

HOW COULD COMPANIES' MANAGEMENT FACE THE CHANGES AND THREATENS OF THE FOURTH INDUSTRIAL REVOLUTION?

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***Abstract:** The fourth industrial revolution is changing the world. The process of change is ongoing and not an easy one. Companies around the world are transforming, reconfiguring, and their management is facing completely new challenges. The paper aims to illustrate the main characteristics of the general framework in which these changes take place and to highlight through a synthesis the main changes and threats faced by company managers compared to the traditional situation.*

***Keywords:** fourth industrial revolution, companies, management, changes, synthesis*

***JEL Classification:** M10, O30*

1. Introduction

The digital revolution or the fourth industrial revolution as it was called by Klaus Schwab, the founder of the World Economic Forum, in action since 1971, describes a world of artificial intelligence, robotics, and digitalization (British Encyclopaedia, 2018).

The technological revolution and climate change of this century have led to profound changes in all global industries. Industrial technological innovations in information and communication equipment, applications of artificial intelligence (AI), but also those in the field of materials have been based on knowledge and innovation. The new skills required of employees focus on expertise, ethics, and the use of IoT. "The speed, scale and depth of this revolution have forced us to rethink how

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countries should develop, how organizations create value and how people from all walks of life can benefit from innovation” (World economic forum, 2021).

Artificial intelligence (AI) systems are created by people for the general good, as tools that reduce especially physical work and repetitive activities, but there is a danger of using them against people, democratic values, and social relations.

There are situations in which people are replaced by such systems, thus losing the only source of income. “The spread of algorithmic management technology in the workplace is increasing the power asymmetry between workers and employers. AI threatens not only to disproportionately displace lower-wage earners, but also to reduce wages, job security, and other protections for those who need it most” (Crawford et al, 2019).

The technological revolution favours large corporations, which have the financial opportunity to invest in state-of-the-art technologies to increase labour productivity and hire highly skilled personnel, to the detriment of low-skilled workers and favouring unequal market competition between large corporations and SMEs.

In this context, the paper aims to illustrate the framework of the fourth industrial revolution and to highlight through a synthesis the main changes and threats facing the management of companies compared to the traditional situation in general.

The paper is based on bibliographical references, analysis and observation and own judgment. The main reference in this paper is Global Risks Report 2016, World Economic Forum.

2. The framework of the fourth industrial revolution

In the context briefly described above, the general framework of the fourth industrial revolution seems to affect the following main domains: digital technology access, working place, new skills and culture, cyber

space and security, the commercial exploitation of personal data and climate change.

The fourth industrial revolution is faster, with much more productivity, destroying many jobs, and being based on knowledge as an investment (Xi, 2018).

Digital technology access

The development of the Internet and mobile devices facilitate not only the worldwide communication, but also the education and training, research, employment, public services and, knowledge accumulation and creation. It is a useful tool to people with disabilities, countryside people or indigenous communities. A statistic provided by the International Telecommunication Union (ITC) relieve that at the end of 2019, a bit more that 51 per cent of the global population, or 4 billion people, are using the Internet. But, the distribution of this figure around the world regions is different. In Europe, for example, more then 82% persons are using the Internet, while in Africa only around 28%.

The digitalization helped the development of many kinds of devices, so called Internet of Things (IoT), that could be used everywhere, such as: machinery in production factories, phones, cars, houses, medical devices and, so on.

By contrary, the new technologies and artificial intelligence may cause drastic changes in the companies' activity and even disrupting some industries, such as the main changes underlined by the World economic forum (2016):

- Market shares, by using drones and/or 3D printing technology;
- Advances in genetic engineering;
- Sustainable energy systems;
- New materials designed to emulate the biological world.

They also may provoke unemployment and wellbeing disparities. Anyhow, the digitalization and the use of cloud data base are not facile

for everybody. According to the World Economic Forum's Future of Jobs report, automation may displace 85 million jobs in the span of just five years.

Working place

The pandemic CORONA virus imposed new rules and tailored the workplaces and adapted jobs in order to provide distance in offices and new configurations of production lines and services. In some countries, the work schedule has even been reduced to facilitate distance (Khanchel, 2020).

At the same time, the IoT helped the rapid switch to remote work and saved thousands of jobs, when it was possible.

In a way, the pandemic accelerated the transformations toward the implementation of the 4th Industrial Revolution. Jobs are no longer secure and are related to the skills of innovation, creativity, and use of the IoT. Instead, they are better connected to each other.

New skills and culture

Apart of professional skills, the fourth revolution requires innovative employees that create values for the company. The efforts are directed to the creation of inclusive workforce.

Inclusive workforce is a working environment that values individuals and harnesses the abilities of each individual, which enable a company to embrace different backgrounds and perspectives; it drives innovation, fosters creativity and increases talent selection (Trillium).

An inclusive and diverse workforce may find an open and creative space for diversity, innovation, disabilities and where everyone can thrive.

A PWC report (2020) underlines that "Over the past year, our priority has been our people: keeping them safe, protecting jobs, looking after their wellbeing, providing opportunities to learn and grow, and continuing to build a diverse and inclusive workforce".

Inclusion establishes a culture in which all employees can benefit from the following: culture where all employees feel free to contribute ideas; making it safe to propose novel ideas; value driven feedback from different perspectives (Trillium, 2021).

The new culture permits employees to feel free to create, diversity and flexibility. It contributes contribute to the success of modern companies worldwide, via employee engagement, satisfaction, and productivity (Richmond, 2017).

According to Harvard Business studies, employees in a diverse work culture are 3.5 times more likely to contribute their full innovative potential. Inclusion is the best way to provide value to any organization. Inclusive employer is a business who values a diverse workforce, including people with disabilities (Hewlett et al, 2013).

Nevertheless, “anticipating and preparing for future skills requirements will be critical for everyone” (World economic forum).

Whether the innovation is carried out within the organization or is purchased from outside, more and more materials, products, technologies or new systems and procedures appear, which hasten the market competition.

Cyber space and security

The massive digitalization created a huge cyberspace used for data collections, commercial transactions, communication and, others. This space and the big data bases are under continuous risk because of cybercrimes. In his annual report (2018) Cisco wrote that 65% of email are spam, 8% of emails re malicious, 47% of malicious documents are zip file and 40% of unknown or unmanaged devices get missed on a network. The hackers are very productive and make the Netscape unsure. The report makes attention to the fact that the hackers “are exploiting undefended gaps in security, many of which stem from the expanding Internet of Things (IoT) and use of cloud services”.

The unsafe IoT causes huge disorder in some industries, such as: aviation, transportation, tourism and leisure, military actions and others. Some of these problems are the responsibility of manufacturers that are using hardware vulnerable to hackers.

The commercial exploitation of personal data

The AI permits the use of personal data that is favourable to companies for personal advertising, which is an unethical practice. The use of personal biometric data without consenting is a matter of crime.

The consumers wish safety IoT and security, so that big AI companies are working on developing blockers.

A survey conducted by Pew Research Center (Geiger, 2018) estimates that 66% of the news and media websites are suspected are suspected of being used by robots, being posted by automated accounts.

Climate change

Despite different engages assumed by world associations, governments and companies, the climate change is a reality and provokes many damages in all the fields.

The global carbon dioxide emissions fell by 9% in the first half of 2020, but the risks of ecosystem degradation, biodiversity loss, and potential infectious disease are still present. Waste and pollutants from mining and agricultural activity, and marine plastic pollution increases (World Economic Forum, 2021).

Crucial actions plans were taken forward in areas including finance, the transparency of climate action, forests and agriculture, technology, capacity building, loss and damage, indigenous peoples, cities, oceans and gender (Cop25 Conference, 2019).

The swift to green and circular economy is environment protection but needs more finance.

Sustainable finance can play a significant role in this regard, by providing the necessary (and often difficult to obtain) funding for sustainable infrastructure in developing economies – and for renovating and refurbishing existing infrastructure in developed economies in more sustainable ways, in fields like energy (using more renewables), mobility (better facilitating public transportation and electric vehicles), and telecommunications (finding more sustainable ways to provide computing power and data storage) (Vecchi, 2021).

The analysis of the general framework that characterizes the main aspects of the current industrial revolution shows the following influencing factors: knowledge, innovation, market competition, globalization and climate change and the main consequences of these factors: digitalization, IoT, artificial intelligence, robotics, circular economy, ethics violation and company change (fig.1).

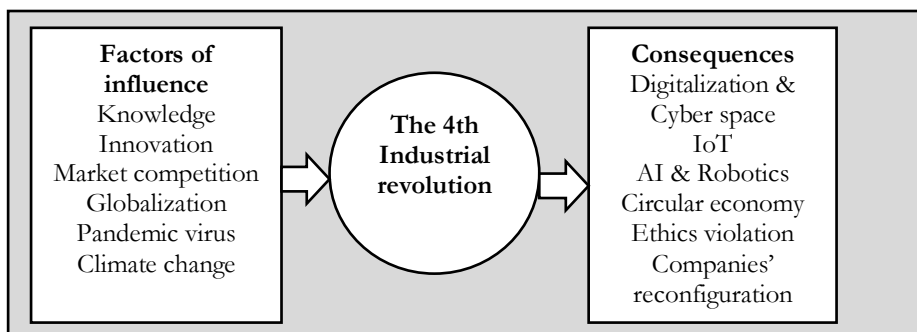


Fig. 1 Influencing factors and consequences of the fourth industrial Revolution (own scheme)

3. Changes and threatens in companies' management

The framework, briefly illustrated above, gives the main directions in which the environment of organizations transforms and in which managers must offer new solutions to survive and develop.

Compared to traditional general management methods, these changes may cause threats that need to be considered.

Given the main aspects of the general framework, a synthesis of changes and threats in company management resulted, as an effect of the fourth industrial revolution (table 1). The main areas of responsibility of the management of the companies grouped on the classic functions of management were selected.

Table 1: The synthesis of changes and threats in company's management

Management's field	Traditional way	Changes	Threatens to changes
Planning			
Strategy	Focus on market	Focus on innovation	Lack of knowledge
Technology	Based on technics and human work	Based on artificial intelligence	Violation of ethics; Unemployment
Materials	Traditional	Nano-materials and substitutes	Dependence on few suppliers
Investment	Focus on physical assets, advertising and stock exchange	Focus on IoT and cyber safety	Costly; Cyber insecurity
Green business	Some recycling	Focus on green solutions	Costly
Cooperation	Mutual interest	Globalization	Loss of identity
Market	Based on generic products and services	Based on innovation; digital	New markets
Finance	Based on banks loans	Based on corporate and financial syndicates	Difficulty of accessing
Organization			
Structure	Mainly functional	Mainly network	Unemployment
People	Skilled and unskilled	Talent, experts; Focus on people	Social division; Digital gaps
Culture	Often bureaucratic	Flexible; Collaborative	Less professionalism
Coordination			
Communication	Mixed; mostly by	Mostly through	Social distancing;

Management's field	Traditional way	Changes	Threatens to changes
	face-to-face meetings	networks based on reports	Cyber insecurity
Motivation	Based on quality of work	Based on innovative ideas	Social division
Control			
Management control	Using procedures	Using software	Cyber insecurity
Feedback	Written or verbal	Automation	Social distancing

The main changes are related to planning and organization. The managers need to reconsider their companies' configuration, strategy, and employees' selection on new bases. Global companies become more powerful, so that the competition of the medium and small business on the markets is harder. The shortage of financing of these type of companies makes the transition difficult in what is concerned investment in talent and innovative people, IoT and cyber safety, new materials, and artificial intelligence.

Some companies started to invest in green industry, such as: solar energy, non-polluting engines, green houses, recycling materials and others to ensure their competitive advantage.

Whether the innovation is carried out within the organization or is purchased from outside, more and more materials, products, technologies or new systems and procedures appear, which hasten the market competition (Negulescu, 2020).

To manage most of these changes, company management must carefully analyse and handle the associated threats, such as: loss of markets, loss of identity, digital gaps, cyber insecurity, unemployment, social division and distancing, lack of knowledge and lack of finances.

Probably, in the future, many of the current companies will disappear, but certainly new ones will be created, based on the beginning of innovation.

Conclusions

The digital revolution or the fourth industrial revolution requires changes in various areas of company's management. In essence, managers need to reinvent their companies. The literature offers a whole series of examples in this regard. They must take into account the aspects that derive from the digitization process and reconfigure the managerial functions.

These changes certainly have a number of risks or threats that managers must assume and find the best solutions to adapt to new business requirements.

The synthesis proposed in the paper could be a useful tool for all managers to keep them alert to the changes they are currently facing and what to expect in the future. However, they must keep their eyes open for possible threats to the transition.

This research will be developed by deepening the aspects presented briefly here and the detailed explanation of the components of the synthesis.

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