

Formation of the Company's Competitive Advantages in the Supply Chain Management and Digital Economy

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Abstract— The article reveals basic competitiveness elements of modern enterprises in the digital economy and its effects on the supply chain strategy. Currently, the search for new sources of competitiveness focuses not only on the field of scientific, technological and innovation policies of the enterprise, but also on the Internet space, which forms new digital formats of intra-and inter-process interaction. The authors emphasize the basic elements of competitiveness in the digital economy: virtual ecosystems, platform enterprises, digital resources, Smart management. The article presents various approaches to the concept of "digital economy" and trends that put an effect on formation of competitiveness. It is concluded that the digital economy is a "digital" system of economic relations based on the use of information and communication technologies. Digital companies are becoming economic agents of the digital economy. The basic elements of a digital company are infrastructure (Internet access, SOFTWARE, telecommunications), e-business (conducting business through computer networks), e-Commerce (distribution of goods via the Internet). In a digital company, changes in business processes occur in real time using the enterprise information system. The content and ability of working with it and using it in all business processes are core of organization and its digital asset.

Keywords— *competitiveness, "smart" product, digitalization, digital companies, supply chain management, competitive advantages, e-Commerce.*

1. The Problem of Research

Because digital economy is becoming such an integral part of products and merchandise, manufacturing industry's traditional supply chains are experiencing a fundamental change. Digitalization is becoming one of the economic development factors. Modern specialists and managers of companies understand that without the usage of digital technologies they will not be able to compete successfully either in domestic or foreign markets. Despite the fact that theoretical economists have not yet developed a consensus on how significant the impact of digitalization is,

practitioners are quite appreciative about the effectiveness of the digital solutions they have already implemented. Digital economy is an economic system based on virtual ecosystems, platform companies, digital resources, network relationships and smart management, in order to create digital products (services) to meet the needs of society (government, business, population).

The digital economy is not a separate industry. In fact, it is the basis that allows creating qualitatively new models of business, trade, logistics, production, changes the format of education, health, public administration, communication between people, and, consequently, sets a new paradigm for the development of the state, economy and society as a whole. Now traditional industrial-type enterprises begin the process of digitalization, which means the replacement of analog (physical) data collection and processing systems with technological systems that generate, transmit and process a digital signal about their state. In a broad sense - the process of transferring functions and activities (business processes) previously performed by people and organizations to the digital environment.

With the development of IT-technologies some stable trends occur:

- changing of industrial production requirements;
- increasing complexity and variety of products;
- increasing speed of production and delivery;
- increasing amounts of data and the ability to obtain the necessary information in a timely manner;
- increasing scarcity of natural resources (energy, water, etc.);
- increasing pressure on production in terms of more competitive prices.

Due to new economic conditions, there is a topical problem of finding new sources of competitiveness.

2. Materials and Methods

The digital economy is developing rapidly and globally in the world, which cause changes in supply chain managements too. According to the European Commission, the digital economy is estimated at 3.2 trillion euros in the Group of G20 countries and is about 8% of GDP. The global

Mackenzie Institute, in a study conducted in May 2011, noted that the Internet is an essential element of economic progress. It provides a significant part of economic growth: the contribution of the Internet to the GDP of developed countries for the 15-year period 1995-2009 totaled 10%, and over the past 5 years it has doubled – to 21%. The development of the digital economy is linked to the development of Internet access and

telecommunications. However, such "channels of communication" have no value if people do not use technologies.

Digital economy is transforming the whole economic system.

The systematization of digital economy concept and the way it changes the competitiveness of the enterprise is presented in table 1.

Table 1. The digital economy and new competitiveness factors approaches

The concept of digital economy	New competitive advantages
This is a system of economic relations based on the usage of digital information and communication technologies[1]	- decrease of payment costs - decrease of promotion costs - availability of services - global market entry
This is a global network of economic and social activities implemented through platforms such as the Internet, as well as mobile and sensor networks. In fact, it is an economy model based on the opportunities that Internet access provides[2]	- labour productivity growth - reduction of production costs - better satisfaction of human needs
This is a model of all economic process participants interaction, based on modern electronic communication channels usage of and methods of accounting and storage of information, using electronic document management[3-6]	- simplification and acceleration of interaction - transparency and scaling of economic process management - easy integration into existing processes
This is the maximum automation of business processes within the enterprise as well as in relations with contractors, government agencies through the use of modern information technology[5]	- lower costs and response time to market changes - higher flexibility and adaptability
This is a set of business models, management and production methods based on information technologies [7]	- new formats of interaction - Analytics becomes intellectual - transformations will be subjected to the interaction of supply and demand - everything will become faster and more personalized

Different definitions of the concept of "digital economy" agree that the digital economy is a "digital" system of economic relations based on the use of information and communication technologies.

Digital companies are becoming players in the digital economy.

Some distinctive features of the digital company are highlighted below:

- high level of automation;
- electronic internal document flow;
- accounting and management accounting systems;
- electronic data warehouses;
- using CRM;
- availability of corporate social networks.

The basic elements of a digital company are infrastructure (Internet access, SOFTWARE, telecommunications), e-business (conducting business through computer networks), e-Commerce (distribution of goods via the Internet).

The term "digital enterprise" has been set out in the Being Digital book written by Director of MIT Media Lab Nicholas Negroponte (Nicholas Negroponte). The book was published in 1996, but the business was able to implement the idea of a digital enterprise in practice only now.

Digital enterprise is an enterprise that uses information technologies (IT) as a competitive advantage in all areas of its activities: production,

business processes, marketing and customer interaction.

Digital can be called a company that struggles to shift most business processes to online mode. This is the management, control and analysis of all major business processes of the company online-contract negotiation, accounting, logistics processes, registration of transactions, procurement, training, monitoring of relationships with partners and customers, technical support and many other aspects.

Additionally to information systems, it is necessary to introduce an appropriate culture in the company. That is what makes the company "digital", provides the efficiency, productivity and growth potential of the business, that are vital competitive advantages currently.

The concept of digital production is a set of tools to optimize the workflow through software and hardware solutions. To simplify this term, digitalization is nothing more than a transition from analog to digital. This process involves not only the replacement of production tools, but also the introduction of analytical systems to make production profitable. The digital economy is based on these tools.

3. Results and Discussions

The digital economy forms a new economic system based on virtual ecosystems, platform companies, digital resources, network relationships and smart management in order to create digital products (services) to meet the needs of society (government, business, population).

The digital economy is not a separate industry, but the basis for creating qualitatively new models of business, trade, production, new formats of education, health care, public administration, and communication between people.

The basic elements of the digital economy are virtual ecosystems, platform enterprises, digital resources and smart management.

Basic elements of digital economy are described below.

1. Creation of virtual territories, which are global virtual platforms with their digital resources: human, computing and communication technologies, digital blanks, online production, Finance, business models. Platforms have no boundaries and restrictions on its use and "settlement". The next stage of development of these virtual territories will be platform networks.

2. The emergence of "platform" companies - the formation of ecosystems.

Companies "populate" virtual territories, forming ecosystems. Ecosystems acquire the properties of self-organization, scalability and sustainability.

The advantages of business models of "platform" companies are the following:

- creation of added value is due to network interactions between the platform and companies;
- the company overcomes the technological barrier through the use of digital resources of the platform;
- reduced time for new products be presented on market;
- the company does not invest for the development of IT infrastructure;
- simplified distribution, access to the end user-the customer, including the collective;
- a single technological space for new technologies, ideas, projects is being formed;
- ability of quick search for partners-effective cooperation with other participants of the ecosystem;
- reducing the cost of production and a multiple reduction in the time of its release.

Examples of ecosystems:

Amazon-global access to computing power leads to the refusal of companies to organize their own industry.

Google - the creation of a virtual robotic production, which leads to the personalization of production with local placement near the consumer.

3. The emergence of digital resources that have an information and communication nature and are used in a targeted way in digital ecosystems.

Features of digital resources are:

- renewability;
- uniqueness;
- integration (excluding resources from existing systems of relations will lead to the need for serious restructuring);
- influence-the ability to influence the behavior of certain agents, thus determining the configuration of the future;
- non-alienation (personification) - based on an individual or collective actor and without this actor can not work as a resource;
- privileged value, because they will reproduce what will be necessary in the future (creation of non-existent needs);
- intellectual foundation;
- ability to create new ecosystems.

4. A new philosophy of management – smart management. The object of management in the digital economy are platform networks - "smart networks". Smart network - is a system of building a value chain with the help of automated and information technologies that automatically improve the efficiency, reliability, economic benefits, as well as the stability of the system targeted on the maximum benefit of each participant. Examples of smart networks are digital factory (factory) (smart factory, virtual factory), Smart city (smart city), digital road and digital transport (smart road and smart transport), Smart Grid (smart power supply).

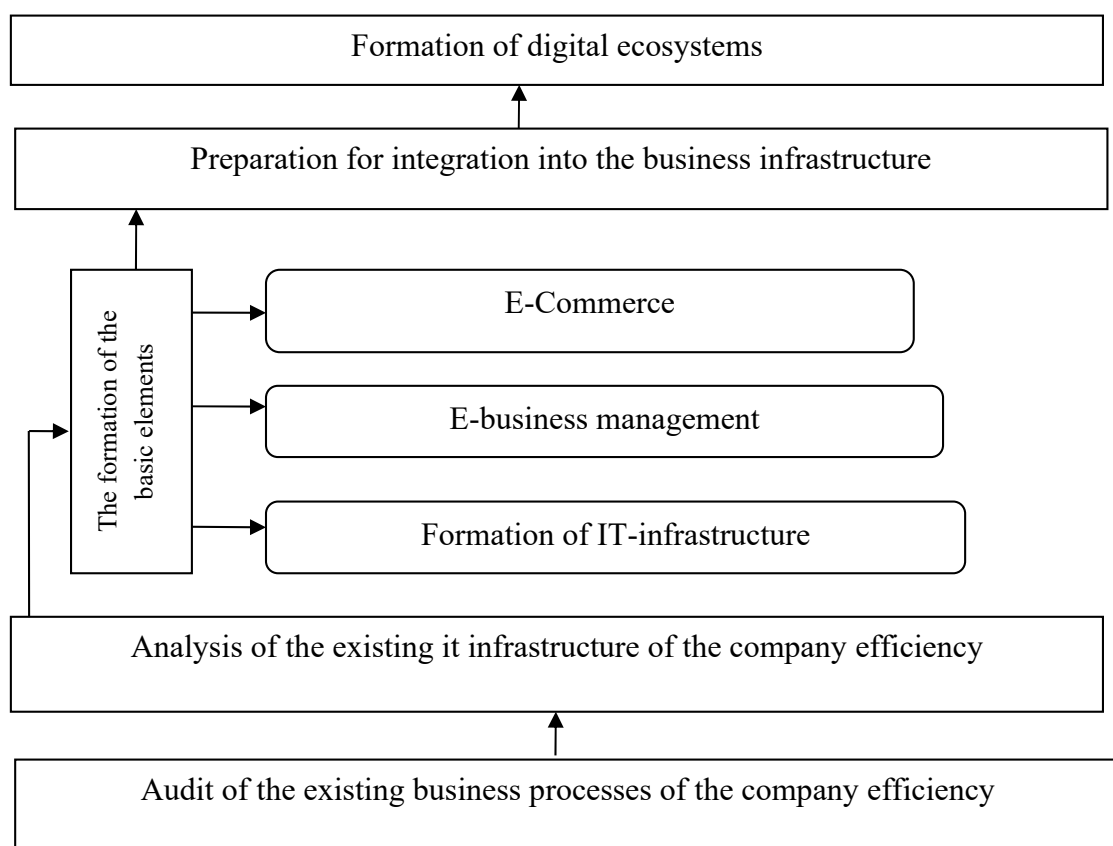
For example, "smart factory" is a unified communication system of "smart" processes, products, equipment, as well as people.

The fundamental level of Smart management is algorithmic management, which is a system of management decision-making without human intervention according to a certain algorithm (the most effective in this situation). An example is the digital HR-factory "Pyaterochka", in which the recruitment process is presented "in figure". Previously, 70% of resources were spent on routine operations. Now robots perform these operations. Digitalization provided the retailer with a personnel basis for continuous expansion of the network: if in 2015 the company hired up to 8000 new employees per month, in 2017-already 12 000 – 14 000.

The use of the best algorithms in the organization of business processes and management decision-making will not only increase the speed of decision-making, but also reduce the number of errors due to the human factor. However, this is only an intermediate phase of digitalization. In the core of algorithmic control is linear thinking and this is its limitation: what seems to us profitable and understandable will soon be ineffective.

Feature of Smart control is nonlinear decision-making. Multi-criteria, complex dependencies, audit of smart networks, their development, control of artificial intelligence development.

The scheme of creating a digital enterprise is provided on picture 1.



Picture 1. The General scheme of the digital enterprise creation [5], [7]

Thus, the process of creating a digital enterprise begins with an audit of the existing business processes of the company effectiveness, checking for efficiency, effectiveness and manageability.

Those processes that do not pass the audit are directed to change, adjustment, output to the planned audit criteria.

The second step is to analyze the efficiency of the existing IT-infrastructure of the company in the context of the efficiency, effectiveness and manageability of existing business processes.

Management should have an understanding of the logic and limitations of certain technologies.

Solutions should be based on IT capabilities and resources. Then the existing processes are about to be implemented, as well as new ones, based on the capabilities of new technologies.

As a result of the second stage, a systematic view of business processes in the "material world" and the level of IT-infrastructure development is formed. It is necessary to understand what processes need to be transferred into electronic format, to determine the costs of these changes and to formulate the advantages that digitalization is expected to provide. When the decision on the transition is made, you can start updates.

The third stage is associated with the formation and strengthening of the basic and necessary elements of a digital enterprise: infrastructure (Internet access, SOFTWARE, telecommunications), electronic business management (conducting economic activities through computer networks), e-Commerce (distribution of goods via the Internet).

Transformation of company management methods is a big challenge for both managers and employees. A complete restructuring of management and business processes will require a revision of the attitude to work with the data available to companies.

The next stages are more global and involve the integration of the company into digital environment industry and the formation of the organizational infrastructure of the ecosystem.

4. Conclusions

Thus, following conclusions can be made:

1. The digital economy is an environment that allows you to create qualitatively new models of business, trade, logistics, production, due to the large-scale penetration of breakthrough technologies (Big Data, artificial intelligence, cyber-physical systems, 3d-technology, supply chain, Internet of things (IoT)).

2. Digital business transformation depends on the transparency and efficiency of business processes formation in the real physical world.

3. The usage of the best algorithms in the organization of business processes and management decision-making process will not only increase the speed of decision-making, but also reduce the number of errors due to the human factor.

What is the impact of the digital economy?

- the nature of productivity will change;
- change of the algorithms of business management in principle;
- the human factor is reduced to minimal participation through the use of analog algorithms;
- new form of business-platform networks;
- business goes into the form of smart networks;
- the model of industry markets is changing.

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