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# The Importance of Implementing Digitalization in Kazakhstan

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## Abstract

The goal of the article is to analyze the international experience in implementing digitalization, both in the private and public sectors of the economy. The objectives of the article are the analysis of the digitalization implementation algorithm in foreign enterprises and the adaptation of this algorithm for most Kazakhstani entrepreneurs, taking into account the specifics of doing business in Kazakhstan. Investigation of logical chain, which introduces digitalization in large world companies. It begins from the first department that has undergone digitalization to obtaining the final result from the process for the company.

To solve the tasks set in the article we used system, logical, comparative-analytical methods. The provisions and conclusions are illustrated by statistical data presented in tables, diagrams, diagrams, accompanied by references to scientific literature and legal acts.

The conclusion is made about the importance of implementing digitalization in business, regardless of the size of the enterprise itself. The examples of digitalization implementation in foreign companies are analyzed. Based on the analysis of foreign experience, an algorithm for the introduction of digitalization for most businesses in Kazakhstan has been compiled.

there are several factors that allow increasing digital technologies in all areas of industry in Kazakhstan. Digital technologies provide an incentive for the development of new areas in SMEs. This fact pushes to review legislation of the country and develop a transit direction in trade.

The digitalization implementation algorithms discussed in the article in foreign companies and the algorithm for domestic entrepreneurs can be used both to improve business strategies by company leaders and government agencies in Kazakhstan to create an internal development program and encourage the introduction of new technologies and digitalization in state enterprises.

## Introduction

In modern world the development and implementation of digitalization in all spheres of human life and activities is a necessity of the time in which we live and allows us to achieve maximum efficiency in all processes. Today technology no longer only is the engine of development of new industries, but also acquired important roles in society. Technology as well brought a significant contribution to solving society problems such as: social disintegration, environmental disasters and climate change. With the help of advanced science and technology, an "intelligent" society arises, based on new values of a person's needs and his creativity. Labor market, health and education spheres are changing drastically with the help of digitalization. As well as people influenced by digitalization are developing spatially.

## Literature Review

Information in the modern post-industrial era acts as one of the bases of social processes. Moreover, information exchange is a trigger for the relationship between social processes. The information space, namely, the global network, expands human capabilities and allows people to overcome political and geographical boundaries, making cultural values of different nations accessible for contemplation to everyone via "visualization" of the economic environment of each individual's life (Kedrovsky, 1994). The high speed of information flows

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dissemination leads to a situation of total digitalization of social processes and lives of individuals.

Digitalization has led to the emergence of more technically complex processes and disappearance of traditional professions due to the automation of the corresponding labor operations. At the same time digitalization has led to creation of new professions and the growing demand for non-algorithmic work and creativity. A significant part of labor relations and entire segments of employment enters the virtual environment, the flexibility of forms of which increases significantly: the proportion of non-standard, partial, unstable and one-time employment increase. Digitalization requires the formation of new competencies in the labor market, which entails the restructuring of the entire education system (Kuzminov, 2018). Transnational forms of education are developing, and a highly competitive environment is being formed in the rapidly growing global education market. The number of students entering universities in another country after graduation is growing by 10% per year and in 2019 reached more than 7 million people. Many countries have adopted and are implementing education export support programs. In the near future, the labor market will experience an increasing influence of young workers, representatives of Generation Z, using digital technologies almost from birth and having unlimited access to information and developed digital competencies. By 2025, their share will reach 25% of the total number of people employed in the world. The key motivating factor for them is the possibility of personal development (including those not related to work).

## Methodology

The research methodology is based on general scientific methods of knowledge, principles and criteria of objectivity in their versatility and inconsistency, based on the totality of works of domestic and foreign scientists, statistical indicators that correspond to the truth and general laws of state and socio-political development at the historical stage under study.

## Findings and Discussion

In 2017, the "Digital Kazakhstan" program was developed. The "Digital Kazakhstan" program is based on five main areas, namely, digitalization of economic sectors - the transformation of traditional economic sectors using breakthrough technologies and opportunities that will increase labor productivity and lead to an increase in capitalization. The main areas include:

At the present time, the basis of **manufacturing sector** in Kazakhstan economy constitute – subsoil use, mining, manufacturing and electric power industries. However, the manufacturing sector is still underdeveloped. The electric power industry meets the needs of the population and production, but requires a transition to a more technological and resource-saving level. In the mining and manufacturing industries, the key trend is the transition to a new technological level in accordance with the concept Industry 4.0 (Korovin, 2018). Today, in comparison with world leaders the mining industry of Kazakhstan has insufficient technological equipment, which in general leads to low labor productivity and competitiveness. The main global trend in the energy sector is the introduction of various Smart technologies in order to ensure effective information exchange between all network participants to protect and provide self-repair from major failures, natural disasters and external threats.

High-quality transport and logistics infrastructure gives a powerful impetus to the development of the economy by increasing the connectivity in certain territory and reducing the overhead costs of delivering goods to their destination.

In order to obtain the maximum effect from the development of the infrastructure of communication networks, it is necessary to simultaneously develop the transport connectivity in certain territory both via the development of all types of transport communication and the reduction of its cost, and via the development of the infrastructure for the forwarding and delivering goods. Currently, Kazakhstan has a highly developed network of railways, but an underdeveloped network of roads and excessively expensive air transportation. Multimodal transcontinental

transportation of goods between Europe and Asia is developing and do have great future growth potential. The experience of foreign countries demonstrates that an increase in freight traffic can be achieved through the optimization of paper workflow, using the international standard "E-freight" in the process of air cargo transportation, as well as the development of multimodal transportation.

**Agriculture** is one of the key sectors of the Kazakhstan economy, which provides food and economic security, as well as the labor potential of the country, especially in rural areas. Experience shows that digital technologies are fundamentally changing this traditional industry. Modern systems and big data obtained from various sources contribute to high yields without depletion of the soil, and with the rational use of resources. Integration of the Internet into the industry allows creating automated farms with remote control. A developed logistics system and electronic commerce can reduce the cost of delivering agricultural products to the final consumer, even to small farms while maintaining its quality.

**E-commerce** and the financial sector. The share of wholesale and retail trade, car and motorcycle repair in Kazakhstan's GDP for 2018 amounted to 18.6% (Galiev, 2018). At the same time, the share of e-commerce is a relatively small part of retail turnover - 1.3% in 2018. E-commerce is rapidly expanding in developed and developing countries. Its positive impact extends not only to the business sector, but also to the quality of life of the population in the country as a whole. In terms of impact on business, it should be takes into account that the growing popularity of e-commerce leads to an increase in the number of people who want to open their own business in this area. Thanks to e-commerce, the population gets access to more goods at lower prices, for example, due to involvement in international trade. A leap in the development of e-commerce can be achieved through the development of delivery services, wide customer analytics, expanding the range of products and the introduction of mobile commerce.

**IT industry development**. Three large segments should be distinguished in the structure of the IT market: equipment, licensed software and IT services. The major problems and at the same time the main direction of development are now

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considered to be - low efficiency of investments in IT, low level of cybersecurity and the need to take measures to promote local content. According to the ALE "Kazakhstan Association of IT companies" 2 840 companies operating in the field of information technology are registered in the country at the end of 2018. These companies carry out various types of activities, and 770 of them are engaged in software development.

World experience shows that the creation of conditions for the development of IT companies and the formation of a full start-up support cycle are provided by technology parks. However, the technology parks operating in the country did not receive proper development due to the low efficiency of work in the segment of information technologies and development institutions. Also, the Institute of Venture Financing in Kazakhstan did not receive proper development. It should be noted that support of domestic IT companies working to increase value added in the information technology sector ensures technological development and the country's cybersecurity. At the same time, the conditions for development are the formation and development of a start-up area involving technology entrepreneurs from around the world on mutually beneficial conditions.

Digital services and a modern approach to the development of "smart" spaces are changing the human's life condition for a more comfortable one. A "smart" space is a physical or digital environment in which people and technological systems openly interact in connected and coordinated intelligent ecosystems (Balandin, 2015). Examples of this space include smart cities, smart homes, digital jobs, and factories. Today, the world is entering a period of accelerated provision of reliable "smart" spaces, when technology is becoming an integral part of a person's daily life in any of his roles - employee, client, community member, citizen. The development of digital spaces challenges the traditional principles of territoriality, geographically sound communities and sovereignty. Policies based on geographical principles, such as rules of origin or specific markets need to be revised to adapt to real value creation and distribution processes.

The digital economy sets the path for the transformation of traditional sectors of the economy and the emergence of new markets and niches. New business models are customer-oriented, and this fact determines their structure: from the value proposal aimed at solving the predicted needs of the client, timely delivery to revenue streams based on the time the client used the product (Javetski, 2017). As transactions occur in real time and quiet often simultaneously, the key source of value creation is high-speed processing of big data. Technologies of big data analysis and Artificial Intelligence (hereinafter refer to as AI) help to find new sources of value creation through the study of digital portraits of consumers and patterns of their economic behavior (Song, 2018). Customer data is becoming the main asset of digital companies, and access to large arrays of them increases the assessment of market value. The current trend is the development of open data platforms, which stimulates the emergence and spreads innovative business models in the economy. In the financial sector the implementation of this concept is the Open Banking System, which provides third parties with the opportunity to analyze or use data, integrate various applications and services, thereby improving the quality of customer service.

New digital technologies expand business opportunities to optimize many processes and improve decision-making. So, the Internet and cloud computing optimize the collection and storage of data. In its turn technologies and methods of machine learning and AI build behavior algorithms, predictive models and allow collected data to be deeply processed. In retail, a new type of business model is associated with the transformation of e-commerce into a-commerce, in which the seller builds algorithms describing the customer's consumption model, and then automatically delivers the goods to him based on the predicted need. Predictive analytics technologies are aimed at constructing algorithms that describe the consumption of products and services, and automation, taking into account data from forecasts of the processes of production and delivery of goods to customers with the participation of partners. Block chain technology allows decentralizing the processes of data collection, transmission and storage, thereby increasing the reliability of transactions and contributing to the development of platform

technologies for interaction with partners and consumers. In this way, INS Ecosystem plans to launch a platform for direct interaction between manufacturers and consumers, bypassing traditional retail, based on deep personalization of offers and using block chain technologies. Accordingly, 7 of the top 20 global FMCG manufacturers collaborate with the platform (Gokhberg, 2019).

Internet applications are also a driver for the development of the servitization model, since they allow evaluating the parameters of product use and the effects achieved. The popular car-sharing models, payment of car insurance depending on the kilometers traveled are based on this principle. In industry the greatest example of internet applications use is payment of the time spent while using equipment or payment based on quantity of products manufactured on it.

The level of distribution of new business models in Kazakhstan varies significantly by industry: the most common are digital platforms in markets characterized by close interaction of suppliers and consumers - in retail, financial services, consumer goods and services.

Digitalization of the business, both small and large, is moving forward in big steps month by month. Thanks to world experience, there is a representation of the algorithm by which the implementation of business digitalization takes place:

**The first stage** is the introduction of small, riskless and independent from each other initiatives or products. The main goal of this stage is the creation of technological solutions without a radical revision of related business processes (Siebel, 2019).

**The next stage** is the transition from disparate initiatives to a wider transformation of the company's operating model. Several changes take place, such as: business processes, organizational structure, key performance indicators (hereinafter refer to as KPI) and staff skills. At this stage, full integration with the basic systems of the organization should be ensured. Such changes already require a comprehensive management program (Siebel, 2019).

**The final stage** of digitalization is a change in the way we interact with external suppliers, customers and contractors: new ways of positioning and promoting existing products and creating new ones. At this stage, digital technologies are "part of the DNA" of the entire organization and are aimed at creating new ecosystems and partnerships. There is a digital platform at the center of ecosystems that implements the unique competencies and know-how of an organization's business model (Siebel, 2019).

In different sectors, the implementation of digitalization is proceeding at different speeds. According to BCG analysis, B2C sectors are historically leading in the implementation of digital technologies: for example, the media, in which fundamental changes have already taken place, as well as retail, telecommunications, insurance and banking. According to Basel D. Industry 4.0 digitalization has already significantly affected these industries, but the final outcome remains to be determined. In turn, metallurgy, the oil and gas sector, electric power and engineering are lagging behind: the impact of digitalization in these sectors is mainly directed to internal improvements, it is difficult to evaluate it to the end, and dramatic changes are yet to come. Implementation of digitalization at once for the entire production is physically impossible. Digitalization applies to all areas of the company's business related to productivity: cost control and return on investment. As a rule, the first wave of digital changes in most companies concerns the management of production assets - predictive analytics for maintenance and repair, as well as the planning of production assets investments. This process is especially relevant for infrastructure companies with a large number of production assets, as well as the costs of their creation and operation, such as telecommunications, transportation and electricity companies. For example, the introduction of predictive analytics allows the organization to achieve new business growth opportunities; more accurately understand the opportunities for additional and cross-selling to existing customers. Many telecommunications companies, including Kazakhstan, are already applying predictive analytics in their performance. For small and medium businesses (hereinafter refer to as SMEs) digitalization is an effective tool for faster and easier

scaling and growth of the whole business. For example, the development of e-commerce opens up new sales channels for SMEs and also potentially reduces the volume of the 'grey' economy. According to a joint study by BCG and Samruk-Kazyna, at the beginning of 2017 the share of e-commerce in retail in Kazakhstan was less than 1%. In comparison to Kazakhstan e-commerce share amounted in Russia - 3% and in China - 8.3%. According to Samruk-Kazyna, Kazakhstan's retail e-commerce market will reach 750-800 million.

An important parameter of the effective implementation of digitalization is the development of e-commerce in the country.
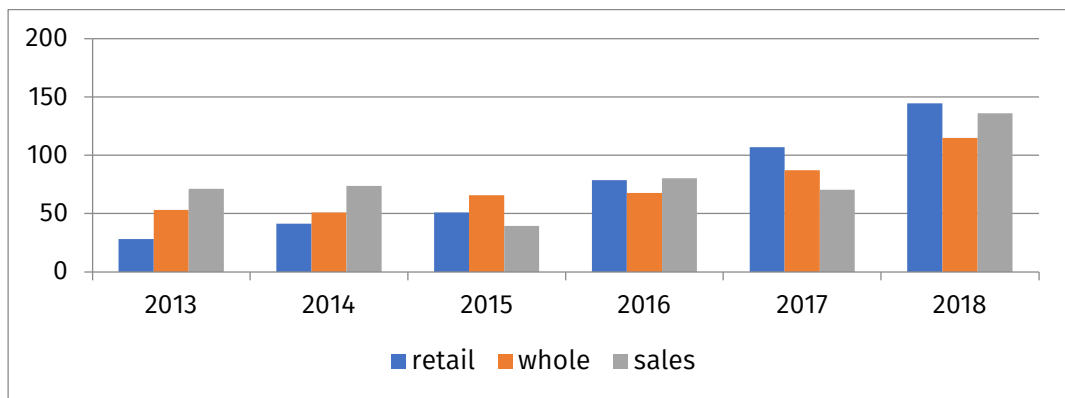


Figure 1. The volume of e-commerce in Kazakhstan, billion tenge.
(E-commerce report based on data from the MNE of Kazakhstan, 2019).

Over the past five years, Kazakhstan has seen an increase in e-commerce by an average of 26%. In gross value, the volume of transactions in 2018 reached 259.5 billion tenge. According to Figure 1 the volume of transactions of 144.6 billion tenge in retail and 114.9 billion tenge in wholesale. According to the forecasts of the Ministry of National Economy, by 2023 the volume of electronic retail trade will grow to 2 trillion tenge.

According to the E-commerce report based on data from the MNE of Kazakhstan the multiplier effect of e-commerce on the economy will provide the possibility to forecast an annual contribution to GDP of 1.1%. The development of e-commerce represents an enormous potential for economic growth. Firstly, it provides an unlimited increase in turnover. Secondly, it provides access to the market of any

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country. And finally, it provides the development of transit potential. The Kazakhstani market is represented by over 1,700 independent online stores and about 20 electronic trading platforms, where over 1 million SMEs operate. The total number of consumers purchasing electronic goods and services is about 2.3 million people.

The structure of the e-commerce market consists of 68% of goods and 32% of services. Building materials, household appliances, cosmetics, clothes and shoes are in high demand in e-commerce platforms. The most popular among the services are sale of air and train tickets, payment for cultural events and utilities. E-commerce as a way of applying modern information technologies and the Internet is becoming an important strategic direction in the development of trading operations. For Kazakhstan, its development is especially relevant during its membership in the World Trade Organization, the Eurasian Economic Union.

One of the key factors determining the development of e-commerce is the population's access to information, communication technologies and the Internet. At the end of 2018, the share of Internet users was 81.3%. The key event of 2018 was the start of the construction of fiber-optic communication lines by Kazakhtelecom JSC under a project aimed at providing broadband access to rural settlements.

In its turn the volume of retail trade through the Internet in Kazakhstani market in 2018 reached 144.6 billion tenge and the share was 1.4% of the total retail trade. Most non-cash transactions are carried out via the Internet and mobile phone. For 8 months of 2019, the total amount of payments reached 4.6 trillion tenge - 66.5% of the total volume of non-cash payments.

The development of online trading is inextricably linked with the development of non-cash payment tools. According to the National Bank as of September 1, 2019 26.6 million people do have payment cards and there are 30,1 million payment cards in circulation. In contrast to the same date in 2018 these indicators increase by 39,6% and 49,5% respectively.

The most common are debit cards. Their share is 78.6%, at the same time the share of credit cards is 18.0%. The volume of transactions using payment cards in August 2019 increased up to 2.7 trillion tenge, which in percentage terms increased by 49,3% in comparison to 2018.
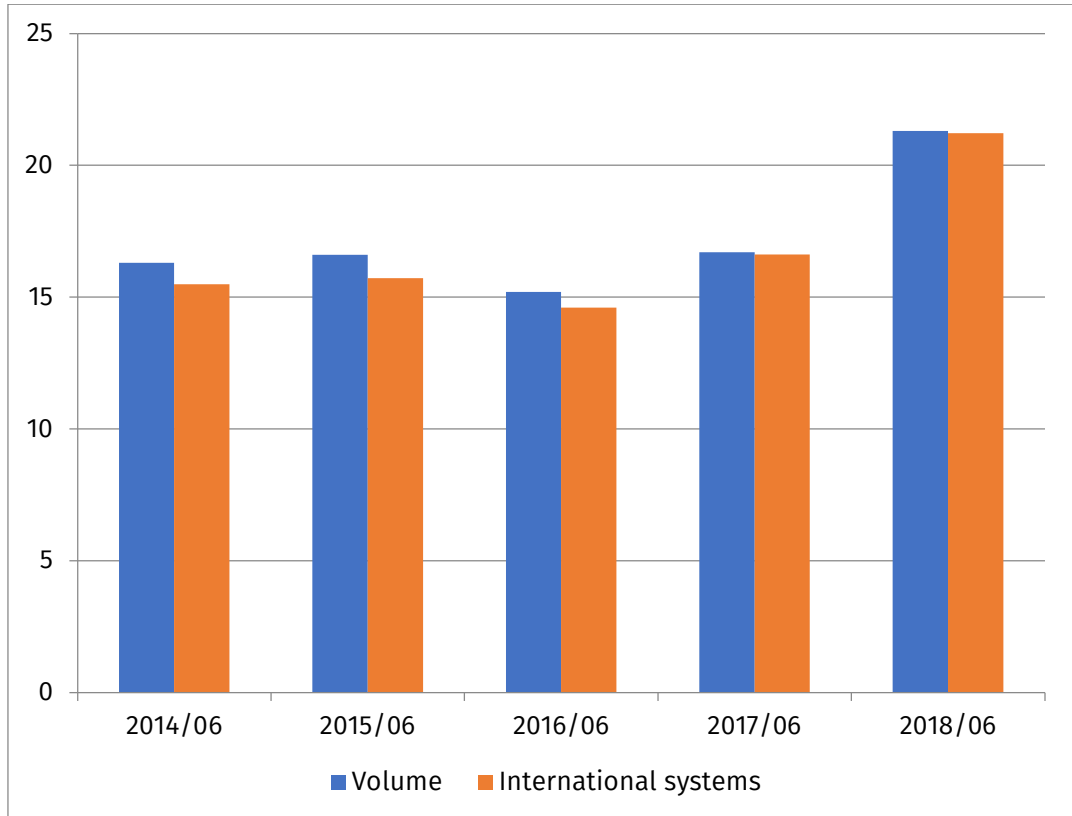


Figure 2. Dynamics of payment cards in circulation, mln units.
(E-commerce report based on data from the MNE of Kazakhstan, 2019).

According to the data provided in Figure 2, it can be concluded that e-commerce is developing rapidly in Kazakhstan. People's loyalty to online stores is growing dynamically. This is due precisely to the fact that in such stores there is less cost for the production, storage and realization of goods. In this regard, both, the number of consumers and the amount they are willing to spend in online stores are increasing.
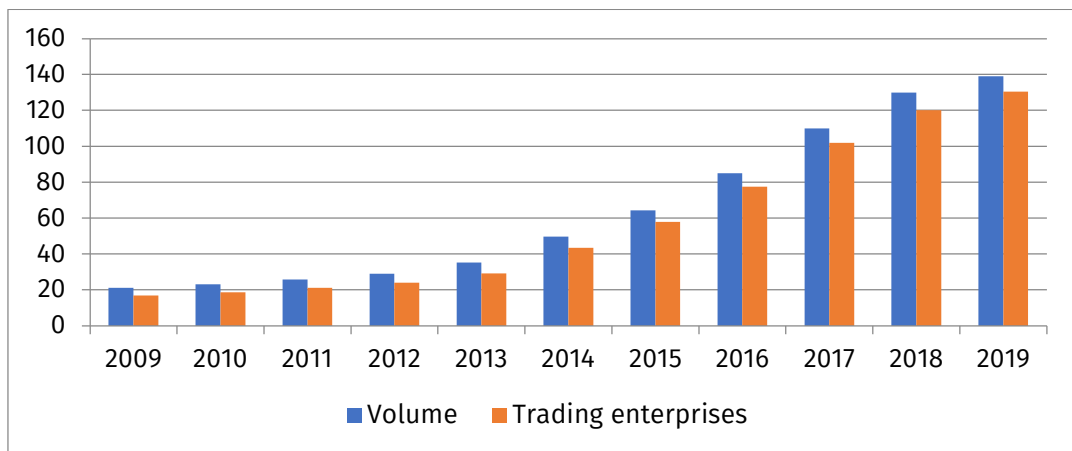
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Figure 3. POS-terminals in Kazakhstan, thousand pieces.
(E-commerce report based on data from the MNE of Kazakhstan, 2019).

## Conclusion

In conclusion, it should be noted that in Kazakhstan there are several factors that allow increasing digital technologies in all areas of industry. Digital technologies provide an incentive for the development of new areas in SMEs. This fact pushes to review legislation of the country and develop a transit direction in trade. Also, qualified people in SMEs sphere should be trained in order to properly use e-commerce tools in their work.

After analyzing the experience of foreign companies, it can be implemented at the enterprises of Kazakhstan with the following adjustments:

Algorithm of digitalization implementation for SMEs in Kazakhstan:

The first stage is the introduction of not large, independent of each other products or services. Due to the fact that the goods are independent of each other, an entrepreneur can find out how advantageous his offers are alone and whether they need to be supplemented. Regarding this information, entrepreneur is able to review related business processes.

The second stage is the transition from disparate initiatives to a wider transformation of the company's operating model. At this stage, full integration with the basic systems of the organization should be ensured. Such changes already require a comprehensive management program.

The third stage of digitalization is a change in the way we interact with external suppliers, customers and contractors: new ways of positioning and promoting existing products and creating new ones. At this stage, digital technologies are "part of the DNA" of the entire organization and are aimed at creating new ecosystems and partnerships. There is a digital platform at the center of ecosystems that implements the unique competencies and know-how of an organization's business model.

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