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Article

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ADAPTABILITY TO TELEWORKING IN EUROPEAN COUNTRIESAniela Bălăcescu^{1*}, Aurelia Pătrașcu² and Loredana Maria Păunescu³¹⁾ "Constantin Brâncuși" University of Târgu Jiu, Romania²⁾³⁾ Petroleum-Gas University of Ploiești, Romania**Please cite this article as:**

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Abstract

The process of digital transformation and teleworking are some of the most debated topics in the specialized literature of the last decade due to the major impact they have on the stability, the evolution and the efficiency of the economy. The COVID-19 pandemic highlighted the competitive advantage offered to the national economies by the implementation of policies dedicated to the digitalization of the society and the economy. In the last year, national economies have been faced with huge challenges imposed by the continuation and adaptation of economic processes in the virtual environment. The pace of adaptability of the workforce to digital technologies, the functional and technical literacy of human resources, the work organization and the level of digitalization influence the economic and social performance of the countries. The main aim of this research is to determine the defining characteristics in terms of the ability to adapt to telework in 30 European countries, to classify them according to their digital performance, but also to analyze their differences and determine the directions of action to capitalize on the opportunities offered by the online environment. The results of this research highlight that despite the investments which the analyzed European countries have made in recent years in digital infrastructure, there are large disparities in terms of adaptability to telework, as follows: poor adaptability (Southern and South-Eastern Europe), medium (Central Europe), high adaptability (Western and Central Europe), very high adaptability (Northern and North-Western Europe). The research is intended to be a catalyst for data-driven discussions on the adaptability of the European countries to digital innovations and the process of managing adaptation by governments to meet the economic and social needs. The analysis of the potential for adaptation to telework represents a contribution to the exploring of potential post-crisis developments. The limits of the research are related to the involvement of only six variables, the analysis can be extended in future research to other variables as well.

Keywords: adaptability, teleworking, digitization, cluster analysis, digital disparities.**JEL Classification:** J24, C38

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Introduction

The rapid pace of penetration of digital technologies and artificial intelligence in all areas of activity has led to considerable changes in the labor market, both structurally and in terms of labor relations. Thus, the emergence of a new form of work such as teleworking was not surprising, but rather can be seen as an effect of digitalization and adaptation to a constantly changing economic environment. Under these conditions, greater attention must be paid to how countries create the strategies and levers needed for optimal adaptation.

The pace of digitization is driven on the one hand by digital innovations and technologies, and on the other hand by people's ability to use these technologies and benefit from the advantages they offer (inclusion) in an environment of privacy and security. Therefore, six variables were considered in the research which refer, in addition to the Internet access, to identifying opportunities for active participation in the digital economy, respectively to the skills and use of digital data by the main resource in any economy, the human resource.

In the context of the COVID-19 pandemic, the pace of telework expansion was accelerated, but differentiated according to the specifics of activities, the occupational and professional status of the workforce, the labor policies, the level of development of countries. To avoid the spread of the SARS-CoV-2 virus, the governments have encouraged the companies to use telework, thus the employers have become more open-minded about this form of work and the employees have adapted to the new requirements. The comparative analysis of the existing telework possibilities in the EU member states becomes all the more important as the emphasis placed on the development of the Digital Single Market is increasing rapidly. In this regard, we must take into account the harmonious digital development of the member countries, identifying those states where more investment is needed in digital technologies and reducing the differences between their levels of development.

This paper aims to analyze the similarities and disparities between 30 European countries from the perspective of the dynamics of adaptability to telework, as well as the analysis of economic and social factors that influence this dynamic as a whole and within each group. In the analysis undertaken, along with the 27 states of the European Union, three other countries were introduced, namely the United Kingdom, Iceland and Norway. The arguments for choosing these three countries are as follows: The United Kingdom was a member state of the European Union until 31st January 2020, and during the transitional period until 31st December 2020, the European Union's law was applied to it, a period taken into account in our analysis; Iceland and Norway, which are part of the European Economic Area (EEA) and the European Free Trade Association (EFTA), have not been and are not EU Member States, are allowed to participate in various stages of the European Union legislative process through the EEA Agreements, participated in the elaboration and implementation of the first Framework Agreement on Telework with the EU-15, officially signed on 16th July 2002.

In order to achieve the proposed objective, the paper was structured as follows: the first section was dedicated to reviewing the literature on telework and its influencing factors, the second section contains the description of the research methodology, the third section captures the results obtained through the research and discussions based on them, and finally the conclusions of the undertaken research are provided.

1. Review of the specialized literature on telework

Throughout history, humanity has gone through moments of trial, adaptation and re-adaptation to the conditions imposed by the stages of development in which it was, there was a continuous desire to discover, to know, to identify the solutions needed to overcome crisis situations. In the modern society, the impact of technological development has been and still is a determining factor in shaping and restoring human characteristics, new trends which influence the way of life and work of individuals. Technological development has always meant progress, discovery, knowledge, innovation, but also essential changes in lifestyle, involvement and activity in the labor relations. The use of technological means came more as a necessity in carrying out activities, in stimulating the work efficiency and the employees' efficiency. At the same time, it also represented a departure from the ordinary human and natural manners and skills, such as social interaction and direct communication, directly through technological tools. However, if we look back, we can see that the trends and direction of mankind are heading dizzyingly towards a massive technologicalization of all aspects of life. Howard Rheingold (1993) in his work "A Slice of Life in My Virtual Community" shows that in the virtual workspace, people behave and carry out their activities, similar to the real life, the only notable difference being that in the approach they use specific tools and communication platforms.

If in the '90s, Rheingold's theories seemed to be quite difficult to imagine, in 2020, they became a practice, a way to continue economic activities, education, etc., thus the decision-makers from various levels of responsibility in the economy have allowed the use of information systems and technologies that bring the individual in a ubiquitous virtual environment. The first negotiations for a Framework Agreement on telework between the European Union, the social partners and the EEA countries (Iceland and Norway) began on 20th September 2001, with an emphasis on exploiting the opportunities offered by the information society and encouraging the new form of work organization, telework. These negotiations took place over eight months, thus the framework agreement on telework was signed on 16th July 2002, with a general framework of rules on the new form of work organization and the modernization of the labor market.

Technological developments have allowed for an expansion and evolution for employees with a high level of education, thus in 2019, the possibility of working remotely targeted 33% of employees and 46% of the annual source of income in the euro area, suggesting that teleworking was predominant in well-paid jobs, according to ECB data. In European countries, teleworking has developed differently depending on the social and economic context, thus knowledge-based economies, in which the innovation process is the key factor of the economic and social development, have quickly activated internet connections succeeding with the help of mobile information technology, the delocalization of the activities. In Europe, even before the pandemic, fewer and fewer jobs remained entirely dependent on a single location (Popma, 2013; Holtgrewe, 2014).

An Eurofound report realized under the auspices of the European Foundation for the Improvement of Living and Working Conditions, published in September 2020, shows that 8% of those working for an employer became unemployed at the start of the pandemic period caused by SARS-CoV-2. The possibility of concluding economic activities was even more important for those who had their own business. Spain, for example, was one of the hardest hit countries in the EU after the first wave of the pandemic. A large number of respondents, as shown in the report mentioned above, were forced to reduce the number of

working hours spent in the office. Two of the main fears of the respondents were the lack of job stability and the related changes on individual employment contracts during the pandemic, taking into account the fact that there was an unprecedented change in the conditions of activities. Telework became normality, the employees no longer spent their time working in the office, in the company headquarters, instead everything took place in their personal space. Thus, the labor legislation, on the Romanian territory, has undergone certain changes over time. In the Labor Code, Law no. 53/2003, a series of articles referring to telework were annotated. A definition of this form of work in legal conditions and with special characters was sought. Article 108 of the Labor Code defines in paragraphs 1, 2 and 3 the fact that: (1) Employees who work from home are considered those employees who fulfill, at their home, the specific attributions of the position they hold; (2) In order to fulfill their work tasks, the employees who work from home establish their own work schedule; (3) The employer is entitled to verify the activity of the employee who work from home, under the conditions established by the individual employment contract.

These articles of the law show that the specifics of the work have been modified, thus we can no longer speak of the place located in the employer's unit but of the domicile or residence of the employee. This also aims at establishing an appropriate work schedule and with the optimal means necessary. Although employees, in this case, establish their work schedule, the law allows the employer to use the prerogatives to track, direct and control the employee's activity.

Lately it has been observed that teleworking has generated a number of advantages but also disadvantages for both the employer and the employees. Among the advantages brought to the employers would be worth mentioning the diminished expenses with the spaces of work, the costs of the invoices related to the economic activities; an increase in productivity and efficiency of working time per employee. The disadvantage, in this case, would be that the employers are losing direct control in the relationship with the employee due to the impossibility of direct supervision (Golden, 2019). For employees, working from home meant a readjustment of working conditions, an individual establishment of the work schedule, without requiring the express consent of the employer, allowed them much greater flexibility and efficiency of the work schedule, the compliance with a strict schedule and working time intervals being no longer necessary. While for some employees, telework meant efficiency, for others it meant destabilization, a difficult activity due to the lack of a clearly established program, the tools needed to carry out activities, lack of resources, reduced ability to concentrate and delays in meeting deadlines.

In Romania, the concept of telework is regulated by Law no. 81/2018, which emphasizes in art. 2, letter a) the following: telework is “the form of work organization through which the employee, regularly and voluntarily, fulfills his attributions specific to the position, occupation or profession he holds, in another place than the workspace organized by employer, at least one day a month, using information and communication technology”. It results in the fact that there is a legal possibility to work from home or from another location outside the employer's premises, but provided that the work carried out is fulfilled with the help of information and communication technology. We can imagine that we are in front of what Peter Drucker called, in his book "The Landmarks of Tomorrow", from 1959 - knowledge worker. This “knowledge worker” represented the type of employee who was able to apply theoretical knowledge and analytical thinking, obtained after a formal training, to develop products and services in various fields. Peter Drucker adds that these

"knowledge workers" were to become the best acquisitions on the labor market due to the high degree of productivity and creativity in the workplace.

The labor relations and the perception of the styles of fulfilling the work tasks are in a continuous change, in a direct adaptation and re-adaptation to the newly imposed conditions, in a completely expected form by the pandemic waves that have affected the entire planet. The increased mobility and the use of ICTs for work have been combined with a growing demand for work flexibility and have led to a rapid increase in the number of women in the labor market.

The crisis caused by the pandemic has accelerated teleworking and managed to reduce the digital differences between European countries, the number of employees working from home has increased and companies have increasingly invested in digital technologies (Zhang, et al., 2020). In regions such as Belgium, France, Luxembourg and Sweden the share of employees working from home exceeds 50%, but in regions such as Spain, Greece and Romania it is only 20%, in Stockholm the percentage is 70%, in Paris 45%, but only 10% in Italy. In Europe, the percentage of employees who can work from home targets sectors such as IT & communications (83%), bank employees, a large part of managers and experts. (Thulin et al., 2019; Steidelmüller et al., 2020). Sectors such as education, public administration, real estate are those in which more than 40% of employees can work online. The occupations which require presence at work are those such as sales, cleaning, health, agriculture (Gschwind and Vargas, 2019). In these circumstances, it might be appropriate to (re) remember Steve Beller, an American businessman, investor and CEO of Microsoft between 2000 and 2014 who said that "the main benefit of information technology is that it gives individuals the power to do as they please. It allows them to become creative, productive and makes them learn things they didn't think they could learn before. Thus, everything has to do with human potential". On the other hand, the role of formal institutions in the management and coordination of human capital is growing in the digital society (Zaborovskaia et al., 2020).

Telework has developed with various variations in Europe in various occupations and sectors of the economy before the pandemic. However, it can be considered that European enterprises did not have contingency plans to deal with the threats arising from biological risk situations. (Nilles, 1975; Baruch, 2000; Bailey et al., 2002; Belzunegui-Eraso et al, 2013; Rebmann et al., 2013; Chung, 2018).

The pace of telework development has depended on technological development but also on the economic structure specific to each country, the link between flexibility in the workplace, social security and the elimination of geographical barriers and for the protection and the limitation of COVID-19, telework has become an extremely important tool for continuing the activity and to ensure the health of employees. (Belzunegui-Eraso et al., 2020; Coelho et al., 2020; Olló-López, 2020).

In order to meet the challenges generated on the one hand by the COVID-19 crisis and on the other hand by the expansion of the information technology and to have the best possible measures to ensure confidence among employers and employees, European governments must ensure its proper functioning by adapting to the new requirements in line with the EU strategic priorities, but also by linking them to best practices in the field.

2. Data series and methodology

Taking into account the purpose of the research, namely the adaptability of European states to telework, the research methodology aimed to identify the similarities and the disparities between them through an integrated analysis of three points of view: access, skills and the level of adaptability of the population between 15 and 64 years to this form of work.

Internet access is a first aspect and an essential condition, its lack excluding any possibility of implementation and use of telework in the conduct of business. For its evaluation, the data series Percentage of households with Internet access at home (Eurostat, 2021a) was used.

The level of digital skills is also an important factor in the productivity of telework. The basis of its assessment was the data series Level of digital skills of individuals (Eurostat, 2021b)

The level of habituation and acceptability of the staff regarding the use of digital technologies, the degree of use of the Internet in everyday life, in relations with public authorities and in working from home also form a group of factors with a direct influence on the opportunity and productivity of telework. The quantitative assessment of these factors was carried out on the basis of the data series Use of the Internet by individuals (Eurostat, 2021c), People who use the Internet to interact with public authorities (Eurostat, 2021d) and Employees who work as a percentage of total jobs (Eurostat, 2021e).

From the analysis of these three points of view resulted six data series, and the variables corresponding to them as well as their units of measurement are presented in table no. 1.

Table no. 1. Significances and units of measurement of the variables used

Variable	Significance	U.M.
LAHI	Level of access of households to the internet	%
SIHDS	Share of individuals who have basic or above basic overall digital skills	%
DUII	Degree of use of the Internet by individuals	%
SPUIPA	Share of people who use the internet to interact with public authorities	%
SEWHS	Share of employees who work from home sometimes	%
SEWHR	Share of employees working from home as a rule	%

Based on the available data, 30 European countries were included in the research, of which 27 are EU Member States and the other three are the United Kingdom, Iceland and Norway. The main data source was Eurostat. The main characteristics of the data series are presented in table no.2.

Table no. 2. The main characteristics of the data series

	LAHI	SIHDS	DUII	SPUIPA	SEWHS	SEWHR
Mean	90.23	58.40	88.53	62.27	10.45	5.51
Standard Error	0.94	2.55	1.42	3.71	1.55	0.64
Median	90.00	56.50	89.00	62.00	8.20	5.10
Standard Deviation	5.17	13.99	7.75	20.33	8.47	3.50
Kurtosis	-0.50	-0.23	-0.38	0.15	-0.44	0.87
Skewness	-0.46	-0.04	-0.56	-0.49	0.72	0.91
Range	19.00	56.00	29.00	81.00	30.70	13.60
Confidence Level(95.0%)	1.93	5.22	2.90	7.59	3.16	1.31
Variation Coefficient (%)	5.73	23.95	8.76	32.64	81.10	63.56

Source: elaborated by the authors using SPSS

In order to highlight the similarities and the disparities between European states regarding adaptability to telework through the integrated analysis of the six indicators (variables), the hierarchical cluster methodology was used as a grouping method, which is conclusive insofar as the values of the variables used are characterized by a diversity significant from one entity to another.

Taking this into consideration, a preliminary stage aimed at analyzing the characteristics of data series distributions in order to verify the existence of diversity of variable values from one state to another, diversity that justifies the use of the hierarchical cluster technology to obtain additional relevant information on the similarities and disparities between the 30 states included in the analysis in terms of the research objective (Zaharia et al., 2017).

The actual research was performed using the method of hierarchical clusters. To generate the clusters, we started from the matrix $Z = \|z_{ij}\|_{i=1,n,j=1,m}$, where n represents the number of countries and m the number of indicators.

The proximity matrix $W = \|w_{ij}\|_{i=1,n,j=1,n}$, was obtained using Euclidean distance (Andrei, 2019):

$$W = \|w_{jl}\|_{j=1,n,l=1,n}, \quad w_{jl} = \sqrt{\sum_{i=1}^n (z_{il} - z_{ij})^2}, \quad i = \overline{1,3}, l = \overline{1,n}, j \neq i, k \neq i, w_{ii} = 0 \quad (1)$$

Ward's method was used to determine the distance between clusters (Marinoiu, 2016), and if A and B are two clusters then:

$$\Delta(A, B) = \sum_{i \in A \cup B} \|x_i - m_{A \cup B}\|^2 - \sum_{i \in A} \|x_i - m_A\|^2 - \sum_{i \in B} \|x_i - m_B\|^2 - \frac{n_{A \cap B}}{n_{A \cup B}} \|m_A - m_B\|^2 \quad (2)$$

The Welch and Brown-Forsythe tests (Robust Tests of Equality of Means) were used to test the statistical significance (relevance) of the use of variables in defining the attributes of the r resulting clusters, respectively the statistical significance of the averages of the variables registered at cluster level, whose null hypothesis is:

$$H_{0_1} : m_1 = m_2 = m_3 = \dots = m_r \quad (3)$$

The condition for accepting the null hypothesis is $Sig.F > \alpha$ which is equivalent to $F_S < F_{\alpha, df_1, df_2}$ where df_1 and df_2 are the degrees of release whose values depend on the number of clusters (r) and elements (n). If the null hypothesis is accepted, it results that the averages recorded by the respective variable (s) are not statistically significant (they do not differ significantly) and the resulting cluster structure is not relevant.

SPSS was used to process the data series. The significance threshold used was $\alpha = 0.05$ (95% confidence level).

3. Results and discussions

The preliminary analysis of the data series shows that they have normal distributions, from the point of view of the vault (Table no.2) four of them are platycurtic (LAHI, SIHDS, DUII

and SEWHS), and the others are leptocurtic, and in terms of symmetry, SEWHS and SEWHR are asymmetric right, and the others are asymmetric left.

It should also be noted that the values of the variables are expressed as a percentage, the Range parameter has high and even very high values (SPUIPA, SEWHR) which highlights the existence of significant differences between states in terms of the values of the variables analyzed. The existence of significant differences between states is also highlighted by the values of the coefficient of variation, which, with the exception of LAHI and DUII, show that the average values have a small signification (SIHDS) and are insignificant for an undifferentiated (global) analysis of the issues considered.

Given the above observations and conclusions, it follows that an analysis of the issue of telework in the light of the data series analyzed needs to be done by grouping them into clusters and identifying similarities and disparities between them.

For the generation and the identification of clusters starting from the data series included in the analysis, the hierarchical cluster methodology was used using the Euclidean distance for the proximity matrix and the Ward method to determine the distance between the clusters. The dendrogram obtained is illustrated in figure no. 1.

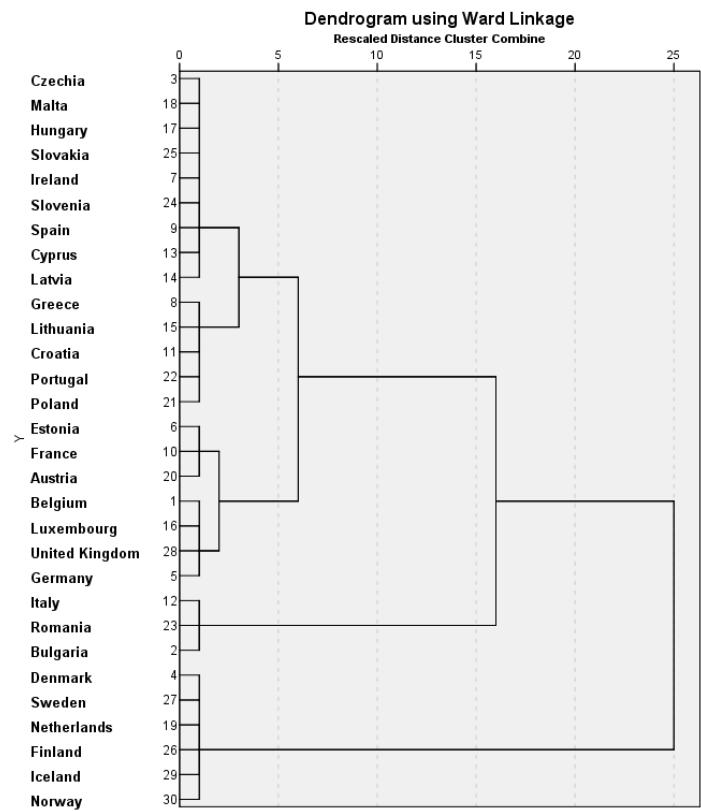


Figure no. 1. Cluster generation dendrogram using the Ward Linkage method

Source: elaborated by the authors using SPSS

Taking into account the appearance of the dendrogram and following the performed analyzes, a structure with six clusters was chosen. To test the statistical significance of the belonging of the variables to clusters and the averages of the variables recorded at the cluster level, the Welch and Brown-Forsythe tests were used, the results of which are presented in table no. 3.

Table no. 3. The results of Robust Tests of Equality of Means

		Statistic ^a	df1	df2	F _{0.05, df1, df2}	Sig.F
LAHI	Welch	17.286	5	8.775	3.6875	0.000
	Brown-Forsythe	15.680	5	10.772	3.3258	0.000
SIHDS	Welch	19.852	5	8.277	3.6875	0.000
	Brown-Forsythe	30.466	5	15.079	2.9013	0.000
DUII	Welch	35.047	5	8.777	3.6875	0.000
	Brown-Forsythe	44.272	5	8.588	3.6875	0.000
SPUIPA	Welch	63.614	5	8.216	3.6875	0.000
	Brown-Forsythe	69.002	5	13.543	3.0254	0.000
SEWHS	Welch	33.816	5	8.488	3.6875	0.000
	Brown-Forsythe	11.293	5	11.837	3.2039	0.000
SEWHR	Welch	4.560	5	8.534	3.6875	0.026
	Brown-Forsythe	4.876	5	15.894	2.9013	0.007
<p><i>a. Asymptotically F distributed.</i> Source: elaborated by the authors using SPSS</p>						

Given that the values of the Welch and Brown-Forsythe statistics are much higher than the critical values $F_{0.05, df1, df2}$, as well as the fact that $Sig.F < \alpha = 0.05$, it follows that the null hypothesis $H0_1$ is rejected and alternative hypothesis are accepted. Consequently, the averages recorded at the level of the clusters differ significantly, the use of the six variables in determining the characteristics of the clusters being relevant (statistically significant).

Based on this conclusion, the 30 countries were grouped into 6 clusters unevenly distributed (Table 4), noting that the fewest countries (3) are included in clusters 2 and 5, most of them (9) are included in cluster 3, the first cluster includes four states, the fourth cluster includes 6 countries, and the last cluster contains five states.

Table no. 4. The structure of clusters

Cluster	N	
1	4	Belgium, Luxembourg, UK, Germany
2	3	Italy, Romania, Bulgaria
3	9	Czechia, Malta, Hungary, Slovakia, Ireland, Slovenia, Spain, Cyprus, Latvia
4	6	Denmark, Sweden, Netherland, Finland, Iceland, Norway
5	3	Estina, France, Austria
6	5	Greece, Lithuania, Croatia, Portugal, Poland

The main characteristics of the clusters are highlighted and can be analyzed by means of the average determined at the level of each variable (table 5).

Table no. 5. Descriptive statistics of clusters

Variable	Cluster	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower	Upper		
LAHI	1	94.50	2.65	1.32	90.29	98.71	91.00	97.00
	2	83.33	3.79	2.19	73.93	92.74	79.00	86.00
	3	90.22	2.77	0.93	88.09	92.35	86.00	95.00
	4	96.00	1.41	0.58	94.52	97.48	94.00	98.00
	5	90.33	0.58	0.33	88.90	91.77	90.00	91.00
	6	84.20	3.77	1.69	79.52	88.88	80.00	90.00
SIHDS	1	67.50	5.69	2.84	58.45	76.55	61.00	74.00
	2	34.00	7.00	4.04	16.61	51.39	29.00	42.00
	3	52.67	6.02	2.01	48.04	57.29	43.00	62.00
	4	77.50	5.96	2.43	71.25	83.75	70.00	85.00
	5	61.67	4.51	2.60	50.47	72.87	57.00	66.00
	6	51.20	4.44	1.99	45.69	56.71	44.00	56.00
DUII	1	95.25	2.75	1.38	90.87	99.63	92.00	98.00
	2	74.67	4.16	2.40	64.32	85.01	70.00	78.00
	3	89.00	2.50	0.83	87.08	90.92	85.00	93.00
	4	97.33	1.86	0.76	95.38	99.29	94.00	99.00
	5	88.67	0.58	0.33	87.23	90.10	88.00	89.00
	6	80.00	2.74	1.23	76.60	83.40	78.00	83.00
SPUIPA	1	61.75	3.78	1.89	55.74	67.76	57.00	66.00
	2	21.00	7.21	4.16	3.09	38.91	13.00	27.00
	3	61.67	6.89	2.30	56.37	66.96	53.00	76.00
	4	89.50	3.33	1.36	86.00	93.00	86.00	94.00
	5	75.67	4.04	2.33	65.63	85.71	72.00	80.00
	6	47.80	7.40	3.31	38.62	56.98	41.00	58.00
SEWHS	1	17.08	6.71	3.35	6.40	27.75	7.40	21.70
	2	0.77	0.29	0.17	0.05	1.48	0.60	1.10
	3	5.60	3.96	1.32	2.55	8.65	1.20	12.90
	4	20.32	8.70	3.55	11.19	29.44	5.20	31.30
	5	13.77	1.81	1.05	9.26	18.27	12.10	15.70
	6	5.86	3.40	1.52	1.64	10.08	2.10	9.80
SEWHR	1	7.10	3.14	1.57	2.10	12.10	4.70	11.60
	2	1.63	1.71	0.99	-2.61	5.88	0.50	3.60
	3	4.28	2.17	0.72	2.61	5.95	1.20	7.00
	4	8.77	4.23	1.73	4.32	13.21	5.00	14.10
	5	7.90	1.73	1.00	3.59	12.21	6.80	9.90
	6	3.46	2.03	0.91	0.94	5.98	1.90	6.50

Source: elaborated by the authors using SPSS

From the analysis of the averages of the variables taken into account, a first observation is that for all six variables the highest values are found in cluster 4, respectively in the countries located in Northern Europe (Denmark, Sweden, Finland, Iceland, Norway) and Europe Northwest (Netherlands).

In 2020, according to Eurostat data, Iceland was the country with the highest percentage (98%) in terms of household internet access, 99% of citizens use the Internet, and a large proportion of Icelandic citizens (94%) use the Internet in relation to public authorities. The embrace of technological innovations by Icelanders can also have as a substratum the

national culture which overwhelmingly influences the behavior of the members (Wojćák and Baráth, 2017). An example of the integration of the digital by the civil society can be the Citizens Foundation, an Icelandic NGO founded in 2008, which promotes the democratic online participation of citizens in the government by designing and developing open access digital platforms. This virtual meeting place for citizens, which gives them the opportunity to ask questions and provide solutions to improve their communities, is a new dimension of citizen involvement which leads to real innovations and changes in behaviour (Bishop, 2014). In this regard, the non-governmental organization (Citizens Foundation, 2020) has as partners public authorities such as the World Bank, the Scottish Parliament and Reykjavík City Hall. On the other hand, the highest employment rates are found in the Nordic countries, so in 2019 Iceland recorded a share of 85.9%, and in the EU Sweden is distinguished with 82.1% (Eurostat, 2020a). The peculiarities of the Icelandic labor market are noteworthy: high qualification (39% of the active population graduated from a university) and membership in trade union groups (85%).

At EU level, Finland, Sweden, Denmark and the Netherlands are leaders in the digital performance (European Commission, 2020). Finland was the first country in the world to declare by an amendment which entered into force on the 1st July 2010 that broadband access becomes a legal right for all its citizens by the end of 2015. (ITU, 2010). Within cluster 4, Sweden has lower values for the use of the Internet for the interaction with the public authorities (86%), but is in the top 10 of the 15th ranking Waseda Digital Government (2020), Denmark being ranked 2nd in this ranking.

On the 1st October 2020, the governments of the Nordic and Baltic European countries adopted a joint declaration, Digital North 2.0 with ambitious goals in terms of consolidating the digital transformation, aiming to become the most integrated and sustainable region globally by 2030.

At the opposite pole of the digital performances recorded by the Nordic countries are the countries in cluster 2, countries located in Southern Europe (Italy) and Southeast (Romania and Bulgaria). The prevalence of telework in these three countries is very low by European standards. In fact, in the overall ranking of DESI for 2020 these countries are on the last four places next to Greece, ranked 27th out of 28 positions in the ranking.

The development of the information society has determined the accessibility of information and communication technologies to the general public, so that the percentage of households with Internet access has increased in all European countries analyzed, with the lowest percentages in Bulgaria (79%) and within the cluster 2 Romania has the highest percentage (86%). In Bulgaria and Romania the largest differences between rural and urban areas in terms of the percentage of households with Internet access were recorded (Eurostat, 2020b). Significant gaps in the basic digital skills of the human capital in the three countries of cluster 2 in 2019 (Bulgaria - 29%, Romania - 31%, Italy - 42%) are reflected in the low use of digital public services (Bulgaria - 27%, Romania - 13%; Italy - 23%). Even if investments have been made in the digital infrastructure in the countries in cluster 2, we can see that the simple implementation of digital tools is not enough for the optimal functioning of digital public services. The governments need to consider the skills of the human capital, both public sector employees and citizens, as the main measure for digital transformation. Unfortunately, a major common problem of the countries in cluster 2 is the “brain drain” to Western and Northern Europe, which contributes to the slowdown in the development of the digital economy. For example, according to the data provided by Eurostat (2020c) Romanian citizens of working age (20-64 years) are the most mobile citizens of the EU, in 2019 they represent 19.4% of Romania's population, while their Bulgarian neighbors had a share of 11.4%.

The second cluster presents countries whose digital performance is above the European Union average, so the positions occupied in the DESI 2020 ranking by these countries are: position 8 (UK), position 9 (Belgium), position 10 (Luxembourg) and position 12 (Germany). The average values recorded by cluster 2 are for four of the six indicators analyzed (LAHI, SIHDS, DUII, SEWHS) close to the average values recorded by cluster 4.

In contrast to the high values of household access to the Internet (97%) and the use of the Internet by individuals (97%) The United Kingdom has the lowest values in cluster 1 in terms of people who use the Internet to interact with the public authorities (57%). To improve this and remove user distrust, the Home Office and the Department for Digital, Culture, Media and Sports published on April 8, 2019 Online Harms White Paper, which is intended to be a regulatory framework for online safety, overseen by Ofcom. In December 2020, the British government published its full response to the Online Harms White Paper, which will introduce a bill on online safety in 2021.

Within cluster 1, Belgium has the lowest values on 2 indicators, namely household access to the Internet (91%) and basic digital skills (61%, slightly above the EU average of 58%). In order to improve the citizens' digital skills, the Belgian authorities have promoted and implemented several actions and projects, including: the #WallCode Digital Wallonia Project and the Federal "Digital Belgium Skills Fund" Program. Regarding the interaction of the citizens with the Belgian public authorities, on February 28th, 2019 a law was adopted which introduced an electronic mailbox, eBox (<https://myebox.be/fr>) which can be used by public actors in the process of communication with Belgian citizens, companies and registered organizations.

The number of countries which are part of the third cluster is 9, the largest of all 6 clusters (almost a third of the total number of countries studied). This is explained by the fact that, for this cluster, the recorded values are close to the average for all related indicators, which has led to a distribution of a larger number of countries for this cluster, which is at an average level in regard to the values of the indicators taken into account. However, the countries in cluster 3 are quite advanced in some digitization performance in the DESI 2020 ranking (European Commission, 2020a). Thus, in terms of the digitalization of the economy Malta ranks 5th and Ireland 6th, while others are quite backward (Slovakia is 23rd and Cyprus is 25th). Malta is also leading the way in replacing traditional cable networks with fiber optic networks (reaching over 90%) to improve the connectivity. At the opposite pole is Cyprus with a percentage of less than 20%.

Malta is the best placed country in cluster 3, with an above average performance on all indicators, especially in the field of broadband connectivity (as seen) but also in the development of the human capital due to the high share of ICT specialists and graduates, as well as the women's involvement in the digital sector. The Maltese Government has developed many strategies to guide its actions in the field of digitalization of the economy regarding: the use of artificial intelligence in business or administration; development of digital skills (proposing a National Coalition - eSkills Malta Foundation - bringing together representatives of the government, the industry and the education, to provide eLearning resources for students and businesses, stimulating teleworking), but also to develop the digitalization of public administration through a new plan called "Mapping Tomorrow" (Government of Malta, 2019).

Ireland is another country in cluster 3 with good digital performance, being ranked 6th in the EU, with a score of 61.8, compared to the EU average of 52.6 (European Commission, 2020a). Ireland does not have a good score on all indicators, being one of the countries with

a very large variation: 23rd place in connectivity, 11th place in terms of human capital, 1st place in digital integration and 9th place in the digitization of public services. Ireland continues to excel in integrating the digital technology, with 35% of Irish SMEs trading online, reaching 29% of their total turnover (almost 3 times the EU average). Irish companies also have a relatively high level of use of big data, cloud services and social media. The development of digitalisation in Ireland is reflected in various policy proposals from 2019. One of these, called Future Jobs Ireland 2019 (Government of Ireland, 2019), proposes a digitalisation approach to promoting innovation, increasing SME productivity and strengthening skills. Another strategy, the Irish Industry 4.0 strategy, is geared towards the production sector to adopt standardized digital technologies in terms of artificial intelligence or process automation. Strategies are also under way for local authorities to digitize services, provide high-level ICT skills and innovative technological investments in infrastructure.

Spain, another country in cluster 3, excels at connectivity / level of internet access (95%) as well as internet use (93%), moreover at EU level it ranks 11th in terms of digitization (European Commission, 2020a). In 2019, in Spain, only 4.9% of employees worked from home on a regular basis (CaixaBank Research, 2020). In order to protect the population in the current context, as well as to reduce the differences compared to the European average, the Spanish government legislated the use of telework in Spain in 2020.

In cluster 3, the lowest score is obtained by Cyprus, which ranks 24th in the EU. Although it has improved its results on all indicators, Cyprus is still below the European average. The Cypriot government has sought to improve indicators on the state of digitalization, implementing certain strategies since 2012, the most important being the Digital Strategy for Cyprus, which is in line with the objectives proposed by the Digital Agenda for Europe. In recent years, it has obtained the best scores for indicators of connectivity/ level of internet access and internet use. However, Cypriots still do not use the internet much (about one-eighth of them has never used it). Cypriot citizens also do not have the basic skills to use digital technology (about half of them) and this is reflected in the lack of ICT specialists which are greatly needed in the country.

An electronic survey was conducted in April and July 2020 by Eurofound (2020) to capture the living and working conditions of European Union employees during the COVID-19 pandemic. In this study, a significant gap was observed between employees from different European countries, so that one fifth (20%) of employees in Croatia, Poland, Slovakia, Bulgaria and Hungary worked exclusively from home, while more than 40% of employees in France, Spain, Italy, Ireland used telework. In countries such as Belgium, for example, the percentage was over 50%, and in countries such as Romania, Hungary, Bulgaria and Slovakia, employees preferred to continue their office work.

Within cluster 5, Estonia has the highest values of the variable for interaction with public authorities (80%), while France has a share of 75% and Austria 72%, well above the EU average (55%). Although it ranks among the EU countries with the highest digital performance in the DESI ranking, in the last five years Estonia has made slow progress in digitization (European Commission, 2020a). In terms of digital skills, in cluster 5, the gap is 5 percent between Estonia with the highest value (62%) and France with the lowest value (57%).

Within cluster 6, Poland has the highest values for the internet access indicator (90%), with Greece at the opposite pole with 80%. In fact, Greece, in the DESI 2020 ranking, occupied

the penultimate position, despite the increase in recent years in some indicators such as digital skills. In order to capitalize on the benefits that the Digital Single Market can bring, the Greek government launched in March 2020 a government portal (gov.gr) for the provision of digital public services modeled on the UK Government Digital Service portal. (OECD, 2020).

At EU level, there are many policies on the challenges of reaping the benefits of digital technology, with a reform of virtual space being launched by the European Commission on 15th December 2020, by establishing a common set of rules on digital services and markets to protect the fundamental rights, the competition and the economies of the Member States. (European Commission, 2020b)

The urgency of addressing the issue of improving the working conditions as a result of the activities performed on online platforms and ensuring adequate social protection was identified by the European Commission, which launched on the 24th February 2021 the initiative to consult the European social partners in this regard (European Commission, 2020c). The European pillar of social rights will be the key instrument in the field of skills, employment and social protection - objectives to be achieved by 2030 through the joint involvement of Member States, social partners and civil society.

Conclusions

The paper explores the adaptability to telework in 30 European countries, studying on the one hand the similarities and differences between them, and on the other hand how authorities implement national and European digital strategies and the involvement of all stakeholders (public, private sector, civil society) in the process of digital transformation.

The methodology used in the research allowed us to group the analyzed countries according to the variables related to internet access, user training level, level of digital skills of employees, level of habituation and acceptability of staff on the use of digital technologies, degree of use of the Internet in everyday life, in relations with public authorities and in working from home.

The results of the study show that there are large disparities in the telework adaptability, such as: poor adaptability (Southern and South-Eastern Europe), medium adaptability (Central Europe), high adaptability (Western and Central Europe), very high adaptability (Northern and Northwest Europe).

The results also suggest that the success of rapid adaptation to telework seems to be linked to the quality of digital skills. Rapid technological change is a real challenge for employees, who need to continuously adapt their skills to the new requirements. The employees' digital skills can be enhanced through corporate investments made in their training and the adoption of digital technologies and investments. On the other hand, supporting a digitally skilled workforce through policy tools and actions helps to build and deliver sustainable human capital.

The Nordic countries are at the forefront of the digital transformation process and can serve as role models for the other states in developing and implementing digital strategies, otherwise the use of inadequate policy tools will increase social inequalities.

The research undertaken has some limitations due to the lack of data and the assumption that telework can be addressed by all jobs which can be done from home. The key contribution of this research was not only to estimate the potential for adaptability to telework for 30 European states, to illustrate the problems and trends associated with telework, but also to act as a catalyst for further research on the impact that telework has on performance, productivity, environment and social relations.

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