The digitization of the industry and its influences on work's world

La numérisation de l'industrie et ses influences sur le monde du travail

Nassima Bouri

University of Oran 2- Algeria

nassimabouri@rocketmail.com

Received: 23/03/2019 Accepted: 11/06/2019. Published: 30/06/2019

Abstract:

The evolution of digitization represents a profound change in the world of work. It opens the door to new possibilities for automation and promotes the advent of new forms and types of work. It is essential for social cohesion and for economic institutions that rapid technological digital transformations are rationally managed in order to promote benefits and eliminate negative impacts. This requires training all economic agents and equipping them with the tools and capabilities needed to successfully adapt to this digital transformation. The article aims to seize the opportunities that arise and identify risks at an early stage in the world of work.

Keywords: Employment, digitization, structural change, robotics, sensor technology, cyberphysics, digital revolution, exponential growth.

Jel Classification Codes: P23, F14.

Résumé:

L'évolution de la numérisation représente un profond changement dans le monde du travail. Elle ouvre la voie à de nouvelles possibilités d'automatisation et favorise l'avènement de nouvelles formes et types de travail. Il est essentiel pour la cohésion sociale et pour des institutions économiques que les transformations numériques technologiques rapides soient gérés rationnellement afin de favoriser les avantages et de supprimer les impacts négatifs. Ce qui exige de former l'ensemble des agents économiques et les équiper des outils et des capacités nécessaires pour s'adapter avec succès à cette transformation numérique. L'article a pour objet de saisir les opportunités qui se présentent et identifier les risques à un stade précoce sur le monde de travail.

Mots clés: Emploi, numérisation, changement structurel, robotique, technologie des capteurs, cyberphysiques, révolution numérique, croissance exponentielle.

Jel Classification Codes: P23, F14.

* Corresponding author: Nassima Bouri, e-mail: nassimabouri@rocketmail.com

Introduction :

Digitization has transformed societies and economies over the last twenty years and this evolution is accelerating. The transforming powers of artificial intelligence, big data, the Internet of Things, mobile technologies and blockchain are underway for a fourth industrial revolution. This development is essentially positive, improving standards of living, life expectancy and quality of life. Nevertheless, it can also have disruptive effects, particularly in the labor markets.

Digitization represents a profound change in the world of work. It opens the door to new possibilities for automation and promotes the advent of new forms of work. It is essential for social cohesion and strong economic institutions that rapid technological change is managed effectively to maximize benefits and minimize negative effects. This includes equipping everyone in society with the tools and capabilities to participate fully and successfully in this digital transformation. Indeed, digitization must serve both the interests of the Swiss economy and workforce. Opportunities must be seized and risks identified at an early stage.

1. Digital Economy : Definitions and Benefits

1.1. Definition of Digital Economy

The economy digital encompasses two Notions who the compound: the economy and the digital. Indeed the term economy having already been defined and explained in several research and several economic references :

"Economics can be defined as a discipline of the social sciences whose object of study is the allocation of scarce (or limited) human resources to the satisfaction of its multiple and competing needs. It focuses on the production, distribution and consumption of goods as well as institutions, regulatory frameworks and the environment facilitating these activities "(Alexandre Nshue M. Mokime, [2012]).

- The second notion "digital ", « Brings together Information Technologies and of the Communication so than all of the techniques used in the treatment and the transmission of the news such than by example the telecommunications, internet or IT. The digital sector refers to the sector of economic activity relating to technologies of Information and of the Communication and at the production and at the sale digital products and services.

1.2. Benefits of the Digital Economy

This new so-called digital economy is today at the heart of the growth and competitiveness of nations and companies on a global scale. Long remained specific, it has become the most dynamic sector of the world economy with a growth rate twice that of the classical economy in most developed countries. It is the main factor

of gaining competitiveness for the economies of these countries and now accounts for nearly 30% of global growth (OECD, [2017]).

The digital market recorded a global increase of 4.3% in 2011 to reach 3070 billion euros in value (OECD, [2017]), said the Audiovisual and Telecom Institute in Europe (Idate). This is a real revolution which, for the present and the near future, is making decisive changes for society and for the world economy in all their aspects and in all fields, thus imposing new rules, conventions and laws that govern international relations.

The digital economy has challenged and profoundly transformed the processes of production, distribution, sale and consumption of goods and services. Its expansion is the usufruct of a long process of global economic and social transformation, which asserts itself every day a little more. The immediate consequence is a radical upheaval in the lifestyles and communication, the professional practices, the consumption habits of states and their citizens.

New technologies have progressively become part of the core business, creating new sectors, businesses, products and services that support the process of digitization of the economy and that offer opportunities for all stakeholders. of the global economy and enables them to conquer the key markets of the future and thus adequately address the major challenges in redefining the principles of international trade, for the advent of a new global economic order.

2. The global impacts of digitization on employment

2.1. The digitization of industrial processes and the volume of employment and its content in terms of skills

Authors in France advocate for improved skills, certifications and better use of these. They also propose placing the digital transition and automation at the heart of social dialogue and strengthening the role of the social partners.

Numerous university studies have attempted to anticipate the effects of digitization on the volume of employment. The results regarding the net effect of gains and losses are extremely varied. The only consensus among academics seems to be: the transformation is deep and fast. The net effects on the employment volume of the potential productivity gains from digitization, as well as the principles that should govern the distribution of these gains in society, remain points of discussion in academia, and between the social partners.

The predisposition of workplaces, businesses and sectors to digitization is very mixed: some will be totally transformed, while others will remain largely intact. The digitization of products and processes, but also the organization of work, specifically modifies the requirements in terms of skills and competences of the workforce. On the one hand, more digital skills are needed: programming, the use of abstract interfaces with numerically enhanced machines, and so on. become more important at all levels.

On the other hand, qualification requirements, other than digital, also [appear], as is the case with all technological developments, for example. knowledge and creation of business models for the digital world, advanced analytical skills (to make sense of the data generated by detectors and platforms), and cyber security skills, but also the ability to communicate, to cooperate, make decisions and take responsibility for dematerialized, remote and asynchronous work processes.

Although some basic skills, such as reading and numeracy, will retain and even enhance their importance in a digitized work environment, other existing skills components may become obsolete due to digitization, threatening the employability of some workers. and the competitiveness of some companies. This has often been the case with technological change in our industry. The effects are therefore not unknown but with scanning, their speed and scale increase.

2.2. The digital transformation of work and its influence on the employment relationship

In this element, French researchers pointed out that there is a positive link between technological progress and flexible organizations, as well as technological and organizational innovations that improve performance and innovation capabilities for employers and employees.

In this context, the authors in France emphasize that machines are only able to reproduce tasks and not to mobilize skills, in other words, to exercise trades.

The technical ability to work remotely, at any time, with mobile devices, calls into question the unity of time and space for work, and the notions of "working time" and "location" of work ".

Supervision by the contracting firm of the work carried out is legitimate (in order to control the execution of the task, and for health and safety considerations at the workplace), but, taking into account the technical possibility of collecting at all times large volumes of work- and worker-related data at short intervals and at very low cost, certain rights and limits could be analyzed in more detail between the social partners.

The technical possibility of concluding individualized contracts at very low transaction costs creates potential challenges and opportunities in terms of collective bargaining. Employers and unions need to think about their roles and whether they should evolve.

2.3. Digital technologies and specific opportunities in health, safety and risk

New technologies generate opportunities in the field of ergonomics (using digital simulation of work processes) and therefore in preventive health care in the workplace. Similarly, the increased use of digital control assistance systems can alleviate physical and mental stress; improve the level of employment of older workers and people with disabilities.

Individual responsibility for health and safety at work (OHS) increases when employees have greater autonomy. OHS requirements in fixed and established workplaces can't be transposed to mobile workstations and home

offices as they are. This transposition could therefore be the subject of further discussion between the social partners.

People use the same digital technology (computers, mobile phones "smartphones") privately and professionally. This situation raises questions about the overlap between what people do in their private and professional lives.

Research must not only focus on hazards, but also examine the realization of potential by preserving or improving people's employability and making businesses more competitive. Machines or autonomous vehicles, the actions of which may depend on the input of a large number of independent entities, may give rise to new accident risks and new compensation issues.

3. Labor market and digitization: trends and vectors

The impact of digitization on the world of work - and especially on employment, unemployment, income, skills profiles, qualifications, working conditions, health, and social security - must be considered in overall context of structural change. Digitization interacts with other long-term trends that have a bearing on the functioning of the labor market. At a lower level too, the digital revolution is directly influenced by certain vectors.

3.1. Long-term trends

Social transformations change values, conceptions and patterns of consumption. The digital generation of children (people who have always lived in a digital environment) differs from previous generations in its use of the media and in the way it works.

While the majority of young people entering the labor market still consider that a stable and well-paid job is the most important element of "quality work", some workers favor the balance between work and personal life, while others aspire to greater autonomy and tend to mix private and professional life.

New consumption patterns are also appearing, such as the growing demand for individualized products or the advent of the sharing economy (according to the "use instead of owning" principle).

3.2. Vectors of structural change

The vectors of the digital revolution can be characterized by the technical progress made in the main areas:

- ✓ **Exponential growth of processor power and improved storage techniques:**

These technologies facilitate communication, management and monitoring of management and production processes; they also simplify communication between consumers and businesses.

- ✓ **The proliferation of artificial intelligence systems**

These systems are based on machine learning and algorithms, such as speech recognition software (Siri, Watson) or translation software (Google Translate).

- ✓ **Robotics and sensor technology**

It is in the processing industry that robotics is currently the most used, as are new manufacturing techniques such as additive processes (3D printing) which make it possible to explore new individualized forms of production and aim efficiency.

- ✓ **Networking information or connecting objects**

These so-called "cyberphysics" systems are networks of small computers equipped with sensors and actuators communicating with each other via the Internet and capable of interacting (internet of things).

Conclusion

The digital economy and the economy of the internet and its commercial uses have attracted great interest. However, computer and networking technologies have the potential to transform not only consumer behavior, but also the functioning of the economy. An economy characterized by these technologies is the digital economy, where market agents behave differently according to economic rules different from those of the physical economy.

On the other hand, it should be added that, digitization has justified consequences on practically all cultural and especially socio-economic domains. In connection with this new trend of substance, new themes are becoming more important related to data security, data protection, cybercrime, as well as business management in the digital age, training and continuing education, social media, sharing economy etc.

Finally, it should be added that, Industry 4.0 will change the face of the entire manufacturing system, both its architecture and organizational structure as products, services and business models. The development and implementation of these solutions will certainly be gradual in line with a long-term trend, but the situation is already favorable. Companies that are not new to technology and do not invest in pilot projects will lose their competitive advantage and miss the opportunity to lead the transformation that is currently sweeping the manufacturing sector.

Our goal has been to demonstrate to what extent the economic transformations triggered by the use of information and communication technologies are fundamental.

Finally, we must recognize that this new era of technological revolution will be social as well as economic. The magnitude of change will require considerable societal adaptation and this process will require extensive preparation and discussion. We must start thinking now about the different development approaches that can help mitigate the social and economic impacts of the technological revolution in advanced and developing countries.

We conclude by noting at the international level that digital and computer and networking technologies not only improve the economic efficiency of financial institutions and businesses, but also present a new type of fictitious

and digital market that could be an example of a perfect market requiring a more vigorous re-examination of the assumptions and economic results provided by studies conducted in traditional markets.

Besides, on the national level that Algeria presents a significant development potential in the digital sector in the coming years, it nevertheless represents a weak dynamic in the digital domain, which is in fact mainly due to a significant lack of support and financing schemes, as well as a weak development of innovation activities. Finally, we hope that our country will be able to catch up with much of the gap with emerging and developed countries in terms of added value achieved by ICT.

5. List of references:

1. Acemoglu, D., and P. Restrepo (2017). "Robots and Jobs: Evidence from US Labor Markets," paper presented at the American Economic Association Annual General Meeting, Chicago, January 7.
2. Agrawal, A., J. S. Gans and A. Goldfarb (2017). "What to Expect from Artificial Intelligence," MIT Sloan Management Review, Vol. 58, No. 3.
3. Autor, D., D. Dorn, L. F. Katz, C. Patterson and J. Van Reenen (2017) Concentrating on the Fall of the Labor Share, Working Paper No. 23108, National Bureau of Economic Research.
4. Derviş, K., and Z. Qureshi (2016). The Productivity Slump-Fact or Fiction: The Measurement Debate, working paper, coll. Global Economy and Development, Brookings.
5. Ericsson, N.R. (2016). Economic Forecasting in Theory and Practice: An Interview with David F. Hendry, Board of Governors of the Federal Reserve, coll. "International Finance Discussion Papers", No. 1184.
6. World Economic Forum (WEF) (2016). Digital Transformation of Industries: Logistics Industry, World Economic Forum white paper prepared in collaboration with Accenture.
7. World Economic Forum (WEF) (2016). Digital Transformation of Industries: Automotive Industry, World Economic Forum white paper prepared in collaboration with Accenture.
8. Frey, C. B., and M. A. Osborne (2017). "The Future of Employment: How Susceptible Are Jobs to Computerization? "Technological Forecasting and Social Change, vol. 114, No. C, p. 254-280.
9. Fung, B., and H. Halaburda (2016). Central Bank Digital Currencies: A Framework for Assessing Why and How, Staff Analysis Paper No. 2016-22, Bank of Canada.
10. Kaplan, G., B. Moll and G. L. Violante (2016). Monetary Policy According to HANK, Working Paper No. 2016/2, Council on Economic Policies.
11. Lev, B., S. Radhakrishnan and P. C. Evans (2016). Organizational Capital: A CEO's Guide to Measuring and Managing Intangible Enterprise, coll. "Measuring and Managing Organizational Capital Series", No. 1, The Center for Global Enterprise.
12. OECD Compendium of Productivity Indicators 2016, Paris, OECD Publishing.
13. Poloz, S. S. (2016). From Wood Cutters to IT Professionals: The Expansion of Canada's Service Economy, delivered at the C.D. Howe Institute, Toronto, November 28.
14. Schwab, K. (2016). The Fourth Industrial Revolution, Geneva, World Economic Forum.
15. Syverson, C. (2016). Challenges to Mismeasurement Explanations for the U.S. Productivity Slowdown, Working Paper No. 21974, National Bureau of Economic Research.
16. Van Ark, B. (2016). "The Productivity Paradox of the New Digital Economy," International Productivity Monitor, Vol. 31, p. 3-18.
17. Varian, H. (2016). "Intelligent Technology," Finance and Development, vol. 53, No. 3, p. 6-9.