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The platformisation of work

Evidence from the JRC Algorithmic Management and Platform Work survey (AMPWork)

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Contents

Abstract

This report provides a first approximation to the emerging phenomenon of platformisation of work, with an empirical analysis of data from the new JRC Algorithmic Management and Platform Work survey (AMPWork) in Spain and Germany. The study focuses on three key elements of platforms: the digital devices used at work, the digital monitoring of work, and the use of algorithms for work organisation. These three elements are studied in three different contexts: regular work settings, Digital Labour Platforms and content sharing platforms. The implications of these new forms of work for work organisation and working conditions are also discussed. The findings show that a small but significant proportion of workers in the two countries analysed are subject to digital monitoring and algorithmic management systems at work to some degree. A smaller but not marginal proportion of the working age population get their main income from providing labour services through Digital Labour Platforms. And another sizeable proportion of the working age population spend a significant amount of time producing unpaid content for sharing platforms outside their family and close friends.

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Executive summary

Digital platforms can be broadly described as technological infrastructures that facilitate interactions between multiple parties. Commercial digital platforms offer a digital infrastructure for transactions between buyers and sellers and are powered by algorithms that facilitate and coordinate these transactions. Digital Labour Platforms (DLPs), specifically, facilitate and coordinate transactions between buyers and sellers of labour services. The algorithmic coordination aspect in DLPs creates hierarchical power structures similar to conventional employment settings, with the providers of labour services being in a *de facto* subordinate position. Initially, DLPs were considered as simple mediators rather than employers, and the providers of labour services were considered independent contractors. However, recent court rulings and regulatory changes in Europe and beyond have tried to clarify the employment status of platform workers, often ruling in favour of their status as employees. This equates DLPs to traditional companies, even though they still use platform-based technologies for work coordination. At the same time, because of the increase in digitalisation and connectedness at work, the use of platforms and algorithms as mechanisms of coordination has spread to more traditional work settings; this is what this report refers to as the *platformisation of work*.

To study the platformisation of work, three crucial components are worthy of examination. Firstly, the digital devices in which platforms are embedded, serving as the digital spaces where labour interactions take place. Secondly, the information collected, stored and processed by platforms, related to labour interactions that occur within them or facilitated by them. And finally, the algorithms that platforms incorporate to govern and coordinate those labour activities.

This report investigates these three components through an empirical analysis of data from the JRC Algorithmic Management and Platform Work survey (AMPWork), a novel and representative survey on the platformisation of work in two European Member States: Spain and Germany. The survey collects data on the three fundamental elements of platforms in the workplace: the digital devices used at work, digital monitoring at work, and algorithmic management of work. These elements are evaluated in three distinct settings, providing a comprehensive view of the phenomenon of platformisation in the workplace. These include conventional work settings, Digital Labour Platforms, and content sharing platforms.

The resulting measures of platformisation across these different contexts offer a unique understanding of this growing trend. The report also examines the association between these measures of platformisation and conventional measures of job quality and working conditions included in the AMPWork survey.

Policy context

This study responds to two of the six priorities of the von der Leyen Commission, namely “A Europe fit for the digital age” and “An Economy that Works for the People”. The main EU-level legal references relevant to the platformisation of work as defined in this report are the General Data Protection Regulation (GDPR), the 2021 proposal for a "Directive on improving working conditions in platform work", and the 2021 Artificial Intelligence (AI) Act. The GDPR requires that personal data processing in the workplace is necessary and proportionate and prohibits fully automated dismissal or punishment without human intervention. The European Commission’s proposal for a directive on improving the working conditions of platform workers provides some principles to clarify the employment status of platform workers, and establishes some provisions to mitigate the negative consequences of algorithmic management. The proposal for an AI Act provides criteria for risk management and data governance for algorithmic management processes involving AI, but does not address the impact on working conditions or provide collective rights in this respect.

The empirical evidence on the platformisation of work provided by this study can help inform future regulation on these matters.

Main findings

This report shows that a significant proportion of workers are using digital devices in their daily work and are subject to some form of digital monitoring or, less often, algorithmic management. The higher levels of platformisation of work (that is, workers using digital tools and subject to digital monitoring and algorithmic management) is found among clerks and operators in high-technology industries, knowledge-intensive services, and public administration. Platformisation is also relatively more common for workers who perform their duties outside of their employer's premises, such as at home, in a vehicle, or in public spaces. In terms of working conditions and work organisation, platformised work is often associated with more detailed and complex work procedures, but also with increased monotony and stress

The study also looks at the provision of paid labour services via Digital Labour Platforms (DLPs) and finds that approximately 1% to 2% of the working age population in the countries under examination do platform work as their main job. Work in DLPs involves an intensive use of digital devices and is associated with high levels of digital monitoring and, predictably, algorithmic management. This implies that, as argued in the third section of this report, a majority of workers in DLPs, including even those that consider themselves self-employed, are *de facto* similar to dependent employees because they are directly subject to the authority of DLPs (even if that authority is algorithmically implemented). In terms of working conditions, the study finds that workers in DLPs have higher levels of autonomy and flexibility than traditional employees, but are also more subject to stress and to atypical work schedules which can conflict with personal life.

Finally, the study explores the phenomenon of unpaid production of content through digital platforms, which is more obliquely associated with the platformisation of work. A significant proportion (more than 20% in Germany, more than 40% in Spain) of the working age population spends some time producing content to be shared in online platforms with people outside family and close friends. If we translate the total number of hours spent in this activity into full-time equivalent units, it would correspond to almost 5% of the working age population in Spain, and almost 2% in Germany. The results suggest that this is a growing trend and raises important questions about the nature of this activity and the economic value it generates.

Key conclusions

The empirical analysis carried out in this report suggests that the platformisation of work is a real phenomenon affecting a small but not marginal proportion of workers in the two countries under examination. It also shows several differences between the two countries – Germany and Spain - which suggests that more data at the European level should be collected, to account for country-specific idiosyncrasies.

By comparing working conditions and work organisation between platform workers and those we call 'platformised' we found several similarities across working conditions, but especially work organisation. This suggests that the policy debate on platform work should be extended to include platformised workers in the regular economy.

Related and future JRC work

This report and the AMPWork survey are part of a larger project on the Future of Work undertaken by the JRC with the support of DG Employment, Social Affairs and Inclusion. It builds on the knowledge generated by half a decade of research on digital labour platforms carried out by the JRC as part of the COLLEEM project (Pesole et al. 2018; Urzí-Brancati et al. 2020; Baiocco et al 2022). The COLLEEM I and II surveys aimed to understand the prevalence and conditions of platform work in Europe, using a non-probabilistic sample of internet users between 16 and 74 years old, with self-completed online questionnaires. The previous surveys had limitations in terms of the representativeness of their sample and difficulties related to online data collection. In contrast, AMPWork was designed to be statistically representative of the working age population with face-to-face interviews. In addition, the transformation of platform work from a marginal and little understood phenomenon to a more regulated and better known one, as well as the extension of platform-like methods to conventional work settings, led to the expansion and transformation of COLLEEM into AMPWork. This report clarifies and expands on key concepts such as platformisation, algorithmic management, and digital monitoring, buidling on both previous research and the new primary data collected. AMPWork provides a representative statistical portrait of the platformisation of work across different domains, based on a representative sample of the working-age population in two European Member States, collected through face-to-face interviews.

This report is also related to a number of studies on digitalisation carried out by the JRC (for instance (Cirillo, et al. 2022, Sostero 2020, Urzì Brancati and Curtarelli 2021)) as well as others which are still work in progress.

1 Introduction

A digital platform is, in broad terms, a technological infrastructure that allows multiple parties to interact with one another. Digital platforms have been a core part of the digital revolution since its very beginnings. Indeed, the internet itself can be considered as a vast digital platform that provides the underlying infrastructure for most of the other existing digital platforms. In the early years of the internet, most digital platforms were non-commercial networks that facilitated informational interactions of different kinds. It was with the arrival of the commercial internet in the second half of the 1990s (together with the dot-com bubble) that the first commercial platforms emerged, shaping the internet and the digital economy into what it is today. Ebay was founded in 1995([1]) and provided the template for many digital platforms that would appear in the following decades: it offered a network-based space where buyers and sellers of certain goods could transact, as well as a set of algorithms to coordinate the transactions. Many of the key features of current digital platforms (such as user reviews and ratings) were pioneered by Ebay in the late 1990s. The generalisation of smartphones in the late 2000s facilitated the definitive explosion of the platform economy in the 2010s (initially called the "sharing economy", a very equivocal term that was soon abandoned), with a massive proliferation of platforms specialised in the coordination of transactions between buyers and sellers of all kinds of goods and services, from accommodation to transport.

All commercial digital platforms share two key aspects: on the one hand, they provide a digital space or infrastructure where transactions between buyers and sellers can take place; on the other hand, a set of algorithms that facilitate and coordinate those transactions. Digital labour platforms (DLPs), in particular, provide digital spaces where buyers and sellers of labour services can transact, facilitating and coordinating those transactions with their algorithms. Because what is transacted in DLPs is human labour rather than goods, the algorithmic coordination aspect makes them hierarchical power structures similar to employers, with the providers of labour services being in a *de facto* subordinate position vis a vis the algorithms. However, especially in the initial phase of their development, DLPs were not considered employers but simple facilitators (or intermediaries) of the transactions they coordinated, and thus the providers of labour services via DLPs were initially considered as independent contractors, not only by the platforms themselves, but also by policy makers and, to a lesser extent, scholars. In recent years, a number of court rulings and regulatory changes in Europe and beyond have tried to clarify the employment status of platform workers, in many cases ruling in favour of the plaintiff and considering them employees of the DLPs. In practice, some of these rulings equate DLPs to regular companies, even if they still use platform-based technologies for the coordination of their work activity.

Simultaneously, regular companies (ie, not DLPs) have in recent years introduced more and more platform-based systems for coordinating work activity too. The pervasiveness of digitalisation and connectedness in work, accelerated by the recent COVID pandemic (Adascalitei et al 2022), tends to expand the use of platforms and algorithms as mechanisms of coordination, simply because they are the most efficient form of coordinating digital interactions of any kind. In other words, there seems to be a convergence between DLPs and regular companies towards the increasing use of platform-based forms of labour coordination. This is what we call the *platformisation of work*, which this report investigates on the basis of a new dedicated survey on this topic, the **JRC Algorithmic Management and Platform Work survey (AMPWork)**. The term platformisation is our own conceptualisation of the phenomena described in this report and is unrelated to ongoing legislative discussions at EU level.

The AMPWork study was undertaken for a number of reasons. First of all, the JRC longstanding research on platform work (Pesole et al. 2018; Urzí-Brancati et al. 2020; Baiocco et al 2022) indicated that some key elements of digital labour platforms, such as algorithmic management and digital monitoring, were seeping through to more conventional work settings and likely to grow in importance in the future – more digitalisation is likely to lead to more 'platformisation'. Given that not much evidence- especially quantitative - is available on the extent of the phenomenon and its impact of working conditions, this study represents a first attempt to fill the knowledge gap. In addition, in spite of the lack of evidence – or possibly because of it – there are reasonable concerns about the potential intrusiveness of digital tools and how constant surveillance may affect workers' wellbeing. Similarly, the breaking down of jobs in smaller tasks required by algorithmic management, so that instruction and task allocation can be easily automated, may lead to an increasing fragmentation and commodification of labour (see for instance Franke and Pulignano 2021)).

([1]) https://www.ebayinc.com/company/our-history/

Secondly, this study tries to provide evidence in support of two of the six policy priorities of the von der Leyen Commission, namely 'A Europe fit for the Digital Age' and 'An Economy that Works for the People'. In particular, we provide evidence not only relevant for the regulation of digital labour platforms, but also, more generically, for digitalisation and Artificial Intelligence, inasmuch as it affects employment and working conditions. As we will see more in detail in the next section, the Artificial Intelligence Act (AI Act) seeks to regulate AI systems used for recruitment, as well as systems used for promotion and termination of contracts for work, for allocating tasks, and for monitoring and evaluating workers' behaviour. In this respect, the evidence provided by this report can be a useful tool to guide policy action.

The original contribution of this study is therefore manifold. From an analytical perspective, the study provides a clarification, as well as new elaboration of concepts such as platformisation, algorithmic management and digital monitoring, based not only on our previous work, but also on existing and emerging literature. In addition, this study provides an operationalisation of the concepts and a list of indicators developed with the help of experts in the field, consulted with policy makers and stakeholders at the EU level, and cognitively tested on the field. In particular, we propose measures of the prevalence and implications of algorithmic management – direction, evaluation and discipline – and features of digital monitoring – activity and physical monitoring -. We also contribute to the scientific knowledge by providing the first quantitative evidence on these topics based on high quality data: a representative sample of the working age population in two different Member States, collected via face-to-face interviews by professional interviewers. It is worth also mentioning that the AMPWork questionnaire and data are released to the public domain so that they can be used by the research community to further advance knowledge in this field.

In the remaining of this introduction, we present some information which is useful to better understand the rest of this report. First, we will briefly discuss the EU policy context of the topics covered here. Secondly, we will present the main characteristics of the questionnaire and sample used in the AMPWork survey. Third, we will introduce some concepts and definitions that will be used throughout the report. Finally, we will briefly outline the main sections of the rest of the report.

1.1 Policy background and the regulatory framework in Europe

Currently, the most advanced piece of EU legislation specifically dedicated to regulating the consequences of the introduction of algorithmic technologies in the realm of work is the 2021 European Commission's proposal for a 'Directive on improving working conditions in platform work' (COM(2021) 762)([2]). This proposal, although restricted in scope to digital labour platforms, introduces three very important principles. First, the need to assess how technologies may blur the boundaries between the traditional definitions of different employment status, implicitly recognising the capacity of such technologies to create new structures of authority and new methods of surveillance affecting workers' freedom and autonomy, even for those who are self-employed. Second, the need to mitigate the potentially negative consequences of algorithmic management, for instance by increasing transparency, reinforcing the GDPR principle of "a right to explanation" and mandating human supervision, the so-called human-in-the-loop approach. Third, the need to clarify the obligation of platforms to declare the work they coordinate and to make key information about their activities and the people who work through them available to national authorities, with the aim of creating a cross-border regulatory approach.

Relying instead on what is already in force and available at EU level, different pieces of legislation may come to help in addressing the risks linked to the use of algorithmic technologies and data collection in the workplace. In particular, a combined and integrated reading of the existing data protection law (GDPR), anti-discrimination law and national collective agreement laws could be a starting point for defining workers digital rights. Under the GDPR, organisations are already required to ensure that all personal data (also of employees) is processed in a manner that is fair, transparent, and secure; anti-discrimination laws can be used to challenge the decisions made by algorithms, supplying tools to correct the disparities they might cause; finally, collective agreement laws can be extended to the use of algorithms and artificial intelligence at

([2]) Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6605

work, ensuring some degree of co-determination and democratic participation in the implementation of new tools.

The GDPR offers some safeguards that could be instrumental for workers' protection. In particular, chapter 3 of the GDPR introduces some relevant rights of the data subjects. Arts. 13 and 14 recognize a right to notify data subjects (in this case workers) when personal data are collected, for what purposes and for how long, and if those data will be processed by automated-decision making, including profiling activities, data subjects have a right to be informed about the 'logic involved'. Furthermore, art. 15 establishes an individual right to access which implies an obligation of the data controller (the employer) to share specific information about the use of data and automated systems. In addition, art. 22 specifically limits the possibility of being subject to purely automated decisions that produce legal effects; in other words, it prohibits fully automated decisions when dismissing or punishing individual workers (based on processed data) without meaningful intervention of a human manager the exact meaning of what would constitutes a meaningful intervention is debated. To this must be added the right to rectification (art.16), the right to be forgotten (art.17), the right to data portability (art.20) and so on.

However, many of the limitations set out by the GDPR do not apply when the data subject makes explicit his or her consent, or "if it is necessary for entering into, or performance of, a contract between the data subject and a data controller" (Art. 22, 2). Although it is commonly agreed that explicit consent cannot be considered valid in an employment relationship (Art. 29 WP) ([3]), it is less obvious that the contractual or performance enforcement would not find application in the working relationship. Also, the GDPR regulates strictly individual rights that cannot be transferred to collective representatives, which excludes the possibility of relying on unions and collective bargaining to address the previously mentioned power imbalance in the case of workers data and algorithmic management.

Similar problems affect the applicability of existing anti-discrimination laws for situations of discrimination at the workplace that may be related to algorithms. When the algorithms do not explicitly target or consider attributes or elements that are discriminatory (i.e. race, gender, so on), it can be difficult to apply anti-discrimination law even if the outcomes are (indirectly) discriminatory. An example is distance from work, which can be used as a proxy to target applicants from poorer neighbourhoods.

Additionally, the 2021 proposal of an Artificial Intelligence Act (COM(2021/206) ([4]), which builds on the Communication on Artificial Intelligence of 2018 (COM (2018) 237), ([5]) lays down the basis for the regulation of artificial intelligence systems and recognises and categorises the use of those systems for algorithmic management, in particular for i) AI systems used for recruitment; and (ii) AI systems used for promotion and termination of contracts for work, for allocating tasks, and for monitoring and evaluating workers' behaviour (p.26, n. 36). The regulation for high risk AI systems provided in chapter 2 of the Act establishes design criteria that providers must put in place, such as a risk management system that identifies, evaluates, and mitigates risks (article 9); criteria for data governance (article 10) including "examination in view of possible biases" and that "training, validation and testing data sets shall be relevant, representative, free of errors and complete". However, although the proposed text of the AI Act categorises the use of AI systems at work as high-risk, there are no specific indications about the potential impact that the use of AI may have on working conditions; additionally, collective rights are not envisaged to mitigate the risk deriving from the adoption of AI at work. The sole obligation AI providers have is to self-certify their compliance with the requirements established. Furthermore, it is not clear who should be held accountable in case of a controversy where a digital labour platform uses an AI system provided by a third party, risking generation of uneven protections for digital workers in the European market.

As we have seen in this section, there is already a considerable policy debate and even an incipient regulatory activity with respect to the use of digital tools and algorithms for purposes of managing and organising work

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([3]) Personal data' means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person" (Art.4)

([4]) Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, COM (2021) 206 final (April 22, 2021). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206

([5]) Communication from the Commission to the European Parliament, The European Council, The Council, The European Economic and Social Committee and the Committee of the Regions, Artificial Intelligence for Europe, COM (2018) 237 final (June 26, 2018).

in the EU. However, an important limitation that hampers this regulatory activity is the lack of reliable evidence in this respect, beyond anecdotal or journalistic accounts. The JRC Algorithmic Management and Platform Work survey (AMPWork) tries to contribute to filling this gap in the EU, providing statistically representative data for two European countries on the use of digital monitoring and algorithmic management in regular workplaces, the prevalence and conditions of platform work, and the unpaid provision of digital content for sharing platforms. In the following section, we detail the contents of the AMPWork questionnaire and the methodology followed in the survey.

1.2 The AMPWork questionnaire and survey methodology

The JRC Algorithmic Management and Platform Work survey (AMPWork) was conducted in Spain and Germany between September 2021 and March 2022. The survey was designed and coordinated by the Employment and Skills Team of the European Commission's Joint Research Centre, in collaboration with the Directorate General for Employment, Social Affairs and Inclusion. The fieldwork was carried out by IPSOS.

The AMPWork survey was initially conceived as a follow up of the COLLEEM I and II pilot surveys, carried out in 2017 and 2018 by the same JRC Employment and Skills Team in collaboration with DG EMPL, with PPMI collecting the data (Pesole et al. 2018; Urzí-Brancati et al 2020). The COLLEEM I and II pilot surveys were focused on exploring the prevalence and conditions of platform work in Europe, using a non-probabilistic sample of internet users between 16 and 74 years old, with self-completed online questionnaires. COLLEEM I and II were exploratory surveys that contributed significantly to a better understanding of the emerging phenomenon of platform work, but they were limited by the lack of statistical representativeness of the sample and by the difficulties of online data collection. For these reasons, it was decided that the third edition of COLLEEM would be statistically representative of the full working age population of the selected countries, and that the data collection would be face to face rather than online.

In the five years that passed since the first edition of COLLEEM, platform work went from a marginal and little understood phenomenon to a largely studied and incipiently regulated one. Furthermore, it was transforming in two important ways that made it necessary to significantly change the approach of COLLEEM. First, the consolidation and growing regulation of digital labour platforms made them increasingly similar to regular companies, even if they used more sophisticated forms of algorithmic management and digital monitoring of work. Second, the increasing digitalisation of economic activity (boosted by the COVID pandemic) had extended many of the same forms of algorithmic management and digital monitoring that were initially associated with DLPs to all kinds of companies. In other words, the phenomenon of platform work had transformed and expanded in ways that required a much broader approach. Hence, the third edition of COLLEEM was also transformed and expanded, so much that it became a different survey: the JRC Algorithmic Management and Platform Work survey (AMPWork).

The questionnaire of the AMPWork survey is structured in three main sections. Of these three sections, only section two is a revised and expanded version of the COLLEEM questionnaire. The other two sections are entirely new both in terms of content and of the population addressed.

The **first section** of the AMPWork survey tries to measure the platformisation of regular work. In other words, it measures different ways in which regular companies (ie, non-DLPs) use digital platforms for coordinating work processes. Therefore, the target population is all workers in the countries participating in the survey. After an initial section with general questions on the characteristics and conditions of the job (type of contract, sector, occupation, working hours and so on), there are three subsections that can be used in combination to measure platformisation of regular work, as we will do later in this report (see section 2). First, there are a number of questions about the use of specific technologies at work; second, some questions on digital surveillance and control; and third, some questions on algorithmic management. There are some final questions on this block of the questionnaire asking specifically about the implications of the COVID pandemic for work patterns.

The **second section** of AMPWork is specifically focused on workers in Digital Labour Platforms (DLPs), covering broadly the same topics as the COLLEEM I and II surveys. First, this section of the questionnaire identifies people that have provided labour services via DLPs: then, those who have provided labour services via DLPs are asked a number of questions about the frequency and intensity of this work, the types of tasks they have performed, the organisation of those tasks, and the conditions under which they have provided their labour services via DLPs.

It is important to note that although the first and second sections of AMPWork target populations that are differently defined, they can partly overlap. The first section focuses on the platformisation of regular work

and it targets the full working population (anyone with a job), whereas the second section focuses on work in digital labour platforms and targets those who have provided labour services via DLPs at least once in the last 12 months. There are two ways in which these two target populations may overlap: first, someone can have a main job in the regular economy and a secondary job or activity in DLPs; second, the main job of someone may in fact be the provision of labour services in DLPs. Both possibilities would be included in the AMPWork survey, and can be easily identified because we included variables to measure such possibilities. In the first case, we would have information on the primary (regular) job of the respondent from the first section of AMPWork, and information on the secondary (via DLPs) labour activity of the same respondent from the second section of AMPWork. In the second case (someone whose main job is via DLPs), we would have all the information in the first section of AMPWork (as if the person is in a regular job), but we would also have information from the second section identifying the person as a provider of labour services via DLPs, with some questions measuring the specificities of that activity.

Finally, the **third section** of AMPWork measures the unpaid provision of digital content for sharing platforms, targeting the entire working age population (whether in employment or not). In previous editions of COLLEEM, we had identified some people that considered the provision of content through sharing platforms (such as Youtube, Instagram or Wordpress) as a form of work analogous to the provision of labour services via platforms. Indeed, in many cases, this type of activity involves labour which is remunerated indirectly via ads or other forms of payment. So for the AMPWork survey, we decided to add this final exploratory section to try to assess the extent and nature of this phenomenon, measuring how many people engage in this kind of activity, for how long and why.

The design of the AMPWork questionnaire was coordinated by the JRC Employment and Skills team, in collaboration with external experts on the topic, and in consultation with DG EMPL and IPSOS, the company that carried out the fieldwork. An initial draft of the questionnaire was subject to cognitive testing by IPSOS in April 2021, and revised accordingly. Then, a pilot was conducted during the Summer 2021, leading to some final very minor adjustments in terms of the identification of platform workers, the training for the interviewers and the presentation of the survey. After this pilot, the main fieldwork of the survey took place from September 2021 to March 2022, with an additional fieldwork for platform workers (see Box 1) extending until May 2022.

The AMPWork survey is representative of the working age population (16-64) living in private households in Spain and Germany, whose usual place of residence is the territory of the country and who are able to speak the national language. The AMPWork sample followed a multi-stage, stratified and clustered design with a random walk procedure for the selection of the respondents at the last stage. Only one individual per household was selected for interviewing, and all interviews were conducted face-to-face in the respondent's own household.

The **first stage** of sampling design involved the stratification of Primary Sampling Units (PSUs) according to region and degree of urbanisation. As usual in this kind of survey, interviews were clustered into groups of 7 in the case of Spain and 10 in the case of Germany, to be carried out within a particular (random) route, as we will see later. These clusters or PSUs were distributed across regions and degree of urbanisation according to the distribution of the population, with a disproportionate allocation of interviews to big cities. In a **second stage**, each PSU was randomly assigned an address (within each stratum) from which a random walk for carrying out the total interviews in the PSU would start. In a **third stage**, and starting from the assigned address, the interviewer followed a predefined procedure for selecting addresses to be interviewed (this is what is called "random walk", which is in fact systematic rather than random, because the random element derives from the start address rather than the walk itself). Once a household was selected, it could not be substituted even if there was nobody at home, until 4 unsuccessful attempts to contact the interviewer had been carried out (at different times and days). Finally, the **fourth stage** involved the selection of the interviewee within selected households. Once a successful contact was established, the interviewer listed the eligible members and chose the one whose birthday was most recent to be interviewed.

Box 1: The boost sample of platform workers

While the main sample of AMPWork consists of a statistically representative clustered random sample, additional data collection for a booster sample was also necessary to reach a minimum number of interviews to study the characteristics and conditions of work in Digital Labour Platforms (DLPs). Since AMPWork provides a statistically representative sample of the working age population, and since there was some uncertainty as to what share of the working age population can be classified as platform worker (as discussed in sections 3.1 and 3.2, previous estimates range from 1 to 10% or more), there was a risk that the number of platform workers identified in the AMPWork sample would not be enough as to study their characteristics and conditions. Therefore, we decided that if the absolute number of platform workers obtained in the AMPWork random sample was below 300 in Germany and 400 in Spain, the fieldwork agency would conduct the necessary additional interviews with platform workers to reach that number, if necessary following a non-strictly random probabilistic approach.

Indeed, the final number of interviews with platform workers obtained in the primary random sample of AMPWork is 72 for Spain and 16 for Germany. This meant that the fieldwork agency had to conduct a complementary non-probabilistic sample of platform workers, adding 329 non-probabilistic cases of platform workers in Spain and 294 in Germany. It is important to note that these additional non-probabilistic cases are properly identified in the AMPWork database, and that they have not been used at all in this report except for the specific sections discussing the characteristics and working conditions of platform workers. In other words, chapters 2 and 4 of this report have not used this secondary sample at all, and the estimation of prevalence of platform workers in chapter 3 (section 3.4) has been conducted also excluding this secondary sample. Only the sections 3.5 to 3.10 of chapter 3 use this secondary sample, merged with the subsample of platform workers obtained in the random sample.

The methods for recruiting interviewees for this secondary non-probabilistic sample of platform workers were the following. First, the interviewers tried to obtain some additional interviews with platform workers through the randomly selected cases, asking whether there were other people in the household (apart from the selected individual) who fitted the definition of platform worker or whether the selected individual could give the reference of a platform worker outside the household. This approach is similar to the snowball method of sampling, which retains some randomness because it recruits secondary cases from the primary random cases. This way, 19 non-random cases of platform workers in Germany and 7 in Spain were added to the secondary non-probabilistic sample of platform workers. Secondly, the fieldwork agency used its own non-probabilistic opt-in online panel of potential respondents to screen for platform workers and interview them by phone (CATI administration). This approach is in fact very similar to the one used in the first and second waves of the COLLEEM survey (as well as in many other surveys on platform work). This way, an additional 189 in Germany and 231 cases in Spain were added to the secondary non-probabilistic sample. Finally, since the number of possible interviews using the panel were saturated, 89 and 91 additional interviews were made using a purely convenience or haphazard approach to reach the targets of 300 for Germany and 400 for Spain interviews with platform workers.

In our subsequent analysis, we found that the quality of the cases obtained via the snowball and online panel methods was sufficient to use them for the analysis of the characteristics and conditions of platform workers. But the 89 (in Spain) and 91 (in Germany) convenience-sample interviews with platform workers were not suitable for the general analysis and thus we excluded them from the analysis in sections 3.5 to 3.10 of chapter 3 of this report, only using them for the specific analysis in box 4.

The achieved response rate in AMPWork was 37.4% for Spain and 22.7% in Germany. In other words, 37.4% of the cases potentially eligible for selection were actually interviewed in Spain, and 22.7% in Germany. The achieved response rates of AMPWork are in line with similar well-known representative surveys of the working age population, although perhaps slightly lower than expected for Germany. For reference, the 2015 European Working Conditions Survey achieved a response rate of 31.4% in Spain and 51% in Germany. The lower than expected response rates in Germany are probably explained by the particular context in which the AMPWork survey was carried out, during the second Winter after the COVID pandemic. In Spain, the most disruptive impact of the COVID pandemic had already passed and the 6 months of fieldwork between September 2021 and March 2022 were relatively normal, so that the fieldwork could proceed without much disruption. But in Germany, the Winter of 2021-2022 was still strongly affected by COVID and the associated restrictions, which implied additional difficulties for carrying out the fieldwork of the AMPWork survey, as reported by the fieldwork agency to the JRC team coordinating the survey. Therefore, although the achieved response rate in Germany is still reasonable by European standards, it is lower than expected and it was harder to achieve.

Box 2: Weights in AMPWork

For analysing AMPWork data, especially when the purpose is estimating the true parameters of the population for any of the included variables with a given level of confidence, it is necessary to use the weights provided. There are two different weights included in the AMPWork data:

1. **Design weights**. These weights are included to correct for the unequal probability of selection into the sample of respondents, because of the way the sampling was designed. There are two main factors to be corrected by this weight. First, as previously explained the sample was stratified by region and degree of urbanisation, and the distribution of cases per stratum in the sample was not identical to that of the population (big cities were oversampled). The weight compensates for this, scaling down cases in overrepresented strata and vice versa. Second, only one individual was interviewed per household, which means that individuals living in smaller households have a higher probability of being included in the sample. The weight also compensates for this.
2. **Post-stratification weights**. These weights are included to correct for the differences in response rates for different groups of the population, which could bias the results otherwise. The distribution of the AMPWORK sample by gender and age was compared to that of the population according to the European Labour Force Survey values, generating a weighting factor that corrects any observed difference. The method followed to calculate these weights was the Raking method, which basically carries out an iterative process of estimation of the weights that would be required for each case in order to replicate with our data the marginal distribution of the LFS in terms of the weighting variables.

Two weighting variables are provided with the AMPWORK database. The design weights are included in w2, while the variable w3 incorporates both the design weights and the post-stratification adjustment. Therefore, w3 should be used for parameter estimation. For non-inferential analysis of the data (for instance, for econometric analysis of the relationship between variables), either w3, w2 or no weights can be used, depending on the purposes of the analysis.

1.3 Some basic concepts and definitions

Before presenting the main results of the AMPWork survey, it is useful to define some basic concepts that were critical for the design of the questionnaire and which will guide the analysis and interpretation of the AMPWork results. Most of these concepts build on previous work by the JRC Employment and Skills team, which is referenced for further details.

Digital monitoring is "any collection and processing of information [using digital tools], whether personally identifiable or not, for the purposes of influencing and managing those whose data have been garnered" (Lyon 2001 cited in Ball, 2021:10; West and Bowman 2014). Ball (2021:10) explains that for an activity to qualify as monitoring, two elements need to be present: data must be gathered and analysed, and then applied in a process of influence over the original data target, where monitoring always involves an exercise of power.

Algorithmic management is the use of computer-programmed procedures, which may be powered by artificial intelligence or not, to coordinate labour input in an organisation (Baiocco, et al. 2022). Algorithmic management and digital monitoring tend to go together to some extent, because algorithms need data to operate and because digital information is most efficiently processed by algorithms. In other words, algorithmic management of work generally presupposes some degree of digital monitoring (which provides the data on which the algorithms operate). And conversely, digital monitoring tends to foster the use of algorithms for managerial purposes.

Platformisation of work is the increasing use of digital platforms for coordinating work processes in all kinds of economic organisations. **Digital platforms** are technological infrastructures that allow multiple parties to interact with one another. In general, digital platforms used for coordinating work processes tend to incorporate functions of digital monitoring and algorithmic management (Fernández-Macías 2017).

Digital labour platforms (DLPs) are digital platforms that provide digital spaces where buyers and sellers of labour services can transact, facilitating and coordinating those transactions with their algorithms (Pesole, et al. 2018, Urzì Brancati, Pesole and Fernández-Macías 2020). Initially, DLPs were seen as a new type of economic organisation that mediated the provision of labour services using digital platforms and algorithms, rather than directly employing the workers whose labour services they coordinate. Some people have challenged this idea arguing that labour service providers are in a relationship of subordination vis-a-vis the

DLPs (largely because of the functions of digital monitoring and algorithmic management that these platforms incorporate), and some court rulings and regulatory changes have reclassified DLPs as regular employers. In any case, they continue to use platforms to coordinate the provision of labour services.

Platform workers are workers who provide paid labour services via DLPs. Depending on the different regulatory contexts, they may provide these services via a regular employment contract or as independent contractors. Also, they may do this as a secondary activity while also having a regular job in the non-platform economy; or this may be their main economic activity.

Content-sharing platforms are digital networks that coordinate the exchange of user-generated content in an algorithmic way. As all platforms, they provide a virtual space where the exchanges take place, and a set of algorithms that govern those exchanges. What is peculiar about these platforms is that they mediate specifically the exchange of user-generated content, which can be any type of digitally-encoded information (text, image, video, audio). In most cases, this provision of content by the users is unpaid.

1.4 The structure of this report

The rest of this report unfolds as follows.

Section 2 presents an analysis of the platformisation of regular work in Spain and Germany according to the AMPWork database. It covers three main areas: use of digital tools, digital monitoring and surveillance and algorithmic management of work. In each of these areas, we present first a description of the main variables, then we use data reduction techniques such as factor analysis to identify main patterns in the variables, and then we explore the implications for work organisation and working conditions.

Section 3 measures the prevalence of platform work in the two countries covered in AMPWork, analyses the sociodemographic profiles of platform workers and classifies them according to the tasks they perform. Then, it discusses digital monitoring and algorithmic management for platform workers, as well as the thorny issue of employment status. Finally, it assesses the implications of platform work in terms of working conditions, and compares platform workers with "platformised" regular workers.

Section 4 presents new exploratory evidence on a phenomenon on which, to our knowledge, there is very little data available at present: the provision of unpaid digital content for online sharing platforms. First, it discusses the concept and presents some tentative indicators that were included in the AMPWork questionnaire. Using these indicators, it then provides an assessment of the prevalence of this phenomenon, and its main types and characteristics in terms of frequency, duration, and motivations.

Finally, **section 5** provides a recapitulation of the main findings of AMPWork and discusses their implications.

2 Platformisation of regular work in Europe

One of the most obvious changes in the world of work in the last three or four decades is the ubiquitous presence of all kinds of digital devices in the workplace. This process started in the seventies and eighties with the introduction of computers for supporting office and administrative processes, and with the use of algorithmic control for industrial robot applications (what was called "numeric control" at the time). Today, companies use connected computers, mobile and even wearable devices to support and coordinate all kinds of work processes, while connected devices that are embedded in products and installed in workplaces are used for real-time control of production processes and the provision of services. This trend of increasing digitalisation of all aspects of work and economic activity was already well advanced in the second decade of the new millennium, but the COVID pandemic gave it the definitive push. Indeed, the massive expansion of telework due to the pandemic (Adascalitei et al, 2022) required a large expansion in the use of digital tools for the control and coordination of remote labour. Although the use of telework as such has partly receded from the heights of the pandemic, its consequences in terms of increased digitalisation are likely to remain. Even for activities of a physical nature, such as industrial production or personal services, the need to minimise interpersonal contact and monitor potential health hazards during the pandemic implied a significant expansion in the use of digital tools for monitoring and control of work.

The most efficient and frequent form of controlling and coordinating the information collected and transmitted by these ubiquitous in-work digital devices is using digital platforms and algorithms. A (digital) platform is a piece of networked software used to coordinate multi-party communication or interaction via connected digital devices. The vast majority of private and public services available on the internet are platforms (including Google, Facebook, Youtube, etc). In an increasingly digital work environment, collaboration platforms such as Microsoft Teams or Slack, as well as many other specialised platforms and even proprietary company-specific platforms (especially in big organisations, such as banks, hospitals or public administrations) are frequently used for work purposes. The most obvious and ostensible purpose of these internal work-oriented platforms is the coordination of internal communications, giving a structure and a (digital) space for collaborative work. But these platforms can also perform to some extent two additional functions. First, they collect information on work processes and workers' activities, which is then stored and processed, and reported to the management of the firm who uses the platform. In other words, platforms are used for the digital monitoring of work. Secondly, these platforms incorporate a series of algorithms that structure and regulate the exchanges that take place inside them: since these exchanges are themselves part of the work processes in the firm, these algorithms become part of the management of work in the organisations concerned. In other words, platforms can be used for what we refer to as the 'algorithmic management' of work (see the introductory section for a definition). Digital monitoring and algorithmic management are two intrinsic functions of digital platforms for the coordination of work in economic organisations, and they are present to some extent whenever platforms (or more generally, digital devices) are used for purposes of work coordination, direction and organisation. But the extent and modalities of these two functions in specific organisations can vary quite significantly and we still know very little about it.

In this chapter, we will present new and unique data on the extent and modalities of platformisation of work in two European countries (Germany and Spain). First, we look at the diffusion of digital tools in work, which can be understood as the material foundation of platformisation. Second, we present some variables and indicators on the use of digital tools for purposes of monitoring of work. And third, we discuss some new measures of algorithmic management at work, with a particular focus on the use of digital devices for automating the direction and evaluation of work. With these three pieces of information (prevalence of digital devices, and their use for purposes of digital monitoring and algorithmic management), we provide an initial classification of workers in Europe according to the levels and types of platformisation. Since the AMPWork survey also includes some key variables measuring working conditions and work organisation, we also present a preliminary approximation about the implications of platformisation for workers.

But before embarking in the analysis of new data on the platformisation of work, we need to make an important clarification. This chapter concerns the platformisation of work in all kinds of sectors and economic activities. This should not be confused with the related but different phenomenon of work through digital labour platforms (DLPs), which is specifically analysed in the following chapter (3). As already mentioned in the introduction, DLPs are a new type of economic organisation which coordinates the provision of paid labour services using webs or apps, putting in contact suppliers and consumers of specific services and algorithmically controlling the process. Some of the methods of coordinating work which were introduced by DLPs are also extending to the regular economy, and this is what we will study in this chapter.

2.1 Use of digital tools

While there are several EU or national employer surveys that collect data about the level of digitalisation of companies (for instance, the EU Community Survey on ICT Usage, Eurofound's European Company Survey ECS, or CEDEFOP's European skills and jobs survey ESJS), there is scant information about the impact of digitalisation at the level of workers. To understand the extent to which a platformisation of regular work is taking place, we need to first take a look at the use of digital tools in the workplace. To this end, the AMPWork survey asked those respondents in paid employment whether they used any of the following digital devices in their current work: 1) personal computers or laptops; 2) tablets, smartphones or other mobile computer devices that connect to the internet; 3) wearable devices such as proximity cards, fitness trackers, smartwatches, dataglasses, or other embedded sensors; and 4) other digital devices not covered by the other three main categories (such as digital cameras, drones, digital laboratory equipment).

Perhaps surprisingly, given the common assumption that digitalisation has reached all forms of work, more than one third of respondents in both countries reported **not** using digital devices at work, a rate which is slightly higher in Germany (38%) than Spain (35%) (Table 1), and, substantially heterogeneous across sectors and occupations, as further sections will show. These values are somewhat higher than in CEDEFOP´s European Skills and Jobs Survey (ESJS), but it should be noted that the two samples are fairly different, in that the ESJS does not include self-employed and family workers, and excludes workers younger than 25.

Among those workers who report using at least one of the four types of digital devices, the most commonly used device is a personal computer (PC) or laptop (55% and 56%, in Germany and Spain respectively). In most cases, the use of a PC or laptop is combined with other devices, with the combination of PC/laptop and mobile devices being the one most frequently mentioned (31% and 27% of all respondents in the respective countries). Indeed, although mobile devices are quite frequently used in combination with computers, they are rarely used on their own (5% and 7%). In line with findings from Urzí Brancati and Curtarelli's study analysing data drawn from EU-OSHA's European Survey of Enterprises on New and Emerging Risks (ESENER), wearables are rarely used, and most frequently in combination with computers and mobile devices (5% and 9%). Other digital devices, such as digital cameras, digital laboratory equipment, are very rarely used, on their own or in combination (less than 1% in Germany, less than 4% in Spain).

Table 1 Digital device usage, Germany and Spain

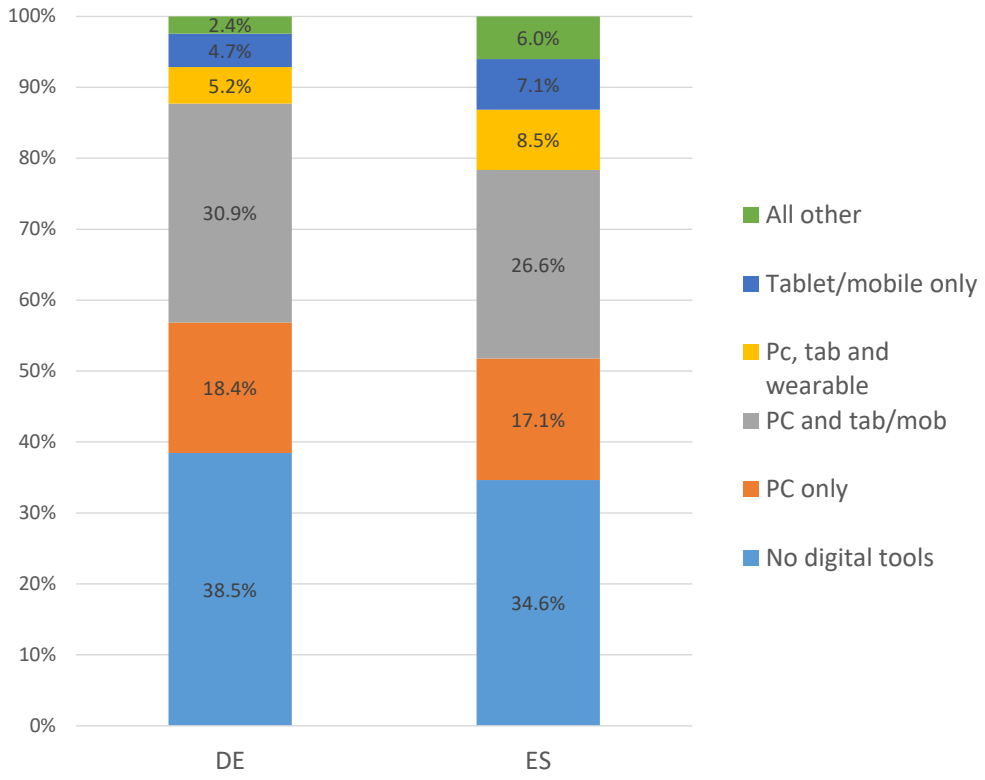
Device/s		**Germany**	**Spain**
No digital device		38%	35%
PC/laptop	and tablet/mobile	31%	27%
	PC/laptop only	18%	17%
	and tablet/mobile and wearable	5%	9%
	and tablet/mobile, wearable and other	*<0.5%*	1%
	and other	*<0.5%*	1%
	and wearable	*<0.5%*	1%
	and wearable and other	*<0.5%*	*<0.5%*
	and other	*<0.5%*	*<0.5%*
Tablet/mobile	tablet/mobile only	5%	7%
	and wearable	*<0.5%*	1%
	and wearable and other	*<0.5%*	*<0.5%*
	and other	*<0.5%*	*<0.5%*
Wearable	and other	*<0.5%*	*<0.5%*
Wearable	wearable only	1%	1%
Other digital device		*<0.5%*	1%

Source: authors' elaborations of AMPWork data.

2.1.1 Classifying workers by use of digital tools

The previous analysis can be used to create a classification of workers according to the intensity of use of digital tools, which will be adopted in the rest of this chapter. Figure 2 shows the broad distribution of workers in Germany and Spain according to this classification. In general, the patterns of usage of digital tools at work are similar in both countries, but with generally slightly higher levels for Spain. As previously mentioned, digital tools are very widespread, but not ubiquitous, since slightly more than one third of the working population in our sample does not use digital tools at work. The second category (corresponding to a relatively basic level of digitalisation) includes those that use computers only, accounting for roughly one sixth of workers. Then, the following category includes those that use computers and some type of mobile digital device, accounting for slightly less than one third of workers. The most advanced of the main categories of digital tools at work includes those that use computers, mobile and wearable devices, accounting for 5% in Germany and 8.5% in Spain. Then, there is a category which as we will see has some interesting peculiarities because it relates to the digitalisation of some types of manual work, including those that use only mobile devices and accounting for 5% of workers in Germany and 7% in Spain. And finally, we have a residual category including all other devices and combinations of digital tools which account for 2% and 6% of workers in Germany and Spain, respectively.

Figure 1 Classifying workers by use of digital tools



Source: authors' elaborations using AMPWork, weighted data.

Box 3: Videoconferencing at work

While videoconferencing tools have been available for some time, the COVID-19 pandemic resulted in many workers having to work from home. This meant that a variety of work activities such as staff meetings, recruitment, medical consultations, legal hearings, conferences, product launches and education and training had to be conducted online. The resumption of normality after the height of the pandemic has led many workers back to the offices, but some have remained working from home and many others have shifted to hybrid work patterns involving a combination of both working from home and in their employer's workplace. To explore this issue, the AMPWork questionnaire asked respondents about whether they used videoconferencing tools to participate in online meetings. At the time of being surveyed, just over one-fifth of both German workers (21%) and Spanish workers (20%) used videoconferencing tools for online meetings.

Error! Reference source not found. below shows the proportion of workers using videoconferencing at work, by the categories of use of digital tools. Clearly, those who use PCs/laptops with mobile phones/tablets as well as PCs/laptops, tablets/mobile phones and wearables are more likely to also use videoconferencing tools. Those workers using only a PC or laptop and all other types of devices (which typically involves using specialised digital tools), tend to use videoconferencing less frequently. In addition, those only using tablets or mobile phones use videoconferencing much less frequently. The very low proportion of workers who do not use digital tools for work, but uses videoconferencing tools may be referring to videoconferences in common rooms.

Table 2 Videoconferencing at work, by use of digital tools

	DE	ES
No digital tools	1%	3%
PC only	16%	43%
PC and tab/mob	47%	69%
Pc, tab and wearable	58%	69%
Tablet/mobile only	0%	12%
All other	16%	45%

Source: authors' elaborations using AMPWork, weighted data

2.1.2 Who uses digital tools?

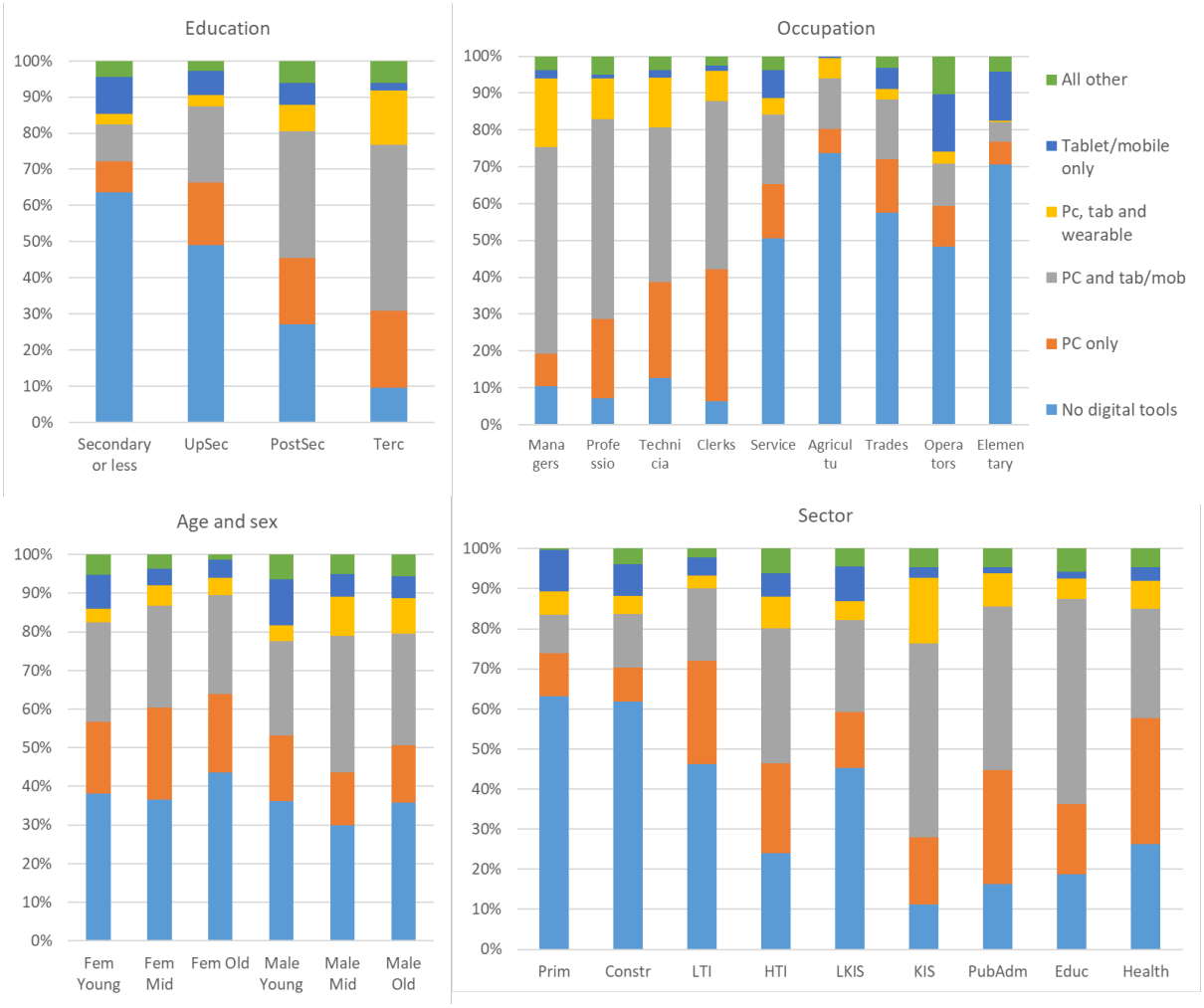
Having classified workers according to their use of digital tools, we can explore its distribution by highest education level, age and sex, occupation and sector (figure 4).

Some striking differences are apparent when looking at digital tool usage by highest level of education, suggesting a strong 'digital divide'. While over three-fifths (62.3%) of workers with secondary or lower educational qualifications report not using any digital tools, this falls to less than one-in-ten (9.5%) among those holding tertiary qualifications. Conversely, usage of PCs/laptops and tablets/mobiles is more than three-and-a-half times lower among workers with secondary or lower education compared to tertiary-qualified workers (12.1% compared to 45.8%). The only category that does not increase in line with education is the exclusive use of tablets or mobile phones, which in fact grows inverse to level of education (decreasing from 10.3% among those with secondary or lower education to 2.2% among those with tertiary qualifications). This category of digital usage is quite different from the rest, corresponding to digitally-enabled (or controlled) physical work, which tends to have lower educational requirements.

By age and sex, differences in the patterns of digital device usage are much smaller than with education, and hardly significant in a substantial way. No digital tool usage is slightly higher among older female (43.5%) and younger female workers (38.2%), while lowest among older male workers (29.9%). Use of PCs/laptops and tablets/mobile phones is most frequent among male prime-aged workers (35.5%), while use of

tablets/mobiles only is most frequent among young workers of both genders (11.9% of young male and 8.8% of young female workers).

Figure 2 Digital tool usage by highest education level, occupation, age and sex, and industry



Source: authors' elaborations using AMPWork, weighted data.

When looking at digital tool usage by major occupation group, *no digital tools* is the dominant category (over 50%) for all occupations below clerks, which includes all "blue collar" workers who generally work with their hands (service, agricultural, trades, operators and elementary workers). Conversely, no digital tools usage is marginal (around or below 10%) for all the "white collar" occupations: managers, professionals, technicians and clerks (Figure 5). In other words, the same striking *digital divide* we previously found by educational level can be also observed by occupational group. Interestingly, using only mobile digital devices is most frequent among operators, elementary and service workers (again, reinforcing the idea that mobile devices are used to direct and control physical labour rather than for office applications). Whereas the use of PCs/laptops in combination with tablets/mobiles grows consistently according to occupational hierarchy, the use of PCs/laptops *and wearables* is mostly found among technicians and clerks.

By sector, no digital tool usage is higher in the primary sector, construction, low technology industries (LTI) and less knowledge intensive services (LKIS). Using a PC or laptop only is highest in health (31.4%), while using a PC or laptop in combination with a tablet or mobile is high in education (51.4%) and knowledge intensive services (KIS) (48.4%). The exclusive use of mobile digital devices is most frequently used in the primary sector (10.4%), construction (7.9%) and low knowledge intensive services (LKIS) (8.6%). The presence of a proportion of workers, albeit small, who do not use digital tools in the knowledge intensive sector (KIS) may seem somewhat surprising, given that the broad sector includes computer programming, ICT services, telecommunications and so on; however, a closer look at the data reveals that most of the workers in

knowledge intensive sectors who do not use digital tools are in occupations that do not require them, for instance personal service workers, cleaners and helpers, or refuse workers.

2.1.3 Digital tools, work organisation and working conditions

Historically, technology has tended to replace the most physically arduous and repetitive tasks, not only to achieve higher productivity and reduce labour costs, but also - to a lesser extent - to protect workers' health and safety. This was clearly the case in the mechanisation of agriculture and manufacturing, although the operation with machinery and reorganisation of production could also lead to deskilling and degradation of work for some categories of workers, as classically argued by Braverman (1974). In principle, digital technologies have the capacity of similarly replacing the most demanding and monotonous intellectual tasks, such as routine information processing for accounting or administrative activities, and therefore they could make intellectual work less monotonous and repetitive. But the final impact of digital technologies in this respect is still not clear, because it has also been argued that digital technologies facilitate a significant standardisation and centralisation of control of all kinds of intellectual work (Fernández-Macías, Bisello, et al. 2022).

In this subsection, we explore whether the main categories of digital tools usage previously identified are associated with systematic differences in work organisation and working conditions. To measure work organisation and working conditions, the AMPWork survey replicated some key questions in the European Working Conditions Survey (EWCS) based on Eurofound's framework (Eurofound, 2021; Fernández-Macías, 2017). According to Eurofound's website (topics: Work organisation[6]), work organisation refers to "how work is planned, organised and managed" and is about the division of labour, the coordination and control of work. It includes quality controls and standards; employee monitoring and control; task definition, content and allocation.

The main indicators of work organisation summarised in this chapter measure **autonomy** and **routine**; in particular, autonomy is measured by indicators for whether workers can:

- choose the order in which the do things,
- the methods of work,
- and the speed of work;

and routine is measured by indicators capturing whether:

- job involves monotonous or complex activities,
- complying with very detailed procedures,
- solving unforeseen problems.

Working conditions can be measured by indicators of job quality, including objective features and characteristics (both positive and negative) of work and employment that are likely to be related with health and well-being. The indicators considered in this chapter refer to **social support**, (communication with peers and superiors), **stress** and **working time flexibility,** measured by variables indicating who sets working time arrangements (company/ organisation or workers), to what extent can the worker change them, and whether discretionary breaks are allowed.

Our analysis also includes indicators on **work location** as they appear particularly relevant for the theme of platformisation, given that – as we will see in the next chapter – work on digital labour platforms is more likely to take place outside conventional work premises and can give rise to more intrusive use of surveillance. In particular, the survey asks how often the worker usually works in the following locations:

- employers'/business' premises,
- client's premises,
- car or other vehicle,

(6) https://www.eurofound.europa.eu/topic/work-organisation.

— outside site or

— own home before Covid 19.

The dependent variables (shown here in the table columns in Figure 3) were standardised with z-scores (value minus average divided by standard deviation), including the binary variables. Thus, the values are centred around the overall mean, and expressed as standard deviations, to facilitate the analysis and the comparison of the observed values across variables and categories.

As we can see on table 5, not using any digital tools is associated with less time flexibility, less autonomy, complexity, problem-solving and detailed procedures: in other words, with more traditional forms of work organisation (characterised by hierarchical control and command power structures), which in turn are associated with specific sectors and occupations, as we will see in the next paragraph. Those that use PCs or laptops only are close to the average in all of these respects, which suggests not particularly innovative nor traditional arrangements in terms of the organisation of work. At the other end of the spectrum, the most advanced use of digital tools (combined use of PCs/laptops and tablets/mobiles and wearables) is associated with more time flexibility and more autonomy, complexity and problem solving, but also with more detailed procedures.

The results for those using tablets/mobiles only and all other types of digital devices are peculiar. Using tablets or mobile phones only is associated with less complexity, autonomy and problem solving, but more detailed procedures, which suggests a more rigid and bureaucratic organisation of work. The category of *all other types* of digital tools is associated with less flexibility and autonomy but more procedures, problem solving and complexity, suggesting a more constrained and intense organisation of work.

When looking at working conditions, those not using any digital tools are close to the average, but slightly higher in terms of monotony and below the average in terms of stress, communication with superiors and peers, and the ability to take a break. At the other extreme, again, those using PCs/tablets, tablets/mobiles and wearables show very high values of communication with superiors and peers (we might assume that these types of digital tools are used for this purpose), but less monotony than average. Using tablets or mobile phones only and the category of other digital tools both register higher than average in monotony, and those using other digital tools communicate less with peers but also have less stress at work.

Figure 3 Digital tool use by work organisation and working conditions outcomes

	Time flexibility	Detailed procedures	Problem solving	Complex activities	Autonomy index
No digital tools	-0.15	-0.22	-0.23	-0.34	-0.19
PC only	-0.11	0.13	0.08	0.06	-0.03
PC and tab/mob	0.19	0.04	0.14	0.29	0.22
Pc, tab and wearable	0.34	0.27	0.32	0.53	0.34
Tablet/mobile only	0.00	0.21	-0.07	-0.24	-0.10
All other	-0.11	0.33	0.24	0.21	-0.15

	Can take break	Can communicate with superiors	Can communicate with peers	Stress at work	Job is monotonous
No digital tools	-0.06	-0.09	0.10	-0.08	0.15
PC only	-0.08	-0.10	-0.17	0.06	-0.09
PC and tab/mob	0.12	0.09	0.00	0.06	-0.18
Pc, tab and wearable	0.11	0.39	-0.03	0.07	-0.13
Tablet/mobile only	-0.03	-0.02	0.09	-0.02	0.19
All other	-0.02	0.03	-0.17	-0.09	0.23

(Main place of work)	Employer	Client	Vehicle	Home	Public space
No digital tools	-0.18	0.17	-0.03	-0.33	-0.04
PC only	0.39	-0.33	-0.30	0.00	-0.12
PC and tab/mob	0.17	-0.11	-0.06	0.34	-0.04
Pc, tab and wearable	-0.09	0.14	0.23	0.64	0.35
Tablet/mobile only	-0.71	0.36	0.82	-0.35	0.32
All other	-0.04	-0.05	0.34	-0.01	0.10

Source: authors' elaborations using AMPWork, weighted data.

Finally, using tablets or mobile phones only is associated with work outside the employer and home, either in the clients' premises, in vehicles or in public spaces. The combination of using a PC/laptop, tablet/mobile phone and wearable device is associated with working at home, whereas using only a PC or laptop is associated with working in the employer's premises.

2.1.4 Final remarks

While preliminary in nature and purely descriptive, the findings in this subsection provide a consistent picture of the types of work and working conditions that are associated with the different types of digital tools used.

First, it is important to emphasize that, even though the use of digital tools is widespread across the working population in both countries, there is still a sizeable proportion of workers who claimed to make no use of personal computers, tablets, smartphones, wearables or other devices. No digital tools usage is most frequent (above 50%) for blue collar and low educated workers (while marginal for white collar and mid-high educated workers). No digital tools usage is associated with more traditional forms of work organisation, hierarchical and authoritarian, but also with less stress at work and more communication with peers. This is likely to depend on the type of sector and occupation in which digital tools are less frequently used, rather than on the usage of digital tools in itself.

Secondly, another sizeable proportion (roughly another third) of workers make relatively intensive use of digital tools (combining personal computers with other devices). These tend to be highly educated workers in white collar occupations, and their organisation of work tends to allow more flexibility and autonomy, but also increased levels of complexity and more detailed work procedures.

Third, those using only personal computers at work are somewhere between the previous two groups: typically in low-mid level white collar occupations, clerical and office work, with average (not particularly traditional nor advanced) forms of work organisation but less communication at work.

Finally, the category of those using exclusively mobile digital tools is quite peculiar: it is most common for unskilled and semi-skilled manual occupations (operators, elementary and service workers), it is associated with more detailed procedures but less complexity, less autonomy and more monotony. It is most common for those working in vehicles, public spaces or client' premises. In short, in this case it seems that digital tools are in fact used for the remote direction and control of physical tasks, rather than for carrying out information processing or intellectual tasks as in the other categories of digital tools usage.

2.2 (Digital) monitoring and surveillance

New digital technologies are enabling a range of monitoring and surveillance practices in the workplace, where big amounts of digital information are collected which can then be used as the basis for performance evaluation and disciplining, and for all kinds of managerial purposes. Surveillance is defined as 'any collection and processing of information, whether personally identifiable or not, for the purposes of influencing and managing those whose data have been garnered (Lyon 2001 cited in Ball, 2021:10). Ball (2021:10) explains that for an activity to qualify as surveillance, two elements need to be present: data must be gathered and analysed, and then applied in a process of influence over the original data target, where surveillance always involves an exercise of power.

Ball (2021:10) suggests that surveillance is 'a taken-for-granted element of working life', as employees 'expect to have their performance reviewed, objectives set, and information gathered on their activities – indeed this is seen as good management practice'. There are many ways that an employer can use the digital data that is captured during the course of work. For example, to track time spent working, file usage, quality of work, online activity, or to monitor staff movement and location (Ball, 2021).

Mateescu and Nguyen (2019:1-2) identify four broad types of monitoring and surveillance technology: prediction and flagging tools; biometric and health data; remote monitoring and time-tracking; and gamification and algorithmic management. In a systematic review of the literature, Ball (2021) found that worker surveillance practices have extended to cover many features of employees as they work, such as thoughts, feelings and psychology, location and movement, task performance and professional profile and reputation (Ball 2021).

The data that is collected can drive algorithmic management, which is in the process of being extended to more sectors of the regular economy, besides platform work (Wood, 2021). More aspects of employees' lives are made visible to managers through data collected by digital devices at work, such that work/non-work boundaries are blurred. Furthermore, it appears that the Covid-19 pandemic intensified the surveillance of employees working remotely, with accelerated deployment of keystroke, webcam, desktop and emailing monitoring in Europe, the UK and the USA (Ball, 2021). While it is not necessarily the case that all companies using digital tools at work use those tools for monitoring purposes (they may lack the resources to do so, or simply may prefer not to), workers may be aware that they can be used for that purpose and thus their mere presence may affect their behaviour at work.

Ball (2021:11) identifies three instances where employee surveillance can be controversial:

- When it goes beyond what is proportionate or necessary;
- When employers demand exacting and precise information about a wide range of employee characteristics beyond performance; and/or
- When the application of monitoring compromises working practices and negatively affects existing levels of control, autonomy and trust, which then results in counterproductive work behaviours and resistance.

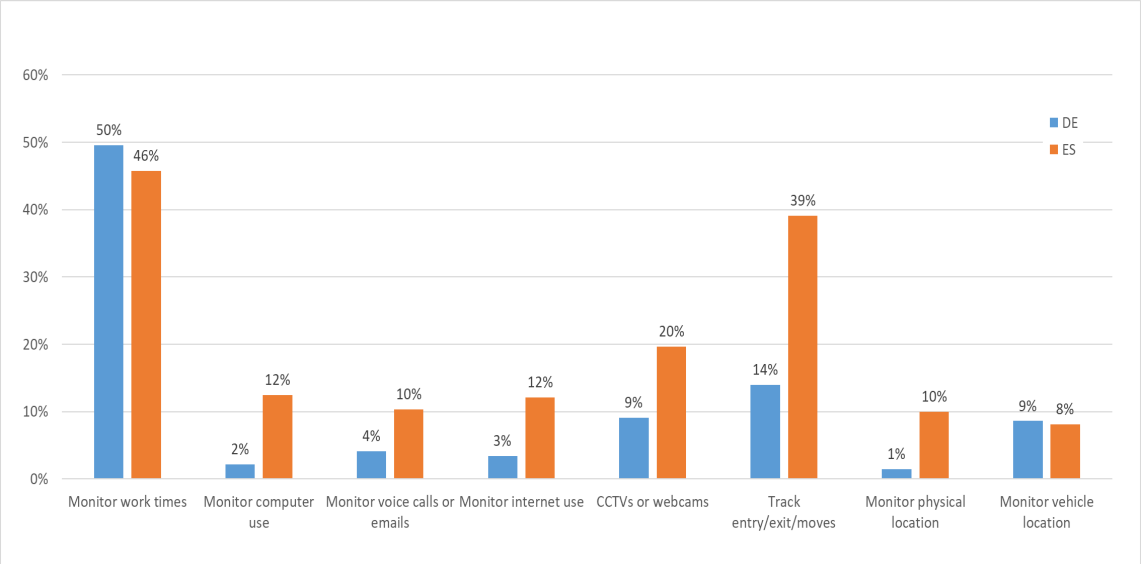
At the European level, there is a shortage of research which examines the pervasiveness and impacts on working conditions, of digital monitoring and surveillance in the regular and platform economies. To the best of our knowledge, this survey is among the first to elicit direct information on the use of digital tools to monitor workers' performance, behaviours, and physical location.

2.2.1 Use of digital tools for monitoring and surveillance of work

Based on a review of the literature and on expert advice, the AMPWork questionnaire elicited information on employers' use of digital devices for purposes of monitoring and surveillance. In particular, respondents were asked whether the organisation where they work uses any digital tools for any of the following: monitoring work times, computer use, voice calls or emails, internet use, use of CCTV or webcams, tracking entry/exit/movements, monitoring physical location, and monitoring vehicle locations.

Figure 4 sets out the incidence of each of these eight types of digital monitoring and surveillance according to the AMPWork data. The most common type of digital monitoring is the tracking of working times, which is reported by around half of all workers in both Germany (50%) and Spain (46%). The second most frequent use of digital monitoring is the use of swipe cards for tracking entry/exit/movements in the workplace (14% and 39% in Germany and Spain, respectively), followed by use of devices to monitor vehicle locations (9% and 8%) and CCTVs or webcams (9% and 20%).

Figure 4 Use of digital tools for monitoring and surveillance of work



Source: authors' elaborations using AMPWork, weighted data.

What is most striking in Figure 6, however, is the differences between Germany and Spain. Only in the case of monitoring working times and monitoring vehicle location are the values similar in the two countries. In all other cases, the respective levels of digital monitoring and surveillance are much higher in Spain, in some cases almost by an order of magnitude. For example, the reported levels of digital monitoring for computer use, voice calls or emails, internet use and even physical location are around 10% in Spain, whereas they are below 5% in all types of digital monitoring in Germany. The first possible explanation is the 'informationelle Selbstbestimmung' (informational self-determination) in Germany, whereby the Constitutional Court established the legal "protection of the individual against unlimited collection, storage, use and sharing of personal data" ([7]). Secondly, the two countries have interpreted and implemented the GDPR is slightly different ways.

In Germany, the GDPR has been implemented with the German Federal Data Protection Act. (BDSG), whereas in Spain with the Organic Law on the Protection of Personal Data and Guarantee of Digital Rights. The two laws are very similar in many aspects, however the level of concern for privacy and data protection is significantly higher in Germany: in particular, Germany allows the processing of personal data only for specific reasons (e.g. hiring decision, terminating the employment contract, investigate crimes) on the basis of collective agreements, whereas Spain grants employers the right to collect data as long as it is deemed

([7]) Abstract of the German Federal Constitutional Court's Judgment of 15 December 1983, 1 BvR 209, 269, 362,420, 440, 484/83 https://data.guardint.org/en/entity/uq8wk597he .

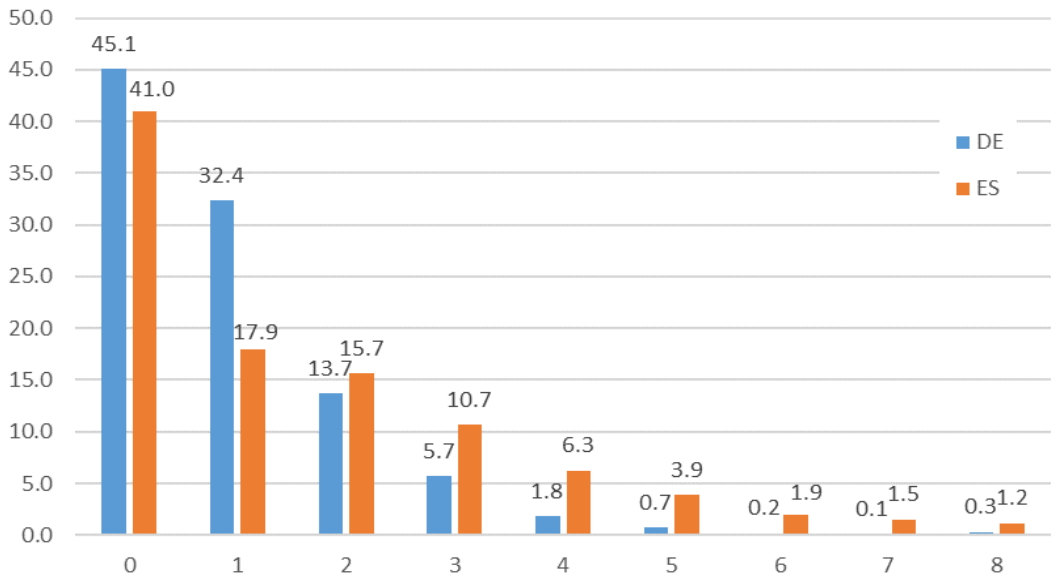
necessary for the performance of the job (technically, they need to have the consent of the employee, but as we have mentioned in the introduction, consent cannot be considered freely given in presence of an imbalance of power such as in an employment relationship). For example, employers may process images obtained from CCTV in order to verify compliance by workers with their obligations and duties, they may process personal data collected by systems recording sound in the workplace or obtained from geolocation systems ([8]). In addition, a recent study on algorithmic management, highlighted the role of works council in Germany to negotiate the use of digital technology when it had the potential to affect working conditions and in some cases strongly limited employers' ability to collect data via monitoring technologies and make automated decisions based on such data (Doellgast, Wagner and O'Brady 2022).

Another possible explanation, which we will explore in later sections, can be related to the different composition of the economy in each country, given that worker monitoring may be more present in some sectors or occupations.

2.2.2 Intensity and types of monitoring and surveillance

Moving beyond looking at each of the different types of digital monitoring and surveillance separately, Figure 5 shows the intensity of monitoring measured by a simple indicator which sums up the number of monitoring functions mentioned by workers. While around two-fifths of workers in both Germany and Spain are not aware of any of the eight types of digital monitoring and surveillance being used by their employer, relatively large numbers of workers in both countries report the use of two or more different types of monitoring, at 22.5% of German and 41.1% of Spanish workers.

Figure 5 Number of monitoring functions mentioned



Source: authors' elaborations using AMPWork, weighted data.

Taking advantage of this overlap between different types of monitoring functions, a principal components factor analysis ([9]) was undertaken to identify underlying patterns of commonly-occurring combinations of different types of monitoring. The analysis suggests that the eight simple types of monitoring observed can be combined into two underlying factors, which are linear combinations of the original variables, (Table 3).

([8]) https://www.whitecase.com/publications/article/gdpr-guide-national-implementation .

([9]) Principal component analysis (PCA) is an exploratory technique used to reduce data dimension, i.e. the number of observed variables, into a smaller number of underlying unobserved variables. PCA generates a number of unobserved variables (factors, two in this case) which are linear combinations of the original variables, accumulating as much of the total original variance as possible but uncorrelated among themselves.

The first factor, which we named "Activity monitoring", explains 27% of the variance, the second factor, named "Physical monitoring", explains 25% of the variance. Both factors combined explain 52% of all the variance included in the original eight variables. The factor *activity monitoring* is a linear combination of the variables related to monitoring of activities carried out with digital tools: monitoring of computer use, voice calls or emails, or internet. The factor *physical monitoring* is a linear combination of variables linked to the monitoring of physical presence in the workplace: tracking of entry/exit, CCTVs, monitoring work times or physical location. The monitoring of vehicle location is a relatively unique category of monitoring, which does not correlate highly with the other types of digital monitoring and surveillance (see Uniqueness column in Table 3).

Table 3 Factor analysis of types of digital monitoring and surveillance (VARIMAX rotated factor loadings)

Type of digital monitoring/surveillance	**Factor 1 Activity monitoring**	**Factor 2 Physical monitoring**	**Uniqueness**
Monitor work times	0.15	0.65	0.55
Monitor computer use	0.71	0.19	0.45
Monitor voice calls or emails	0.84	0.12	0.27
Monitor internet use	0.82	0.15	0.30
CCTVs or webcams	0.15	0.70	0.49
Track entry/exit/moves	0.18	0.73	0.43
Monitor physical location	0.35	0.53	0.59
Monitor vehicle location	0.20	0.40	0.80

Source: authors' elaborations using AMPWork, weighted data. The cells are coloured according to the values, from lowest (blue) to highest (red).

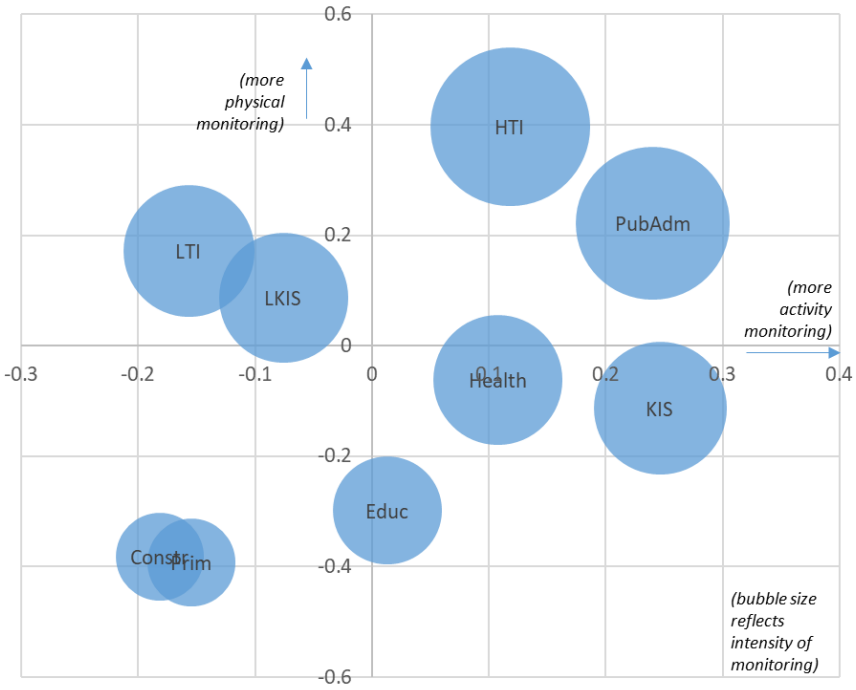
In the analysis to follow, we use the two abovementioned factors (activity monitoring and physical monitoring) plus a simple indicator of intensity of monitoring (the number of monitoring functions mentioned by each worker) to analyse monitoring and surveillance by sector and occupation.

2.2.3 Monitoring and surveillance by sector and occupation

Figure 6 plots the two indicators of monitoring derived from the factor analysis described in the previous subsection: physical monitoring on the vertical axis and activity monitoring on the horizontal axis, while the size of the bubbles represents monitoring intensity (i.e. a simple indicator summing up the eight different types of monitoring). Sectors and occupations in the top right quadrant are characterised by relatively higher levels in both domains, whereas sectors in the bottom left are characterised by relatively low levels of monitoring. Sectors in the top left and bottom right quadrants are characterised by relatively high levels of one type of monitoring, but relatively low levels of the other.

By sector, the highest levels of monitoring and surveillance are found in high technology industry (HTI) and Public Administration, for both activity and physical monitoring (Figure 6). Both knowledge intensive services (KIS) and Health have high activity monitoring yet low physical monitoring. In high technology industry (HTI) and less knowledge intensive services (LKIS) there is some physical monitoring but less than average activity monitoring, while the opposite is found in Education (some activity monitoring but less than average physical monitoring). Construction and the primary sector have the lowest levels of digital monitoring and surveillance overall, likely because these are also the sectors where use of digital tools is lowest, as seen previously in Figure 2 .

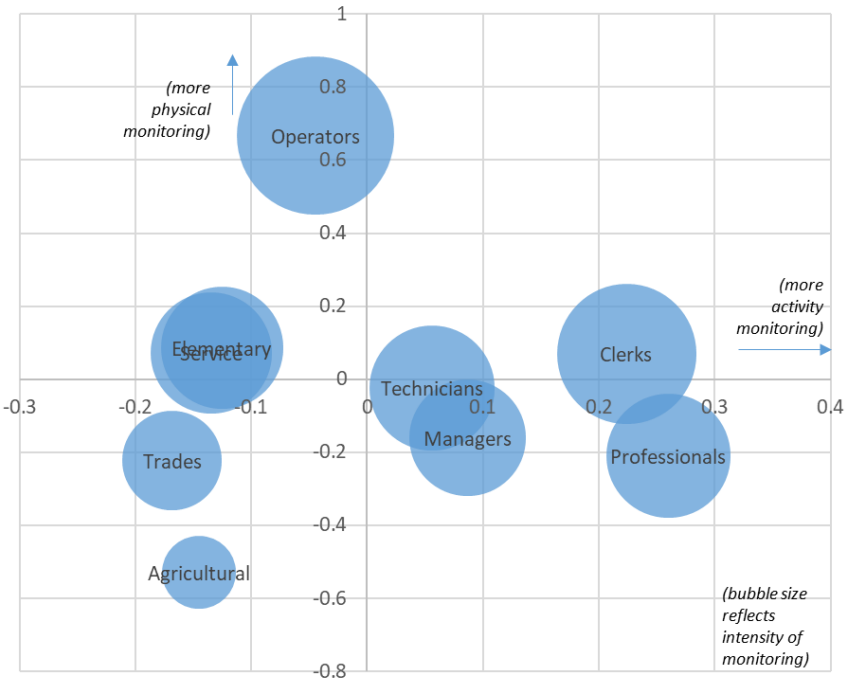
Figure 6 Digital monitoring by sector



Source: authors' elaborations using AMPWork, weighted data;
Note: monitoring intensity is a simple indicator summing up the eight different types of monitoring

By occupation, high levels of physical monitoring are found for operators, while it is relatively low for all of the other occupational groups, and lowest among agricultural occupations (Figure 7). As for activity monitoring, it is highest for clerks and professionals, and lowest for those in elementary, service, trades and agricultural occupations.

Figure 7 Digital monitoring by occupation



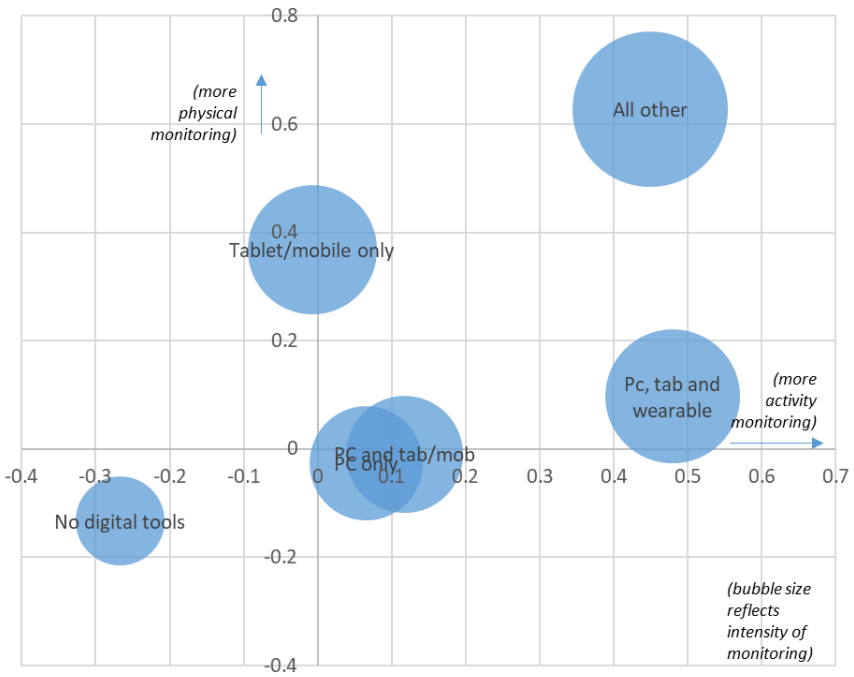
Source: authors' elaborations using AMPWork, weighted data.
Note: monitoring intensity is a simple indicator summing up the eight different types of monitoring

2.2.4 Monitoring and surveillance by use of digital tools at work

The digital monitoring and surveillance measured in the AMPWork survey had to be carried out (at least partly) using the same digital tools analysed in the previous section. It can be therefore informative to see how the different types and intensities of monitoring and surveillance vary across categories of digital tools usage at work: partly for validation purposes, but also because such an exercise has interest in its own right.

In terms of validation, we can see that, as expected, the use of digital tools is associated with higher levels of monitoring and surveillance (Figure 8). The most intense monitoring in both dimensions (activity and physical) is associated with the category of use of 'all other' types of digital tools. While a clear link is found between the use of tablets or mobile phones only and physical monitoring, this is not so evident for activity monitoring: this confirms our speculation in the previous section about mobile devices being used for the digital monitoring and control of physical labour. On the other hand, the combined use of computer, mobile and wearable devices is strongly associated with activity monitoring. Use of computer only at work, or computer plus mobile devices, are associated with moderate levels of activity monitoring. And, obviously but reassuringly, those not using any digital tools at work report the lowest (in many cases, zero) levels of monitoring and surveillance, at least as measured by our indicators.

Figure 8 Digital monitoring by use of digital tools



Source: authors' elaborations using AMPWork, weighted data.
Note: monitoring intensity is a simple indicator summing up the eight different types of monitoring

2.2.5 Monitoring and surveillance and working conditions

Finally, we will explore the association (by means of correlation coefficients) between the three indicators of digital monitoring (activity and physical monitoring, and intensity of monitoring) and the set of broad indicators on work organisation and working conditions already discussed in the previous section (using the same set of standardised variables).

From Table 3 we can see that activity monitoring is mildly associated with complexity, working from home and detailed procedures. On the other hand, physical monitoring is positively associated with working in vehicles and monotonous work, and negatively associated with autonomy and time flexibility. In other words, physical monitoring is more likely to be associated with traditional forms of work organisation and poor working conditions. This is also consistent with the findings reported in figure 9, according to which physical monitoring is more prevalent among operators.

Table 4: Correlations between digital monitoring and surveillance, work organisation and working conditions outcomes

	Activity monitoring	Physical monitoring	Intensity of monitoring
Time flexibility	0.017	-0.165	-0.124
Detailed procedures	0.086	0.063	0.101
Problem solving	0.056	0.003	0.037
Complex activities	0.142	0.016	0.103
Autonomy index	0.062	-0.124	-0.064
Can take break	0.071	-0.072	-0.015
Can communicate with superiors	0.071	-0.030	0.016
Can communicate with peers	0.045	-0.042	-0.014
Stress at work	0.064	0.017	0.052
Job is monotonous	0.075	0.113	0.133
Place of work: employer	-0.011	0.084	0.062
Place of work: client	-0.003	-0.090	-0.075
Place of work: vehicle	0.083	0.173	0.186
Place of work: home	0.122	-0.103	-0.006
Place of work: public spaces	0.039	0.070	0.070

Source: authors' elaborations using AMPWork, weighted data.
The cells are coloured according to the values, from lowest (blue) to highest (red).

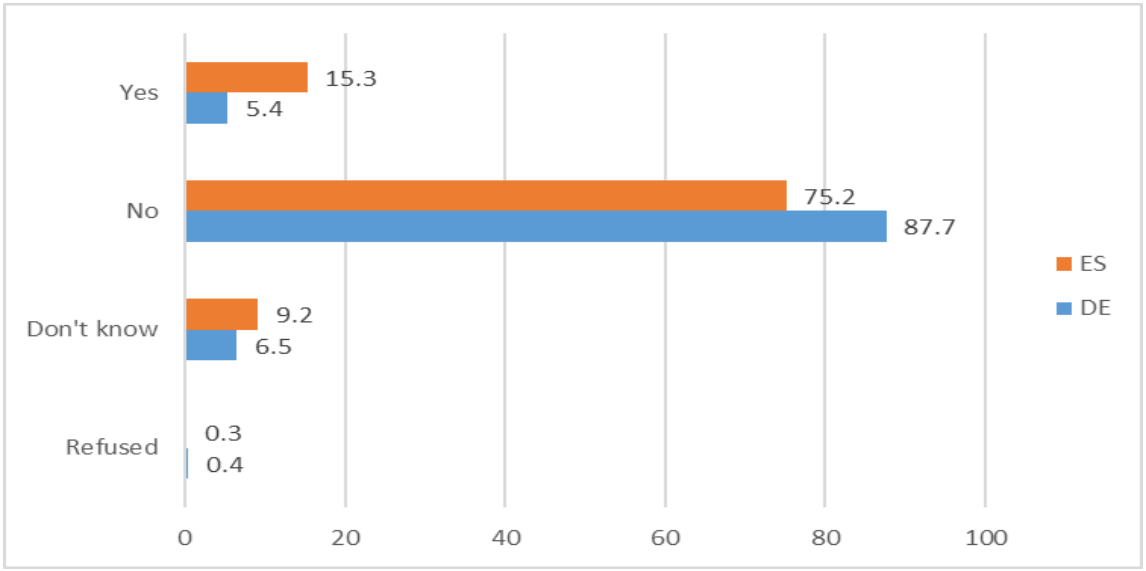
2.2.6 Transparency in digital monitoring and surveillance

Based on a systematic review of the literature, Ball (2021: 17) observed a strong positive relationship between the transparency of electronic monitoring (that is, the extent to which employees are given information about it) and perceptions of fairness, justice and task satisfaction. She also found that the positive perceptions of informational justice (as defined by (Colquitt, et al. 2001)([10]) can increase trust in management, and indirectly, decrease turnover. Conversely, low transparency is likely to result in perceptions of monitoring as purposeless and authoritarian. As a result of this review, two questions were included in AMPWork to ask workers if (to their knowledge) their organisation has a policy in place explaining what digital information is collected about them and their activities at work, and whether they have, or can be granted, access to this information.

As shown in the Figure 9, only 5.4% of German workers said that the organisation where they work had a policy explaining what digital information is collected about them or their work activities. While the proportion was 2.8 times higher in Spain, still only 15.3% of Spanish workers said this was the case. A further 6.9% of German and 9.5% of Spanish workers either did not know or refused to answer this question.

([10]) Colquitt et al, 2001 define informational justice as "the explanations provided to people that convey information about why procedures were used in a certain way or why outcomes were distributed in a certain fashion", page 2.

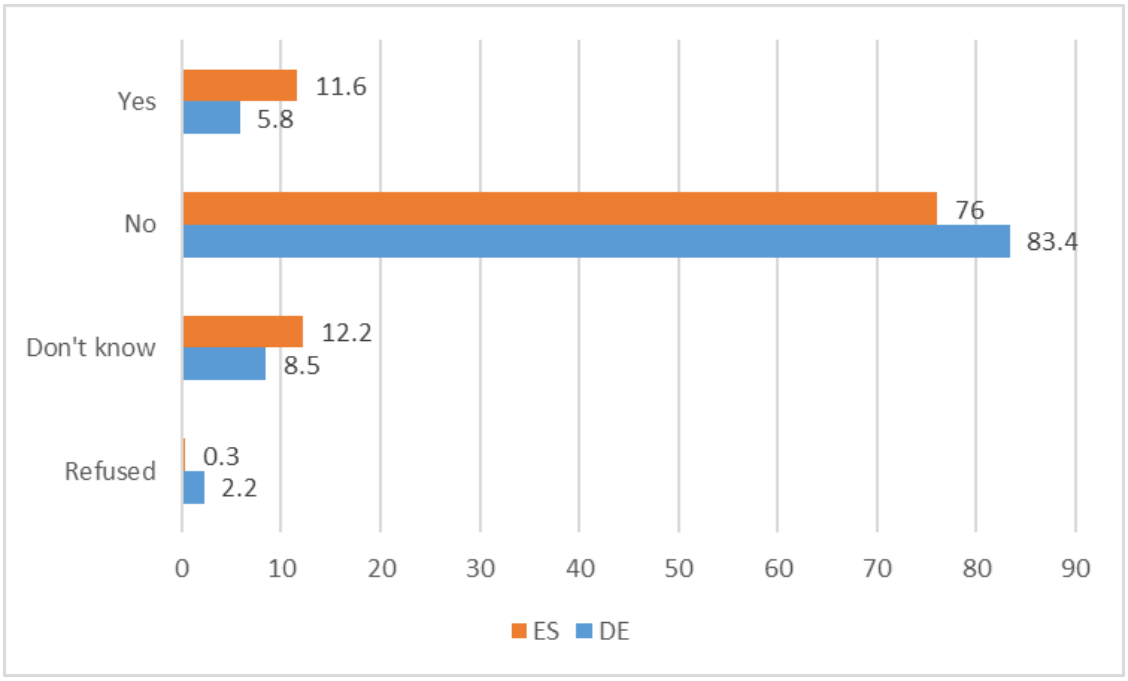
Figure 9 Organisation has a policy explaining what digital information is collected about the worker or their work activities



Source: authors' elaborations using AMPWork, weighted data.

As shown in Figure 10, as few as 5.8% of German workers said that they either had access or could be granted access to digital information about them or their work activities, with 11.6% of Spanish workers reporting similarly. A further 10.7% of Germans and 12.5% of Spaniards either did not know or refused to answer this question.

Figure 10 Access to digital information collected about them



Source: authors' elaborations using AMPWork, weighted data.

2.3 Algorithmic management of work

Algorithmic management is a term first described by Lee, Kusbit, Metsky, and Dabbish referring to work settings, in which "human jobs are assigned, optimized, and evaluated through algorithms and tracked data" (Lee, et al. 2015). It involves some degree of data processing in addition to data collection. While an official common definition is yet to be agreed upon, algorithmic management can be defined as the use of computer-programmed procedures, which may be powered by artificial intelligence, to coordinate labour input in an organisation (Baiocco, et al. 2022). Algorithms, especially if powered by AI, can be programmed to make autonomous decisions regarding workers (within the limits set by the law). At the most basic level, algorithms can support some managerial functions by automatically allocating tasks, shifts or instructions to workers (Kellogg, Valentine and Christin 2020, Wood 2021). However, algorithms can take on more complex functions, by directing, evaluating and disciplining workers. While algorithmic management is central to many types of platform work, the use of automated management systems is not restricted to the platform economy (Wood 2021).

In addition to asking workers about what types of digital devices they use to perform their jobs, and the ways their organisations use digital devices to monitor and survey their work and workplaces, all AMPWork respondents in paid work were asked a series of eight questions about algorithmic management and automated performance benchmarking systems.

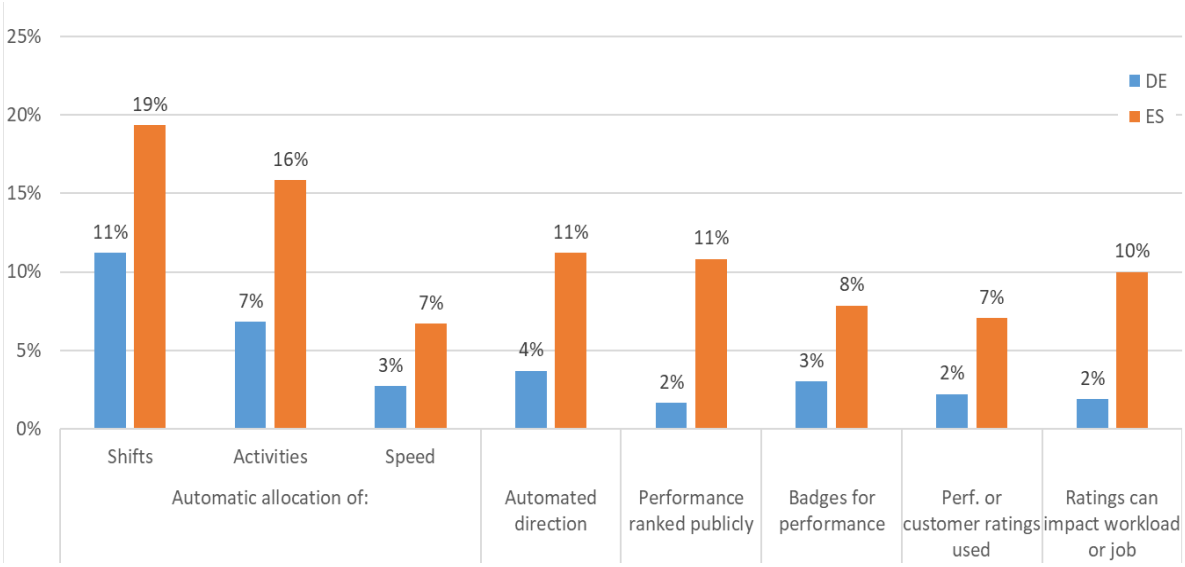
In particular, respondents were asked whether the digital tools they used at work were used to automatically allocate or and communicate their roster/shift/working time, the activities to carry out, the speed or rate of work and instructions regarding how work should be carried out. Additionally, they were asked whether their performance was ranked on a leader board; whether they were awarded points, badges, prizes or stars, or similar, for meeting targets or different levels of performance; whether their performance ratings were used as a way to decide which tasks, work or shifts they were given. Finally, they were asked whether they could lose their job, get suspended or have their shifts cancelled if they didn't maintain a minimum rating, score or metric.

2.3.1 Indicators of algorithmic management

Figure 11 illustrates the prevalence of each of the eight indicators of algorithmic management. As with other areas of AMPWork, the values are generally higher for Spain than for Germany.

Automated allocation of work is the most widespread form of algorithmic management, where more than 10% of German workers and almost 20% of Spanish workers are automatically allocated their shifts or working time via a digital device. Moreover, 7% and 16%, respectively, are allocated work activities via digital devices; 3% and 7% have the speed of their work determined by a digital device; and 4% of German workers and 11% of Spanish workers follow automated instructions or directions at work.

Figure 11 Indicators of algorithmic management



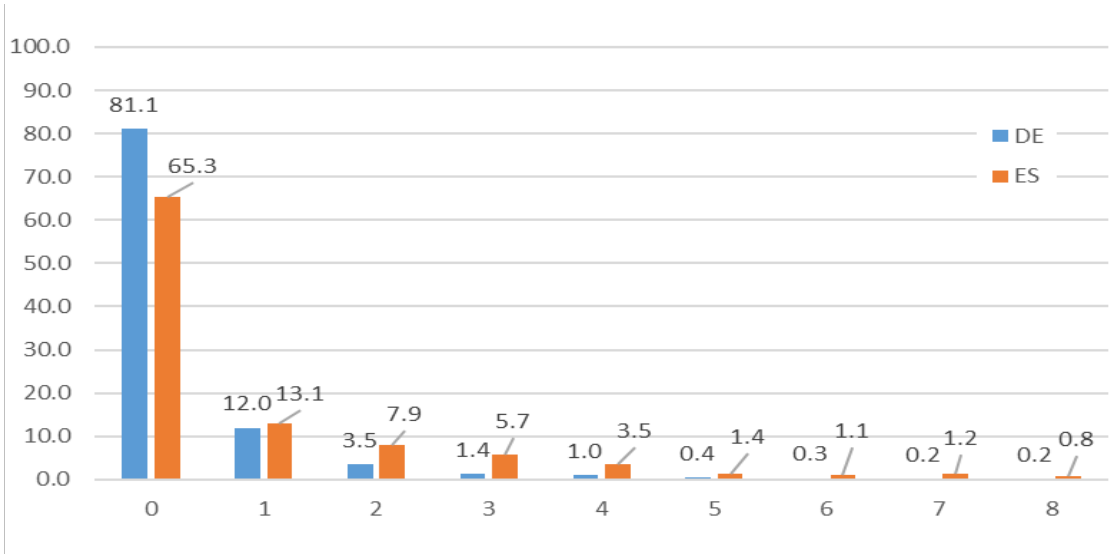
Source: authors' elaborations using AMPWork, weighted data.

As mentioned above, AMPWork also collected information on use of automated performance benchmarking systems, and again such systems are used much more frequently in Spain than in Germany. In Spain, 11% of workers have their performance publicly ranked, 10% can have their workload or job cancelled on the basis of those rankings, 8% use badges or prizes for performance; and 7% have their work allocated at least partly on the basis of performance or ratings. However, the same systems only affect between 2% and 3% of German workers.

2.3.2 Two main factors of algorithmic management

In both countries, most of the workers are under no algorithmic management system, but a fairly large minority, approximately 20% of Germans and 35% of Spaniards are subject to at least one of the systems of algorithmic management mentioned in the previous section (Figure 12).

Figure 12 Number of algorithmic management systems mentioned



Source: authors' elaborations using AMPWork, weighted data.

To simplify the analysis, we also applied factor analysis here, and two common factors were identified. The first factor captures automated *direction* systems, comprising four indicators: automatic allocation of time/shifts, automatic allocation of activities, automated allocation of speed, and automated direction. A second factor captures automated *evaluation* systems, comprising four other indicators: performance being publicly ranked (such as on leader boards), badges being awarded for performance, ratings being used to allocate work, and ratings being used to cancel work. Each of these two factors explains around 28% of variation of the 8 original variables. Combined, the two factors account for 56% of variation.

Table 5 Relationship between different types of algorithmic management (VARIMAX rotated factor loadings)

Types of algorithmic management	Factor 1 (Direction)	Factor 2 (Evaluation)	Uniqueness
Automatic allocation of time/shifts	0.78	0.04	0.39
Automatic allocation of activities	0.80	0.20	0.31
Automatic allocation of speed	0.62	0.32	0.51
Automated direction	0.69	0.29	0.43
Performance publicly ranked	0.29	0.74	0.38
Badges for performance	0.13	0.71	0.47
Rating used to allocate work	0.19	0.72	0.44
Rating used to cancel work	0.12	0.66	0.54

Source: authors' elaborations using AMPWork, weighted data.
The cells are coloured according to the values, from lowest (blue) to highest (red)

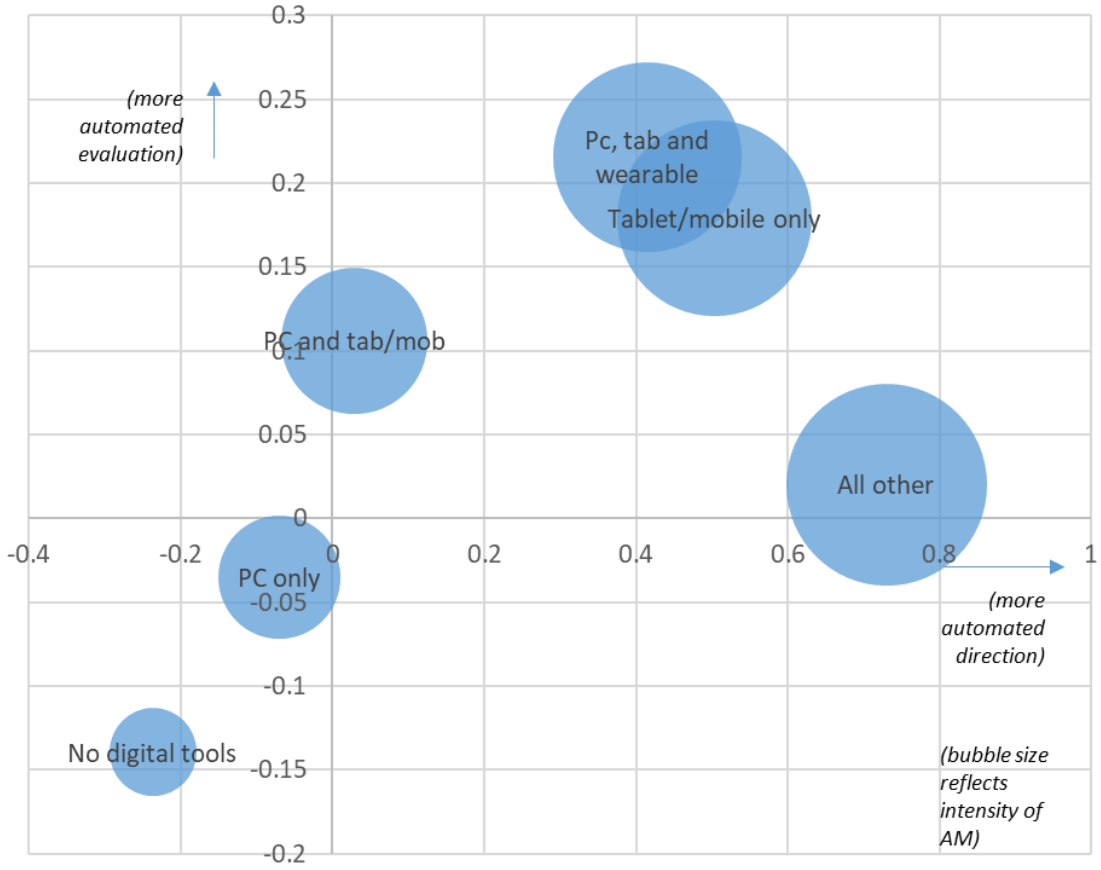
2.3.3 Algorithmic management by use of digital tools at work

As in the section on digital monitoring and surveillance, the values of the two factors of algorithmic management have been analysed across categories of digital skill usage, partly for validation but also because for its own interest.

In terms of validation, we can see that, as expected, the use of digital tools is associated with both forms of algorithmic management (Figure 13). The most intense forms of algorithmic management are found for those workers using a combination of computers, mobile and wearable devices, and for those using tablets or mobile phones only. Those using other types of digital devices have high levels of automated direction but lower levels of automated evaluation, whereas using a computer in combination with a mobile device is associated only with automated evaluation.

It is interesting to note that the use of computer only is not associated with algorithmic management practices. As we have already observed in previous sections, the use of computer only at work is not anymore an indicator of sophisticated use of digital tools but rather the contrary. As expected, no digital tool usage is (strongly) negatively associated with algorithmic management.

Figure 13 Algorithmic management by use of digital tools



Source: authors' elaborations using AMPWork, weighted data.

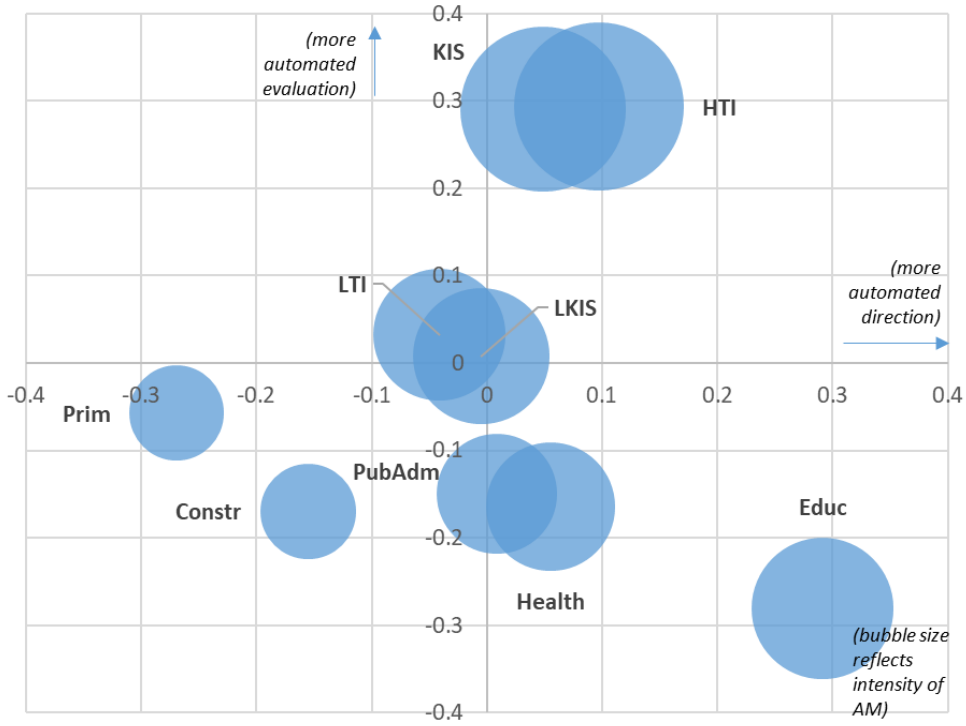
2.3.4 Algorithmic management by sector and occupation

The previous factors plus an intensity indicator (computed by simply counting the number of positive replies to the full set of 8 variables on algorithmic management by each worker) allows us to analyse algorithmic management practices by sector and occupation.

By sector, we see surprisingly high levels of algorithmic direction in education. This might be linked to the increasing use of digital tools for education at all levels, which has been greatly accelerated by the Covid-19 pandemic. The digital tools used to organise classes and to communicate with students (and parents) are probably also used for assigning work tasks and working times to teachers, hence these responses. Automated direction is also relatively high in high technology industries (HTI), health and knowledge intensive services (KIS); and as expected, automated direction is lowest in the primary sector and in construction. Automated evaluation of performance (benchmarking), on the other hand, is highest in high technology industries (HTI) and knowledge intensive services (KIS) (Figure 14).

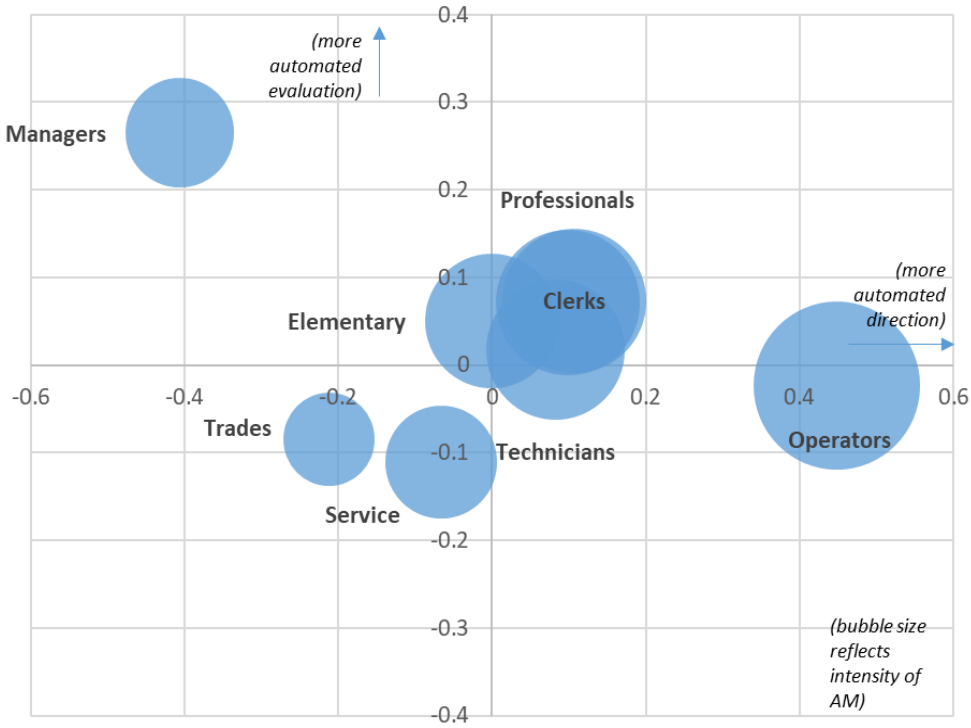
By occupation, the highest levels of automated direction are found among industrial plant and machine operators and assemblers, as could be expected. Clerks and professionals have moderate levels of both indicators simultaneously, whereas trades and service workers have low values in both. Interestingly, managers have high levels of automated evaluation but very low levels of automated direction (Figure 15).

Figure 14 Algorithmic management by sector



Source: authors' elaborations using AMPWork, weighted data.

Figure 15 Algorithmic management by occupation



Source: authors' elaborations using AMPWork, weighted data.

2.3.5 Algorithmic management, work organisation and working conditions

As in previous sections, we can see now how the two indicators of automated direction and automated evaluation, as well as the indicator of intensity of algorithmic management, are (mildly) correlated to some broad indicators on work organisation and the nature of work. Table 6 shows that automated direction is more common for those working in a vehicle, and mildly associated with detailed procedures and monotonous work. Automated direction is also negatively associated with time flexibility and autonomy (mildly). On the other hand, automated evaluation is positively associated with working from home, monotonous work, and to a lesser extent, detailed procedures; and negatively associated with working in employers' premises. Additionally, the overall algorithmic management intensity indicator is most associated with working in a vehicle or at home, monotonous work, and detailed procedures.

In general, these results suggest that algorithmic management is frequently used when working outside the employers´ premises, where digital tools are used for communication with the employer, and we might reasonably assume, also for algorithmic management purposes, which is linked to monotonous work and detailed procedures. Although this is only preliminary descriptive analysis that will have to be confirmed with more sophisticated methods, it appears that algorithmic management is mildly linked to poor quality work.

Table 6 Correlations between indicators of algorithmic management, work organisation and working conditions outcomes

	Automated direction	Automated evaluation	Intensity of AM
Time flexibility	-0.070	0.044	-0.032
Detailed procedures	0.094	0.080	0.124
Problem solving	0.020	0.049	0.044
Complex activities	0.060	0.066	0.083
Autonomy index	-0.029	0.008	-0.018
Can take break	-0.039	0.066	0.007
Can communicate with superiors	0.038	0.041	0.058
Can communicate with peers	-0.012	0.039	0.019
Stress at work	0.046	0.093	0.097
Job is monotonous	0.082	0.100	0.130
Place of work: employer	-0.055	-0.046	-0.071
Place of work: client	-0.004	-0.016	-0.013
Place of work: vehicle	0.148	0.081	0.164
Place of work: home	0.045	0.123	0.111
Place of work: public spaces	0.043	0.030	0.058

Source: authors' elaborations using AMPWork, weighted data.
The cells are coloured according to the values, from lowest (blue) to highest (red)

2.4 Putting it all together: a general picture of the 'platformisation' of regular work

This final section of the chapter brings together the various elements previously covered by investigating the overlap between digital tool usage, digital monitoring and surveillance, and algorithmic management, culminating in the construction of a classification of the general working population according to four levels of *platformisation*.

2.4.1 Digital tools, digital monitoring and surveillance, and algorithmic management

Table 7 shows correlations between algorithmic management and digital monitoring and surveillance by use of digital tools. The underlying idea is that workers who make more intensive use of digital tools may also work for organisations who make more intensive use of algorithmic management and digital monitoring systems, even though the correlation is not to be taken for granted. Some interesting correlations can be observed.

First, the use of a PC or laptop is the category most linked to activity monitoring, and least with physical monitoring.

Second, being connected to mobile devices such as tablets or mobile phones is often linked with automated direction (that is, where the device is used to give instructions to the worker), and with the intensity of algorithmic management.

Third, use of wearable devices is most linked to automated direction and activity monitoring: it is somewhat surprising that it is not very linked to physical monitoring, despite the fact that this is in principle what these wearable devices were designed to do.

It is interesting to note that physical monitoring has in general the lowest correlations with the use of digital devices at work. This may be because digital monitoring is often not conducted with the devices that workers 'use', but rather with devices installed in the workplace for specific monitoring purposes, which are not captured in the AMPWork survey.

Table 7 Algorithmic management and digital monitoring by surveillance by use of digital tools

	Use of digital tools				
	PC or laptop	**Connected mobile device**	**Wearable device**	**Other digital devices**	**Video-conferencing**
Algorithmic Management					
Automated direction	0.079	0.169	0.161	0.142	0.112
Automated evaluation	0.091	0.118	0.062	0.028	0.154
Intensity of AM	0.115	0.203	0.162	0.125	0.182
Digital monitoring and surveillance					
Activity monitoring	0.196	0.153	0.165	0.074	0.259
Physical monitoring	0.023	0.078	0.086	0.108	0.011
Intensity of M&S	0.148	0.160	0.166	0.126	0.176

Source: authors' elaborations using AMPWork, weighted data.
The cells are coloured according to the values, from lowest (blue) to highest (red)

How often do our indicators of digital monitoring and algorithmic management overlap? Table 8 shows the correlation between the different indicators of digital monitoring and algorithmic management which we have been using in this report, which are in general moderate. The strongest associations can be found between the indicators of intensity of digital monitoring and algorithmic management. Moreover, intensity of algorithmic management is associated with activity monitoring, and intensity of digital monitoring is associated with automated direction. The strongest association between factors is found for automated direction and activity monitoring. But in general, they all tend to go together to a greater or lesser extent, as expected.

Table 8 Digital monitoring by surveillance by algorithmic management

	Algorithmic Management		
Digital monitoring & surveillance	**Automated direction**	**Automated evaluation**	**Intensity of Algorithmic Management**
Activity monitoring	0.3202	0.3048	0.4341
Physical monitoring	0.2541	0.2172	0.3393
Intensity of digital monitoring & surveillance	0.3932	0.3515	0.527

Source: authors' elaborations using AMPWork, weighted data.
The cells are coloured according to the values, from lowest (blue) to highest (red)

2.4.2 Classifying workers by 'platformisation'

Finally, we can classify the working population in four different categories based on the use of digital tools and the presence of algorithmic management, digital monitoring, or both. The categories are not intended to be exhaustive, as they are created with the idea of illustrating the concept of platformisation.

The first category (*no use of digital tools and no platformisation*) includes all those workers that use no digital tools at work and are not subject to either algorithmic management, nor digital monitoring, comprising 38% of German workers and 35% of Spanish workers (Table 9).

The second category (*use of digital tools but no platformisation*) include those workers that use digital tools, but which are not under digital monitoring or algorithmic management systems. The specific condition for belonging to this category is using digital tools at work and being subject to zero or at most one aspect of digital monitoring or algorithmic management. ([11]) Using these conditions, we estimate that just over half (51%) of German workers and just over two-fifths (41%) of Spanish workers fall into this second category.

The third category (*soft platformisation*) includes those workers that use digital tools and are under mild forms of digital monitoring and algorithmic management. The specific condition is that they should use digital tools at work, while being simultaneously under at least one form of digital monitoring and one form of algorithmic management. Using these conditions, we estimate that 10% of German workers and 18% of Spanish workers can be classified into this third category.

The fourth category (*strong platformisation*) includes those workers that use digital tools, and are under strong forms of both digital monitoring, and algorithmic management. The specific condition is that they use digital tools at work, while being simultaneously *under all four* main types of digital monitoring and algorithmic management previously discussed. That is, at least under one form of activity monitoring, one form of physical monitoring, one form of automated direction and one form of automated evaluation. The specific condition applies to just 1% of German workers and 6% of Spanish workers.

Table 9 Categorisation of platformisation of employed population

	DE	ES	Total
No digital	38.5%	34.6%	36.4%
Digital but not platformised	50.6%	41.3%	45.7%
Soft platformised	9.7%	18.0%	14.1%
Strong platformised	1.3%	6.1%	3.8%

Source: authors' elaborations using AMPWork, weighted data.

2.4.3 What workers are 'platformised'?

Using the above classification, this section illustrates an analysis of 'platformisation' by education level, age and sex, occupation and industry (Figure 21).

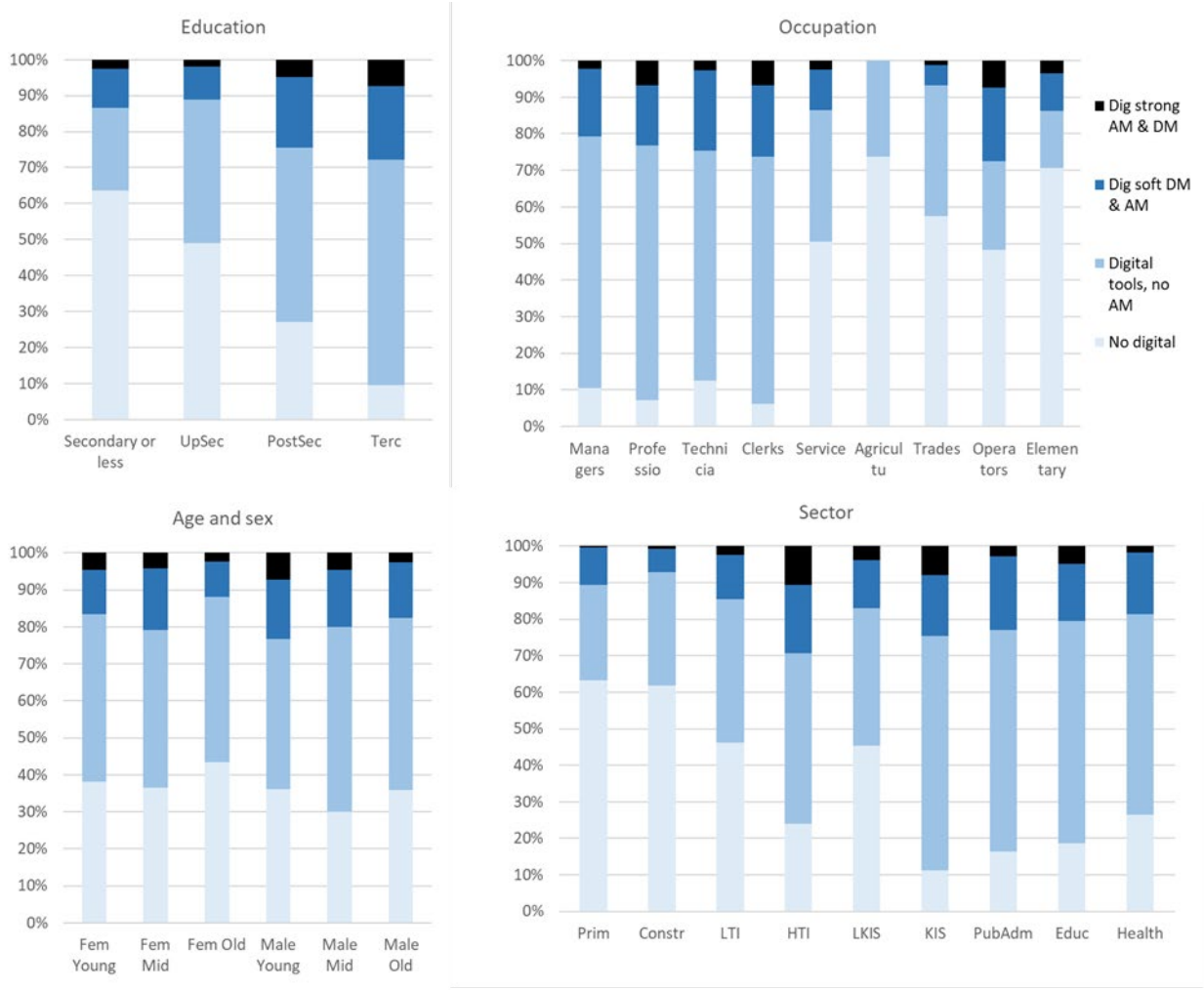
Although the use of digital tools and platformisation tends to grow with education, there is a slight bump of mild platformisation for those with lower education attainment when compared to middle-to-lower educated workers. As observed in previous sections, no marked differences by age and gender are noteworthy, other than a slightly higher level of platformisation for young male workers.

By occupation, the highest level of platformisation (both strong and soft) is found among operators and clerks. Professionals show a comparatively high percentage of strong platformisation (although in absolute terms it remains below 10%), whereas technicians have high levels of soft but low levels of strong platformisation.

There are also some interesting sectoral differences. High technology industries (HTI) have the highest levels of both strong and soft platformisation, followed by knowledge intensive services (KIS). Interestingly, education comes third in the category of strong platformisation (although it is important to note that in general, the levels of strong platformisation are low).

([11]) We found that considering "platformised" those workers who said yes to just one of the 15 variables measuring digital monitoring and algorithmic management was probably excessive. For this reason, we relaxed this condition, considering as non-platformised those who only said yes to one of these variables. In other words, the "platformisation" categories require answering positively to at least one variable measuring digital monitoring and one variable measuring algorithmic management.

Figure 16 'Platformisation' by education level, occupation, age and sex, and sector



Source: authors' elaborations using AMPWork, weighted data.

2.4.4 'Platformisation' and working conditions

The standardised set of indicators for work organisation and working conditions outcomes are finally analysed according to the categories of 'platformisation' (Figure 17). Again, the dependent variables (shown here in the columns) have been standardised with z-scores, including the binary variables. Thus, the values are centred on the overall mean, and expressed as standard deviations rather than in their original scales.

In terms of work organisation, 'platformisation' is associated with the variables measuring detailed procedures, problem solving and complex activities, but not with time flexibility or autonomy. If anything, there is a very mild negative association between both 'platformisation' and time flexibility, and 'platformisation' and autonomy. In terms of working conditions outcomes, 'platformisation' seems to be associated with greater monotony. In addition, the 'strong platformisation' category is associated with stress at work. Finally, with respect to location of work, 'platformisation' is stronger for those mainly working outside of their employers' premises, namely in a vehicle, at home, or in public spaces.

Figure 17 'Platformisation' by work organisation and working conditions outcomes

	Time flexibility	Detailed procedures	Problem solving	Complex activities	Autonomy index
No digital	-0.24	-0.22	-0.23	-0.34	-0.19
Digital tools, no AM	0.22	0.06	0.12	0.19	0.13
Dig soft DM & AM	-0.06	0.27	0.14	0.13	0.08
Dig strong AM & DM	-0.11	0.34	0.23	0.50	-0.06

	Can take break	Can communicate with superiors	Can communicate with peers	Stress at work	Job is monotonous
No digital	-0.17	-0.21	-0.22	-0.16	0.15
Digital tools, no AM	0.10	0.08	0.12	0.09	-0.20
Dig soft DM & AM	0.08	0.22	0.18	0.05	0.13
Dig strong AM & DM	0.14	0.18	-0.02	0.36	0.51

	(Main place of work)				
	Employer	Client	Vehicle	Home	Public space
No digital	-0.18	0.17	-0.03	-0.33	-0.04
Digital tools, no AM	0.15	-0.09	-0.09	0.18	-0.01
Dig soft DM & AM	0.04	-0.12	0.18	0.18	0.11
Dig strong AM & DM	-0.21	-0.06	0.59	0.33	0.10

Source: authors' elaborations using AMPWork, weighted data.

2.4.5 Summary and conclusion

In this chapter, we have presented some new and unique data on the platformisation of regular work in Europe. In particular, we have looked at the diffusion of digital tools at the workplace, and its uses for purposes of monitoring and surveillance on the one hand, and algorithmic management on the other. To conclude, we can summarise the main findings as follows.

Overall, we have found very high levels of digital tools usage at work. In the two countries covered in the AMPWork survey, two thirds of the employed population use digital tools at work. However, we should not forget that there is still a very sizable minority of workers who do not use digital tools at all in their jobs, around one third of the employed population.

Although we do not have historical data to compare, our descriptive analysis suggests an increasing sophistication in the use of digital tools at work. Most workers use a combination of different digital tools (computers and mobile digital devices most frequently), and we have found clear evidence that digital devices are not only used in office-type work settings but also in manual work. We found a significant minority of workers (5-10%) who use mobile devices to assist them in physical tasks.

Our evidence shows that digital devices are quite frequently used to monitor work processes. Most workers surveyed in Germany and Spain are subject to at least one form of digital monitoring, with more than a third of them being subject to two or more. Results from a factor analysis suggests that the different forms of digital monitoring at work surveyed in this report can be grouped into two main types: the monitoring of work activity carried out through computers (most common in office work) and the monitoring of physical work activity (most common for industrial and service manual work).

The use of digital devices to algorithmically manage work process is less frequent, but it is not a marginal phenomenon. According to our analysis, around 1 in 5 workers in Germany and 1 in 3 in Spain are subject to at least one form of algorithmic management, with 1 in 10 in Germany and 1 in 5 in Spain being subject to two or more. Performing a factor analysis of the distribution of a set of new indicators on algorithmic management, we found two main types: automated direction, which is most frequent for industrial operators and drivers, but also for educators; and automated evaluation, most frequent in high technology industries and knowledge intensive services, as well as for managerial occupations.

Combining this information, we have proposed a classification of workers according to the levels of platformisation, defined as the use of digital devices for purposes of digital monitoring and algorithmic

management at work. Following this logic, around 11% of German workers and 24% of Spanish workers are "platformised" to some extent – with 1% and 6% respectively being "strongly platformised". Then, there is a much more numerous category of workers (51% in Germany, 41% in Spain) who use digital tools at work but who are not subject to either digital monitoring or algorithmic management systems.

The higher proportions of platformised workers are found among clerks and operators, in high-technology industries, knowledge-intensive services, and public administration (for all these groups, between 10% and 20% of workers can be defined as "platformised" according to our definition). Platform-based monitoring and management is often found for those who work outside regular employer premises (at home, or in a vehicle, or in public spaces). It is often linked to more detailed work and complex work procedures, but also to more monotony and stress.

As briefly mentioned in the introduction to this chapter, the platformisation of regular work should not be confused with the different phenomenon of work in digital labour platforms (DLPs). However, it is obvious that the two phenomena are related (in both cases, key aspects of work organisation are carried out using digital platforms) and we can expect some similarities in terms of other attributes and conditions. The focus of the following chapter is specifically on work in digital labour platforms, including an explicit comparison between "platformised" regular work and work via DLPs.

3 The new realities of platform work

The JRC-COLLEEM surveys, launched in 2017 and 2018 respectively, were among the first to estimate the size of the platform economy at the European level, and to analyse the socio-economic profiles and working conditions of platform workers in Europe.

Since 2017, much has changed in our understanding of platform work. First of all, we can no longer say it is an understudied phenomenon: a simple search on Google Scholar returns thousands of studies, spanning different disciplines. Secondly, platform work is no longer referred to as 'collaborative' or 'sharing' economy, since it has become obvious that it is a form of employment. In addition, policy makers have become aware of the struggles faced by many platform workers, especially due to the proliferation of court cases meant to establish the economic nature of the relationship between digital labour platforms and the people who provide services through them. For this reason, the current president of the European Commission, Ursula von der Leyen, explicitly mentioned improving working conditions for platform workers as one of the political priorities for 2019-2024([12]). In December 2021, the European Commission published a proposal for a directive on improving the working conditions of platform workers (COM(2021) 762), providing guidelines to correctly classify platform workers' employment status and establishing rules to mitigate risks related to algorithmic management. Results from the COLLEEM surveys have been extensively used in the European debates on this topic, and explicitly mentioned in the 2021 proposal on platform work. However, there are still unresolved issues, which we discuss in this chapter.

Because so many studies are being carried out on platform work and because of its political relevance, reaching a consensus on definitions and measurement has become imperative. Different institutions have conceptually similar, but still slightly different definitions of platform work. For instance, the ILO defines platform work as work on or via digital labour platforms that are either "web-based or location-based and where work is allocated through software applications" ([13]). Eurofound defines platform work as the 'use (of) 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'; it subsequently puts a special emphasis on the existence of three parties (the platform, the worker, and the client) ([14]). The OECD uses a simpler phrasing but essentially the same concept, and defines platform workers as those who 'use an app or a website to match with customers in order to provide a service (rather than goods) in return for money' (OECD 2019). The European Commission defines platform workers as individuals performing work through digital labour platforms (irrespective of the contractual designation of the relationship), where digital labour platforms are defined as any natural or legal person that complies to the following criteria: 1) provides a commercial service, at least in part, at a distance through electronic means (such as a website or a mobile application); 2) at the request of a recipient of the service; and 3) that involves the organisation of work performed by individuals (online or in a certain location). ([15]).

The JRC has worked in close collaboration with other institutions to refine and harmonise the definition of platform workers, which forms the basis of this chapter. In particular, the JRC is part of an international technical expert group (a taskforce), including other EU institutions, such as Eurostat and DG Employment, as well as agencies such as Eurofound and the European Institute for Gender Equality, and the OECD, the ILO, and representatives from National Statistics Institutes. The taskforce's mandate was to develop a pilot data collection for the year 2022 (postponed because of the COVID pandemic), whose main objective is to estimate the total number of persons employed in digital platform work and to collect information on their working conditions.

This taskforce identified three approaches to measure platform work in national practices: (1) the job-based (or task-based) approach, which investigates whether the respondent had a paid job in platform work usually during a reference week; (2) the income-based approach, which investigates whether a respondent generated income from platform work during a long reference period (12 months); (3) the location-based approach

([12]) https://ec.europa.eu/info/sites/default/files/state_of_the_union_2020_letter_of_intent_en.pdf.
([13]) https://www.ilo.org/global/topics/non-standard-employment/crowd-work/lang--en/index.htm .
([14]) Eurofound's definition of platform work is available at: https://www.eurofound.europa.eu/topic/platform-work#:~:text=workRead%20more-,Platform%20work%20uses%20an%20online%20platform%20to%20enable%20organisations%20or,connected%20thanks%20to%20an%20algorithm .
([15]) Chapter I, Art. 2(1) of the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on improving working conditions in platform work, available at: https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM:2021:762:FIN .

which identifies platform work based on the location of the work, 'at home over the Internet' (the use of this approach can produce unreliable estimates of platform work since it will likely include teleworking but exclude some types of on-location platform work). Typically, different surveys use different reference periods and may or may not include certain platforms (e-Bay, Airbnb) within the scope of digital labour platforms. Eurostat's proposed definition of platform workers is based on the ILO concept of employment: 'at least one hour of work for pay or profit in a reference week'. Platform work therefore means: to have worked for pay or profit in tasks/activities organised through an internet platform or a phone app, for at least one hour in at least one week, during the reference period. In addition, any activity that can be considered as "employment" in the LFS, namely, production of goods or provision of services, but also time spent in searching for clients or in setting up the working activity, should be considered as digital platform employment when the other criteria are fulfilled.

The definition of platform work used in this report follows a mixed job- and income-based approach. The broadest definition of platform workers includes all those who have ever gained income providing services either online or in-person using online platforms or apps.([16]) Then, this broad definition gets progressively narrowed down by adding time references (frequency of provision), number of hours worked, and relevance of income gained (as a proportion of total earnings). Thus, we come up to a definition of platform work as a main form of employment (equivalent to the concept of a regular job in the non-platform economy), including all those who have gained income providing services either online or in-person using online platforms or apps in the last month and who have spent at least 20 hours a week or gained at least 50% of their overall income via this activity.

3.1 Previous attempts at measuring the prevalence of platform work

As mentioned in Pesole et al (2018), Urzí Brancati, Pesole and Fernandéz-Macías (2020), as well as by O'Farrell and Montagnier (OECD 2019), different statistical methodologies can yield very different estimates of the number of people doing platform work. Even when the methodology used is similar, the comparability of results across different studies is limited by differences in the way platform work is defined, or using different timeframes, or simply by country selection.

Most of the available data on platform work comes from non-probabilistic self-administered online surveys (Pesole et al., 2018; Urzì Brancati et al., 2020), which are problematic for a number of reasons. Firstly, online surveys tend to overestimate the number of platform workers, possibly with a bias towards those who provide online services. "Because respondents are contacted online and the information is collected entirely online, [in online surveys] it is likely that some of the most disadvantaged forms of platform work (such as delivery or other low-skilled in person services) are underrepresented" (Urzí Brancati, Pesole and Fernández-Macías, 2019, page 54). Online surveys often rely on commercial panels of potential respondents, which are not statistically representative and can suffer from other biases. ([17])

Similarly, studies estimating the number of platform workers by looking at the publicly available data on the number of people registered on digital labour platforms may provide unreliable estimates for several reasons. For instance, it can lead to double counting in the case of 'multi-homing', or the practice of being affiliated with more than one platform, or underestimates in the case of multiple workers using the same account (Kassi, Lehdonvirta and Stephany 2021).

([16]) In the AMPWork questionnaire, the question about platform work is within a battery of items on "income gained from different online sources", which includes several possible online sources of income such as selling products (as in eBayEbay), renting accommodation (as in Airbnb), etc. The last item in the list is "providing services either online or in-person using online platforms or apps (e.g. Upwork, Freelancer, Clickworker, PeoplePerHour Uber, Deliveroo, Handy, TaskRabbit and others)". Those responding positively to this question are included in the broadest measure of platform work, and get a series of questions about their conditions, tasks performed, etc.

([17]) "For example, given that CINT panelists choose to sign up to a panel to earn money from answering surveys, it is possible that we end up with a sample of people that differs from the real population in ways that are not observable, which cannot be adjusted with weights based on demographics, and that we cannot pre-empt, because our knowledge of the phenomenon is still limited. For this reason, in spite of all the precautions, drawing inferences from the sample to the population may be problematic" (Urzí Brancati, Pesole and Fernández-Macías, Annex 1, Page 65).

Arguably, the best way to measure prevalence would be to include a set of questions to identify platform workers in national labour force surveys; however, that may also carry some problems because of the nature of the phenomenon, as already argued in Pesole et al. (2019). Because platform work is much more unstructured, and in many cases variable and sporadic than regular work, the ILO concept of employment – at least one hour of work in a week in the reference period – may both capture non-relevant cases of platform work and miss some relevant ones.

The very first efforts carried out to estimate the size of the platform economy date back to 2015 and found prevalence rates (for the US) between 0.5% and 1.5% of the working age population (Krueger and Hall 2015, Farrell and Greig 2016, McKinsey Global Institute 2015). The methodologies adopted by the different authors vary widely. Harris and Krueger selected 26 labour platforms and calculated the number of people likely to be working through them by tracking the number of searches containing the name of each platform on Google Trends, and rescaling the number using searches including the term "Uber". With this method, they estimated that a number between 600,000 and 1.9 million people were working through online platforms. McKinsey (2015) estimated the number of platform workers by simply summing up the number of people active on 10 platforms and dividing it by the US working age population. Finally, Farrell and Greig had access to a unique dataset, namely 6 million bank accounts of JP Morgan Chase customers, so they could simply estimate how many people received income ([18]) from at least one of 42 online platforms. Numerous ad-hoc (and generally online) surveys were carried out in Europe between 2016 and 2021 (Bonin 2017, Huws, et al. 2017, Lepanjuuri, Wishart and Cornick 2018, Pesole, et al. 2018, Urzì Brancati, Pesole and Fernández-Macías 2020). As previously mentioned, these surveys are generally self-administered and non-probabilistic, and their estimates of the scale of the phenomenon was larger, probably over-estimated to a certain extent.

A more recent study commissioned by the European Trade Union Institute (ETUI 2022), the Internet and Platform Work Survey (IPWS), uses a probabilistic sample drawn from random dialling of mobile phones. This is certainly an improvement over non-probabilistic online panel surveys, because to the extent that mobile phones reach all the population, a random sample of numbers should produce a representative sample of the population. However, this methodology still has some problems compared to traditional household surveys with face-to-face interviews such as the Labour Force Survey: most importantly, random dialling tends to produce very high rates of non-response (as people generally dislike receiving unsolicited calls), which can compromise the representativeness of the sample. Also, the quality of the information collected by phone is not as good as face to face. It is interesting to note that the IPWS estimate of platform work is between the very high numbers of online panel surveys and the low numbers of the early estimates: the IPWS estimates that around 4% of the working age population did some platform work in the year before the survey, and around 1% has platform work as their main form of employment. Similarly, the OSH Pulse survey, carried out by IPSOS on behalf of EU-OSHA, with the same sampling approach as the IPWS on a representative sample of workers, found that 3.1% of respondents received part of their income and 3% received most of their income through platform work in the last 12 months.

In addition, some European countries have recently launched their own ad hoc surveys to gauge the size of the digital labour platform economy. For instance, the Italian National Institute for the Analysis of Public Policies (INAPP) carried out in 2020/21 an ad hoc module on the "Gig economy" using a representative sample of the population aged 18 to 74; the survey found that approximately 1.3% of the sample respondents had provided services online or on-location via digital labour platforms. A similarly low prevalence rate is found in the ad hoc module of the Swiss labour force survey, according to which approximately 0.4% of the population had carried out work via an internet-mediated platform in the past 12 months ([19]). The UK Household Longitudinal Study, Understanding Society, also included a module on the 'gig economy' in 2021, and found a similarly low prevalence rate (<2%) of workers who provided online or on-location (taxi, courier and in-person) services using a website, platform or app during the past month ([20]). This is in stark contrast with much larger estimates from online surveys, as previously discussed, but close to the figure estimated in COLLEEM II for main platform workers (0.9%) or to the figure of platform work as main form of employment estimated by ETUI´s IPWS (1%).

([18]) And at least once over the 36 months preceding the study.

([19]) https://www.bfs.admin.ch/bfs/en/home/statistics/work-income/employment-working-hours/working-conditions/internet-mediated-platform-services.html.

([20]) https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/wave/11/questionnaire-module/gigeconomy_w11 .

3.2 Measuring platform work: AMPWork vs. previous editions of COLLEEM

The COLLEEM surveys (I and II) were exploratory and could be considered as pilot surveys mostly aimed at refining our concepts and measures of what was at the time (COLLEEM I started preparations in 2015) a poorly understood emerging phenomenon. COLLEEM I and II also provided an initial quantitative approximation to the prevalence and conditions of platform work in Europe. In terms of its initial purposes, the COLLEEM I and II achieved their aim to provide a better understanding and operationalisation of digital labour platforms in Europe, and also contributed to providing much-needed evidence on the phenomenon. But as the JRC team behind the COLLEEM studies repeatedly cautioned in the reports (Pesole et al, 2018; Urzí Brancati et al, 2020), the COLLEEM I and II surveys were pilot surveys with important limitations, in particular with respect to the statistical representativeness of its data. COLLEEM I and II were online surveys with a non-probabilistic (largely self-selected) sample: on the basis of the largest available European commercial panel of internet users, a random selection of EU nationals in many member states were contacted via the internet and asked to respond a number of questions about their activity online. The panel used as a basis for randomly selecting respondents was not exhaustive nor statistically representative of the working age population in the respective countries, and therefore, the resulting sample was not statistically representative either. Furthermore, online surveys have very large non-response rates (typically, over 90% of contacted persons do not complete the survey), compounding the representativeness problem of the sample. And finally, online surveys tend to produce poor quality information because people often have little patience for responding to complicated questions online, and there is no interviewer to clarify any possible ambiguity.

Thus, the COLLEEM I and II surveys do not provide a statistically representative portrait of platform work in Europe. In fact, there are reasons to consider them biased towards online platform work. This is because online platform workers are more likely to appear in commercial panels of internet users than the general population: indeed, some categories of online platform work (in particular, microtasks and online clerical work) are very similar to the activity of completing online surveys, an activity which in some cases (though not in the context of the COLLEEM surveys) is remunerated. This suggests that the COLLEEM I and II surveys probably tend to overestimate platform work, in particular for the category of online platform work and for the type of secondary/marginal activity which is similar to completing online surveys. The COLLEEM I and II reports cautioned about this potential sources of bias, and carefully applied a number of corrections and adjustments to the data in order to provide more reliable estimates on the prevalence of platform work as a form of employment equivalent to regular work, as we will discuss later.

For all these reasons, it was decided that the 3rd edition of COLLEEM (expanded and rebranded as **AMPWork**, the **JRC Algorithmic Management and Platform Work Survey**) would be carried out as a statistically representative survey, leaving behind the pilot phase of this study. Thus, in late 2021 and early 2022 a statistically representative sample of the full working age population in Spain and Germany as interviewed face to face. Statistical representativeness and face-to-face interviews are considerably more costly than a self-selected sample of online surveys, and thus only two countries were covered initially in the AMPWork survey. However, the sample per country was considerably larger than in the previous waves (roughly 3,000 cases in Germany and 4,000 in Spain), and the methodology used allows for proper statistical inference this time. Additionally, the information provided by AMPWork is much more detailed and of a higher quality, because face-to-face interviews can be longer and more complicated, and the interviewer can clarify any ambiguity improving the accuracy of responses. The scope of the survey is much broader also, as attested by the other chapters of this report (covering the platformisation of regular work and the unpaid production of digital content for online platforms, entirely missing in COLLEEM I and II).

But of course, there is no perfect method of data collection, and the AMPWork survey may also suffer from some biases and problems that we should carefully consider. There are two specific potential problems that we have to take into account when comparing its results with those of previous waves. First, face-to-face interviews in the private households of selected respondents is generally an excellent method of data collection, but there are some categories of the population that may be difficult to reach this way. For instance, minorities or people with a migrant background are often underrepresented in this kind of survey, and people with particularly busy schedules at work are also more difficult to interview. To the extent that these characteristics may be more associated with platform workers than with the general population, there may be a downward bias in the survey, potentially leading to some underestimation of platform workers. Secondly, there was a specific problem with the timing of data collection in the AMPWork survey, which took place in the winter of 2021/22, a period when the COVID pandemic was still present and disrupted social and economic activity. Especially in Germany (where the COVID wave in winter 2021-22 was particularly hard), this led to problems in face to face interviewing, and may have generated some biases in the data which are

difficult to assess. It is unclear whether the COVID pandemic may have affected the prevalence of platform work and in what way, or whether it may have led to a specific under-(or over-)representation of platform workers. As we did in previous waves of COLLEEM, we caution the reader against possible biases in our estimates, and AMPWork we suspect that because of the two reasons just mentioned, we may have a slight downward bias in the estimation of the prevalence of platform work. This affects not so much the category of "main platform workers", which corresponds to significant forms of platform work which are equivalent to regular work, and which is reassuringly consistent in the two COLLEEM waves and in AMPWork, but the less significant categories of "secondary and marginal platform workers" (corresponding to platform work as secondary activity).

3.3 Income generating activity in platforms: contextualizing platform work

To distinguish digital labour platforms from other types of platforms that can be used for generating income (such as renting or selling platforms), respondents of the AMPWork survey were asked whether they had ever gained income from any of the following sources:

- Selling products or your own possessions on online marketplaces (e.g. Etsy, eBay and others)
- Renting out accommodation on online platforms (e.g. Airbnb, Sharedesk, Nestpick and others)
- Leasing out goods on online platforms (e.g., Turo, PeerRenters and others)
- Crowdfunding or lending money on peer-to-peer lending platforms (e.g. Kickstarter, Indiegogo, Zopa, Prosper, Kiva and others)
- Providing services either online or in-person using online platforms or apps *(e.g. Upwork, Freelancer, Clickworker, PeoplePerHour Uber, Deliveroo, Handy, TaskRabbit and others)*

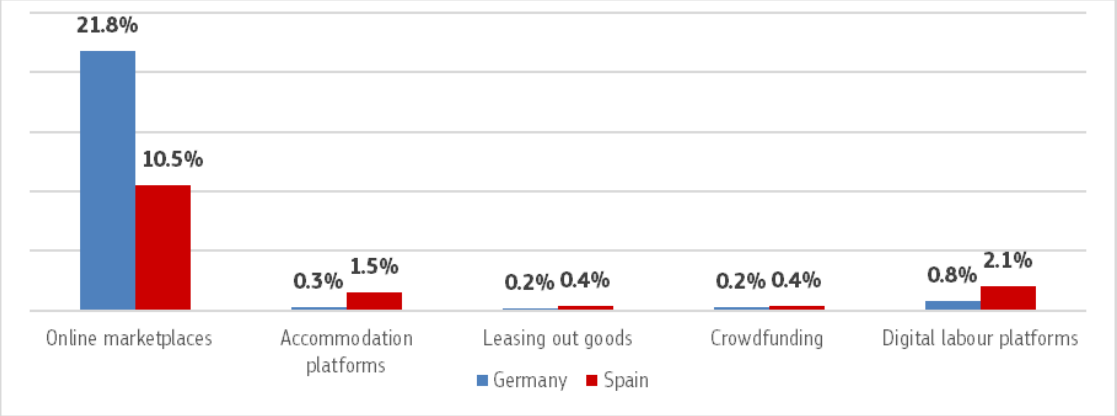
The examples provided were adapted to the local context in the Spanish and German versions of the questionnaire to reflect the most commonly used platforms in the countries surveyed.

Only the last item (option e) was used to identify platform workers in the broadest sense – those who have provided paid services at least once (the 'ever platform worker' category). It should also be noted that the wording in this questionnaire is slightly different from the previous versions in COLLEEM I and II, since it does not differentiate between online and on-location services. This change was implemented in the development phase of the AMPWork questionnaire, because the previous version was found to be misleading in the cognitive testing, whereas this simpler alternative worked better.

Figure 1 shows that selling products or own possessions on online marketplaces is by far the most common income-generating activity carried out on digital platforms, with more than one in five German respondents (21.8%) and more than one in ten Spanish respondents (10.5%). The provision of paid labour services via digital labour platforms (the focus of this chapter) is the second most frequent income-generating activity via platforms, with 2.1% of Spanish and 0.8% of Germans. Then, gaining income via accommodation platforms is slightly less common (1.5% in Spain, 0.3% in Germany). This very low prevalence rate may look surprising, especially given how widespread some platforms such as Airbnb are perceived to be in countries like Spain; however, we should bear in mind that the greatest majority of listings on Airbnb are multiple listings and from professional companies, as data from the investigative watchdog website 'inside Airbnb' reveal ([21]), which means that only a very small proportion of people actually rent out their home or 'spare room'. Platforms for leasing out goods and crowdfunding are even less widespread, with prevalence rates below 0.5%.

([21]) http://insideairbnb.com/.

Figure 18: Percentage of the working age population that has ever gained income from different types of platforms in Spain and Germany (weighted data)



Source: AMPWork, weighted data; only random sample.

3.4 Estimating the prevalence of platform work in Germany and Spain

We have already seen the preliminary estimate of people that have ever provided paid labour services via digital platforms according to the AMPWork survey: 0.8% of the working age population in Germany and 2.1% in Spain. These figures contrast strikingly with the equivalent figures in the COLLEEM 2 survey. In COLLEEM 2 (carried out in 2018), 12% of German respondents reported having provided paid labour services via digital labour platforms at least once, and 18% of Spanish respondents. How can we explain this discrepancy?

First of all, it is worth emphasizing that this discrepancy concerns the broadest and less adjusted measure of the prevalence of platform work in our approach. As previously argued, previous COLLEEM studies cautioned against using this broad measure because it includes a large proportion of sporadic and marginal forms of platform work which are of little practical relevance and which were likely to be inflated because of the nature of online data collection (see Urzì Brancati, Pesole and Fernández-Macías, 2019, page 15).

Both the COLLEEM I and COLLEEM II studies provided an alternative preferred measure of prevalence which – taking into account the regularity, time intensity and income generation of platform work – focused on those cases of platform work significant enough as to be comparable to a regular job in the non-platform economy. This alternative adjusted measure of prevalence, called "main platform work", was in fact an order of magnitude smaller than the broad measure of prevalence previously mentioned, and therefore much closer to the values we find in AMPWork.

In order to compare the estimation of prevalence in AMPWork and COLLEEM II, we will therefore replicate the distinction between "main platform workers" and "secondary platform workers" which was used in previous waves of COLLEEM. To ensure comparability, we apply the exact same criteria used in COLLEEM II to the data in AMPWork: that is, in order to qualify as a "main platform worker", respondents must fulfil all of the following criteria:

1. They must have provided paid labour services via digital platforms at least once in the previous month.
2. They must have worked at least 20 hours via digital labour platforms (or 10 hours but earning more than 50% of her income this way).
3. They must earn at least 50% of her income via digital labour platforms (or 25% but working at least 20 hours in the platform).

Using these restrictive criteria, we estimate that the prevalence of main platform work according to AMPWork is 0.6% in Germany and 1.4% in Spain. It should be noted that the discrepancy between this estimate and the equivalent estimate for COLLEEM II (which was 1.5% in Germany and 2.6% in Spain) is much smaller than the discrepancy for the broader unadjusted measure. This is illustrated by Table 10 below, which shows the respective estimates of broad and adjusted prevalence of platform work in COLLEEM II and AMPWork.

Table 10 Estimating and comparing prevalence rates of platform work (%)

		Broad (ever)	**Adjusted (main)**	***Ratio Broad/Adjusted***
Spain	COLLEEM II	18.11	2.65	*0.15*
	AMPWork	2.05	1.40	*0.68*
	Ratio COLLEEM/AMPWork	*8.84*	*1.89*	
		Broad (ever)	Adjusted (main)	*Ratio Broad/Adjusted*
Germany	COLLEEM II	12.29	1.54	*0.13*
	AMPWork	0.82	0.59	*0.72*
	Ratio COLLEEM/AMPWork	*14.98*	*2.61*	

Source: AMPWork, weighted data; only random sample.

As shown by the final rows of Table 10, the ratio of COLLEEM II to AMPWork with respect to the broader measure of "ever" platform worker is particularly large: the estimate in COLLEEM II was 9 times larger than AMPWork for Spain, and 15 times larger for Germany. But if we look at the ratio for the adjusted measure of "main" platform worker (again, using the exact same estimate), the gap narrows significantly: for Spain, the estimate in COLLEEM 2 was less than twice as large as in AMPWork, and for Germany 2.6 times larger. In other words, the estimates for the prevalence of main platform workers is quite consistent across COLLEEM/AMPWork waves, whereas the estimates for *ever* platform workers is very inconsistent.

The final column of Table 10 provides a hint as for why this may be the case. In COLLEEM 2, only a very small proportion of those who had ever provided paid services via digital labour platforms were classified as "main platform workers" (between 10 and 15%). In contrast, in AMPWork the majority of those who ever provided paid services via platforms are in fact main platform workers (around 70% in both countries). This is a striking difference between AMPWork and previous waves of COLLEEM: in previous waves, most platform workers were secondary or marginal cases, whereas in AMPWork most platform workers are people for whom this type of work is their main employment activity.

This suggests two possible explanations, which can be simultaneously true to some extent. First, the different survey mode may have magnified some of the observed discrepancy in the prevalence of secondary and marginal platform work. Whereas online panel surveys probably tend to overestimate secondary and marginal platform work, face to face surveys can capture better significant (main) forms of platform work but may miss some of the secondary and marginal types. Secondly, the phenomenon itself may be shifting and perhaps stabilizing, with the secondary and marginal types of platform work becoming less important but the more relevant category of platform work as a main form of employment remaining remarkably stable over time (at around 1 or 2 percent of the working age population).

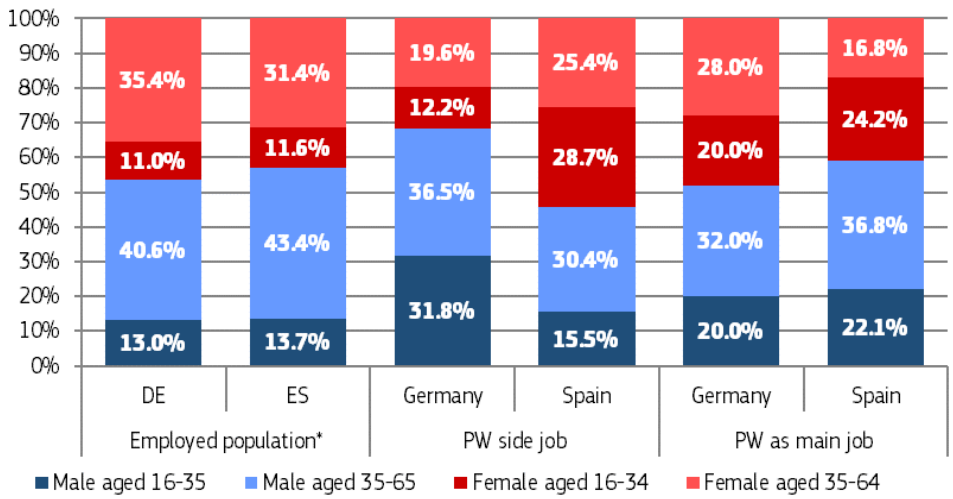
3.5 The typical platform worker: a socio-demographic profile

This section of the report summarises the main features of platform work by comparing three non-overlapping categories: the first category includes all employed population (that is employees, self-employed, and people at work and on child-care leave or other leave), excluding platform workers; the second category includes all those who have provided services via platforms in the past 12 months, as a side job and not as a main job; and the third and final category includes those who provide services via platforms as their main job. We first start with a demographic profiling of the three categories of workers, by summarising age, gender, household composition, educational attainment, and nationality.

In terms of demographic profiling, previous research on digital labour platforms revealed that platform workers are more likely to be young, male and with higher education. Our estimates confirm previous findings, but also show some difference between Germany and Spain. For instance, German platform workers are older than their Spanish counterparts, regardless of whether they provide services via platforms as their main job or not. The average age is between 38.3 and 41.7 for German platform workers and between 36.6 and 38.3 for the Spanish ones. In terms of gender, the majority of platform workers who do it as a main job are men in both countries; whereas more than half of the platform workers who provide services as a side job in Spain are women. In addition, men who carry out platform work as their main job tend to be younger, especially in Spain, where more than 20% of main platform workers are men aged under 35. By contrast, the proportion of

women aged between 35 and 64 is higher among German platform workers who do it as a main job – however, estimates should be taken with caution given the extremely small size of the sample of main platform workers in Germany. It should also be noted that the distribution of age and gender among German platform workers who provide services via platforms as a main job is fairly similar to the distribution of age and gender among the German working population.

Figure 19: Age and gender of platform workers compared with employed people in the rest of the sample

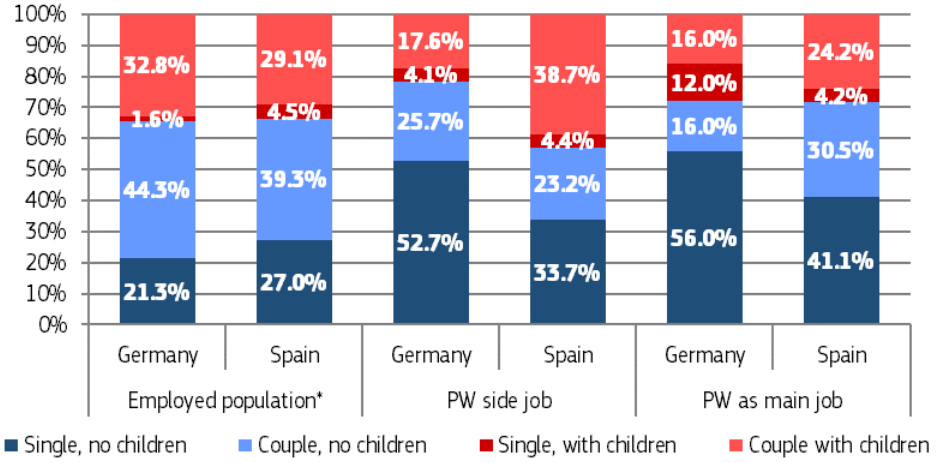


Average age	43.7	42.3	38.3	37.2	41.7	36.6	

**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

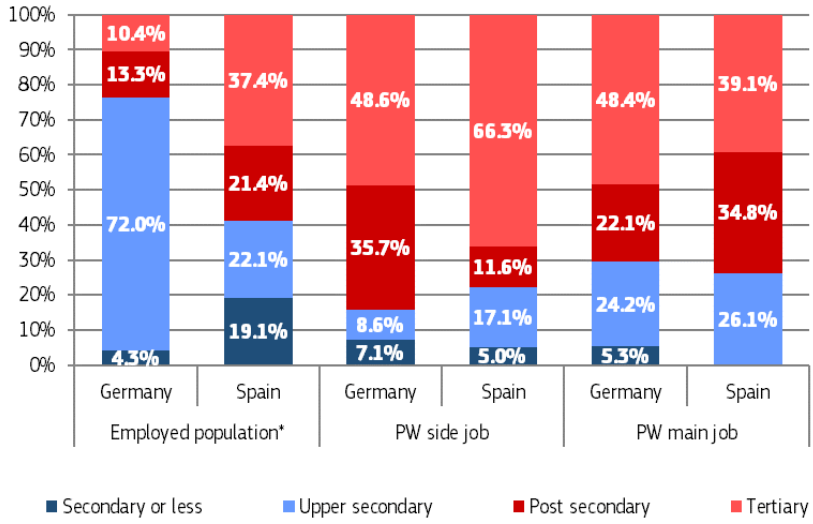
The next figure compares the household composition of platform workers in Germany and Spain with the rest of the employed population in each country. Unlike in previous COLLEEM surveys, which simply asked whether there were any dependent children in the household (excluding the respondent), in AMPWork we obtained information on all household members, and then enquired about their relationship with the survey respondent. This allows us to assess household composition with more accuracy. Results in Figure 20 show that the majority of platform workers are single without dependent children, and the proportion is nearly twice as high as among the rest of the working population. However, a significant minority of platform workers are either couples or singles with dependent children. This adds more emphasis to the importance of protecting platform workers' rights, as it will have repercussions not only on them, but also on their families. Estimates in Figure 21 show that the proportion of platform workers with tertiary education is generally higher than in the general working population, both in Germany and in Spain.

Figure 20: Household composition of platform workers compared with employed people in the rest of the sample



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

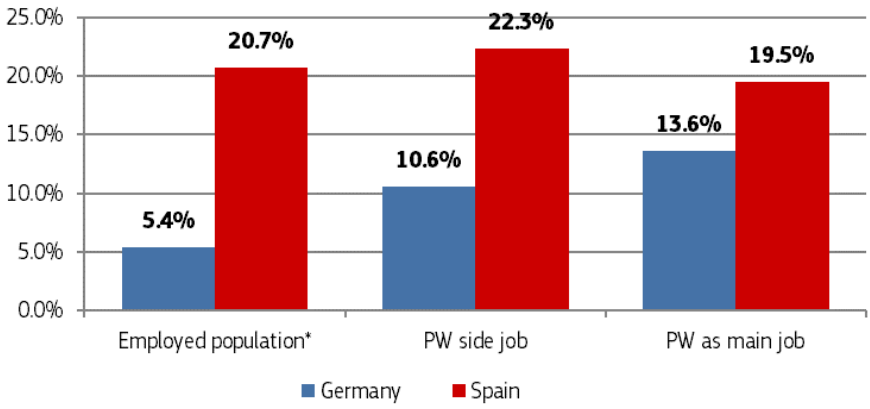
Figure 21: Educational attainment of platform workers compared with employed people in the rest of the sample



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted.

Finally, Figure 22 reports the proportion of foreign-born among platform workers in Germany and Spain, and compares it with the rest of the employed population. The proportion of foreign-born is somewhat higher among platform workers, as already pointed out in previous research (see Urzí Brancati, Pesole and Fernández-Macías, 2019), however there are differences between the two countries, since in Germany the proportion of foreign born platform workers is about twice as high as in the working population, while in Spain it is approximately the same.

Figure 22: Proportion of foreign born workers compared with employed people in the rest of the sample



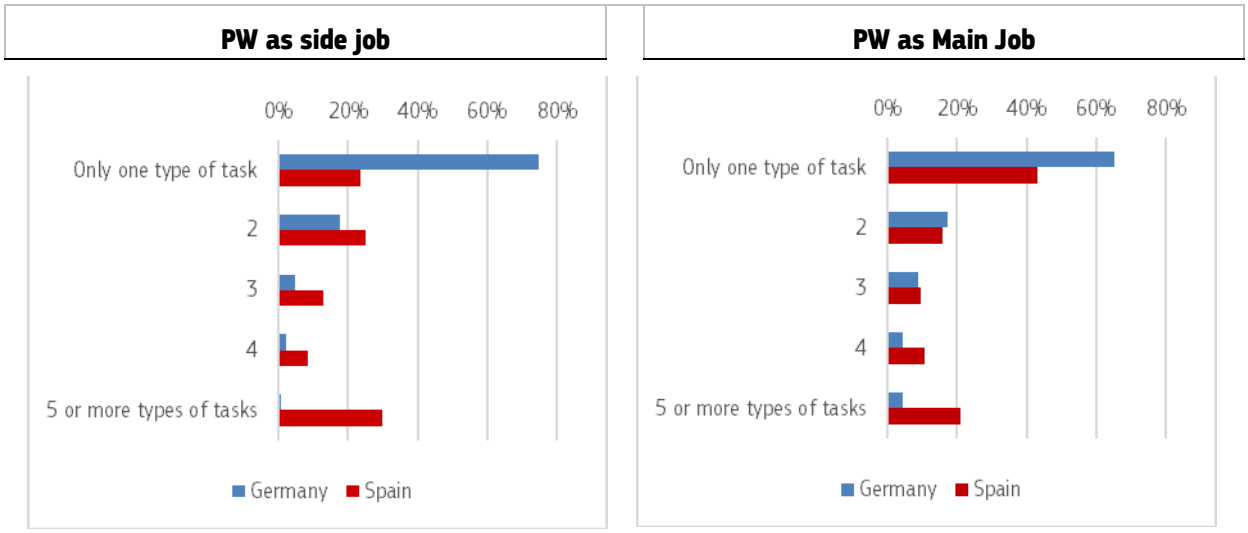
**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.6 What services do platform workers provide? – A task based approach

A distinctive feature of platform work - which distinguishes it from what may be called 'regular 'or 'traditional' employment - is the so-called "unbundling" of tasks, whereby a task is defined as the breakdown of a job into atomised units of activity that produce output and can be performed by different people at different times. In regular employment, tasks are bundled into coherent jobs or occupations, which are then assigned to specific workers under a labour contract; by contrast, in platform work the labour service is generally provided as specific and individually contracted tasks (or projects, or services). As we will see in this section, the types of tasks provided via online platforms are so varied and different from each other that it is hard to think of platform work as a homogeneous phenomenon pieced together by the mediating role of an online platform and its use of algorithmic management. For this reason, whenever possible, the analysis will be carried out at the task level. In addition, given that many platform workers carry out more than one type of task, some of the questions have been asked referring to the main task, that is, the task on which respondents spend most of their time. Task types can be broadly classified as services performed online (or web-based) and services performed on location (or in person). They can also be differentiated according to the skill level (professional vs. non-professional) and the scale (large vs. small tasks).

Figure 23 summarises the number of tasks provided by platform workers who carry them out either as a main job or on the side, as secondary activity, in Spain and Germany. If we look at all platform workers who have provided services as a side job in the past 12 months, the proportion of people carrying out only one type of task is significantly larger in Germany (75%) than Spain (24%). However, the difference shrinks when considering platform workers who work via platforms as their main job, with 64% in Germany and 43% in Spain carrying out only one type of task. In addition, only 21% of German platform workers and 36% of the Spanish ones have provided the same type of services through more than one platform (multi-homing); together the findings suggest that platform work is becoming increasingly similar to traditional dependent work, based on one type of activity and one main employer. The reliance on a single platform may be exacerbated by multi-homing costs – i.e. the costs associated with participation in more than one platforms – which include the cost of switching in terms of the time and investment required to set up an account with a new platforms, the loss of ratings and reputation, and the loss of benefits accrued. Portability of data and benefits is therefore a key issue for platform workers (Arets 2021) .

Figure 23: How many types of tasks do platform workers carry out?



Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.
Source: own elaborations using AMPWork data. Data for platform workers include booster sample.

Table 11 describes all the different task types and aggregates them into three broader categories of *online professional*, *online non-professional* and *on-location tasks*. Respondents were asked to select one or more types of tasks from a list, and then in a follow up question, they were asked to indicate which task was the main one and the name of the main platform they used to carry out their main task. Before commenting on the estimates, it should be mentioned that compared with the list of tasks in COLLEEM I and II, this list includes a new task, namely 'content moderation' and in addition it differentiates between transportation (taxi) services and food or goods delivery services, which before were grouped as one type of task. This makes the estimates not directly comparable.

Online professional tasks are the most widespread, both in Germany and in Spain (53.9% and 71.0%). In more detail, online writing and translation work and online professional services are the most widespread in Germany (23.1% and 12.1% respectively), while online creative and multimedia work and online lessons are the most widespread in Spain (33.7% and 30.1% respectively).

Nearly twice as many Spaniards carry out online non-professional tasks (60.3% in Spain vs. 32.5% in Germany), or on location tasks (49.6% in Spain vs. 30.2% in Germany). Among non-professional online tasks, the most widespread both in Germany and in Spain are clerical tasks, such as customer service, data collection and cleaning (23.1% in Germany vs. 34.4% in Spain), followed by online sales and marketing (13.9% in Germany vs. 34.1% in Spain). It should also be noted that particularly controversial tasks, such as content moderation - the "dirty work of social media" (Roberts 2016)- are carried out significantly only in Spain.

On-location services are carried out by 49.6% of platform workers in Spain and 30.2% in Germany. The types of on-location tasks performed in the two countries are somewhat different: while the most frequently mentioned on-location task for both countries is in-person services, such as housekeeping, handy/repair work, beauty services, care services, on-location photography (26.0% in Germany vs. 28.3% in Spain), food and other goods delivery services are quite pervasive in Spain (25.7%), but rarely mentioned in Germany (2.9%). In addition, by looking at the most frequently mentioned platforms, we can assume that the type of in-person services provided in the two countries are to be quite different, with German platform workers more likely to carry out handy/repair work through Task Rabbit or MyHammer, and the Spanish one more likely to carry out care services through platforms such as Top Nanny. Even though cab hailing apps, such as Uber, are among the most frequently studied in the literature or mentioned in newspapers, platform taxi services are not particularly widespread in either country.

The main platforms used to carry out online (professional and non-professional) services are fairly consistent across countries. Germany's top 5 are Freelancer, Clickworker, Upwork, Fiverr and Textbroker; Spain's top 5 platforms for providing online services are Clickworker, Fiverr, Instagram, Freelancer and Upwork. The German market for online tasks appears more concentrated, with approximately half of the respondents mentioning one of the top five platforms; by contrast, the Spanish market for online services looks more competitive,

since a larger proportion of respondents mention unique entries and only one in five (22.6%) mention one of the top five platforms.

The top five platforms to carry out on-location tasks are Taskrabbit, MyHammer, eBay Kleinanzeigen, Lieferando and Uber in Germany; in Spain, the top five on-location platforms are Glovo, Uber, Just Eat, Deliveroo, and Blablacar. It should also be noted that the top platforms used to carry out professional and non-professional tasks tend to be international: for instance, Freelancer is Australian, Fiverr Israeli, and Clickworker is based in the US and Germany. By contrast, the main platforms used to carry out on-location services tend to reflect more local or at least European realities: Glovo is Spanish and headquartered in Barcelona; MyHammer is German and headquartered in Berlin; Lieferando is Dutch and TopNanny French.

Table 11: Task types and proportion of platform workers performing them, in Spain and Germany

	Proportion of PW mentioning the type of task (last 12 months)		**Top platform**	
Type of task	**Germany**	**Spain**	**Germany**	**Spain**
Online professional	53.9%	71.0%		
Online software development and technology work: for example data science, system design, security system, development (such as game, mobile, web, etc.) programming and coding and similar	10.4%	26.4%	fiverr.	fiverr.
Online creative and multimedia work: for example animation, graphic design, photo editing and similar	8.1%	33.7%	freelancer	Instagram
Online writing and translation work: for example blogs, content creation, copy writing, proof reading, editing, translation	23.1%	26.8%	textbroker	freelancer
Online professional services: for example accounting, legal, project management	12.1%	22.1%	freelancer	LinkedIn
Interactive online lessons: for example language teaching, interactive consultations	6.9%	30.1%	NA	tusclases particulares
Online non-professional	32.5%	60.3%		
Online sales and marketing: for example lead generation ads, posting ads, search engine optimisation, market reviews, website feedback and opinions	13.9%	34.1%	clickworker	milanuncios
Online clerical tasks: for example customer service, data collection and cleaning, transcription, verification and validation, surveys and experiments	23.1%	34.4%	clickworker	clickworker
Online data entry task: for example captcha, object/image classification, tagging, book marking, colour determination, audio and video tagging, voice recognition	5.2%	23.6%	freelancer	Ipsos
Online content moderation: for example assessing objectionable material or illegal content, reviewing images, videos and content	1.2%	17.0%	-	clickworker
On-location	30.2%	49.6%		
Taxi and people transportation services: for example driving people, moving services and others	4.6%	13.0%	BlaBlaCar	Uber
Food and other goods delivery services: for example food delivery and courier services	2.9%	25.7%	Lieferando.de	Glovo
In-person services: for example, housekeeping, handy/repair work, beauty services, care services, on-location photography services	26.0%	28.3%	TaskRabbit / MyHammer	topnanny
Other	0.7%	2.5%		
Number of obs	*173*	*276*		

Source: own elaborations using AMPWork data. Data for platform workers include booster sample.

It should be noted that some of the platforms mentioned by respondents can be classified as something else other than labour platforms; for instance, Milanuncios is one of the most commonly used online marketplaces in Spain, whereas eBay Kleinanzeigen is the equivalent in Germany. Similarly, Ipsos is a market research company, while Linkedin and Instagram are social media companies. However, by looking at the description of the activities carried out on these platforms, it would appear as though the respondents do provide labour services, and therefore we keep them in our sample. For instance, a respondent who mentioned Instagram as main platform described their job as 'designing and mending clothes', while another claimed to be a videographer and described their job as 'recording events', so in both cases, they appear to use the platform not as a social media tool, but as a means to find clients, promote their work and so on. Admittedly, these platforms occupy more of a grey area and it is sometimes difficult to ascertain whether they fit the definition of digital labour platforms or not. For a more in depth discussion of the grey area of labour services for the creation of content in sharing platforms see section 4.

Box 4: Earnings and hours worked by main task

How many hours do platform workers spend on their main task and how much do they earn? To answer these questions, in this box we use a different, larger sample, including an additional purposive sample consisting mainly of face-to-face interviews with platform workers selected according to the interviewers' judgement (see Box 1). This "booster sample" cannot be used for the main estimates as it would introduce some bias. The figures provided should therefore be considered as purely indicative.

Estimates in the table below show that the number of hours that platform workers put in weekly and the amount of money they earn monthly differ greatly according to the type of task on which they spend most of their time (i.e. their main task). There are also considerable differences by country, with German platform workers generally putting in fewer hours, but earning significantly more than their Spanish counterparts. Overall, German platform workers who provide services as a main job work approximately 29.5 hours on their main task, or only 7.2 hours if they work on platforms as a side job. Their Spanish counterparts work considerably more hours on their main task both when it is their main job (40.5 hours on average) and when platform work is only a side or secondary activity (10.1 hours). In terms of average take-home pay, German platform workers earn about €584 per month from their main task, when platform work is a side job or nearly €2,000 euros a month when platform work is their main job, which is higher than the minimum wage in the country. By contrast, Spanish platform workers earn on average €347 on their main task when platform work is a side job or little more than €1,000 a month (about the level of the minimum wage) when it's their main job.

These differences persist even when we look at individual types (or groups) of tasks. Professional tasks appear to be more remunerative for German platform workers, who, on average, take home more than €2,300 a month when they do it as a main job. By contrast, Spanish platform workers who carry out professional tasks as a main job take home a bit more than €800 a month, despite working a similar number of hours (this result seems implausible and we discuss it in more detail later). Quite surprisingly, non-professional tasks, and specifically online sales and marketing, are the types of task that generate more money in Spain. Finally, on-location tasks generate a fairly low income in Spain, but not in Germany. Indeed, consistently with journalistic or anecdotal evidence, Spanish couriers, delivering food or other goods (mainly for the platform Glovo, as shown in Table 10) work on average around 48 hours per week and earn little more than €1,000 euros.

Hours worked and monthly earnings per task type via platforms, in Spain and Germany

	Platform work as side job				Platform work as main job			
	Hours		Earnings		Hours		Earnings	
Type of task (main or only)	**DE**	**ES**	**DE**	**ES**	**DE**	**ES**	**DE**	**ES**
Professional tasks	**7.2**	**8.5**	**€724**	**€315**	**29.0**	**27.3**	**€2,343**	**€826**
Online software development	5.8	16.3	€1,908	€742	21.7	35.0	€1,533	€1,150
Online creative and multimedia work	5.4	6.9	€568	€263	30.7	23.4	€2,525	€604
Online writing and translation work	10.0	4.8	€187	€139	32.4	32.5	€2,207	€1,350
Online professional services	3.5	9.8	€1,004	€259	27.7	28.9	€2,525	€964
Interactive online lessons	5.8	6.0	€218	€195	NM	24.8	€2,250	€388
Non-professional tasks	**6.7**	**10.1**	**€392**	**€354**	**25.1**	**30.3**	**€772**	**€1,597**
Online sales and marketing	7.1	14.4	€456	€492	NM	26.5	€400	€2,233
Online clerical tasks	6.3	7.4	€168	€183	21.7	35.0	€600	€1,280
Online data entry task	6.8	5.9	€1,269	€135	23.7	29.8	€1,010	€1,038
Online content moderation	-	20.8	-	€1,138				
On location tasks	**7.3**	**13.4**	**€526**	**€437**	**31.9**	**45.4**	**€1,901**	**€1,062**
Taxi and people transportation services	6.6	14.8	€300	€127	26.7	48.6	€1,567	€1,130
Food and other goods delivery services	9.0	21.9	€446	€845	26.7	45.8	€2,117	€1,069
In-person services	7.2	7.3	€334	€251	34.6	36.4	€1,936	€908
Total	***7.1***	***10.1***	***€584***	***€347***	***29.5***	***40.5***	***€1,997***	***€1,069***

Source: authors' elaboration of AMPWork data, plus additional observations from a face to face convenience sample (see box 3 for more details). Values not reported as they are not meaningful (NM) when sample size is below 5.

How can we explain the difference in earnings between Germany and Spain, even after accounting for the type of task carried out? To a certain extent, the earnings differential is not surprising since labour market conditions are more favourable in Germany than in Spain, both because of lower unemployment rates (3% in Germany vs 10% in Spain according to the latest LFS data([22]) and because of higher average earnings: employed persons aged 16 to 64 in Germany earn nearly 60% more than for their Spanish counterparts (€29,278 vs. €18,533 annual earnings according to EU SILC ([23]).

However, while the role of local labour market conditions is likely to be relevant for on-location tasks (and related platforms), it should be less important in determining payment for strictly online tasks. According to the literature, one of the main benefits of digital labour platforms is that workers gain access to clients worldwide, "transcending the constraints of their local labour markets" (Graham, Hjorth, & Lehdonvirta, 2017). In other words, a Spanish platform worker should be able to access better paid (professional and non-professional) online tasks in Germany – or other countries in which clients offer higher wages - unless they face some kind of obstacles or discrimination. Indeed, according to conventional economic theory, in a frictionless market - which online labour platforms should be an example of - workers with the same skills (or performing the same tasks) should receive equal payments. Since this is not the case according to our data, it is worth investigating what mechanisms drive the earnings gap: first of all, are workers really performing the same task or is there more heterogeneity than what it appears at first sight? Secondly, to what extent are digital labour platforms frictionless markets and what kind of obstacles do workers face when trying to access better paid tasks?

To provide a tentative answer to the first question, we can start by looking at the main platform used and job description (in their own words) of main platform workers by broad task group. Clearly, the information provided is to be considered purely indicative, but it nevertheless offers some interesting insights.

([22]) LFS data for employed and unemployed: Population by sex, age, citizenship and labour status (1 000) [lfsq_pganws] 2021Q4.

([23]) Mean and median income by most frequent activity status - EU-SILC survey [ilc_di05] .

If we look at platform workers who carry our professional tasks as their main job, we see that the Germans work more consistently through online platforms such as Freelancer or Gulp, whereas the Spanish work for a larger variety of platforms. When asked to describe what they do in detail, the answers indicate that the highest paid workers provide more high skilled services, often of managerial level. For instance, the top German earners carry out tasks involving 'strategy consulting for companies', reorganisation of companies' finances, 'management, purchasing and personnel planning', and other types of consulting and planning. Similarly, the highest paid Spanish platform workers also carry out highly specialised tasks (for instance, risk management, regulation and regulatory compliance). However, most of the tasks classified as professional in the Spanish sample often involve some type of sales, accounting, web design and a host of different services which are hard to group together. In addition, a much larger proportion of German platform workers is paid per project (54%) or per hour (19.8%), while Spanish platform workers tend to be paid per task, item or gig (48.9%). This variety in the task content alone can provide a good justification for the wage differential across countries.

3.7 Algorithmic management and digital monitoring in digital labour platforms

The availability of large amounts of data collected and processed through a wide range of digital devices can revolutionise management practices in traditional sectors, as we have seen in the chapter on the platformisation of regular work, but we can assume that it reaches higher levels in the digital platform economy. In digital labour platforms, most managerial functions are replaced by software algorithms, that is, 'computer-programmed procedures for transforming input data into a desired output' (Kellogg, Valentine, & Christin, 2020, p. 341; Barocas, Rosenblat, Boyd, Gangadharan, & Yu, 2014; Gillespie, 2014).

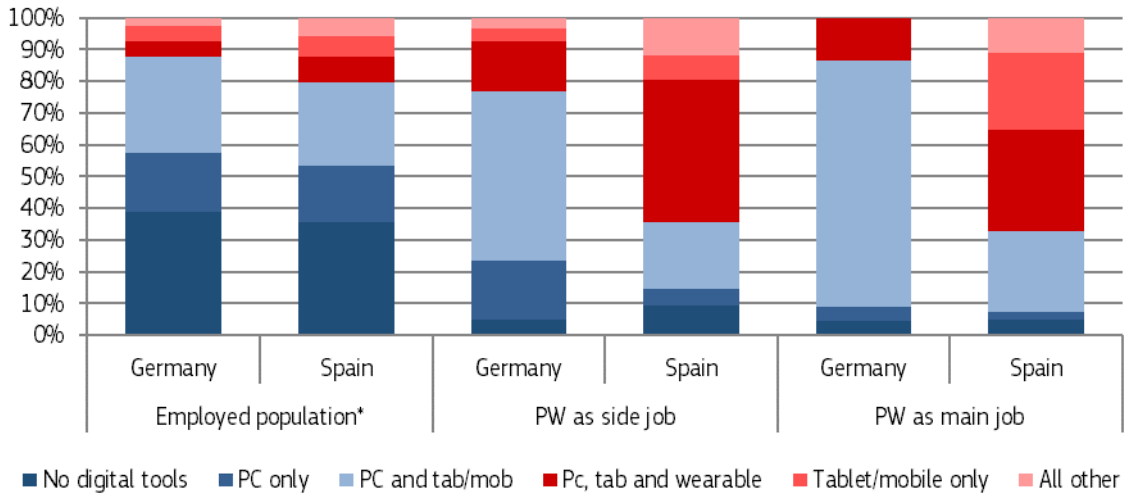
As we will see in this section, platform workers use a variety of digital tools, such as computers or laptops, mobile phones and tablets, to carry out their work. These tools are generally able to collect data, which are then processed and fed to algorithms that carry out automated actions, such as assigning shifts and tasks, providing instructions, evaluating performance and disciplining behaviour.

3.7.1 Use of digital tools

Before assessing the extent to which platform workers are subject to digital monitoring and algorithmic management, we quickly look at their use of digital tools. Estimates in Figure 24 show a staggering difference in use of digital tools between platform workers and the general employed population. While a fairly large proportion of people in work both in Germany (approx. 38% of the workforce) and in Spain (35.7%) claim not to use any digital tools for work,[24] only a tiny proportion of platform workers claim not to use digital tools. . Theoretically, there should be no platform workers claiming not to use digital tools for their work, at least if we look at those who do it as a main job, but it is possible that platform workers who provide transportation services don't consider their phone app as a tool for work – even if from our perspective it is.

In Germany, the majority of platform workers uses a personal computer (pc) and tablet/mobile combined, whereas in Spain the most widespread category among platform workers differs between those who do it as a secondary activity –with 43% of them using a combination of pc, tables and wearables – and those who do it as a main job, who for the most part (59%) use only tablets/mobile phones. The digital tools summarised in Figure 24 can be used to gather data and monitor workers, as discussed in the next section.

Figure 24: Use of digital tools: comparing platform workers with the employed population in Germany and Spain



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

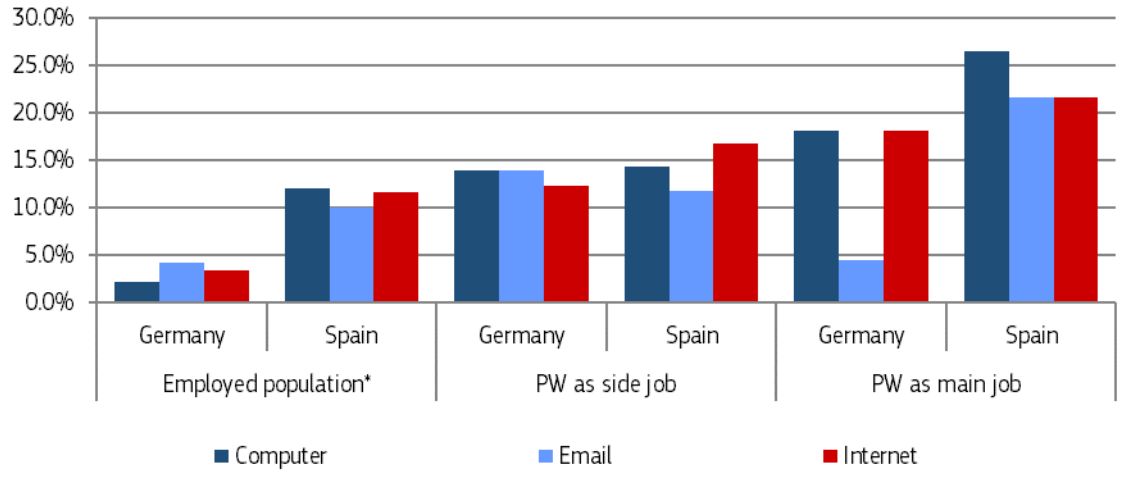
[24] Please note that the proportion differs from section 2 because the category 'employed population' excludes platform workers.

3.7.2 Digital Monitoring and Surveillance

To analyse the prevalence of digital monitoring and surveillance across platform work, we distinguish two broad categories (described more in detail in the previous chapter). The first one refers to activity monitoring (computer use, voice calls and emails, internet use); while the second one refers to physical monitoring (tracking entry and exit, whereabouts in the office, location outside the office and time spent working). Both types of monitoring can be used to (automatically) control, evaluate and discipline workers.

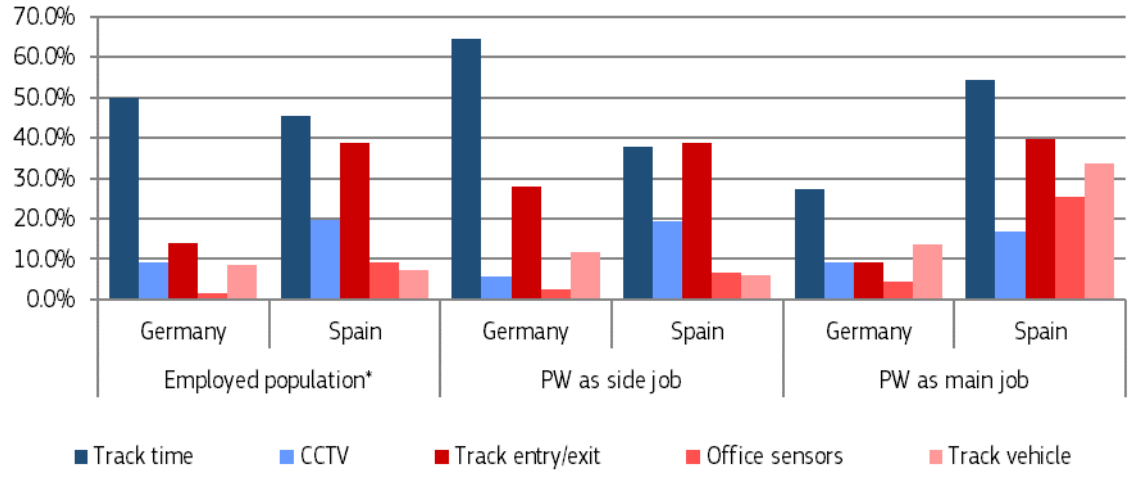
Estimates in Figure 25a and 8b show platform workers are significantly more likely to have their activity monitored than the rest of the employed population in both countries, but not always more likely to be physically monitored. The activity that is monitored more often is internet use, peaking at about 26.5% for the Spanish platform workers who do it as a main job. However, physical monitoring is more pervasive than simple activity monitoring, with between 37% and 64% of platform workers having at least their working time tracked, and more than a third having their entry and exit tracked (in Spain). In addition, more than half of Spanish platform workers who do it as main job claim to have their location tracked via digital devices in their vehicle.

Figure 25a: Activity monitoring: comparing platform workers with the employed population



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

Figure 25b: Physical monitoring: comparing platform workers with the employed population



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.7.3 Algorithmic Management

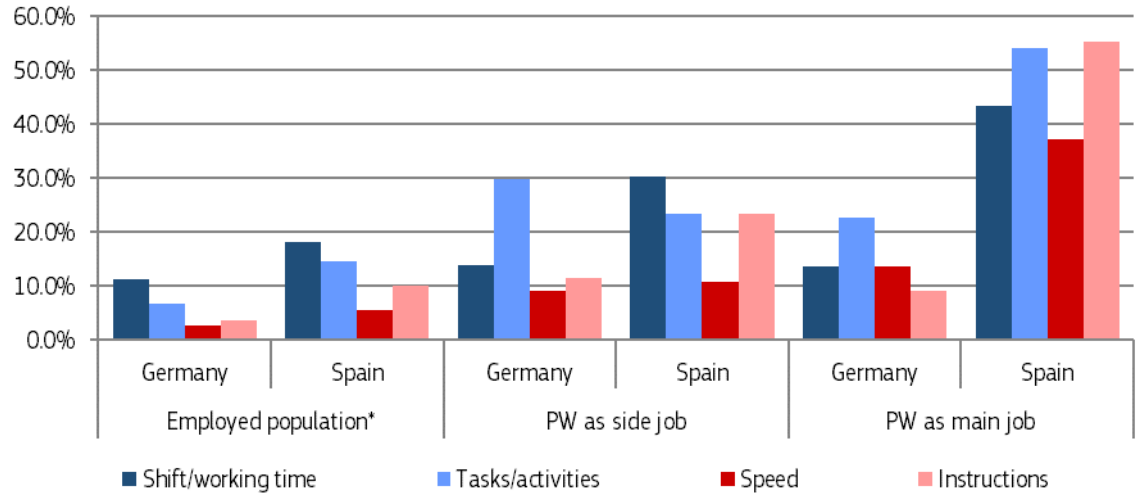
All the aforementioned monitoring actions produce data that can be collected and processed. In digital labour platforms, the collected data are then fed to the platforms' algorithms and used to automate several managerial functions, such as directing and organising, controlling, evaluating and disciplining. The automation of such functions is generally referred to as algorithmic management (which is more formally defined in the introduction and in the chapter on platformisation of regular work).

Our survey collects information on algorithmic management by asking workers whether the digital devices they work with (tablet, smartphone, computer or laptop) are used to automatically allocate shifts and tasks, provide instructions, determine the speed or rate of work, rank their performance on a leaderboard, and award points, prizes or badges for good performance. Finally, respondents are also asked whether their performance ratings are used as a way to allocate projects or tasks, or as a reason to cancel their shift/suspend their account.

Like in the previous section, we divide algorithmic management in two broad categories: the first category is *algorithmic direction* which includes the automatic allocation (or determination) of rosters, shifts or working times, tasks or activities, speed or rate of work and instructions. The second category refers to automated actions that fall into the category of *algorithmic evaluation* (and disciplining). Many of the activities carried out to automatically evaluate workers include aspects of **gamification**, as workers can be evaluated by the automated ranking of their performance on a leaderboard or through the awarding of points, badges, prizes, stars, or similar. Another evaluation activity – ratings – is performed by customers, but automatically aggregated by the organisation (or platform). Finally, respondents are asked whether they could suffer consequences should their rating drop below a certain level, for instance the automatic cancelling of their shift, job (or account) suspended etc.

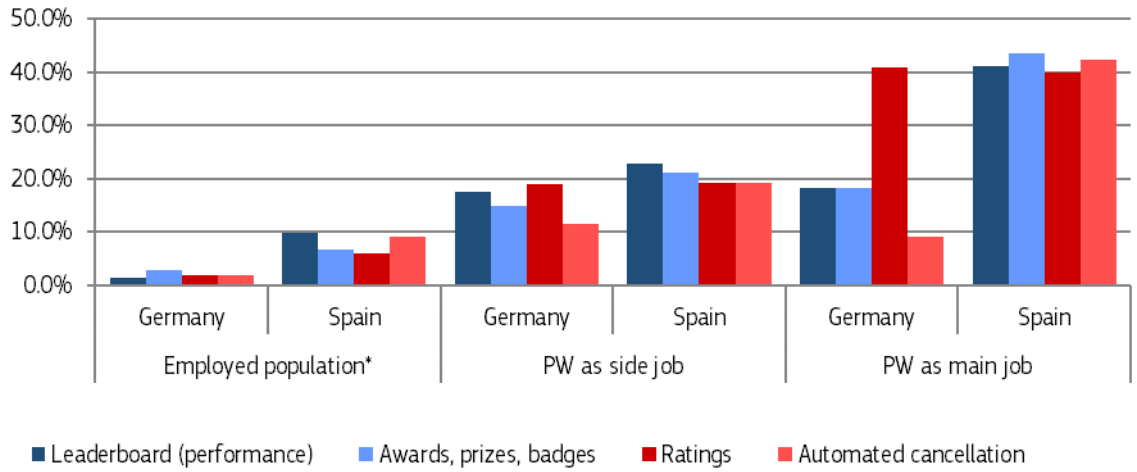
Estimates for the two broad groups are reported separately for the two categories in Figure 26a and b. Consistent with the literature and our priors, algorithmic management practices are significantly more widespread in digital labour platforms, but significantly more so in Spain than Germany, with 40/50% of the Spanish platform workers who do it as a main job being assigned their shifts, tasks and instructions automatically by a digital device. Similarly, algorithmic evaluation is more widespread in Spain and among main platform workers, with approximately four in ten having their performance ranked or awarded with points, stars, or badges, their activity rated by customers, and also suffering the consequences of poor ratings with cancelling or suspension. The proportion of German platform workers who are algorithmically evaluated is roughly half, and only a small fraction answered that they might be suspended or have their shift cancelled due to bad performance.

Figure 26a: Algorithmic direction: comparing platform workers with the employed population



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

Figure 26b: Algorithmic evaluation (gamification): comparing platform workers with the employed population



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.7.4 Algorithmic Management and digital monitoring by task

Finally, we can look at activity and physical monitoring as well as algorithmic direction and evaluation by task by using simple indicators equal to 1 if any of the items in its category is equal to 1 and zero otherwise. We use standardised measures of the four main composite indicators, with zero mean and standard deviation equal to 1, for ease of comparability. Results in Figure 27 show that both types of algorithmic management and of monitoring are more pervasive for platform workers who carry out on-location tasks; overall, algorithmic direction appears to be more pervasive in Spain than in Germany, whereas algorithmic evaluation is similarly distributed. The pervasiveness of activity monitoring depends more on the type of task: for professional online tasks, it is generally more widespread in Germany, while for non-professional online tasks seems to be more widespread in Spain. Similarly, physical monitoring in Spain is much less widespread among platform workers who carry out professional tasks, but fairly present for those who carry out non-professional or on-location tasks.

Figure 27: Algorithmic management and monitoring by task (platform workers who provided services in the past 12 months)

	Algorithmic direction		Algorithmic Evaluation		Activity monitoring		Physical monitoring	
Type of task (main or only)	**DE**	**ES**	**DE**	**ES**	**DE**	**ES**	**DE**	**ES**
Professional tasks								
Online software development	0.444	0.347	0.468	0.197	0.54	0.062	0.661	-0.085
Online creative and multimedia work	0.502	0.556	1.1	0.611	0.826	0.388	0.034	-0.113
Online writing and translation work	0.054	-0.172	0.216	0.246	0.154	0.305	0.059	-0.096
Online professional services	0.347	0.687	0.739	0.468	0.635	0.196	0.392	0.07
Interactive online lessons	0.193	0.11	0.378	-0.094	0.444	-0.056	0.273	-0.269
Non-professional (micro) tasks								
Online sales and marketing	0.502	1.132	1.461	1.605	1.017	1.056	0.989	0.435
Online clerical tasks	0.105	0.465	0.739	0.306	0.499	0.368	0.136	0.006
Online data entry task	0.131	0.965	0.955	0.793	0.368	0.54	-0.252	0.285
Online content moderation		0.965		1.28		1.4		0.392
On location tasks								
Taxi and people transportation services	0.502	0.838	-0.344	2.314	1.973	0.93	0.034	0.88
Food and other goods delivery services	0.965	1.428	1.28	1.59	-0.321	0.662	0.392	0.699
In-person services	0.552	-0.066	0.709	0.599	0.051	0.123	0.77	-0.266

Source: authors' elaborations based on the AMPWork survey. Data for platform workers include booster sample.

3.8 Platform workers' employment status and issues around misclassification

The correct classification of platform workers' employment status is more than an issue of nomenclature, since labour and social protection rights and benefits – including in the area of safety and health - depend on how this relationship is classified. In their terms of references, digital labour platforms often describe themselves as software or technology companies that provide a matching service (or in the words of the European Commission 'an information society' service) between clients and independent contractors. By classifying themselves as 'information society'/technology platforms, they may avoid some sector-specific regulation - since technological companies in Europe are regulated by the less strict e-Commerce Directive whose aim is to remove obstacles to cross-border online services in the EU[25]- and circumvent labour law.

In Europe alone, more than 100 court cases have examined the matter of employment status misclassification; the final decisions tend to vary by country (sometimes city) or court type. However, the most recent rulings often establish that platform workers are indeed employees (Eurofound 2021). Unfortunately, the classification is still not automatic. For instance, Glovo's latest terms of reference (available online) state that Glovo is a 'multi-category Technological Platform mediating the online contracting of "on demand" services'.[26] Glovo claims to act by merely matching local clients or businesses ("users") with third parties who voluntarily collect and deliver their products ("agents", or *mandatarios* in Spanish). The 2021 Spanish Riders' Law, published in the Official Bulletin on 12 May (Real Law Decree N. 9/2021, 11 May 2021), established a 'presumption of employment' in that the platform has to demonstrate that the riders are independent contractors and not employees. More specifically, the law establishes that riders delivering food or other goods for Glovo are employees of the platform if the activities of distribution (of any type of product or merchandise) are organised, directed and controlled, directly or indirectly, through the algorithmic management of the platform. In addition, to determine whether this sort of algorithmic organisation, direction and control take place, the Law established that algorithms must be transparent and available for scrutiny. Unsurprisingly, the Riders' law – like many other attempts to regulate the platform economy – has met with significant resistance from the platforms.

The new proposal for an EU directive on improving working conditions for platform workers follows similar lines, and establishes that platform workers are to be considered employees of the platform (presumption of employment) if at least two of the following five criteria are met (COM(2021)76, page 3, article 4, Legal presumption): the remuneration (or its upper limit) is determined by the platform; binding rules are in place with regards to appearance, conduct towards clients or performance of the work; electronic means are in place to supervise and assess performance; restrictions are in place on working time, freedom to turn the App off or to use a substitute; and exclusivity/non-competition is required.

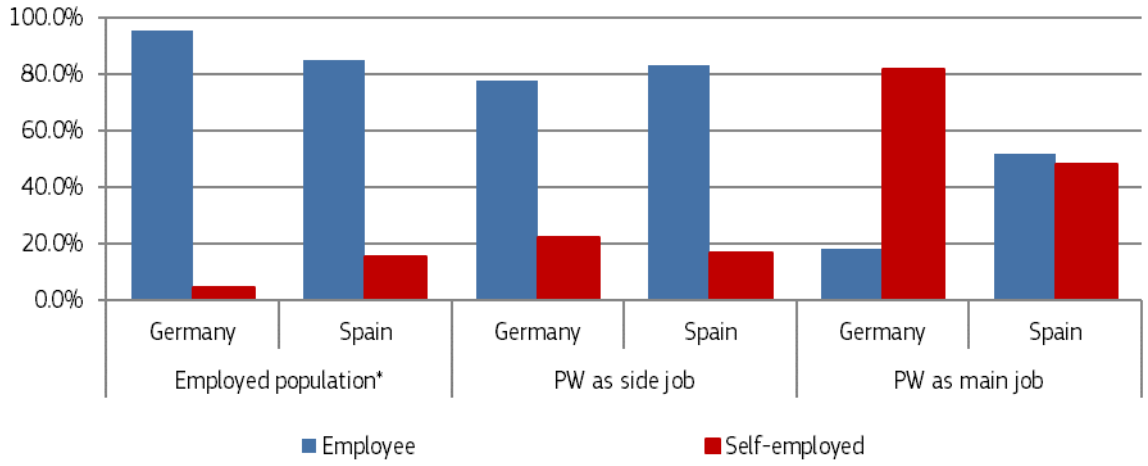
At the moment, there are no hard data on the misclassification of platform workers, and most of the surveys merely look at (self-declared) employment status. If we were to apply at least some of the criteria set out by the directive, how many platform workers would be reclassified as employees?

First of all, we can look at self-defined employment status in our survey. Previous studies based on the COLLEEM surveys highlighted how platform workers were more likely to classify themselves as self-employed than the general working population, even though a significant minority claimed to be employees. We compare the employed population with platform workers who do it as a main job, but also with those who do it as a side job for completeness, even though those who work on platforms as a secondary activity are likely to be referring to their other job.

Estimates in Figure 28 show that, indeed, the proportion of self-employed among platform workers is significantly higher, even though about half the workers who provide services via platforms as their main job still claim to be employees. Unfortunately, because the employment status is self-assessed and because the survey does not ask directly about the presence of a dependent employment contract with the platform, we cannot know the extent to which these workers simply perceive themselves as employees (for instance, because of their working conditions) or whether they actually have a contract stating that they are employees of the platform. The latter, however, seems somewhat unlikely because of what we have already mentioned, namely, that platforms make significant efforts to avoid being legally considered employers.

[25] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32000L0031&from=EN
[26] https://glovoapp.com/en/legal/terms/

Figure 28: Self assessed employment status: comparing platform workers with the employed population in Germany and Spain



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

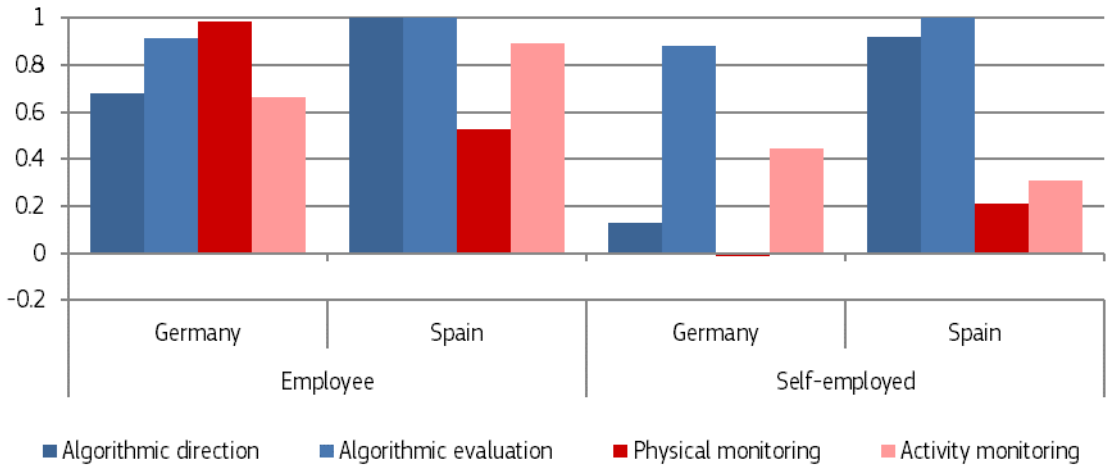
In any case, it is worth investigating whether the large proportion of platform workers that claim to be self-employed would be classified as such if we were to apply (approximately) the criteria set out in the directive.

We start inspecting the data by combining information on (self-assessed) employment status, with our indicators of algorithmic management and digital monitoring. To this end, we use standardised measures of the simple indicators for *soft* activity and physical monitoring, algorithmic direction and evaluation, which are equal to 1 if respondents answer 'yes' to at least one individual item in the broad categories of digital monitoring and algorithmic management, as described in the previous section([27]).

Estimates in Figure 29 show that both platform workers who claim to be employees and those who classify themselves as self-employed are very frequently subject to algorithmic management (direction and evaluation) as well as monitoring. However, there are large differences between the two countries. In Spain, both platform workers who claim to be employees and those who claim to be self-employed are subject to algorithmic direction and evaluation, whereas monitoring is less pervasive among the self-employed. In Germany, algorithmic direction and physical monitoring are significantly lower for platform workers who claim to be self-employed.

([27]) Activity monitoring includes tracking of computer use, voice calls and emails, internet use; physical monitoring includes: tracking entry and exit, whereabouts, location and time spent working; algorithmic direction includes automatic allocation of shift/working time; tasks/activities; instructions; and determination of speed; algorithmic evaluation includes: performance ranked on a leaderboard; awards, prizes, badges; ratings; and automatic cancellation..

Figure 29: Algorithmic direction and evaluation, activity and physical monitoring by employment status – all platform workers who provided services in the past 12 months



Source: authors' elaborations based on the AMPWork survey. Data for platform workers include booster sample.

The relatively high proportion of platform workers who claim to be self-employed but are under some form of algorithmic management and are monitored by the platform suggests that, in fact, they may be misclassified to some extent. In principle, the self-employed should enjoy a level of autonomy and independence that is incompatible with any form of automatic direction and evaluation, and above all with any form of digital monitoring, since monitoring can only be justified on the basis of an employment relationship. If this relationship does not exist, and the worker is an independent contractor or self-employed, then there is no justification for any monitoring (although the platform may claim to be monitoring its assets, as it may be the case when cameras and sensors are mounted inside company vehicles).

As a simple exercise, we can check the extent to which platform workers may be misclassifying themselves by combining elements of the indicator for soft/strong platformisation of regular work and information on employment status. We then isolate platform workers who claim to be self-employed and classify them into *(actual) self-employment* if they are not even under soft algorithmic direction/evaluation or activity/physical monitoring; by contrast, we consider them as (potentially) misclassified self-employed if they claim to be self-employed but are subject to at least one item in at least one category of digital monitoring and one item in at least one category of algorithmic management.

By applying this rule, we find that approximately 60% of the self-employed platform workers in Spain and 64% in Germany are under (soft or strong) algorithmic management and monitoring, which suggests that they could be considered misclassified by the law. The proportion goes up to 72.5% of the Spanish self-employed if we focus on those who do platform work as a main job.

We can double check whether these findings make sense by looking at other variables, for instance at whether the platform directly handles the payment. In this case we find that 76% of the self-employed in Spain and 48% of their German counterparts say that the platform or app processes their payment, which brings more evidence in support of a potential misclassification of their employment status.

3.9 An assessment of working conditions in platform work

To assess working conditions in platform work, we incorporate some elements from Eurofound's conceptual framework (Eurofound, 2021; Fernández-Macías, 2018) focusing on job quality and work organisation to guide the following descriptive analyses. Job quality includes objective features and characteristics (both positive and negative) of work and employment likely to have a link with health and well-being, and captured by indicators on the physical environment, work intensity, working time quality, the social environment, and so on. Work organisation refers to "how work is planned, organised and managed" and is about the division of labour, the coordination and control of work. It includes quality controls and standards; employee monitoring and control; task definition, content and allocation. [28]

3.9.1 Measures of job quality: work intensity and working time quality

Work intensity refers to the effort and strain associated with carrying out the work, whereas working time quality refers to how work is arranged. Decent working time is a core element of working life and of workers' health and safety. The EU's Working Time Directive requires all Member States to guarantee minimum standards on the organisation of working time for all workers throughout the EU; this includes standards on maximum weekly working hours (set at 48 hours), minimum rest periods and breaks, annual leave, night work and shift work.

Estimates in Table 12 summarise the number of total hours worked (including those worked on platforms), the hours worked only on platforms, and the hours spent simply looking for platform work. The table also differentiates between workers who work full time or part-time, to provide a more precise picture. On average platform workers put in more hours than the rest of the employed population, both when they are working part-time and full time, and especially so in Spain (see Table 12). When answering the question on the number of hours worked via platforms, a significant proportion of platform workers did not include the number of hours spent looking for work, updating their profiles or promoting themselves online (53% of the Spanish platform workers and 37% of their German counterparts). The number of extra hours worked amount to an additional 4.5 hours a month for German platform workers (more than 10 hours a month for those who do it as a main job, but the sample size is extremely small, so the estimates should be taken with caution) and 4.2 for the Spanish ones (6.6 hours for those who do it as a main job). This constitutes unpaid labour, which is however necessary in order to eventually get paid and is arguably exploited by the platforms.

Table 12: Hours worked on platforms and time spent searching for work, in Germany and Spain

	Total hours worked			
	Part time	**Full time**	**Hours worked on platforms**	**Time looking for platform work**
Platform work as side job				
Germany	23.2	39.3	7.1	4.5
Spain	20.1	38.6	9.3	4.2
Platform work as main job				
Germany	23.8	44.7	28.1	12.3
Spain	26.8	41.8	33.8	6.6
Employed population				
Germany	20.4	40.1	-	-
Spain	23.8	40.5	-	-

**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

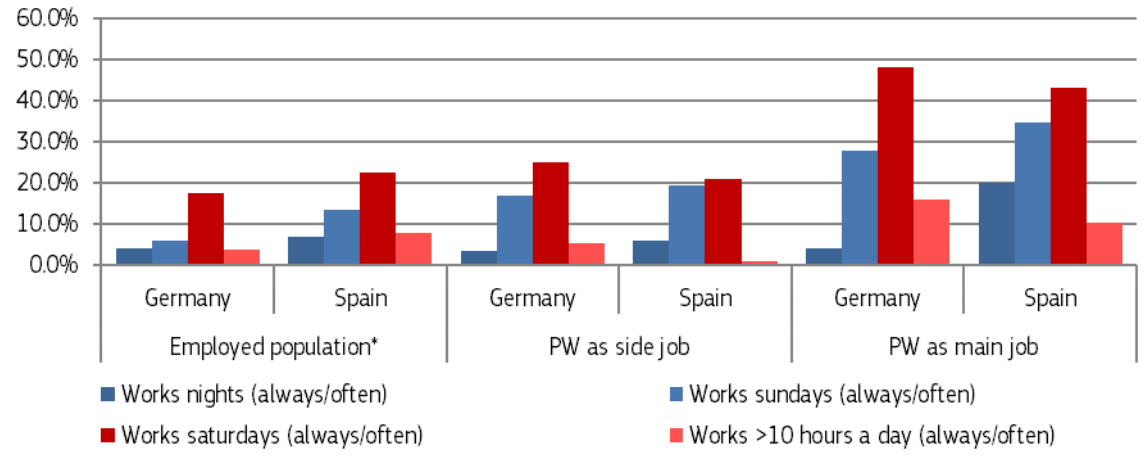
If we look at working time arrangements (Figure 30a and b), we see that platform workers are also more likely to work long and unsociable hours and have unpredictable work schedules. In particular, platform workers are more likely to answer that they work night shifts, during weekends, and for longer hours. Once

[28] https://www.eurofound.europa.eu/topic/work-organisation.

again, working time quality appears worse in Spain than in Germany and especially for those who work via platforms as their main job, with at least one in five working nights, more than a third working over the weekend, and about one in ten working for more than 10 hours a day.

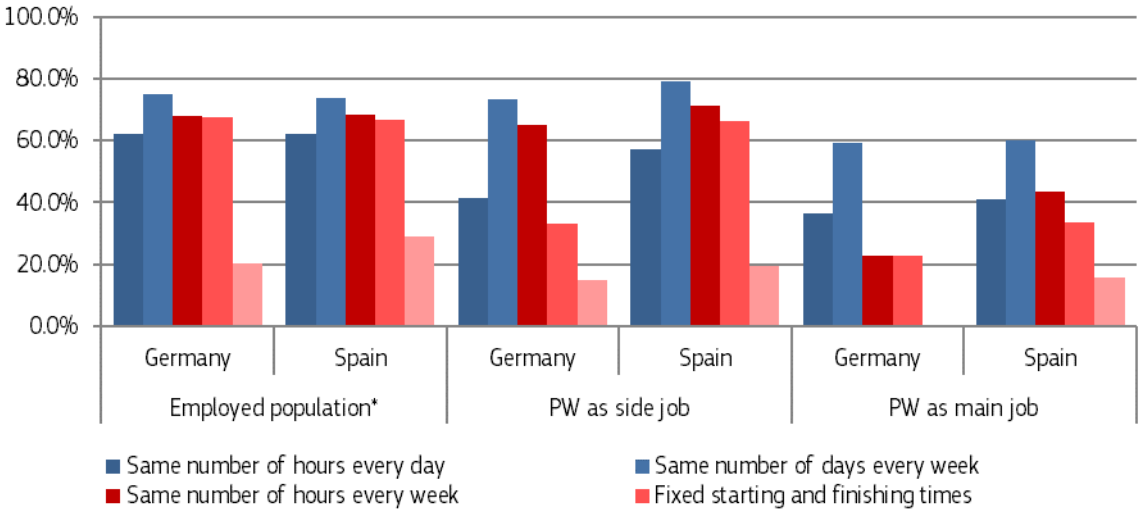
Platform workers are also less likely have predictable work schedules, in that they more rarely work the same number of hours every day, the same number of days every week, and the same number of hours every week, have fixed starting and finishing times or work shifts. In this latter case, however, differences with the general working population are small

Figure 30a: Working time arrangements: working long and unsociable hours



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

Figure 31b: Working time arrangements: (un)predictable work schedule



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.9.2 Social environment and social support

Social environment refers to the interpersonal relationships a worker may have with their organisation, clients and other workers. Given that platform workers are in many cases classified as independent contractors, they generally do not share an office or a common space as such, and are managed by algorithms, they may lack of contact with peers (even though they generally tend to interact via fora) or lack of support from their supervisor, all factors which may lead to social and professional isolation (Wang, Li and Coutts 2022,

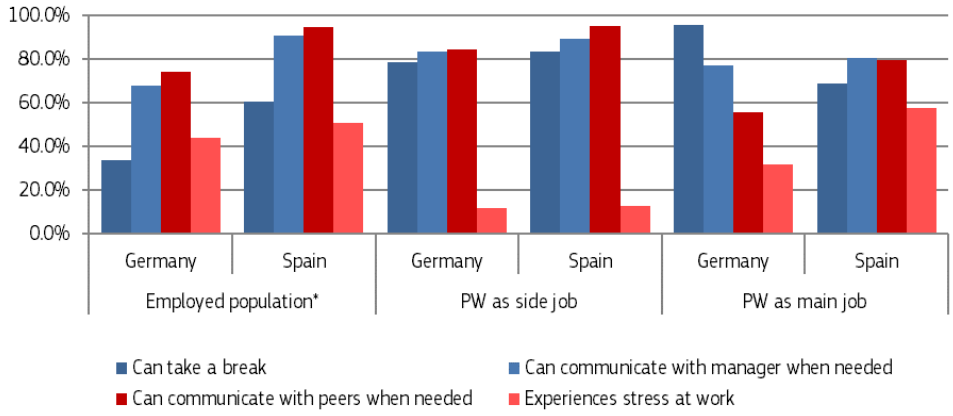
Bérastégui 2021). At the same time, a recent study of food delivery riders in the UK and Italy showed that the existence of a 'shared condition'- in this case grievances resulting from a unilateral change of contractual agreements with the introduction of piecework payment systems – is sufficient for workers to meet, communicate and organise some form of collective action, or what the authors call 'proto-strikes' (Tassinari and Maccarrone 2020).

To assess the social environment of platform workers, we examine whether they can take a break when needed, interact and communicate with their manager when needed; interact and communicate with peers when needed; and whether they experience stress at work.

Estimates in Figure 32 seem to suggest that, even though a lower proportion of platform workers agree or strongly agree that they are able to communicate with their manager or peers compared with the employed population, the values are still fairly high. This seems to suggest that, to a certain extent, platform work does not preclude communication with managers or peers. On the positive side, platform workers are better able to take a break when needed than the rest of the employed population; in addition, the majority of platform workers feel that they are able to communicate with their manager or peers when needed, more so in Spain than in Germany. On the negative side, they are also more likely to experience stress at work (only in Spain).

That platform workers are able to take breaks more often that the employed population should not be surprising, given that this is one of the main purported benefits of being an independent contractor. By contrast, even though ease of communication among platform workers is lower than in the working population, the difference between groups is quite small, and still eight out of 10 main platform workers agree or strongly agree that they can communicate with peers or managers. This finding may depend on the existence of fora for workers, as well also informal groups on social media and messaging apps, not to mention the physical spaces (for instance squares, dedicated street corners, or by pick-up places) where riders or drivers tend to meet in between jobs (Galière 2020). It is also possible that platforms provide a direct communication channel between workers and managers that can be easily accessed. For example, the Spanish platform Glovo offers a 'specialised treatment policy' to promote work-life balance, an app (IFeel) to track daily emotions and routines and provide advice and guidance, as well as 'employee resource groups' (communities on separate Slack channels which organise events and promote inclusion) ([29]). The difference between Spain and Germany could also be explained by the types of tasks that are more frequently carried out in each country (on-location as opposed to online), since according to the literature and as evident by the number of court cases, it is mainly on-location workers who meet, communicate and pursue a common action. However, we cannot exclude the role of cultural differences, given that even among the general working population, a lower proportion of Germans feel that they are able to communicate with their manager or peers when needed.

Figure 32: Social environment in Germany and Spain, comparing platform workers with the general employed population (proportion that strongly agrees or tends to agree with the statement)



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

([29]) https://jobs.glovoapp.com/well-feeling-at-glovo/ .

3.9.3 Physical environment: where platform workers work

The location in which workers carry out their activity is important from a health and safety perspective because it may be related to the presence of physical risks (Broughton 2007). For instance, if workers carry out their activity in public spaces, they may be more likely to be subjected to loud noises or extreme temperatures. Similarly, if they work in a car or other vehicle, they are subject to a number of risks, ranging from bad ergonomics to the risk of accidents. By contrast, those working from home are in charge of making their workspace ergonomically fit – and they may not have the knowledge, time or resources to do so – and in addition they are in charge of utility bills which would generally be paid for by the employer.

The information we have on the physical environment is how often respondents work in one of the following locations: employer's/ own business' premises (office, factory, shop, school, etc.; clients' premises; a car or another vehicle; an outside site (e.g. construction site, agricultural field, streets of a city); own home (before the outbreak of the Covid-19); and public spaces such as coffee shops, airports etc.

Estimates in Table 13 show that while the most common work location among the employed population is the employers' or own business premises, platform workers are more likely to work from home (even before Covid 19), from their vehicle (especially in Spain) or in a site outside (only in Spain). It should always be emphasised that the large differences among Spanish and German main platform workers may be due to sample size.

Table 13: Respondents usually work in each location [during the last 12 months in your main paid job always or often

	Employed Population*		PW as side job		PW as main job	
	Germany	**Spain**	**Germany**	**Spain**	**Germany**	**Spain**
Your employer's/your own business' premises (office, factory, shop, school, etc.)	74%	70%	62%	75%	55%	38%
Clients' premises	16%	16%	9%	16%	18%	19%
A car or another vehicle	9%	8%	6%	3%	5%	31%
An outside site (e.g. construction site, agricultural field, streets of a city)	10%	11%	12%	4%	5%	7%
Your own home (before the outbreak of the Covid-19)	3%	8%	41%	20%	50%	19%
Public spaces such as coffee shops, airports etc.	2%	5%	3%	3%	0%	6%

**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.9.4 Work organisation methods: autonomy and routine

Autonomy and control at work are intrinsically related to workers' wellbeing. Autonomy involves the freedom of workers to choose their working time, the order in which they do things, the methods or ways in which they do their work, the speed or rate of work and so on; in platform work, it also involves decision on how to organise and perform their tasks. More autonomy is typically associated with more satisfaction with working conditions. One of the first theoretical models studying the relationship between workers' health and their level of autonomy at work is Karasek's (1979) job strain model, subsequently developed as the Job-Demand-Control model. According to the model, the negative impact of high workload and time pressure can be mitigated by higher autonomy and control over how the work is done. A combination of high job demands and lower autonomy are likely to lead to higher stress.

One of the purported benefits of platform work is, or should be, that workers enjoy a greater level of autonomy, both in terms of (more) latitude (ability to decide working time, task order, methods and speed) and in terms of (less) control (by boss or clients and through monitoring). We have already seen in the previous section how platform workers are, in fact, subject to more intense digital monitoring than the general population (Figure 25a and b). Similarly, the workings of algorithmic management with the automatic allocation of tasks and shifts can be a great limitation to autonomy in sense of latitude, even though platform workers are theoretically able to accept or reject a task. To ascertain the extent to which this is the case, we asked platform workers a number of questions about their autonomy with respect to the allocation of tasks. Estimates in Table 7 show that German platform workers enjoy a much higher level of autonomy compared

to their Spanish counterparts, since about half of them can decide which tasks, jobs or projects to accept, versus only a quarter of the (main) platform workers in Spain. However, German platform workers are also more likely to be picked by the client, directly or through the platform.

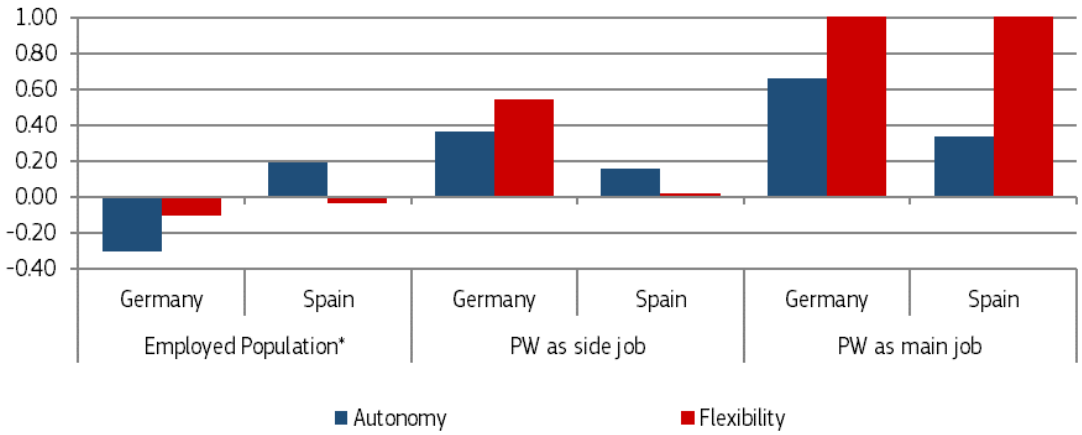
Table 14: Autonomy (latitude) and task allocation

	PW as side job		Main PW as main job	
	Germany	**Spain**	**Germany**	**Spain**
When logged in/available for work, I am automatically assigned to a task, job or project by the platform	4.7%	12.1%	-	47.9%
When logged in/available for work, I can decide which tasks, jobs or projects to accept	52.7%	36.8%	60.0%	21.9%
The client chooses who gets to do the task, job or project after I have posted my details online	28.4%	24.2%	20.0%	10.4%
I find the tasks, jobs or projects outside of the digital platform. The platform is only used to book specific time slots or appointments	0.7%	1.6%	4.0%	0.0%
The client directly contacts me or my business (e.g. shop) by phone, email or the web about a task, job or project outside of the digital platform. The platform is only used to book specific time slots (e.g. click and collect) or appointments (e.g. medical hair appointments).	13.5%	23.6%	16.0%	17.7%
Other	-	0.5%	-	1.0%
DK/no opinion/refusal	-	1.1%	-	1.0%
Number of obs	*148*	*182*	*25*	*96*

Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.
Source: authors' elaborations based on the AMPWork survey (including booster sample).

Even though not all platform workers are free to choose the task, job or project they want to work on, estimates in Figure 33 show that they still enjoy a relatively higher level of autonomy and flexibility, as measured by two different indicators. The first one, *autonomy*, combines information of whether workers can choose the order in which the do things, the methods of work, and the speed of work (values range from 0 if no autonomy to 1 full autonomy). The second indicator, *flexibility*, combines information on who sets the working time arrangements, and it's equal to 0 if they are set entirely by the company with no possibility of change to 1 is they are entirely determined by the worker. Both indicators are then standardised by subtracting the overall (for the full AMPWork sample) mean and dividing the values for the standard deviation for ease of comparability. The only category of platform workers which enjoys relatively less autonomy and flexibility consists of those who carry out services via platforms as a side job in Spain.

Figure 33: Autonomy and flexibility

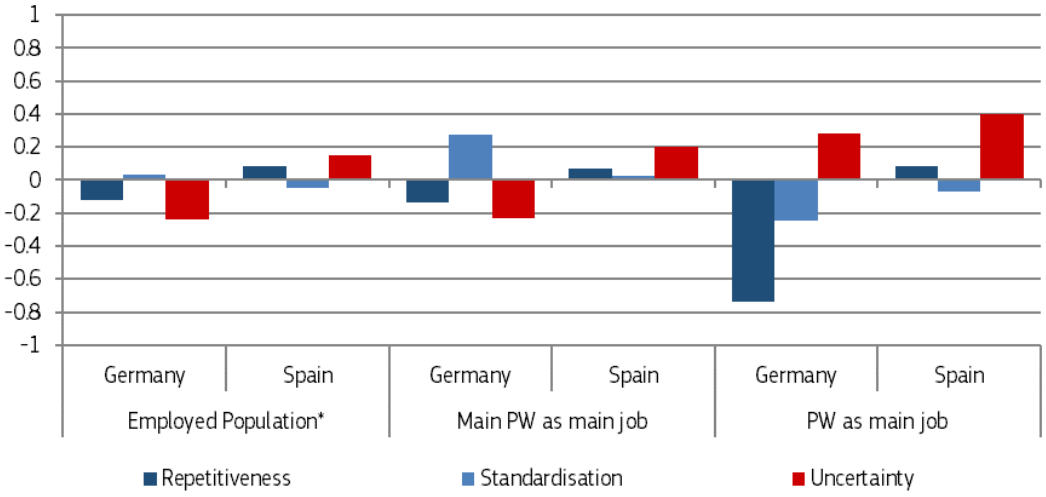


**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

To ascertain how routinized platform work is, we combine information from six binary indicators to generate the three standardised measures of routine (according to the task framework CITE): *repetitiveness*, or the extent to which the worker has to repeat the same procedures (measures: job involves monotonous activities and job does not involve complex activities); s*tandardisation*, which is the extent to which work procedures and outputs are predefined and encoded in a formalised system (measures: job involves complying with very detailed procedures and does not involve assessing the quality of own work); and *uncertainty* (in reverse) extent to which the worker needs to respond to unforeseen situations (measures: job involves solving unforeseen problem and learning new things).

Estimates in Figure 34 show that platform work differs substantially in terms of routine from traditional/regular work overall, but also across the two countries. For instance, repetitiveness is lower for German platform workers, but slightly higher for the Spanish ones relative to the employed population. whereas uncertainty follows more or less the opposite trend. The level of standardisation is somewhat similar across the different categories, except for Germans who do platform work on the side.

Figure 34: Routine: repetitiveness, standardisation and uncertainty



**The category 'employed population' excludes all platform workers. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative.*
Source: authors' elaborations based on the AMPWork survey. Data for the employed population are weighted. Data for platform workers include booster sample.

3.9.5 How do working conditions vary by task?

In this final subsection, we compare working conditions by task by using a standardised version of most of the indicators summarised in sections 3.9.1 to 3.9.4. In particular, we have the four measures of working time quality (working nights, weekends or overtime); the four indicators for social environment (whether the worker can take a break when needed, can communicate with manager or peer, or whether they feel stressed at work); the indicators for work location (employers' premises, clients' premises, car or vehicle, outside or from home before Covid 19); and finally the raw indicators for routine (job involves following detailed procedures, worker can assess their own work, job involves monotonous activities, job involves complex activities, job requires problem solving and job involves learning new things) and autonomy (whether the workers can choose the speed, methods or order of work).

The values of the working conditions indicators appear fairly similar for online professional and non-professional tasks (with some notable exceptions) but rather different for on-location platform work. In particular, platform workers who carry out on location tasks are more likely to work night, on week-ends and overtime, they are less likely to be able to communicate with their manager or peers, and more likely to work on client's premises or from their vehicle. They also enjoy less learning on the job and have to perform relatively less complex tasks. It should also be noted that if we differentiate on-location tasks into transportation, delivery and in-person, we find different measures of stress, with platform workers providing the first two types of tasks suffering significantly more than those providing in-person services.

Unsurprisingly, platform workers who provide online professional tasks enjoy greater autonomy and less routine than the rest.

Table 15: Comparing working conditions by task group (all platform workers who provided services in the past 12 months)

	Main task		
	Online professional	**Online non professional**	**On location**
Work nights	-0.07	-0.13	0.40
Works sundays	0.21	0.13	0.76
Works saturdays	0.07	-0.05	0.59
Overtime	-0.04	-0.14	0.09
Takes breaks	0.79	0.61	0.20
Comm with manager	0.08	0.26	-0.05
Comm with peers	0.15	0.07	-0.07
Stress	-0.51	-0.48	-0.32
Employer's premises	-0.20	-0.06	-0.47
Client's premises	-0.09	-0.14	0.16
Works in vehicle	-0.22	-0.17	0.75
Works outside	-0.13	-0.07	0.02
Works from home	1.10	0.48	0.19
Detailed procedures	0.37	0.35	0.26
Assess quality	0.28	0.10	0.21
Solve problems	0.15	-0.04	0.31
Job monotonous	-0.15	0.32	0.41
Job complex	0.46	0.08	-0.01
Learning at work	0.11	0.09	-0.19
Choose speed	0.40	0.09	0.28
Choose methods	0.41	-0.13	0.07
Choose order	0.52	0.01	0.23

**Estimates for the first four categories exclude all platform workers and are weighted. Please note that the sample of main platform workers for Germany is extremely small, and estimates should be considered purely indicative. Data include booster sample.*

3.10 Platform workers vs. "platformised" regular workers: comparing working conditions

This last section compares the typical working conditions of platform workers with the rest of the working population grouped into four categories of workers, based on use of digital tools and the presence of algorithmic management and digital monitoring. The first category includes all those who do not use any digital tools at work and therefore are neither subject to algorithmic management, nor digital monitoring; the second category, includes all those who use digital tools, but not platformised; the third category, includes all those who use digital tools and are under mild forms of platformisation (specifically they have to be simultaneously under at least one form of digital monitoring and one form of algorithmic management); the final category, includes those workers that use digital tools, and are under strong forms of both digital monitoring, and algorithmic management (specifically, they have to be simultaneously under at least one form of activity monitoring, one form of physical monitoring, one form of automated direction and one form of automated evaluation).

To measure working conditions, we use the same indicators summarised in section 3.9.5 - working time quality; social environment; work location; routine and autonomy – however, to keep estimates consistent with section 2.4., we normalise the indicators with respect to the working population.

Estimates Figure 35 suggest that platform workers are indeed similar to what we call the 'platformised' workers, and in particular to the strongly platformised. Platform workers fare worse than soft or strong

platformised workers in terms of working time quality, since they are more likely to work overtime or over the weekend; by contrast, platformised workers appear to suffer from worse mental health, as measured by reported stress, than all other categories, including platform workers. In terms of work location, there are a few snall differences in values, but generally platform workers follow the same pattern as platformised workers.

Finally, in terms of work organisation, and specifically task content, we find that platform workers and platformised workers share similar levels of standardisation and routine; however, platform workers enjoy relatively more autonomy, especially in terms of being free to choose the methods of work or order in which they do things.

Figure 35: Comparing working conditions between platform workers and regular 'platformised' workers

	No digital tools	Digital tools, not platformised	Soft platformised	Strong platformised	PW side job	PW main job
Work nights	0.01	-0.07	0.11	0.03	-0.04	0.46
Works sundays	0.09	-0.09	-0.03	-0.06	0.26	0.75
Works saturdays	0.14	-0.11	-0.06	-0.19	0.05	0.58
Overtime	0.02	-0.01	-0.03	-0.03	-0.13	0.23
Takes breaks	-0.17	0.08	0.06	0.10	0.78	0.64
Comm with manager	-0.21	0.08	0.23	0.19	0.04	-0.05
Comm with peers	-0.23	0.12	0.19	0.01	0.23	-0.08
Stress	-0.16	0.09	0.05	0.38	-1.04	-0.02
Employer's premises	-0.16	0.19	0.03	-0.10	-0.06	-0.66
Client's premises	0.19	-0.13	-0.14	-0.03	-0.10	0.08
Works in vehicle	-0.04	-0.11	0.10	0.19	-0.15	0.60
Works outside	0.12	-0.16	-0.16	-0.01	-0.10	-0.14
Works from home	-0.23	0.13	0.18	0.40	0.99	0.79
Detailed procedures	-0.21	0.03	0.33	0.37	0.34	0.37
Assess quality	-0.19	0.08	0.09	0.32	0.12	0.44
Solve problems	-0.24	0.10	0.15	0.24	0.10	0.33
Job monotonous	0.21	-0.16	0.13	0.61	0.16	0.32
Job complex	-0.34	0.18	0.19	0.47	0.18	0.40
Learning at work	-0.34	0.18	0.25	0.35	-0.08	0.30
Choose speed	-0.15	0.06	0.09	0.04	0.23	0.43
Choose methods	-0.14	0.15	0.03	-0.06	0.19	0.20
Choose order	-0.19	0.14	0.13	-0.09	0.33	0.36

Source: authors' elaborations based on the AMPWork survey. Data for platform workers include booster sample. Please note that estimates for the first four categories may differ from those in section 2.4.4 because they only include the general population and exclude platform workers. Also note that estimates for platform workers may differ from those in section 3.9.4 because they are normalised with respect to the mean in the working population for the sake of comparison.

3.11 Conclusions

The past few years have seen a proliferation of studies, court rulings and policy initiatives to understand, regulate and possibly improve work on digital labour platforms. The JRC's COLLEEM surveys were among the first attempts to study the phenomenon systematically, provide a robust conceptual structure on how to measure platform work and study its working conditions. Because of the type of data used, previous studies may have overestimated the prevalence of platform work (especially for the category of platform work as a side job). The AMPWork survey, which is statistically representative following a more robust methodology, including face to face interviews, revealed a smaller, albeit not negligible (around 1-2% of the working age population), presence of platform workers in two European Member states, Spain and Germany. It also showed that more than half of the people who engage in platform work do so for a considerable amount of hours and earn a significant share of their income, so that platform work can be considered their main job. This confirms the importance of regulatory attempts, since even a prevalence rate of 1-2% means that platform work is the main source of income for millions of people across Europe.

A clear finding from this survey is that there are considerable differences between the two countries surveyed - Spain and Germany - mainly in terms of prevalence and working conditions, with Spanish platform workers

often faring worse, except for a few indicators, such as those related to social support. There are, however, also some similarities, for instance in terms of the most widespread type of tasks and platforms.

In terms of tasks, this chapter has shown that platform workers are becoming more specialised, in that around half of them tend to provide one type of service, especially if platform work is their main job, and to use only one platform. Professional tasks, such as computer programming, creative and multimedia tasks, writing and translation, are the most widespread, both in Spain and in Germany, whereas on-location tasks are particularly prevalent in Spain. The main platforms used to carry out online (professional and non-professional) services are fairly consistent across countries, with respondents frequently mentioning Freelancer, Clickworker, Upwork, and Fiverr in both countries. However, the German market appears more concentrated, with approximately half of the respondents mentioning one of the top five platforms, while in Spain a larger proportion of respondents mention unique entries and only one in five (22.6%) mention one of the top five platforms. It should also be mentioned that while the main platforms used for online services tend to be international - Freelancer is Australian, Fiverr Israeli, and Clickworker is based in the US and Germany - the main platforms used to carry out on-location services tend to reflect more local or at least European realities: Glovo is Spanish and headquartered in Barcelona; MyHammer is German and headquartered in Berlin; Lieferando is Dutch and TopNanny French.

As expected, digital monitoring and algorithmic management are widespread among platform workers, even though there appear to be considerable differences by country, with levels of algorithmic direction and evaluation, as well as monitoring of work activities, such as tracking computer and internet use, always higher in Spain. To be noted that while activity monitoring is generally more pervasive among platform workers, physical monitoring is not.

This chapter also looked at a number of indicators for working conditions in platform work, related to work intensity and working time quality, social support, work location and work organisation, and found that platform workers tend to work for longer and more often at unsociable hours; they are also more likely to have unpredictable work schedules and suffer more stress. On the positive side, it does not appear as though platform workers struggle to communicate with their peers of managers, even though this is more common in Spain and may be due to the sample composition as well as to social and cultural factors.

In terms of work organisation, platform workers enjoy more autonomy and flexibility, but also higher levels of standardization.

Finally, this chapter compared platform workers with workers in the regular economy who can be considered platformised – that is, who use digital tools and are under some forms of algorithmic management or digital monitoring – and found similarities across several indicators of working conditions, but especially work organisation. A striking finding is that strongly platformised workers appear to suffer from some of the downfalls of platform work, for instance high stress, without enjoying the same levels of autonomy.

This suggests that the policy debate on platform work should be extended to include platformised workers in the regular economy.

4 Unpaid Production of Digital Content for Online Platforms

One of the most conspicuous manifestations of the digital economy is the user-generated content platform. In this category, we can include many popular online services that provide (and manage) digital spaces for the decentralised exchange of all kinds of content between users, generally for free (though supported by ads). This includes social networks such as Facebook or Twitter, media sharing platforms such as Instagram or YouTube, blogging platforms such as WordPress, online fora such as Reddit, review aggregators such as TripAdvisor, collaborative community projects such as Wikipedia or open-source software development platforms like GitHub. These platforms for sharing user-generated content, which hardly existed 20 years ago, now dominate a big share of the cultural production and consumption across most of the world, and significantly shape leisure patterns and even social interaction in broad terms. Their importance cannot be overstated.

At the highest level of generality, platforms are digital networks that coordinate informational exchanges in an algorithmic way. There are two key elements in this definition. First, platforms provide a structured digital "space" where informational exchanges can take place. It is a peculiar "space", because it is owned and controlled by the platform, which typically collects, organises and stores large amounts of data about the users and their interactions for its own purposes, as well as the content they share. Secondly, platforms always incorporate a set of codified rules that are automatically implemented, and which govern the informational exchanges taking place within them. The algorithms governing the platforms are often invisible to its participants, but they are always present and crucial for their functioning.

The digital platform is the dominant form of coordination of any kind of interaction that takes place on the internet. The internet itself can be considered as a *platform of platforms* (being a digital space where informational exchanges take place, governed by a set of protocols and algorithms), and most internet services and apps are platforms as well. In other sections of this report, we have dealt with the increasing use of platforms and algorithmic management systems for the internal coordination of work across all types of companies (chapter 2) and with the specific phenomenon of platforms mediating the provision of paid labour services (digital labour platforms, chapter 3). In this final section, we will deal with a different type of platforms, those that mediate user-generated content.

The general definition of platform also applies in this case: content-sharing platforms are digital networks that coordinate the exchange of user-generated content in an algorithmic way. As all platforms, they provide a virtual space where the exchanges take place, and a set of algorithms that govern those exchanges. What is peculiar about these platforms is that they mediate specifically the exchange of user-generated content, which can be any type of digitally-encoded information (text, image, video, audio). In most cases, these platforms are free for users (both for the providers and the consumers of content in the platform), although in some cases there can be small fees (for instance, for premium features or no advertisements). In most cases, these platforms generate revenue via advertisements which appear alongside the user-generated content, or via the monetisation (sale) of personal information obtained from users´ interactions.

The business model of these platforms depends crucially on the content generated by users. This content is used to attract other users and keep them actively engaged for as much time as possible, which generates revenue via advertisements in the platform or via the commercialisation of information about users. Increasingly, this information can also be used to feed machine-learning systems which can generate new value out of it, for instance by automating some tasks like mage or speech recognition, product recommendations, language translation, design, etc.

In other words, *the main source of value for these platforms is the content generated by the users*. The creation of this content requires time and effort, and thus it can be considered as a form of work. But despite creating economic value – for the platforms and society at large – and despite obviously involving time and effort, this work is in most cases unremunerated. What motivates users to create and share this content for free seems to be in most cases the intrinsic value this sharing activity has for them (in terms of communication or social interaction), although there are other possible motivations such as social recognition, the possibility of promoting one´s work or gaining experience, or even the chance of generating future income related to popularity within the platform, for instance via advertisements.

The time and effort spent producing content for sharing platforms is not paid labour, and thus it is not measured in any economic survey that we know of (nor regulated or taxed as such). And yet it can be considered as work in a material sense – human effort done to achieve a purpose – and it certainly produces economic value. Even though we do not know much about the amount of time spent in this type of activity, we can be sure that it has increased exponentially in recent years, and it seems most likely that it will

continue to increase in the near future. In this chapter, we will provide an initial and exploratory estimation of the magnitude and nature of this phenomenon.

We will approximate this phenomenon as yet another manifestation of the broader trend of platformisation of work, which is the focus of this report and the underlying survey. There are important similarities and continuities between this type of activity and platform work (understood as paid labour services mediated by digital labour platforms, see chapter 3 for more details). For instance, in activities such as software development, creative work or online writing, the nature of the work performed can be almost identical in digital labour platforms and content sharing platforms, the main difference being that there is no remuneration in the latter case. In fact, in some cases the difference can become quite blurred and equivocal. Some of the work provided to digital labour platforms is not directly remunerated: for instance, in some software development labour platforms, some of the labour is provided for free as part of a contest in which only the winner will get paid. This is similar to YouTubers sharing content for free with the expectation of generating revenue after gaining enough popularity. Conversely, some of the providers of content sharing platforms can get some monetary compensation for the content they share, via advertisements that appear alongside their content and that are managed by the platforms: in this case, we can say that the labour services they provide, embedded in their content, are in fact remunerated and coordinated by the platforms, even if indirectly in the form of advertisements.

4.1 Incidence, types, and distribution of content sharing in online platforms

For an initial approximation to the measurement of work spent producing content for content sharing platforms, we asked respondents of the AMPWork survey whether they had produced the following types of content for sharing in online platforms over the last twelve months: written posts for social networks aimed at people outside family and close friends; produced photos, videos or audios to be shared online with people outside family and close friends; written blogs; participated in online forums; written public customer reviews online; written for collaborative online projects like Wikipedia; or participated in voluntary online development projects. It is important to note two qualifications in the question: that the content had to be shared in the last 12 months, and that it had to be shared outside family and close friends. This latter qualification is important because we did not want our primary measure to include strictly private communications (such as the sharing of pictures with family), focusing instead on the production of content aimed for people outside the private sphere. Table 16 below shows the distribution of the working age population in Germany and Spain that produced content to be shared online in those categories, by sex, age and activity/employment status.

Table 16 percentage of the working age population that has shared content in different types of online platforms over the last 12 months

	Social networks	Media sharing	Reviews	Forums	Blogs	Wikis	Volunteer
Germany	17.48	12.69	3.26	2.08	1.4	0.46	0.24
Spain	34.65	23.81	18.62	10.2	7.39	5.96	4

Table 16 shows that the production and sharing of online content outside family and friends is quite frequent in both countries, but especially in Spain. The most frequently shared content is posts in social networks and media in sharing apps, followed by online reviews and participation in online forums. In Spain, one third of the working age population has written posts for social networks outside family and friends over the last 12 months, and one fourth has produced media to be shared online. The same activities are half as frequent in Germany. In Spain, writing public consumer reviews is also quite common (almost 20% of the working age population has done it over the last 12 months), whereas in Germany it is relatively rare (around 3%). Although less frequent, in Spain other sharing activities are also significant: 10% of Spaniards have participated in online forums, more than 7% have written blogs or similar, 6% have produced content for Wikipedia-type websites and 4% in other collaborative development projects online. The same activities are very marginal in Germany.

It is important to note that the categories of table 16 are not mutually exclusive: many people, especially in Spain, responded positively to more than one category of online sharing activity. Inspecting the most frequent combinations of categories, we have created a new classification which is shown in Table 17. The first category in this classification includes those that have not produced any content for a sharing platform in the last 12 months, which applies to 79% of the working age population in Germany and to 55% of the working

age population in Spain. This confirms that the production and sharing of content outside family and friends via online platforms is much more common (around twice as common) in Spain than in Germany. The reasons for this striking difference are to be explored, but cultural differences in sociability practices as well as different attitudes towards sharing private information online between the two countries are likely to be behind these results.

Among those who share content and media, we have first differentiated those that only use social networks, a category that applies to roughly 7% and 10% of the population in Germany and Spain, respectively. A second (and more frequent) category includes those who have produced content mostly for sharing in media webs/apps, which applies to 9% and 10% of the population in Germany and Spain. It is interesting to note that these two categories of sharing (social networks only and mostly media) have a similar prevalence in Germany and Spain: where we see bigger differences between both countries is in the other categories, much more frequent in Spain: those who have mostly shared online reviews are around 9% in Spain and less than 2% in Germany, those who have shared across many different types of platforms simultaneously are 8% in Spain and less than 1% in Germany, and finally those who have shared in platforms other than social networks, media or reviews but not simultaneously (only in one type) are around 8% in Spain and 2% in Germany.

Table 17 distribution of sharing across different platforms by population and employment categories

Germany

	Female			Male			Activity and employment status							
	15-29	30-44	45-64	15-29	30-44	45-64	Self empl.	FT empl.	PT empl.	Unemployed	Retired	Homemaker	Student	Total
No content sharing	*57.32*	*72.71*	*93.84*	*59.87*	*76.4*	*91.09*	*68.85*	*80.54*	*85.58*	*75.11*	*97.72*	*88.84*	*55.52*	***78.75***
Social networks only	10.11	12.21	1.75	7.77	10.04	3.6	2.97	8.16	6.22	10.14	0.86	3.72	6.35	**6.73**
Mostly media	25.76	9.84	1.26	23.89	6.46	1.65	9.09	5.95	4.5	8.55	0	5.55	31.15	**9.24**
Mostly reviews	3.74	2.3	1.13	2.69	3.14	0.54	3.7	2.53	1.13	3.65	0	0.38	1.84	**1.98**
Sharing across many platforms	0.82	0.69	0.93	1.09	0.67	1.42	2.56	1.1	0.8	1.68	1.07	0.47	0.48	**0.98**
Other sharing, few platforms	2.25	2.26	1.08	4.68	3.28	1.7	12.83	1.72	1.78	0.87	0.35	1.04	4.65	**2.32**

Spain

	Female			Male			Activity and employment status							
	15-29	30-44	45-64	15-29	30-44	45-64	Self empl.	FT empl.	PT empl.	Unemployed	Retired	Homemaker	Student	Total
No content sharing	*36.71*	*49.01*	*66.02*	*35.04*	*47.7*	*70.76*	*51.22*	*54.78*	*54.09*	*53.19*	*76.79*	*70.69*	*28.48*	***54.6***
Social networks only	9.37	14.57	9.85	9.68	7.19	7.11	7.92	8.31	13.37	12.9	4.4	10.47	8.13	**9.59**
Mostly media	19.83	11.51	5.81	21.19	9.75	4.78	9.98	9.71	9.53	11.23	6.33	8.25	18.66	**10.45**
Mostly reviews	14.07	10.72	7.56	11.25	9.77	6.27	7.8	9.87	10.02	8.98	4.09	4.8	15.37	**9.26**
Sharing across many platforms	11.79	9.8	4	11.53	13.04	4.32	11.46	8.54	6.83	7.3	4.92	2.24	15.98	**8.18**
Other sharing, few platforms	8.22	4.38	6.77	11.31	12.56	6.76	11.62	8.77	6.17	6.41	3.48	3.55	13.38	**7.92**

Source: authors' elaborations based on the AMPWork survey.

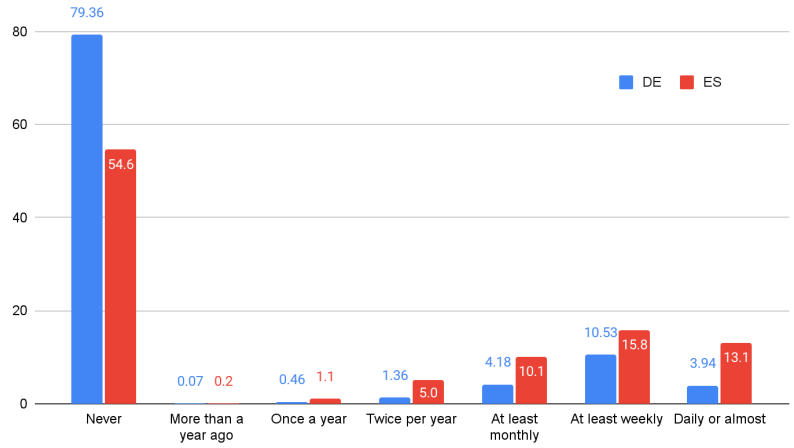
Table 17 also shows the distribution by gender, age and activity/employment status of the working age population across these categories of content sharing. In general, content sharing is more frequent for young people, especially in media sharing platforms. Sharing in social networks only is in fact slightly more frequent for mid-aged people, and the age differences for those that mostly write reviews and other categories are less strong. Table 17 does not show strong nor clear differences by gender. Across the different categories of activity and employment, students stand out as the ones with more sharing activity (especially in media platforms), as could be expected because of their age and time availability. But it is interesting to note that the self-employed also do a lot of content sharing (media and other in particular), perhaps because they use

content sharing as a form of promotion or for business communication purposes. The unemployed also do slightly more content sharing than average, although only in the category of social networks.

4.2 Frequency and duration

How frequent is this content production for online sharing platforms? Figure 36 below shows that most of the people who produce content to be shared online do it quite frequently. In Spain, 13% of the working age population shares content daily or almost daily, and another 16% does it weekly (so in total, almost one in three Spaniards share content weekly or more). In Germany, the frequency is lower but still significant: almost 4% of working age Germans share content daily and another 11% weekly (so around one in six Germans share content weekly or more).

Figure 36: *content sharing activity in online platforms, frequency*



Source: authors' elaborations based on the AMPWork survey.

Table 18 shows the distribution of frequency across different categories of the working age population, using a pseudo-continuous indicator. For this, we have transformed the original categories of frequency (the ones shown in figure 1) into a numeric variable using an arbitrary (but reasonable) equivalence (never being 0, and daily being 1). This allows us to quickly inspect the differences in the frequency of sharing activity across subgroups. Overall, the indicator gives a value of .18 for Spain and .07 for Germany: this would be the overall assessment of frequency of production of content for sharing platforms for the average working age person, according to this indicator. In the first panel of table 18, we can see the average frequency for the categories of sharing that we created earlier (see table 17 above). Obviously, the frequency for those who did not share any content in the last year is zero; among those sharing, the highest frequency is for Spaniards sharing across many platforms (.52), with high values as well for those sharing mostly in media platforms and those sharing in social networks only. The lowest frequency of sharing is for those mostly sharing reviews online.

In Table 18 we can also see the distribution for different categories of the working age population, which essentially confirms results discussed earlier. The difference in the frequency of sharing between men and women is very small, but it tends to be slightly higher for women. The biggest differences are by age, with young people sharing much more frequently than mid-aged and especially older (45+) people. Students share most frequently, followed by unemployed and self-employed workers, with retired and homemakers having the lowest frequencies.

Table 18 production of content for online platforms - pseudo-continuous frequency indicator

[Daily = 1; weeky = 0.25; monthly = 0.1; twice per year = 0.05; once per year = 0.01; less than once per year = 0.001; Never = 0]

	Germany	Spain
No content sharing	0.00	0.00
Social networks only	0.36	0.40
Mostly media	0.36	0.43
Mostly reviews	0.18	0.33
Sharing across many platforms	0.32	0.52
Other sharing, few platforms	0.27	0.35
Total	**0.07**	**0.18**

	Germany	Spain
15-29 women	0.17	0.29
30-44 women	0.08	0.20
45-64 women	0.01	0.13
15-29 men	0.15	0.27
30-44 men	0.07	0.22
45-64 men	0.03	0.11
Self empl.	0.07	0.21
FT empl.	0.05	0.17
PT empl.	0.04	0.18
Unemployed	0.08	0.21
Retired	0.00	0.06
Homemaker	0.03	0.11
Student	0.20	0.32

Source: authors' elaborations based on the AMPWork survey.

But perhaps the most important question for our purposes is: how much time do people spend sharing content for online platforms? Table 19 shows the average time per week spent sharing content online, for different types of platforms and categories of the working age population. Looking at the first panel in Table 19, which shows average time producing content to be shared in each type of platform, we can see significant differences between Germany and Spain. In Germany, the people who share only on social networks spend the longest time in this activity: even though sharing with family and close friends is excluded, this suggests a more leisure-oriented use of online sharing platforms. On the contrary, in Spain, the longest time spent producing content to be shared online is done by those sharing across many different types of platforms, and among those sharing mostly in media platforms: this suggests a more intense and developed habit of content sharing in Spain, as we have been consistently finding in this chapter.

Table 19 average time spent sharing content in online platforms per week (in hours)

	Germany	Spain
No content sharing	0.00	0.00
Social networks only	3.88	3.45
Mostly media	2.68	4.45
Mostly reviews	2.31	3.17
Across many platforms	2.38	5.35
Other, few platforms	2.76	4.30

All respondents (those that produced no content for online sharing count as zero)

	Germany	Spain
15-29 women	1.34	3.62
30-44 women	0.76	2.11
45-64 women	0.18	1.51
15-29 men	1.21	2.99
30-44 men	0.79	1.55
45-64 men	0.24	0.88
Self empl.	0.58	1.40
FT empl.	0.55	1.60
PT empl.	0.38	1.63
Unemployed	1.14	2.70
Retired	0.06	0.40
Homemaker	0.46	0.80
Student	1.38	3.55
Total	**0.64**	**1.87**

Only respondents who produced some content for online sharing

	Germany	Spain
15-29 women	3.13	5.77
30-44 women	2.79	4.13
45-64 women	3.06	4.48
15-29 men	3.03	4.67
30-44 men	3.35	2.96
45-64 men	2.71	3.05
Self empl.	1.85	2.88
FT empl.	2.85	3.55
PT empl.	2.66	3.56
Unemployed	4.68	5.78
Retired	2.45	1.71
Homemaker	4.29	2.73
Student	3.10	5.08
Total	**3.03**	**4.14**

Source: authors' elaborations based on the AMPWork survey.

This is confirmed by the bottom row of the second panel of Table 19, which shows the average number of hours spent sharing content (outside family and friends) in online platforms by the average individual of the working age population. In Germany, this value is 0.64 (which would correspond to around 40 minutes, because the notation used is decimal), whereas in Spain it is close to 2 hours. This may seem small, but since this is the total average for the entire working age population – which includes many people spending zero minutes on this activity – it actually amounts to a very large number in aggregate. Considering a working age population of roughly 53 million in Germany and 31 million in Spain, these values would amount to a total of 34 million hours per week sharing content online in Germany and 48 million in Spain. That would correspond to 850 thousand full-time equivalent workers (based on 40 hours per week) in Germany, and 1 million and 450 thousand full-time equivalents in Spain. Relative to the size of the working age population, these full-time equivalents would be 1.6% in Germany and 4.7% in Spain. These numbers are just provided to get a sense of the magnitude of the phenomenon in Germany and Spain, but they should not be taken literally: of course, all those hours are not paid working hours and in most cases they are provided for leisure rather than professional reasons. Yet, they amount to a very significant number of hours, and we should not forget that they require effort and generate value, both social value for those who share or consume the content, and economic value for the platforms where the content is shared. In Spain, the scale of the phenomenon is quite striking: producing and sharing the same amount of content with dedicated full-time workers would require almost 5% of the working age population. In Germany, the scale of the phenomenon is less striking but still significant: it would require 1.6% of the working age population working 40 hours a week to produce and share the amount of content currently shared in online platforms.

Table 19 also shows the distribution of average time spent sharing content online by subgroups of the working age population. The figures confirm the findings above, namely that young people are more likely than mid-aged and especially mature people to spend time sharing online, and women are slightly more likely than men. Students and unemployed workers are the ones who spend more time in online sharing activities, followed by full-time and part-time employees. It is interesting to note that the values for self-employed are not so high when we consider the number of hours instead of the simpler indicator of percentage of people sharing: the self-employed are more likely to share content online outside family and friends than employees, but they spend significantly less time on it (as shown in in the third panel of table 4, which shows the time spent sharing online only for those doing it, excluding the zeroes from the calculation).

To understand the phenomenon better, it is useful to focus our attention specifically on those who spend long hours producing and sharing content for online platforms. In Table 20 we can see the time spent sharing content online by intervals for different types of platforms and categories of the working age population. Both in Spain and Germany, the most frequent category of time spent sharing content online is 1 to 4 hours per week (outside of the category of zero hours, of course). But apart from that, the patterns look very different in Germany and Spain. In Germany, very few people (only around 5% of the working age population) spend more than 5 hours per week producing and sharing content online, whereas in Spain this proportion more than doubles. Whereas in Germany hardly anybody (less than 1%) spends more than 10 hours a week, and essentially nobody more than 20, a small but significant proportion of the Spanish working age population fall in those categories. More than 6% of Spaniards spend at least 10 hours a week producing and sharing content online for people outside their family and close friends, and there is even 2% who spend more than 20 hours a week in this activity. This latter category, despite being very small, is very important because if it was paid labour it would correspond to a part-time job.

Table 20 Average time spent sharing content in online platforms per week (in hours)

Germany

	No sharing	Social networks	Mostly media	Mostly reviews	Across many platforms	Other, few platforms	Total	Self-empl	FT emp	PT emp	Unemp	Retired	Homemaker	Student
0	100	0.43	0.3	1.02	0	0	**78.83**	68.85	80.58	85.58	75.65	97.72	89.2	55.52
1-4	0	61.2	76.04	84.23	90.65	79.68	**15.55**	27.82	14.44	11.71	17.93	1.42	6.5	30.85
5-9	0	34	19.93	12.03	6.57	17.7	**4.84**	1.91	4.46	2.71	2.13	0.86	3.57	12.22
10-19	0	3.87	3.73	2.71	2.78	2.61	**0.75**	1.41	0.53	0	3.67	0	0.72	1.41
20+	0	0.5	0	0	0	0	**0.03**	0	0	0	0.62	0	0	0

Spain

	No sharing	Social networks	Mostly media	Mostly reviews	Across many platforms	Other, few platforms	Total	Self-empl	FT emp	PT emp	Unemp	Retired	Homemaker	Student
0	100	0.55	0.5	1.06	0	1.14	**54.89**	51.22	54.93	54.31	53.31	76.79	70.69	30.27
1-4	0	80.38	69.8	79.11	65.06	80.4	**34.02**	38.36	35.65	35.31	30.95	21.43	23.78	49.56
5-9	0	9.02	14.33	10.35	12.66	6.68	**4.89**	6.31	4.37	4.12	7.27	1.25	2.75	6.05
10-19	0	5.65	11	5.97	15.45	7.33	**4.09**	3.61	3.8	3.97	4.98	0.54	2.62	7.89
20+	0	4.39	4.37	3.51	6.83	4.46	**2.11**	0.5	1.25	2.29	3.5	0	0.16	6.23

Source: authors' elaborations based on the AMPWork survey.

Table 20 also allows us to compare the patterns for different types of platforms and categories of the working-age population. In Germany, the longest hours are observed for those only sharing in social networks, whereas in Spain those sharing across many platforms and those sharing mostly in media platforms spend considerably longer hours than the rest. In Germany the only group spending very long hours (more than 10) producing and sharing content online are the unemployed, whereas in Spain students spend the longest hours, followed by the unemployed and part-time employees. 6% of Spanish students spend more than 20 hours a week, and 14% more than 10 hours a week producing and sharing content on online platforms.

Box 5: Main platforms used for sharing content online in Germany and Spain

In the AMPWork questionnaire, all respondents who declared having produced content to be shared in online platforms in the last twelve months were asked to name the specific platform or platforms they used. This information is very valuable to test the validity of the analysis in this section (being much more concrete, it can help identify wrong answer patterns), and is also interesting in itself. Table B3 below shows the distribution of respondents across the most frequently mentioned platforms. It is important to note that the respondents could name as many platforms as they wanted (without any predefined set of options).

The most frequently mentioned platform used for sharing content outside family and close friends in both countries is Facebook, followed by Instagram and Twitter. Around 25% of the Spanish working-age population, and around 15% of the German, have used Facebook in the last 12 months to share content produced by themselves with people outside their family and close friends. In Spain, Instagram is mentioned almost as frequently as Facebook, whereas in Germany Instagram and all the other platforms are mentioned by less than 10% of the working age population. In general, most of the platforms get more mentions in Spain than in Germany, as in the former the general practice of sharing content online is much more frequent (as we have repeatedly found in this chapter). The only exception is TikTok, which is slightly more frequently mentioned by Germans than Spaniards, even if the overall value is low (2.9% and 2.5%, respectively, share content in TikTok).

Table B3 also shows the platforms mentioned in each of the categories, across both countries. Those saying that they share only on social networks mostly mention Facebook, as could be expected. Those saying that mostly share in media platforms mention Instagram most frequently, but also often TikTok and YouTube. Those saying that they mostly do reviews mention Google, Booking, TripAdvisor and Amazon much more frequently than the rest. Those saying they share among many types of platforms have particularly high values for Twitter and others, and those saying that share among other but few platforms have particularly high values for Reddit and online forums. All in all, these figures provide some validation for the classifications and analysis performed in this chapter, because the specific platforms mentioned by respondents are consistent with our analysis.

Table B3: specific platforms used for sharing content online in the last 12 months

	Use of platforms, all respondents		Use of platforms, only among those that share content, both countries					Use of different platforms, among all respondents, both countries											
	Germany	Spain	Social networks	Mostly media	Mostly reviews	Across many platforms	Other, few platforms	15-29 women	30-44 women	45-64 women	15-29 men	30-44 men	45-64 men	Self-empl	FT emp	PT emp	Unemp	Retired	Home maker	Student
facebook	14.7	25.2	79.1	62.6	46.1	56.1	39.7	25.7	30.1	16.7	24.3	23.1	12.4	26.0	20.6	18.2	27.1	7.4	16.9	22.7
instagram	8.5	22.6	26.2	69.6	44.5	59.2	31.0	38.9	19.0	7.1	34.5	15.0	5.1	25.0	12.8	11.5	19.6	3.3	9.2	40.3
twitter	2.1	7.0	9.9	13.3	13.1	26.2	10.7	9.5	2.4	2.0	12.1	5.5	3.0	4.0	4.2	2.8	6.1	1.9	0.5	13.9
other	1.3	4.3	1.5	2.3	11.2	19.4	18.2	4.1	3.5	2.0	3.0	2.9	3.3	4.3	2.9	2.1	3.6	2.9	2.6	4.1
google	0.8	4.4	0.9	3.0	18.4	13.1	13.2	2.8	3.3	2.2	3.9	4.3	2.0	6.8	2.9	1.5	3.7	3.4	0.3	2.9
tiktok	2.9	2.5	1.6	13.6	6.4	10.3	4.5	9.5	2.5	0.8	4.9	2.0	0.6	2.1	1.8	0.9	3.4	0.3	1.9	9.0
youtube	2.0	2.9	1.3	12.1	2.6	12.5	6.5	2.4	2.9	1.1	4.7	3.9	1.3	2.8	2.6	1.5	3.0	1.1	1.9	3.6
whatsapp	2.2	2.3	7.9	8.2	5.7	4.4	3.2	4.6	2.4	1.3	3.4	1.9	1.5	3.0	1.8	1.6	3.4	1.5	1.3	4.1
booking	0.4	1.5	0.0	0.0	9.2	5.4	3.7	0.5	1.3	1.3	0.9	0.9	1.1	1.3	1.4	0.7	1.2	0.4	0.0	1.2
reddit	0.8	0.9	0.0	0.0	0.0	6.5	9.1	0.6	0.2	0.3	3.4	1.0	0.5	1.4	0.9	0.1	0.7	0.1	0.0	2.6
forum	0.0	1.3	0.0	0.0	0.7	5.0	8.6	0.6	0.3	0.3	2.1	1.3	0.7	0.5	1.0	0.5	0.8	0.0	0.1	1.2
tripadvisor	0.0	1.3	0.0	0.0	7.8	2.8	1.8	0.7	0.6	0.5	0.4	1.2	1.0	1.3	0.9	1.2	0.1	0.2	0.1	0.9
linkedin	0.1	1.0	0.8	0.6	0.8	7.2	1.4	0.1	1.4	0.1	0.6	0.9	0.7	2.1	0.8	0.0	0.9	0.0	0.0	0.5
amazon	0.2	0.9	0.0	0.0	5.9	2.5	2.0	0.6	0.9	0.5	0.3	0.8	0.5	0.5	0.5	0.8	0.9	0.5	0.8	0.4
DK/NR	0.3	0.6	0.0	0.1	1.9	1.2	4.5	0.1	0.7	0.3	0.4	0.5	0.5	1.4	0.5	0.3	0.6	0.0	0.0	0.2
pinterest	0.7	0.2	0.2	0.8	3.1	1.7	1.0	1.5	0.9	0.2	0.4	0.1	0.0	0.4	0.4	0.5	0.4	0.0	0.5	0.8
blog	0.0	0.6	0.0	0.8	0.4	3.5	0.9	0.2	0.2	0.1	0.4	1.0	0.2	1.0	0.4	0.1	0.2	0.0	0.1	0.3
twitch	0.1	0.5	0.1	1.0	0.8	0.6	2.3	0.0	0.4	0.1	0.4	0.8	0.2	0.8	0.2	0.0	0.8	0.0	0.0	0.7
wikipedia	0.0	0.4	0.0	0.0	1.4	1.9	0.6	0.4	0.1	0.1	0.2	0.1	0.4	0.0	0.4	0.0	0.2	0.0	0.2	0.3
snapchat	0.4	0.1	0.0	1.3	0.0	1.1	0.4	0.5	0.3	0.0	0.7	0.2	0.0	0.7	0.0	0.0	0.0	0.0	0.2	1.2

Source: authors' elaborations based on the AMPWork survey.

Finally, table B3 also shows the platforms mentioned by population subgroups and categories of employment. Young women are more likely than average to use Instagram, TikTok and WhatsApp, while young men are more likely than average to use Twitter, YouTube, Reddit, and online forums. Mid-aged women use Facebook more than average, while mid-aged men use Google (probably for reviews). Men and women above 45 have below average values for all platforms, except marginally for Booking (for reviews). Across working age categories, students are more likely than average to use Instagram, Twitter and TikTok; the self-employed are more likely to use Google, LinkedIn and others; and the unemployed are more likely than average to use Facebook.

4.3 Motivation for content creation

A final important aspect to understand the nature of the activity of producing and sharing of content for online platforms is its motivation. Since this is an activity with no monetary remuneration (even if it produces social and economic value), it is not at all obvious what motivates so many people to engage in it. Therefore, the AMPWork survey asks this directly. In Table 21 below, we can see what people producing content to be shared in online platforms say motivated them to engage in this activity. Looking first at the column with the totals for the working age population for Germany and Spain, we can immediately see that the most important and widespread motivation is simply *fun*. As we could expect, sharing content in online platforms

has intrinsic value for those sharing, and this is clearly the main reason why they engage in this activity without any monetary compensation. This is overwhelmingly so in Germany (96% of the Germans sharing say they do it for fun), and also in Spain although to a lesser extent (80%).[30]

With respect to other possible motivations (those interviewed could respond affirmatively to more than one motivation), they vary considerably between Germany and Spain. In Germany, the second most frequently mentioned motivation is non-monetary exchange or barter (37%, compared to 20% in Spain), whereas in Spain it is peer recognition (50%, compared to 19% in Germany). Gaining experience and altruism are also frequently mentioned in both countries (between 25% and 40% of respondents). It is interesting to note that more commercial or professional motivations (publicity, the expectation of future income, gifts, or lottery tickets) are the least frequently mentioned in both countries, although in Spain, publicity and the expectation of future income is mentioned by around 15% of those who share.

Although there are some differences across platform types and categories of the working age population, they are not very important. Fun remains the dominant motivation in nearly all cases, with perhaps the self-employed as the only partial exception. Especially in Spain, 40% of the self-employed sharing content online do not say they do it for fun, with higher-than-average values for the "commercially-oriented" motivations (56% say they do it for publicity and 33% for the expectation of future income). Another partial exception is the contribution to review platforms, which especially in Spain is less frequently than other categories associated with fun and more frequently associated with altruism.

Table 21a motivations for engaging in online sharing activity outside family and close friends in the last 12 months (Germany)

Germany

	Social networks	Mostly media	Mostly reviews	Across many platforms	Other, few platforms	Total	Self-empl	FT emp	PT emp	Unemp	Retired	Homemaker	Student
Fun	97.43	98.08	90.7	100	86.16	**95.97**	80.5	95.31	98.64	96.36	100	95.34	98.13
Exchange	23.33	37.17	40.47	81.82	57.61	**37.4**	46.15	34.93	33.92	28.56	69.26	26.27	42.86
Experience	15.72	20.02	20.14	80.33	57.24	**25.54**	51.88	31.03	20.35	22.11	69.26	10.86	17.43
Altruism	15.51	15.7	57.52	82.02	32.63	**24.49**	26.55	32.06	23.2	40.7	62.21	16.88	10.83
Recognition	10.63	16.87	25.52	37.78	33.67	**18.51**	34.58	19.56	12.24	18.22	64.18	0	18.54
Publicity	0.95	4.42	5.99	34.01	17.62	**6.28**	56.79	4.8	11.25	2.28	26.38	4.15	0
Future income	1.78	2.09	5	33.85	9.45	**4.54**	18.59	5.08	7.19	5.38	26.38	0	0.79
Gifts/lottery	2.21	0.91	3.97	10.82	4.35	**2.45**	11.15	1.95	0	9.01	41.75	0	0.97
Other	0.43	1.17	1.03	0	1.53	**0.9**	0	0.38	0	3.64	0	0	0

[30] The 20% of people in Spain who do not say they share content for fun say they do it for altruistic reasons (54%), recognition (42%) or for gaining experience (23%). As we have already observed, in Spain the activity of online sharing is more widespread but less strictly leisurely than in Germany.

Table 21b motivations for engaging in online sharing activity outside family and close friends in the last 12 months (Spain)

Spain

	Social networks	Mostly media	Mostly reviews	Across many platforms	Other, few platforms	Total	Self-empl	FT emp	PT emp	Unemp	Retired	Homemaker	Student
Fun	83.17	88.93	67.17	88.51	70.08	**79.96**	60.42	79.45	79.38	84.88	86.75	73.06	89.41
Recognition	41.34	48.17	42.3	68.65	51.12	**49.8**	62.17	46.64	43.13	52.77	47.41	51.83	51.82
Altruism	14.4	13.43	47.36	65.03	50.9	**36.41**	48.59	37.99	32.01	33.7	34.2	28.88	32.59
Experience	10.19	18.71	19.47	63.32	44.22	**29.67**	39.97	30.23	24.33	31.93	29.79	20.11	28.2
Exchange	7.09	8.67	15.77	47.33	27.3	**20.07**	24.64	23.06	12.63	19.74	27.39	13.47	17.51
Publicity	6.37	13.82	8.86	38.96	19.42	**16.81**	55.69	11.33	16.79	14.67	4.29	7.49	16.62
Future income	3.39	8.18	7.76	36.72	18.75	**14.14**	32.76	10.82	10.56	15.21	1.2	10.28	15.85
Gifts/lottery	1.58	2.18	4.77	17.91	4.02	**5.75**	5.12	6.47	1.74	7.9	1.2	2.24	6.25
Other	4.48	4.81	4.43	2.8	4.91	**4.31**	1.92	3.99	4	6.61	14.12	7.02	1.9

Source: authors' elaborations based on the AMPWork survey.

To further probe for the possibility of other non-monetary compensations for content sharing activity, the AMPWork survey includes a final question on this. Consistently with previous findings, there is a significant difference between Spain and Germany in this respect. 4% of Spaniards who shared content online outside family and friends got some kind of non-monetary reward for this activity, compared to less than 1% of Germans. This is a small but non-trivial percentage, especially in Spain. The most frequent non-monetary reward received for online sharing activity in both countries is free products.

4.4 Final remarks: is digital content creation a form of work?

We started this chapter wondering about the nature of content producing activity for online sharing platforms. This activity is generally considered as a form of leisure, as the digital age equivalent of centuries-old forms of private communications, shared enjoyment and communal leisure. Yet, in contrast with these pre-digital forms of private communications and communal leisure, this sharing activity creates economic value, which is mostly appropriated by big digital platforms that coordinate (algorithmically) the whole process. And as we argued before, the actual activities that go into content sharing are in many cases very similar to some categories of paid labour services via online platforms, the main difference being simply the motivation and remuneration associated with the activity in each case. But even that can be equivocal, because some labour services put into labour platforms are unremunerated, and some content produced for sharing platforms can be indirectly remunerated via ads.

In this chapter, we have provided some new evidence on this phenomenon that can help to understand it better. However, this evidence cannot resolve the contradictions previously mentioned, because these contradictions are embedded in the very nature of this activity. The production and sharing of content in online platforms is a form of work, which requires human time, effort and creativity. We have seen that, in fact, there is a significant amount of time that goes into this activity in the two European countries that we have surveyed: the total amount of hours spent in producing and sharing for online platforms is equivalent to 5% of the working age population working for 40 hours a week in Spain, 1.6% in Germany. On the other hand, most of the people that engage in this sort of activity do it for fun, which implies that for them this activity is indeed a form of leisure, even though there also is a non-trivial amount of people (especially in Spain) that do it for reasons at least indirectly related to professional or commercial interests (such as publicity, experience or the expectation of future income).

Therefore, we can only conclude this chapter by underlying the uncertain nature of the activity of producing and sharing content for online platforms, and urging researchers and policy-makers to pay more attention to this phenomenon until we understand it better. The production and sharing of content for online platforms involves a growing amount of work which produces economic value but is not remunerated, in a process which is appropriated and coordinated by big transnational corporations. At the very least, this requires some scrutiny and debate.

5 Discussion and conclusions

Like most other aspects of social life, economic activity and work are becoming increasingly digitalised and interconnected. And as we have argued in this report, digitalisation tends to be linked to platformisation. Digital platforms are a very efficient form of coordinating any kind of complex interaction between many parties, whenever such interaction takes place using digital networks and tools. To study platforms and their effects, there are three elements which are useful to consider. First, platforms are embedded in digital devices that provide the infrastructure or digital space where interactions take place. Secondly, platforms collect, store and process information about the transactions that take place within them. And thirdly, platforms incorporate a set of algorithms that regulate and coordinate how those transactions take place.

In this report, we have presented data from a dedicated new survey on the platformisation of work in Europe, the AMPWork survey. This survey collects original representative data for two member states on the three key elements of platforms in work contexts: first, on the digital devices used at work; second, on digital monitoring of work; and third, on algorithmic management of work. These three elements are measured in three different contexts which provide complementary perspectives on the phenomenon of platformisation of work: first, in conventional economic organisations; second, in digital labour platforms; and third, in content sharing platforms. Together, these new measures of platformisation in different contexts provide a unique picture of this emerging phenomenon. In addition, we have linked these measures of platformisation to more conventional measures of working time and working conditions included in the AMPWork survey to assess their association. What have we learnt with this study?

With respect to the platformisation of regular work, AMPWork shows that the material basis for platformisation is already well established in the countries analysed. The majority of workers (around two thirds) are already using digital devices in their daily work activities; these devices are likely to incorporate platform-type software for the coordination of their input. And those using digital devices at work are in most cases also subject to some degree of digital monitoring, according to their responses in the AMPWork survey. We identified two main types of digital monitoring at work: one focused on the activities carried out with digital tools and the other focused on the physical monitoring of movement and location of workers. *Activity monitoring* is common in all forms of office work, whereas *physical monitoring* is frequent in work that takes place outside the employers' premises and also for manual work in manufacturing. On the other hand, algorithmic management is much less common, although not marginal. Around one in five workers in Germany, and one in three in Spain, is subject to one or more automated systems of management, of which we identified two main types: *algorithmic direction* (where the algorithms provide instructions to workers) and *algorithmic evaluation* (where the algorithms assess the performance of workers).

Putting all these pieces of information together, we classified workers in four categories according to the level of platformisation of their work. First, we have a sizeable minority of workers who are not 'platformised' at all, because they do not even use digital tools at work: this accounts for roughly one third of the workforce in the countries analysed. Second, we have a big category of workers who use digital tools but who are not platformised according to our definition, meaning that they are not subject to any form of digital monitoring or to algorithmic management at work. This category accounts for 40 to 50% of the workforce. Third, we have a category of *soft platformisation*, including between 10% of workers in Germany and 20% in Spain, who are subject digital monitoring and algorithmic management simultaneously but no more than one form. And finally, we have the small category of *strong platformisation*, including 1% of workers in Germany and 6% in Spain, who are subject to all of the main types of digital monitoring and algorithmic management identified in this report.

This classification implies that the platformisation of regular work is indeed a real phenomenon, which affects a small but far from marginal proportion of workers, which is likely to grow if our hypothesis that digitalisation begets platformisation is indeed correct. AMPWork also allows to explore the characteristics and implications of platformised work. The higher proportions of "platformised" workers (between 10 and 20%) are found among clerks and operators, in high-technology industries, knowledge-intensive services, and public administration; it is also relatively more common among those who work outside their employer´s premises (at home, or in a vehicle, or in public spaces); and it is often linked to more detailed and complex work procedures, but also to more monotony and less communication with co-workers.

In this report, we also studied a second dimension of platformisation of work, namely the provision of paid labour services via Digital Labour Platforms (DLPs). As with the platformisation of regular work, our estimation of this phenomenon suggests that it is small but not marginal: according to AMPWork, around 1-2% of the working age population in the countries analysed have DLPs as their main source of income.

Contrasting this estimation with previous ones (including the COLLEEM surveys) suggests that this phenomenon has probably stabilised after an initial period of rapid growth, consolidating as a small but significant form of employment. Work in DLPs corresponds very well with our framework for analysing the platformisation of work, involving in essentially all cases an intensive use of digital devices, which incorporate functions of digital monitoring and algorithmic management. Our evidence suggests that, as argued in the third section of this report, the majority of workers in DLPs, including even those that consider themselves self-employed, are *de facto* similar to dependent employees because they are directly subject to the authority of DLPs, even if that authority is algorithmically implemented. On the other hand, AMPWork does show that workers in DLPs have relatively higher levels of autonomy and flexibility when compared to traditional employees, although they are also typically subject to more unsocial work schedules, more stress and more standardisation of their work.

In fact, AMPWork allowed us to explicitly compare the characteristics and conditions of the "platformised" segments of the regular workforce and those of workers in DLPs. And as expected, we could see that they are quite similar, although not in all respects. Both are likely to work outside regular work premises, and have similar characteristics in terms of work organisation (autonomy, routine, complexity and procedures). But workers in DLPs are more likely to have long and unsocial working hours, whereas platformised regular workers are subject to higher levels of stress. In any case, our results suggest that the use of digital platform tools for the coordination of labour input, shared by both categories of workers (platformised and DLPs), tends to be associated to particular forms of work and work organisation.

Finally, in this report we have also made some exploratory analysis of a more fringe phenomenon that is also associated with the platformisation of work, albeit more obliquely: the unpaid production of content for digital sharing platforms. In fact, we came to this concept because of a recurrent problem in previous versions of the COLLEEM survey, where many people classified themselves as platform workers because of their work in producing content for sharing platforms such as YouTube or Instagram. Indeed, this is a fringe category because it is an activity that can generate income via ads in those platforms, and therefore it can be considered in some cases as provision of labour services via platforms in exchange for money. To explore this, AMPWork included some basic questions about whether the respondent had spent time producing content to be shared online with people outside family and close friends, for how long and for what reasons. The results are certainly very interesting even if difficult to interpret, because it is unclear whether this activity should indeed be classified as a form of unpaid labour or as leisure activity. A significant proportion (more than 20% in Germany, more than 40% in Spain) of the working age population spends some time producing content to be shared in online platforms: in total, this activity would correspond to almost 5% of the working age population working full-time in Spain, and almost 2% in Germany. On the other hand, most of the people that engage in this sort of activity do it for fun, which implies that for them this activity is indeed a form of leisure, even though there also is a non-trivial amount of people (especially in Spain) that do it for reasons at least indirectly related to professional or commercial interests (such as publicity, experience or the expectation of future income).

All in all, this study provides an initial approximation to a new phenomenon whose importance is likely to grow. The increasing digitalisation of everything often involves an increasing use of digital platforms for the coordination of all kinds of exchanges and processes, including in the world of work. As we have seen in this report, this extends the importance of digital monitoring and algorithmic management across different types of work settings, and tends to be associated with particular forms of work organisation and working conditions. We hope that this study and its associated survey (which is freely available to any interested researcher) has contributed to a better understanding of this phenomenon, but much research continues to be needed in order to understand its broader implications.

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Annex: Algorithmic Management and Platform Work (AMPWork) Survey Questionnaire

QUESTIONNAIRE

Information note:

This is the source questionnaire of the AMPWork Survey.

The interviewer instructions are written in CAPITAL letters. Show cards are highlighted in GREEN. Programming instructions are highlighted in RED.

INTRODUCTION

INTERVIEWER INSTRUCTION: INTRO IF APPOINTMENT MADE RATHER THAN INTERVIEW PROCEEDED STRAIGHT AWAY

INTRO: Good morning/evening, I am an interviewer for IPSOS, a company dedicated to social and opinion studies. We are currently conducting a survey on working conditions, including in platform work, and when we spoke to you on [INSERT DATE APPOINTMENT SET] you agreed to take part. The study has been commissioned by the European Commission's Joint Research Centre (JRC) as part of its line of research on the impact of digital technologies on work organisation and working conditions. The results will be used to support policy making. We appreciate your participation in the survey.

INTERVIEWER ADD IF NECESSARY:

Your answers will remain anonymous, and participation is voluntary. At any stage, you can refuse to answer a question or terminate the interview completely.

Your household has been selected at random as part of a representative sample of the [COUNTRY'S] population.

SECTION A: SOCIO-DEMOGRAPHICS

ASK ALL.

I'd like to start by asking you a few questions about your household. [*Only read if clarification is necessary:* By household, I mean one person living alone or a group of people, not necessarily related, living at the same address with common housekeeping, that is, sharing at least one meal per day or sharing a living or sitting room.]

A1a. Including yourself, can you please tell me how many people live in your household?

Number of people living in household: [enter numeric]
99 - Refusal (spontaneous)

A1b. Including yourself, how many of them are aged between 16 and 65?

Number of people aged 16 to 65 living in household: [enter numeric]
99 - Refusal (spontaneous)

A2.

a. (INTERVIEWER: CODE GENDER OF RESPONDENT IN GRID BELOW)
b. **Starting with yourself, what is your first name?**
c. **And how old are you?**

SHOW CARD A2

d. **Please look at this card and tell me which of these categories describes your current situation the best?**

(INTERVIEWER: IN THE SCENARIO WHERE SOMEONE HAS MORE THAN ONE OF THE SITUATIONS ON A2 CARD TO THE SAME EXTENT, ALWAYS PRIORITIZE CODES 1 OR 4.)

ASK A2e IF A2d=01 OR 04

e. **And do you work part time or full time?**

INTERVIEWER: RESPONDENT TO SELF-DEFINE PART TIME AND FULL TIME AND USE AS THE BASIS THEIR OWN CONTRACTUAL WORKING ARRANGEMENTS

1 – Part time
2 – Full time
8 - DK/No opinion (spontaneous)

9 – Refusal (spontaneous)

ASK A3 IF A1a>1

A3. Now thinking about the other members of your household, starting with the oldest …

INTERVIEWER: FOR SECOND HOUSEHOLD MEMBER, START WITH THE OLDEST MEMBER OF THE HOUSEHOLD. REPEAT GRID QUESTIONS A-E FOR ALL OTHER HOUSEHOLD MEMBERS.

FOR REMAINING HOUSEHOLD MEMBERS

Now thinking about the next oldest household member …

a. What is their name?

b. Could you tell me whether [name] is a male or a female?

c. How old is he/she?

SHOW CARD A3

d. What is this person's relationship to you? Is he/she your …?

ASK QUESTION E. ONLY FOR MEMBERS OF THE HOUSEHOLD AGED 16+YEARS.

SHOW CARD A2

e. And which of these categories describes the current situation of [name] the best?

ASK A3f IF A3e=01 OR 04

f. Does [name] work part time or work full time?

1 – Part time
2 – Full time
8 - DK/No opinion (spontaneous)
9 – Refusal (spontaneous)

Card A3 - Relationship Codes

01 - spouse/partner
02 – child: son/daughter of respondent or of cohabiting partner
03 - parent, step-parent or parent in law
04 - daughter or son in law
05 - grandchild
06 - brother/sister (incl. half and step siblings)
07 - other relative
08 - other non-relative
88 - DK/No opinion (spontaneous)
99- Refusal (spontaneous)

Card A2 - Economic Activity codes

01 - at work as employee or employer/ self-employed */relative assisting on family farm or business **
02 - unemployed
03 - unable to work due to long-term illness or disability
04 – at work and on child-care leave or other leave
05 - retired
06 - full time homemaker/ responsible for ordinary shopping and looking after the home
07 - in full time education (at school, university, etc.) / student
08 – other (e.g. military duty)***
09 – [A3 only] child under 16 (PROGRAMMING: do not ask, code from A3c)
88 - DK/No opinion (spontaneous)
99 - Refusal (spontaneous)

* Even in cases where the business fails to deliver any profit or any income yet
** In the case of unpaid family members, they should be included in this status even in case when the remuneration is not monetary and /or the person does not receive any formal pay.
*** Please include the example only if it is applicable to that country.

A4a. Were you born in [PROG: this country]?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

ASK ALL.
A4b. Were your parents born in [PROG: this country]?

INTERVIEWER: BY [THIS COUNTRY], WE MEAN CURRENT NATIONAL BOUNDARIES RATHER THAN ANY HISTORIC BOUNDARIES.

1- Yes
2- No
3- My mother yes, but not my father (spontaneous)
4- My father yes, but not my mother (spontaneous)
7- Not applicable (spontaneous)
8- DK/no opinion (spontaneous)
9 - Refusal (spontaneous)

PROG: CUSTOMISE CATEGORIES FOR EACH COUNTRY AS LONG AS CAN CODE TO BELOW CATEGORIES
A5. What is the highest level of education or training that you have successfully completed?

SHOW CARD A5 –ONE ANSWER ONLY

[Note; additional explanation of ISCED classification and correspondence to local qualifications were provided in each country]

01 - Early childhood education (ISCED 0)
02 - Primary education (ISCED 1)
03 - Lower secondary education (ISCED 2)
04 - Upper secondary education (ISCED 3)
05 - Post-secondary non-tertiary education (ISCED 4)
06 – Short-cycle tertiary education (ISCED 5)
07 – Bachelor or equivalent (ISCED 6)
08 – Master or equivalent (ISCED 7)
09 – Doctorate or equivalent (ISCED 8)
10 – Not elsewhere classified
88 - Don't know (spontaneous)
99 - Refusal (spontaneous)

SECTION B: CONDITIONS OF WORK

ASK ALL IN PAID EMPLOYMENT I.E. IF A2d=01 (work as employee or employer/self-employed/relative assisting on family farm or business) or A2d=04 (at work and on child-care leave or other leave)
IF A2d ≠ 01 OR 04 SKIP TO SECTION C.

READ OUT
I'm now going to ask you a few basic questions about your job. If you have more than one job, please answer for your main job. By main job, we mean the one where you spend most hours. If you spend an equal amount of time at jobs, you need to choose which job you will focus on as your main job.

B1. What is the title of your main paid job?

INTERVIEWER: ASK AND WRITE IN FULL DETAILS – PROBE FOR AS MUCH INFORMATION AS POSSIBLE WITH VIEW TO OBTAINING ACCURATE 4-DIGIT ISCO CLASSIFICATION.

IF RESPONDENT HAS TWO JOBS WITH IDENTICAL HOURS, ASK THEM TO SELECT THE JOB THEY PERSONALLY FIND MORE IMPORTANT.

.....

.....

.....

88 - DK/no opinion (spontaneous)
99 - Refusal (spontaneous)

B2. What do you mainly do in your job?

INTERVIEWER: ASK AND WRITE IN FULL DETAILS – PROBE FOR AS MUCH INFORMATION AS POSSIBLE WITH VIEW TO OBTAINING ACCURATE 4-DIGIT ISCO CLASSIFICATION.

.....

.....

.....

88 - DK/no opinion (spontaneous)
99 - Refusal (spontaneous)

B3. Are you working as an employee or are you self-employed?

READ OUT – ONE ANSWER ONLY.

INTERVIEWER ADD IF NECESSARY:
By 'employee' we mean someone who gets a salary from an employer or a temporary employment agency.
'Self-employed' includes people who have their own business or are partners in a business as well as freelancers. A self-employed person may or may not have employees.

INTERVIEWER NOTE: Respondents who work as an employee for their own business should be coded as self-employed. Members of producers' cooperatives should be coded as self-employed. Family workers should determine which alternative matches their situation best.

1. An employee → GO TO B6
2. Self-employed → GO TO B4b
8. Don't know (spontaneous) → GO TO B4a
9. Refused (spontaneous) → GO TO B4a

ASK IF B3=8 OR 9

B4a. Are you paid a salary or a wage by an employer?

ONE ANSWER ONLY

1. Yes → GO TO B6
2. No → GO TO B4b
8. Don't know (spontaneous) → GO TO B4b
9. Refusal (spontaneous) → GO TO B4b

ASK IF B3=2 OR B4a=2, 8 OR 9

B4b. Looking at this card, please select the category or categories which apply to your main paid job?

INTERVIEWER READ OUT. MULTIPLE ANSWERS

1. Sole director of own business
2. A partner in a business or professional practice
3. Working for yourself
4. Working as a sub-contractor
5. Doing freelance work
6. Paid a salary or a wage by an agency
7. Other (write in: _____)
8. Don't know (spontaneous)
9. Refused (spontaneous)

ASK IF B4b=1-5 AND B4b≠6-9

B5. Regarding your business, do you:

READ OUT 'A' – 'D' – ONE ANSWER ONLY PER LINE

	Yes	No	DK	REFUSAL
A. Have the authority to hire or dismiss employees?	1	2	8	9
B. Get paid an agreed fee on a weekly or monthly basis?	1	2	8	9
C. Have employees working for you?	1	2	8	9
D. Generally, have more than one client or customer?	1	2	8	9

ASK EMPLOYEES ONLY (B3=1 or B4a=1 or B4b=6-9 or no to all of B5a-4)

B6. What kind of employment contract do you have in your main job?

SHOW CARD B6 – READ OUT – ONE ANSWER ONLY

1 – Contract of unlimited duration (UK: permanent)
2 – Contract of limited duration (UK: fixed-term)
3 – A temporary employment agency contract
4 – An apprenticeship or other training scheme
5 – No contract
6 – Other (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

ASK ALL IN PAID EMPLOYMENT I.E. IF A2d=01 (work as employee or employer/self-employed/relative assisting on family farm or business) or A2d=04 (at work and on child-care leave or other leave)

B7. What is the main activity of the company or organisation where you work?

INTERVIEWER: ASK AND WRITE IN FULL DETAILS – PROBE FOR AS MUCH INFORMATION AS POSSIBLE

.....

.....

.....

88 – DK (spontaneous)
99 - Refusal (spontaneous)

B8. Are you working in...?

READ OUT – ONE ANSWER ONLY

1 – the private sector
2 – the public sector such as state administration officials, military, teachers in public educational centres, doctors in public health centres, ...
3 – a joint private-public organisation or company
4 – the not-for-profit sector or an NGO
5 – other (write in: _____)
8 – DK (spontaneous)
9 – Refusal (spontaneous)

B9. How many people in total work in the company or organisation where you perform most of your work?

SHOW CARD B9 – READ OUT – ONE ANSWER ONLY

(N.B. RESPONDENT SHOULD INCLUDE THEMSELVES IN THE NUMBER)
INTERVIEWER: CLARIFY IF NEEDED: BY COMPANY WE MEAN THE ORGANISATION AS A WHOLE, NOT JUST THE LOCAL WORKPLACE OR UNIT.

01 – 1 (works alone)
02 – 2-4
03 – 5-9
04 – 10-49
05 – 50-249
06 – 250-499
07 – 500 or more
88 – Don't know (spontaneous)
99 – Refusal (spontaneous)

B10. How many years have you been working for this company or organisation?

INTERVIEWER: CLARIFY IF NEEDED: BY COMPANY WE MEAN THE ORGANISATION AS A WHOLE AND NOT THE LOCAL UNIT. RESPONDENT SHOULD COUNT ALL TIME REGARDLESS OF CONTRACT STATUS OR POSITION HELD.

Number of years: [.....] enter

00 - if less than 1 year
77 - Not applicable (spontaneous)
88 - DK/no opinion (spontaneous)
99 - Refusal (spontaneous)

ASK ALL IN PAID EMPLOYMENT i.e. IF A2d=01 or A2d=04

[READ OUT]: In this section, all of the questions continue to be about your main paid job.

B11. How many hours do you usually work per week in your main paid job?

INTERVIEWER: EXCLUDING LUNCH BREAK AND EXCLUDING TIME SPENT TRAVELLING TO AND FROM WORK – IF 30 MINUTES OR MORE, ROUND UP TO NEXT HOUR
INTERVIEWER: CLARIFY IF NEEDED: WE MEAN ACTUAL HOURS WORKED NOT WHAT IS WRITTEN IN YOUR EMPLOYMENT CONTRACT

Number of hours per week: .....

888 – DK/no opinion (spontaneous)
999 – Refusal (spontaneous)

B12. Do you work...?

READ OUT FROM 'A' – 'E' –ONE ANSWER PER LINE.

	Yes	No	DK	Refusal
A -The same number of hours every day	1	2	8	9
B - The same number of days every week	1	2	8	9
C- The same number of hours every week	1	2	8	9
D - Fixed starting and finishing times	1	2	8	9
E – Shifts	1	2	8	9

B13. Normally, how many times a month do you work... ?

READ OUT 'A' – 'D' – TYPE IN NUMBER – ONE ANSWER PER LINE.

SHOW CARD B13 (WITH WORKING DAY ARRANGEMENTS AND SCALE)

	Always	Often	Sometimes	Rarely	Never	Don't know	Refused
A. – at night, for at least 2 hours between 10.00pm and 05.00am?	1	2	3	4	5	8	9
B. – on Sundays?	1	2	3	4	5	8	9
C. – on Saturdays?	1	2	3	4	5	8	9
D. – more than 10 hours a day?	1	2	3	4	5	8	9

B14. How are your working time arrangements usually set??

SHOW CARD B14 – READ OUT - ONE ANSWER ONLY

1 - They are set by the company / organisation with no possibility for changes
2 - You can choose between several fixed working schedules determined by the company /organisation
3 - You can adapt your working hours within certain limits (e.g. flextime)
4 - Your working hours are entirely determined by yourself
8 - DK/no opinion (spontaneous)
9 - Refusal (spontaneous)

B15. Please take a look at these locations. In a moment, I will ask you how often you usually work in each location [during the last 12 months in your main paid job / (IF B10=00: since you started your main paid job)].

SHOW CARD B15 (WITH LOCATIONS AND SCALE)

READ OUT FROM 'A' TO 'F' – ONE ANSWER PER LINE

INTERVIEWER ADD IF NECESSARY: REFERS EXCLUSIVELY TO THE PLACE WHERE HE/SHE PERFORMS HIS/HER WORK, FOR EXAMPLE, IF A GLOVER GOES TO GET FOOD AT A CAFETERIA AND CARRIES THE FOOD ON HIS BIKE, HE/SHE IS NOT CONSIDERED TO BE WORKING AT A CAFETERIA ONLY IN HIS/HER VEHICLE.

	Always	Often	Sometimes	Rarely	Never	Don't know	Refused
A. Your employer's/your own business' premises (office, factory, shop, school, etc.)	1	2	3	4	5	8	9
B. Clients' premises	1	2	3	4	5	8	9
C. A car or another vehicle	1	2	3	4	5	8	9
D. An outside site (e.g. construction site, agricultural field, streets of a city)	1	2	3	4	5	8	9
E. Your own home (before the outbreak of the Covid-19)	1	2	3	4	5	8	9
F. Public spaces such as coffee shops, airports etc.	1	2	3	4	5	8	9

READ OUT: THE FOLLOWING QUESTIONS DEAL WITH THE WAY YOUR WORK IS ORGANISED

B16. Generally, does your main paid job involve…

SHOW CARD B16 – READ OUT 'A' TO 'F' – ONE ANSWER ONLY PER LINE.

	Yes	No	DK	Refusal
A – meeting precise standards of work	1	2	8	9
B – assessing yourself the quality of your own work	1	2	8	9
C- solving unforeseen problems on your own	1	2	8	9
D- monotonous activities	1	2	8	9
E- complex activities	1	2	8	9
F- learning new things	1	2	8	9

B17. Are you able to choose or change…

INTERVIEWER: READ OUT 'A' TO 'C' – ONE ANSWER ONLY PER LINE

	Yes	No	DK	Refusal
A – the order in which you do things?	1	2	8	9
B – the methods you use or ways you do your work?	1	2	8	9
C- your speed or rate of work	1	2	8	9

B18. To what extent do you agree or disagree with the following statements?

SHOW CARD B18 – READ OUT 'A' TO 'D' – ONE ANSWER ONLY PER LINE.

	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not applicable	DK	Refused
a. You can take a break when you wish								
b. You can interact and communicate with your manager when you need to								
c. You can interact and communicate with your peers when you need to								
d. You experience stress in your work								

B19a. Do you use any of the following digital devices when doing your current main work/job?

[READ OUT: YOU DO NOT HAVE TO USE EVERY DAY OR ALL OF THE TIME.]

	YES	NO	DK
a. Personal computers or laptops			
b. Tablets, smartphones or other mobile computer devices that connect to the internet			
c. Wearable devices, such as proximity card, fitness tracker, smartwatch, dataglasses, or other (embedded) sensors			
d. Other (please describe)			

B19b. Do you use videoconferencing tools, for example to participate in online meetings or training, when doing your current main work?

1 - Yes
2 – No
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B20. To your knowledge, does the organisation where you work use digital device/s to:

	YES	**NO**	**DK**
a. Track the amount of time you have spent working?			
b. Track your keystrokes, take screenshots or track the files you use?			
c. Record the content and quality of your voice calls or your use of emails?			
d. Record your use of the internet during work time (e.g. websites visited, social media use)?			
e. Monitor your work/workplace using cameras (e.g. CCTV or webcam activation)?			
f. Track your entry, exit and/or movement in the workplace (e.g. swipe cards)?			
g. Track your whereabouts in your working environment with embedded sensors or other work equipment (e.g. in office furniture, or the floor)?			
h. Track your location and movements using a device in your vehicle (e.g. GPS device, smartphone, biometrics)?			

[READ OUT]: In this section, all of the questions continue to be about your main paid job.

B21. Is your roster, shift, or working time automatically allocated and communicated to you via a device such as a tablet, smartphone, computer, laptop or app?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B22. Are the activities you undertake at work automatically allocated and communicated to you via a device such as a tablet, smartphone, computer, laptop or app?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B23. Is the speed or rate of your work determined by a device such as a tablet, smartphone, computer, laptop or app?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B24. To do your work, do you have to follow automated instructions or directions from a device such as a tablet, smartphone, computer, laptop or app?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B25. Is your work performance ranked on a leaderboard or dashboard so that you can be compared to your colleagues?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B26. Are you awarded points, badges, prizes or stars, or similar, for meeting targets or different levels of performance?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B27. Are your performance ratings or online customer ratings used as a way to allocate the projects, tasks, work, or shifts you are given?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B28. Could your shifts be automatically cancelled, you lose your job or be suspended if you do not maintain a minimum performance rating, score or metric?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B29. Does the organisation where you work have a policy that explains what digital information is collected about you and your activities at work?

1 – Yes
2 – No
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B29a. Do you have access or can you be granted access to this information collected?

1 – Yes
2 – No
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

B30. Please can you provide the approximate range for your NET monthly earnings from your main paid job?. What letter best matches your total net earnings from your main job (SHOW CARD B30)? Use the part of the show card that you know best: weekly, monthly, or annual earnings.

SHOW CARD B30 - RANGES.

Code	weekly	monthly	annual
D	Less than 175€	Less than 700 €	Less than 8400 €
B	176 €- 225 €	701 €- 900 €	8401 €- 10800 €
I	226 € - 275 €	901 € - 1100 €	10801 €- 13200 €
O	276 € - 300 €	1101 € - 1200 €	13201 € - 14400 €
T	301 €- 325 €	1201 € - 1300 €	14401 € - 15600 €
G	326 € - 350 €	1301 €- 1400 €	15601 € - 16800 €
P	351 €- € 400 €	1401 €- 1600 €	16801 € - 19200 €
A	401 €- € 450 €	1601 €- 1800 €	19201 € - 21600 €
F	451 €- € 500 €	1801 €- 2000 €	21601 € - 24000 €
E	501 €- 600 €	2001 € - 2400 €	24001 € - 28800 €
Q	601 € - 700 €	2401 € - 2800 €	28801 € - 33600 €
H	701 € or more	2801 € or more	33601 € or more
88888888	DK (spontaneous)	DK (spontaneous)	DK (spontaneous)
99999999	Refusal (spontaneous)	Refusal (spontaneous)	Refusal (spontaneous)

[READ OUT]: I now want to ask you some questions about the Covid-19 pandemic and how it has affected you.

ASK ONLY IF B4a=1,8 OR 9

B31. As a result of the Covid-19 pandemic, in your main job were you .....

RANDOMIZE CODES

	YES	NO	DK	Refused
a. Required to take any paid leave?				
b. Required to cut your hours?				
c. Required to take a pay cut?				
d. Furloughed/temporarily stood down with pay?				
e. Furloughed/temporarily stood down without pay?				
f. Made redundant, lost your job entirely or have your employment terminated?				
g. Required to work from home at least some of the time				

PROGRAMMING INSTRUCTION: ASK IF B31g=YES. ELSE GO TO SECTION C.

B32a. How frequently did you need to work at home due to the Covid-19 pandemic?

1- all of the time
2-most of the time
3- some of the time
4- occasionally
5- never
8-Don't know (spontaneous)
9-Prefer not to say (spontaneous)

B32b. Before the Covid-19 pandemic, how frequently did you usually work from home?

1- all of the time
2-most of the time
3- some of the time
4- occasionally
5- never
8-Don't know (spontaneous)
9-Prefer not to say (spontaneous)

B32c. Did you have the necessary ICT equipment to work from home during the Covid-19 pandemic?

1- Yes, I already had the necessary ICT equipment → Go to SECTION C
2- No, I did not have all of the necessary ICT equipment → Go to B32d
8-Don't know (spontaneous)→ Go to B32d
9-Prefer not to say (spontaneous) →Go to SECTION C

B32d. Did you ….?

RANDOMIZE CODES EXCEPT CODE 8 AND 9

1- Make do with what I already had
2- I had to buy some additional ICT equipment with my own money
3 – My employer either provided me with the necessary ICT equipment or paid for or reimbursed me to purchase necessary equipment
4- I borrowed necessary ICT equipment from another person or people (not employer)
8 – Don't know (spontaneous)
9-Prefer not to say (spontaneous)

PROGRAMMING INSTRUCTIONS: ALL GO TO SECTION C

SECTION C: PLATFORM-MEDIATED WORK

PROGRAMMING INSTRUCTION: ASK ALL

C1. Have you ever gained income from any of the following online sources?

SHOW CARD C1

	Yes	No
a. Selling products or your own possessions on online marketplaces *(e.g. Etsy, eBay and others)*	( )	( )
b. Renting out accommodation on online platforms *(e.g. Airbnb, Sharedesk, Nestpick and others)*	( )	( )
c. Leasing out goods on online platforms *(e.g., Turo, PeerRenters and others)*	( )	( )
d. Crowdfunding or lending money on peer-to-peer lending platforms *(e.g. Kickstarter, Indiegogo, Zopa, Prosper, Kiva and others)*	( )	( )
e. Providing services either online or in-person using online platforms or apps *(e.g. Upwork, Freelancer, Clickworker, PeoplePerHour Uber, Deliveroo, Handy, TaskRabbit and others)*	( )	( )

ONLY FOR 100% PW

ASK IF C1e=Yes

C1e3. Is your work on the platform the same "main job" that you mentioned in the previous section?

1- Yes Skip questions: C14, C16, C17, C18

2- No

QUESTIONS FOR POSIBLE PW IN CASE OF CONTINGENCE

ASK ONLY IF C1e = No.

C1e1. You've just said you do not provide services either online or in-person using online platforms or apps, but is there someone in your home who use these online platforms?

1- Yes Ask C1e2

2- No Go to section D

C1e2. Could you please give me his/her name and phone number in case we need to contact with him/her?

INTERVIEWER: ASK AND WRITE NAME AND PHONE NUMBER THEN GO TO SECTION D

.....

.....

IF C1e = No go to SECTION D. IF C1e (YES) ASK C2

C2. What type of service or services have you provided via online platforms?

SHOW CARD C2 – MULTIPLE ANSWERS ALLOWED

	Yes	No
a. Online software development and technology work		
b. Online creative and multimedia work		
c. Online sales and marketing		
d. Online clerical tasks		
e. Online data entry task		
f. Online writing and translation work		
g. Online professional services		
h. Interactive online lessons		
i. Online content moderation		
j. Taxi and people transportation services		
k. Food and other goods delivery services		
l. In-person services		
m. Other [please specify]		

PROGRAMMING INSTRUCTION: IF ANSWERED YES TO ANY OF ABOVE (C2 a-m), GO TO C3. IF ANSWERED NO TO ALL OF ABOVE, GO TO SECTION D.

Card C2 – Types of Online Platform Services with examples

a - **Online software development and technology work**: for example data science, system design, security system, development (such as game, mobile, web, etc.) programming and coding and similar

b – **Online creative and multimedia work**: for example animation, graphic design, photo editing and similar

c - **Online sales and marketing**: for example lead generation ads, posting ads, search engine optimisation, market reviews, website feedback and opinions

d - **Online clerical tasks**: for example customer service, data collection and cleaning, transcription, verification and validation, surveys and experiments

e - **Online data entry task**: for example captcha, object/image classification, tagging, book marking, colour determination, audio and video tagging, voice recognition

f - **Online writing and translation work**: for example blogs, content creation, copy writing, proof reading, editing, translation

g - **Online professional services**: for example accounting, legal, project management

h - **Interactive online lessons**: for example language teaching, interactive consultations

i - **Online content moderation**: for example assessing objectionable material or illegal content, reviewing images, videos and content

j- **Taxi and people transportation services**: for example driving people, moving services and others

k - **Food and other goods delivery services**: for example food delivery and courier services

l**- In-person services:** for example, housekeeping, handy/repair work, beauty services, care services, on-location photography services

C3. When providing the above services, how do you get assigned the task, job or project?

SHOW CARD C3

INTERVIEWER: ONE RESPONSE ONLY.

1 – When logged in/available for work, I am automatically assigned to a task, job or project by the platform
2 – When logged in/available for work, I can decide which tasks, jobs or projects to accept
3 – The client chooses who gets to do the task, job or project after I have posted my details online
4 – I find the tasks, jobs or projects outside of the digital platform. The platform is only used to book specific time slots or appointments
5 – The client directly contacts me or my business (e.g. shop) by phone, email or the web about a task, job or project outside of the digital platform. The platform is only used to book specific time slots (e.g. click and collect) or appointments (e.g. medical hair appointments).
6 – Other – write in: _____
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

C4. For these services, does the online platform or digital app process the payment for the work?

1 - Yes, I get paid via the platform
2 - No, the client directly pays me (the payment is not processed via the platform)
3 – Other – write in: _____
8 – DK (spontaneous)
9 – Refusal (spontaneous)

C5. How frequently have you worked via online platforms or apps providing the services indicated?

READ OUT: Please consider the period of the past 12 months (or since you started working on online platforms or apps, if that began more recently).

1 – Daily or almost daily
2 – At least weekly
3 – At least monthly
4 – At least once during the past 6 months
5 – At least once during the past 12 months
6 – I provided the services more than a year ago, but not in the past 12 months → Go to SECTION D
8 – DK (spontaneous)
9 – Refusal (spontaneous)

PROGRAMMING INSTRUCTION: THE FOLLOWING QUESTIONS ARE ASKED ONLY TO WORKERS WHO PROVIDED A SERVICE VIA PLATFORM AT LEAST ONCE IN THE PAST 12 MONTHS (C5.1-C5.5), ELSE THEY GO TO SECTION D

C6. How many hours per week did you work, on average, via all online platforms or apps in the last month? IF C5.4 or C5.5 add "or the last time you provided a service"?

[ ] enter hours

C7a. Does this time [infill C6 hours] include the time you spent searching for work, updating your online profile and/or promoting yourself online?

1 – Yes
2 – No Go to C7b

C7b. How many additional hours did you spend, on average, during the last month searching for work, updating your online profile and/or promoting yourself online?

INTERVIEWER INSTRUCTION: IF ANSWER IS BELOW ONE HOUR ROUND IT UP

[ ] enter hours

C8a. Could you tell me your average monthly personal net earnings from all work you do via online platforms or apps?

[enter amount] Euros per month

8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

C8b. What proportion of your personal net earnings comes from providing work via platforms or apps?
READ OUT: 0 to 100%, where 50% means around half of your total income comes from providing platform or app work. While 100% means all of your income comes from providing platform or app work.
[0-100] %
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

FOCUS ON MAIN TASK/PLATFORM
ASK IF C2 > 1

C9. On which of the types of service that you provide through online platforms or apps do you spend more of your time?

[Interviewer instruction: If they spend an equal amount of time on more than one platform or app, please ask them to select one to focus on for the next questions]

PROGRAMMING INSTRUCTION: INFILL PULL DOWN LIST FROM C2=YES. ONLY ABLE TO SELECT ONE.

Main task

a. Online software development and technology work
b. Online creative and multimedia work
c. Online sales and marketing
d. Online clerical tasks
e. Online data entry task
f. Online writing and translation work
g. Online professional services
h. Interactive online lessons
i. Online content moderation
j. Taxi and people transportation services
k. Food and other goods delivery services
l. In-person services
m. Other [please specify]

READ OUT: THE NEXT QUESTIONS REFER TO YOUR TYPE OF MAIN SERVICES AS [TASK selected in C9]

READ OUT: BASED ON YOUR LAST ANSWER, THE NEXT QUESTIONS REFER TO YOUR TYPE OF MAIN DIGITAL SERVICES AS [TASK selected in C9]

C10. What is the name of the <u>main</u> platform or app that you use to provide this service?
INTERVIEW INSTRUCTION: If clearly does not sound like a platform or app ask for clarification on the activity done. If necessary, list some examples of platform names (e.g. Uber, TaskRabbit, Lyft) to check whether they do platform work or not.

_____

INTERVIEWER INSTRUCTION: IF ABSOLUTELY CLEAR THEY DO NOT DO PLATFORM WORK:
[interviewer check] do not do platform work → GO TO SECTION D. ALL ELSE CONTINUE:
C11. How many hours per week did you work, on average, through <u>this [main] platform or app</u> in the last month?
[ ] enter hours

C12a. During the past month, did you also provide the <u>same service</u> through another/or more than one <u>other similar platform or app</u>?

1 – Yes — Go to C12b
2 – No — Go to C13

C12b. In total, how many different platforms or apps did you provide this same service through in the last month?

[ ] enter number must be higher than 0

IF C12b > 1

INTERVIEWER READ OUT: NOW WE WILL FOCUS ON THE SERVICES YOU PROVIDE FOR THE MAIN PLATFORM OR APP

C13a. When you work through this [IF C12b > 1: main] platform or app, how is your work schedule normally set?

ONE ANSWER ONLY

1 – It is mostly set by the platform/app
2 – It is mostly set by the client(s)
3 – It is mostly set by myself
4 – Other – specify _____
8 - DK/no opinion (spontaneous)
9 - Refusal (spontaneous)

C13b. Are the services you provide through platform or app automatically allocated to you by the platform or app?

1 - Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

ASK ONLY IF C1e3=No

C14. Normally, when providing services through this platform or app, how often do you work…?

READ OUT 'A' – 'D' – TYPE IN NUMBER – ONE ANSWER PER LINE.

SHOW CARD C14 (WITH WORKING DAY ARRANGEMENTS AND SCALE)

	Always	Often	Sometimes	Rarely	Never	Don't know	Refused
A. – at night, for at least 2 hours between 10.00pm and 05.00am?	1	2	3	4	5	8	9
B. – on Sundays?	1	2	3	4	5	8	9
C. – on Saturdays?	1	2	3	4	5	8	9
D. – more than 10 hours a day?	1	2	3	4	5	8	9

ASK ONLY IF C1e=Yes

C15. Please tell me, when providing services through this platform or app, does your work involve short repetitive tasks of less than…

INTERVIEWER: READ OUT 'A' – 'B' – ONE ANSWER ONLY PER LINE! IF NECESSARY, SPECIFY THAT WE MEAN TASKS AND NOT MOVEMENTS SUCH AS CLICKING THE MOUSE BUTTON.

	Yes	No	DK	Refusal
A – 1 minute	1	2	8	9
B – 10 minutes	1	2	8	9

ASK ONLY IF C1e3=No

C16. Generally, when you provide services through this platform or app, does the work involve…

SHOW CARD C16 – READ OUT 'A' TO 'F' – ONE ANSWER ONLY PER LINE.

	Yes	No	DK	Refusal
A – meeting precise standards of work	1	2	8	9
B – assessing yourself the quality of your own work	1	2	8	9
C- solving unforeseen problems on your own	1	2	8	9
D- monotonous activities	1	2	8	9
E- complex activities	1	2	8	9
F- learning new things	1	2	8	9

ASK ONLY IF C1e3=No

C17. When you provide services through this this platform or app, are you able to choose or change…

INTERVIEWER: READ OUT 'A' TO 'C' – ONE ANSWER ONLY PER LINE

	Yes	No	DK	Refusal
A – The order in which you do things?	1	2	8	9
B – the methods you use or ways you do your work?	1	2	8	9
C- your speed or rate of work	1	2	8	9

ASK ONLY IF C1e3=No

C18. To what extent do you agree or disagree with the following statements?

	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not applicable	DK	Refused
a. You can take a break when you wish								
b. You can interact and communicate with your manager when you need to								
c. You can interact and communicate with your peers when you need to								
d. You experience stress in your work								

ASK ONLY IF C1e=Yes

C19. Is your access to work projects, tasks or shifts for the services you provide through this platform or app dependent on any type of ratings or performance metrics?

1 – Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

C20. Will your access to projects, tasks or shifts for the services your provide through this platform or app be automatically restricted, or possibly terminated, if you do not maintain a certain rating, score or performance metric?

1 – Yes
2 – No
7 - Not applicable (spontaneous)
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

C21. On what basis do you get paid for your work on this platform or app?

READ OUT: IF SEVERAL METHODS APPLY, SELECT THE ONE WHICH IS MOST COMMON.
INTERVIEWER ADD IF NECESSARY: IF PEOPLE GET PAID WEEKLY/MONTHLY BUT BASED ON THE NUMBER OD TASKS/RIDES ETC, THEY SHOULD SELECT CODE 1

1 – per task, item or gig
2 – per hour
3 – per project
4 – I am paid a fixed amount either daily, weekly or monthly regardless of how many tasks or hours I work
5 – Other – [write in] _____
8 - DK/no opinion (spontaneous)
9 - Refusal (spontaneous)

C22a. Could you tell me your personal average monthly net income from the paid services you provide through this this platform or app?
[enter amount] Euros per month
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

C22b. What proportion of your personal total net income comes from providing these paid services through this platform or app?
INTERVIEWER: EXPLAIN WELL THE % OF MONEY IS COMING ONLY ABOUT THE "MAIN PLATFORM" NAMED IN QUESTION C10
READ OUT: 0 to 100%, where 50% means around half of your total income comes from providing services to this [main] platform or app. While 100% means all of your income comes from providing services to this [main] platform or app.
[0-100] %
8 – DK/no opinion (spontaneous)
9 – Refusal (spontaneous)

[READ OUT]: I now want to ask you some questions about the Covid-19 pandemic and how it has affected you.
C23. As a result of the Covid-19 pandemic, did you .....
RANDOMIZE CODES

		YES	NO	DK	Refused
a.	lose other regular income so you started doing platform or app work for the first time?				
b.	have to buy new technology so you could do platform or app work? E.g. laptop, printer, mobile phone, tablet				
c.	have your hours/pay cut in another job so you increased the number of hours doing platform or app work?				
d.	lose other regular income so you increased the number of platforms or apps you work for compared to before Covid-19				
e.	stop doing platform or app work, for at least some time, because you were worried about the risk of getting Covid19?				
f.	stop doing platform or app work, for at least some time, because of government restrictions				
g.	start doing platform or app work, for at least some time, because there is now more demand				

SECTION D: UNPAID DIGITAL LABOUR

ASK ALL

INTERVIEWER READ OUT: THE NEXT QUESTIONS ARE ABOUT YOUR **UNPAID** ONLINE ACTIVITIES. MULTIPLE ANSWERS ARE POSSIBLE

D1. In the past 12 months, have you ever ....

RANDOMIZE CODES

	Yes	No	DK	Refusal
a. **Written posts for social networks** (e.g. Facebook, Twitter, etc) aimed at people outside your family or close friends				
b. **Produced photos, videos or audios to be shared online with people outside your family and close friends** (e.g. posting videos on googlephotos, youtube, instagram, tiktok)				
c. **Written blogs or other long pieces of text/articles to be shared online**				
d. **Participated in online forums** (e.g. Reddit or technical forums)				
e. **Written public consumer reviews for websites and/or apps** (e.g. google, booking.com, tripadvisor, trustpilot, IMDB, goodreads)				
f. **Written text or other content for collaborative information websites** (e.g. Wikipedia)				
g. **Collaborated in voluntary projects coordinated from a website or an app, such as free software development?** (e.g. Mozilla, R)				

IF NO IN ALL D1a-g GO TO END STATEMENT

ASK IF YES to at least one D1a-g

D2. During the past 12 months, how often did you do this?

INTERVIEWER READ OUT: Please consider the period of the past 12 months (or since you started doing this, if that began more recently).

1 - Daily or almost daily
2 - At least weekly
3 - At least monthly
4 - At least once every 6 months
5 - At least once during the past 12 months
6 - I provided services more than a year ago, but not in the past 12 months
8 – Don't know (spontaneous)
9 – Refused (spontaneous)

D3. On average, how much time, on average, each week did you spend doing this?

[ ] minutes (if less than 60 minutes)

or

[ ] hours

or

[ ] days

D4. What is/are the name/s of the webs or apps (platforms)?

_____

D5. What motivates you to do this?

RANDOMIZE CODES EXCEPT OTHER

INTERVIEWER READ OUT – MULTIPLE ANSWERS ARE POSSIBLE

	Yes	No	DK	Refusal
Peer recognition/social interaction/communication				
Self-promotion (publicity for myself, my services, or my products/art)				
Fun				
General benefit to society/help others				
To gain experience				
Chance to win gifts/lottery				
Mutual exchange, barter				
Unpaid work experience in order to get future income				
Other – [write in]				

D6a. Can I just check whether you received any kind of non-monetary reward (free products, commissions, royalties, money, etc) for this online activity?

1 – Yes → GO TO D6b
2 – No → GO TO END STATEMENT
8 – Don't know (spontaneous)→ GO TO D6b
9 – Refused (spontaneous) → GO TO END STATEMENT

D6b. Did you ….

1 – Receive free products
2 – Receive commission or money from in-site advertising
3 – Receive royalties or commission based on the number of views/followers
4 – Other – [write details]
8 – Don't know (spontaneous)
9 – Refused (spontaneous)

ASK ONLY IF A4a=NO (NO SPANISH BORN IN SPAIN, NO GERMAN PEOPLE IN GERMANY)

A4c. Finally, keeping in mind that this information will remain confidential, anonymised and used only for statistical purposes, do you have all the necessary (legal) documents to live and work in this country ?

1- Yes
2- No
3. Prefer not to answer (spontaneous)
4. DK (spontaneous)

END STATEMENT: THANKING FOR PARTICIPATION

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