

Emerging Digital Labor: Literature Review and Research Design



Abstract

The key players of the platform economy (e.g., Uber) represent the 21st century form of capitalism, which has the following key dimensions: 1) supported by patient capital, 2) network effects, 3) focal role of consumers. The paper outlines the major characteristics of changing labor, focusing on the platform work in a European context. This study employs a mixed approach: there is a literature review about platform economy and platform work, a methodological examination of the research objective, and the preliminary results of semi-structured interviews with workers in the platform economy. The results of the study clarify some key characteristics of digital labor, in particular platform work, and it lays out the research design of a European research project (<https://crowd-work.eu/>), which focuses on organizing digital workers in Europe.

Keywords: platform economy, on-demand workforce, crowd work, future of work

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INTRODUCTION

Digitalization brings about both social-economic and cultural changes at the same time. One of the critical drivers is increasing computing power. According to Moore (1965), the number of transistors on a dense printed circuit can double every 24 months. The other key driver is the growing role of data. McAfee and Brynjolfsson (2012) stated that in 2012, 2,5 exabytes of data were created every day, and this volume would be doubled every 40 months. As mentioned in a study by Domo (2018), “data never sleeps,” they estimated that in 2020 there would be 1,7MB data created by every person in every second.

There are two major development areas of digitalization: Industry 4.0 and the platform economy. Industry 4.0 is about the digitalization of industrial technologies to increase efficiency and productivity of these technologies. Industry 4.0 is about executing the same processes, albeit much faster and with less waste in the process. The general implementation of this technology-centered approach seems to be necessary and decisive without any alternatives for the competitiveness of national economies. However, the “only question if its socially acceptable design remains to be answered.” (Kopp et al., 2016, 7)

The platform economy can be viewed as a disruptive change in the capitalist economy: it is radically reshaping the traditional economic models of value chain. The platform economy is a peer to peer model, where a platform company connects the parties for content, goods, or service provision over the internet. Compared to Industry 4.0, the novelty of the platform-based business model lies in its ability to trigger entirely new eco-systems.

Contrary to the widespread general view, platform companies are not merely matchmakers in the concerned peer to peer (P2P), business to clients (B2C) and business to business (B2B) relations, but they also create new markets for a great variety of services, which did not exist before the appearance of the platform economy. The platform economy covers a variety of activities, such as search, sales and marketing (Google, Facebook, Instagram), broadcasting (YouTube, TikTok), funding (Kickstarter), banking (WeChat), travel (Uber, Lyft, Bolt, Airbnb), food delivery (Wolt, NetpincerGo), labor services (TaskRabbit, Gig Smart, Upwork), and logistics (Amazon).

Besides market creation, platforms may result in game-changing models in the 1) value creation (i.e., owning assets to granting assets), 2) governance structure (i.e., from make-or-buy to employ-or-enable), 3) management (i.e., from back-end-to front-end), and 4) labor (i.e., from jobs to gigs) (Grabher-van Tuijl, 2020). Our research focuses on the fourth dimension, in other words, the role of digital labor (platform work) and the labor process.

The next section outlines the critical features of the platform economy. The third section presents the main characteristics of the platform work. Section four assesses the literature review results, presenting Uber's emblematic case and insisting on the visible cross-country differences. The fifth section is focusing on the research design of the "CrowdWork21" European research project. The paper provides conclusions and indicates some future research challenges.

1. PLATFORM ECONOMY: "PATIENT CAPITAL," "NETWORK EFFECTS," AND "FOCAL ROLE OF CONSUMERS"

Platform economy stems from the sharing economy models, in which the exchange of services and goods happens in a peer to peer relationship. It is a new type of economy besides the traditional B2B and B2C relations. This means that these firms strengthen the characteristics of the 20th century's Network of Contract Firms. In this relation, Rahman and Thelen (2019) rightly stress the following three social-economic enablers of platform firms:

- These firms are supported by a more "patient" form of capital. Unlike the "break it up and sell it off" mentality of the 1990s, the financial interests behind firms, such as Uber and Amazon, are in it for the long haul. The financialization as a driver of their growth based "... on the assumption of

attracting a sufficient mass of users to occupy a monopoly position and then monetize their cusses ... very high capital gain will compensate for all the other risky investments most of which are not profitable.... Airbnb became profitable only in the second half of 2016.” (Montalban et al., 2019, 5, 14)

- “... network effects are the *sine qua non* of the platform firms. The central goal is to secure a level of market dominance and concentration that will ultimately vindicate investors’ patience.” (Rahman-Thelen, 2019, 180)
- “Consumers figure centrally not just in the platform firm’s market strategies but in their political strategies as well ... enjoy a much more direct and unmediated link to their users, most of whom connect to these firms through devices they carry in their pockets every day.” (Rahman-Thelen, 2020, 179-180)

In this paper, we refer to the expression “platform” as a digital platform that enables a peer to peer connection between – both individual and organizational - sellers and buyers of services or goods. By using the information and computing technology (ICT), platform firms make the information available for both clients and service providers. However, in exchange for this service, a certain percentage of the value of the work is requested as a fee for the platform (e.g., Upwork requires 20 per cent commission fee for their services from the workers’ income) (Grabher-van Tuijl, 2020).

2. PLATFORM WORK: HETEROGENEOUS LABOR MARKET AND TASK STRUCTURE, RATING AND RANKING AS TOOLS OF THE OUTSOURCED MANAGEMENT CONTROL

2.1. HETEROGENOUS LABOR MARKET AND TASK STRUCTURE

According to Reich (2015), the platform economy is the biggest change in the American workforce in a century. Supporters of the technology-oriented innovation stress that platform work has a promising “bright” future, where the demand of the next-generation workforce for independence and flexibility is matched with client hunger for the 24/7 working culture of a global, on-demand workforce. Others, representing the multi-sided view focusing on people as much as on technology think that there is a risk of erosion of quality work, which may have an unfavorable long-term impact on innovation and productivity (Makó-Illésy, 2020; Warhurst, 2020).

Concerning the labor market, it is worth making a distinction between Online Labor Market (OLM) and Mobile Labor Market (MLM). The OLM means that the client and worker have a distant relationship; the work is performed, assessed, and financed online (Upwork, Fiverr, Amazon Mechanical Turk (AMT)). In the case of

MLM, the contact between clients and service providers is mediated by the platform, but the service is carried out personally (e.g., Uber, Wolt, Bolt.eu, Oszkár). Other critical dimensions of platform work are work duration (micro vs. macro work) and skill requirements (high vs. low); these characteristics are described in Table 1.

Table 1 Types of Labor Markets and Platform Work

Characteristics of platform work	Online Labor Market (OLM)		Mobile Labor Market (MLM)	
	Electronically transmittable tasks		Services requiring personal presence	
	Micro-tasks	(Mini) Projects	Physical services	Interactive services
Duration	Short	Long	Short	Long
Skill level	Low-to-Middle	Middle-to-High	Low	High
Dominant form of transactions	Peer-to-Business	Peer-to-Business	Peer-to-Peer	Peer-to-Peer
Types of platforms	Amazon Mechanical Turk	Upwork	Uber	TakeLessons

Source: Codagnone et al. (2016, 7); Pajarinen et al. (2018, 5) – In: Makó et al., (2020, 152)

While platforms solve specific technical or informational problems, they also create new ones (e.g., precariat), especially for those gig workers who leave their ordinary work arrangements and engage in platform work as a full-time worker (Thelen, 2019).

Hicks (1963, 65) determined the following about the labor market “... although this market is one of the most imperfect with which we have to deal, demand and supply do influence wages even here, in however halting and irregular a fashion”. As Hicks (1963) stated, demand and supply influence the wages of the workers. However, the online labor market is different compared to the traditional job market. In the traditional job market, most of the demand comes from for-profit firms; these firms use their sales and operational plans to calculate the labor demand and hire or lay-off employees based on the calculated results on top of their general workforce. Therefore, the demand for the firms’ goods and services indirectly affects the demand for labor. While in the platform economy, the labor demand is straight market demand. The demand for goods and services relates directly to the labor demand and the price of labor. There is no mechanism or organization to smoothen the market demand; therefore, the wages reflect the real-time market value of the job.

In the case of Wolt, if operation managers see that the weather forecast is bad, e.g., heavy rain or snow, they expect clients to order more food as they will not go out to eat. At the same time, the food carriers are less likely to turn on their applications as they would also like to avoid having to ride a bike. The demand will exceed the capacity of food delivery through the Wolt application. In this case, the

operation managers introduce a so-called “surge price” to motivate the workers to work for a few hours and to fulfill the service deadline of 30 minutes for every food delivery; based on what Wolt is charging its customers. Wolt informs their workers of surge pricing through every possible channel, e.g., their application, SMS, and the social media. A similar surge pricing model works for UBER as well^[1].

Platform companies distribute the market demand among platform workers. Thus, they aim to have a mechanism to cope with the fluctuation of demand and supply, especially incentivizing workers in case of upsides in demand.

Another significant difference between traditional employment and platform working practices is management control (Wood et al., 2019). In the early days of the platform operation, there was no systematic recruitment process in the case of platform workers; they downloaded the given platform’s application, enrolled as a worker, and settled down to work. Nowadays, the platforms rely on a better structured recruitment process. When a future candidate enrolls, Upwork checks the applicant’s skills and expertise to approve the Upwork profile. If they do not see demand for the types of profiles, the platform refuses the candidate. Wolt holds a half-day event for new workers as part of their recruitment and onboarding process.

2.2. RATING SYSTEM FOR QUALITY MANAGEMENT

During the operational phase, the platforms use rating systems as a *form of managerial control*. There are several forms of rating systems, but most platforms utilize the 5-scale method. For example, Bolt asks the passenger as well as the driver to rate each other. A rating system may be used as a constant quality assurance tool. At Uber and Bolt, taxi drivers are locked out of the application (so they cannot work anymore on the platform) if they fail to reach a given rating level. At Uber, if the rating of the drivers goes below 4.6 on the 1-5 scale, they can be dismissed from the Uber application, the details of the calculation method are not shared with them. There is no explanation of the system, while the drivers are surveilled constantly through the application (Kobie, 2016).

Wolt uses the 5-scale rating system; the customer is asked to rate both the restaurant and the food carrier. In case the rate is lower than 5, a customer service agent contacts both the food carrier and the restaurant. Sometimes, it may result in the termination of the contract with the carrier or the restaurant.

Upworkers also receive a rate from their clients using a 5-scale rating. Moreover, there is an opportunity to submit a written feedback report. During the interviews of our CrowdWork21 project, the rating system turned out to be the most crucial tool of controlling the workers. They make an effort by going beyond the standard services that the platform company requests from them.

At Upwork, during the hiring process, a future client may review every worker’s completed jobs to date, all the ratings and written feedback, and even screen-

[1] <https://www.uber.com/us/en/drive/driver-app/how-surge-works/>

shots of the jobs completed. It improves the client's faith while hiring a platform worker but also functions as an efficient tool of the platform (managerial) control.

Some platforms ask the workers as well to rate customers; in case of Upwork and Bolt, if the customer's rating is low (according to the interviews, lower than 4), workers refuse the client's future contract. While human resource managers (HRM) in the traditional world of employment struggle to find the right performance management technics, the platform companies use direct customer/client assessment as a quality and performance control tool. In addition, they use technology to measure and manage workers' performance as well.

2.3. "COLLECTIVE SUPERINTELLIGENCE"

Platform companies identify themselves as IT companies. They provide technical solutions for their partners and their partners are both clients and workers. Upwork provides communication space to build a community in order to solve conflicts between clients and workers. It represents the outsourcing of conflict resolution by platform management.

Bolt, Wolt, and Uber use mobile devices to have real-time information about the worker's position, a machine learning algorithm to define the best solution for an upcoming request, and mobile-payment solutions to manage financial transactions. As Morschhauser et al. (2018) state, the platform companies use the technology to reach out to many people and distribute problem-solving.

In the case of Bolt, Wolt, and Uber, the platforms' algorithm forms a "collective superintelligence" (Bostrom, 2014) with the worker. Machine and human work together when it comes to task allocation, performance management, wage management, and quality assurance. The task allocation and wage management algorithms are a rare form of Artificial Intelligence when acting as a manager of the human worker.

In the platform economy, traditional labor practices and labor economic models are changed; hence platform working is considered an atypical work arrangement. There are examples of very high quality and very laborious work that has been done by people without any payment in exchange for their efforts, such as the development of Wikipedia or the operating system Linux (Malone, 2004). In these cases, the firms (Wikipedia and Linux) secured a platform and created a cause for professionals to contribute without any remuneration. They are true examples of the power of platforms.

There are also examples of elementary work for a minimal remuneration, such as micro-tasks on Amazon Mechanical Turk (AMT). Even though these micro-tasks seem to be easy and cheap; some are used in large scale Artificial Intelligence development projects. Thus, they are very valuable. There are also examples of people wanting to take on extra jobs besides their full-time jobs and perform gig work on the side.

The common theme in the aforementioned types of work, e.g., volunteering to something meaningful, doing micro-tasks for passing the time, or performing jobs on the side, is that the worker's engagement is different compared to ordinary work arrangement. The worker has more control over the work schedule, the number of working hours, the type of work, and the clients they work for. On the other hand, workers sacrifice job security, allowances, paid holiday/sick leave in exchange for the freedom of choice. The benefits that employers provide for their employees are either because of regulations or because of their interest in keeping their employees in their organization. The trade-off between freedom of choice and sacrifice of the corporate safety net is critical in the platform economy.

The above-described issues and the labor process, i.e., the job content, working conditions, employment conditions, and collective voices, are core topics of the CrowdWork21 project^[2]. Before presenting the project design, we intend to give a summary of the outcomes of the literature review on platform work.

3. LITERATURE REVIEW: LACK OF TERMINOLOGY CONSENT AND VARIETY OF RESEARCH FOCUS

The platform economy is a trending topic in the academic field, primarily due to the technology involvement in the platform mechanisms, and the most substantial market capitalized firms are platform companies (Brynjolfsson, 2019).

The terms of 'gig economy', 'sharing economy', 'collaborative economy', and 'platform economy' have spread quickly since the foundation of such well-known global digital platforms, such as Uber, Upwork, and Amazon Mechanical Turk (AMT). The availability of digital data and smartphones are the most crucial factors that enabled the birth of platform economy (Montalban et al., 2019).

Despite the abundance of terms, there is no commonly used terminology. In the USA, the majority of papers use the term "gig economy". In Europe, the term "sharing economy" and more recently "platform economy" have become popular. In the research project CrowdWork21, the research consortium of four countries (Hungary, Germany, Portugal, and Spain) agreed to use term "platform work".

Based on a systematic literature review, the following seven research areas could be distinguished:

- Disruption of business and labor market,
- "Platformization" of work,
- "Servitization" of commerce through platforms,
- Working and employment conditions of platform workers,
- The technology infrastructure of platforms,

[2] Website: <https://crowd-work.eu/>, Facebook: <https://www.facebook.com/CrowdWork>, Twitter: https://twitter.com/crowd_work21

- Regulation of platform work (i.e., dis-embeddedness or re-embeddedness process), and
- Future of digital work.

The existing literature covers predominantly the USA and Europe (particularly EU-15 countries) from a geographical dimension. However, the academic performance in Asia has been increasing at an impressive rate; the number of articles related to Asia is minimal, although platforms in this region, such as ZBJ.com, operate on a large scale. They provide services for micro, small, and medium enterprises by 13 million platform workers and have 6 million clients.

According to Manyika et al. (2016), being a gig worker is more complicated than the positivists would think. Based on the study of McKinsey Global Institute, a large portion, about 30% of 8,000 interviewed independent workers in the USA and Europe, chooses this form of work by necessity^[3].

Frequently quoted papers focus on the issues of institutional embeddedness and the regulation of the platform economy. These papers question the narrow technological presentation of the platform companies as being a pure “match-maker”. “Platform operators insist on the role of neutral intermediary that solely matches the supply of and demand for independent contractors ... platform operators seek to avoid basic entitlements resulting from employment contracts – like social security, minimum wages, as well as work time and security regulations.” (Grabher-van Tuijl, 2020, 9)

In this relation, it is worth calling attention to Thelen’s (2018) analysis on an interesting international comparison on Uber’s institutional regulations of personal transport (taxi) services in several countries. She contrasted Uber’s rapid success in the USA with its failure in Germany and compromised based on its operation in Sweden. Assessing the role of institutional regulation and social actors, Rahman and Thelen (2019) insist that in the USA, platform companies successfully developed a strong alliance with consumers, which strengthened their position while running their operations. Moreover, these companies became rather quickly too important and too large to be just regulated by authorities.

After exploring the empirical experiences in the literature, Uber related analyses take the lion’s share compared to all publications related to other platforms. The reasons are the following: Uber has received by far the most significant venture capital investment to date (~60BUSD); there were 3,9 million Uber drivers in 2018, these drivers worked in 63 countries and 700 cities, and they completed 14 million trips each day^[4]. Uber also explores other industries besides taxis, such as food delivery, corporate or business mobility solutions, freight transportation, health services, urban air mobility, and advanced technologies. It is not by chance

[3] <https://www.mckinsey.com/featured-insights/employment-and-growth/independent-work-choice-necessity-and-the-gig-economy>

[4] <https://www.uber.com/en-GB/newsroom/company-info/>

that many articles dealing with the digital platforms resulted in disruption in the capitalist economy, often using the label of “Uber-ization” of the economy (Grabher-van Tuijl, 2020; Thelen, 2018).

Some comprehensive international comparative surveys on platform work in Europe will be briefly presented in the next section of “Methodology – Data Collection”. The results of these surveys call attention to the so-called “knowledge asymmetry” phenomenon within the EU. In the EU-15 countries, there is a knowledge asymmetry between the Northern and Southern European countries, and between the “Old” and “New Member States” (NMS). However, there are some important projects carried out in Serbia (Andjelkovic et al., 2019), in Hungary (Meszmann, 2018), and in Slovakia (Sedlakova, 2018). On the positive side, Hungarian scholars are involved in several recent EU supported projects (Kun-RÁCz, 2019; Makó et al., 2020).

4. FILLING THE KNOWLEDGE GAP: OUTLINE OF THE “CROWDWORK21” INTERNATIONAL PROJECT

It is necessary to mention the four-country research consortium project called “CrowdWork21” involving Hungary, Germany, Portugal, and Spain.

The aim of the project is to map the existing and emerging new forms of interest representation (“collective voice”) of platform workers. Identification of new trajectories of interest articulation requires an unorthodox and innovative approach towards labor relations. For example, according to our prior experiences with the platform workers carrying out “high-quality knowledge-intensive projects” (e.g., developing for Artificial Intelligence algorithms), the “Customer Service” portfolio of Upwork fulfills a crucial role of “grievance management” or conflict treatment between platform workers (freelancers) and clients. “Grievance management” at traditional firms represents the process by which HR departments of companies handle various types of employee-complaints. In the case of platform firms - usually regarding themselves as neutral intermediaries matching supply and demand - it would be a new platform function or “enrichment” of the standard responsibility of the “customer service”. Creating this dispute resolution system or a kind of “caring management” about the platform worker complaints could give birth to a new form of interest reconciliation in the platform economy. This is not a new “role enrichment” practice to solve worker grievances to avoid the unionization at workplaces that took place in the early 20th century by the Human Relations Departments at the large U.S. companies.

The CrowdWork21 project aims to collect fieldwork (empirical) experiences regarding the following:

- Nature of platform work (i.e., micro-task vs. macro task, high-skilled vs. low-skilled jobs),
- Working conditions (i.e., autonomy in working time setting, incentive system (rating-ranking practice))

- Employment status (i.e., entrepreneurs, freelancers, contractors)
- Platform as a neutral intermediary or/and slowly engaging in employers' responsibility (e.g., the recent decision of the "Just Eat" platform company to stop using gig workers (Josephs, 2020)
- A collective voice and interest representation (i.e., the role of trade unions or emerging grassroots organizations, movements of blog writers, new global employers' initiatives (World Economic Forum, 2020).

4.1. METHODOLOGY AND DATA COLLECTION: PREFERENCE TO A CASE STUDY APPROACH

To better understand both generic and country-specific characteristics of platform work, it is advisable to mix the survey method with a case study approach.

Among the European platform work surveys, it is worth mentioning the following international ones:

- The "Collaborative Economy Research Project" (COLLEEM) survey covers 14 EU member states. Its ambition was to measure the size of platform workers among internet users (2017–2018) (Pesole et al., 2019).
- "Platformisation of Work in Europe" survey was carried out in 11 EU countries. This survey primarily aimed to identify the frequency and income generation effects of this kind of work (2016–2019) (Huws et al., 2019).
- "Digital Labor in Central and Eastern Europe: Evidence from the ETUI Internet and Platform Work Survey" - (2018–2019). This survey covered both internet-based (web and mobile application) and platform work and measured the frequency and contribution of platform work to monthly income (Piasna-Drahokoupil, 2019).

The above-mentioned European surveys were useful to receive a cross-country snapshot of the distribution of platform workers and their general characteristics (e.g., the regularity of platform work, income generation capability, socio-demographic characteristics of people involved, etc.). However, the survey method could not gain insights into the complexity of this new form of work: task-structure and content, functioning of the rating system as a form of managerial control, grievance solutions mechanism, and articulation or lack of the collective voice mechanisms.

To better understand how platform work is embedded into its social-economics and institutional context, qualitative research tools seemed to be more suitable for the international consortium members as a research tool. According to Yin (2009), a case study is preferable in case of how or why inquiries, if the researcher's control is limited. If several case studies are combined, it is a collective-case, multi-case, or multi-site study (Stake, 1995). The individual cases share a common characteristic or condition. The cases in the collection are somehow categorically bound together. They may be members of a group or examples of a phenomenon (Stake, 2006; Tomory, 2014).

Besides systematically reviewing the academic and gray literature, the core research tool of the CrowdWork21 project will be the “multi-case study”. Each consortium member has to conduct interviews with stakeholders (i.e., platform workers, platform operators, officials of interest representative organization, and representatives of the grassroots organization) related to the selected platforms. Each research consortium country (Hungary, Germany, Portugal, and Spain) agreed to create case studies of at least four comparable global or national platforms representing the Online Labor Market (OLM) (e.g., Upwork) and Mobile Labor Market (MLM) (e.g., Wolt).

The Hungarian research team (Centre for Social Sciences at Eötvös Loránd Research Network, Budapest in cooperation with – SzEEDSM Doctoral Program in Business Administration at Széchenyi University, Győr) is planning to carry out case studies regarding the following platforms:

- Upwork (global, “high-end” digital platform)
- Wolt (European food delivery platform)
- Bolt (European taxi service platform)
- Oszkár (Hungarian ride-sharing platform)
- Click-for-Work (Hungarian micro-work platform)

4.2. CHARACTERISTICS OF INTERVIEW DESIGN: PRE- AND POST-INTERVIEW PROCESS

During this research process, four types of stakeholders were interviewed: 1) workers, 2) trade unionists, 3) associations/movements of workers, 4) association/movements of owners, or platform operators. The aim of selecting a variety of stakeholders is to get a comprehensive understanding of the platform work.

In order to have a well-designed interview structure, a checklist was created for each type of interview developed for various stakeholders. The first version was created during the project team meeting in Barcelona in 2019; several iterations were in the four country teams. Each team tested the initial version and added or modified the original questions. Once a national team was ready, a new checklist was shared within the entire research consortium. The checklist was verified, and a new version of the checklist was released after the list of questions and structure was finalized; there were seven versions until the final form. Versions five and seven of the checklists were tested with real interviewees to verify if it resembles the research objectives.

The critical challenge is to retrieve the information and structures from the interviewee correctly; while it has to have proper flow, it cannot take too much time. Otherwise, the interviewee will be lost. These nuances cannot be handled theoretically; empirical tests and verification of the research tools (i.e., questionnaire template) are inevitable.

Since the core methodological aim of this project is to collect comparable data, the critical challenge was to create a common language and terminology for the

consortium member countries. Each national team finalized their research checklist, iterated them in their local language, and translated them into English when submitting to the research consortium. The four-country teams ended up with the same list of questions and interview structure created collaboratively with several iterations via repeated video conferences.

Due to the COVID-19 pandemic, Microsoft Teams was used for recording the interviews. The interviewees agreed on being recorded during the interview. The interviews were carried out in Hungarian. The interviewer recorded the interview with Microsoft Teams, and created notes, asked further questions that were not on the checklist. Once the interviews were ready, the document with the notes and the recorded video could be uploaded into Atlas.ti for interpretation and coding purposes.

In the Hungarian team, each team member reviewed the interview results and created a summary of the interviews. These summaries were then sent back to the interviewer, so the interviewer could see whether the reflection of the other team members -who were not present during the interview - resembles the essential parts of the interview and if there were unclear items and misinterpreted texts by the interviewer, there was a possibility for further discussion and to reach consent on the content of the interview.

Based on the empirical evidence learned from the interviews and relevant knowledge collected from documents (e.g., Upwork Annual Report), the case studies are edited and integrated into a national fieldwork report. These national reports are the basis for further issues (e.g., working conditions, management control, collective voice) within the CrowdWork21 project. The comparative reports related to these issues certainly reflect the impact of the cross-country differences in employment regimes, technological and social infrastructure, and the stakeholders' interest and value systems in the four countries involved in this European project.

5. CONCLUSION AND FUTURE RESEARCH CHALLENGES

Firstly, the authors aimed for a systematic literature review of the platform economy and the role of labour. Then illustrating the impacts of the national institutional regulations; using the case of an emblematic platform company: Uber. The final research objective was to present an ongoing EU research project entitled "CrowdWork21".

The present study leads to several conclusions and outlines some future research challenges. First, it should be emphasized that the platform-based business model represents the 21st century form of capitalism. The ICT driven change in the *techno-economic paradigm* (Perez, 2009) has several outcomes. Among the well-known consequences, it is necessary to mention the hypes of the Industry 4.0 or recently the Industry 5.0 and the platform economy. Our paper outlines some features of the platform economy. Patient capital, network effects, and alli-

ance between platform operators with consumers are the key features of this platform economy. This economy is transforming the current practice of value creation, governance, management, and labor.

Second, the platform economy represents a disruptive change compared to the late 19th century firms in both organizing economic activities and markets. As mentioned above, in the 21st century, these functions will be practiced by the platform. *Patient capital* supports platform companies unlike the traditional firms where the shareholders are interested in the quarterly profit increase only. The network effect is the sine quo non for these companies, and their diffusions are supported by the close alliance between platform owners (entrepreneurs and venture capitalists).

In terms of illustrating the extremely fast growth and mega-character of the platform companies it is enough to mention the following example: Google, the platform economy giant, which, despite its 2014 revenues of 66 billion USD, had only 50,000 employees^{[5],[6]}.

The third important conclusion of this study concerns the *heterogeneous character of platform work*. Contrary to such a label as “crowd work”, platform work covers high-skilled vs. low-skilled, micro-tasks vs. macro-task, high-paid vs. low-paid, and self-employed vs. contract workers. Therefore, our paper challenged the use of “crowd” terminology and suggested using the term “platform” work (or digital labor). In this relation, we share the position of Pongratz (2018, 59) claiming, “Though large numbers of workers are involved in the global online labor market, there is some evidence that they are addressed as individual experts rather than as an anonymous mass of people”

As a fourth conclusion – there is *no consensus* in the scientific community about the *terminology* – despite the great number of terms used on digital work (e.g., gig work, digital labor, crowd work, platform work, online labor). It is also important to emphasize the *systematic knowledge shortage* and the unbalanced nature of the research experiences in the digital labor market. For example, there is a knowledge within EU-15 (Northern vs. Southern countries) and between the Old and New Member States (NMS) of the European Union. Even in these circumstances, we may assert that platform work represents a fast-growing but still residual form of employment globally. This development has been sped up by the COVID-19 crisis in an unbalanced way. For example, platform work related to food delivery (i.e., Wolt, Deliveroo etc.) is growing very fast, and other types of platform work representing service work involving closer physical-social contacts (e.g., child-care, home-care) are decreasing, whilst some platform operation even closed (e.g., ClickforWork in Hungary).

[5] <https://www.statista.com/statistics/266206/googles-annual-global-revenue/>

[6] <https://www.statista.com/statistics/273744/number-of-full-time-google-employees/>

In conclusion, the paper outlines the main features of the CrowdWork21, an EU supported international project, to diminish the above presented “knowledge deficiency” syndrome. The four-country research consortium (Hungary, Germany, Portugal, and Spain) – using a qualitative research method (case study) – intends to understand job structure, working conditions, employment status, and collective voice of the platform workers in a comparative perspective.

Concerning the *future research challenges*, the Hungarian research team intends to go beyond the “hype” of platform work and question the unproven rosy picture of this disruptive change in the world of work. A similar overoptimistic and oversimplified view of technological changes took place at the end of the 1990s. “When, just before the bursting of the dot-com bubbles, it was thought that the Internet’s new economy’ model would reduce inventories, increase flexibility and transactions and subsequently accelerate growth and reduce economic fluctuation. That, however, turned out to be a myth.” (Montalban et al., 2019, 20)

It would be important to question the validity of public view on the anonymous and isolated nature of public work. In this regard, one of the numerous research challenges is to understand better the “*community building*” strategy of platform management (“social-engineering”). This may help us better understand the complex and dynamic nature of the managerial control and the socially-culturally embedded character of platform work. The country-specific institutional arrangement may shape the degree of autonomy of the participants in the digital communities. In future work, it would be worth making a distinction between “loose community-building aims to activate the self-help and self-regulation of the crowd” and “controlled community building conversely, steers interactions through a highly structured technical design and strong platform moderation to prompt specific behaviors.” (Gerber, 2020, 19)

To better comprehend the re-embeddedness process of the managerial control through various forms of community building, it would be necessary to integrate the role of *collective voice* (i.e., labor relations system, emerging grassroots associations) into our analysis.

Furthermore, the Hungarian research team intends to pay particular attention to the impact of the *COVID-crisis* on the platform workers’ working and employment conditions. To this end, it would be an additional fundamental challenge to better interpret the differences in the share of “teleworkers” (or home office workers) during the first cycle of the COVID-19 pandemic: the share among the CrowdWork21 project countries was the lowest in Hungary (28%) in comparison to Spain (30 %) to Germany (37%) and Portugal (39.5%) (Eurofound, 2020). Hypothetically, differences may indicate that “beyond technical feasibility, differences in access to teleworking across occupations also depend on aspects related to the organization of work and the position in the occupational hierarchy (and related privileges), rather than the task composition of the job as such.” (Milasi et al., 2020, 2).

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