic on the IT sector

The global health crisis that began in 2020 affected nearly all small and medium-sized enterprises (SMEs) across all industries, but on an unequal scale. According to Hebert (2021), the number of workers in some industries was reduced due to Covid-19 disease and quarantine; supply chain irregularities occurred due to factory closures and problems with suppliers, resulting in a shortage of raw materials and parts of goods needed by SMEs for production. On the other hand, there was a decrease in consumer demand, which resulted in a decrease in revenue and liquidity. In order to survive, some companies, according to Carroll & Conboy (2020), were forced to adopt new information technology systems, while others were forced to completely rethink their business models shifting to online services and products and engaging in new business channels to replace those that were eliminated by the pandemic. According to OECD (2021), small and medium-sized companies were disproportionately affected. SMEs in the accommodation and food, services and transport sectors were the most affected, experiencing higher closure rates and a higher proportion of lost sales. Due to national

lockdowns and movement restrictions, consumer purchasing habits changed, leading to a significant shift of business activity to an online environment in 2020. Digitalization and online sales proved to be a panacea for a number of SMEs, but there were challenges here too, particularly for smaller businesses where internal capacity to adapt to change and adopt digital tools is more limited than for larger companies (OECD, 2021, p. 19). Almost all SMEs faced "new normal" operating conditions, i.e., according to Herath & Herath (2020), most companies were forced to adopt new forms of remote work and use new platforms and communication systems, all for the purpose of social distancing and maintaining their business results.

Like other sectors, the IT industry was disproportionately affected by the pandemic. The software sector was more spared from the impact of the crisis than other sub-sectors because there were no supply chain issues and, according to Market Data Forecast (2020), demand for software and communication tools such as Google Hangouts, WhatsApp Video call, Zoom and Microsoft Teams increased. The sharp increase in demand for these services was the result of global lockdown and remote work, as the only way to stay in business and keep in touch with family and friends around the world was through video conferencing. Schaefer et al. (2020) say that the demand for security solutions such as data protection, secure backups, document retention and compliance also increased due to the new working conditions. The ability to protect confidential information is extremely important for companies that see remote work as a viable long-term solution. Remote work also impacted demand for cloud technologies by enabling virtual collaboration between sales teams and customers. In addition, people were looking for new ways to have fun and interact socially during the pandemic, so streaming and gaming companies did not lose their growth potential. On the other hand, the pandemic had a negative impact on some sub-sectors of this industry. Edin et al. (2020) note that hardware companies lost 9% or more of their market cap in the first three months of the Covid era, although they are still doing better than other sectors and industries, but worse than the software industry mentioned above. Shin et al.

(2020) find that new smartphone launches were delayed due to lower consumer demand, labor shortages due to closed factories in Asia, and lack of necessary raw materials.

It is expected that this negative trend, which affects some activities in the IT industry will slow down with the improvement of the health situation related to the pandemic, the relaxation of government measures around the world, and the end of remote work.

### *3.1 Managing people during the time of crisis*

One of the top priorities during the Covid-19 pandemic, according to Rudolph et al. (2021), is for most employers to implement and maintain health and hygiene measures for all employees. Since the virus can be easily transmitted from person to person, physical distancing was critical to prevent further spread of infection among employees. In addition to concern for employees, a lower number of infected employees also meant better sustainability for the company. To stop the spread of the virus and protect the labor force, governments around the world ordered companies to close their offices and allow employees to work from home - in other words, to remote work. It is estimated that more than four-fifths (81%) of the world's 3.3 billion employees were affected by the full or partial closure of workplaces (Savić, 2020).

Although it has a negative impact on people's health and brings many challenges, this crisis also brings several benefits and opportunities, such as potential for increased social and organizational support from leadership, digitization of work processes, introduction of more effective teamwork, and changes in health management strategies (Rudolph et al., 2021, p. 3). During the Covid-19 pandemic, virtual teamwork proved to have many benefits and to be a good solution to physical distance in the workplace. As Rudolph et al. (2021) state, the advantages of virtual teamwork are reflected in the flexibility of the workplace and the saving of office space. By organizing various video conferences with the whole team, using virtual coffee breaks, constantly communicating with team members via online chat and keeping them informed about the progress of their work (e.g., via

advanced groupware tools), employees are able to maintain a high level of team spirit despite the physical distance. Team cognitions and team emotions, which are already highly valued in face-to-face collaboration, according to the research of Bernardy et al. (2021), are even more important in virtual teams. CEKOM (2020) states that research conducted by FlexJobs showed that employees working remotely were additionally motivated to complete all work tasks, i.e., they were much more productive in a large number of cases. This is because they were less likely to be interrupted by their colleagues, meetings were more productive, and a lot of time was saved by avoiding the trip to work. On the other hand, employees who work remotely are exposed to major changes in their work environment. According to Xiao et al. (2021), employees while working remotely no longer had the opportunity to socialize with their work colleagues, which was an important part of their daily lives before the pandemic. They also exercised less as they no longer had to walk back and forth between different meeting places. Hours of exposure to screens due to full-time computer work can lead to fatigue, headaches and eye-related symptoms. As Gholami et al. (2021) state in their research, one of the major concerns related to Covid-19 was the mental health status of workers. According to Pfefferbaum & North (2020), numerous emotional consequences such as sadness, irritability, insomnia, depression, confusion, anger, frustration, anxiety, and stigma associated with the quarantine were noted in people during the pandemic, some of which persisted even after the quarantine was finished. Given that remote employees are by definition far from their workplace, it is no surprise that social isolation was identified as one of the biggest challenges of remote working (Allen et al., 2015, p. 52). According to Azobu et al. (2020), application of such work brings a number of not only emotional and psychological challenges, but also challenges in performing work assignments. Poor and slow Internet connections, the risk of work-related burnout, disruptions to personal life (e.g., unscheduled work-related calls in the evening), and the possibility of producing incorrect results due to inadequate communication with colleagues were just some of the challenges faced by remote workers. Rudolph et al. (2021)

emphasize that remote work had disadvantages such as higher social isolation, less trust between superiors and subordinates, more potential conflicts that may arise from the lack of trust, less control from team leaders, and slow feedback on employee performance.

Companies in the IT industry and beyond need to make great efforts to reduce these drawbacks. Organizing one-on-one meetings, hiring people in the HR department to deal with this issue, and also enhancing mutual trust, which according to Wong (2020) can be fostered through employee empowerment, managerial consistency, honesty, transparency, and encouraging professional development and autonomy, are just some of the ways to reduce the disadvantages of virtual teamwork.

### *3.2 Was there a need for IT companies to change their business model?*

The Covid-19 pandemic affected almost all industries, and thus many organizations had to adapt to the newly created conditions. Sandalić (2020) points out that digitalization of work took place and permeates the business of companies on two levels: internal (the way of working within the company, communication and collaboration between employees) and external (change of business model and digitalization of services). According to the UNCTAD report (2021), businesses and consumers are becoming increasingly digital, offering and buying more goods and services online, increasing the share of e-commerce in global retail from 14% in 2019 to around 17% in 2020. Many industries that were negatively affected by the pandemic, such as the restaurant industry, had to look for new solutions to maintain profitability and turn to alternative methods of selling. Hofstätter et al. (2020) also state that the pandemic caused people to stop traveling and factories around the world closed, leading to a decrease in car sales and mass layoffs. According to Seiler et al. (2020), there was also a significant increase in remote working, changing customer needs (shifting to services reflecting new health and hygiene needs), and customer preferences for remote interactions that positively impacted the entire IT industry, both globally and locally.

Therefore, companies in the IT industry did not necessarily need to change their business model due to the increased demand for their products and services during the pandemic. The research shows just the opposite and directly confirms that their business models are sustainable even during the global health crisis. Under the conditions of the pandemic, it was showed that it is very important for the business model to be as flexible and agile as possible so that the organization can respond quickly to changes and continue to operate positively despite rapid changes and market uncertainties.

#### 4. IT sector in Croatia

The SME sector has significantly the largest share in the number of companies in Croatia, 99.7% (CEPOR, 2020, p. 7), so most Croatian IT companies belong to small and medium companies (Žitnik, 2015, p. 6). According to a 2020 survey by the Croatian Chamber of Commerce, the Croatian IT industry was growing before the pandemic. In 2019, according to Žitnik and Subotičanec (2020), the Croatian IT industry generated a total turnover of around HRK 27 billion, with an annual growth of 12.4%. The number of IT companies in Croatia amounted to about 5,000, out of which more than 50% were newly established software micro-companies, about 39% were IT service companies, 4% were IT equipment and component retailers and 0.8% were manufacturing IT companies. In 2019, there was an increase in exports, which reached HRK 8 billion, with an annual growth of 15%, which is twice the annual growth rate of the overall economy (7.4%), and most of them done by service companies. The highest turnover was generated by IT service companies, followed by IT retailers and manufacturers of IT equipment and components. The number of employees in the IT sector in Croatia was about 33,000 and was increasing in recent years. Most employees were in the category of IT outsourcing companies.

##### 4.1 Impact of the pandemic on the Croatian IT sector

The pandemic affected the Croatian IT sector in many different ways. According to Barančić (2020), IT companies belonging to the most

affected sectors (e.g., air transport, tourism, entertainment, sports), as expected, had the largest decrease in turnover in 2020, up to 85%. One can note the expected decline in total revenues of those that had a significant share of "infrastructure" (equipment and licences) in their business, as this segment decreased sharply in 2020, but at the same time revenue growth was expected from the services segment, which is also more profitable. Vice President of the Croatian Chamber of Commerce for International Affairs Ivan Barbarić states that investments in the IT sector, more specifically in computer programming, reached an extraordinary growth of about 600% in 2020 compared to 2019 (Poslovni dnevnik, 2021). The reason for this is that the number of online businesses increased, as well as the digitalization of certain processes, which affected the increased demand for this type of services. According to a survey conducted by Barančić (2020), more than 500 IT-related professions were established in 2020, so the demand for labor in this field increased, especially for developers, engineers, designers, artists, and many others. Compared to 2019, the IT industry recorded a revenue growth of 8.7%, export growth of about 24% and an increase in the number of employees of about 10%.

In addition to the positive consequences, the pandemic also brought a number of challenges to the IT industry. According to a report by the Croatian Ministry of Internal Affairs (2020), one of the main challenges was to ensure cyber security and manage potential risks arising from remote work that most companies had to organize. Some of the most common forms of Covid-19 cyberattacks took the form of fake messages or links in the name of Microsoft, Google Drive, etc., attempting to obtain a username and password and falsely offering "help"; or messages that threatened user account, such as donation appeals or messages in the name of healthcare organizations that exploit concerns and lead to malicious websites or software. To reduce the number of victims of cyberattacks, European Parliament News (2020) states that the European Union worked with telecommunications operators to provide a number of tips that enable uninterrupted remote work and protect many Internet users. These include providing a secure network,

increasing password strength and installing anti-virus software. With the increase in remote work, many industries realized the importance of investing in cybersecurity. Due to declining sales in the industries most affected by the pandemic, ensuring cybersecurity can be challenging, but nonetheless, cybersecurity became a top priority during the pandemic.

## 5. Result and discussion

The aim of this study was to investigate the perceptions of employees and managers in the IT sector about the impact of the pandemic caused by the COVID-19 virus on business in their companies. The first part of the study was conducted through an online questionnaire in the form of measurement scales using Likert scale and multiple-choice questions. The purpose of the questionnaire was to explore employees' concerns about the pandemic-caused changes that occurred in the company where they work. Interestingly, only 7% of the respondents did not implement remote work during the pandemic. The results of the survey indicate that 82% of the respondents were not concerned and only 3% of the respondents were concerned about possible changes within the company. For managers, the results were the same - none of them were concerned about the changes that the pandemic might cause. The results also showed that about 83% of the respondents had full confidence or trust in their management team to make the right decisions during the pandemic. About 87% of the employees agreed that they received psychological support from their managers during the pandemic. This suggests that managers were successful in providing psychological safety to their employees.

When working remotely, employees faced a number of challenges. According to the survey, the top three problems for employees were social isolation (44%), space (36%) and too many distractions at home (33%). It is interesting to see that managers faced similar challenges in their own remote work. The top three challenges for managers were too many distractions at home (75%), social isolation (50%) and childcare (50%). However, they were wrong in their assessment of the biggest challenges for their employees. Managers felt

that the top three challenges for their employees were more difficult communication with colleagues (62.5%), childcare (62.5%), and social isolation (50%).

The results show that there was no significant change in the business model as according to the respondents "online services have become even more popular". However, there was an internal change in the organization of work. Although almost all companies occasionally organized remote work before the pandemic (1-2 times per month), the use of remote work increased to 1-2 times per week during the pandemic or there was even a complete transition to remote work. When working remotely, companies used different technological solutions such as communication solutions (Google Meet, Zoom, Skype, Slack) and collaboration solutions (Active Collab, Jira, Monday Software, Google Docs, etc.). These types of tools had already been used by the companies before, so there was no need for additional training of employees or familiarization with new tools. One of the interviewees said, "The big advantage is that employees knew how to use these tools, and employees were more willing to do the work, which made remote work much easier." In addition, managers indicated that there were no significant issues with ensuring cybersecurity, but that they were aware of the risks and exposure to various cyberattacks. However, no company faced such a problem. Although managers were most concerned about the decline in employee productivity, the research showed that remote work reduced idle time in the office and employee productivity remained the same or even increased when working remotely. Some 41% of respondents believed they were equally productive when working remotely or in the office, 28% believed they were more productive when working remotely, while 21% believed they were more productive when working in the office. On the other hand, most managers pointed out that the biggest disadvantage of this way of working was that it reduced team cohesion and the sense of belonging to the team, which made it easier for employees to look for a new job. According to the managers, team management is certainly easier in the office because it ensures a good and productive organizational culture, which is

very important to them. One respondent stated that they found a solution to this problem in their company "by opening a permanent channel for all employees to communicate throughout the day via Google Meet." Although managers believe that the biggest disadvantage of remote work was the reduction of teamwork, the research showed that all the surveyed employees who used remote work did not give a negative answer to this question, i.e., about 69% of the respondents agreed that they felt connected to their team regardless of where they work.

In almost all companies, the number of employees increased during the pandemic. The respondents indicated that they made efforts to train new employees with the same professional quality, but it was a challenge to build the same relationship with them as with the employees hired before the pandemic. However, according to the managers, all employees fit in equally well with the team. According to the survey, most companies implemented additional employee satisfaction interviews and/or evaluations to ensure the psychological safety of their employees during the pandemic.

For most respondents, offering online services to their clients and sales remained at similar levels or increased. There was also an increase in enquiries, new customers and conversions to digital services. However, companies that develop hardware solutions for customers in industries whose business was negatively impacted by the pandemic saw their workloads and revenues decline in the first half of 2020. Their goal for the coming years is to win back customers that were hurt by the pandemic. Some companies that develop the necessary hardware solutions for customers in the automotive industry also faced a lack of necessary resources due to closure of factories in Asia.

Despite the finding that remote work had more advantages than disadvantages, all managers would like to return to working in the office, with the option of working remotely occasionally. Similarly, most employees (38.5%) said they would like to continue working in the office with the option to work remotely (hybrid mode). About 20.5% indicated that they would like to continue working primarily remotely with the option to

go to the office occasionally (hybrid mode), about 15% would like to continue working exclusively from home, and 13% would like to return exclusively to the office. According to the study, the main reason why employees would like to continue working remotely is that they would like to save on commute time from home to work (about 70%), followed by childcare (about 13%) and other things (about 18%), i.e., they believe that they are more productive and can better organize their working time. According to the managers, most companies will continue to use the hybrid business model after the pandemic. The reason for this decision is the greater satisfaction of employees, which was studied in monthly surveys and individual interviews. As showed so far, the productivity of most employees also remained the same, and in some companies, engagement and productivity actually increased. In addition, the benefit of the hybrid business model can be seen in the reduction of operating costs, as some companies decided to reduce office space. Savings were also made in meetings. According to the respondents, before the pandemic, all meetings with clients were held in person, which required additional travel costs and time, but since the beginning of the pandemic, almost all meetings were held online, with almost the same effect.

The Covid-19 pandemic led to changes in the organization of work in many companies in the IT sector, but most companies successfully managed these changes and continue to operate without their business being affected.

## 6. Conclusion

The Covid-19 pandemic had a disparate impact on companies in the IT industry, depending on the main sectors in which the companies themselves and their customers operate. Companies that develop hardware solutions and provide services to clients whose businesses were struggling with various issues due to the pandemic felt the decline in revenue and business volume in the first quarter of 2020. On the other hand, IT companies that develop software solutions and provide online digital services saw revenue and business growth. This is supported by accelerated digitalization of other companies that adapted their business to the newly created conditions.

The greatest changes are evident in the organization of work, that is, in the application of remote work. The IT industry is quite specific, as some IT companies applied this work concept even before the pandemic, but on a much smaller scale. The research showed that the use of remote work had several advantages, such as lower operating costs, less 'idle time' at the workplace and time saved on traveling. On the other hand, the disadvantages of such organization of work include a lower team spirit, social isolation and, for some employees, an inadequate working space. According to the study, most companies will continue with the current, hybrid model of work organization even after the pandemic, as employees are more satisfied when they have the option to choose and combine remote work and work from office.

The relatively small number of the respondents is a limitation of the study. The study was conducted with 41 employees and 10 managers working in IT companies. Since the respondents were anonymous, it is difficult to determine the age group, which may affect the generalization of conclusions for all age groups regarding the advantages and disadvantages of remote work. For further research, it is recommended to increase the number of respondents, and conduct separate studies for the hardware and the software industry. It would be interesting to see, using a larger sample, whether the impact of the crisis differs given the different core activities within the IT sector. Based on the research findings, companies can gain insight into how IT employees cope with remote work and what are the advantages and disadvantages of doing so. This study can serve all those companies that are looking into which type of work arrangement is more suitable for their company. Based on this, companies can better prepare for another unpredictable change like the COVID-19 pandemic.

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\* There are many terms in literature related to practicing work from home, such as telecommuting, work from home, home-based work, remote work. For the purposes of this paper, we have used remote work in the text