

Approaches to Organizational Leadership in the Digital Age

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Abstract Scientific and technological development is an evolutionary process, which is characterized by growth and acceleration trends. Moreover, the results of scientific and technological development are becoming more complex and are changing exponentially. The topic of technological singularity and its impact on the economy, business models, entrepreneurial activities and leadership of organizations are increasingly being discussed.

Acceleration of scientific and technological progress is changing the approaches to the leadership of organizations and causing a transformation of managerial thinking. In our opinion, for success in a singular environment, organizations need to rethink the traditional view of leadership based on hierarchy, power, control and submission in favor of such organizational skills: collaboration and teamwork, flexibility, creativity, involvement and inspiration.

1 Introduction

The turbulent industrialization processes characteristic of the economy of the 20th century, under the influence of global trends in scientific and technological development, have reached their historical maximum. The economy has entered a new era. Development factors confidently become cyber-physical systems, digital technologies, artificial intelligence (McKinsey Global Institute 2016).

Entering a new era of development has become possible as a result of the integration of computing resources and physical processes throughout the process of creating value. There is an opportunity to create and use cyber-physical systems. The spectrum of action of such systems is much wider than the boundaries of traditional industrial sectors. As a result, there are waves of technological breakthroughs in various fields: decryption of information hidden in human genes; new energy sources; quantum computing (Ford 2016; Schwab 2016; Schwab and Davis 2018).

Digital technology has become a force that has brought about global transformations not only in industrial sectors. A high rate of change has been achieved in retail, logistics, and finance. Business transaction speed is measured in seconds. Intangible assets are becoming a critical factor in long-term business success (Loucks et al. 2018; or Skinner 2019).

The high rate of change and the dynamics of scientific and technological development based on cyber-physical systems and digital technologies have created the basis for theories and concepts of singularity. In the minds of people, the expectations of the imminent onset of technological singularity are ripening.

The rapid spread of AI (artificial intelligence) technologies confirms that the use of robots replaces humans in many areas of society (Bostrom 2016; Kurzweil 2018; Bloommart and Van den Brooke 2019).

How will the usual life of people change under these conditions, what will the economy be, and what will be entrepreneurial activity?

The authors put forward a hypothesis - the acceleration of technological development of the world economy, the wider spread of ICT (information and communication technologies), AI (artificial intelligence),

AR (augmented reality), IoT (Internet of things), etc. changes the conditions of activity in the XX century , management and leadership in organizations.

The task was set to investigate how global technological trends affect the change of strategy, business models, management tools and leadership style in organizations.

In the process of research, methods of deductive logic, system analysis, management theory and leadership in organizations were applied.

2 Organizations in the digital age

In the global economy of the late XX century and the beginning of the XXI century, the processes of global digitalization have received further development.

There is an active growth in the interconnections between the economies of individual countries and an increase in the participation of developing countries in world flows of goods, services and capital.

Intangible information flows (big data, video, transactions, e-commerce, analytics, etc.) between countries, regions, corporations, individuals have increased. So, cross-border data flows at the global level from 2005 to 2014 increased by 45 times and reached \$ 2.8 trillion. At the same time, the growth of data flows over the specified period had a greater impact on the growth of world GDP than global trade in goods (McKinsey Global Institute 2016).

Digital infrastructure was further developed, including global digital platforms.

The number of users of some of the largest online platforms is comparable to the population of the largest states (table 1). Individuals through digital platforms and social networks gain access to global markets for training, work, and talent search.

Table 1. Comparative analysis of the number of users of digital platforms and the population of the largest countries in the world

Digital platform / number of users	Country / Quantity residents
Facebook / 1,590 billion people	China / 1.372 billion people India / 1.314 billion people
Alibaba / 407 million people	United States / 321 million people

Source: Own results

The use of digital platforms and digital solutions provides organizations with new opportunities and changes the functional directions of their activities:

- organization of business “without borders”. Internet technologies change business processes, allow organizing global access to information and “instant” operations (e-commerce);
- reduced costs for the implementation of international expansion, transactions, marketing, interaction with customers in new markets. Effective use of digital platforms allows you to sell in remote and fast-growing markets, organize virtual teams interacting online;
- small enterprises and start-ups from the moment they start functioning become “micro-transnational”;
- companies carry out remote monitoring and support of employees' activities during operations, customer service and supporting functions;
- implemented remote management of supply chains on a global scale, the formation of optimal supply chains;
- AI, AR, IoT technologies are increasingly being used to create a better customer experience.

Today we are witnessing how global digitalization is changing the business models of companies and organizations in many industries, for example, in the financial and banking sectors.

Customers abandon long-standing relationships with banks in favor of applications from companies such as PayPal, Apple Pay, Kabbage and Venmo.

According to Citi Bank, global private investment in financial technology (the so-called fintech) increased from \$ 2 billion in 2010 to \$ 21 billion in 2016. Approximately 30% of banking industry employees are expected to lose their jobs over the next ten years.

Technology companies, including financial and technological ones, are not as burdened with supervision as traditional banks, and with the help of mobile technologies they have a direct connection with consumers. If large banks do not revise their business models and become much more attractive to customers,

they will be involved in a price war, which will lead to a deterioration in their performance. Some will be forced to leave the market.

Digitalization is also undermining other industries: Uber - (taxi business), Airbnb (hotel business), Amazon (retail). Amazon's share of apparel sales is continuously growing. Recently, American customers have been abandoning purchases at major department stores, such as Macy's (which announced the closure of hundreds of stores in 2016) in favor of Amazon. According to analysts, by the end of 2017, Amazon became the largest seller of clothing in the United States.

As practice shows, digitalization affects the change in business models of companies in three areas:

- The emergence of new companies in the existing market.

Uber, Airbnb, Amazon, WeChat entered the existing market (often complex, which is difficult for customers to navigate) with a new, attractive value proposition.

- New business models for traditional competitors.

Companies already operating in the market are introducing a new business model that is more attractive to customers. For example, the company Nordstrom, has implemented the transition from a traditional offline business (department store) to an omnichannel online business. She combined the best that she has in physical stores (customer-oriented tangible interactions with customers, which are based on the product) and the Internet (intangible interactions with customers, which are based on a service focused on consumer experience). Banks, insurance, retail and energy companies strive to optimize their physical and online channels for interacting with customers.

- Crossing industry boundaries.

Leading companies in their industries use digital channels to consolidate in other industries.

3 Management of organizations in a singular environment

The changes that are taking place thanks to the digital coup do not allow organizations to stand aside. Respond to this coup is an urgent need for company leaders.

What challenges do organizations need to solve in order to take advantage of global digitalization?

It seems to us that in the conditions of an accelerating external environment and the transition to a singularity, companies should review the established and proven approaches to management and leadership to maintain the long-term competitiveness of organizations.

- Linear thinking of leaders.

Changes occur suddenly and are difficult to predict. In such a situation, leaders need to reconsider their mentality and understand that the future should be approached not as extrapolations of the past, but as a chain of spasmodic changes. Intermittent changes and leaps should be considered the norm, and not an exception, and considered them as a source of new opportunities and prospects.

This provision makes it necessary to abandon the linear approach in predicting the activities of the company. The linear type of thinking of managers will not lead the company to success in an exponential world and may even be destructive (Bloommart and Van den Brooke 2019).

- Mass production and economies of scale.

Thanks to IT platforms and big data, it is possible to fully implement the principle of customization and individualization in the production of goods and services. Consumers will be supplied with products that take into account the individual needs of each client. Mass production of the same type of product will be replaced by the production of individual products and services.

Breakthrough technologies, including, for example, 3D printing, big data, nanotechnology and social platforms, will make unit production common. The new minimum order quantity will be the unit of a specific product.

In this case, companies should increase competencies such as flexibility, speed of development, production and delivery of products, rather than increasing the volume of their production.

- Benchmarking approach based on comparing the company with the best representatives in the market, industry.

As a number of researchers have noted, a singular environment often provides organizations with the opportunity to become exponential. An exponential organization is an organization that significantly outstrips its traditional competitors.

Achieving this level of competitiveness is possible if the organization develops and introduces breakthrough innovations. The benchmarking approach does not allow to achieve such results. This is a method that focuses on the past, not the future (Weill and Woerner 2019).

- Ensuring competitiveness due to advantages in the organization of production processes.

In the conditions of robotization, all processes will become automated and the cost of manufacturing products and services will be minimal.

To achieve competitiveness, it is necessary to provide customers with excellent service, advice, exclusive content, as well as access to valuable networks.

- Marketing strategies focused on the standard needs of consumer groups (segments).

In a new economy, customers are becoming more savvy, competent and informed than ever before. They independently determine the characteristics of the products, place orders and make payment.

Improving the educational level of consumers, the ability to access intelligent databases make them more informed and demanding. The client gets the opportunity to produce goods without leaving home, using, for example, 3D printing.

In these conditions, companies need to implement marketing strategies aimed at meeting the individual needs of each client at a high professional level. Simple tips from manufacturers and sellers will not succeed with consumers.

- Stakeholders have limited influence on the activities of the company.

In an accelerating external environment, the roles of stakeholders will increasingly erode and overlap. Buyers, customers, suppliers, stakeholders can become a supplier of new ideas for the company. In addition, they will be able to act as investors, financing individual projects, or join them as freelancers.

Implementation of an open team approach by companies involving a large number of stakeholders will help to search for new ideas and better adapt to changes and breakthroughs in the markets.

- Bureaucratic organizational structure, leadership based on control.

Accelerating the implementation of innovations, ensuring flexibility and maneuverability necessitates transforming the organizational structures of companies in the direction of collaboration and cooperation.

Bureaucratic structures must be changed to more flexible ones, including cross-functional teams, focused not on the control of orders issued from above, but on the initiative of all employees, regardless of position and level of management.

Leadership approaches based on the position that an employee needs to clearly follow instructions, do only what they ordered does not work in a changing environment of the organization.

The new leadership encourages the following behaviors in employees:

- involvement, interest and inspiration;
- taking responsibility for decisions being made;
- Entrepreneurial approach to business;
- lack of fear for possible mistakes;
- high level of emotional intelligence.

Table 2 presents a comparison of some basic approaches to management (traditional approach), which, in our opinion, will undergo changes in an accelerating environment (innovative approach).

Table 2. Comparative analysis of the traditional and innovative approach to some of the provisions of management.

Traditional approach	Innovative approach
Predictable external environment	Unpredictable (singular) environment
ICT is a supporting function	ICT is a strategic function
Stable goals	Changing goals
Planning (current based on strategic)	Maneuverability is most important; use of various options
Production optimization, benchmarking	Continuous and fast innovation
The business model is rarely subject to change	Changes and explosions are the rule, not the exception
To maintain profitability, it is necessary to determine the minimum order quantity (batch size), standardization	Personalization options (batch = 1 product)
The trust model is good, but checks are necessary	A control model with a focus on engagement, inspiration, passion. At the core lies the credibility of the employees
Relatively long product life cycle	Relatively short product life cycle
The key to success is performance	The key to success is corporate intelligence

Source: Own results

4 Conclusions

The results of the study showed that cyber-physical systems, digital technologies are changing the conditions for the activities of economic entities.

At the same time, these technologies are transformed from a supporting factor in the development of organizations into a key factor in their long-term growth.

In conditions of accelerating technological development and the onset of singularity, organizations will have to make large organizational changes. These changes are associated with the use of management tools, leadership styles that will allow organizations to become flexible, adaptive, innovative, capable of exponential growth.

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