

Ensuring Competitive Advantages of the Industrial Enterprises and Entrepreneurship in a Digital Economy

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Abstract

The main characteristics of the new production paradigm, aspiring by the global leadership to change radically the role of the industrial sector, acquire, on the one hand, the obvious features of the service, providing individual consumption, and on the other - the horizontal infrastructure, based on principal socio-economic processes within the digital economy. The aim of the study is searching and identification of significant organizational and economic reserves to increase the production efficiency, applying in the conditions, ensuring the competitiveness of domestic enterprises, which are provided due to involving in the economic turnover of innovative digital solutions new methods to work with market counterparties and consumers, taking into account the big data, social requirement, creativity, high standards of human-machine morality. The appropriate typification of enterprises was made, depending on their place in the chain that created the new usage value and the complex range of technologies and equipment. In further research, it should be continued to identify new production concepts as "growth points", because "breakthrough" technologies offer fundamentally new ultra-efficient methods of organizing industrial research and development, production and marketing science-intensive products.

Keywords

Enterprise Competitiveness, Industry 4.0, Digital Transformation, Typification of Enterprises, Virtual Counterpart of the Enterprise.

Introduction

Nowadays there is an urgent need to address the pressing problems of economic growth acceleration, caused by global changes in traditional reproductive chains and the widespread rapid development of "disruptive" technologies, generated by the fourth industrial revolution. It is necessary to find and to use new methods of organizing production, increasing efficiency to use resources of the enterprises digital transformation, which are essentially different from traditional forms and interaction methods with subjects of market activity, attracting competences from the virtual sphere. As a result, the nature of consumer demand will change, product life cycle management, and key parameters for assessing the enterprises efficiency on a comprehensive scale will change inevitably (Yakovlev, 2007) [1].

Digitalization of the economy is considered as a new objective need for social and economic development, radically different from the previous processes of Informatization, which were able to previously quite satisfactorily problem solving, using computer and information technology in the application process to the economic problems, developing of labor factor productivity (Holford, 2019) [2]. In this regard, N.K. Hanna (2007) considered the problems of digital development ten years ago and noted the high role of industrial enterprises as primary links in the Formation of Added value takes place in the framework of coherent international production systems using potential synergies between the programs of the proliferation in electronic business and the services sector development (Hanna, 2007) [3]. Added value takes place in the framework of coherent international production systems using potential synergies between the programs of the proliferation in electronic business and the services sector development [3].

The specialists of the German company Siemens AG believe that the increase in the efficiency of modern industrial production will occur due to the intensive development of digital technologies, including the acceleration of product entry into the market, increasing the production flexibility due to the equipment modularity, providing the possibility to creating an individual product for each consumer, effective industrial design due to possible appropriate digital design, as well as fundamentally low energy and material consumption (Sutherland & Jarrahi, 2018) [4]. Today, a

systematic approach to the optimization of business processes of enterprise is being formed by forming integral technological covers with a friendly technical and organizational environment for a comprehensive solution of production efficiency problems based on digital solutions.

Methods

Methods of retrospective economic analysis, strategic decision-making model, international comparisons, technical and economic foresight, as well as meaningful economic interpretation of the results, using digital technologies in modern enterprises, were used to reveal the phenomenon of society digital transformation. As a result, it is shown that it is possible to provide a competitive advantage on the basis of enterprises digitalization by determining the "points of growth" on existing production facilities and innovative developments in accordance with the concept of their digital transformation. Methodically, the new model is the transformation of the traditional enterprise on the digitalization basis, solving of problems to reduce the operating costs and to use the drivers in moving towards to goal of optimizing the business processes, specified in the works written by N. Negroponete (1996) [5].

Results

The substantial analysis of the digitalization phenomenon leads to the logical conclusion that the modern world community is faced with a fundamentally new type of economy and organization of production processes. At the same time, according to (Ermolaev, 2018), it becomes obvious that science has not yet formed a holistic view on the essence, structure, content, directions and consequences of society digitalizing [6]. Sutherland & Jarrahi (2018) [4], highlighting such important challenges of the digital economy related to new close relationships with consumers, business partners, growth of sociality, forming a new ecosystem, nevertheless indicates that the main problems of even strong and resource-rich companies in the digital economy will be associated with the complexity of abandoning the implemented business models, examined by experience; at the same time, beginning companies, which are not associated with stereotypes, will have access to better consumer data and more flexible management technologies.

Upon careful consideration, it becomes clear, whether a certain country will be able to generate a sufficient mass of material goods and scientific products, develop the most modern technologies in accordance with the challenges of digitalization as a key element of "industry 4.0", depends completely the national security and the solvency of the state seeking to preserve its sovereignty. Some researchers such as Rullani et al. (2016) believe that the crisis of the current economic paradigm reflects the trend of the ongoing transition to a networked, knowledge-based, globalized economy, and this transition enhances the role of sound industrial policies of some states [7]. It is recognized that it is important to rely on the development of high-qualified and innovative potential of the country's regions, the formation of human capital, communication skills and infrastructure, as well as increasing productivity and attracting foreign investment in high-value-added production. The bottom-up approach should be used to develop industrial and innovation policies in order to promote self-organized individuals, creative groups and communities, and to liberate the entrepreneurial talent of the general public.

Discussion

Industrial enterprises in implementing digital transformation open a new diversity of opportunities to create unique technologies and products that can compete in global markets. There is an opportunity to preserve and qualitatively improve the existing economic potential through close cooperation with research and venture organizations, universities and technological start-UPS within the framework of the newly created infrastructure of support and development of innovative companies. In questions of supporting enterprise digitalization processes, it is necessary to develop a reliable scientific basis for the following problems:

- Identification of features to improve enterprise management by digitalization its main functional areas and business processes, allowing raising competitiveness by giving greater customer focus, involvement in the operational activities of various organizational and technical reserves.
- Areas of flexible reformation of production, optimization of industrial design of new products, the maximum possible reduction of energy, material, labor intensity, support of social partnerships.
- Substantiation of methods of connecting digital transformation with the overall strategy of the enterprise, as it relates to the main business indicators, decision-making on the size and direction of investment in the right context.

The opportunity to get to know the consumer better (through digital technology) opens up broad prospects for companies, although this will require changing many elements of the value chain. Changing the business model in the company itself can cause tensions with partner companies due to their unwillingness to change their business models and management systems. The emergence of innovation in one company and (or) at one stage of the value chain inevitably causes the need for innovation in other (partner) companies and (or) chain links.

And the more revolutionary the nature of the innovation, the higher the level of interdependence, that is, such interdependence is "inevitable". Evtyanova D.V. (2017) believes that is the basis of the production digitalization, leading other social and public institutions, as a management system, the ability to coordinate all the production processes in time and space [8].

The inevitable become principal changes and challenges in organizations strategic management, because most of them will not be available to meet the challenges of the digital economy, said G. N. Ryazanova etc. (2018) [9]. R. Nikulin (2018) [10] believes that in the context of the digital economy there are opportunities for effective management of business processes on the basis of incoming data from the enterprise, transforming traditional value chains. E.Y. Andieva & V.D. Filchakova (2016) [11] note that the revival of the digital economy contributes to the country virtualization. The main indicators of the information industry development are: the number of people using computers, as well as the number of Internet users [11]. The increasing use of digital networks in complex technological processes opens up new opportunities to ensure greater sustainability of production activities and reduce the material products consumption (Neligan, 2018) [12].

In a digital enterprise, it becomes real to organize an effective online dialogue between the parties of production and consumption, which was not even envisaged under the previous socio-economic concepts. Even with the extensive automation of existing productions and operation activities, traditional products and services could be produced with only a slight increase in efficiency. The fundamental difference is that digitalization reveals a close convergence of advanced technologies, methods organizing production, communications, artificial intelligence, organic solutions aimed at generating waves of radical innovations in many spheres of social activity, producing goods.

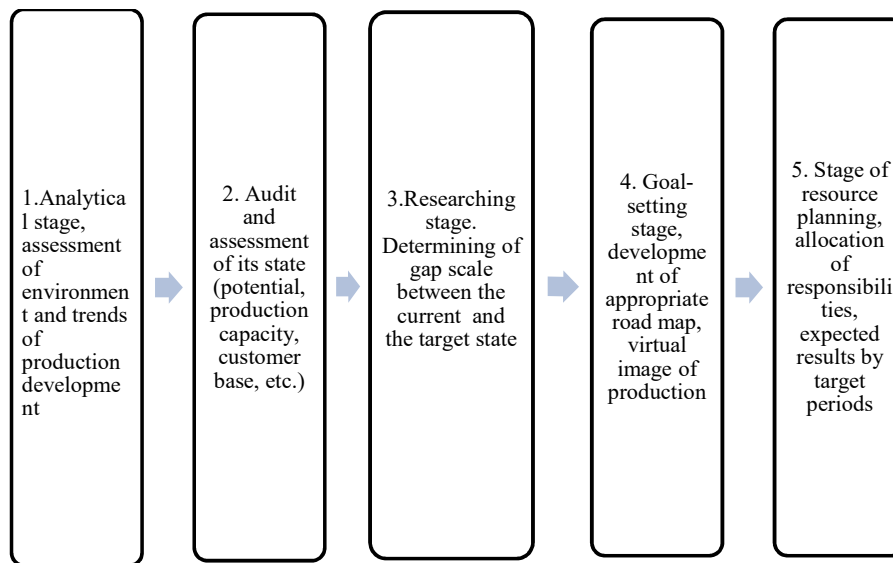


Figure 1: Sequence of Digital Transformation Stages of Industrial Enterprise.
Source: Compiled by the Authors.

This model allows you to combine digital transformation with the overall strategy of the enterprise, as it relates to the main business indicators, to make decisions on the size and investment trends in the context of digital transformation.

- At the first stage, a comprehensive study of the external scientific-technical, socio-economic, political and legal environment are carried out. Managers of companies need to be aware of the impact of emerging concepts and technologies on their business. It is determined who in the organization initiates digital transformation, on a local or comprehensive scale. Positive customer experience is studied, because partners and customers nowadays have interests in reliable work of the company everywhere. The responsible managers for conceptualization and implementation of digital transformation are defined.
- At the second stage, it is necessary to assess the available capacity and current capabilities, the results of work that require changes, as well as the target state of the enterprise at which the required results can be achieved; decisions on the need for investment in integrated production management information systems, automated workplaces, the Internet components, and how to combine them in the context of "digital transformation".
- In the third stage, the scale and magnitude of the gap between the current opportunities and the target state are determined based on the study of the leading companies experience, industry leaders, as well as their own ideas about the progressive enterprise. Where are we today in terms of opportunities? What can we do ourselves, and why do we need to hire specialists?
- At the fourth stage, the results of the previous studies turn into a "road map", which can be implemented based on the priorities of the company's business and operational activities. What are our goals and ways to achieve them?
- The fifth stage includes planning and implementation of the planned activities in the feedback mode closely coordinated with customers, targets and deadlines for their achievement, indicators of production efficiency and cost reduction, flexibility of rapid production and expansion of sales channels. The enterprise should

extend lines of communication through its current state by taking initiatives of "flexibility readiness" with the desired, target state of high competitiveness characterized by assessing the maturity of the enterprise in key areas of operations. The maturity of the digital transformation of enterprise is characterized by the effective state of the key elements of the value creation process in relation to:

- Product life cycle development and management.
- Methods of organization and production management.
- Audit and business analytics, controlling.
- Convergence and integration in data management.
- Information security and the amount of resources to maintain it.
- Innovative organizational culture and staff ready for change.

Performing the digital transformation, "the model of digital maturity" is developing better in virtual reality, based on its necessary enterprise to determine compliance with the current state of the production system with the target, complementing management decisions with the state analysis of the main functional areas that determine the business stability (Sutherland & Jarrahi, 2018) [4]. At the same time, the positive experience of interaction with customers and consumers, who have a high interest in informing about the results of the supplier company, its products and services, is taken into account. Positive customer experience allows us to justify the presence of the company in the market, and then increase sales, thereby attracting financial resources for the production modernization, improving operational efficiency in the course of digital transformation.

The digital transformation strategy has been successfully developed by a significant number of industrial companies around the world, which allowed the government of Germany in 2014 to put forward the initiative "Industry 4.0", in response to the need to further ensure the competitiveness of enterprises to rely on horizontal and vertical integration in the industry, with the effective use of information and data. This strategy allows us to make the development of promising products as a continuous process that accompanies the entire process of creating added value, in close coordination with the interests of customers, suppliers, various groups of influence.

In the US market, which is the world leader in digitalization, most companies in the implementation of the growth strategy primarily invest in the efficiency of business processes. At the same time, most companies plan to increase investment in research and development, a significant part of which is directed to digital technologies such as mobility, cloud computing, analytics, social networks, e-commerce and M2M communications. The initial goal of investing and concentrating on digital technologies is process efficiency and cost reduction, which are then transformed into sales channel expansion due to the high competitiveness of new products. To a lesser extent, investments are directed at establishing links with partners and consumers. Leading companies focus on higher operational efficiency rather than sales growth, creating new sales channels or developing new products and services.

While in the United States digitalization is considered as a movement in the information society, further development of globalization and trans-nationalization within the entire system of information relations on the planet, in Europe, Asia, and Latin America — as a means of protecting and preserving national characteristics and interests through the creation and development of their own national information technologies and means:

- 26% higher profits than among the industry have the firms, actively using technology and new management methods. However, financial performance is 11% lower for those firms that pay little attention to governance when investing heavily in digitalization.
- More conservative companies, which improve only management, receive plus 9% to profits, but can potentially purchase three times more with the help of digital technologies.
- Those who have not chosen a development strategy yet, they've got negative results in their financial indicators in comparison with other market players, they decreased on 24%.

There are three groups of enterprises, differ in the level of technical development and readiness for digital transformation:

1. Enterprises that are already at the existing technological level can simultaneously start work on the above stages of digitalization, installing the necessary sensors on all types of technological equipment. These include, for example, engine-building enterprises, which, along with the needs of the Russian aviation and Navy, can produce outboard motors, compressors and mass-demand goods in direct contact with consumers, flexibly rebuilding the production program.
2. Enterprises with an outdated and specialized fleet of equipment, fully protecting oriented. These enterprises are the most vulnerable in the context of the forthcoming transformation, which may lead to significant negative economic and social consequences, since the suspension of production is required.
3. Enterprises that produce components for other enterprises in a single value chain, often with unique competencies. For them, it is advisable to develop projects for the production of technological similar components for use in the production of finished products at other enterprises, including abroad, while the process of modernization and switching to digital rails is in progress.

Conclusion

The digital transformation of the enterprise is understood as a set of measures aimed at creating a "smart production" (smart factory). Domestic manufacturing enterprises and entrepreneurs need to identify the most promising areas to apply digital technologies. Horizons of future development should be based on the implementation and development of digital culture based on advanced specialists in digitalization, providing them with conditions for high-quality creativity. To be ahead, you shouldn't not wait, but act now, implementing the strategy "to get ahead without catching up", i.e. to jump on a new technological basis organizing high-performance industries.

Obviously, that the challenge of digitalization is one of those big tasks when have to mobilize the forces and resources of total Russian society in the name of progress. Clearly, that in the conditions of hyper competition, each progressive organization must undergo its genetic development to determine modern business goals and the main tools in order to achieve them on the basis of digitalization, which is the main condition for survival in a rapidly changing environment.

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