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Transforming the Organization … Towards Resilient Businesses within the 4th Industrial Revolution

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Abstract

A variety of situations and unexpected developments are challenging societies all over the world. At individual level, people often have the feeling that things are 'going crazy' or that they - regardless of their roles in their organization, profession, industry etc. - are unprepared and 'taken by surprise' by the elements that interrupt their regular activities, plans and/or scenarios. These disturbances, shocks or rhythm breaks − bigger or smaller − are commonly approached under the term of 'disruption'!

In such a context, change becomes essential for survival. However, individuals do not just want to survive, but to thrive and/or to achieve their goals, to be successful. Thus, any 'disruption' needs to be perceived as an opportunity! Any professional individual and any organization that will not be able to adapt to the new realities of the 21st century, might be set to fail during the 4th Industrial Revolution (4IR). Every individual and every organization should be able/prepared to change, even if, generally, reluctance to change is very high., Based on a comprehensive desk research, in this paper we will analyse a series of new business models for the future of businesses. We aim to provide a clear image on the resistance to change, approached as an 'immune system' of any organization, especially in the context of the 4IR. We will tackle organizational transformation in a pragmatic way, emphasizing the importance of the 'immune system', focusing in the same time, on key people and organizational culture transformation. The paper brings an innovative approach on businesses' flexibility and adaptability to the new challenges and opportunities generated by the 4IR, adding value to the broad scientific literature in the area of entrepreneurship and, in a more specific way, in the area of change management.

Keywords: business, entrepreneurship, 4th industrial revolution, transformation, resistance to change.

JEL Classification: M10, M14

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1. Introduction

In the world of business, performance is the key. In a changing environment, in the future of business, if businesspeople – owners, managers, entrepreneurs, intrapreneurs or any kind of decision makers – target sustainability in their actions, they should focus on new business models and new approaches.

Business owners and business managers, either in entrepreneurial start-ups or big corporations, should change the way they organize and manage their assets, resources, people and priorities.

In this paper we will analyse a series of new business models for the future of businesses, after setting-up their related context. Then, we focus on the resistance to change, approached as an 'immune system' of any organization, especially in the context of the 4th Industrial Revolution (IR). We will tackle organizational transformation in a pragmatic way, emphasizing the importance of the 'immune system', focusing at the same time on key people and organizational culture transformation. Thus, the paper is structured into six main parts, introduction and conclusions included. The following section outlines the context associated with the emergence of our idea. The third and fourth sections briefly explain the research's methodological aspects, while the fifth puts forwards its findings.

2. Problem Statement

The fact that technology is disrupting the world is commonly agreed. Throughout history, people developed different types of technology. Depending on the era and century, the technology developed and used by humans was not of the same shape and size as today, but people became used to it and, after a while, even dependent of the technology of their time. In any society, in the daily life or in the economic and business life, people have used the available technology to make their lives easier. And, some of the most innovative minds of their time tried and succeeded to improve, perfect and upgrade the available technology. From time to time, some inventors and innovators pushed the human technology to the next level. In different times in history, some technology advancements and new inventions had a huge impact on some industries and even on the human society. The disruption and changes brought about by them were so important that they went down in history as IRs. Right now, as many scholars agree, we are at the beginning of the 4 IR, commonly found under the term of Industry 4.0. (Hermann et al., 2016) However, in order to understand the actual context we are placed in, a brief overview of the three previous IR is provided in the following paragraphs.

2.1. The 1st IR

This is actually The Industrial Revolution (about 1760 to sometime between 1820 and 1840), represented by the transition from hand production methods to machines, by new manufacturing and production processes, by the increased use of steam power and waterpower, by the development of machine tools and by the development of the mechanized factory system (Hobsbawm, 1988).

The biggest change (the disruptive change) was produced by mechanization. This represented a main argument in supporting industry, instead of agriculture, as the backbone of the economy in societies.

The disruptive technological innovation defining the 1st IR was the invention of the steam engine. This led to the fast development of railroads, accelerating the economy growth and the development of many businesses.

Economic historians agree that the 1st IR was the most important event in the history of humanity since the domestication of animals and plants, leading also to an unprecedented population growth (McCloskey, 2004).

2.2. The 2nd IR

Also known as the Technological Revolution, the 2nd IR "was a phase of rapid standardization and industrialization from the late 19th century into the early 20th century" (Muntone, 2013). Characterised by "massive technological advancements in the field of industries that helped the emergence of new sources of energy: electricity, gas, and oil", its most important outcome was the "creation of the internal combustion engine that started to reach its full potential" (Anderson, 2019). Other key points are represented by: the development of steel and new methods of communication such as the telegraph and the telephone. One of the emblematic business models in the 2nd IR was the FORD assembly line – maybe, the most iconic element of mass production. In present times, the 2nd IR may be perceived as probably the most important IR due to its most used inventions: the automobile and the plane.

2.3. The 3rd IR

The second half of the 20th century is marked by the emergences of a new source of energy: the nuclear energy. Also, the increasingly fast development of electronics, telecommunications and, maybe the most important, the computers, represent important milestones within the 3rd IR (Khan, 1987). Through new technologies, the 3rd IR opened the doors to space expeditions, research, and biotechnology. In the business world, the development of robots and automated machines led to the era of high-level automation.

The disruptive and fundamental economic change occurred when new communication technologies converged with new energy sources, as the renewable electricity (McCloskey, 2004).

3. Research Questions/Aims of the research

As outlined in the previous section of the paper, three main factors arise as drivers of the 1st, 2nd, and 3rd IRs: *a new energy source, a new communication system* and *a new financial system* (de Vasconcelos, 2015). Starting from this premise, we are aiming to:

- Identify if these factors can also be tracked at the beginning of the 4th IR;
- Analyse what are the disruptive changes and new technologies driving the 4th IR;
- Analyse what are the proper business models and approaches for the future.

In such a context, when resistance to change in organizations is approached using the 'immune system' syntagma (Gilley et al., 2009; Ismail et al., 2014), we aim to understand how does this affect organizational transformation?

4. Research Methods

This paper is based on a desk research, mainly consisting in analysing on-line materials – books, documents of representative institutions in the area, scientific and newspaper articles, blogs of economists and businessmen, etc. All the information we gathered was further analysed in a critical and comparative manner. In the following section of the paper, based on an inductive approach, we outline the research's main results.

5. Findings

5.1. The three main factors driving an IR

Within the 1st IR:

- the *new energy source*: represented by the change from wood power to coal power helping the development of the steam powered boats and trains and leading to industrialisation (using machines and fast mass travel opportunities).
- the *new communication system*: represented by the steam-powered printing press. This led to affordable/cheap newspapers and magazines, enabling somehow mass education. This was a great transformation for humanity, after the Gutenberg moment in 1439, respectively the invention of the first printing press (Gutenberg's press enabled the mass production of books, making books accessible for, theoretically, anybody) (Ismail et al., 2014).
- the *new financial system:* represented by the London stock market.

This new financial system strongly supported the development of the new energy sources and the new communication system, while these, in turn, supported the new financial system, leading to hard-to predict synergies.

Within the 2nd IR:

- the *new energy source* was oil replacing coal. Also, electricity was developed which led to the new communication system.
- the *new communication system* was the telegraph, then the telephone. The cities and homes began to be electrified due to Thomas Edison's invention. Furthermore, oil and electricity, inspired Daimler and Benz in Germany to develop the internal combustion engine. Further developments can be seen in highways construction and other forms of transport infrastructure that help people and goods connect.
- the *new financial system*: represented by the "limited liability corporation, which reduced the risks of individuals engaged in entrepreneurial activities." (de Vasconcelos, 2015).

Within the 3rd IR:

- the *new energy source:* the nuclear energy (at the end of the 3rd IR we can observe the beginnings of the solar power really developed in the 4th IR).
- the *new communication system* was the internet after the development of personal computers (PCs) in the '90s, when the desktop PCs became linked for the first time by Tim Berners-Lee's World Wide Web.
- the *new financial system* is less clear and advanced but internet-driven breakthroughs such as crowdfunding and peer-to-peer finance led to a democratisation of finance.

The technological advances and developments in communication, digital systems and computers, started in the 1960s marked the 3rd IR beginnings, enabling new ways to process and share information - the IT era (Schwab, 2017). In many parts of the world, aspects of the 2nd and 3rd IRs are still fully experienced and implemented. More than that, new technologies are in some cases able to "leapfrog" older ones. More people in the world have access to a mobile phone than to basic sanitation. Therefore, it can be argued that the 4th IR is beginning exactly in the same period when the 3rd IR is getting more and more implemented in many organizations across countries and continents.

So, at the beginning of 4th IR:

- the *new energy sources* are the renewable/green energy sources − fuel and energy sources that restore themselves over short periods of time and do not diminish. Such energy sources include the sun, wind, moving water, organic plant and waste material and the earth's heat (geothermal). The most developed and more and more used new form of energy is the solar and photo-voltaic energy.
- the *new communication system* is based on the Social Media revolution, but also on the internet digital communication systems and on the Virtual Reality (VR) and Augmented Reality (AR) technologies and breakthroughs. The faster and more stable Internet – the 5G – will help the faster development of the Internet of Things which will probably drive the next phase of healthcare advances and many other technological innovations.
- the *new financial system* is probably based on the blockchain technology, most simply defined as a decentralized, distributed ledger that records the provenance of a digital asset. Also, the Internet of Things will have an impact on the financial exchanges of the future. And, since we are only at the beginning of the 4th IR, the development of AI, Machine Learning, and Robotics may lead to the more and more debated Universal Basic Income (UBI).

5.2. The 4th IR − disruptive changes and new technologies

The previous IRs liberated humankind from animal power, made mass production possible and brought digitalization to billions of people.

This 4th IR is, however, fundamentally different. It is characterized by "a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human" (Rifkin, 2013).

All these changes, challenges, and disruptions prove that we live in "a time of great promise and great peril" (Schwab, 2017). Billions of people are now connected to digital networks, the efficiency of many organizations is obviously improved and people can now begin to manage their assets in ways that can help regenerate the human natural environment, therefore, humanity has now the potentially to undo the damage of previous industrial revolutions.

However, as Schwab pointed out, "there are also big risks and grave concerns: some organizations might not be able to change and adapt; some governments may not succeed to use and/or to regulate new technologies. That is why, the big changes in the power system of the 21st century society will create important new security risks and inequality between people will probably grow." (Schwab, 2017).

However, the real impact of technology is not the disruption! The world and people have been dealing with that for centuries.

The pace, density, and unpredictability that disruption brings in the beginning of this 4th IR is without precedent and truly amazing. In the 15th century, the Gutenberg printing press changed the world. Today, thanks to computational advances, we have fully 20 such disruptions hitting us all at the same time, including renewable (solar) energy, blockchain, AI & Machine Learning, biotech, autonomous cars, VR & AR, drones, nanotechnology, quantum computing and more. The fact that so many things are happening at once is unique in human history.

5.3. New business models and new approaches for the future of business

For businesses, the disruptions in their external environment are now so many and so big, that the speed of change exceeds the speed at which they can move and adapt. The new technology start-ups are taking advantage of this situation. That's why so many entrepreneurs are trying their luck with innovative ideas and technologies. And that's why technology and internet companies have grown to global corporations faster than ever in history.

In the past, a company had years to figure out how to position itself and how to adapt and react in relatively slow-moving markets. Today, that time frame is down to months as a new breed of start-ups drive new business models and disruption. As an example, witness the pace at which Elon Musk has disrupted cars (TESLA), space (SPACE X) and is now planning to disrupt energy and transportation (Hyperloop).

Traditional business models are based on scarcity: value is derived from selling a product or service that is in limited supply. However, exponential technologies are generating an abundance of everything - from information to energy – so the main challenge is finding new business models that work for abundance. In such a context, below, we briefly outline a series of relevant examples of new Business Models:

- *Product as a service*

A system, primarily based on the Internet of Things related facilities, that allows consumers to buy less and rent more, being based on the idea of servitizing products – respectively, to sell solutions to clients rather than tangible goods – instead of having just one-time sell. One relevant example is Uber. As users call on only when they need a car, this can leverage an abundance of both drivers and clients to provide

its service. Furthermore, as perceived by many businesspeople, this, somehow, revolutionized the way people, especially young adults, perceive car ownership. Another example is represented by the way in which Philips conceived this business model. Schiphol Airport in Amsterdam, the Netherlands, fully takes advantage of this opportunity since 2015. Even if the lamps (very expensive ones) which provide light in the airport belong to Philips, which is in charge with their permanent maintenance and with the insurance of their proper operation, while the airport benefits of their light by paying for the energy used to light it.

- *Multi-sided platforms*

Online software connects and automates the processes between consumers and producers. A relevant, highly known example is represented by Airbnb. Individuals lease homes or rooms they are not using. Airbnb can leverage an abundance of places to rent, and it became already the biggest hotel chain in the world, without owning any rooms. Another example might be represented by the 99designs, that is an online graphic design marketplace that allows someone looking for a design (e.g., a logo) to post a request and have designers compete for the job. 99designs accesses an abundance of designers to offer its clients a wide range of designs.

- *Ecosystems*

Beyond platforms, ecosystems connect different services and solutions to offer comprehensive value to the members of the ecosystem. Recently, emerging ecosystems have been extending the platform model. Successful global companies are building their own ecosystems, within which a number of companies exist. Not all of these companies have clear business models, but all contribute value to the ecosystem. For example, Google built its own ecosystem by creating entities such as Gmail, Google Maps and Google Drive, while Facebook built its ecosystem by buying entities such as Instagram, WhatsApp and Oculus.

The real challenge is to discover the right business model for a certain organization. Or, even more difficult, the right shape and configuration of the ecosystem for a given business.

5.4. Resistance to Change − as an 'immune system' of the organization

The problem in the businesses existing today is not a lack of disruptive idea – as we previously explained; there are a lot of those. The real problem is that, if and when, someone may attempt disruptive innovation inside a traditional business, the organizational/corporate immune system will react and probably attack the innovators and disruptors. But, before continuing with the 'immune system' concept it is worth explaining it: "An organization's immune system, like the human immune system, protects against change (intrusions) by erecting a powerful barrier. The organizational immune system is comprised of the people, policies, procedures, processes, and culture it creates to prevent change, regardless of the consequences." (Gilley et al., 2009).

Even if the top management or owners of an organization have already decided upon the new business model that their organization should implement to adapt and become more resilient, it might be argued that picking the right business model (not

an easy task) may prove to be the easiest part. The challenge they will inevitably face will be that any time a large organization attempts to innovate or transform itself, the organizational (corporate) immune system might attack. The corporate immune system does its job for a good reason: established organizations usually have a working business and functioning processes, which are important to maintain. However, the immune system should not be perceived as the 'bad character of the story'. Therefore, the goal should not be to destroy the immune system, but to manage it.

The ways in which an organization introduces innovation tends to magnify the immune system problem. Organizations often ask external consultants what needs to be done in order to achieve transformation. Or they invest in or buy external start-ups. Either way, the organization's immune system might attack, usually because the corporate immune system reacts to whatever it considers 'foreign DNA'. Transforming an organization is not only about the organization itself, but also about updating the mindset and knowledge base of the people who work for it.

6. Conclusions

Societies are at the beginning of the 4th IR: an inflection point where the human experience is digitized and augmented with technology. This digitization is accelerating change. The question and the challenge for the future is *How can individuals, businesses, and society, more generally, navigate it!?*

Five hundred years ago, Johannes Gutenberg's printing press freed information as never before. The current pace of technology is bringing a dozen Gutenberg moments all at the same time.

Any organization built in the last century might not be able to survive the 4th IR if it fails to adapt. Therefore, organizational transformation is essential not for thriving but for surviving in the 21st century.

Any established organization may want to transform its business model to connect with abundance by becoming a platform, creating their own ecosystem or choosing another abundance-based business model.

Today's business executives (business owners, entrepreneurs or corporate decisions makers) face challenges by doing a couple of things simultaneously: find new ideas that can develop, grow, and adapt their company and suppress the immune system response of their organizations

Finding new ideas is not easy, but the harder task lays in the prevention of the immune system of their organization to attack the innovative ideas and disruptions.

In order for the organizational transformation to be successful, key employees should be heavily involved in the transformation process. They should learn new concepts, practice by using the new tools and generate their own transformation ideas. The new environment and changes will occasionally prove uncomfortable, so the leadership team must offer the employees their full support.

As a final conclusion, considering all the previously outlined information, in order to transform the organization within the 4th IR, business owners and decision makers should be oriented towards: discovering the right new abundance-based

business model; managing or neutralizing the corporate immune system; supporting people in their transformation experience; supporting intrapreneurship and a learning by doing culture.

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