

Digital age

**Further exploring the working
conditions of ICT-based mobile
workers and home-based
teleworkers**

[Working anytime, anywhere: The effects on the world of work](#)

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Introduction

New information and communication technologies (ICTs) have revolutionised work and life in the 21st century.

Advances in digital technology have led to an expansion in the use of ICT to enable working anytime and anywhere. The use of smartphones, laptops and other mobile devices as tools for work has increased, driven by the need of companies for higher productivity and improved performance, as well as by employees' needs of spatial and temporal flexibility, in order to help them balance work demands with their family and other personal responsibilities. Eurofound and ILO have named this form of work 'Telework/ICT-Mobile work (TICTM)'. The phenomenon can also contribute to reducing pollution in major cities by reducing commuting traffic and to the inclusion of some groups in the labour market that otherwise could not work. This is, for example, the case of people caring or those with health problems (Eurofound and ILO, 2017).

This is just one sign of the digital revolution. A revolution that can be defined as a general acceleration in the pace of technological change in the economy, driven by a massive expansion of our capacity to store, process and communicate information using electronic devices. Although some of its key underlying technologies and scientific foundations were developed between the 1950s and 1970s, the 'big bang' of innovations and applications of digital technologies was triggered by the invention of the microprocessor in the early 1970s – a general-purpose programmable electronic device capable of processing digital information. The continuous increase in performance and decrease in the cost of microprocessors over the next four decades facilitated a very rapid spread of different digital technologies, such as the personal computer, the internet and mobile phones (Eurofound, 2018a).

The use of ICT at work and outside the employer's premises for work purposes is part of the digitalisation of work. Digitalisation of work can have consequences for work and employment. Of interest for this working paper is the capacity of digital technologies to enable a more flexible production and service provision, based on the fact that in the digital era, often there is no need for a fixed workplace and therefore employees can potentially work anywhere and at any time. This is related to accessibility of information at all levels and points of the economic process, bringing a potential for changes in the work organisation.

This working paper will not deal with the technological aspects of the digitalisation of work but with how the use of those technologies have changed work organisation and how they are directly or indirectly associated with some working conditions.

For example, ICTs have facilitated flexible forms of work organisation. However, the working conditions associated with TICTM are not (only or necessarily) a direct consequence of the technology used for work, but a result of the interaction between the technological change and the institutional context.

In this context, the bulk of research on the topic recognises that implementing TICTM arrangements can potentially offer a range of flexibility benefits for both individuals and organisations (Lee, 2016; Nicklin et al, 2016; Raffaele and Connell, 2016). Nevertheless, research is extensive but seldom conclusive regarding the actual benefits and drawbacks

associated to TICTM work. Most of the evidence gathered is paradoxical and contradictory in nature (Boell et al, 2016).

Recent Eurofound findings showed that workers who use ICTs intensively and are mobile have greater working time autonomy. For this reason, TICTM can facilitate balancing work and family demands. However, the promises about ICTs making our lives easier with positive effects in our living and working conditions have not taken effect for all. Moreover, there are some risks for deterioration of working conditions associated with the use of ICTs or more accurately with some of the work arrangements in TICTM. TICTM can lead to longer working hours and to work in the evenings and weekends, resulting in blurring boundaries and increased interference between work and private life. Negative impacts on work-life balance are largely due to remote work which supplements office-based work. This work pattern implies working at home beyond contractual working hours, usually as informal and unpaid overtime.

Gendered patterns are found: women tend to use more often the possibilities of new technologies to combine work and family obligations, mainly by teleworking from home.

The typical working conditions of TICTM can also have consequences for the health and well-being of workers. Stress, sleeping problems and perceptions of negative impacts of work on health occur more often among high mobile workers and home-based teleworkers. However, those working only occasionally with ICTs outside the employer's premises seem to report better levels of well-being.

All these elements have been researched in Eurofound and ILO (2017) and Eurofound (2015). This working paper will explore some additional elements related to the working conditions of TICTM based on further literature review and analysis of the European Working Conditions Survey (EWCS2015). It will start explaining the concepts used, followed by recent approaches found in the literature on TICTM.

Aspects of work organisation as well as their consequences for intensification of work, autonomy, learning and career prospects will be explored more in-depth¹. As working time in TICTM has been profoundly studied before (Eurofound and ILO, 2017), this report will add some additional considerations which complement and support previous findings.

For this working paper the categorisation of TICTM as drawn from the EWCS for the analysis of Eurofound and ILO (2017) has been slightly modified. Self-employed TICTM and those working very often with ICTs at employers' premises have been included in the analysis. For this reason, some analysis of Eurofound and ILO (2017) is replicated, and results should not be directly compared. Another aspect considered in this working paper is the national context. It influences the development of this work arrangement and therefore the paper attempts to compare differences by country in relation to the job quality indexes elaborated by Eurofound using the EWCS (Eurofound, 2017).

¹ Health and well-being effects are included in the paper. However, a specific analysis on the topic will be developed in the framework of another Eurofound project in 2019 and included in a consolidated report on TICTM in the same year.

Finally, it is important to acknowledge that this form of work might be a choice for some workers but not for others and that working conditions will be different depending on occupations and sectors. However, the analysis shows that regardless these differences, TICTM influences working conditions of workers in Europe.

Conceptualisations related to the use of ICTs for work purposes

This section reviews and analyses the different concepts used in the literature to reflect the impact of the so-called Information and Communication Technologies (ICTs) on work arrangements involving a variety of working time adjustments, workplaces and mobility patterns and, more generally, on the tasks, activities, jobs and employment relationships associated with digitalisation (Degryse, 2016).

Telework is a prevalent concept in empirical research for referring to work arrangements outside employers' premises enabled by ICT. As explained by Messenger and Gschwind (2016), the terms telecommuting and telework, originated in Jacks Nilles' (1975, 1988) and Alvin Tofflers' analysis (1980), refer to processes where work could be relocated to employees' home thanks to new technologies such as computers and telecommunication tools. While the term telecommuting mostly focused on reducing commuting times, an issue especially problematic at that time in the United States (Nilles, 1975), the term 'telework' subsumed this aspect (Nilles, 1988, Toffler, 1980). In this sense, Messenger and Gschwind (2016) perceive an evolution from telecommuting to telework, despite the fact that both concepts are usually treated as synonyms in the contemporary literature. Compared to telecommuting, telework included, in the framework of a narrative characterised by an optimistic vision of the effects of technology on working and living conditions, additional advantages beyond reducing commuting time and related costs such as decreasing pollution or even favouring the creation of new industries.

The literature produced in the 1980s and early 1990s, influenced by Nilles' and Tofflers' early analyses as well as pioneer work arrangements promoted by California-based companies in the 1980s, focused on telework understood as home-based work carried out by a standard employee. At that time, the concept referred thus to a form of remote but stationary work because the first generation of ICTs did not allow mobile work. Three decades later, however, the spread of cheaper, smaller and increasingly connected devices, like smartphones and tablet computers (new ICTs) accompanied by a vast dispersion of the Internet and the World Wide Web, has favoured a diversification in the way ICT-enabled work is performed, organised and regulated. Due to this, the understanding of telework as 'work from home' carried out by a standard employee falls short. Over the past decade the concept of telework has been increasingly contested by the proliferation of new terms referring to a variety of forms of ICT-enabled mobile work which partly overlap. At the same time, it is worth stressing that in many articles (for example in Beauregard and Basile, 2016; Biron and Veldhoven, 2016; Boell et al, 2016; Chen and McDonald, 2015; Collins et al, 2016 and Coenen and Kok, 2014) and in some national contexts (for example, Estonia), the term telework is mostly used for any kind of work performed outside of the employer's premises, not specifying the place and nature of the task performed. Moreover, there is an underlying understanding that the work done through telework mostly uses ICT-devices and does not

have to be done from home. Thus, the term telework is closely related to ICT-based mobile work in contemporary articles.

However, other concepts used to refer to work done with ICTs and work organisation can complicate this field of study and therefore further explanation is needed. Bearing this in mind, it is worth clarifying the variety of concepts which refer to the variety of work arrangements enabling working 'anytime, anywhere' through the use of the new ICTs as a preparatory step to analyse their outcomes regarding working conditions.

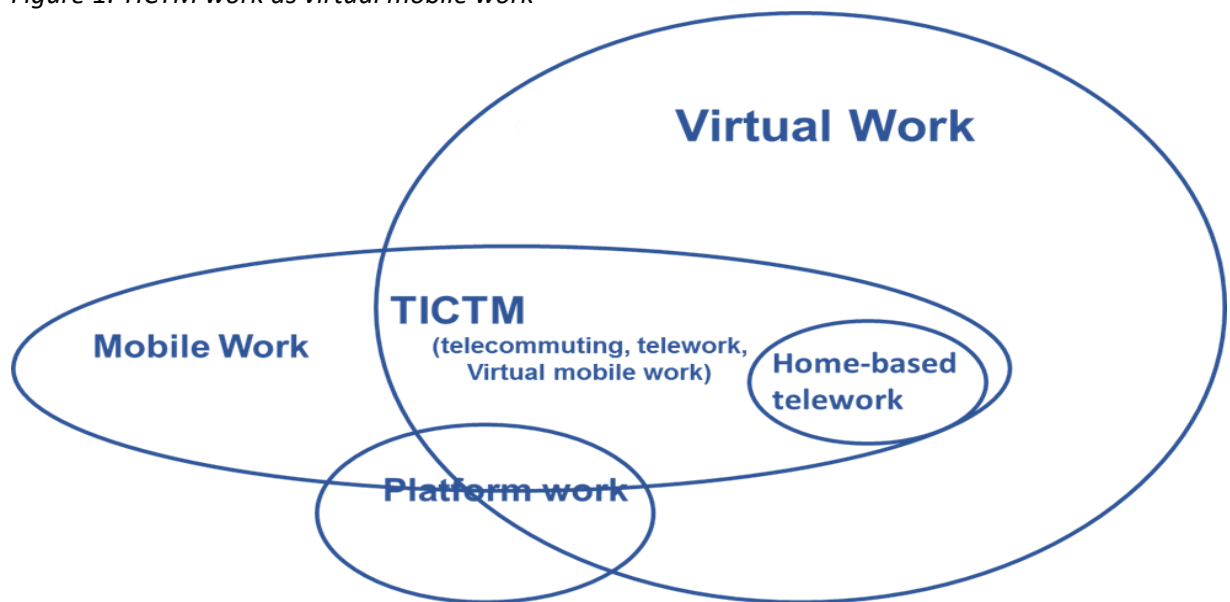
Table 1 in the Annex summarises the main definitions gathered from the literature review: from the well-established concepts of telework and telecommuting to the most recent concepts of virtual work and mobile virtual work, including concepts related to the emergence of the so-called 'platform work' (and other connotations used for this type of employment).

Three key analytical dimensions can be identified in relation to these concepts and terms formulated to approach the transformation of work practices due to the effect of ICT (Lee, 2016):

- Technology: the use of the distinct concepts is related to different stages in the development of ICTs over the last four decades;
- Time and place (working time and workplace flexibility): the adoption of these technologies in work environments has enabled new working time arrangements for the workers concerned, as well as a variety of feasible workplaces and mobility patterns;
- The nature of tasks (knowledge intensity, knowledgification, projectification or virtualisation) and the forms of employment relationships involved.

The concepts of telecommuting, telework and ICT-mobile work mostly deal with the first two analytical dimensions. In fact, recent definitions of telecommuting and telework are similar to the concept of TICTM work used by Eurofound and ILO (2017). The focus is placed on flexible work arrangements (time and place) enabled by the use of new ICTs. This is also the case of less common terms such as e-nomad (which suggests high spatial mobility) and smart work (a term that entails a positive connotation as 'convenient' and 'efficient'). Alternative concepts such as virtual work also encompass these two dimensions (technology and time/place) but additionally refer to changes in the organisation of work fostered by ICT, in the nature of tasks and, to some extent, in the employment status. In most approaches, the focus of virtual work lies on jobs and activities which use a combination of digital and telecommunication technologies and/or produce content for digital media - regardless of time and place flexibility (Webster and Randle, 2016; Meil and Kirov, 2017). Besides, it is worth noting that debates around changes in employment relationships are also related to the virtualisation of the organisation of work, especially as regards the emergence of platform work, a term which encompasses different forms of paid work mediated by an online platform (Eurofound, 2018b). In most of the definitions, platform work does not explicitly address the time-place dimension although at least some forms of platform work relate to a very flexible work arrangement in terms of time and space by using ICTs. Therefore, some platform work would be included in the definition of TICTM.

Figure 1: TICTM work as virtual mobile work



Source: Unpublished literature review by NOTUS for Eurofound.

Attending to the dimension of place and time flexibility, there is no universal definition. Overall, most of the concepts tend to adopt a comprehensive approach, covering all potential feasible workplaces and time arrangements. As far as virtual work is concerned, its distinguishing feature is that it focuses on 'virtual workplaces' instead of physical locations and mobility patterns, although these virtual workplaces enable a flexible work organisation in terms of time and location.

Next to the spatial and working time flexibility, the adoption of new ICTs is also related to changes in the nature of tasks and activities carried out as well as the emergence of new forms of employment located in a blurred area between employment contracts and self-employment. These transformations have been more often addressed under the concepts of virtual work and platform work (Valenduc and Vendramin, 2017). Indeed, most of the conceptualisations of telework, telecommuting, e-nomad, TICTM work, etc. do not specifically address any changes related to the content of work or its employment status. Thus, they cover all work activities as far as they involve to some extent the use of ICTs for the purpose of work outside the employers' premises or the self-employed own premises. The only distinction is that while some concepts only cover employees, others include also the self-employed.

In contrast to that, in the contest of virtual work, the kind of tasks or activities carried out is an issue discussed. The main question concerns whether traditional work activities which are recruited and organised via online platforms or apps but do not involve the use of ICTs for performing the work (for example, cleaning, food delivery, etc.) should be considered as virtual work, as found in some publications (Vendramin and Valenduc, 2016). Shedding some light on this, Huws (2017) makes a distinction between virtual work and the virtualisation of work organisation. While virtual work refers to labour that is carried out using a combination of digital and telecommunications technologies and/or produces content for digital media, virtually organised work refers to work which is, for example, managed via online platforms. As explained by the author:

'When work is organised virtually, that is managed via online platforms, virtual work is, of course, involved in the development of systems and software, the management and maintenance of websites, the development of digital content, the processing of financial and security checks (...). However, many of the workers being managed by such platforms are performing work that is anything but virtual – involving the production of material goods or the delivery or real services in real time and space to actual customers physically and in person' (Huws, 2017:31).

Bearing this distinction in mind, Huws confirms that platform work may cover activities that do not meet the criteria to be qualified as virtual work.

Concerning the nature of tasks and activities, literature normally associates the concept of virtual work with managerial, professional and technical occupations, especially in traditional knowledge- and technology-intensive services and the new industries involved in the production and communication of digital contents, such as online journalists and broadcasters, apps and game developers, etc. (Brenke, 2014). It is also noted that other occupations such as clerical support and sales workers are experiencing an extension of ICT use (Eurofound and ILO, 2017). From a conceptual perspective, parallel to the extension of ICT-enabled work to a larger share of workers across different occupations and sectors, the emergence of intrinsically virtual work, understood as work which produces digital content and/or can only be carried out through virtual work spaces, is highlighted (Webster and Randle, 2016). An additional feature related to the virtualisation of work organisation is the enhancement of team work on project-by-project basis, usually related to the establishment of virtual teams where spatially dispersed workers collaborate throughout the project lifespan (Tworoger et al, 2013).

As regards employment relationships, it is worth noting that the definitions of virtual work formulated by some authors (Huws, 2017; Meil and Kirov, 2017) include both paid and unpaid work. From this approach, virtual work also encompasses digital activities of a blurred nature, in between work and consumption, which are not recognised as formal employment and are thus unpaid, such as those carried out by users of social networks and other forms of peer-generated content. For some authors, these so-called online 'prosumption' activities (Toffler, 1980) (for example, forms of user-generated content such as journalist's blogs which are blurring the lines between professionals and amateurs or even internet users rating content and contributing to generate value) are considered as a further form of virtual work as long as they contribute to generating value to the services provided by online platforms or social networks (Webster and Randle, 2016). On the contrary, such unpaid activities would fall outside the scope of concepts such as telework and TICTM.

The diversity of employment relationships is explicitly addressed under the concept of platform work, which generally refers to 'different forms of paid work' (Huws et al, 2016). Some platform workers are established freelancers or self-employed professionals who have converted to this form of intermediation in order to maintain or expand their clients. On the other hand, many people engage in this type of work to supplement their incomes from another paid employment (De Stefano, 2016).

In a nutshell, this section shows that there is a diversity of terms used in the literature. There is no universal definition and, in consequence, inconsistencies in the literature concerning

what qualifies as telework and ICT mobile work, etc. may appear. The next section explains the concept of TICTM used for this working paper, which has been developed from the perspective of the flexibility of work in relation to time and place facilitated by ICTs. Therefore, the emphasis is put on working anywhere, anytime and not on the employment relationship or the nature of tasks.

TICTM as a work arrangement

TICTM is a comprehensive concept that overlaps with others used in the literature (see above). It is a work arrangement characterised by working with ICTs from more than one place (with different degrees of mobility) and with a potential for flexibility as regards time and place of work.

Examples of TICTM include the work developed by office workers that also work in other places like cafes and the work carried out with ICTs mainly from home. It also comprises virtual work carried out through platforms when this is done from different locations, the work performed by freelancers using ICTs in more than one place or sales persons with high degree of mobility, etc. They all have in common working often with ICTs in more than one place.

Following this concept and for the purpose of the statistical analysis of the EWCS, the working paper will differentiate between different types of TICTM based on the degrees of mobility, places of work and employment status. Therefore, workers will be classified in different groups of employees:

- those working frequently with ICTs from home (mainly but not exclusively);
- workers using often ICT with high level of mobility and finally;
- workers using ICT only occasionally from other locations different from the employers' work place;

Moreover, this working paper differentiates between employees and self-employed. Due to the scarce literature and the limited number of cases of TICTM self-employed in the EWCS, this paper will mainly refer to 'TICTM self-employed' as a whole group, without a differentiation by degree of mobility or place of work and for comparative purposes the category of 'self-employed working from a fixed location' has also been created. In relation to the employees an additional group has been created: those working often with ICTs at employer's premises. In this way the paper explores the specific effect of ICTs while working always in the employer's premises by comparing this group with those using only sometimes or not using at all ICTs at employer's workplace (see Table 1).

Even though some groups have been differentiated in relation to use of ICTs and mobility, a large degree of heterogeneity (in terms of jobs for example) is found within TICTM which can have implications for the results on working conditions and outcomes. However, since they all have in common the use of ICTs and some degree of temporal and place flexibility their working conditions will be influenced, at least, by these two important traits. For example, an employee working through a platform can have similar conditions as a project manager working in an office and outside the workplace or a freelance journalist because in all these cases workers use ICTs and might be to some degree mobile and as a consequence their work experience involves some degree of temporal and spatial flexibility.

Finally, it should be borne in mind that neither the use of ICTs nor the mobility of the work determines all working conditions and their outcomes. It is mainly the interaction of the institutional aspects and characteristics of the employment relationship with the use of technology what configures working conditions. Digitalisation and ICTs offer possibilities that did not exist before, in terms of advantages of processing, storage and communication of digital information and temporal and spatial flexibility. However, it is up to employers, workers and the institutions to shape TICTM and their working conditions and outcomes.

Table 1: Categories of TICTM operationalised for the analysis of the EWCS

Employment status	Category	Frequency of use of ICT	Place of work/frequency
Employees	High mobile work – employees	High	At least in two locations several times a week
	Home-based telework – employees	High	Mainly from home (at least several times a month)
	Occasional mobile work – employees	High	Occasional work in one or more places outside employer’s premises and lower degree of mobility than the high mobile group
	Always at employer’s premises high ICT – employees	High	Always at employer’s premises
	Always at employer’s premises low ICT – employees	Low or no use of ICT	Always at employer’s premises
Self-employed	Self-employed TICTM	High	Work in more than one location
	Self-employed no TICTM	All	Only one place of work

Note: In blue TICTM groups.

Source: Own elaboration and Eurofound and ILO, 2017.

Methodology

The report aims to complement the state-of-the art on TICTM provided by Eurofound and ILO (2017), in which flexibility of working time and work-life balance were the main aspects investigated. As such, special attention has been paid to other aspects, namely work

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.

organisation, including autonomy and control in work, skills and training opportunities, earnings and career prospects, employment status, contractual arrangements, as well as participation at the workplace. Moreover, additional aspects related to working time, work-life balance and health and well-being has been incorporated.

For this report, a literature review has been conducted, drawing on recent publications, journals and articles published in English, Estonian, German, French and Spanish. These are languages from countries with a comparatively higher number of publications on the topic (English, German, French, Spanish), with a relative high level of deployment of the work arrangement (French and English) and where digitalisation is very relevant in the national policy (Estonian).

The review focused on empirical research on employment and working conditions of teleworkers and ICT-mobile workers. It followed the definition of TICTM adopted by Eurofound and ILO (2017), but included self-employed TICTM.

Literature at international, European and national level has been reviewed. Although the focus was on EU Member States, studies addressing world-wide trends or providing further insights on specific aspects have been included. The focus was placed on recent studies (since 2012) although this time horizon was not considered too rigid. Notably for literature on countries where TICTM has been longer established also older publications have been analysed.

In addition, sources such as Open Access, Google Scholar and Web of Knowledge have been consulted.

Drawing from this review, including previous findings of Eurofound on TICTM, an analysis of the European Working Conditions Survey (EWCS) has been developed. The EWCS main objectives are to:

- measure working conditions across European countries on a harmonised basis;
- analyse relationships between different aspects of working conditions;
- identify groups at risk and issues of concern, as well as areas of progress;
- monitor trends over time;
- contribute to European policy development – in particular, on quality of work and employment issues.

The sixth wave was carried out in 2015 and covers 35 European countries: the 28 EU Member States plus the candidate countries for EU membership – Albania, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and Turkey (all supported by the EU Instrument for Pre-accession Assistance (IPA)) – as well as Norway and Switzerland. The sample size ranges from 1,000 to 3,300 people per country. In total, 43,850 employees and self-employed workers were interviewed between February and September 2015.

The survey questionnaire covers a wide-ranging set of topics: worker characteristics (including household situation), job design, employment conditions, working time, exposure to physical risks, work organisation, skills use and autonomy, work-life balance, worker participation and representation, the social environment at work, and health and well-being.

The categories of TICTM (see table 1) have been built based on three items of the survey:

- Q7. Are you working as an employee or are you self-employed?

- Q30. Please tell me, using the same scale, does your main paid job involve...?
i) Working with computers, laptops, smartphones etc.
The answer includes seven scale possibilities from 'all of the time' to 'never'.
- Q35. Please take a look at these locations. In a moment, I will ask you how often you have worked in each location [during the last 12 months in your main paid job].
The possible multiple choice answers include five different locations (regular workplace premises, client's premises, a vehicle, outside site, home and public spaces) and a frequency scale with five different levels for each location from 'daily' to 'never'.

For the purpose of the statistical analysis workers in TICTM were defined as those employees and self-employed working with computers, laptops, smartphones etc. 'always' or 'almost all of the time' (Q30) and working in at least one other location than the employers' premises at least several times a month (Q35). The selected workers are differentiated between self-employed and employees (Q7). For the category of employees three groups were defined based on the degree of mobility and the place of work (Q35): **regular home-based teleworkers**², those working from home at least several times a month and in all other locations (except employer's premises) less often than several times a month; **high mobile TICTM**, those working at least several times a week in at least two locations other than the employer's premises or working daily in at least one other location; and **occasional TICTM**, those working less frequently and/or in fewer locations than high mobile TICTM. Additionally, for comparative purposes the categories of **employees always at employer's premises** (Q35) **working with ICT** always or almost all of the time and the same group **with lower or no use of ICT** (Q30) was added. However, for the **self-employed** the distinction was only made between **TICTM** and those working in a **fixed workplace**. The reason is the small number of cases within the possible different categories within self-employed TICTM, making the analysis of this group impossible for a relevant statistical analysis.

To analyse working conditions in TICTM some items of the EWCS have been selected, which correspond to some of the issues that have been researched before in the literature in relation to this work arrangement. In some cases the items have been considered as a proxy since they did not exactly correspond with the concepts used in the literature. The population covered for the analysis of this working paper includes workers in the EU28. Analysis looking at differences by country is limited due to the small sample size. However, results of some Job Quality Indexes will be shown for illustrative purposes for the five

²The Labour Force Survey (LFS) produced by Eurostat has an indicator showing 'Employed persons working from home as a percentage of the total employment'. This indicator shows employees working from home usually, sometimes or never and the reference period is the last four weeks. In the EWCS, the reference period is the last 12 months and there are five different categories for responses. Moreover, the 'regular home-based telework' category elaborated from the EWCS in the context of TICTM research includes the use of ICT and the possibility to work in other locations. Therefore, the indicators in the two surveys are not comparable. However, the country rankings of both are similar, which shows the validity of both measurements when comparing countries within the EU28.

countries (Belgium, France, Slovenia, Spain and the United Kingdom) with larger samples of TICTM.

For the different sections of the paper research based on the EWCS provides a descriptive analysis of the prevalence of certain working conditions in the categories of TICTM and, if necessary and of interest for the research, a multivariate analysis to control by contextual variables (including occupation, for example) and other factors where relevant. For illustrative purposes, the Job Quality Indexes³ have been used in order to summarise the relative position of the TICTM groups and the five selected countries for an area of working conditions.

The working paper will try to disentangle some of the contradictory situations and paradoxical effects of TICTM by exploring further some of the areas already researched or shedding light on those conditions that have been hardly studied. It starts showing the incidence of the work arrangement and continues by looking at the characteristic of the work organisation that somehow is influenced by space and time flexibility of TICTM.

Incidence of TICTM

As highlighted by the study from Eurofound and ILO (2017), cross-country differences in the extension of TICTM work appear to be not only related to divergences in technological developments and the occupational structure, but also different work and managerial cultures. However, it is important to stress that this study also points to a common trend: There is a growing share of employees using ICTs to work flexibly at least occasionally as regards space and time, and this trend is even more marked for the self-employed.

TICTM in the EU Member States

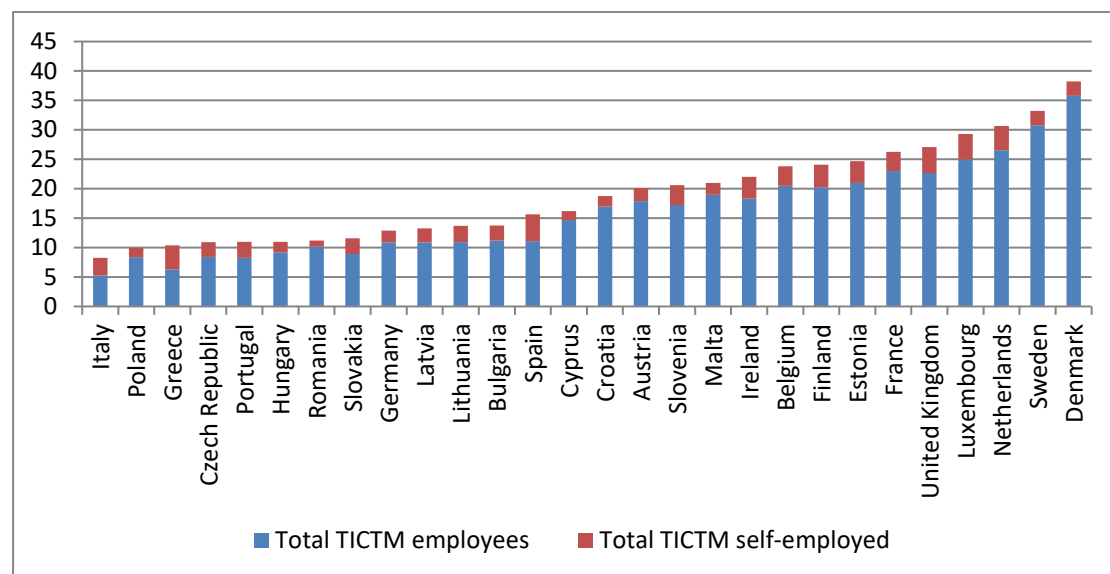
Across the 28 Member States of the EU, about 18% of employees and self-employed are TICTM. A higher proportion of workers in the Scandinavian countries use ICTs – always or almost all of the time – and work, to varying degrees, outside the employer's premises. Other EU countries with a relatively high share of workers performing TICTM are the Netherlands, Luxembourg, the UK, France and Estonia. Therefore, generally speaking TICTM arrangements are more common in the north and west of Europe. However, some exceptions are found to this pattern. For example, Germany with 13% presents a share of workers below the EU average (18%) and Estonia is above this average with 24% of workers in TICTM. Spain is the South European country with highest share of ICT-based mobile workers and home-based teleworkers (16%).

³ For a detailed composition of these indexes see the Sixth European Conditions Survey – Overview report at <https://www.eurofound.europa.eu/publications/report/2016/working-conditions/sixth-european-working-conditions-survey-overview-report> . Due to the margin of errors, results have to be considered cautiously.

Differentiating by employment status, at EU-level, among the 18% TICTM, 15% are employees and 3% are self-employed. Interestingly, the percentage of self-employed TICTM is higher in Southern European countries. In Italy, 36% of self-employed, but only 7% of employees are TICTM.

Exploring the reasons behind the country differences would go beyond the scope of this paper. However, Eurofound and ILO (2017) indicate that variations can be explained by different factors: the spread of ICTs, internet connectivity, ICT skills, economic structure, GDP of the country and geography and culture of work, including managerial models.

Figure 1: Percentage of workers in TICTM arrangements by employment status and country



Source: EWCS 2015

TICTM by sectors and occupations

Considering the whole EU28, a higher number of workers in TICTM arrangements is found in wholesale and retail trade and in professional, scientific and technical activities. Some differences exist by type of TICTM. Home-based teleworkers are mainly in the education sector (also in the ICT sector and professional, scientific and technical activities), the high mobile TICTM are more widespread across sectors but more concentration is found in wholesale and retail trade (also in manufacturing, transportation, ICT, public administration and human health). Occasional TICTM is the most common type across sectors and found mainly in manufacturing, professional activities and in public administration, with large numbers also in wholesale and retail, ICT, financial and insurance activities, transportation, support services, education and human health and social work activities. Self-employed TICTM are mainly found in professional, scientific and technical activities and also in ICT and wholesale and retail.

Table 1: TICTM workers by sector as a percentage of the overall workforce, EU28 (EU28=100%)

	Home-based teleworker, employee	High mobile TICTM, employee	Occasional TICTM, employee	Self-employed TICTM	All TICTM
Agriculture, forestry and fishing	0.0	0.0	0.0	0.1	0.2
Mining and quarrying	0.0	0.0	0.0	0.0	0.0
Manufacturing	0.2	0.4	1.1	0.2	1.9
Electricity, gas, steam and air conditioning supply	0.1	0.1	0.1	0.0	0.2
Water supply; sewerage, waste management and remediation activities	0.0	0.1	0.1	0.0	0.2
Construction	0.0	0.3	0.3	0.2	0.8
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.2	0.6	0.9	0.4	2.2
Transportation and storage	0.1	0.4	0.4	0.1	0.9
Accommodation and food service activities	0.0	0.2	0.1	0.1	0.4
Information and communication	0.3	0.4	0.6	0.4	1.6
Financial and insurance activities	0.2	0.2	0.6	0.2	1.2
Real estate activities	0.0	0.1	0.1	0.1	0.3
Professional, scientific and technical activities	0.3	0.3	1.0	0.7	2.4
Administrative and support service activities	0.1	0.3	0.5	0.1	1.0
Public administration and defense; compulsory social security	0.2	0.4	1.0	0.0	1.7
Education	0.8	0.3	0.6	0.1	1.7
Human health and social work activities	0.1	0.4	0.7	0.1	1.3
Arts, entertainment and recreation	0.1	0.1	0.1	0.1	0.3
Other service activities	0.0	0.1	0.1	0.1	0.4
Activities of households	0.0	0.0	0.0	0.0	0.0
Activities of extraterritorial organisations and bodies	0.0	0.0	0.0	0.0	0.0
EU28	2.8	4.6	8.5	3.0	18.8

Source: EWCS 2015

Table 1 interestingly shows that the ICT sector and professional activities include a variety of TICTM types whereas in other sectors like the financial services the occasional type is prevalent.

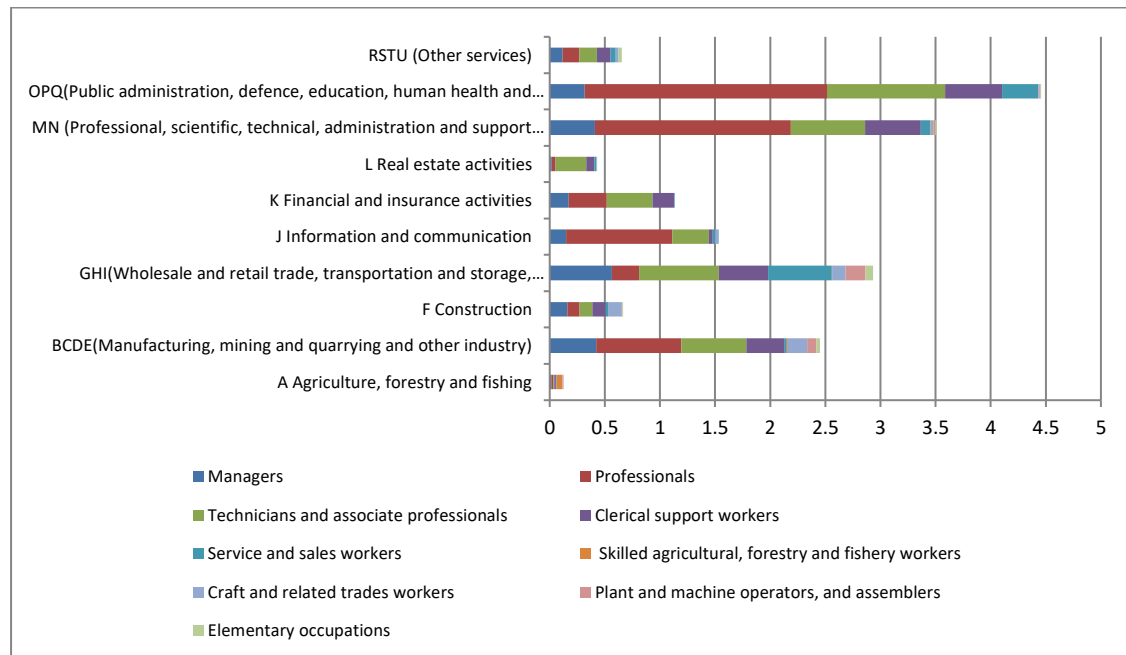
Within sectors, and following the NACE Rev. 2, the sectors with higher proportions of workers in TICTM arrangements are information and communication (61%), financial and insurance services (44%) and real estate activities (44%). TICTM self-employed are concentrated in the financial services and the real estate activities.

In relation to the occupation, TICTM are working mainly as professionals (6.5% of EU28). They are followed by technicians and associated professionals (4.5% of EU28) and clerical workers and managers (2.5% of EU28 respectively). This is the general pattern of occupations in all TICTM groups. However, looking into the different types of TICTM, home-based teleworkers are mainly professionals (including teachers, for example) whereas workers in high mobile TICTM include a relative larger share of technicians. This type of arrangement is also performed by smaller percentages of services and sales workers and craft workers. The distinctive characteristic of employees in occasional TICTM is the larger share of clerical support workers than in the other two arrangements. In general, self-employed in TICTM comprise higher share of managers.

There are some differences between sectors⁴ as regards the occupational distribution of TICTM (Figure 3). In the financial sector technicians and associated professionals is the largest occupation. In the group comprised by retail, transportation and horeca (hotel, restaurant and catering) there is a more diverse composition of TICTM, including managers, technicians and services and sales workers. In the ICT sector, professional and service activities and public administration, the occupation of professionals is the most prominent among TICTM workers. Some of these occupations were traditionally mobile like some sales persons but they have recently adopted the use of ICTs.

⁴ In this case, the 21 sectors of the NACE Rev. 2 classification are aggregated into 10 sectors as it was carried out in the overview report of the EWCS (<https://www.eurofound.europa.eu/publications/report/2016/working-conditions/sixth-european-working-conditions-survey-overview-report>). It is not possible to use the 21 sector classification because of the very small number of cases per occupation that would result.

Figure 3: TICTM workers in sectors (NACE 10) disaggregated by occupations. Percentage of EU28 (EU28=100%)



Source: EWCS 2015

TICTM: second job and self-employment

One characteristic of some of the workers using ICTs outside the employer's premises is that they develop this type of arrangement as a second job. For example, some platform workers have a main paid job and work from home or other places through platforms in order to get an additional income (Eurofound, 2018b). The share of employees reporting working in another job than the main job is (after controlling by sector of activity) higher among TICTM than among the rest of the workers. And considering only TICTM, the regular home-based teleworkers is the group with highest share of workers reporting to have a second job. For example, 14% of employed home-based teleworkers in 'other services' in the EU28 are in that situation (compared to 7% of employees working always at employers' premises in the same sector), of which half of them work in more than one job on a regular basis. It is plausible that working from home with ICTs facilitates working in more than one job.

Considering the total of self-employed in the EU28, around 20% are in some type of TICTM and almost half of them are high mobile. This arrangement represents the 27% among employees. Therefore, one characteristic differentiating the employees and self-employed in TICTM is that there is a larger share of self-employed doing TICTM intensively.

The composition of TICTM self-employed resembles the overall types of self-employed in Europe. The majority are working for themselves and/or are sole directors, and the proportion of those considered freelance or working as a partner in a business or professional activity represent less than one fifth of the total self-employed.

The data suggest that for the self-employed in TICTM the 'level of dependency' (percentage of the work done for a single client) is somewhat higher for the high mobile group in comparison with other groups. However, the comparison between self-employed TICTM and

other self-employed in general shows slightly higher dependency of the latter. Therefore, although differences have been found within the TICTM categories, there is no evidence that TICTM self-employed have more dependency than the rest of self-employed.

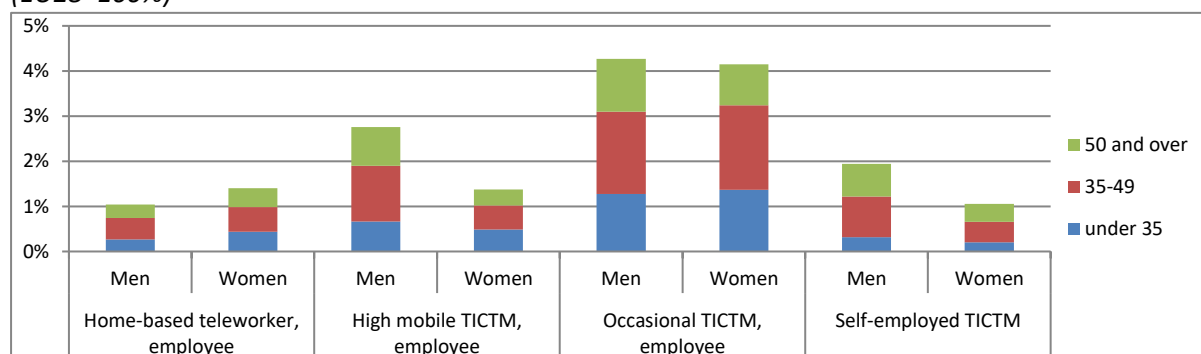
A higher share of self-employed TICTM (regular home-based and high mobile) compared to those self-employed in different arrangements report not to have the capacity of hiring employees and not having employees working for them in comparison with those working always in the same place. Therefore, the profile of an employer is slightly less common for TICTM self-employed than for self-employed working only in a fixed place.

TICTM: gender, household and age

The EWCS findings show that there is a higher share of men doing TICTM (54% are men 46% are women (Eurofound and ILO, 2017)). Within the different types of TICTM arrangements, a higher share of men is found in high mobile TICTM employees and self-employed TICTM, whereas women are more prevalent in regular home-based telework and both sexes are almost equally distributed in occasional TICTM. This might be related to an effect of the gender roles that still persists in the EU28. Although more women are at work, they generally continue doing more house work than their partners. As a consequence more women than men telework from home in order to combine work and care needs (Eurofound and ILO, 2017). The EWCS supports this fact. It shows there is a higher share of workers with caring responsibilities in TICTM than in the rest of the workforce. Moreover, it is also frequent that workers in TICTM are the main earners in the household, which might imply that work is very important for them and therefore they are inclined to work also outside the employers' premises.

In relation to age, the occasional TICTM group has a relative high share of young workers, and home-based teleworkers and high mobile TICTM include a relative larger share of men of prime age. The self-employed TICTM are older (both, women and men) compared to employed TICTM.

Figure 4: Percentage of workers by TICTM, gender and age as a percentage of the EU28 (EU28=100%)



Source: EWCS 2015

Online connected and physically disconnected: work organisation and social environment in TICTM

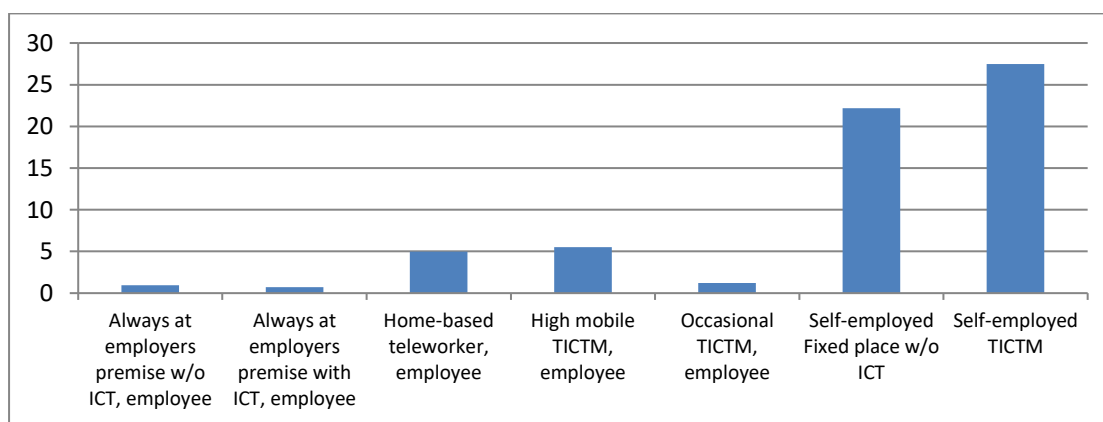
TICTM is associated with certain characteristics of work organisation that can be less frequent in other work arrangements. This is mainly due to the combination of elements described in other sections before: the use of ICTs, the place and time flexibility. This work arrangement increases the connectivity (with potential consequences on constant availability and blurring between private and work life), the levels of autonomy and finally the detachment from the office or employer’s premises. Most of the conditions described in this section are also associated to certain jobs. However, the multivariate analysis confirms that regardless the specific job or occupation considered, TICTM plays a role in shaping organisational aspects related to the social environment, experiencing interruptions and intensification at work.

Working alone and social support

TICTM can facilitate working from anywhere, but in some cases can be associated with working alone and isolation, which can have negative consequences for the health and well-being as well as for training and career development of workers due mainly to the lack of sharing and access to informal information (Eurofound, 2015; Eurofound and ILO, 2017). Moreover, the detachment from the workplace shared with others might also result in problems related to experiencing lack of support from either colleagues or managers.

The chances of working alone increase for all TICTM arrangements, except for those working occasionally under such arrangement. According to the EWCS, 27% of TICTM self-employed report working alone, 5 percentage points higher than the self-employed working always from the same place. Among employees, more workers in home-based telework and high mobile work report working alone, 5% in both groups, compared with 1% among those working only occasionally as TICTM or from the employer’s premises. This result has been confirmed with multivariable analysis, after controlling by relevant work and demographic variables and therefore this result is not related to the sector and the occupation of the worker.

Figure 5: Workers reporting working alone by TICTM categories (%)



Source: EWCS 2015

In a qualitative case study, Collins et al (2016) illustrate this finding by addressing the issue of isolation and social support between teleworkers and their office-based colleagues. The research is focused on full-time home-based teleworkers in clerical occupations in a public local organisation in the UK. The findings show that the experience of social isolation of teleworkers and their strategies for managing social support from other colleagues are related to the extent of teleworking and for how long they have been teleworking. The study points out that full-time teleworkers tend to develop a sense of individualisation and a strong level of social disconnection between office-based and teleworking staff and that these experiences and feelings tend to increase over time. People who telework for long periods may find that their traditional social support networks diminish and are difficult to sustain. The study finds that teleworkers' social support networks were mostly with people known to them prior working from home. Furthermore, teleworkers seem to face more difficulties in establishing new relationships with people they did not meet previously. Finally, the study points out that the type of ICTs adopted to support telework arrangements also influences the experience of social isolation. In this case, the ICT was implemented for the specific purpose of allowing work at home rather than for enabling online cooperation or support.

However, a distinction has to be made between working alone and isolation. The connectivity offered by technologies can prevent situations of isolation if online cooperation or support is enabled. In general, the descriptive analysis of the EWCS does not show strong evidence of differences between workers doing TICTM and the rest in relation to support from colleagues or managers. It could be the case that the connectivity of the new technologies somehow enables working with others.

Nevertheless, based on the multivariable analysis some significant results are found for some groups: Workers in occasional TICTM present some association with higher levels of social support by managers, whereas home-based teleworkers, and especially self-employed (TICTM or not) are less likely to report having support from colleagues. These are groups with comparatively more workers working alone, less likely to experience face-to-face contact, and hence also report less social support from colleagues. Interesting is that (although with limited number of cases) TICTM self-employed who work alone report less problems of social support from colleagues (14% of workers) than self-employed with none or low use of ICT and working alone (57%). These findings suggest that ICTs can prevent isolation for the self-employed who physically work alone.

A study by Hislop et al (2015) explains how ICTs can help self-employed to overcome potential problems related to their isolation while working from home. They examined how the use of mobile ICTs among self-employed homeworkers was perceived to impact their experience of work, focusing particularly on their experience of professional isolation. The findings suggest that the experience of greater spatial and temporal flexibility enabled by the use of smartphones was helpful to overcome the social isolation for self-employed working from home. The use of mobile ICTs allowed the self-employed to socialise through getting out of their home environment, while still being available to their clients. Considering the lack of colleagues of self-employed, mobile ICTs can help reduce their experience of social isolation.

Team work, influence and involvement

Other potential consequences of being physically less present at the workplace are the possible difficulties for participating in the working life. Some social aspects of work like working in teams or possibilities for influencing decisions might require being present at the workplace.

Considering the results of the multivariable analysis of the EWCS, the general hypothesis that not working all the time at the employer's workplace has negative consequences for team work has to be rejected. As an example, 68% of regular home-based teleworkers and 33% of TICTM self-employed report being part of group work, while 56% of those working always at employer's premises report the same situation.

The reduced percentage of self-employed could be expected given the nature of their status.

This should not be an unexpected result considering a feature of the digitisation of work organisation, which is the enhancement of team work on project-by-project basis, usually related to the establishment of virtual teams where spatially dispersed workers collaborate throughout the project lifespan (Tworoger et al, 2013). Therefore, ICTs not necessarily prevent team work but on the contrary can enhance it for a (potential globally) dispersed work force.

Moreover, participation of workers in different teams is found to be positively associated to higher levels of job decision latitude (Chen and McDonald, 2015) and research has shown that TICTM workers in general tend to have higher levels of job autonomy (in the next sections intensification of work and autonomy and its drawbacks is analysed). The question remains in relation to the quality of team work which is mostly developed in a digitised context.

Box 1. Team work and telework: positive effects on performance

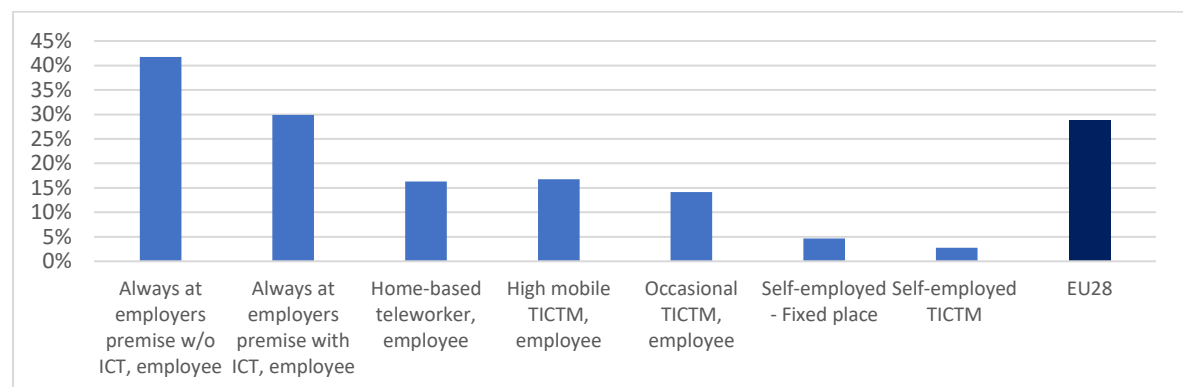
Coenen and Kok (2014) assess the impact of the implementation of telework and flexible work schedules on the performance of teams in product development projects in two Dutch companies. The study is focused on five cases from two big companies having implemented telework arrangements for their employees in new product development projects. The results suggest a positive effect on the performance of work teams within organisations which is mediated by increased knowledge sharing and cross-functional cooperation. Telework is found to improve the quality of the product under development because it enables the involvement of both internal and external parties with relevant knowledge that become integrated in the work process. The findings also show that these positive effects may be offset when face-to-face interactions are completely replaced by online contact. The latter is stressing the role of telework intensity as a mediator effect and points out the need for management to balance online and physical contact in teleworking settings.

Source: Unpublished literature review by NOTUS for Eurofound.

Considering Coenen and Kok (2014), it can be argued that TICTM is not an obstacle for workers for being involved in team work, and that occasional TICTM actually facilitates group work since the combination of the use of ICTs and face-to-face interaction reinforces the social interaction required for team work. The multivariate analysis of the EWCS confirms that occasional TICTM offers better possibilities for team work than any other TICTM category and those always at employer's premises. Therefore, combining occasional TICTM and working at employers' premises offers higher possibilities for being involved in team work.

Another aspect that could be affected by working outside the employer's premises is the level of influence on decisions. Workers in TICTM have the same opportunities in relation to influencing decisions (Figure 6) or being involved in changes related work organisation. Some explanatory factors could be that most TICTM workers are mid-to-high skilled workers, enjoy somehow more decision latitude and can be connected to the work process from different places. Indeed, the EWCS shows for both employees and self-employed that TICTM workers are more likely to influence decisions. A higher share of employees in TICTM also report being involved in improving the work organisation, in comparison with employees at the employer's premises.

Figure 6: Workers reporting lack of influence on decisions (answers rarely and never) by TICTM (%)



Source: EWCS 2015

Interestingly, after applying controls (for example, occupation) the likelihood of reporting lack of influence on decisions at work is higher among workers who work always at employer's premises, followed by home-based teleworkers (the other TICTM groups are less likely to report no influence). These findings can be related to the fact that working mainly from home with little face-to-face interaction could have an impact on the level of influence more influential than the home-based. However, clerical home workers are as influential as those working remotely occasionally.

In conclusion, the findings suggest that ICTs are an enabling element for 'virtually' participating in social relations at work and that face-to-face relations facilitate further participation. The paradigmatic example of having good access to both channels among TICTM is occasional TICTM employees.

Is trust a necessary condition for TICTM?

Some literature suggests that TICTM work is often carried out in a context of a work relationship of trust between the employee and the manager (Eurofound, 2015; Gajendran et al, 2015; Arlinghaus, 2014; Eurofound and ILO, 2017). However, according to the EWCS, large numbers of high mobile workers are sales persons and home-based teleworkers are teachers. Often, for these workers being outside the employer's premises working with ICT is in the nature of their job. There is no reason to think that these workers work under TICTM arrangements only because there is a relationship of trust with the employer. It is typical of some of these profiles to work from other places than the employers' premises regardless the level of trust. Moreover, trust can be a requirement for some TICTM but not for all. It will depend on the level of discretion and the possibilities of control over the work done outside employers' premises.

The EWCS analysis shows that the share of workers reporting that 'the management trusts the employees to do their work well' (proxy of trust between employee and manager/employer) is not very different between the TICTM groups and those working only at employer's premises. However, multivariate analysis (after controlling for contextual variables) shows that employees in TICTM (especially high mobile and home-based teleworkers) are comparatively less likely to report that management trust employees in comparison with workers not using ICTs at employer's premises. Therefore, it seems that after controlling for occupation and other variables it cannot be concluded that TICTM work is more based on relationships of trust between employees and the management than non-TICTM work. It is possible that the mobile work based on a trust relationship is more common among specific high level occupations but this cannot be generalised for all workers doing TICTM. In fact, the apparent higher trust among TICTM reflected by some publications might be related to the fact that higher skilled occupations are more prevalent in TICTM than in the rest of the work force.

Nevertheless, this result has to be taken with caution since the EWCS question is not exactly about the trust between the worker and the employee but about a general perception of the interviewee about the trust of the management towards employees in general.

Chapter summary

In this chapter on work organisation and social environment, characteristics of the work organisation that could be affected by place flexibility or by being less present at the employer's premises have been introduced. The findings show that those workers under TICTM who are less present at the employer's premises, namely high mobile and home-based teleworkers, are also those reporting more that they work alone or lack social support from colleagues. The whole group of TICTM is not negatively affected in aspects related to influence, involvement or trust with the manager. However, because of the additional element of more face-to-face interaction results seem to be better for occasional TICTM in relation to involvement in how work is organised. Interestingly, similar favourable results for occasional TICTM have been reported by past research in relation to working time, work-life balance and health and well-being outcomes. In the next section the focus will shift to the effect of TICTM on intensification of work and job demands.

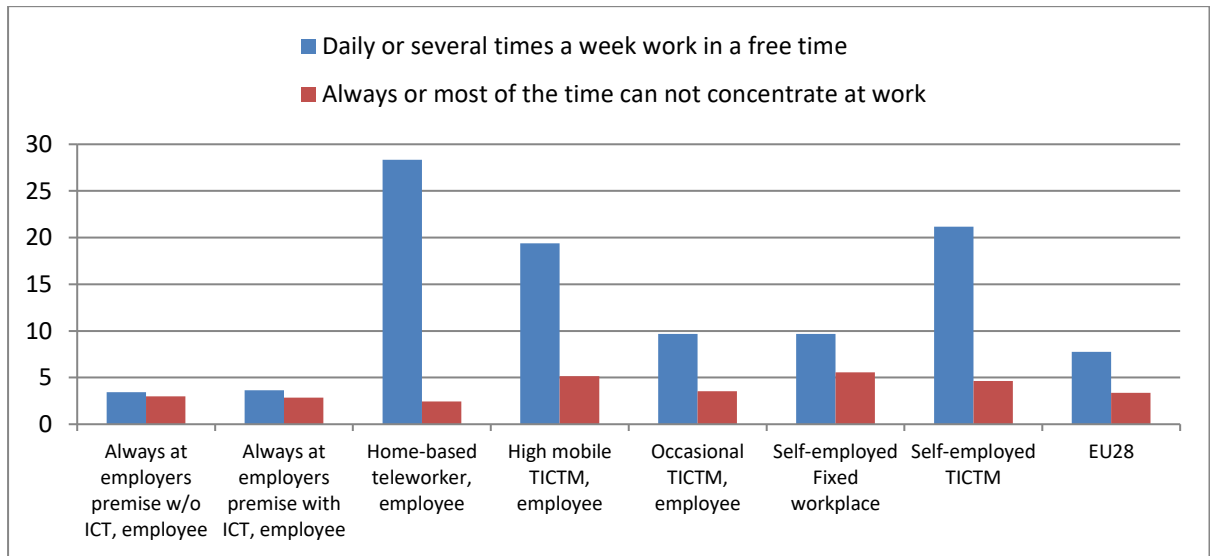
Intensification of work and job demands

TICTM has been labelled by some authors as New Ways of Working (NWW). With respect to job demands, Derks and Bakker (2010) suggested that NWW increase three kinds of 'overload': information overload, work overload and societal overload. Information overload occurs when the amount of information to be consumed and assimilated, particularly to a task or decision, exceeds the individual's information processing capacity. In the context of ICT use, one source of work overload occurs when the volume of messages received and the time required to respond appropriately exceeds the time available to do so. This may be due to the receipt of a large number of unnecessary messages, a low trust culture that prompts users to 'cc:' many recipients, a worker being engaged in too many simultaneous projects, or a lack of group or organisational norms to promote judicious use of email. Finally, social overload occurs when a worker receives email messages from too many different people evoking too many distinct roles and social contexts, exceeding the recipient's interaction capacity.

This description of workload in the context of NWW is valid for workers using ICT in general, but their consequences may be exacerbated for those in TICTM because of the mobility, the longer working hours (Eurofound and ILO, 2017) and the different places of work, which potentially can multiply demands and not only for work but from home, for example. In this context TICTM has a potential for an intensification of work due to working long and blurring of boundaries between work and other activities.

According to Eurofound and ILO (2017), TICTM poses some risk of overlap between work and personal or family life (work-home interference or home-work interference) because of longer working hours and the mix of duties at the same time, which may result in blurring work-life boundaries. In fact, this is due to the use of ICTs which increase the possibilities for working anytime and anywhere as well as developing social interactions anytime and anywhere. An updated analysis including self-employed and those workers working often with ICT at the employer's premises confirms that life is more blurred for TICTM (Figure 7).

Figure 7. Share of workers reporting working in a free time and problems for concentration at work because of family related issues by TICTM (%)



Source: EWCS 2015

Multivariate analysis shows that self-employed TICTM are more likely to report working in free time and experiencing difficulties in concentrating at work because of their family responsibilities (proxy of family – work interference) than those self-employed working from a fixed workplace. As in the case of high mobile and home-based TICTM, the family responsibilities of self-employed TICTM can cause problems for concentration at work if they neglect them because of working in free time or working very long or because of the blurring of the various spheres. Also home-based teleworkers who work while caring can easily experience this situation.

Box 2: German survey on employees working from home beyond office hours

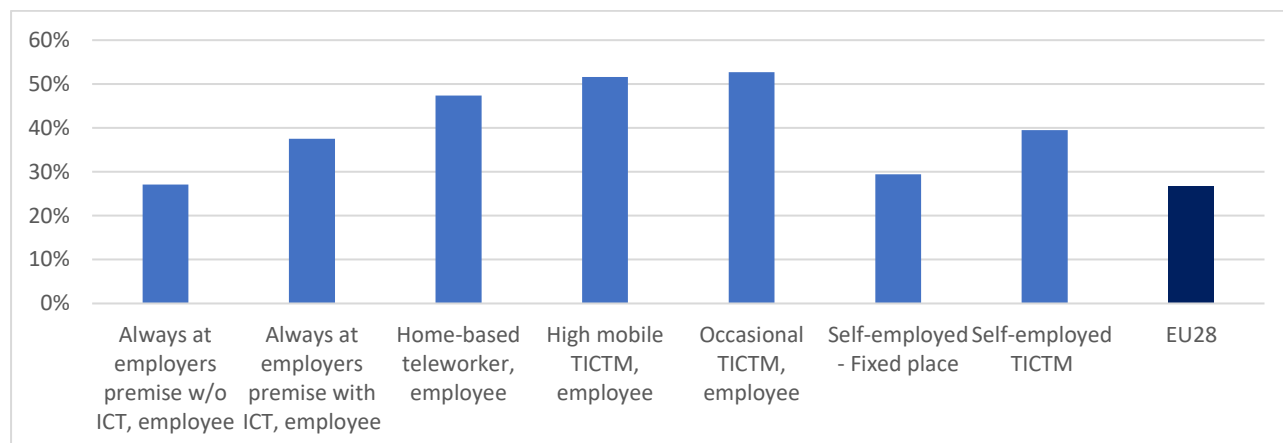
Recent survey results provide evidence for work intensification and increasing work-life conflicts, namely for dependently employed workers working from home beyond office hours. A large representative survey in Germany suggests that the implementation of digitalisation processes go along with increased stress at work, work intensification, partially increased workloads and volume of work, and increased needs for multi-tasking (Institut DGB-Index Gute Arbeit, 2017). Employees report that they are stressed at work and are pressed for time the more they use digital means/media compared to non-digital workplaces and therefore they need to work supplementary hours from home (60% of employees using digital means report that they are (very) frequently stressed at work). The majority of the employees state that the work burden has increased (46%) due to the introduction of digital tools or remained the same (45%); the volume of work has increased according to 54% and remained the same according to 39%. Interruptions of the workflow and work intensification are also frequent when the use of ICT is high.

Source: Unpublished literature review by NOTUS for Eurofound.

The different aspects of 'overload' described by Derks and Bakker (2010) and 'boundaryless' work of TICTM can produce consequences for workers, which are not always positive. The connectivity offered by ICTs and the potential of working any time during the day can be associated to experiencing more interruptions, higher levels of workload or being called to work while the worker is anywhere.

Workers in TICTM arrangements tend to experience more often interruptions in order to take on unforeseen tasks (Figure 8). In this case, all types of TICTM employees experience a similar level of interruptions. Moreover, both self-employed TICTM and those working often with ICTs at employer's premises experience more interruptions than their non ICT counterparts. This result suggests that it is likely that the use of digital technology determines to a greater extent the level of interruptions than the mobility or the time spent outside the employer's premises. This is supported by the multivariate analysis showing that occasional TICTM is the arrangement leading to a higher level of interruptions and not those in very mobile or regular home-based work.

Figure 8: Experience of interruptions (often or fairly often) in order to take on unforeseen tasks by TICTM (%)



Source: EWCS 2015

The reported interruptions are disruptive for half of the TICTM employees and one third of TICTM self-employed. They are less disruptive for those who do not use ICT or have a low level of use of these technologies for work. In this regard, it is possible that for some activities or tasks, TICTM is not totally optimal. However, the solution to this problem lies in the ways work is organised while using ICTs.

Box 3: Study of interruptions of TICTM workers with no designated desk

Boch-Sijstema et al (2010) is focused on the performance of mobile knowledge workers from a Finnish company in the high-tech industry. These workers who partially work at the office do not have an assigned place on their own and may be required to work at different places of the building throughout the day. The mobile desks are set aside for the use of knowledge workers who either work in multiple locations or are part-time in the office. The survey showed that the perceived productivity of mobile workers was significantly lower than of employees with a dedicated desk. Besides perceived productivity, the authors also reported other aspects that might be hindering the performance of mobile desk workers such as an increase in interruptions and distractions, difficulties in finding and reaching other colleagues and the availability of appropriate spaces for different work activities.

Source: Unpublished literature review by NOTUS for Eurofound.

Another aspect related to ICT connectivity is the potential of constant availability of TICTM workers. ICT enables employees and workers in general to become constantly available to their colleagues and clients, thus potentially extending time and work pressure.

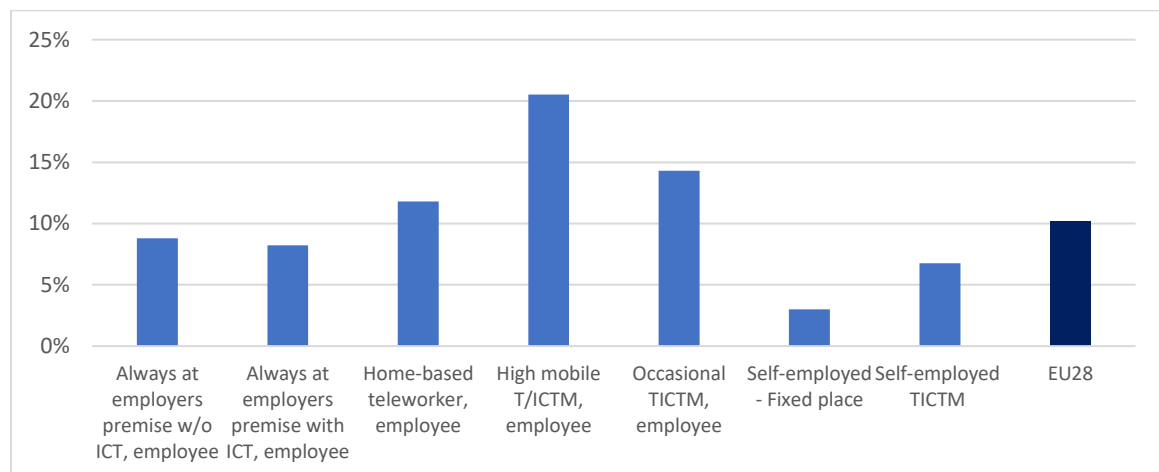
The EWCS includes an item ‘being called to work on short notice’. Although it can only be considered a proxy, it gives an indication of the possibility to be contacted anytime while the worker is not physically at the workplace.

Multivariate analysis shows that only high mobile TICTM (15%) and self-employed TICTM (28%) report significantly higher chances of being called to work on short notice (followed by

home-based teleworkers), in comparison with the rest of TICTM categories or workers always working at employer’s premises. These two groups are mainly composed of professionals in the services sector and associated professionals in the services and commerce sectors. These findings suggest that being high mobile exposes workers to being called to work on short notice. Moreover, if the self-employed are under TICTM the chances of ‘being called’ almost doubled.

Finally, in this section an element which has not been very much associated with ICT-mobile work but more specifically with the use of ICTs is analysed: Work load and work pressure. Hurtienne et al (2014) have identified computerisation as one of the sources of increased work pressure. As mentioned above, the working conditions related to TICTM are not only a result of the use of ICTs and being mobile, but a product of the interaction of technological developments and societal and institutional changes impacting the world of work. In this context computerisation is one the factors that can influence workload in TICTM. From the EWCS the answers given to the question whether workers ‘have enough time to do their job’ are explored. This variable is used as a proxy of both workload and work pressure.

Figure 9: Workers reporting that ‘rarely’ or ‘never’ have enough time to do their job by TICTM (%)



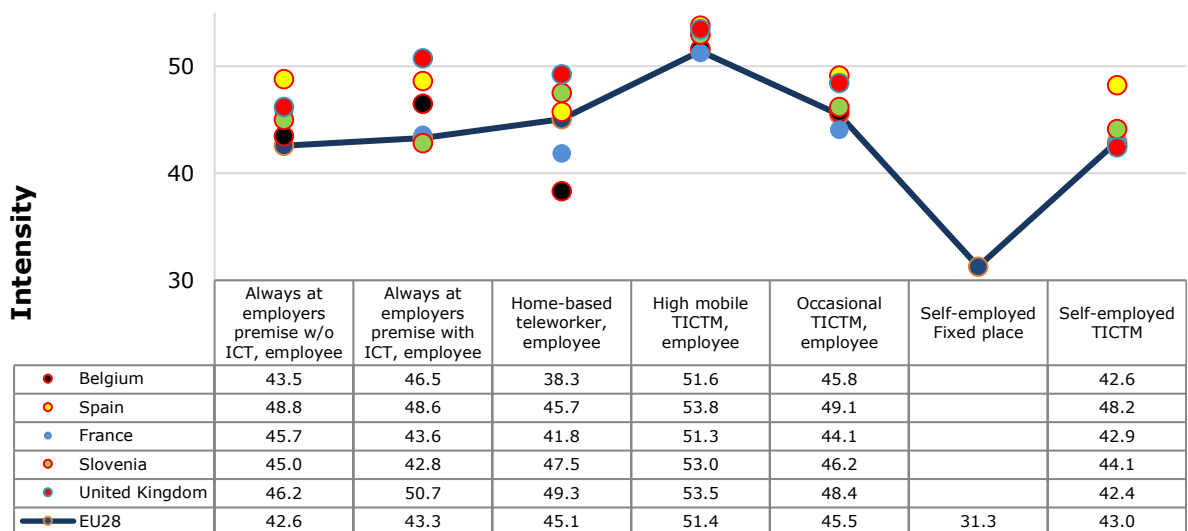
Source: EWCS 2015

According to the multivariate analysis, TICTM employees are more likely to report that they have difficulties in relation to ‘having enough time to do their job’. Considering all groups of workers, the self-employed with low or no use of ICTs are more likely to have sufficient time to do their job. No significant results have been found for self-employed TICTM. Therefore, it could be argued that the autonomy of the self-employed is effective in tackling work pressure related issues.

Some of the conditions included in this section (having time to do the job, experiencing interruption, work pressures and working in a free time) form part of the Eurofound Job

Quality Index⁵ on work intensity. The figure below confirms that workers in high mobile TICTM experience higher levels of job intensity in the EU28. Analysis suggests that the country of the worker is associated with the job intensity and therefore differences by country could be expected. In Figure 10, the intensity index for different countries is included. The results should be taken cautiously because of the small number of cases⁶. The figure suggests that for home-based teleworkers there are more differences between countries which could be related to the different circumstances or policies in each country (differences are more evident between the UK and Belgium). It also shows that in some countries (Spain and UK) most of the indexes are above the EU average which could be related to the overall higher level of work intensity in the country.

Figure 10: Slim Work intensity index (mean index scores 0-100) (countries average for total: 57 Cyprus – 32 Latvia. Range = 25)



Notes: (1) country data not shown for Self-employed Fixed place due to the very small number of cases (2) countries selected when there is a minimum of 50 cases per TICTM category.

Source: EWCS 2015

Autonomy and its drawbacks

A clear example of the paradoxical nature of TICTM is working time flexibility and the associated job autonomy, which is supposed to have positive consequences for working conditions. However, in some contexts of TICTM work, the autonomy is not used for a better work-life balance and general well-being.

⁵ The job intensity index is based on the following EWCS questions: working at high speed and to tight deadlines, the number of work pressure sources, having enough time to get the job done, having frequent disruptive interruptions and working in a free time.

⁶ This applies to all indexes presented in this report.

Although not all workers in TICTM enjoy the same level of autonomy, in general they have more autonomy than the rest of the workers. This is influenced by their occupation but also by the fact that they work with some degree of spatial and temporal flexibility with ICTs.

Theoretically, autonomy at work helps to deal with intensity of work. The question remains as to whether the autonomy these workers enjoy is sufficient to cope with the high level of work intensity of high mobile workers and self-employed TICTM. Analysis of the EWCS 2010 showed that work intensity is more strongly associated with stress than autonomy (Eurofound and EU-OSHA, 2014). It seems that such autonomy cannot always act to fully eliminate the potential negative effects of the working conditions related to intensity of work. This autonomy paradox is also reflected in several qualitative researches. It seems that the autonomy in how to organise work in general might not totally help in work contexts of high levels of work intensity, as it is the case for some types of TICTM.

Sewell and Taskin (2015) report that the use of ICTs to work outside of traditional workplaces can give employees a greater sense of autonomy while simultaneously extending managerial control to social areas which previously were out of their reach. The authors define telework as a work arrangement which involves the use of ICTs to undertake work while on the move, at home, or at other sites away from the traditional workplace. The authors draw on a case study of a Belgian biopharmaceutical company. Research shows that professionals and technical staff taking part in telework arrangements anticipating greater autonomy find themselves confronted with the extension and the re-regulation of social norms and control that are associated to the traditional workplace. These pressures tend to undermine the perceived autonomy of teleworkers in different ways. First, by fixing in advance the work schedule when they are supposed to be available, second, through informal coordination meetings that were effectively used to check what is actually done outside the office and, third, by the extension of hierarchical supervision to matters that were left to the discretion of workers if they had been at the office (for instance, by scheduling regular formal meetings for the coordination of teleworkers with their on-site colleagues). In response to these pressures, both groups of teleworkers developed similar coping strategies aimed at re-establishing their visibility and presence in a more obvious way than if they had not been teleworking. The authors suggest that physical distance from the workplace increases the likelihood that teleworkers experience tension between largely internalised collective norms and the expectation of discretion and autonomy, and this results in renewed impetus for self-control and more complex forms of organisational control.

Mazmanian et al (2013) provide insight on how autonomy and commitment are balanced through a study of knowledge professionals using mobile and email devices on the basis of a qualitative case study. More specifically, it was based on multiple interviews with 48 knowledge professionals (services) who were identified as BlackBerry users. In contrast to technological deterministic approaches, these authors stress the role of workers themselves and their aspirations and commitments to perform as accomplished professionals. That is, they internalise the requirements to be constantly accessible to work demands and assume the loss of control over their time as a simple matter of personal choice and professional identity.

Huws (2017) has analysed long trends in autonomy and new forms of control and monitoring related to crowd work and the virtualisation of work organisation. Virtually

organised work is defined as work which is managed via online platforms and crowd work as work that includes different forms of paid work organised by an online platform. On the one hand, the growth of telework (as one form of virtually organised work) and the new possibilities enabled by new ICTs to work remotely have provided greater autonomy for an increased number of workers to decide how and when work is completed. In the same way, these technologies have enabled ways of virtual presence in work environments which previously required physical collaboration. On the other hand, virtualisation of work organisation is related to an increasing use of standardised performance indicators and monitoring. Some standardisation of tasks and monitoring is required when work is carried out remotely. Digitised tracking of workers generates more precise data of workers' performance which turns in further monitoring and stringent target setting. This external monitoring places increased pressure on workers.

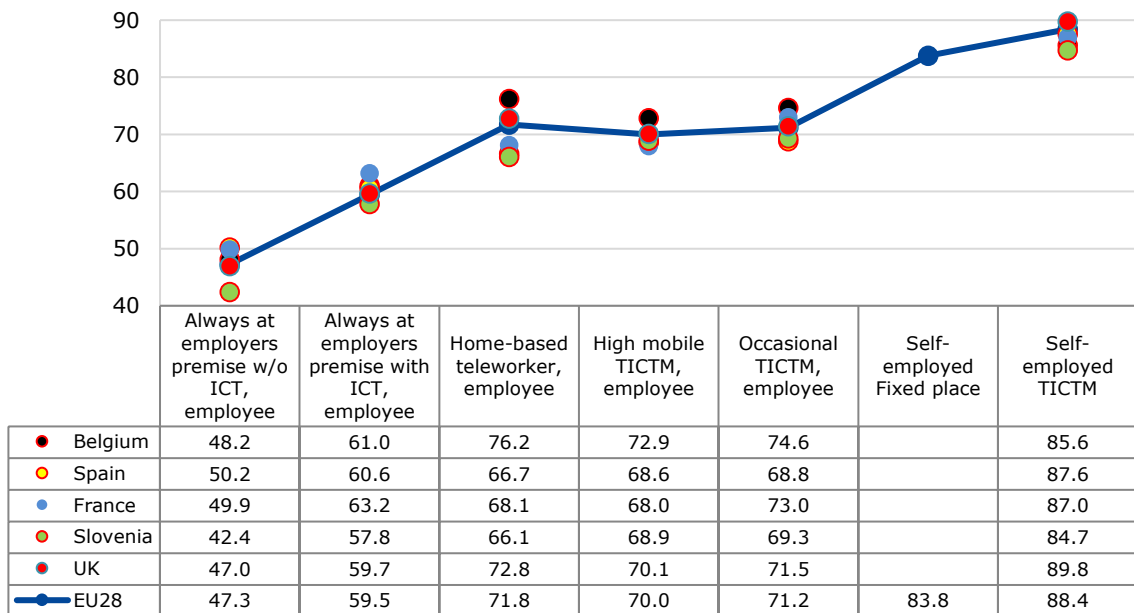
Finally, from another perspective, Biron and Veldhoven (2016) concluded that for those professionals and managers with the highest levels of autonomy over working time, autonomy may turn from an 'asset' (a resource of freedom to choose when to work) to 'liability' (the obligation to deal with an increased work load). Then, these workers do not experience better outcomes on the days they work from home, as they become similar to office days due to the high level of control they have of their working time.

In general, in the context of an overall higher level of autonomy in TICTM several authors (Biron and Veldhoven, 2016; Huws, 2017; Sewell and Taskin, 2015) have alerted on sources of higher control (or work intensity) limiting somehow job autonomy or its potential positive effects: one take the form of 'self-imposed' internalised control by the worker assuming higher workload in a context of the sovereignty the worker has and the other is driven by the managers (or employers) in order to control performance or remote work.

These findings contribute to explaining differences in autonomy levels among TICTM and why the autonomy does not always produce positive outcomes for workers doing TICTM.

The level of autonomy is related to their ability to determine aspects like order of tasks, speed and methods of work, as well as having a say in the choice of one's work colleagues and the ability to take a break when desired. Considering these elements, the analysis of the EWCS shows the higher level of autonomy of TICTM self-employed compared to workers in other arrangements. Similar levels of autonomy are observed among TICTM employees. Country differences are not pronounced, but higher in relation to home-based telework resulting in better average for home workers from Belgium as it was the case for lower levels of work intensity. In most groups Slovenia is under the EU28 average which should be related to being the country with the lowest score of level of autonomy among the five selected Member States.

Figure 11: Autonomy index by TICTM (mean score 0-100) (Countries average total Finland 73 – Bulgaria 51. Range= 23)



Source: EWCS 2015

In summary, the data confirm that high ICT mobile work has more potential for reporting undesired situations in relation to their autonomy. The reason is that this autonomy goes hand in hand with the highest level of work intensity among the TICTM categories. This aspect together with the above-mentioned limitations of job autonomy among those teleworking (especially those teleworking more intensively) confirms that in TICTM autonomy has its drawbacks.

Interim conclusions

- Workers in TICTM tend to work more often alone.
- ‘Intense’ forms of TICTM experience more likely lack of support from colleagues.
- ICTs help self-employed to reduce feelings of isolation and increase their opportunities for support from ‘colleagues’.
- Compared to working at employer’s premises, working remotely from other places does not have a negative effect on participation in team work or in decisions related to work and work organisation. However, workers in TICTM who have clear opportunities for face-to-face interaction at work and work only occasionally from distance are more likely to report that they influence decisions affecting their own work.
- TICTM is not related to higher levels of trust between employees and managers/employers. However, higher level occupations tend to report higher levels of trust and these occupations are more common among TICTM.
- The intensification of working life is evident among the high mobile TICTM employees in relation to experiencing blurred boundaries between work and private life, more interruptions at work and more work pressure/work load. However, self-employed TICTM (with a large share of high mobile) can handle better at least the

interruptions and the work pressure, which very likely is due to the higher autonomy of the self-employed.

- Country characteristics seem to have some influence on the levels of intensity at work in TICTM. Results suggest that, for example, in relation to high mobile TICTM employees the country context is not playing a strong role, very likely because this type of work is intense anyway and national practices or policies are not making much difference. However, in relation to home-based TICTM large differences exist in the level of work intensity by country.
- The job autonomy of TICTM does not always have positive effects. The reasons are high levels of intensity, internalisation of a work ethics related to professionalism and use of workers' sovereignty and managers' mechanisms to enforce performance outside the employer's premises.

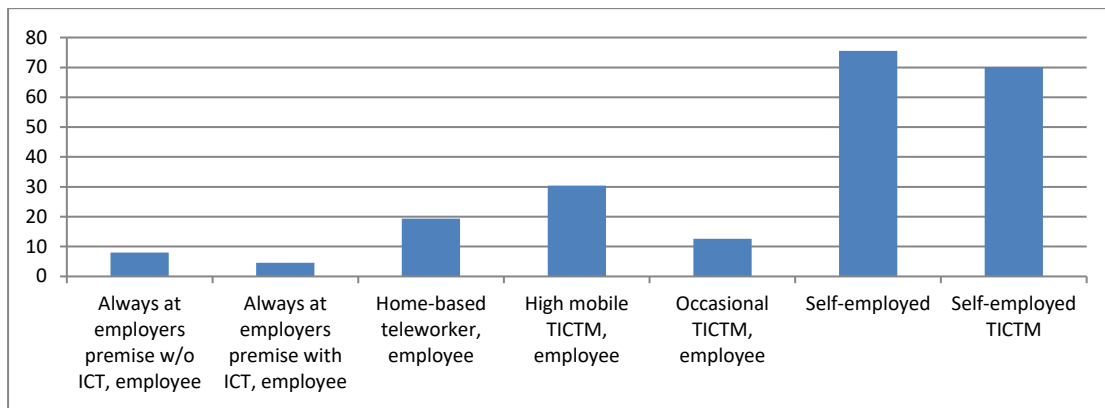
Working time and work-life balance revisited: reasons for working long and the 'children' effect

Eurofound and ILO (2017) demonstrated that the working hours of workers in TICTM arrangements, particularly those of home-based teleworkers and high mobile workers, are typically longer than those of employees who always work at the employer's premises. In line with the findings presented in the previous section, the report added that available evidence suggests that working outside the employer's premises using ICTs appears to supplement normal working time to some extent, although this might not be requested by the employer. TICTM workers are also more likely to work in the evenings and on weekends than workers who work always at the employer's premises. In relation to working time autonomy, the report concluded that a substantial share of TICTM workers enjoy a significant degree of time autonomy.

The Working Time Directive (2003/88/EC) establishes certain provisions related to the duration of the working time, daily and weekly rest periods for workers, protection for night workers, paid annual leave and a rest break during daily working time. The Directive requires EU countries to guarantee a limit to weekly working hours, which must not exceed 48 hours on average, including any overtime. It is also a threshold which prevents negative effects of working time on health and well-being (Eurofound, 2013).

According to the multivariable analysis, in general TICTM workers are more likely to work longer than 48 hours per week, but differences exist across categories. High mobile TICTM and home-based teleworkers are more likely to work more than 48 hours a week than the rest of employees. The self-employed TICTM and the self-employed working in a fixed place are most likely to work more than 48 hours.

Figure 12: Workers reporting working more than 48 working hours per week (%)



Source: EWCS 2015

In the previous section qualitative research identified autonomy and the self-imposed obligation to deal with the workload as reasons for working long. Interestingly, the EWCS analysis does not show an overall effect of autonomy (understood as how to organise work – see Autonomy index above) on working long. However, it shows that among TICTM employees, the high mobile who can entirely determine their working time have a high share (43%) of workers working more than 48 hours. This percentage drops to 13% when considering regular home-based teleworkers and to 29% for occasional TICTM. Therefore, having high working time autonomy does not prevent a large share of high mobile workers from working 48 or more weekly hours. It appears that the autonomy in the organisation of working time contributes to working long.

Although overall job autonomy might not have a direct effect on working long, a multivariate analysis has been developed to understand whether other characteristics related to work organisation, like work pressure or interruptions, play a role in working more than 48 hours. The analysis confirmed that work pressure and interruptions contribute to working long.

When TICTM workers are exposed to work pressures (using proxy ‘having time to do the job’), for example, they have the option to use ICTs to continue working outside the employer’s premises. Therefore, ICTs enable working longer. This is confirmed when comparing those who use ICTs and those who do not. The former are more likely to work long when experiencing work pressure.

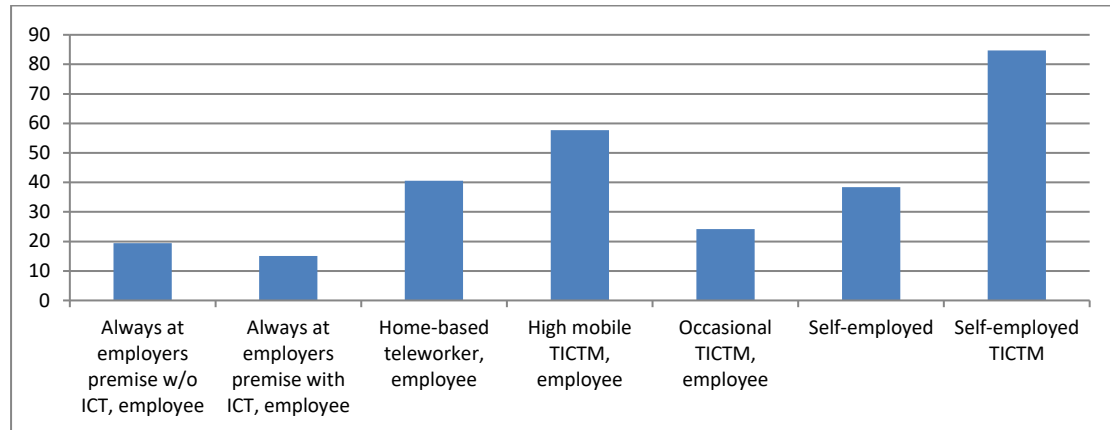
According to a multivariate analysis, experiencing interruptions also increases the likelihood of working longer than 48 hours. This is especially significant for home-based teleworkers, occasional TICTM and self-employed TICTM, which suggests that the use of ICTs and being mobile at the same time is related to experiencing interruptions. High mobile workers work long anyway and therefore interruptions might not add significantly to long weekly working time.

Working in a free time goes hand in hand with work pressure and interruptions, aspects which are more prevalent in TICTM than in other work arrangements.

If TICTM workers work long they might have less time to rest between working days. A provision of the working time directive establishes a minimum daily rest period of 11

consecutive hours in every 24 hours. Figure 13 shows that self-employed and high mobile TICTM workers are most likely to report not to have this rest at least once a month.

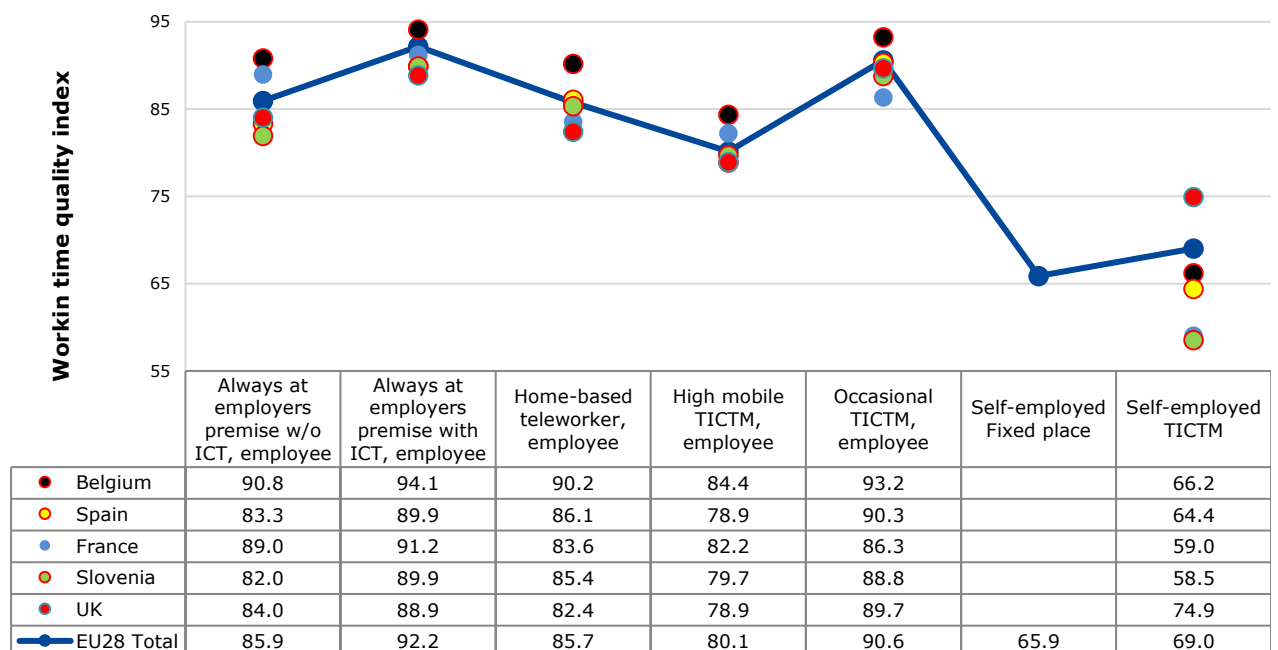
Figure 13: Workers reporting they rested less than 11 hours (at least once during last month) (%)



Source: EWCS 2015

The following figure represents an index of working time quality integrating elements related to duration, atypical working time, working time arrangements (autonomy and changes in time schedule) and worker flexibility. This composite indicator confirms the lower working time quality of high mobile TICTM and notably self-employed (irrespective of whether they are TICTM or working only from one place). For illustration, country scores are shown. Except for self-employed TICTM, workers in Belgium in all groups have better working time quality. Slovenia shows particularly worse results for the working time quality of the self-employed TICTM and the UK a comparatively good score for the same group.

Figure 14: Working time quality index (mean score 0-100) (Countries average total: from 69 Greece to 89 Denmark – Range = 20)



Source: EWCS 2015

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.

Overall, meta-analysis studies (Allen et al, 2015) and literature reviews (Dén-Nagy, 2014) confirm that there is little empirical evidence on overall positive effects of TICTM work on work-life balance. Allen et al (2015) focus on telework, defined as work performed by those whose remote work is from the home or satellite office, those whose telework is primarily in the field, and those whose work is 'networked' in such a way that they regularly work in a combination of home, work, and field contexts. The paper by Dén-Nagy (2014) is based on a literature review of 30 publications on the impact of the use of mobile devices for work purposes on work-life balance and it does not rely on a pre-established definition of telework. In particular, Dén-Nagy (2014) highlights that telework arrangements may lead to blurring boundaries between life and work and increased interferences in both directions, with positive and negative effects on work-life balance. Working from home may increase the amount of family responsibilities assumed by the teleworker, thereby increasing the family interferences on work. On the other hand, connectivity via mobile devices also generates expectations of 'constant availability' to attend work demands, which may lead to conflict with family roles and work-related stress.

Behind this conflict lies the higher likelihood of workers in TICTM to work longer hours because they do supplemental work beyond normal working time as described before. According to Ojala and Natti (2014), differences arise when considering family type as couples with children clearly do both telework and informal overtime (working in free time) at home more than other household types. This informal overtime is strongly correlated with increased conflict over time allocation in the family, and this connection remains after controlling for family and job characteristics. Not surprisingly, work-life conflicts are especially reported among those employees working from home during their leisure time, whereas various aspects of job quality and job satisfaction are assessed more positively among employees working from home during office hours (BMAS, 2015; BITKOM 2013).

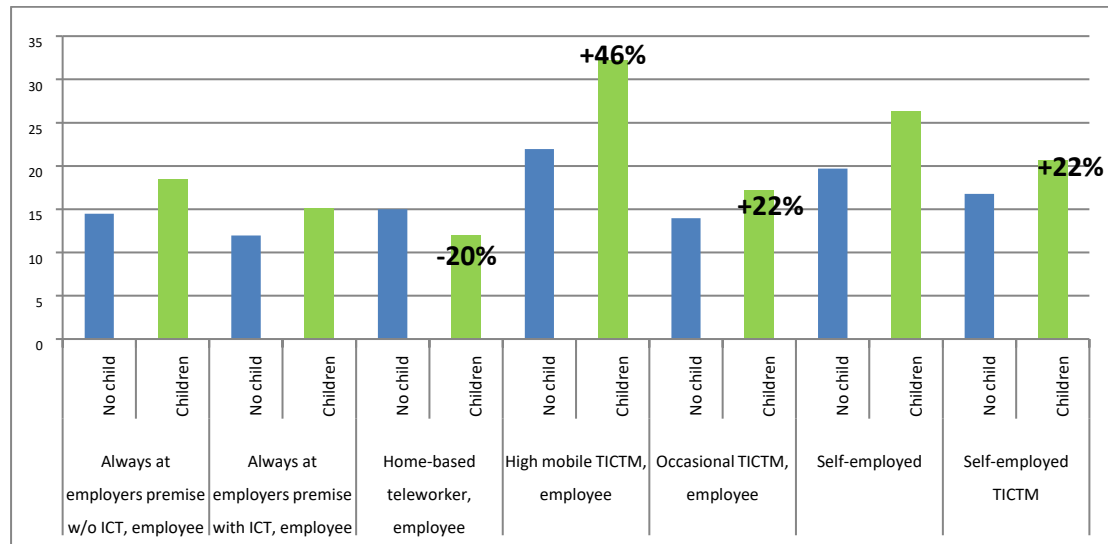
These findings are only partially supported by the EWCS. The survey confirms that 'informal overtime' (working in free time) produces worse results in relation to work-life balance. However, there is a nuance in relation to work-life balance being more often reported by those working from home during their leisure time and having children. This is true for most TICTM groups except for regular home-based teleworkers. This result confirms previous findings. Home-based teleworkers is the only TICTM group reporting slightly better work-life balance than workers at employer's premises. One of the reasons is that mostly female workers use this arrangement precisely to combine work and care (Eurofound and ILO, 2017).

The prevalence of work-life balance problems for the different groups of TICTM with and without children is shown in Figure 15. Employees in high mobile TICTM arrangements not only have higher prevalence of work-life balance difficulties, but also when they have children the prevalence increases by 46%, whereas for the occasional TICTM in the same situation the share increases only by 22%. For home-based teleworkers, the share of employees with children reporting work-life balance problems is not only lower than their colleagues using ICTs at employer's premises, but also lower than that of teleworkers without children.

Some sources mentioned above reported that workers working from home with children experience more work-family conflicts, but did not consider differences between TICTM groups. The difference might be in the type of indicator used in relation to work-life balance.

It might be that in the studies explained above the perspective is on home-work interference while the question in the EWCS is related to the possibility to combine work and family properly timewise.

Figure 15: Workers reporting work-life balance problems by TICTM and household type (children versus no children) (%)



Source EWCS

Note: percentages in numbers represent the difference between % of workers with 'No child' and % of those with 'Children' for specific groups of TICTM

Interim conclusions

- Since TICTM involves working intensively with ICTs, work pressure, experiencing interruptions and working in free time contribute to longer working hours of these workers.
- For high mobile TICTM (in comparison with other groups), high time sovereignty can contribute to working 48 or more hours per week.
- Regular home-based teleworkers, high mobile and self-employed TICTM are more likely to report not resting at least 11 hours at least once a month.
- The overall working time quality is comparatively better for occasional TICTM and those working from the employer's premises than for high mobile and self-employed TICTM. Country differences seem to be related to the national level of working time quality.
- The quality of the working time interacts with TICTM to produce work-family balance outcomes. In general, working in free time is negative for work-life balance. However, some forms of TICTM are better than others. For example, high mobile work produces more negative results than home-based telework for workers with children.

Learning and career prospects

Some aspects of TICTM have attracted the attention of a small number of authors to question the learning and career opportunities of workers doing TICTM. Nevertheless, there is very little research on the consequences of remote work on learning, career prospects and wages, for example, high mobile workers or regular home-based teleworkers. In this section some findings of the existent literature are highlighted, which is complemented with an analysis of the EWCS in order to shed light on these very relevant aspects of working conditions of TICTM.

Learning and training in a TICTM environment

Workplace socialisation is widely recognised as a critical component of workplace learning and organisational knowledge transfer. Consequently, TICTM workers may feel excluded from knowledge sharing through interpersonal relationships and informal learning that enhances work related skills, and thus getting disconnected from important sources of professional development and career advancement. Employees opting for intensive TICTM work run the risk to be perceived by managers and colleagues as having ‘opted out’ of a career. Moreover, managers may be reluctant to the loss of control on TICTM workers and may be tempted to implement restrictive policies that undermine potential benefits (Sewell and Taskin, 2015).

Taskin and Bridoux (2010) propose making a distinction between the knowledge that is the object of the transfer (explicit knowledge) and the knowledge that facilitates the transfer (tacit knowledge). The latter refers to cognitive and relational factors involved in organisational socialisation, such as the existence of shared mental schemes, language and narratives, and the quality of relationships between co-workers. In line with the bulk of research literature on telework, the authors consider different ways in which these factors are affected by the frequency of telework.

First, telework frequency decreases the possibility of physical interaction between co-workers, and with that, the availability of different channels through which teleworkers and the rest of the workers share mental schemes and meanings. This is tacit information which cannot be communicated easily through ICTs. In consequence, the more time spent in telework, the more teleworkers’ schemes (shared specific knowledge) are likely to differ from the ones that non-teleworkers construct jointly through face-to-face informal interactions. Second, telework frequency is likely to affect the extent to which teleworkers identify with the organisation’s goals and values. This element is related to relational aspects affecting the creation and transmission of tacit knowledge in the workplace, which can affect transmission of explicit knowledge. Third, telework frequency also affects the relationship between teleworkers and non-teleworkers. Workers who telework frequently need to develop new interaction routines based on the use of ICTs, which may be perceived more distant by non-teleworkers. As a result, the lack of face-to-face interactions is likely to negatively affect the level of trust between both groups of workers, which would also inhibit the transfer of knowledge between them.

Martínez and Gómez (2013) found that employees who had more flexibility to work outside the workplace on a regular basis received fewer training opportunities. This may be the

effect of their lack of visibility and thus receiving less managerial support for their professional development.

However, other research also points out the role of technology for knowledge sharing and gives equal importance to technology and face-to-face interaction for sharing knowledge. Golden and Raghuram (2010) suggest that face-to-face interactions and the extensive use of technology are likely to facilitate knowledge sharing especially for teleworkers with low trust relationships, but both are less necessary for knowledge sharing among those with high trust relationships. The authors conclude that the affective-based nature of interpersonal relationships is not fundamentally affected by the altered nature of a teleworker's spatial and technological interactions.

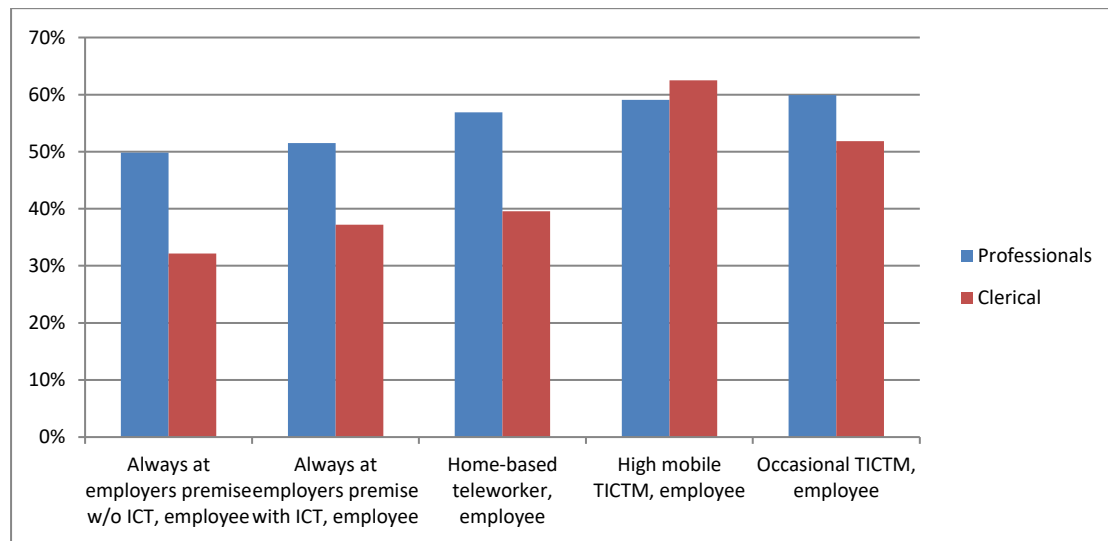
From this literature review, it seems that the social interaction at the workplace contributes to the sharing of knowledge and learning skills. However, it can also be argued that this social interaction can take place also through ICTs leading to online learning. In general, workers in TICTM experience the same social support from colleagues or the managers as the rest of the workers (except for home-based teleworkers). Moreover, developments in e-learning and self-learning processes through internet should be considered in this context before concluding that TICTM prevents from learning and developing skills. It is plausible that there is a need for some face-to-face contact for developing tacit knowledge and that workers hardly present at the workplace might be less considered for training opportunities. However, the potential of online social interaction and learning through ICTs should not be underestimated. Moreover, the companies who offer modern types of training through ICTs are also companies more open to implement this work arrangement, providing in turn workers with new learning pathways.

The EWCS analysis shows that after applying contextual controls (including occupation) the employees in high mobile and occasional TICTM are more likely to report that they learn new things in their current job while home-based teleworkers are less likely to learn new things, which somehow could support the perspective according to which the detachment and social isolation can result in less tacit learning or learning in general. However, this cannot be definitively confirmed with the analysis.

Workers doing occasional TICTM are more likely to receive training offered by the employer, whereas home-based teleworkers have less chances to participate in such. It is interesting also to look at on-the-job training, which is closer to 'transfer of tacit knowledge' or 'informal training', a type of training that implies some workplace connection or at least relations with colleagues and supervisors. Also here the occasional TICTM workers are more likely to report on-the-job training and the home-based teleworkers report fewer opportunities for this type of training.

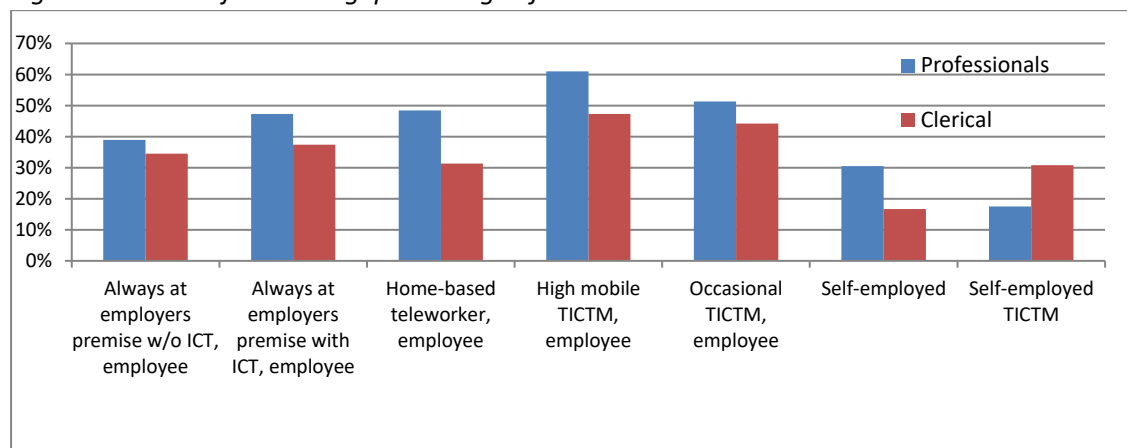
As it would be expected, differences exist by occupations. Apart from the fact that highly skilled professionals have more chances to participate in training, the differences are bigger for home-based teleworkers than for the other types of TICTM, meaning that in general clerical workers are more negatively affected in relation to training by being home-based teleworker than professionals.

Figure 16: Training paid by the employer: percentage of employees by type of TICTM



Source: EWCS 2015

Figure 17: On the job training: percentage of workers



Source: EWCS 2015

From the results of the analysis of the EWCS, it is reasonable to conclude that TICTM employees are more likely to participate in on-the-job training than the self-employed or those at the employer’s premises. Regular home-based teleworkers have fewer opportunities for learning and training than the other TICTM groups. Therefore, at least for home-based teleworkers and self-employed, the concerns expressed by some of the authors mentioned above seem to be confirmed by the EWCS. Although online learning or training exists and can be accessible for workers in TICTM arrangements, being in contact with colleagues and supervisors at the workplace might enhance the chances of learning and receiving training.

Another aspect to consider is that for working in TICTM arrangements it is necessary to have some IT skills. And these competences are not only crucial for accessing work but also for self-promotion and building an online reputation to guarantee employment opportunities. The latter is directly linked to the next section on career prospects.

Career prospects

The point of departure to investigate the career prospects of workers in TICTM has already been suggested. On one hand, the lack of visibility and detachment from the employer's workplace can jeopardise the career development of some workers. On the other hand, following several authors (Dubravka and Campbell, 2016; Gajendran et al, 2015; Glas and Nooman, 2016 and Kolowski, 2016) stating that TICTM is often based on high level engagement and trust and supportive relations between the employee and the employer, it can be suggested that TICTM is positive for career advancement. For some groups, like disabled people or those with family responsibilities, TICTM can offer an opportunity for accessing the labour market. However, it has also been reported that due to their conditions and being for long away from the employer's premises they can be negatively affected in terms of career prospects.

With regard to subjective career progression outlooks, Allen et al's (2015) meta-analysis on telework showed no significant association between telework and perceived career prospects. However, empirical research has also acknowledged risks that career advancement may be hindered for workers who practice telework. On the basis of signalling and stigmatising the adoption of flexible working practices defined as 'practices that afford employees' control over when, where, or how much they work', such as reduced working hours, flexible scheduling and working at home, may be perceived by managers and supervisors as a sign of low commitment which can result in career penalties for the workers concerned (Leslie et al, 2012).

Flexible work practices may entail the danger of restriction of career advancement for the most vulnerable groups of the workforce, such as females with care responsibilities and people with disabilities. The reason is that workers on flexible work practices tend to isolate from the organisation and their promotion possibilities might therefore be impaired (Leslie et al, 2012). In line with these findings, research conducted by Maruyama and Tietze (2012) found that female teleworkers in particular, especially those with children and those who spend more than 50% of their working hours at home, were more likely to report the disadvantage of reduced visibility and career development as a result of telework. The study was focused on the company British Telecommunications (BT). In this company, employees retain the right to use the offices to work using hot-desking⁷, and have full access from home to the BT intranet and communications systems such as conference calls (Hills et al, 2002). This group of BT employees are defined as teleworkers. Thus, the study considered both home-based and mobile workers.

On the other hand, research by Masuda et al (2017) found that, contrary to expectations, employees who had the opportunity to work from home were more engaged, perceived more support from their supervisors and experienced more progress on their career-related objectives and plans. Here it is to be noted that the sample was made of business

⁷ the practice in an office of allocating desks to workers when they are required or on a rota system, rather than giving each worker their own desk

professionals from a Spanish business school and their modelling did not consider the household characteristics of the respondents.

Other studies considering gender, presence of children and marital status of workers who use different work-life interface benefits (reduced working hours, flexible scheduling, compressed scheduling and working at home) find no evidence of these being a 'career-limiting move' (Konrad and Yang Yang, 2012). Drawing on the results from a Canadian large national survey, these authors suggest that the long-term benefits of using these flexible arrangements for the performance of workers tend to offset the initial negative views of managers and co-workers and enhance their chances of promotion. In the same vein, Dijkers et al (2010) find that the utilisation of flexible work-home arrangements by Dutch working parents from different organisations are associated to more positive career outcomes compared to those working at regular times and normal workplaces, and this relationship is especially strong for working mothers.

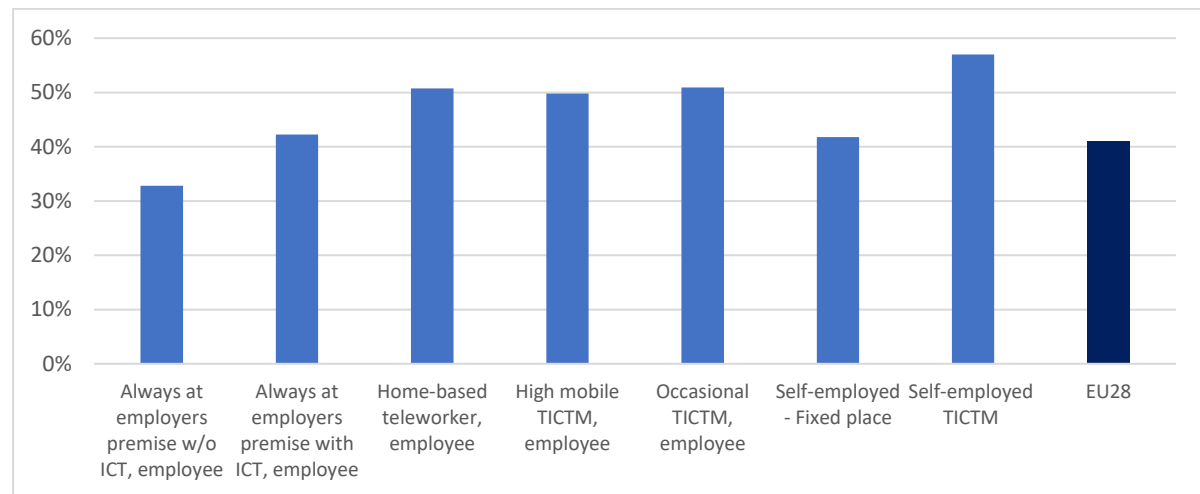
Kaldmäe (2017) concludes that telework, understood as a work arrangement whereby the employees work outside of the regular premises of the employer, is considered more diversified and often helps to develop ones' skills and career better than regular in-office work. At the same time, teleworkers feel less often that their good results are being noticed and valued (16% agree compared to 26% among other employees), thus affecting their promotion.

Crowley and Kolenikov (2013) investigate the relationship between control over different workplace flexibility dimensions and the perceptions of career outcomes related to different parental status of American women. In their analysis, based on data from a random telephone survey, and contrary to expectations, the authors found that the control over the timing and location of work did not significantly alter the perceptions of mothers with regard different career outcomes (earnings and promotions).

Furthermore, the employment opportunities of young people with special needs in Estonia were analysed, coming to the result that the employers are not knowledgeable enough to provide suitable flexible employment opportunities for young people with disabilities (Haaristo et al, 2016).

The EWCS includes the question 'To what extent do you agree or disagree with the following statements about your job? My job offers good prospects for career advancement. After applying some controls (for example, occupation), the results show that self-employed TICTM are those who are more likely to state that they have prospects for career advancement. TICTM employees are also more likely than their counterparts at employer's premises to report career prospects. From these results, it can be suggested that the argument of higher engagement and support from manager is more often the case and that workers in TICTM have more prospects. In another model the weekly working hours was added and the association between TICTM and career prospects decreases to some extent, meaning that working short hours in TICTM reduces workers' prospects, but it does not fully explain the career prospects of TICTM. Therefore, to explain the higher prospects of TICTM, apart from the possible effect of weekly working hours, the aspects mentioned before related to engagement have to be considered.

Figure 18: Percentage of workers reporting that their job offers good prospects for career advancement



Source: EWCS 2015

Wages

Research on wages of workers in TICTM is scarce in Europe. From the literature review three aspects can be considered: First, the potential negative effect related to the lack of visibility and detachment from the workplace, second the fact that workers in TICTM tend to work unpaid overtime more often outside the employer’s premises and third, the potential impact on wages (and career) of their longer hours in comparison to other workers.

According to the meta-analysis of Allen et al (2015⁸), research on wages and career prospects has also produced conflicting results. Specific case studies show that teleworking has a negative effect on the wage growth of the workers concerned and that this effect is strongest among women in professional and managerial functions. On the other hand, studies based on cross-sectional data (Glass, 2004 and Weeden, 2015) suggest the opposite effect when comparing the wage growth of teleworkers in relation to current wages, both for men and women. These differences may be attributed to the fact that those in higher wage job positions are more likely to adopt telework than their counterparts in lower paid jobs.

Most research references dealing with the specific issue of wages stem from the US. This may be explained by the distinct role and coverage of collective bargaining institutions in wage settings of Europe and the US.

The work of Glass and Noonan (2016) analyses the impact of telecommuting on earnings of midlife salaried employees in the US according to gender and parental status on the basis of

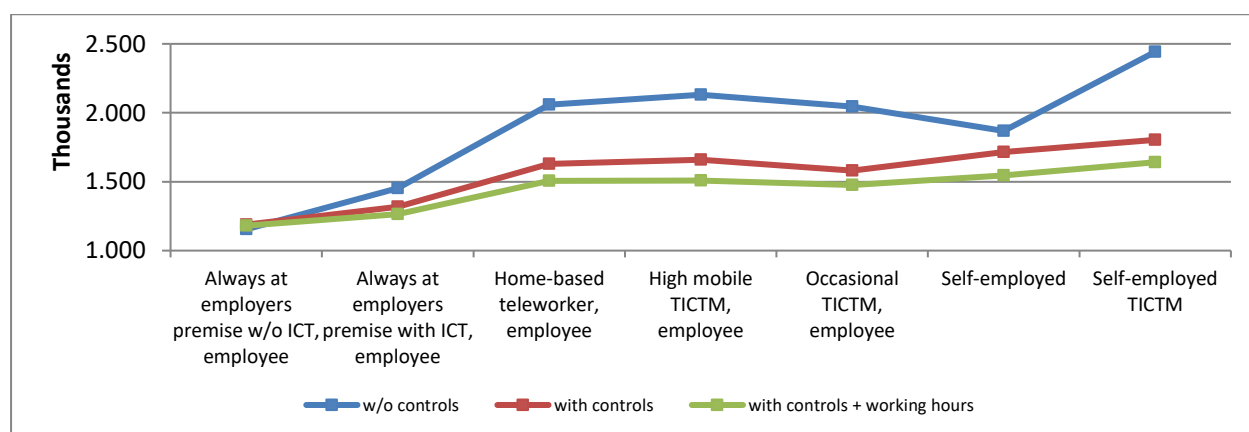
⁸ Allet et al (2015) define telework in their meta-analysis as work performed by those whose remote work is from the home or satellite office, those whose telework is primarily in the field, and those whose work is ‘networked’ in such a way that they regularly work in a combination of home, work, and field contexts.

a longitudinal data panel from 1989 and 2008. Telecommuting is understood as home-based telework as both substitution and extension of on-site standard working hours. The latter is a critical distinction for estimating the effects of telecommuting on earnings. The results pointed out by the research suggest a revealing paradox: whereas employees are most likely to telework from home as overtime (taking work home at the end of the day), the wage premium associated to this practice is lower compared to overtime carried out in the workplace. This result suggests that managerial biases reward employees for overtime beyond the standard working week as 'signal' of commitment or devotion to the organisation, while working from home after hours is less valued than those worked on-site.

The study of Simon and McDonald (2015) aims to explore the earnings gap by gender among self-employed US millennials on the basis of a longitudinal survey which allows to compare self-employment by gender and work location while controlling for other earnings-related characteristics. Their analysis concludes that earnings for self-employed women working from home are far lower than for men and that these differences are not associated to their parental status or working in low-return industries or occupations. The authors acknowledge some limitations in the analysis as that the dramatic segregation by gender in non-professional self-employment may not be properly captured in their binary industry classification. Also, differences in working hours are a factor influencing the earnings gender gap. The study found that home-based self-employed women worked approximately 75% of the hours men work.

The overall differences in wages using Eurofound's Index of Monthly Earnings are shown in Figure 19. TICTM workers' monthly average earnings in the EU28 are higher than that of those who are not in this arrangement. The highest earnings are received by self-employed TICTM. Using Analysis of Variance, when controls are applied (occupation, gender, country, sector and age and working hours), the difference is reduced but it does not disappear. Therefore, it seems that the TICTM work arrangement has some influence on receiving higher earnings and there are no significant differences between the different types of TICTM employees.

Figure 19: Monthly earnings in Euros (without controls, with controls and with controls + working hours)



Source: EWCS 2015

Are all workers in TICTM enjoying good employment conditions?

As shown above, in general workers in TICTM report higher wages, participation in training and no differences in relation to job insecurity and employment status compared to the general workforce. However, in a heterogeneous group of workers it is very likely that some of them do not benefit from the general positive employment conditions.

Although traditionally TICTM has been viewed as a form of work more typical of professionals and high qualified workers, the EWCS shows that it is also prevalent among clerical and service workers in services. In these sectors, some literature pointed to the potential precarious/non-standard conditions of some groups working intensively with new technologies and with time and space flexibility. This is, for example, the case in the context of the emergence of work managed by online platforms, which often has been viewed as representing a new form of 'non-standard' employment (Huws et al, 2018). Some of these workers, especially those with higher dependence on the platform, may experience precarious conditions, including low earnings, non-standard contract and less control over the work. In most EU Member States, public and policy debate is driven by trade unions on the unclear employment status of workers and working conditions in platform work. Taking into account that many platform workers work with ICTs and with some flexibility, they might be included in the definition of TICTM. Moreover, there are also mid-skilled workers in TICTM who do not work through platforms and could have different conditions than the high-skilled professionals. It is also possible that employment status vary within TICTM arrangement. In summary there is a need to explore further whether employment conditions of workers in these arrangements vary.

Following the results of a latent class analysis, 24% of the TICTM workers belong to the group which is characterised by precarious conditions: they are more likely to have a fixed-term contract, low income, experience job insecurity, and lack of training opportunities. This group with worse employment conditions includes workers in services (information and communication, professional activities, administrative and support activities, arts, entertainment and recreation, and other services). By occupation, they are more likely to be professionals (for example legal, cultural and social professionals), services and sales workers (customer service workers and sales workers) and also some information and communication technicians. In relation to type of TICTM, there is a relative higher probability for the self-employed TICTM to be in this group. This result could be expected given the nature of their status.

Final remarks

The paradoxes of the findings on working conditions in TICTM were already reflected in the conclusions of Eurofound and ILO (2017). This work arrangement is not unequivocally advantageous compared to traditional office work at employer's premises. Neither does it seem to result in mainly negative effects. On the positive side, workers report a reduction in commuting time, greater autonomy in working time organisation, better overall work-life balance and higher productivity. The disadvantages of TICTM with which workers seem to struggle the most are its tendency to extend working hours, create an overlap between paid work and personal life due to the blurring of boundaries, and intensification of work. It appears that many of these ambiguous or paradoxical effects have to do with the interactions among ICT use, the place of work, specific work environments and the characteristics of different occupations. Finally, occasional or partial forms of this work arrangement, in general result in better working conditions and outcomes in relation to working time and work-life balance and general health and well-being.

Further analysis of the EWCS shows other perspectives which somehow reinforce the paradoxical effects of TICTM. Autonomy does not always have positive effects because of a combination of intensification of work, high level of time sovereignty and work cultures represented by professionalism, self-responsibility and managers' mechanisms to enforce performance outside the employers' premises. Some authors suggest that among other factors, the competitive capitalism plays an important role in this dynamic.

An example of the side effects of autonomy can be given by the results obtained for the self-employed in TICTM. These workers have some similarities with those employees working in TICTM frequently and who also are very mobile. But they have even poorer conditions in relation to some factors like their working time quality, which is probably related to the high level of autonomy that characterises this employment status. For example, it is the group with a higher share of workers not having the necessary rest between working days. Another typical condition of these workers is their isolation, which somehow can be overcome, precisely with the use of ICTs. The technology helps them to be in contact with colleagues and clients more often and anytime and anywhere.

Work-life balance is a core aspect in relation to TICTM. Depending on how TICTM is implemented, it can have either positive or negative effects. The EWCS suggests that other variables play an important role. For example, workers in TICTM and with children tend to worsen their work-life balance. In the case of high ICT-mobile workers, the share of workers reporting poor work-life balance increases by 46% when they have children. However, in the case of regular home-based teleworkers, having children has a positive effect on work-life balance.

Regardless the country, findings confirm the same patterns in relation to differences between the TICTM groups (classified by frequency of ICT use and mobility) in relation to working conditions. Moreover, results suggest that some differences have an influence of the institutional settings of the country, for example, differences between the UK and Belgium in relation to work intensity and working time. Regular home-based teleworkers in Belgium enjoy better conditions, which might be related to a more regulated labour market in this country.

Conclusions – Selective new insights into TICTM

- TICTM work does not prevent workers from participation in formal training paid by the employer or on-the-job training.
- However, tacit knowledge through informal learning is more difficult when there is lack of face-to-face interaction. This could be the case of self-employed and to some extent of regular home-based teleworkers.
- In general, occasional and high mobile TICTM employees are more likely to learn new things at work.
- In general, TICTM workers have more career prospects, which is partly related to their working hours and the level of engagement and support from managers. Therefore, TICTM can be a resource for career advancement, especially for high qualified workers.
- However, while access to employment for vulnerable groups can be facilitated by using ICTs, there is a risk of stigmatisation of regular home-based teleworkers by attributing them low commitment and lack of visibility which could jeopardise the career development.
- Workers in TICTM receive higher average wages. Nevertheless; further research is needed to find out the influence of TICTM on higher level of earnings.
- Although, in general, TICTM workers are medium or high qualified and have standard employment conditions and higher wages than other workers, there are around 25% of them that cannot be included in this definition. Interestingly, the precarious group includes also mid and high qualified workers. In this group, self-employed TICTM are more likely to be present than the other TICTM groups.

Policy pointers

- Given the effects of TICTM on working conditions, it would be necessary to revisit certain regulations. For example, by considering TICTM in the existent framework agreement on telework, including aspects like occasional TICTM.
- EU legislation limits the duration of the working time and establishes minimum rest periods. TICTM workers are more likely to trespass these limits and therefore there is a need for measures to be taken for the effective implementation of working time (and health and safety) regulation. For example, incorporating in the legislation a special emphasis on psychosocial risks, recording working time and establishing a new framework of responsibilities when there is a high level of autonomy could help to tackle some negative effects.
- Some of the negative effects on well-being or work-life balance are related to elements of the work organisation in TICTM. Therefore, improvements in work organisation (workloads, limiting aspects of job autonomy, interruptions or constant availability) at company level can lead to better job quality of workers in TICTM.
- Social partners could address at sectoral and company level the positive and the negative effects of TICTM by balancing them and considering the positive aspects for all workers. Elements to consider are:
 - To take into consideration their positive and negative effects.

- To avoid intensive forms of TICTM (for example, high mobile or regular home-based) while fostering occasional forms of TICTM so that there is still face-to-face interaction at work.
- Control of total working hours and supplemental working time.
- Prevent parents from being involved in 'intense' forms of TICTM.
- The general good employment conditions in TICTM should not make policymakers forget that around ¼ of these workers are likely to report precarious conditions in relation to access to training, job insecurity and wages. Therefore, research and actions should also consider the workers with worst employment conditions in TICTM.
- National contexts and how they affect the job quality of TICTM arrangements should be included in further research on use of ICTs and work organisation.

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Annex

Table 1: Identified⁹ terms and definitions

(*) Included in a meta-analysis of Allen (2015)

Concept	Definition	References	Employment status
Telework (EU framework agreement)	Telework is any form of organising and or performing work using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer's premises, is carried out away from those premises on a regular basis.	EU Framework agreement on Telework	Employee
Telework	Work performed by those whose remote work is from the home or satellite office, those whose telework is primarily in the field, and those whose work is 'networked' in such a way that they regularly work in a combination of home, work, and field contexts. A form of work organisation in which the work is partially or completely done outside the conventional company workplace with the aid of information and telecommunication services.	Morganson et al. (2010) (*) Allen et al (2015) Konradt et al (2010)* (*) Allen et al (2015)	Employee
Telecommuting	Telecommuting is a work practice which involves members of an organisation substituting a portion of their typical working hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace - typically principally from home - using technology to interact with others as needed to conduct work tasks.	Allen et al (2015)	Employee

⁹ All the terms found in the literature review that referred to work practices enabled by the use of new ICT that may involve a variety of working time adjustment, workplaces and mobility patterns.

	Telecommuter is any employee working outside the main office on at least one occasion each month, and using various forms of information and communication technologies to complete work-related responsibilities.	Nicklin et al (2016)	
T/ICT mobile work	The use of ICT – such as smartphones, tables, laptops and desktop computers – for the purpose of work outside the employers’ premises.	Eurofound and ILO (2017)	Employee
ICT-based mobile work	ICT-based mobile work refers to the worker operating from various possible locations outside the premises of their employer supported by modern technologies less ‘place-bound’ than traditional teleworking. Work mainly from locations other than their employer’s or their own premises, and make extensive use of computers, the internet and e-mail in the course of they work.	Eurofound (2015) Vendramin and Valenduc (2016)	Employee and self-employed Employee and self-employed
E-nomad	Individuals who use ICT at least sometimes and do not have their employer’s premises (or their own premises if self-employed) as the main place of work.	Eurofound (2012)	Employee and self-employed
Smart work	Flexible working system which allows to work in a convenient and efficient manner free from time and place constraints (anytime, anywhere) using ICT on a network.	Lee (2016) based on South Korean policy documents for the activation of smart work	Employee and self-employed
Flexible work arrangements	Alternative work options which allow work to be accomplished outside of the traditional temporal and/or spatial boundaries of a standard workday.	US Office of Personnel Management (2013)* (*) Allen et al (2015)	Employee
Virtual work	Labour, whether paid or unpaid, which is carried out using a combination of digital and telecommunications technologies and/or produces content for digital media.	Webster and Randle (2016), Meil and Kirov (2017)	Employee and self-employed
Virtual teams	Spatially or geographically dispersed work arrangements which are	Tworoger et al (2013)	Employee and self-employed

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	generally characterised by a relatively short life span, technology-enhanced communications, and a dearth of face-to-face interaction.		
Mobile virtual work	Virtual work which is physically mobile	Vartiainen (2006)	Employee and self-employed
Platform work	Platform work includes different forms of paid work mediated through an online platform.	Huws et al. (2016)	Employee and self-employed
	Employment that uses an online platform to enable organisations or individuals to access other organisations or individuals to solve specific problems or to provide specific services in exchange for payment.	Eurofound (2015) Eurofound (2018)	Employee and self-employed Employee and self-employed

Source: Unpublished literature review by NOTUS for Eurofound.

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