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# The impact of telecommuting on the performance and productivity of teleworkers

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**Abstract.** The pandemic phenomenon Covid 19 has significantly conditioned the routines of workers in their companies. There was a need for organizations to adapt to a new context, quickly and efficiently, using telework. This study aimed to analyse the impact of telework on teleworkers' productivity. In this methodology a sample of 152 professionals was used and a survey was administered through an online questionnaire. The respondents expressed, in a positive way, a quick and easy adaptation to telework, with a greater conciliation between professional

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and family life, decrease in business expenses, positive environmental impact, resulting from the reduction of travel to work and a reduction of costs for companies. They also consider that they were able to increase productivity and performance because they had fewer distractions and were not bothered as often as if they were physically in the company. On the other hand, they consider as a disadvantage the fact that not all workers can carry out their activity because they don't have Internet or are from the industry/production areas, which are indispensable in face-to-face work. Despite adaptability, with regard to how they would like to work in the future, respondents prefer hybrid work to remote/presence work.

**Keywords:** Telework; Teleworkers; Workers' perception; Covid 19.

## 1. Introduction

The period of confinement brought about a very significant change in the forms of social organisation and companies. The greatest impact was on work and family situations. There was, in fact, an instantaneous adaptation, by almost all sectors of activity, to this form of distance work, due to the ease of use of these disruptive technologies.

The Internet imposes itself in the digital context with certain capabilities that are fundamental for the affirmation of several areas, such as Marketing, Advertising or Management [1,2].

Organisations had to develop competent mechanisms that could give continuity to the desired objectives, as well as pursue the strategies defined to cement greater competitiveness. The use of Information and Communication Technologies (ICT), from home, was fundamental as an alternative to the work done in the workplace. This communication was carried out mainly through the three most popular platforms - Zoom, Microsoft Teams and Google Meet, as a tool to connect employees [2,3].

Working remotely became part of everyday life. There is, naturally, a change of paradigm, mainly by the new generations, in the business world, with the flexibilisation of remote work, with recourse to immediacy and multitasking. The distancing imposed by the pandemic, created a new reality in companies and the exponential increase of telework triggered new questions related to telework. This change in the productive process caused considerable changes in the business dynamics, but also in its social and family context. Thus, and in line with the objective of this work, it is of interest to investigate the impact that telework has on the productivity of teleworkers [2,4].

There are several factors that explain the relevance of this research. First, there is little research to analyse the impact of teleworking on the productivity of companies,

because on this subject, the studies are very recent. Second, the sample in question is significantly different from other studies, because the new technologies are more used in other countries than in Portugal. Third, the theme, besides being current, is fundamental to companies that are concerned with their performance and productivity. These organisations feel the need to be competitive in the market and, in this way, to foster their enterprise.

This paradigm shift has decisively changed the worker's way of life. In this sense, and in line with the objective of this work, it is of interest to investigate what changes occurred in terms of performance and productivity of teleworkers in this context of telework.

## **2. Literature review**

With the great technological development and the proliferation of digital networks, the media system sees the emergence of a new communicational support that progressively integrates the previous media.

This phenomenon sets the basis for a new social model, proactive and innovative, called Information and Knowledge Society. It is an evolution which encompasses various alterations, of a political, economic nature, but particularly of a social and technological nature, with implications at market and business level on a global scale [5].

The information society creates a break in the paradigm established by the industrial society, through the development of the Internet and its platforms, where, in turn, the technological engine determines new models of economic and social organisation. It is a society with new rules, structures and patterns of behaviour. There are also emerging forms of business dynamization, grounded on the technological component, which revolutionize the way companies and consumers communicate, evolve and market products [6,7].

The technological phenomenon imposes rapid mutations in the pattern of consumption, purchase and commercial offer, in three major areas: in the office, at home and on the move. At the business level, it has become essential to use the Internet as a tool of competitive advantage, working initially as an instrument of communication and relationship support in sales, stimulating new ways of providing services, with a view to greater customer loyalty. Later, the Internet became part of a fundamental instrument of information, collaborating to a greater productivity of companies [8].

The integration of the Internet in the domestic environment imposes a change of habits within the family. Traditional activities give way to an entertainment and multimedia centre. With the democratization of Internet access and a greater availability

of bandwidth, users, in their homes, will have greater ease of information, perform downloads of the latest music, access new movies, interact through instant messaging tools, MySpace, Hi5 or, play in multiuser multimedia globally [7,9].

With the familiarity of new “gadgets” and the mobility to which professionals are subjected, due to the enlargement of markets and the pace that companies impose, employees are assimilating an “always on” philosophy, provided by portable equipment that facilitates access to information anywhere and anytime [10,11].

This concept based on the “always best connected” inevitably migrates to the organisational environment. Companies see in these features, a practical and functional way to interact with their audiences, in particular, with their current or potential customers, but mainly the way the consumer interacts with the company and receives its promotional stimuli. Obviously, this phenomenon has contributed a lot to the evolution of the industrial process, on the one hand, through technology and on the other, by the network effect [6,12].

All managers, and not only IT managers, are responsible for investing wisely and using these information technologies effectively for the benefit of their organisations [13]. The use of information technology (IT) thus becomes ubiquitous. Companies not only have information systems (IS) that connect front-line employees with back-office accounting and production systems, but also compete with other companies through web-based shops and online customer service channels based on social media, namely Facebook, Instagram, Twitter, website, among others.

It is also notorious that the emergence of digital platforms is dimensional, as in less than a decade they have created jobs and about ten thousand platforms. Today, there is an application for everything or almost everything, from simpler activities such as clothes delivery, to more complex activities such as legal services provision, even so there is always innovation and the creation of more and more platforms. In the face of today’s society, those that are well established in the market reinvent themselves every day or vary their application from country to country [14].

Working without leaving home might have been a desire in other times, but in times of pandemic, in Portugal it is an obligation, as a way for people not to move away from their residences [15].

In Portugal similarly to many other countries in the world, has reached an unprecedented number of teleworkers, who provide their activity from their homes [16]. This new way of working implemented in the world, in large organizations and multinationals, is intended to give the worker the possibility of working independently, in distant locations, outside the physical place of your company and without direct relationships with their superiors and co-workers [17].

Thus, the situation of the pandemic by COVID-19 stimulates many companies to start or to intensify telework, because through the portable computer and mobile phone, telework can also adopt a perspective of mobility, allowing the worker to have no spatial and temporal limitations and as such a greater speed in the service provided, through its development in an itinerant way. In the face of this new reality increasingly present in the world of work, the exponential increase of telework has triggered many questions about this mode of provision of the activity that until now had not aroused the attention of the administrator.

### **3. Methodology and sample**

The aim of this study is to identify the impact of telework on productivity and performance of companies. To pursue this objective the following research questions are defined:

- [Q<sub>1</sub>] - Has the form of work changed with the confinement due to the pandemic by COVID-19?
- [Q<sub>2</sub>] - Was the worker able to adapt to the new remote working technologies?
- [Q<sub>3</sub>] - What are the consequences of teleworking in the productivity of the companies?
- [Q<sub>4</sub>] - Which factors may have caused a change in productivity in teleworking?
- [Q<sub>5</sub>] - What are the benefits/advantages of teleworking for the companies?

The analysis developed aims to answer the questions listed, for which a survey was structured based on the surveys of Couto [18], Lima [19] and Ferreira [20] and on the literature review. In addition to characterising the respondents' profile, the survey includes structured questions to answer the research hypotheses. The Google forms were used to develop the survey and the population under study is the Portuguese individuals who have a professional activity. The collection of information is exclusively through the online survey disseminated in the digital platforms Facebook and LinkedIn, during a period of three months, from 10 January to 10 April 2021. From this resulted a sample consisting of 152 respondents. In some questions, respondents indicated the degree of importance in relation to certain prepositions presented, using the Likert scale, which ranges from one to five, from strongly agree (5 points), to neither agree nor disagree (3 points) and strongly disagree (1 point). The preposition that presents a mean value greater than three it is concluded that, on average, the respondents agree, and conversely, the one with a mean value less than three, the respondents disagree.

In the statistical treatment of data and hypothesis testing, EViews 9 is used. In the research a confidence interval of 95% is defined and statistical tests, Student's T-test, are performed to assess the statistical significance of the variables at a 5% statistical significance level.

4. Empirical results

To get to know the sample under analysis a sociodemographic descriptive analysis is performed. Of the 152 respondents, 92 are female (60.5%) and 60 are male (39.5%). The age group with the highest number of respondents is between 19 and 25 years old with 55 respondents (36.2%), followed by two age groups of 26 to 35 years old and 36 to 50 years old, both with 43 respondents (28.3%). The age group with no respondents is under 18 years old, which is explained because they are covered by compulsory education and as such do not have a professional activity, a requirement of the sample. Amongst the respondents, 80 (52.6%) are single and 68 (44.8%) are married or cohabiting. It is also noted that the vast majority of respondents, 116 (76.3%), have higher education and only 12 (7.9%) have basic education. Figure 1 presents the respondent's professional area according to the activity of the company in which they carry out their professional activity.

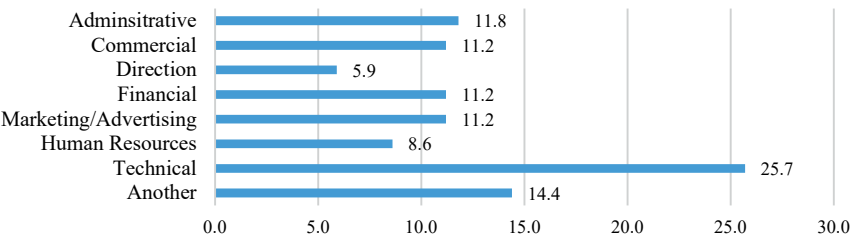


Figure 1. Professional field of the respondent.

The most representative group of the sample belongs to the technical area of their company (25.7%). The commercial, financial, administrative and marketing areas present values close to 11 to 12%.

As for the size of the company where the respondent works, 66 (43.4%) work in large companies (more than 250 employees), followed by 31 (20.4%) who work in micro-companies (less than 10 employees). The remaining 28 and 27 (18.4 and 17.8%) work in small (11 to 50 employees) and medium enterprises (51 to 250 employees) respectively.

It starts with analysing how the way of working with the pandemic was changed by COVID-19 and whether the respondents have adapted to this new way.

Before the pandemic, only 11.2% (17 respondents) state that the company where they work had the telework modality. But, the pandemic by COVID-19 changed the way of working, 62.5% (97 respondents) worked in telework during the pandemic. Of these 97 respondents, 90 (92.7%) claim to have adapted to this new way. However, it should be noted that the sample is mostly made up of 18 to 25 year olds, with a greater capacity to adapt to new technologies than the other age groups. Age is not a barrier, which is corroborated in this sample, because the 7 respondents who did not adapt to teleworking are not all from the older age group as one would expect [21].

From the analysis carried out, it may then be stated that the pandemic has transformed the way organizations work, with a large majority of companies adopting the digital transformation process.

One of the arguments commonly indicated as unfavourable to teleworking is the difficulty of workers to separate their personal life from their professional life. Although in the sample under analysis, most respondents (77%) do not feel this difficulty, it is also found that there is no significant difference between females (76.3%) and males (77.7%). However, most of the respondents prefer to carry out hybrid work (50% remote work and 50% face-to-face work).

Figure 2 presents the perception of teleworkers regarding the change in productivity. The productivity is the relationship between the production of goods or services and the production factors used, such as people, machines, materials and others. It is not mass production or working non-stop but rather having good planning to perform the maximum amount of work possible with the minimum necessary resources while respecting and even anticipating deadlines.

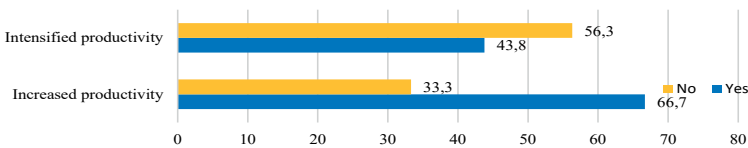


Figure 2. The consequences of Telework on productivity.

It is found that more than half of the respondents (67.4%) agree that with teleworking they managed to increase productivity (Figure 2). If they performed the work physically in the company productivity was lower due to having more distractions and being bothered more often. Additionally, also more than half of the respondents (56.8%) agree that during teleworking did not increase productivity.



There are several factors that may explain the change in productivity in teleworking, to mention, the reconciliation between work and personal life, the relationship with co-workers and their superiors, the ease of use of digital platforms. Each of these factors is then analysed in the sample under study.

Figure 3 shows whether respondents were able to separate personal and professional life for the entire sample and by gender.

Figure 3 shows that 77% of the respondents managed to separate their personal and professional lives. The remaining 23% of respondents who were unable to separate their personal and professional lives mentioned the following reasons: lack of discipline, difficulty in adapting to the new environment, lack of working conditions at home, lack of contact with colleagues, and failure to manage the logistics at home, particularly with their children [18,22,23]. It was also found that there are no significant differences between women and men.

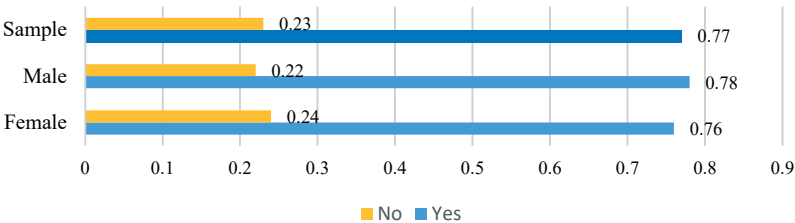


Figure 3. Separation of professional and personal life during teleworking.

Another challenge/consequence of telework is the difficulty in establishing relationships/connection between colleagues and superiors. However in the sample, 85% of respondents state that both the relationship with colleagues and the relationship with superiors was not affected during telework (Figure 4).

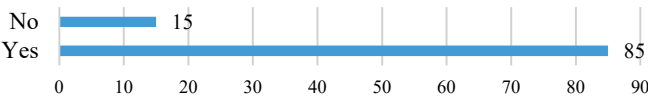


Figure 4. Change in the relationship with colleagues and hierarchical superiors during teleworking.

The current society is dominated by new technologies and the vast majority of the population knows them and adapts well to them. Fact confirmed in the sample, as most respondents (85.3%) had no difficulty in using the new digital tools for telework (Table 1).

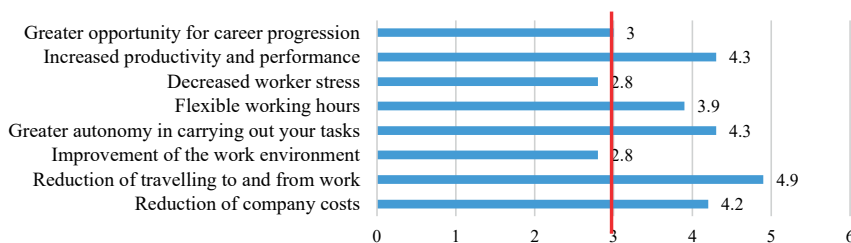
Table 1. Knowledge of new technologies to support work (namely Teams, Zoom, Co-libri).

	New technologies to support teleworking			
	Known before the Pandemic		Did you find it difficult to use	
	%	P-value	%	P-value
Yes	4.5	0.069	14.7	0.061
No	95.5	0.023	85.3	0.029

In the sample only a small percentage (37.9%) considers teleworking as a challenge, listing the following challenges: in the discussion of ideas and in reaching a consensus online, in the opportunity to make better use of time at a distance overcoming the inconvenience of isolation, in meetings and online training, in maintaining personal accuracy, being less efficient in solving problems, in internal communication, having to be permanently attentive in messages and meetings, in the constant learning of tools, in communication with customers and for some the fact of being in the company shortly before the pandemic. The p-value corresponds to the statistical test of the null hypothesis: the mean variable is zero.

To gauge the benefits/advantages of teleworking considered by respondents a set of questions was provided to rate on a scale of one to five, ranging from totally agree (5 points), to neither agree nor disagree (3 points) and totally disagree (1 point). The statements with a mean value greater than 3 it is concluded that on average respondents agree, conversely, those with a value less than 3 where respondents disagree. Figure 5 presents the results for each of the questions.

In Figure 5, the major benefits of teleworking are the reduction of travel to and from work, increased productivity, performance and costs for the company and greater autonomy in performing tasks. Of the benefits of teleworking, two are for the company and two are for the worker, so we can conclude that teleworking has benefits for both companies and workers. To emphasize the commuting to and from the workplace will have some consequences, for the worker reduces the cost of travel and for society a reduction of pollution caused by transport. Inversely the factors that workers identify less as benefits of teleworking are the reduction of stress and the improvement of the work environment. The increase of opportunity for career advancement the respondents still do not have a formed opinion.



*Figure 5. Benefits/advantages of teleworking from the perspective of the workers.*

Table 2 presents the respondents' opinions on the beneficial effect of teleworking for companies and for society. From Table 2 it can be stated that there is consensus among the respondents, most agree that telework presents benefits both for society (78.3%) and for companies (77%). We conclude that in the atypical time of 2020/2021 of isolation derived from the pandemic by COVID-19, as several authors refer, there would have to be an articulation of technologies and work to avoid the paralysis of the economy. Home office work has many advantages for the company that according to Figure 5: reducing business costs and increasing productivity and performance. However, it should be noted that not all sectors or professions can allow this situation, areas such as health and production could not join this way of working. The p-value corresponds to the statistical test of the null hypothesis: the mean variable is zero.

*Table 2. Beneficial effects of teleworking from the perspective of the workers.*

	Benefits of teleworking				
	Yes		No		P-value
	n	%	n	%	
Beneficial effects of teleworking for:					
The company	117	77.0	35	23.0	0.002
The society	119	78.3	33	21.7	0.003

## 5. Conclusions

The COVID-19 phenomenon had an extremely big impact on society, on the way companies are organised and on the consequences of adaptability and change in private life. In fact, these technologies become fundamental in the pandemic scenario, but they implied changes in performance and productivity in teleworkers.

The aim of this research was the effect of telework on the performance and productivities of workers. In pursuit of this objective, a survey was analysed in which resulted a sample

of 152 respondents, distributed on digital platforms such as Facebook and LinkedIn.

There are several factors that explain the relevance of this research. First, although there are studies analysing teleworking, in Portugal, research in this area is relatively recent. Second, the vast majority of studies analyse the vision of the company and not that of the worker. Third, the sample under analysis presents characteristics that differentiate it from the samples analysed in other studies. Fourth, the theme, besides being current, is crucial to companies that are increasingly concerned with the satisfaction of their workers, but especially due to the adversities that were experienced throughout the pandemic.

The sample analysed is composed mostly of female respondents and the age group of greater representativeness is 18 to 25 years of age, as well as the majority of respondents have higher education.

Taking into account the research questions, the conclusions obtained are:

- (1) During the confinement companies used telework, hence the transformation in the paradigm in the world of work and in organizations. Most of the respondents (62.5%) worked remotely during confinement. However, it should be noted that the sample is mostly made up of 18 to 25 year olds, with a greater capacity to adapt than the other age groups. Additionally, most respondents of this sample had no difficulty in using these digital tools, despite not knowing them before teleworking.
- (2) Respondents were able to separate professional life from personal life, although in the future respondents would prefer hybrid work to remote/presence work.
- (3) A positive factor of teleworking is that respondents were able to increase productivity (67.4%) as they had fewer distractions and were not disturbed as often as if they were physically in the company. It is also found that 77% of the respondents were able to separate their professional life from their personal life and the relationship between colleagues and superiors was not affected.
- (4) The main advantages of telework are cost reduction and greater autonomy and flexibility of working hours. Regarding career opportunities in the company the respondents still do not have a formed opinion.
- (5) The respondents show that teleworking has a positive contribution to society and to companies.

A limitation of this study is the questionnaire sample, which assesses behavioural aspects, hence the information collected depends on the honesty of the interviewees. To overcome this limitation, the interviewees were asked to provide more genuine information about their perceptions, emphasising the importance of this attitude for the reliability of the research. Another limitation of the study is the lack

of adherence to answer the questionnaire.

The results found and the limitations of the study generate additional questions for future research. The analysis conducted is regarding the attitude of the respondents in the year 2022. One of the future researches is to reproduce the study and check if the results are the same. It would also be interesting to focus the study on a larger sample, where it included spreading the study abroad.

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