WORKING PAPERS SERIES
DIPARTIMENTO DI
SCIENZE SOCIALI ED ECONOMICHE

Platforms from the Inside-Out

Maria Concetta Ambra

Platforms from the Inside-Out

Maria Concetta Ambra[1]

Department of Social Sciences and Economics, Sapienza University of Rome

Abstract: This article focuses on Amazon Mechanical Turk (AMT), the crowdsourcing platform created by Amazon, with the aim to enrich our knowledge of this specific platform and to contribute to the debate on 'platform economy'. In light of the massive changes triggered by the new digital revolution, many scholars have recently examined how platform work has changed, by exploring transformations in employee status and the new content of platform work.

This article addresses two interrelated questions: to what extent and in what ways does AMT challenge the boundaries between paid and unpaid digital labour? How does AMT exploit online labour to extract surplus value?

The research was undertaken from December 2018 and July 2019, through the collection of 50 documents originating from three Amazon web sites. These documents have been examined though the technique of content analysis by adopting the NVivo software.

In conclusion, it explains how Amazon has been able to develop a hybrid system of human-machine work. This specific model can be also fruitful used to speed up the machine learning process and to make it more accurate.

[1] Post doc researcher at Department of Social Sciences and Economics, Sapienza University of Rome;
E-mail: mariaconcetta.ambra@uniroma1.it

1. Introduction

Contemporary work is increasingly influenced by digitalisation and technological innovations, including the development of Artificial Intelligence. The contents and nature of work, as well as the organisation and management thereof, are greatly affected by technology as well as the massive generation of data caused by the spread of algorithms. Furthermore, platforms and crowd working are growing by enabling "firms to employ a digital, flexible and scalable workforce on a global scale that sits outside the traditional boundaries of labour laws and regulations" (Bergvall-Kåreborn and Howcroft 2014).

This article focuses on Amazon Mechanical Turk (AMT), the Amazon crowdsourcing platform matching supply and demand of micro-work. AMT is a highly relevant case study due to the large number of workers involved. According to Amazon, this workforce is over 500 thousand workers[2] while Difallah et al. (2018) demonstrate that these workers are at least 100 thousand with more than two thousand active at any given time. This analysis of AMT workers, based on the results of a survey conducted over a period of 28 months, illustrates an updated composition of the AMT workers population across demographics variables such as country, gender, age, income and marital status[3].

It is worth noting the potential of AMT, which is a technically usable platform anywhere in the world. According to Difallah et al. (2018) it is currently active mainly in the United States (75%), India (16%) and Canada (1.1%) and less so in Europe, with Great Britain first (0.7%) followed by Germany (0.27%) and France and Italy both just above 0.20%.

However, researchers noticed around May 2016 a notable effect in sharp dropping of the percentage of US workers on AMT and the increase of international workers from Canada, Great Britain, and other countries.

Most likely, various factors hinder the spread of AMT in the European market and in Italy.

First of all the language used. Today, almost all available micro jobs require the knowledge and competence of the English language. A second problem could be the different forms of payment. While U.S. workers can transfer their earnings directly to their bank accounts, European workers, on the other hand, cannot, and Amazon pays them back with gift card to spend on Amazon.com. This can adversely affect the platform's attractiveness to potential European and Italian turkers.

In this regard, it is interesting to note that recently, in May 2019, Amazon announced a new feature that allows "turkers outside the United States to transfer their earnings to a virtual US bank account through a third-party paid service provider". This new solution, available for 25 countries and for

---

[2] Source: AWS_File 8, November 28 2018.

[3] Turkers are a generally balanced workforce, with 51% female workers and 49% male. Mainly younger; 40% of the workers report being single and 42% report being married; another 10% reports cohabitating, 5% being divorced, and 3% being engaged. MTurk workers have household incomes that are below the average US population (Difallah et al. 2018).

Italy, has been adopted to responds to requests from "thousands of international workers, which have expressed that they would prefer to receive earnings in their local currency[4].

With these aspects in mind, this article aims to shed light on two related issues.

The first concerns workers' conditions, pay and the growing relationship between the performance of this online work and the increase in unpaid activities. The second regards the specific mechanisms through which turkers contribute to the creation of surplus value through their platform work.

The article is structured as follows: par.2 provides a general overview of the main literature on AMT; par. 3 illustrates the method and research techniques adopted here. Section 4 focuses on working conditions within the AMT, emphasizing how turkers contribute to the value creation process. Par. 5 highlights the links between AMT and AWS showing how Amazon has also been able to exploit human intelligence to develop artificial intelligence, greatly increasing its profits.

2. Literature review

By using a Crowd Platform and a virtual network, firms can outsource to an undefined pool of digital workers those functions once performed by internal employees or offshored to low-cost geographies, thus shifting costs and offloading risks (Bergvall-Kåreborn &Howcroft, 2014). There is an emerging critical literature, which clusters around Amazon's Mechanical Turk as an example of labour exploitation (Howcroft & Bergvall-Kareborn, 2018). According to (Lehdonvirta, (2016), from the perspective of capital, voluminous crowds can process large quantities of data in a short time frame, enabling the exploitation of geographical differences in skills and labour costs. The availability of low-cost work attracts consumers, allowing the platform to grow rapidly, strengthen the brand and generate higher market ratings. Crowdsourcing platforms maintain strict control over the nature and contents of the work, rate performance and payment, while at the same time they can eradicate all human contact (Irani 2015; Graham at. al. 2017) thus obscuring "the pivotal role played by labour, employment relations and the exploitative working conditions, which underpin it" (Bergvall-Kåreborn &Howcroft, 2014). Platforms can capture and create value with the sourcing of unregulated and unprotected labour/expertise (Katz, 2015), by letting a flexible and scalable workforce outside the traditional boundaries of labour laws and regulations (Bergvall-Kåreborn &Howcroft, 2014). Many analyses outlined how crowdsourcing allows companies to lower labour costs without any significant obligation regarding labour regulation, welfare benefits and intellectual property rights (Irani 2015; Cherry 2016; 2017).

The cumulative impact of work-related changes such as casualisation, informalisation and demutualisation of risk (de Stefano, 2016) means that increasing numbers are attracted to crowd work. While some participate for additional earnings, others relies on digital platforms as their primary source of income (Berg, 2016). In terms of the employment contract, the majority of these platforms classify external contributors as 'independent contactors' (Smith and Leberstein, 2015; De Stefano 2016; Berg, 2016) with self-employed status. This provides tax advantages for platforms and alleviates the regulatory requirements of paying minimum wage (Felstiner, 2011), while contributors shoulder personal liabilities. Bogus self-employment represents a process of legal engineering that shifts risk onto workers who are unprotected by minimum wage legislation or any other workplace entitlements. In

---

[4] Source: BlogMTurk_Workers Outside US, File 48, May 1, 2019.

this respect, crowdsourcing feeds the worrying phenomenon of non-standard work (Eurofound, 2015). This raises concerns regarding the regulation of these working activities, which lack any basic social security contributions and welfare entitlements such as holiday pay, sick leave, and insurance programs including group health insurance or retirement benefits, or any compensation benefits in the event of injury or illness. Moreover, many analyses have shown how the ruthless competition on platforms often pushes earnings so low that workers are compelled to work longer in order to earn a decent income (De Stefano 2016). According to Hara *et al.* (2015), the use of asymmetric rating systems and the limited protection against wage theft are factors in wage instability and stressful working conditions. Consequently, remuneration is often comparatively lower than the non-platform-based equivalent (Howcroft and Bergvall-Kåreborn, 2019).

Recently some scholars focused on the emerging relationships between human activities and Artificial Intelligence and consequence thereof on the nature of work (Casilli and Posada 2019; Gray and Suri 2019). In their study on digital labour, Casilli and Posada (2019) showed how the execution of human micro-tasks is necessary to 'train' artificial intelligence. Despite promises of full automation, human digital labour provided by both users and micro-workers calibrate machine learning and compensate the technical limitations of algorithms. Gray and Suri (2019) analyse how the spread of platforms has led to the deep dismantling of employment and the fundamental transformation of the nature of work. They call those invisible and low-paid human activities that power digital platforms 'ghost works'. This fusion of code and human smarts is growing fast, but Artificial Intelligence systems need humans to help them learn how to answer anything in the first place, since engines do not see or understand images in the way humans do. In this respect the platform economy raises a number of questions regarding not only the nature and content of digital work (both paid and unpaid), but also how to use this "inexpensive, yet high-quality data" (Buhrmester et al. 2011) to extract surplus value (Fuchs, 2014). With regard to worker pay, Gray and Suri (2019) focused on piecework, intended as precursors of online-distributed tasks. However, they do not deepen how platforms could create surplus value. Concerning this issue, it is interesting to underline that according to Marx (1867, p. 361) "the most appropriate form of wage to the capitalist mode of production" was piecework, since in his opinion it provided to the capitalist "an important source of reductions of wages and capitalistic cheating". In fact, piece-wage allowed the capitalist to "more easily raise the normal degree of labour intensity", while every worker was led to "exert his labour-power as intensely as possible and to lengthen his working day". Others scholars referred to Marx's Labour Theory of Value, as Fuchs (2014) who examined labour changing in the age of computers, the internet, and social media, by focusing on Facebook, Google, YouTube and Twitter and on unpaid social media prosumers. However, regardless their similarity each platform could have its own functioning, but it is still unclear which are the mechanism allowing them to create surplus value.

The aim of this working paper is to shed light on a well-known Platform, Amazon Mechanical Turk (AMT) in order to analyse the growing phenomenon of unpaid workers and of very low-wage workers, by deepening the renewal of piecework within this platforms. In particular, the present contribution wish to enrich the current analytical and empirical framework by exploring two key points. On the one hand, which are the boundaries between paid and unpaid work. On the other hand, which are the specific mechanisms able to generate surplus value within the examined platforms.

3. Research Methods

This section explains the method used to acquire new data and the techniques adopted to examine the functioning of AMT platform. Since it was not possible to interview Amazon' managers, primary source of data were the following Amazon web sites: 1) Amazon Mechanical Turk (AMT); 2) Amazon BlogMTurk, the official Amazon blog aimed at 'turkers' and 'requesters'; 3) Amazon Web Service website (AWS).

Rogers (2013, 2015) calls 'Digital methods' the using of the web as a dataset collected through an internet-related research. The adoption of digital methods could be problematic since web data can be 'short-lived' as some APIs (Application Programming Interfaces) may be interrupted, modified or removed. To overcome this limitation each document gathered from the Amazon websites has been archived as a "text" and carefully examined through the technique of content analysis. As Stemler (2015, p.11) pointed out: "the versatility of the content analysis method for managing textual, visual and auditory data makes it extremely powerful. This technique can be usefully combined with the huge amounts of next-generation archive data from advanced technology".

For the purposes of the research questions all the textual documents has been analyzed through N-Vivo Software, by focusing in particular on issues related to nature and content of the work done and to the remuneration modalities.

Tab.1- Empirical data collected between December 2018 and July 2019

Amazon Web Site	Acronym	N. Textual document	N. Screenshot	Tot
https://www.mturk.com	AMT	6	13	19
https://aws.amazon.com	AWS	12	-	12
https://blog.mturk.com	Blog AMT	19	-	19
Total		**37**	**13**	**50**

A second step, to understand the experience of being a turkers was to sign in on AMT as a worker (is it also possible to sign in as a requester). This kind of net-nography approach has been very useful to known the AMT platform functioning 'from within' and to collect further information about the turker' earning through the "dashboard", an interactive tool used by the worker for collecting, monitoring and displaying data and information relating to the tasks undertaken as well as to payment.

The dashboard visualizes all the available tasks, the payments status and the amount of earnings and so on. Therefore, data collected also includes 13 screenshots[5] of the dashboard.

4. Toward a badly paid 'digital piece-wages'?

To analyse the growing phenomenon of unpaid workers and of very low-wage workers, it is useful to deepen the renewal of piecework within platforms. Marx (1867, p. 332) distinguished between absolute and relative surplus value. The former depend on the increasing the overall duration of the working day, the latter by the shortening the working time necessary to produce a certain product, and it can also transpire, for example, when work processes are improved, and new technologies introduced.

Marx also underlined the difference between labour-power, which can be purchased by the capitalist by paying an hourly wage to the worker, and the use-value, which does not coincide with the labour-power because it represents its function, i.e., its purpose: for example, the ability to create a certain type of tailoring product *(ivi, p. 353).* This clarification is useful to analyse piece-wages compared to hourly-wages. The difference emphasised leads us to highlight the distinction between the time of work necessary to produce a certain good, and the ability to create the same. In a Fordist society, the scientific division of labour has influenced both the time needed to produce a certain good - reducing it - and the ability of those who were once artisans to produce a certain type of good in its entirety. By breaking work down into simple and elementary operations, expertise becomes unnecessary and workers are not paid for their skills but only for the time they spend working on routine and much-simplified operations. This process of work organisation therefore also influences the way in which work is paid for. Since expertise becomes obsolete, production is reduced to the simple organisation of the various work activities and the final assembly of the finished product.

Marx then developed his analysis of wages by exploring the difference between time-wages and piece-wages. Time-wages were based on a set amount for a certain period, e.g., per hour, while piece-wages were based on the output of the worker.

Marx noted that "piece-wages are nothing else than a converted form of wages by time, just as wages by time are a converted form of the value or price of labour-power" (ivi, p. 360). "In time-wages the labour is measured by its immediate duration, in piece-wages by the quantity of products in which the labour has embodied itself during a given time" (ivi, p. 361). *"*The use of piece-wages allows the capitalist to increase the intensity of labour, by providing an 'incentive' for workers to work harder, produce more, and thus to be paid more. However, "as soon as the working day ceases to contain a definite number of hours, the connection between the paid and the unpaid labour is destroyed" (ivi,

---

[5] A screenshot is a digital image of what is visible on a computer monitor or other visual output device.

p. 356). Moreover "piecework not only destroys the link between paid and unpaid work, but it allows the capitalist to increase productivity and its profits, putting workers in competition with each other" (ivi, p.358).

In this respect, the adoption of piece-wages is strictly connected to the creation of surplus value, since it uncouples the production of goods or services from working time and intensifies work rhythms, thus influencing the growth of productivity and profits.

Despite some similarities, this new "*digital piecework*" is different from the traditional one.

In fact, while in the past it was adopted to pay blue-collar producing a material and tangible product (such as a bolt to be used in the final assembly of a vehicle), now turkers are paid for the production of data that expressly requires human intelligence. It is important to underline that turkers do not create data at random and of any kind, but specific data, such as the labelling of a particular image, or the translation of a speech in detail. As far as the creation of surplus value, while a bolt can be used once for a vehicle, on the contrary these human data can be used infinitely.

In fact, they are first acquired by the platform, then assembled to recreate the finished product ordered by the requester (for example, entire transcripts of hours and hours of audio recordings) and finally also Amazon itself can use them, as we will explain in the next paragraph.

5. How Amazon generates surplus value by combining AMT and AWS

In this paragraph, we will go into more detail about the connections between Amazon Mechanical Turk (AMT) and Amazon Web Services (AWS), by examining in particular what links the two platforms. AWS, since it launches in 2006, has become one of the most popular cloud platforms used to create and deploy any type of application in the cloud*:*

> "*Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 165 fully featured services from data centers globally. Millions of customers —including the fastest-growing startups, largest enterprises, and leading government agencies—trust AWS to power their infrastructure, become more agile, and lower costs*" [AWS, File 11, March 21 2019].

AWS offers a wide array of other IT solutions and utilities for modern organizations", such as featured services for compute, storage, networking, analytics, application services, deployment, identity and access management, directory services, security and many more cloud services. AWS is also a particular marketplace. More recently, AWS has also produced a series of additional software designed to train machines, in order to develop Machine learning (ML). Through AWS, it is also possible, to have free access to a course which:

> "*introduces Amazon Machine Learning and Artificial Intelligence tools, that enable capabilities across frameworks and infrastructure, machine learning platforms, and API-driven services*" [AWS_ML, File 42, July 25 2019].

Regarding machine learning, some scholars identify three types, depending on the nature of the 'signal' used for learning or the 'feedback' available to the learning system (Sutton and Barto, 2018).

First, the 'unsupervised learning', in which the algorithms automatically find a structure in the inputs provided. AWS has developed and sells this type of ML:

> "*the powerful algorithms of Amazon Machine Learning create machine learning (ML) models by finding patterns in your existing data. The service uses these models to process new data and generate predictions for your application*" [AWS_ML, File 41, July 25 2019].

Second, a 'supervised learning', in which the algorithms receive an input and respective desired output, for instance using the labelling input. Amazon allows adopting a "supervised learning" approach, through the combined use of Amazon SageMaker together with AMT, by using turkers as "trainers" of the algorithms:

> "*Use Amazon Mechanical Turk with Amazon SageMaker for supervised learning. This tutorial will show you how you can use Amazon Mechanical Turk from within your Amazon SageMaker notebook to get annotations for your dataset and use them for training. From within your SageMaker notebook you can quickly send tasks to MTurk Workers for annotation, review the results, and move on to your training*" [AWS_Files 5, February 8 2018].

> "*Building human-in-the-loop solutions can be very effective, but integrating humans into existing ML or business process workflows can be complex. Learn how you can easily connect the Amazon Mechanical Turk on-demand human intelligence platform with other AWS services*" [BlogMturk_AWS, File 25, November 19 2018].

The third model is a 'reinforcement learning', in which the algorithms interact with a dynamic environment and try to achieve a goal, having a teacher who tells him only if he has reached said goal. According to Sutton and Barto (2018) some of the most remarkable developments in artificial intelligence have involved reinforcement learning, most notably 'deep reinforcement learning', or a reinforcement learning with function approximation by deep neural networks".

> "*The AWS Deep Learning AMIs provide machine learning practitioners and researchers with the infrastructure and tools to accelerate deep learning in the cloud, at any scale. You can quickly launch Amazon EC2[6] instances pre-installed with popular deep learning frameworks and interfaces [...] to train sophisticated, custom AI models, experiment with new algorithms, or to learn new skills and techniques* [AWS_Deep Learning, File n. 45, July 25 2019].

---

[6] Amazon EC2 (Amazon Elastic Compute Cloud) "*is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers, by providing them the tools to build failure resilient applications and isolate them from common failure scenarios [AWS_Amazon EC2, File 46, July 25 2019].

It is worthing to underline the potentiality of the link between AMT and AWS, especially for the supervised learning:

> *"You will use the MTurk account to publish tasks and you will use the AWS account to host your images for each task using Simple Storage Service"* [BlogMTurk _ML, File 17, May 22 2017].

> *"Three groups of humans can provide labels using these workflows: Amazon Mechanical Turk workers, your employees, or third party vendors. If you use a vendor or Mechanical Turk to provide labels, you pay an additional cost per labelled object. If you use your employees for labelling, there is no additional cost per labelled object"* [AWS_ Amazon SageMaker Ground Truth Pricing, File 10, March 1 2019].

These documents show how Amazon has been able to develop a specific business model, by integrating the workforce in AMT with AWS marketplace. This link between AMT and AWS help us to understand how the global giant is able to create surplus value. From the extracted documents, we can deduce how, over time, Amazon Web Service has been able to market and advertise a series of increasingly elaborate software such as Amazon SageMaker, and Amazon SageMaker Ground Truth.

> *"Amazon SageMaker provides every developer and data scientist with the ability to build, train, and deploy machine-learning models quickly. Amazon SageMaker is a fully managed service that covers the entire machine learning workflow to label and prepare your data, choose an algorithm, train the algorithm, tune and optimize it for deployment, make predictions, and take action. Your models get to production faster with much less effort and lower cost* [AWS_ Amazon SageMaker, File 7, March 21 2019].

Thus, by using its platform, Amazon can exploit human intelligence in two ways.
Firstly, by fragmenting the work into micro-tasks, which can be performed simultaneously by a large global and scalable workforce, Amazon reduces the time and cost of human data production. The AMT documents examined, underline how Amazon suggests to businesses or developers to outsource a business process, by using the efficient organizational strategy offered by the AMT crowdsource platform and its thousands of on-demand workers:

> *"Business process outsourcing. A large, seemingly overwhelming task can sometimes be transformed into a set of smaller, more manageable micro-tasks that can each be accomplished independently. Crowdsourcing can be an efficient organisational strategy to harness innovation and agility by distributing work to Internet users. Businesses or developers can use MTurk to access thousands of on-demand workers—and then integrate the results of that work directly into their business processes and systems"* [AMT_Homepage Files 4, March 1 2019].

Secondly, Amazon can exploits the human work of turkers to accelerate machine learning, as some documents expressly declare:

> *"MTurk enables companies to harness the collective intelligence, skills, and insights from a global workforce to streamline business processes, augment data collection and analysis, and accelerate machine-learning development. MTurk can be a great way to minimize the costs and time required for each stage of ML development. It is easy to collect and annotate the massive amounts of data required for training machine learning (ML) models with MTurk"* [AMT_Homepage Files 4, March 1 2019].

Thus, turkers are not only contributing to the process of accumulation of a vast amount of data, but are working to produce good quality data by deploying their human intelligence to train algorithms. This is also the reason why AMT forbids turkers to use bots in their work:

> *"you may not use any data mining, robots, or similar data gathering or extraction tools on the Site"* *[…] "If the HIT is completed by a bot, script, or other automated method, then it's not human intelligence"* *[AMT_File 1, December 17 2018].*

This is the specific business model through which these platforms produce surplus value. It is through the human work of turkers over the AMT platform and then used, for instance in the testing of new software by AWS, that Amazon can multiplying its profits, without any fair economic and monetary recognition of turkers intellectual property rights.

In fact, while Amazon provides no warranty, turkers must accept full responsibility of their production means: energy costs, internet connection, software, time and training for the use thereof. Moreover, they must assume all of the risks connected with the work carried out and the payment of taxes, being even obliged to give up the benefits of fair pay and minimum social protection.

> *"No warranties. You expressly agree that use of the site, developer materials, payment processing service and tasks are at your sole risk"* [AMT_File 1, December 17 2018].

> *"Limitation of liability. We will not be liable for any indirect, incidental, punitive or consequential damages (including any loss of revenue, profits, goodwill, use, or data) arising in connection with this agreement, the site, developer materials, payment processing service, tasks, or transactions through the site"* [AMT_File 1, December 17 2018].

In conclusion, Amazon has been able to use AMT and AWS, to grow up and to increase its profits, at the expense of the turkers, often paid below the legal minimum wage. Thus, a large global company can accumulate huge profits without caring about the minimum social protection for workers who contribute to such gains, and without giving them the fair compensation for their contribution in the creation of surplus value.

6. Conclusion

In recent years, in light of the massive transformation triggered by the new digital revolution, many scholars have examined how work has changed across platforms, by exploring the transformations occurring in employee status and the new contents of work.

Platform economy raises a number of questions regarding not only the nature and content of digital work (both paid and unpaid), but also how this "inexpensive, yet high-quality data" (Buhrmester et al. 2011) are used to extract surplus value (Fuchs, 2014).

With regard to worker pay, Gray and Suri (2019) focused on piecework, intended as precursor of online-distributed tasks. However, they do not deepen how platforms create surplus value.

This issue has been examined by Fuchs (2014), who referred to Marx's Labour Theory of Value to analyse labour changing in the age of computers, the internet, and social media. However, he focused only on the specific target of "unpaid prosumers" and on specific social media, such as on Facebook, Google, YouTube and Twitter.

Despite similarities, each platform has its own business model. Therefore, in order to understand which are the mechanisms of creation of surplus value it is necessary to examine in depth the functioning of each of them.

This article focuses on Amazon Mechanical Turk, the crowdsourcing platform created by Amazon through which other companies can speed up the pace of some jobs, having a constantly on-demand and scalable global workforce available. The aim is to shed light on the growing phenomenon of unpaid workers and of very low-wage workers, by deepening the renewal of piecework within this platforms. In particular, the present contribution wishes to enrich the current analytical and empirical framework by exploring two key points. On the one hand, which are the boundaries between paid and unpaid work. On the other hand, which are the specific mechanisms able to generate surplus value within the examined platforms.

Since it was not possible to interview Amazon' managers, primary source of data were the following Amazon web sites: 1) Amazon Mechanical Turk (AMT); 2) Amazon Blog MTurk, the official Amazon blog aimed at 'turkers' and 'requesters'; 3) Amazon Web Service website (AWS).

Each of 50 documents gathered from these Amazon websites, has been archived as a text and carefully examined through the technique of content analysis. For the purposes of the research questions all the textual documents has been analysed through N-Vivo Software, by focusing in particular on issues related to nature and content of the work and to the remuneration modalities. In addition, the opening of an account on AMT has been useful to understand the experience of being a turkers and to collect screenshots of the dashboard, where information about the work done and payments are displayed.

Concerning the first issue, it is true that the boundaries between paid and unpaid work and between employed and self-employed are blurred. However, this border does not exclusively depend upon whether workers are paid for in vouchers rather than money. In fact, as the introduction of a new payment regulation for non-US workers (see par. 4) show, it is marked by a purely strategic choice of the company, which as such can also be changed. Moreover it is worth pointing out how piecework has created the space for the growth of unpaid labour. Taking up Marx's current words, surprisingly still relevant today it is the use of piece-wages that allows the capitalist to increase the intensity of labour, by providing an 'incentive' for workers to work harder, produce more, and thus to be paid more. However, "as soon as the working day ceases to contain a definite number of hours, the connection between the paid and the unpaid labour is destroyed. This is a crucial aspect, which deserves to be examined also in reference to many other "modern" works that are spreading and that similarly

adopt piecework as a form of payment. The adoption of piecework is also linked to the worsening of working conditions and to the growth of competitiveness among workers, a tendency that undermines the very essence of the trade union and threatens its existence.

The second question regards the creation of surplus value within this platform. Analysed data (par. 5) show which are the mechanisms used by Amazon to create plus value. The AMT business model has been created in order to dispose of specific data: human intelligence task. These high quality data are very useful also to test new software products developed by Amazon Web Service.

This way, turkers' work is deployed not only to create value for the benefit of requester, but it is also exploited to create surplus value, for the benefit of Amazon. In fact, they contribute to the production of 'digital pieces' which are captured by the platform and employed - simultaneously and many times - also for other purposes, such as to develop supervised machine learning software, which is able to foster the development of Artificial Intelligence, thus creating further added value.

The possibilities to accumulate a large and scalable human intelligence tasks, completed exclusively on line and the use of this specific workforce in connection with AWS, make AMT a unique platform and very different than other platforms. On the other side, AWS over time has becoming not only a marketplace but also the core platform and main source of revenue for the entire Amazon Company.

Thus, while Amazon through its platforms (AMT and AWS) can multiply its profits, turkers do not receive any compensation, neither in terms of earnings, nor in terms of recognition of intellectual property rights.

References

Bergvall-Kåreborn B., Howcroft D., (2014), Amazon Mechanical Turk and the commodification of labour, *New Technology, Work and Employment,* Vol. 29, Issue 3, pp. 213-223, https://doi.org/10.1111/ntwe.12038

Berg J., (2016), Income security in the on-demand economy: findings and policy lessons from a survey of crowdworkers, *Comparative Labor Law & Policy Journal* 37(3): 543–576.

Buhrmester, M., Kwang, T., Gosling, S. D., (2011), Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?, *Perspectives on psychological science, 6*(1), 3-5.

Casilli A., Posada J., (2019), The Platformization of Labor and Society, in Graham M., Dutton W. H., (2019), *Society and the Internet. How Networks of Information and Communication are Changing Our Lives* (second edition), Oxford University Press, pp.293-306.

Cherry M.A., (2016), Beyond misclassification: the digital transformation of work*, Comparative Labor Law & Policy Journal* 37(3): 577–602.

Cherry M. A., (2017), The Sharing Economy and the Edges of Contract Law: Comparing U.S. and U.K. Approaches, in *The George Washington Law Review*, November 2017 Vol. 85 No. 6, pp. 1804-1845

De Stefano V., (2016), "The rise of the «just-in-time workforce»: On-demand work, crowdwork and labour protection in the «gig-economy»", *Comparative Labor Law & Policy Journal*, Vol. 37, No. 3, 2016

Difallah D., Filatova E., Ipeirotis P., (2018), Demographics and Dynamics of Mechanical Turk Workers, in *Proceedings of WSDM 2018: The Eleventh ACM International Conference on Web Search and Data Mining,* Marina Del Rey, CA, USA, February 5–9, 2018 (WSDM 2018), 9 pages. https://doi.org/10.1145/3159652.3159661

Eurofound (2015), New Forms of Employment. Luxembourg: Publications Office of the European Union.

Felstiner A., (2011), Working the crowd: employment and labor law in the crowdsourcing industry, *Berkeley Journal of Employment & Labor Law* 32: 143–203.

Fuchs C., (2014), Digital Labour and Karl Marx. New York: Routledge.

Graham M., Hjorth I., Lehdonvirta V., (2017), Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods, in *Transfer*, vol. 23 (2) 135-162.

Graham M., Dutton W. H., (2019), Society and the Internet. How Networks of Information and Communication are Changing Our Lives (second edition), Oxford University Press,

Gray M. L., Suri S., (2019), Introduction: Ghosts in the Machine, in *"Ghost Work: How To Stop Silicon Valley From Building A New Global Underclass",* Houghton Mifflin Harcourt, Boston, p. ix-xxxi.

Hara K., Adams A., Milland K., Savage S., Callison-Burch C., Bigham J., (2018), A Data-Driven Analysis of Workers' Earnings on Amazon Mechanical Turk, in CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, April 2018 Paper No.: 449 Pages 1–14, https://doi.org/10.1145/3173574.3174023

Harris, S.; Krueger, A., (2015), A Proposal for Modernizing Labor Laws for Twenty-First-Century Work: The "Independent Worker, *The Hamilton Project*, Discussion Paper 2015-10 (December)

Howcroft D., Bergvall-Kåreborn B., (2018), A Typology of Crowdwork Platforms, in *Work, Employment and Society,* Volume: 33 issue: 1, page(s): 21-38, DOI: 10.1177/0950017018760136

Ipeirotis, P., (2010), Demographics of Mechanical Turk, *Working Paper CeDER-10-01*, New York University, Stern School of Business. Available at http://hdl.handle.net/2451/29585

Irani L., (2015), Difference and Dependence among Digital Workers: The Case of Amazon Mechanical Turk, *South Atlantic Quarterly,* Vol. 114, No. 1, pp. 225-234.

Katz V., (2015), Regulating the sharing economy. Berkeley Technology Law Journal 30(4): 1066–1126.

Kittur J., Nickerson M., Bernstein E., Gerber A., Shaw J., Zimmerman M., (2013), The future of crowd work, in *Proceedings of the ACM conference on computer supported cooperative work*, San Antonio, TX, 23–27 February, 1301–1318.

Lehdonvirta V., (2016), Algorithms that divide and unite: delocalisation, identity and collective action in microwork. In: Flecker J (ed.) Space, Place and Global Digital Work. London: Palgrave Macmillan, 53–80.

Marx K., (1867), (First English edition 1887), *Capital: A Critique of Political Economy*. Volume I: The Process of Capitalist Production, Trans. from the 3rd German edition, by Samuel Moore and Edward Aveling, ed. Frederick Engels. Revised and amplified according to the 4th German ed. by Ernest Untermann (Chicago: Charles H. Kerr and Co., 1909). 5/4/2019. <https://oll.libertyfund.org/titles/965>

Rogers R. (2013). *Digital* methods. Cambridge, MA: MIT Press.

Rogers R., (2015), Digital Methods for Web Research, *in Emerging Trend In Social And Behavioral Sciences,* edited by Robert Scott e Stephan Kosslyn 2015, John Wiley & Sons.

Smith, R.; Leberstein, S., (2015), Rights on Demand: Ensuring Workplace Standards and Worker Security in the On-Demand Economy, New York, National Employment Law Project.

Stemler S., (2015), Content Analysis, in *Emerging Trend In Social And Behavioral Sciences*, edited by Robert Scott e Stephan Kosslyn 2015, John Wiley & Sons.

Sutton R. S., Barto A. G., (2018), Reinforcement Learning: An Introduction, 2nd edition, MIT Press, Cambridge, MA, 2018.