

INDUSTRY 4.0. THE ROLE OF GIG ECONOMY IN THE INDUSTRIAL REVOLUTION OF THE 21ST CENTURY

PhD Student **Alexandra UNGUREANU**
„Ștefan cel Mare” University of Suceava, Romania
alexandra.ungureanu2016@gmail.com

Abstract:

The 21st Century is marked by the digital revolution, the center of which is the giant economy alongside the artificial intelligence and algorithms. This paper is dedicated to the analysis of the gig economy, that is the movement against the routine and the hierarchy of the system in which the human capital has undergone a gradual destruction of the creative and innovative spirit. The labor pool of the 21st century is characterized by the cooperation between man and technology, the result of which is a high degree of wellness for all nations. We could even say that at this moment, what unites us globally is the economy, not politics or governments, and the gig economy anticipates the potential impact of industrialization and the beneficial potential it might bring. The gig revolution brings to foreground challenges that can be transformed into opportunities, but it requires creativity and a correct mindset of the human capital in order to maximize the benefits of the revolution and minimize potential threats.

Key words: gig economy, digital revolution, artificial intelligence, innovation, continuous development

JEL classification: F66, J21, J24, J28, O30

1. INTRODUCTION

Gig economy is a terminology that reflects the recent changes on the global labor market and a response to full-time employment. Instead of long-term employment, giggers choose to work contractually or part time. Simultaneously, it is largely the result of early 21st century innovations. As technology evolves, opportunities to improve welfare through technology have expand with an significant measure. Independent workers can now be easily connected with employers all around the globe, because internet and smart applications have become mediators between this two categories. This employment status of the gig economy led to a large number of independent contractors due to the flexibility and nature of work.

One driven factor of gig economy global enlargement is the constant technological progress that facilitate and improves the methods of adaptation and inclusion on the labor market. In this circumstances and in the same time because of the assets provided by gig economy, the number of giggers is growing constanly and as a consequence, the recruitment and hiring sector are being forced to develop alternative systems to dispose of traditional employment structure.

Nevertheless, curently economics could not put in frame an unanimously accepted definition of the gig economy, because the diversity of this global phenomén is subject to constant changes as a result of technological development factors correlated to digital revolution and its particularities cannot be included in one specific theory or in a common vision.

2. EVOLUTION OF THE GIG ECONOMY. PAST, PRESENT, FUTURE

The gig economy evolved during the all industrial revolutions, begining with the mechanization revolution, which started in the late 1700s, characterized by the appearance of the steam engine. The second industrial revolution, 2.0, was revolutionized by electricity and in the second half of the 20th century, industrial revolution 3.0 took place, when information technology collide with production lines. In the present, 21st century is marked by the fourth industrial revolution, Industry 4.0, which is a movement towards digitization and artificial intelligence.

2.1 The past of the Gig economy - Retrospective of the industrial revolutions was necessary because along this lines of evolution, gig economy transformed constantly and the form that it took today is the last step in the development of the labor market. The first industrial revolution changed labor patterns when was accelerated by the new steam engine technology, generating massive productivity gains.

Today, the evolution of the workforce is extremely dynamic but also atypical because we are witnessing an exodus towards flexible and less affiliated jobs. This phenomenon is not new, starting with the first industrial revolution, and has constantly changed to the present, where Revolution 4.0 has accelerated the transformation into the digital space of what revolution 1.0 has done in materialistic field.

2.2. The present of Gig economy - The Brookings Institute has estimated that this economic area will grow from 14 billion dollars in 2014 to 335 billion dollars in 2025 (Yaraghi, 2016). Nonetheless, even if the size and growth rate of the gig economy is challenging, it is difficult to capture it in official statistics on employment. In 2016, the JPMorgan Chase Institute estimated that at least 1% of adults earned revenue in a month from online platforms and that more than 4% had worked for about three years. In addition to replacing a full-time traditional job, workers in the organization's economy can also use platforms in order to earn extra income (Farrell, 2016).

McKinsey & Company's consulting firm has conducted an survey regarding the motivation of gig industry workers (McKinsey Global Institute, 2016). With a narrower set of criteria for self-employed workers, the analysis was carried out on a sample of 20-30% of the active population in the field. The conclusion of the study was that they are direct participants for primary or secondary sources of income, but also out necessity, as can be seen in the table below.

Table no. 1. Motivation of workers in the Gig economy

	Primary income	Supplemental income
Preffered choice	Free agents 30% 49 million	Casual earners 40% 64 million
Out of necessity	Reluctants 14% 23 million	Financially strapped 16% 26 million

Source: Stuidiu McKinsey Global Institute, 2016, own processing

2.3. The Future of the Gig Economy - The probability that in the coming decades the gig economy will affect aspects of life and the global economy is very high, considering the degree of continuous development of technological systems and artificial intelligence which are heavily worn out on the labor market. The gig economy intends to modify how basic services will be provided, with implications for all stakeholders, such as consumers and workers, but also the business ecosystem.

The determining factors of growth in gig services are comfort, flexibility and price. By directly connecting suppliers and consumers, in many cases using physical or human assets, these services can eliminate many secondary costs. Beyond choice and price, consumers also benefit from increased availability of services, especially in areas served by traditional businesses.

Balance of costs and benefits is the most debated aspect of the gig economy. Fundamental trade in workers is one of flexibility that allows employees to strike an offset between work and life and respects their own unique circumstances, limitations or obligations, but does not provide security. There are risks on which gig workers deliberately expose, such as increased revenue volatility and potentially lower pay for the same types of work, fewer workplace protections, lack of valuable benefits packages offered in habitually by employers, including paid and sick leave, tax complexity, health insurance and retirement schemes. Gig activities may also have an impact on health, studies suggesting that a decade of irregular work could lead to a cognitive decline of 6.5 years, compared to those who work regular hours (Marquié, 2014).

A fundamental premise of the gig economy is that suppliers and consumers of goods and services can be matched directly and efficiently by technology. This has the potential to improve capital efficiency and productivity. But again, these gains do not come without costs and risks. A

thorough look at the gig economy must take into account public benefits and social security programs, unemployment and health and retirement systems.

3. THE IMPACT OF 4.0 REVOLUTION ON THE GLOBAL ECONOMY

The global labor market is constantly adopting new technologies because it makes it easier for companies to automate their routine tasks. Given that intelligent technology is becoming more and more important, awareness must be taken into consideration of the impact this will have on society and the workforce. The use of artificial technologies has led to the disappearance of certain jobs, but at the same time has created new ones, especially in the IT field. These complex information patterns change the current and future life levels and their potential impact will lead to a high level of global well-being.

The Fourth Industrial Revolution, or Industry 4.0, implies the adoption of cyber-physical systems, such as the Internet of Things (IoT) and the Internet of Systems. The Internet of Things is a network of interconnected smart devices that allow each device to interact with devices on the network, while corporate-owned systems can collect data from IoT networks to make independent decisions about various activities.

As the Internet of Things becomes more important, intelligent devices will have more access to data that would allow them to become independent. Eventually smart devices may have enough information to make decisions and autonomously control key business processes without human input. Currently, this technology focuses on routine issues, providing more time for industry professionals to identify solutions that will lead to the development of society. A European Commission report launched in 2016 includes a SWOT analysis of industry 4.0, from which we can deduce that productivity has increased at European level through the smart use of resources, resulting in flexibility and control of production but also in the increase in the number of jobs.

Table no. 2. Industry 4.0. SWOT Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Increase productivity, resource efficiency, global competitiveness and revenue • Increasing the number of qualified and well-paid jobs • Improving customer satisfaction by developing new markets • Flexibility and production control 	<ul style="list-style-type: none"> • High dependence on technology and network resistance • Dependence on a number of success factors, including standards, coherent framework, labor supply with appropriate skills, investment in research and development • Development and implementation costs • Potential loss of control over contractors • Semi-skilled unemployment • Need to import qualified labor force and integrate immigrant communities
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Strengthen Europe's position as a world leader in manufacturing (and other industries) • Developing new markets that are hardly accessible to promote products and services • Counteracting the negative demographic situation of the EU • Reducing entry barriers for SMEs in new markets and developing trade relationships with new supply chains 	<ul style="list-style-type: none"> • Cybersecurity, intellectual property, data privacy • Workers, SMEs, industries and national economies who do not have knowledge or means to adapt to industry 4.0 and will stagnate • Vulnerability and volatility of global value chains • Adoption of industry 4.0 by foreign competitors neutralizing EU initiatives

Source: Policy Department: A Economic and Scientific Policy, Industry 4.0, 2016, pag. 71, own processing

3.1. The impact of 4.0 Revolution on the future of workforce

The fourth industrial revolution is largely determined by four specific technological developments: high-speed mobile internet, artificial intelligence and automation, Big Data and

cloud technology. Of these four technologies, artificial intelligence and automation have the most significant impact on global employment figures.

A recent study released by McKinsey Global Institute, shows that by 2022 about one fifth of the global workforce will be affected by the embracing of artificial intelligence and automation, with the most significant impact on developed countries such as the UK, Germany and the US. The same survey reveals that by 2022, 50% of companies believe that automation will reduce the number of full-time employees and by 2030, robots will replace 800 million workers around the world (McKinsey Global Institute, 2017).

At first sight, these figures seem to be threatening, but it represents the global change in the workforce. The World Economic Forum reports that 38% of businesses believe that artificial intelligence and automation technology will allow entrepreneurs to create new jobs in order to increase productivity, while over 25% of companies believe that automation will lead to new jobs (World Economic Forum, 2017).

In addition to new roles and responsibilities, the fourth industrial revolution will have an impact in almost every industry and it is estimated that 50% of jobs are vulnerable to automation (PwC, 2018.)

However, some industries are more likely to be automated than others because robots, such as human employees, have a specific set of abilities. Over the next few years, we will see a reduction in the number of full-time employees in the production and agriculture roles, as many of these positions are already eliminated by the increase in automation.

3.2. The future of work

At a certain level, changes in the workforce and technological progress are normal and are expected from any developing company. The fourth industrial revolution will have a predominantly positive impact on the future of work. However, although positive factors are being addressed, there are also negative circumstances in terms of the future of labor in industry 4.0. Undoubtedly, jobs that follow repetitive processes are most likely to be automated in the future.

In this context, Industry 4.0 brings into discussion two support measures to prevent a negative impact on the global workforce. We are talking about the need for responsible leadership and the introduction of lifelong learning. Responsible leadership is the focus on entrepreneurs in order to make ethical choices when it comes to balance-of-profit issues in relation to job losses and changes brought by new technologies.

Lifelong learning is the conviction that all workers will become accustomed to acquiring skills and learning new information throughout their career, especially when it comes to a new technical experience.

The full impact of Industry 4.0 is still unknown, as many of the technologies in question are in the early stages of their development. Changes to the labor market culture remain remarkable, but as these new technologies evolve, the global workforce's ecosystem will constantly change.

3.3. Influence of the gig economy on the development of entrepreneurship

The gig economy is based on innovation and creativity, and lately, a large number of companies in all sectors benefit from this type of economy. The major benefit it brings is cost-saving, considerably reducing long-term wage spending and enabling companies to invest time and capital in development and innovation. Companies adopting the economics gig model reduce the amount of all types of resources used and earn in the long run.

The workforce in the company is radically changing and the need to implement an innovative model of human capital management is necessary for the growth and development of the global business environment. This model is powered by self-employed workers (freelancers) of all ages who choose temporary jobs.

For this reason, companies are starting to develop remote work platforms, giving employees the ability to work from anywhere. At the same time, the model plays the role of a social inclusion policy, eliminating social stereotypes related to age, mobility or family obligations. Entrepreneurs

able to provide services to large companies using a contingent workforce composed of independent professionals will benefit from greater benefits from adopting this model of economy.

Many gig workers consider themselves as being entrepreneurs even if they have not created a company to attract human capital or to produce goods, focusing on working for their own. In this situation, it is not surprising that freelancers in the gig sector intend to develop their own business in the future. A comparison of expected and nascent entrepreneurship rates among adults (ages 18-64) active in gig work within 27 economies has been performed by the Global Entrepreneurship Monitor (GEM) in 2018 and it reveals that they represent an important category of potential entrepreneurs.

Table no. 3. Comparison of the expected and developing entrepreneurial rate among adults (aged 18 to 64)

	Expects to start a business in the next 3 years. Not active in gig economy	Expects to start a business in the next 3 years. Active in gig economy.	Nascent entrepreneur. Not active in gig economy.	Nascent entrepreneur. Active in gig economy.
Bulgaria	0% – 10%	10% - 20%	0% – 10%	0% – 10%
Italy	10%	10% - 20%	0% – 10%	0% – 10%
United Kingdom	0% – 10%	10% - 20%	0% – 10%	10% - 20%
Netherlands	20%	20% - 30%	0% – 10%	0% – 10%
Germany	0% – 10%	20% - 30%	0% – 10%	10% - 20%
Sweden	20%	20% - 30%	0% – 10%	0% – 10%
Indonesia	20% - 30%	0% – 10%	0% – 10%	10% - 20%
Poland	20%	30% - 40%	0% – 10%	0% – 10%
Republic of Korea	30% - 40%	30% - 40%	0% – 10%	0% – 10%
Russia	0% – 10%	30% - 40%	0% – 10%	10% - 20%
Saudi Arabia	30% - 40%	30% - 40%	0% – 10%	0% – 10%
Cyprus	10% - 20%	30% - 40%	0% – 10%	0% – 10%
Ireland	10% - 20%	30% - 40%	0% – 10%	10% - 20%
Panama	10% - 20%	30% - 40%	0% – 10%	0%
United States	10% - 20%	0% – 10%	30% - 40%	20% - 30%
Argentina	10% - 20%	40% - 50%	0% – 10%	10% - 20%
Madagascar	30% - 40%	40% - 50%	40% - 50%	10% - 20%
Slovenia	10% - 20%	40% - 50%	0% – 10%	10% - 20%
Uruguay	30% - 40%	40% - 50%	0% – 10%	30% - 40%
Israel	40%	40% - 50%	0% – 10%	10% - 20%
Qatar	40%	0% – 10%	50% - 60%	10% - 20%
Taiwan	50% - 60%	0% – 10%	0% - 10%	10% - 20%
Puerto Rico	20% - 30%	60%	50% - 60%	30% - 40%
Chile	40% - 50%	60% - 70%	10% - 20%	20% - 30%
Turkey	30% - 40%	60% - 70%	0% – 10%	10% - 20%
Morocco	40% - 50%	10% - 20%	0% – 10%	60% - 70%
Sudan	60% - 70%	8% - 9%	10% - 20%	10% - 20%

Source: Global Entrepreneurship Monitor Adult Population Survey, 2018, own processing

Considering the magnitude of this phenomenon and its implications at all levels of the global economy, I consider that an analysis of the gig economy impact on entrepreneurial environment can be a decision maker for future entrepreneurs because the presence of competitive platforms can exert opportunities and pressures in the entrepreneurial ecosystem.

Increasing gig and sharing economies, has led 27 GEM teams to include questions about this issue in their 2018 survey as long as it is a globally phenomenon. The report presents the initial

results on participation rates in the gig economy and the distribution of economic workers in participating economies. As such, it reflects one of the first harmonized cross-border comparisons on the phenomenon and the division of the world economies. As the figure below shows, the highest rate of shared economic activity is far in the Republic of Korea, with more than one in every five adults involved in such activities. Israel, Chile, Ireland and the United States have also reported high rates of involvement in the gig and sharing economy. On the other hand, entrepreneurs are almost absent in Indonesia and Madagascar, low-income countries, which have high rates of TEA indicators.

Table no. 4. Gig and Sharing Economy Participation Rates by Country

	Active in gig economy	Active in sharing economy	Active in gig and sharing economy
Panama	0% - 5%	0% - 5%	0% - 5%
Indonesia	0% - 5%	0% - 5%	0% - 5%
Poland	0% - 5%	0% - 5%	0% - 5%
Madagascar	0% - 5%	0% - 5%	0% - 5%
Bulgaria	0% - 5%	0% - 5%	0% - 5%
Russia	0% - 5%	0% - 5%	0% - 5%
Taiwan	0% - 5%	0% - 5%	0% - 5%
Italy	0% - 5%	0% - 5%	0% - 5%
Puerto Rico	0% - 5%	0% - 5%	0% - 5%
Netherlands	0% - 5%	0% - 5%	0% - 5%
Germany	0% - 5%	0% - 5%	0% - 5%
Cyprus	0% - 5%	0% - 5%	0% - 5%
United Kingdom	0%	0% - 5%	0%
Slovenia	0% - 5%	0% - 5%	0% - 5%
Qatar	0% - 5%	0% - 5%	5% - 10%
Turkey	0% - 5%	5% - 10%	5% - 10%
Morocco	0% - 5%	0% - 5%	5% - 10%
Argentina	0% - 5%	0% - 5%	5% - 10%
Sudan	0% - 5%	0% - 5%	5% - 10%
Saudi Arabia	0% - 5%	5% - 10%	5% - 10%
Uruguay	0% - 5%	5% - 10%	5% - 10%
Sweden	5%	5% - 10%	5% - 10%
United States	5% - 10%	5% - 10%	10% - 15%
Ireland	5% - 10%	5% - 10%	10% - 15%
Chile	0% - 5%	5% - 10%	10% - 15%
Israel	5% - 10%	10% - 15%	10% - 15%
Republic of Korea	10% - 15%	20% - 25%	20% - 25%

Source: Global Entrepreneurship Monitor Adult Population Survey, 2018, own processing

4. BENEFITS AND THREATS OF THE GIG ECONOMY

The growth and development of the gig economy offers opportunities and challenges for all participants, whether passive or active. Perceived as a catalyst for self-employment by removing a ruin system in which workers are paid far below the limit, overworked and unprepared for change, the gig economy has the potential of massive productivity gains, but at the same time prefigures the end of job security. Among the main benefits of the gig economy that motivates and attract a growing number of participants, are:

1. Flexibility of the program - Independent work offers flexibility to the human capital

segment, which also has other responsibilities. Here we mention students, parents with young children and even those who make a transition in professional life.

2. Control of chosen work - Freelancers can control their work and related costs by freely choosing partners with whom they work according to their skills, experience, interests and values. This benefit includes both professional and financial satisfaction, as it provides the opportunity to expose knowledge and education, automatically leading to self-empowerment.

3. Freedom at the workplace - The gig economy has many options in terms of work. This flexibility helps to improve work-life balance, especially in economies where employees receive only two weeks of annual leave, and corporate culture can involve hours in the office to demonstrate commitment. This mistaken culture generates chronic stress, with a potential for decreasing productivity.

4. Protection against prejudice and politics - Home-based workplaces provide protection against the toxic environment in some companies, especially in large corporations with a vertical hierarchy and unidirectional communication, rather than an open and collaborative culture. Promotion may be influenced by favoritism or prejudice of any kind.

5. Motivation - In traditional jobs, people can feel unjustified, which has an impact on professional satisfaction. As the financial results are directly related to performance, in the gig segment, self-employed workers may be more motivated to provide high-quality work.

Workers who choose self-employment as primary income have higher levels of satisfaction than workers who choose traditional jobs. But while there are many benefits that can be gained from the ever-growing gig economy, the free market presents some obstacles that gig workers should take into consideration:

1. Financial insecurity - Self-employed persons pay a higher amount to compensate for the absence of paid leave, sick pay, pension contributions and training provided by permanent employers. Also, some customers need time to pay, or they do not pay at all, and legal procedures to request payment are expensive.

2. Data security - Centralized digital platforms are vulnerable to cyberattacks that could affect order history, customer discussions, databases, and outstanding payments.

3. Lack of transparency - Centralized digital platforms focus on maximizing short-run profit for the platform. Although feedback from users is required on some platforms, policy and process changes are supported by corporate interests.

4. High taxes - Gig workers, contribute significantly to the centralized success of the freelancing platforms, but some platforms require parties that sell up to 20% of the fees.

5. Social isolation - Independent work can be a lonely business with associated risks to mental health. Communication and relationships between buyers and sellers are often short-term and there is no community at work.

The gig economy offers benefits but is a field subject to constant challenges. However, it continues to expand, leading to global discussions on the protection of gig workers and the setting up of policies to overcome challenges and barriers.

5. CONCLUSIONS

Globalization and industry 4.0 will constantly develop gig economy. Enterprises of all sizes should consider proactive strategies to support this type of economy because the growing and independent workforce cannot be ignored as long as it is a critical factor in supporting the global workforce. In order to keep this phenomenon under control, it is necessary to monitor the changes that could arise in governmental and employment policies.

The expansion of the gig economy gives us a new opportunity to integrate innovation and creativity into the labor market with the aim of developing new products, offers or even identifying markets for them. Although there are challenges that the gig economy will have to gain in the future, statistics and analytics are optimistic about integrating the gig economy into a system that removes the negative aspects and provides a certain degree of safety for workers in the field.

Replacing fixed and independent jobs can generate economic impetus, not only by allowing workers to better adapt to jobs, but by releasing cumulative negative energies of frustrations and deadlines, thus developing creativity and self-esteem, which together lead to work performance.

Despite the fact that until the present have been made analyzes, surveys and statistics about the gig economy and its impact on Industry 4.0, it is perceived as a field where research is at the beginning and statistics will constantly change given the high degree of exposure to technology innovation and to the artificial intelligence of the Revolution 4.0. This exposure is the incipient phase of Revolution 5.0, which will be the Revolution of Personalization, centered on cooperation between man and artificial intelligence. Putting man back into industrial production, alongside collaborative robots, will lead to an added value in production and a high level of globally welfare.

BIBLIOGRAPHY

1. Anitha, J., *Determinants of employee engagement and their impact on employee performance*, International Journal of Productivity and Performance Management, volume 63, issue 3, 2014
2. Burke, Andrew, *The entrepreneurship enabling role of freelancers: Theory with evidence from the construction industry*, International Review of Entrepreneurship, volume 9, number 3, 2011.
3. European Parliament, *Precarious employment in Europe—Part 1: Patterns, trends and policy strategy*, July 2016.
4. Farrell, Diana and Greig, Fiona, *Paychecks, Paydays, and the Online Platform Economy*, 2016.
5. *Independent Work: Choice, necessity and the Gig Economy*, McKinsey Global Institute, 2016
6. Intuit, *Intuit 2020 report: Twenty trends that will shape the next decade*, October 2010.
7. Marquié, Jean-Claude, Tucker, Philip, Folkard, Simon, Gentil, Catherine, Ansiau, David, *Chronic effects of shift work on cognition: findings from the VISAT longitudinal study*, 2014.
8. McKinsey & Company, *Jobs lost, jobs gained: Workforce Transitions in a Time of Automation*, McKinsey Global Institute, 2017
9. McKinsey Global Institute, *A window of opportunity for Europe*, June 2015.
10. McKinsey Global Institute, *A labor market that works: Connecting talent with opportunity in the digital age*, June 2015.
11. Pew Research Center, *Shared, collaborative and on demand: The new digital economy*, May 2016.
12. PwC, *Will robots really steal our jobs? An international analysis of the potential long-term impact of automation*, 2018.
13. Sundararajan, Arun, *Will the on-demand economy raise global living standards?*, World Economic Forum online, September 9, 2015, available at www.weforum.org/agenda/2015/09/will-the-on-demandeconomy-raise-global-living-standards/
14. Weil, David, *The fissured workplace: Why work became so bad for so many and what can be done to improve it*, Harvard University Press, 2014.
15. *World Economic Forum, The Future of Jobs Report*, 2017
16. Yaraghi, Niam and Ravi, Shamika, *The Current and Future State of the Sharing Economy*, 2016