RESEARCH ON THE IMPACT OF DIGITIZATION UPON WORK FLEXIBILITY: EXAMPLE FROM THE EUROPEAN UNION

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ABSTRACT

Technology is big influencer that has transformed the way work is being carried out today, triggering the development of numerous alternatives to the traditional fixed work schedules. Over the past ten years, more and more companies, from small to large-sized ones have decided to introduce new forms of employment, in order to attract and retain employees and to maintain focus on their core competitive functions.

The objective of this study is to determine the main dependencies between the progress made in information and communication technologies and the sustainability of new work types, such as homeworking, with various examples from the European Union. A comparative analysis was conducted by the authors on the investment of enterprises in building digital skills for their personnel.

Also the research will emphasize the importance of digital skills development, considering that the benefits of having a well-equipped workforce will help companies maintain a competitive advantage on the market, by extending their business and further reinvesting their profit in research and innovation.

KEYWORDS: *digitization, flexible workplace, homeworking, information and communication technologies*

1. INTRODUCTION

The constant development in information and communication technology, globalization and the increased mobility in the workforce are challenging the standard "nine to five" work schedule, triggering the development of numerous alternatives to the traditional fixed work schedule. What is more, there is hardly a multinational company in the 21st century that has not established some form of flexible work arrangements over the last decade.

The factors that triggered the emergence and expansion of flexible work are numerous, and trace back to many decades ago. In the opinion of Kamerman and Kahn (1987), the importance of paying attention to employees' needs is key component that influences productivity at work. Hence work flexibility is one of these requests and one of the biggest influences that can be considered catalysts for changes in the work environment is digitization. Technologies such as the cloud, laptops and mobile phones allow individuals to work anytime, from any location. A global study carried out in 2011 across 24 countries by the research company Ipsos for Reuters News emphasizes that one in five employees telecommutes frequently.

The continuous progress and diffusion of technology is a high priority in today's work environment. The rapid growth in communication and information technologies has led to the creation of different patterns of work, which are done in accordance to people's preferences. More and more

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enterprises establish such flexible work programs to remain competitive on the market and to be up to date with the progress made in technology. For these reasons, they also need to show openness and investment in keeping the digital skills of their employees up to date, as skills demand is changing rapidly globally.

This paper analyzes the notion of flexible work under the impact of digitization, with an attention to the way enterprises are investing in building digital skills for their employees, using examples from the European Union Member States.

In the digital era, the work environment is taking various paths of development and the revolutionary technologies are constantly raising new questions and are changing the traditional expectations. Data analysts and scientists, software and applications developers, digital transformation and new technology specialists are among the main new jobs which are based on the use of digitization and are set to experience increasing demand over the next years according to World Economic Forum's "Future of Jobs Survey" from 2018.

Given that technology is progressing so fast, the development of people's skills in accordance with this progress is inevitable. Digitization changed the nature of society and in the process of making the future work and continuing to have secure jobs, people need to be aware that their skills need to be upgraded as per the demands of the new emerging roles.

According to World Economic Forum, some skills will disappear, while new opportunities for new capabilities will be created. The skills that are declining towards 2022 are the ones in which machines and learning algorithms can replace the repetitive tasks of employees or in which technologies can amplify people's abilities.

This paper illustrates the fact that the expansion of digitization in the work field and the progress in information and communication technologies will continue to change the nature of future jobs flexibility and will increase mobility among workforce, allowing people not only to work from a different office than the traditional one, but to easily migrate from one country or region to another.

The authors proposed the following research objectives:

- To clarify the concepts of digitization and flexible work and present a literature review.
- To present the correlation between digital skills development and homeworking trends within the European Union Member States.

2. RESEARCH METHODOLOGY

In order to analyze the impact of digitization upon work flexibility in the European Union Member States, a comparative analysis was performed by the authors by looking at factors such as: cross-country homeworking tendencies and enterprises investment in building digital skills for their personnel. For data examination, several statistics from to the Eurostat database have been analyzed, which are focused upon flexible work arrangements, work-life balance and the digital skills development.

It is important to emphasize that work flexibility is employment policies aimed at regulating flexible work are emerging across the European Union. Shifting from traditional work schedules to non-standard work arrangements is directly linked to the progress achieved in the communication and information technologies and work landscape is expected to undergo further transformations. Thus, the development of work flexibility and the digital skills required to perform in a flexible environment are explored in this comparative study.

3. THEORETICAL UNDERPINNINGS

Taking into consideration that flexible working is rapidly spreading across various companies, many researchers in domains such as economics and management have started to give it increased

attention, observing the success and limitations of a flexible workplace and the effect flexibility can have upon overall organizational performance.

In 2013, Georgetown University Law Center established a public policy entitled "Workplace Flexibility 2000", that defines the flexible work arrangement as "*any spectrum of work structures that alters the time and/or the place that work gets done on a regular basis*".

Financial Times Lexicon acknowledges that there is a high diversity in labor patterns that emerged over the last years and defines flexible working as the one that "*gives employees flexibility in how long, when and where they work*". It also distinguishes between three main types of work flexibility: full-time, part-time and career flexibility.

According to Amigoni and Gurvis (2009), the employees that opt for flexible work have a variety of places where they can work from:

- Home office – option that can be chosen by workers whose work does not involve heavy equipment;
- Remote work center – an office that offers working experience to a place closer to employees' homes;
- Shared space – also known as "business centers" or "executive suites", allow employees even of different companies, to share the same office space, at different time intervals;
- Virtual office – allows employees to work from any location, as long as there is an Internet connection;
- Office hoteling – option that allows workers to rent space in a building, hotel, or any other location, for a particular amount of time.

The classification offered by the authors is very comprehensive and actual, as it is based on a thorough analysis of the key locations that can enable an efficient flexible work program.

The Business Dictionary takes into account the impact on both employer and employee and defines job flexibility as "*a work practice that allows the employees a certain degree of freedom in deciding how the work will be done and how they'll coordinate their schedules with those of other employees*", emphasizing the importance of ensuring that there is a core work schedule during which people are requested to be present.

To further expand upon the understanding of flexible work and its connection to digitization, we can add that it refers to the ability to work from any location, from home for instance, using information and communication technologies and access to the Internet to perform job activities (Eurofound, 2015). The dynamic flexible work environment is continually being enhanced, considering the needs of companies and employees worldwide. Flexible work, in one form of another, is nowadays essential to individuals, as more and more of them want independence and choice. While the factors that enabled the development of flexible work are plentiful, digitization is one of the main ones that triggered the emergence of numerous work patterns. According to Gartner IT glossary, digitization can be defined as "*the process of changing from analog to digital form*". It is important to specify that digitization has caused a major transformation in the perceptions of employers and employees as far as work forms are concerned, which means that the traditional ways of employment, with fixed schedules and contracts, are no longer the only efficient and effective way of obtaining successful business results. Furthermore, as per TDK Technologies, a Missouri based technology company, hiring practices are changing and recruiters are no longer looking at the word "permanent", as today's job market offers countless employment possibilities that people can choose from. On top, employes today value work flexibility, as it allows them to establish a balanced work-life system. The progress of information technology and digitalization changed the jobs significantly during the last 50 years and an increasing percentage of computer-mediated work is expected to develop across many industries. According to Jonscher (2000), we are now all living in a wired world and Deegan and Tanner (2002) indicate that the developments in the digital data creation and transmission radically are changing the way many organizations do their

work. The rise of the digital era creates new work opportunities and models, increases internalization and poses new economic and strategic problems for enterprise leaders across the globe, as they continually need to be up to date with the technological advances and with the employees' needs and wants. According to Eurofound's research report from 2015, new forms of employment are emerging and reshaping the future work patterns across European countries, relying on mobility and strong support of information and communication technologies. The ever-growing interest in digitization is continually transforming the contemporary work patterns and some of the biggest professional services companies around the world identify technology as a key "force" shaping the work environment of the future.

4. RESEARCH RESULTS

The European Union is a story of contrasts when it comes to the investments of enterprises in building digital skills for their employees, as well as to the homeworking patterns across each of the Member States. Several groups can be distinguished in terms of digital skills investments: the enterprises from Northern and Western Europe are investing the most in building digital skills, Central Europe is rising as well, while South East Europe falls behind the rest of the EU countries on this matter. Understanding the degree of investment in developing digital skills in the workplace is very important, as these competencies lead to increased efficiency and productivity. Furthermore, digital skills are directly linked to the possibility of opting for flexible work, as a proper knowledge of using technology and access to the Internet are necessary for performing work away from a traditional office.

4.1 Research Results on the Digital Skills in the European Union

The attention given to technology and digitization is nowadays increasing constantly. As technological revolution intensifies, the development of digital skills becomes crucial for individuals. While the use of digital skills was impacting only a number of industries a few decades ago, nowadays they are present across the majority of industries (Berger & Frey, 2016). Most of today's occupations require employees to have digital skills, and these can range from basic competencies, such as using email, social media and Microsoft Office knowledge, to more advanced ones such as programming and software design or more expert skills, such as designing ICT architecture. Using the job requirements approach of OECD and CEDEFOP, the European Commission compiled a set of three levels of digital skills, shown in Table 1.

Table 1: Levels of digital skills

Basic digital skills	- Use a word processor (e.g. Word) - Create a spreadsheet (e.g. Excel) - Search for, collect and process information using ICT (e.g. online/Internet) - Communicate through ICT using email - Communicate through ICT using social media, Skype/videocalls
Advanced digital skills	- Use software for design, calculation or simulation - Program and use CNC machines - Program and use robots
Specialist digital skills	- Undertake programming and software development - Design and maintain ICT architecture for the workplace

Source: authors, based on Curtarelli et al, ICT for Work: Digital Skills in the Workplace, carried out for the European Commission, 2016, p. 62

Examining the cross-country 2014 – 2018 trend of enterprises that ensured trainings to develop digital skills for their workers, it can be observed that the average percentage for the 28 EU Member

States remained steady, registering a very small growth from 2014 to 2018, from 21% to 23%. The countries from Northern and Western Europe are among top EU countries that stand out as investing the most in developing competencies, Finland, Belgium, Austria, Ireland and Germany being the top five states. On the other side of the spectrum, among the countries in which there were less enterprises that trained their personnel invested a lower effort are Poland, Latvia, Bulgaria, Lithuania and Romania, and no big increases have been noticed from 2014 to 2018. It can also be identified that the enterprises from certain countries invested more in developing ICT skills in the past that they are investing in the present. Some examples are: Finland, where in 2014 the investment was 40%, while in 2018 dropped to 36%, Austria, which decreased from 34% (2014) to 27% (2018), Sweden from 27% (2014) to 24% (2018), Portugal from 26% (2014) to 19% (2018), Bulgaria from 15% (2014) to 9% (2018). The enterprises from most of the EU countries however invested efforts in increasing the trainings to develop ICT skills. Consequently, comparing the years 2014 to 2018, some of the most notable increases can be noticed for Slovenia which rose from 20% to 29%, Malta from 21% to 26%, Netherlands from 18% to 26%, and Italy from 10% to 17%. The trend of investment in building ICT skills by enterprises in the EU Member States during the last five years (2014 -2018) can be seen in Table 2.

Table 2: Percentage of enterprises that provided training to develop digital skills for their personnel, 2014-2018

Finland	40	37	34	38	36
Belgium	33	32	34	35	36
Austria	34	33	37	31	27
Ireland	25	30	30	30	30
Germany	31	30	29	28	30
Denmark	30	29	28	27	28
United Kingdom	24	27	28	26	28
Slovenia	20	28	27	27	29
Sweden	27	26	25	28	24
Luxembourg	22	25	29	28	27
Cyprus	22	23	22	26	26
Croatia	23	25	22	23	24
Malta	21	25	23	26	26
Czech Republic	22	22	22	23	25
Portugal	26	22	23	21	19
European Union - 28	**21**	**22**	**22**	**21**	**23**
Spain	22	22	23	23	21
Netherlands	18	18	22	24	26
France	21	21	20	19	19
Slovakia	17	19	20	17	18
Hungary	16	16	16	17	17
Greece	11	15	15	12	14
Estonia	14	14	13	13	13
Italy	10	12	12	13	17
Poland	10	12	12	12	13
Latvia	11	12	12	10	11
Bulgaria	15	8	8	9	9
Lithuania	9	11	10	11	9
Romania	5	5	5	4	5

Source: authors, based on Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_ske_ittn2&lang=en

The majority of EU countries have more than 50% of their individuals equipped with digital skills, more precisely, 19 nations, out of 28. The overall level of digital knowledge in households reflects the proportion of candidates in the work field as well, as the better the people are skilled in digital knowledge, the easier it will be for them to get hired and obtain better wages.
The yearly trend (2015-2016) of individuals' level of digital skills can be visualized in Fig. 1., which shows a very small but steady growth from one year to another.

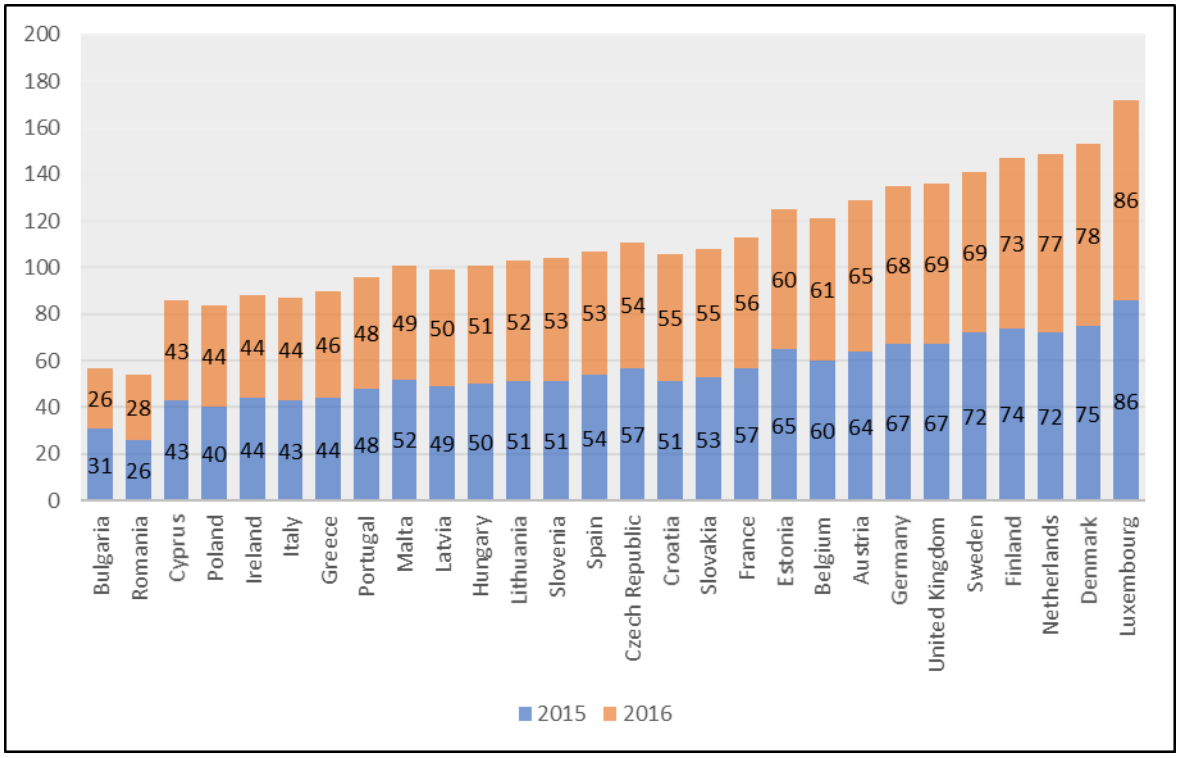

Figure 1: Trend in individuals' level of digital skills in EU – 2015-2016
Source: authors, based on Eurostat,
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_i&lang=en

4.2 Research Results on the Flexible Work trends in the European Union

According to Tredup (2016), the importance of work-life balance has become a significant factor for employees when looking for a job, as people want to have independence in choosing their work location and their schedule as well. Additionally, digitization is allowing individuals to easily connect anytime, from any place, with the help of mobile devices. Telecommuting has consequently gained increased popularity and a high number of workers are embracing the benefit of working from home, using a computer and the Internet to perform their job activities.
The most frequently used type of flexible work arrangement in the European Union is work from home, which only has as requirements a good connection to the Internet and a laptop and phone to communicate with the colleagues from work.
The overall trend in the EU Member States illustrated in Fig. 2 indicates that the percentage of individuals working from home over grew slowly, but steadily from 2009 to 2017. Consequently, in 2009, the percentage of individuals working from home was at 12.2%, while in 2017, it rose to 14.7%.

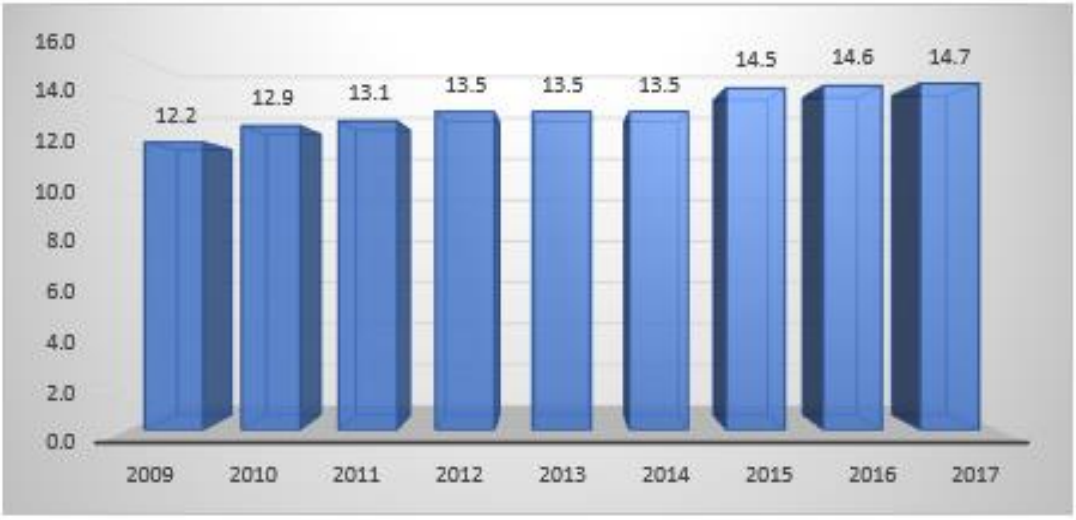

Figure 2: Percentage of employed adults working at home by gender, age groups and number of children – 2009-2017

Source: authors, based on Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhwahchi&lang=en

Fig. 3 illustrates the homeworking patterns in the EU based on gender. While there are no major differences between genders, it appears that men are slightly more inclined to work from home than women. This can be explained by the fact that the industries which allow work flexibility are usually form IT, which tends to still be male-dominated.

As far as the proportions are concerned, these have been constant over 2009-2017, small yearly growths can be noticed both in the percentages of men and of women. The percentage of females increased from 11.9% in 2009 to 14.5% in 2017, while the percentage of males working from home increased from 12.4% in 2009 up to 14.8% in 2017. Furthermore, while in 2009, the gender gap was higher (11.9% females vs 12.4% males), by 2017 it was brought more to a balance (14.5% females and 14.8% males).

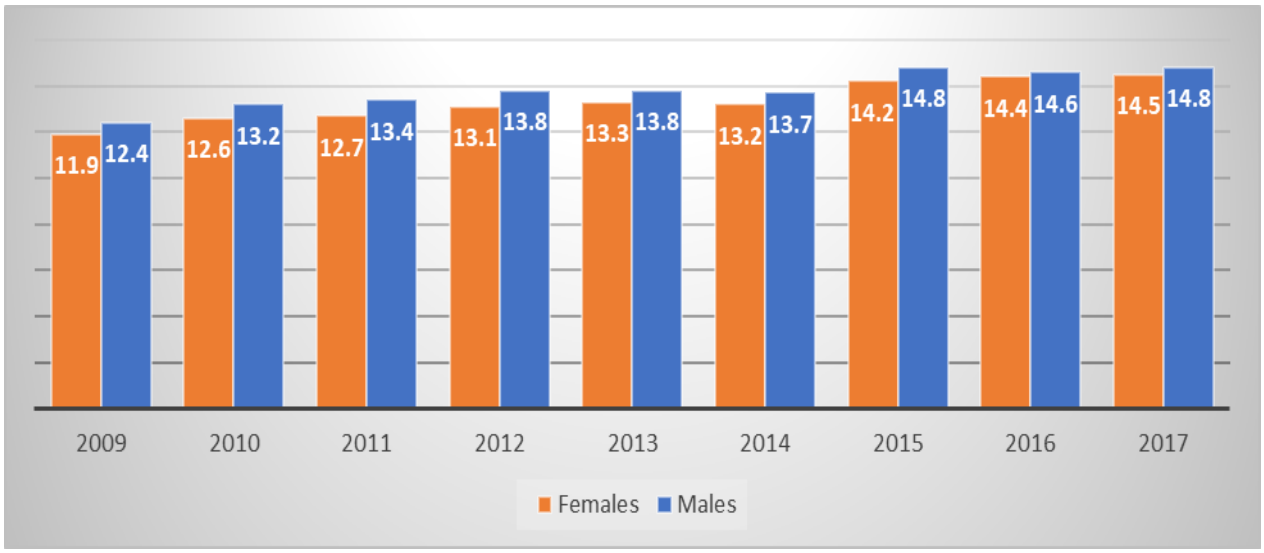

Figure 3: Percentage of employed adults working at home by gender– 2009-2017

Source: authors, based on Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhwahchi&lang=en

The percentages of employed adults working from home based on the age of children is illustrated in Fig. 4.

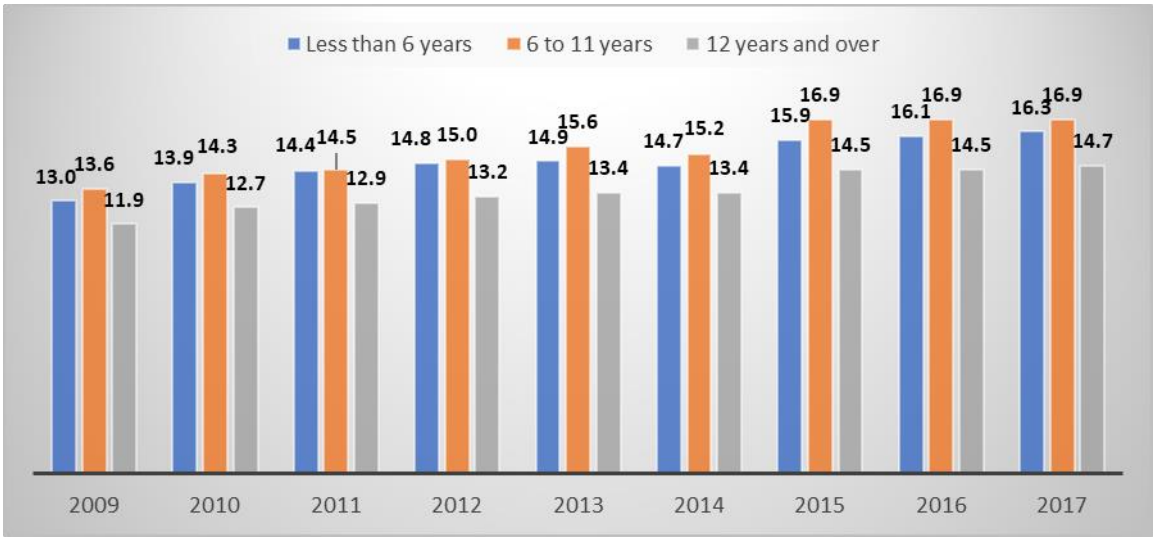

Figure 4: Percentage of employed adults working at home by age of children
Source: authors, based on Eurostat,
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhwahchi&lang=en

Examining the trend of employees' homeworking based on the age of their children, several categories emerge:

- Work from home is most frequently used by parents of children aged 6 to 11 years. The rate of adults from this category rose from 13.6% in 2009 to 16.9% in 2017.
- The second category of adults working from home are parents of children which are less than 6 years. The average for this group rose from 13% in 2009 to 16.3% in 2017.
- The third category and the one in which parents work from home less compared to the other groups belongs to the ones which have children of 12 years and over. The overall score across the EU rose from 11.9% in 2009 to 14.7% in 2017.

The comparison of adults working at home in the EU based on the number of children is shown in Fig.5.

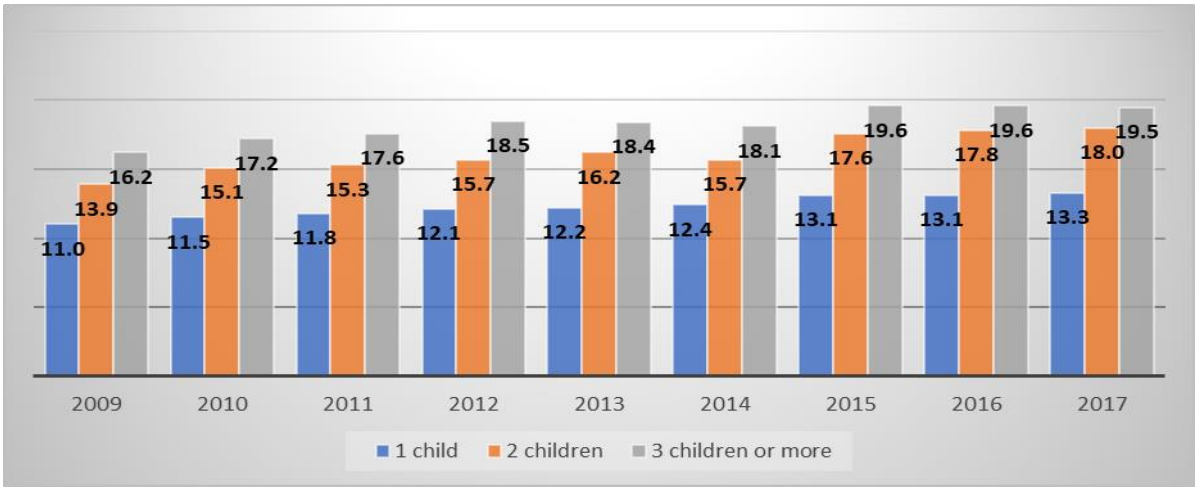

Figure 5: Percentage of employed adults working at home by number of children
Source: authors, based on Eurostat,
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhwahchi&lang=en

The trend in working from home has increased progressively year after year for each category, parents of one child, two children and more than three children, with the exception of one year (2014), when a small decrease was registered. Furthermore, homeworking is most mostly used by parents with three children or more (19.5% in 2017). Is also frequent in the case of parents with two children (18% in 2017), while parents of one child tend to work less from home (13.3% in 2017). Overall, adults with more than two children are more inclined to opt for homeworking than parents of a single child.

6. CONCLUSIONS

The study illustrates the link between homeworking and the digitization trends in the European Union, overall, by country split, by gender and number of children. As globalization is becoming more widespread and technology continues to evolve, the nature of future jobs will change as well. Flexible work is connected with an improved quality of life, allowing for instance families with children to manage their schedule in a way in which they can balance their child care responsibilities and obtain a better work-home balance.

The research also disclosed that flexible work arrangements are present across all European Union Member States and that those enterprises that exhibit adaptability to the needs and wants of the market and of the employees, are also the ones that succeed. While there is no general matrix on how enterprises should develop flexible work programs, there are certain aspects that need to be taken into consideration, using as example the companies that managed to be successful in this respect.

It was identified in the study that the countries which invest the most in digitization and in building information and communication technology skills with their employees are also the ones with the highest rates of adults working from home. The enterprises from Western and Northern European countries invest the biggest efforts in ensuring trainings for their employees to digital upskilling, while the ones from Central, South and South East Europe registered the lowest investments in training their employees on digital competencies.

The alternatives of working away from the traditional office has gained increased popularity among the EU enterprises and homeworking is the preferred flexible work alternative across the Member States. In 2017, 14.7% of individuals were telecommuting in the EU and no major gaps were noticed in terms of gender distribution, the percentage of men working from home being very close to the one of women (14.8% versus 14.5%). Furthermore, it was identified that parents of a child or more are more inclined to work from home more compared to parents which have no children.

Consequently, observing employees' interest in job flexibility and their need of work-life balance, enterprises should seek to grow and regulate flexible work arrangements (homeworking, flexible working hours, part-time work etc.). According to researchers, the jobs that offer employees flexibility, are also the ones where reduced absenteeism and health issues are noticed.

The results of this study may contribute to enterprises that are looking to obtain improved performances and that want to remain competitive on the market as far as recruitment process is concerned. An important aspect that will make a difference regarding the jobs of the future is for companies to constantly up to speed with the latest technological innovations and to invest in building digital skills for their employees, as there is a high demand for mobile, international jobs.

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