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# **GIG ECONOMY AND UBERIZATION OF WORK AS PRELIMINARY STAGES OF TECHNOLOGICAL UNEMPLOYMENT**

## **ZJAWISKO GIG ECONOMY I UBERYZACJA PRACY JAKO WSTĘPNE ETAPY BEZROBOCIA TECHNOLOGICZNEGO**

### **Streszczenie**

W artykule autor posługuje się metodami desk research (analiza dyskursu naukowego i analiza danych wtórnych), aby dowieść, że współczesne zjawiska zmian zatrudnienia: gig economy (ekonomia fuch) i uberyzacja mogą być interpretowane jako zapowiedzi i wstępne etapy nadchodzącego bezrobocia technologicznego. Autor skupia się na atomizacji pracy, wykorzystaniu platform, zautomatyzowanym nadzorze, kontroli nad procesem przydzielania i wykonywania pracy i zmianie językowej w dyskursie. W rezul-

### **Summary**

In the article, the author uses desk research methods (scientific discourse analysis and secondary data analysis) to argue that the contemporary phenomena of employment changes: gig economy, and uberization can be interpreted as presages and preliminary stages of the forthcoming technological unemployment. The focus is set on the atomization of work, usage of the platforms, automated supervision, control over the process of work assignment and performance, and the linguistic shift in discourse. As

tacie można stwierdzić, że najbardziej charakterystyczne cechy uberyzacji, rozumianej jako trwający proces kształtowania gig economy, można powiązać z konkretnymi modelami powstawania bezrobocia technologicznego – modele te dotyczą automatyzacji konkretnych umiejętności, czynności rutynowych lub całych zawodów.

**Słowa kluczowe:** bezrobocie technologiczne, gig economy, uberyzacja, rynek pracy

a result, it can be assumed that some of the most distinctive features of uberization, understood as an ongoing process in the gig economy can be connected with the specific models of the emergence of technological unemployment – these models are related to automating specific skills, routine activities or the whole occupations.

**Keywords:** technological unemployment, gig economy, uberization, labor market

**JEL Classification:** J23, J24, O33

## INTRODUCTION

The contemporary modes of labor are emerging topics in scientific discourse. It appears that terminology used in the discourse constantly tries to capture the changes in how work is assigned, done, and remunerated. In this paper, the author tries to argue that the phenomena of uberization and gig economy are, in essence, the presages and the preliminary stages of the ongoing process of taking over the workload and workplaces by technology (the phenomenon of technological unemployment). The author also examines if the “uberized” jobs are the ones evaluated as more prone to automation. This article has two aims: the first is to check whether different aspects of organizational change that are connected with new modes of labor could be grasped as harbingers or early stages of technological unemployment; the second is to show how these processes can accelerate the pace of the emergence of technological unemployment. This article hypothesises that there are some organizational changes connected with the widespread usage of technology in workplaces that can lead to the displacement of human workers.

The methodology used in this paper is desk research – discourse analysis of the selected scientific articles and books written in English, published in the last decade, connected with the subject of technological unemployment, and secondary data analysis.

## 1. KEY CONCEPTS

To begin the argumentation, it is compulsory to define the notions of the gig economy, uberization, and technological unemployment:

- **A gig economy** (or shared economy) is a kind of a system where work is performed on demand. It can be distributed with the usage of various online platforms. Work in this system may be performed as a main or as an additional source of income for the worker (Lepanjuuri et al., 2018, p. 12). Supporters of such a working mode often connect it with the freedom to decide what tasks a person chooses to perform and underline the absence of a supervisor who gives direct orders. Opponents tend to underline the lack of workplace protections and high dependence on algorithms (Ravenelle, 2019, pp. 5-6).
- **Uberization** is a process of transforming work from a full-time job understood in a classic way to a job that fits in the “gig economy” system described above. This process is connected with the individualization of human work and diminishing the role of trade unions (Fleming, 2017, p. 2). Some authors underline that the process of uberization is a threat to the so-called “old economic model” (David et al. 2016, p. 58). Such a statement implies that the start-ups can potentially take over the “traditional” market (for example, Uber can be a threat to taxi corporations).
- **Technological unemployment** is a kind of unemployment that happens when the methods of production change by substituting people’s services with machines and no other methods that engage human workers can be used (Oxford Reference, n.d.). Technological unemployment can be analyzed in the terms of professions or tasks that are being taken over by machines (Susskind & Susskind, 2016, p. 213).

It is worth noticing that the first two concepts are significantly younger than the last one. It cannot be strictly determined how they can be dated, but it seems that “technological unemployment” is the oldest and “uberization” is the youngest one. The notion of “technological unemployment” was used by Keynes back in the 1930s (Ashokbharan, 2019, p. 2; Keynes, 1963, pp. 358-373; Swan, 2017, p. 20). The popularity of these three concepts in the last decade can also be seen in Table 1. The years 1995, 2000, and 2010 have also been included for better insight.

**Table 1. Popularity of three concepts in the scientific discourse**

Figures with an asterisk (\*) are the ones with all irrelevant or incorrectly dated results.

Notion/Year	„Gig economy”	„Uberization/Uberi- sation”	„Technological unem- ployment”
1995	2*	1*	63
2000	7*	0	90
2005	28	2*	65
2010	42	5*	98
2012	56	6*	111
2013	49	3*	158
2014	74	5*	172
2015	179	65	242
2016	737	269	353
2017	1960	435	525
2018	3340	562	744
2019	4800	674	952
2020	6520	754	988
2021	6820	870	1040

Source: Own work based on Google Scholar database current as of the date of 3rd of February, 2022.

It has been checked how many results are in Google Scholar for each concept each year. The results seem to be suggesting (but not proving) at least a few things: all three concepts were getting more and more popular in the scientific discourse over the years; the sudden popularity of the “gig economy” burst around 2016-2017 and the notion of uberization wasn’t present in the scientific discourse until 2015.

By showing these figures, the author tries to focus the reader’s attention on the important note – uberization and gig economy are not the factors that cause technological unemployment – this issue was there before them. It is safe to say that neither the concept of uberization nor the concept of the gig economy was named in science before the advent of the 21<sup>st</sup> century. However, the nature of technological unemployment in the 21<sup>st</sup> century is extremely different than in times of Keynes – while technological unemployment was historically connected with machines working solely in a physical environment, present-day technological unemployment is based on the use of artificial intelligence, machine learning, and other technologies – this is a part of the so-called “fourth industrial revolution” that happens due to progress within the development of

digital technologies (Campa, 2019, pp. 147; 151). These technologies can also be seen in the gig economy and uberization.

## 2. MODELS OF TECHNOLOGICAL UNEMPLOYMENT

There are three different models of understanding the phenomenon of technological unemployment that can be distinguished from the literature. Each of them is hypothetically possible but is also based on some specific assumptions.

- **Occupational Biased Technological Change (OBTC)** - this approach can be connected with a widely-cited Oxford research performed by Frey and Osborne (2013). In that paper, the authors assessed to what extent various occupations are susceptible to automation. It can be seen that this kind of methodology fits in the OBTC model (see also: Fernandez-Pol & Harvie, 2020, para. 6.5.1). Although this approach can be assessed as quite exaggerated, it must be underlined that there are also authors who claim that - at least in the short term - machines are anticipated to play a complementary than a replacement role in the context of occupations (Sorells, 2018, p. 72).
- **Skill Biased Technological Change (SBTC)** - this model of technological change can be connected with the so-called “third industrial revolution”. It rewards the workers with rare and advanced skills (by increasing their wages) and leaves the unskilled workers with lower wages and reduced employment (D’Orlando, 2018, p. 6). In this model, there is also an underlying concept of the skilled workers being able to adapt to technological change – which is supposed to leave them in a better position in the context of a growing number of computerized tasks (Radhi, 2020, p. 28). The first formulation of this model is assigned to three researchers: Autor, Levy, and Murnane (Longton, 2019, p. 15)
- **Routine Biased Technological Change (RBTC)** - the last model is somewhat similar to SBTC – but, in this case, the main focal point is on the question of how routine the tasks are. The demand for more creative and cognitive tasks increases – both in the case of high-skilled and low-skilled workers (as both writing a book and renovating the room can be examples of non-routine work). The excluded group in this case are the middle-skilled workers whose tasks are repetitive and more prone to automation (Esposito & Scicchitano, 2020, p. 3). This leads to the polarization of the workers. The middle-skilled workers fall into a trap

– their position is getting worse, so they can either try to obtain new skills (which is often difficult and costly) or they end up doing a job they are overqualified for (see also: Fiorelli, 2018, pp. 338-339).

For the sake of the next paragraph of this paper, SBTC and RBTC models will be used as a background for the argumentation. It is more probable that more current occupations will evolve rather than completely disappear – at least in the foreseeable future. For example, the data of the European Commission (n.d.) say that, in OECD countries, 14% of jobs are automatable, and 32% more face the possible change in how they are performed. The atomization of work (dividing the occupation into smaller pieces that are separately ordered and billed) is the essence of the process of uberization. In the last section, the author will turn to the OBTC model.

### 3. THE CHANGING NATURE OF THE OCCUPATIONS

In this section, the author attempts to show the distinct stages of transforming the classic, full-time job into the one that is uberized – in other words, it will be shown how the gig economy changes the nature of performing an occupation. On one hand, this is an attempt to build a simplified model of the process of uberization. But, what's more important, it will be shown how each of the parts corresponds with the ability to automate the tasks.

- **Atomization of work and usage of the platforms:** Although the process of atomization was known at least from the advent of the Ford-type factory, the contemporary authors name the phenomenon of the “microtask industry”. It is a name for the way of performing work as in Amazon’s Mechanical Turk (mTurk). Microtasks can be: labeling photographs, finding duplicates in the systems, or correcting mistakes, among many others (Olsen & Carmel, 2013). These kinds of tasks can be found in the gig economy kind of work. It is seen that work is being atomized to order human workers to perform activities that cannot be completed by the computer. The platforms used in the uberized work can be defined as “[digital structures] capable of linking hardware and software through designated standards” (Barns, 2020, p. 36). These platforms can, for example, be focused on the new, “collaborative” model of consumption connected with the distribution of the city’s resources (transportation, accommodation, etc.) (Barns, 2020, p. 88). Working with the platforms can often be advertised as a kind of gaming and entertainment activity – as in the case of Mechanical Turk (Kessler, 2018,

- p. 33). The main reason for the platforms to work is that they link the individual service providers with the individual customers (at a specific time and in a specific place) to allow them to make a transaction (Nerinx, 2016, p. 253). It can be seen that the main task of the platforms is to connect different parties – service providers with customers, software with hardware, and gig workers with the companies. Massive streams of data are indispensable to make the system work. It can be noticed that in this case, human service providers constitute only a part of this system. In the case of uber driving, a human worker is put between two machines – a vehicle and a device with an application (platform) connecting the worker with customers. It can be assumed that when computers were able to perform all the tasks that human workers do (labeling pictures, driving a vehicle using the information provided by the platform), humans would become obsolete in these occupations.
- **Model of automated supervision:** Supervision in the Uber-like platforms is becoming invisible. Through various systems, customers can rate a service they were provided with. Using this data, the worker can be punished (or rewarded) without any human supervisor taking part in it (Wu et al., 2019, p. 15). On the Gigster platform, there is a “Karma” score that allows people to be positioned in the system (Kessler, 2018, p. 57). That leads to several ethical issues – the algorithm can be ruthless and may not take all the factors into account (for example, sickness or bad mood of the worker). Uber in the United States uses a CRM (Customer Relationship Management) system to respond to the queries of its drivers. However, it can be seen that these questions may come from templates, FAQs, robots, or outsourced customer service employees who may be unaware of the nuances of this occupation. The lack of human supervision is often evaluated as harmful to Uber employees (Rosenblat & Stark, 2016, p. 3771). Automated supervision is related to the automation of work in two ways. Firstly, this is a clear example of how human managers are becoming obsolete; secondly - automated supervision is the system that can be maintained when human workers become redundant (for example, Uber passengers will evaluate autonomous cars and not human drivers).
  - **Control over the process:** It seems clear that the uberized workers are under the control of various algorithms and the design of the process of delivering the service they are providing. For example, Uber drivers do

not have any real power to dictate or negotiate their fares. Instead, Uber is nudging their drivers to work more when the real or predicted demand is high – they use so-called “surge prices” to multiply the driver’s fares in specific areas. However, the drivers do not have control if they get requests from these areas (Rosenblat & Stark, 2016, pp. 3765-3771). Human workers are treated the same way machines would be treated – without the right to negotiate or the possibility to form unions. It can be seen that this kind of control of the process was designed to manage robots, not people. Or, in other words, it was intended to treat people like robots.

- **Linguistic shift:** the linguistic shift can be treated as another prognostic of the upcoming change. Philosopher Bostrom (2014, p. 70) describes the human body the similar way the computer hardware can be described. He writes about “the human retina [that can] transmit data at an impressive rate of nearly 10 million bits per second” and that it is “packaged” with other components that allow humans to process data coming from the external environment. It can also be noticed that the scientific discourse in the last few years has adopted the term “wetware” which has a similar etymology as the words “software” and “hardware” and is defined as the human brain described in terms of its computational capacity and to underline the similarities between the brain and the machine (Courtemanche, 2014; Merriam-Webster, n.d.). What is more, this shift can also be found in the current engineering process of shaping artificial intelligence - which is now aimed at emulating the human brain and at copying its structure (Fuller, 2019, p. 120). This linguistic shift can be interpreted as admitting that the human brain and the computer are not very different from each other – and, in the case of technological unemployment, that the computer can perform tasks as well as a human. Therefore, the qualitative differences between “gigged” human workers and artificial intelligence solutions are being blurred through this linguistic shift.

All the changes described above clearly correspond with the discussed models of technological change – especially SBTC and RBTC, because the routine and non-routine tasks of the gig economy are being gradually automated.



#### 4. ARE THE UBERIZED JOBS PRONE TO AUTOMATION?

In this last section, the author will turn back to Frey and Osborne's research results (2013, pp. 57-72) and will search for the occupations most prone to uberization to check how susceptible to automation they are (per the OBCT model of change). Table 2. shows a few examples of such (hand-picked) occupations along with the score given by the authors of the cited research (where the probability of automatization was scored in the closed interval from 0 to 1, where 1 means the highest probability of automation).

**Table 2. The set of uberized jobs with their chances of being automated**

*Although the table can be extended, the results of this comparison suggest that the susceptibility of occupations to uberization and their susceptibility to automation correlate with each other.*

Occupation prone to uberization picked by the author	Matched occupation from Frey and Osborne's research	Frey and Osborne's score
Taxi driving and carpooling	Taxi Drivers and Chauffeurs	0.89
Food or groceries delivery	Light Truck or Delivery Services Drivers	0.69
Cleaning services	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	0.66
Accommodation services	Hotel, Motel, and Resort Desk Clerks	0.94
Private loans	Loan Interviewers and Clerks	0.92
	Loan Officers	0.98
Paralegal services	Paralegals and Legal Assistants	0.94
Performance of various, simple manual tasks (e.g., labeling photographs or building furniture) and supervising of such workers	Data Entry Keyers	0.99
	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	0.66
	First-Line Supervisors of Housekeeping and Janitorial Workers	0.94

*Source: The first tab is an own choice and the latter ones are chosen and cited from Frey and Osborne's research results (2013: pp. 57-72).*

Looking at the table, it seems to be probable that the susceptibility of occupations to uberization and their susceptibility to automation correlate with each other – in other words, the more the occupation is prone to uberization, the more susceptible it is to automation. It requires more primary research to

prove this – nevertheless, this comparison aimed to signalize the issue and extend it in the context of the previous paragraph.

## RESULTS AND CONCLUSION

The conducted analysis was aimed at proving that the phenomena of gig economy and uberization can be seen as preliminary stages of technological unemployment. It also aimed to show how different processes can influence the pace of the discussed transition. Using the inductive argumentation (scientific discourse analysis, and secondary data analysis), it was concluded that the main aspects of the progressing phenomena of gig economy and uberization can be treated as presages of the upcoming technological unemployment understood especially in terms of SBTC and RBTC models of change. The changes that can influence the pace of leading to technological unemployment can be grasped in categories of: structural changes (atomization of work, usage of the platforms), possession of control (algorithmic supervision, control over the process of production) and following linguistic shift. Using the secondary research, it was argued that the same aspects can also be prognostics of the upcoming technological unemployment in terms of the OBTC model. Therefore, the hypothesis of the article, saying that there are some organizational changes connected with the widespread usage of technology in workplaces that can lead to the displacement of human workers seems to be reliable and confirmed (as these changes have been shown and named). Nevertheless, as the subject of the connection between uberization, gig working and technological unemployment is still novel, there is a need to deepen the research in further studies.

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