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## **The Main Trends in the Formation of the Internet Space and Information Society in Kazakhstan**

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### **Abstract**

The article reveals the problems of the information space of Kazakhstan, which is undergoing significant changes related both to the political events that have recently occurred in the world and to the rapid development and widespread use of new Internet technologies. Today, the telecommunications services sector is one of the main directions of the economy, on the effective operation of which the functioning and coordinated work of all state systems depend. The development of the telecommunications services sector is not only a key factor of economic growth but also a necessary condition for the development of the country's economy in the context of globalization. The purpose of the study is to analyze the data of the main agents of the information environment, the level of development of the subjects of the telecommunications sector and to determine the main trends in the development of the Internet space. The methodological basis of the study was made by general scientific methods of economic, statistical, logical, and analytical analysis, the system method, synthesis. Based on the conducted research, it turns out that the development of the information environment is an intersectoral, interdepartmental, and state task that requires coordination of the actions of many participants in this process. The influence of the information environment on the business community of the country and the economy of Kazakhstan has increased and requires an understanding of the trajectories of its development. The interest to researchers of the information environment and business practitioners interested in the market of Kazakhstan.

*Keywords:* *Economics*, Information Environment, Development, Internet Space, Information and Communication Technologies

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## Қазақстанда интернет-кеңістік пен ақпараттық қоғамды қалыптастырудың негізгі үрдістері

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### Түйін

Мақалада соңғы уақытта әлемде орын алған саяси оқиғалармен, сондай-ақ жаңа интернет-технологияларды жылдам дамыту және кеңінен пайдаланумен байланысты елеулі өзгерістерге ұшырайтын Қазақстанның ақпараттық кеңістігінің проблемалары ашылады. Бүгінгі таңда телекоммуникациялық сектор экономиканың негізгі бағыттарының бірі болып табылады, барлық мемлекеттік жүйелердің жұмыс істеуі оның тиімді қызметіне байланысты. Телекоммуникациялық қызметтер секторын дамыту экономикалық өсудің негізгі факторы ғана емес, жаһандану жағдайында ел экономикасын дамытудың қажетті шарты болып табылады. Зерттеудің мақсаты ақпараттық ортаның негізгі агенттерінің деректерін, телекоммуникация секторы субъектілерінің даму деңгейін талдау және Қазақстанның интернет-кеңістігінің дамуының негізгі үрдістерін айқындау болып табылады. Зерттеудің әдіснамалық негізін танымның жалпы ғылыми әдістері, атап айтқанда экономикалық, статистикалық, логикалық-аналитикалық талдау әдістері, жүйелік әдіс, синтез құрады. Жүргізілген зерттеу негізінде Қазақстанның интернет-кеңістіктегі ақпараттық ортасын дамыту осы процестің көптеген қатысушыларының іс-қимылын үйлестіруді талап ететін салааралық, ведомствоаралық және мемлекеттік міндет болып табылады. Ақпараттық ортаның елдің бизнес-қоғамдастығына және Қазақстан экономикасына әсері өсті және оның даму траекторияларын айқындауды талап етеді. Мақала Қазақстан нарығына қызығушылық танытатын ақпараттық ортаны зерттеушілер мен бизнес-практиктерді қызықтыруы мүмкін.

*Түйін сөздер:* экономика, ақпараттық орта, даму, интернет-кеңістік, ақпараттық-коммуникациялық технологиялар

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## Основные тенденции формирования интернет-пространства и информационного общества в Казахстане

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### Аннотация

В статье раскрываются проблемы информационного пространства Казахстана, которое претерпевает значительные изменения, связанные как с политическими событиями, произошедшими в последнее время в мире, так и с быстрым развитием и широким использованием новых интернет-технологий. На сегодняшний день сектор телекоммуникационных услуг является одним из основных направлений экономики, от эффективной деятельности которого зависит функционирование и согласованная работа всех государственных систем. Развитие сектора телекоммуникационных услуг является не только ключевым фактором экономического роста, но и необходимым условием развития экономики страны в условиях глобализации. Целью исследования является анализ данных основных агентов информационной среды, уровня развития субъектов сектора телекоммуникации и определение основных тенденций развития интернет-пространства Казахстана. Методологическую основу исследования составили общенаучные методы познания, методы экономического, статистического, логико-аналитического анализа, системный метод, синтез. На основании проведенного исследования получается, что развитие информационной среды Казахстана в интернет-пространстве является межотраслевой, межведомственной и государственной задачей, требующей координации действий многих участников этого процесса. Влияние информационной среды на бизнес-сообщество страны и экономику Казахстана возросло и требует понимания траекторий ее развития. Статья представляет интерес для исследователей информационной среды и бизнес-практиков, интересующихся рынком Казахстана.

*Ключевые слова:* экономика, информационная среда, развитие, интернет-пространство, информационно-коммуникационные технологии

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### Introduction

In recent years, research in this area has been in great demand. The most important part of the new information society is its global nature. The large-scale transformations taking place today around the world are due to the rapid development of information and communication technologies. The Charter for the Global Information Society notes that “information and communication technologies are one of the most important factors influencing the formation of the society in the twenty-first century. Their revolutionary impact concerns people’s lifestyles, education, and work, as well as the organization of interaction between government and civil society. Communication technologies are rapidly becoming a vital stimulus for the development of the world economy.” That the global information network Internet is the largest and most massive source for the world information space. Information in the global network has become a key strategic resource of any state, and the scale and methods of using information are actively used in political processes in many countries along with the use of traditional resources.

Thus, this article examines the stages of development of the information environment of Kazakhstan in modern conditions. To do this, the tasks were set to consider and analyze the economic indicators of the information space of Kazakhstan. In general, these results show that information has an immeasurable potential for both creative and destructive impact. Development of Kaznet in global informatization, on the one hand, and the unpreparedness of the state and business for this, on the other hand, led to the fact that the country’s information and communication infrastructure and national information resources turned out to be the most vulnerable objects of influence from unfriendly states, terrorist organizations, and criminal groups, individual malefactors and specially created compromising material.

### Literature review

In modern conditions, Kazakhstan is giving way to its information environment to the external influence of business companies from the countries of the Eurasian Economic Union. Kazakhstan needs a set of systemic measures to improve information and cybernetic technologies, which should provide support and development of the business community in the information field of the country. The role of the information environment in the development of the country’s economy is being studied by such authors as G.M. Aubakirova, M.M. Idrisov. Publications devoted to the development of the information

sphere are fragmentary and practically do not represent any analysis of the development of national information markets. The basis for the development of the economy of Kazakhstan is the technological revolution and the use of new technologies. There is a convergence of information and communication technologies, the integration of information resources, miniaturization and combination of functions of various devices, development of mobile communications.

The fundamental principle of the formation of the information environment of the Republic of Kazakhstan is understood to be the state of protection of the business community and national interests in the information environment, which is determined by the totality of balanced interests of business, society, and the state [1]. At the same time, the state does not realize its essence and is not a trusted means of communication with the business. In addition, communication with public opinion of business has been lost as a means of feedback and government administration in the Kazakhstan information sphere. The only representative of the country’s business community in government bodies is the National Chamber of Entrepreneurs of the Republic of Kazakhstan “Atameken”, in which several industry associations and organizations of the information and ICT industries in the country are represented [2]. The Internet began its history on September 19, 1994, from the day when the registration record of the KZ top-level domain was made in the international organization IANA. It is characteristic that the first catalog of Kazakhstan websites appeared in June 1995 and had an analog of the world-famous «Yellow Pages» (Kazakh Internet Yellow & White Pages). The Kaznet space combines the following types of resources:

- independent Internet resources of the KZ domain zone;
- network resources of other domain zones located at the sites of Kazakhstan providers;
- foreign resources aimed at the Kazakh audience;
- resources of Kazakhstan companies located in other domain zones [3].

### Research methods

The scientific research was based on the application of classical scientific methodology. The main research methods were general scientific methods of cognition methods of economic and logical analysis, the system method, synthesis, analytical-synthetic, statistical methods of research, and the method of developing hypotheses. Also, to analyze the development of the internal environment of the information

space, a comparative and statistical method of these indicators was used, which represents a positive growth trend in the main indicators of the information environment. The research algorithm was based on a phased analysis of the dynamics of the development of the information society and the main indicators of the information environment of the Republic of Kazakhstan.

The scientific research algorithm was based on the analytical research method, in which all the constituent elements of the development of the information society of the Republic of Kazakhstan were analyzed separately. System methods have made it possible to identify problematic aspects of the functioning of the digital economy. Also, at this stage of the study, an analytical method was used to find out that the growth of the Internet audience leads to the fact that the information field of Kazakhstan is actively created through new media, which determines new trends in the development of the country's information environment. The next stage of the research algorithm was to evaluate the effectiveness of operator services, determine its impact on the quality of content and, in general, on the development of the digital space in Kazakhstan. At the third stage of the study, the synthetic method and the method of hypotheses were applied.

The information base of the article was the official statistical information in the field of the development of communications and information and telecommunication technologies, scientific journals, including near and far abroad [1,8,10,12,13,14]. The data sources were the official information of the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan, International Telecommunication Union: index of development of information and communication technologies in the world, Ministry of Information and Social Development of the Republic of Kazakhstan and Report on the development of the information and communication technologies industry in the Republic of Kazakhstan JSC «National Info communication Holding «Zerde» for 2020.

### Results and discussion

The analysis of the current state of the industry was based on the most significant indicators that determine the effectiveness of the use of national means of communication. The development index of Kazakhstan information and communication technologies among all countries of the world for 2020, according to the International Telecommunication Union, is 6.79 and occupies the 68th position in the overall rating of 176 countries [4]. To analyze the development of the internal environment of

the information space, the following series of development indicators for 2020 are used:

- the number of Internet users in Kazakhstan per 100 people is 89;
- the provision of the population with computers is 8.3%;
- Internet penetration is 81.9%;
- the number of fixed-line subscribers amounted to more than 28 million units [5];
- the volume of Internet services over wired and wireless telecommunication networks amounted to 243.3 billion;
- the number of enterprises using the Internet was 100 702 units.

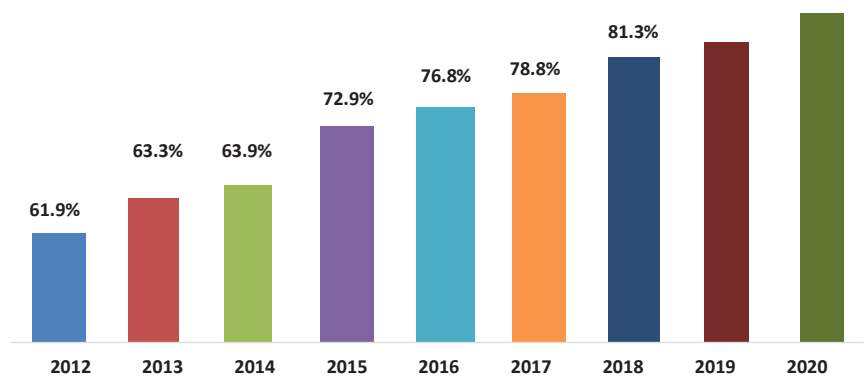
Despite the positive dynamics of growth of the main indicators of the information environment, the Republic of Kazakhstan is still lagging in development in comparison with the leading industrial countries [6]. Penetration of the Internet One of the most important factors in the development of the country's information society is the indicator of Internet penetration. From 2012 to 2020, Internet penetration in Kazakhstan increased 2 times (Fig. 1).

The main indicators of the use of types of communication for Internet access in households in 2020 are shown in Figure 2 according to the data of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan [8]. Many households use a mobile phone as a means of accessing the Internet.

The main goals of using the Internet for households are:

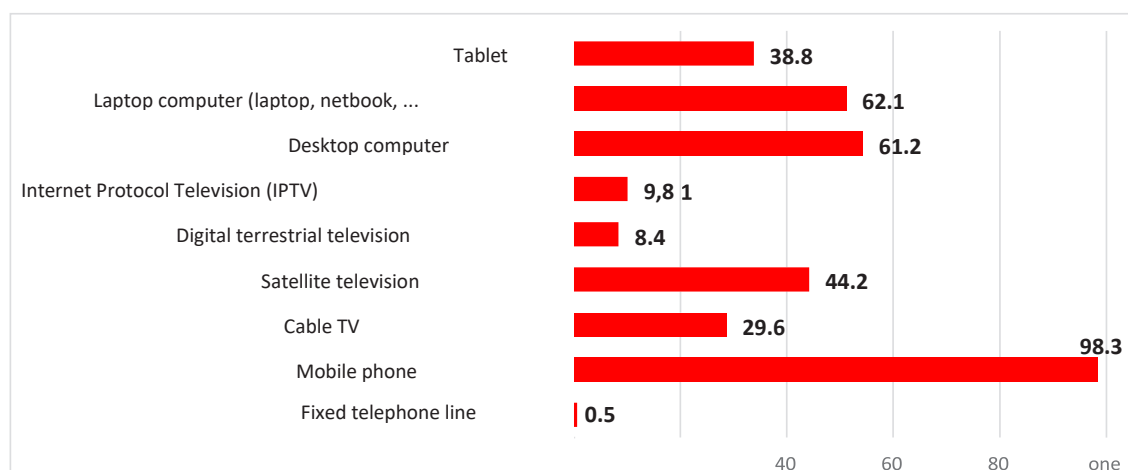
- posting information or instant messaging - 75.4%;
- participation in social networks - 69.7%;
- Downloading movies, images, music, watching videos, listening to music, playing or downloading games - 63.3%;
- obtaining information about goods and services - 36.8%;
- sending and receiving email - 32.6%.

The most active regions of the country in the use of computers for Internet access are Nur-Sultan, Shymkent and Karaganda oblast. However, the intensity of the use of cloud technologies is highest in Almaty, Nur-Sultan, and Atyrau.



**Figure 1** - Internet penetration in Kazakhstan from 2012 to 2020 (share of Internet users)

Note - compiled by the author based on data [7]

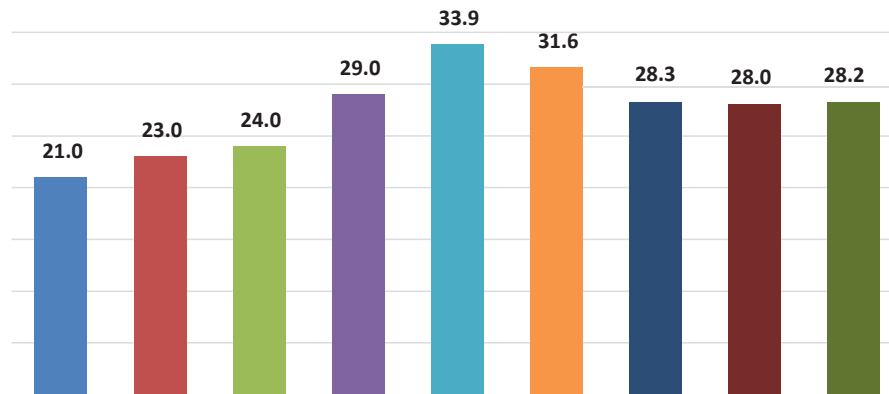


**Figure 2** - Use of types of communication for Internet access by households in 2020 (percent)

Note - compiled by the author based on data [9]

One of the most important indicators of the development of the information society is the number of computers per capita. This indicator is presented in all world rankings and the development index of any state. All international organizations use it as the first parameter to assess the development of the state and society. In Kazakhstan, in the early 2000s, a special program “Reducing the digital divide” was adopted, the tasks of which were to provide the country’s population not only with computers but also with knowledge of computer technology. The results of this program are obvious and demonstrate the growth of advanced Kazakhstan youth (Fig. 3).

According to the statistics committee of the Ministry of National Economy. In 2020 in Kazakhstan, the indicator of the number of subscribers with fixed Internet access was 15 units. The dynamics of growth in the number of enterprises using the Internet from 2006 to 2020 is significant.



**Figure 3** - Dynamics of the provision of the population with computers per 100 people from 2012 to 2020

Note - compiled by the authors based on data [7]

A fundamental leap in the provision of computers to the country's enterprises took place in 2008, and until 2013 there was a steady growth, which decreased in 2014 due to the difficult economic situation after the introduction of Western sanctions against Russia [10]. The growth of the Internet audience has led to the fact that the information field in Kazakhstan is actively being created at the expense of new media. It today features social networks, blogging platforms, forums, and online media. Significant deformation of the information environment occurs due to the exclusive dominance of social networks. The very psychology of information dissemination on the Internet is changing [11]. The main role in the information environment of Kazakhstan is played by the blogging institute. E-commerce in Kazakhstan is currently only developing and includes the following provisions. one. A prerequisite for the development of e-commerce is the improvement of the regulatory framework, the creation of a legislative framework and regulation of e-commerce for the legal existence of the market, and the protection of the rights of all its participants. 2. Existing logistics transport solutions are only at the very beginning of their development. The national provider represented by Kazpost JSC is making significant efforts to organize the supply chain within the country. 3. The market of existing online stores shows that the financial capacity of the Kazakhstan market is quite high and has all the prospects for its development. 4. Taxation of online stores remains the same as for any other business. There are no benefits or simplified mechanisms to stimulate the development of the industry. 5. Payments are supported by the processing centers of the two main banks in Kazakhstan: Halyk Bank of Kazakhstan JSC and KazkomBank JSC, which accept payments by credit and debit cards. There are electronic money systems that allow

payments to be made electronically. However, cash payment is still commonly used. 6. The market is represented by several industry associations that are involved in the development of e-commerce. Conferences and seminars are held periodically, guests and experts in the field of e-commerce are invited, special events are held to support start-up Internet projects [12]. «Electronic government» of the Republic of Kazakhstan Development of the information environment of the Republic of Kazakhstan is impossible without the structure of «electronic government». The portal of the «electronic government» of Kazakhstan ([www.egov.kz](http://www.egov.kz)) is a backbone element of the infrastructure of electronic interaction of government bodies and supports the processes of functional activities of executive authorities. The «electronic government» of Kazakhstan is the most developed among the CIS countries and is recognized by the United Nations as one of the most successful in the world. The main indicator of the work of the e-government portal is the number of registered users, the number of services provided, and the number of services provided. The registered users of the e-government website at the end of 2018 amounted to 8.86 million people (with a population of 16.9 million people), the number of services provided on average per day was 176 921 services, and in 2018 27 481 239 services [13]. The next stage in the development of e-government services in Kazakhstan should be the provision of services to legal entities and individual entrepreneurs in the same volume and quantity as for individuals. There are very few online government services for businesses today. At the same time, many state bodies independently provide such services (for example, the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan). Since the 2000s, the information industry of Kazakhstan has seen a growing convergence of the ICT industry and

media systems in the information environment, in which old and isolated information flows merge so much that they become barely distinguishable. Convergence has entered as a phenomenon in the modern information nature at many levels - the integration of the telephone network and the Internet, telecommunications and information technology, business technologies, and consumers, end users, and corporate application technologies [14]. New models for creating and delivering information from the user to the largest information resource provide instant publication of materials in new media and social networks. The development of the digital market in Kazakhstan affects the quality of content and its delivery, business development and advertising, marketing and telecommunications, as well as the interaction between government and business. The economic downturn is accelerating the growth rate of the digital marketplace. The Kazakhstan media market is not fully formed and is constantly under pressure from both foreign media agencies and Kazakhstan companies. On the one hand, many information resources began to actively use illegal traffic, taking advantage of the opacity of the market and the lack of reliable statistical information. On the other hand, the market suffers from a large number of news aggregators (they only collect information, but do not create it), an acute shortage of tools for accurately measuring the traffic, a lack of multimedia solutions, and poor optimization of the sites themselves [15].

Only in 2015, many information sites began to offer mobile versions of their resources and create special applications for the convenience of users. Mobile letters of the Republic of Kazakhstan wandering letters came to Kazakhstan in the beginning one-half of the 90s. In the early 2000s, the number of Kazakhstan cellular subscribers did not exceed 15,000. With the arrival of other telecom operators Kcell and K-Mobile on the market, the possibility of new IP-telephony formats appeared. The first mobile operator Altel is currently on the market with the Altel 4G brand and is the only one offering a network of new 4G / LTE standards. The mobile user of Kazakhstan is showing explosive growth today. Whereas in 2012 there were only 1.6 million mobile Internet users, in 2018 there are 14.1 million cellular subscribers with Internet access. A characteristic feature of the emergence of the communications market in Kazakhstan was a monopoly on mobile communications for five years [16]. The first mobile operator was Altel, which received exclusive and exclusive rights (license) to carry out mobile communications in Kazakhstan from 1994 to 1999. After the termination of the exclusive license, the government of Kazakhstan organized a tender for the issuance of other licenses for operator activities in the country, and since February 1999, two more cellular operators, GSM-Kazakhstan and KaR-Tel, have appeared. The telecommunications market of Kazakhstan is characterized by the fact that 90% and more users are served by ten companies (Table 1).

**Table 1** - Main operators providing ICT services in Kazakhstan

Market segments	Operators of Kazakhstan
Fixed telephony	Kazakhtelecom JSC, KazTransCom JSC, Transtelecom JSC, DUCAT (Arna), VimpelCom Group of Companies (SA-Telcom, TNS-plus, SkySilk)
mobile connection	Kcell JSC, Altel JSC, MTS LLP (Tele2), VimpelCom Group of Companies (KaR-Tel LLP)
Broadcast data and internet	Kazakhtelecom JSC, KazTransCom JSC, Transtelecom JSC, DUCAT (Arna), Astel, VimpelCom Group of Companies (SA-Telcom, 2DAY-Telecom)
Services to operators	Kazakhtelecom JSC, KazTransCom JSC, Vimpelcom Group of Companies (SA-Telcom, KZ-Trans), Transtelecom JSC
Pay cable TV	LLP «TV Alma-TV», LLP «Aina-TV», Secatel company, ICON, Kazakhtelecom JSC IDTV and Digital-TV

In 1991 Kazakhstan firm Parasat opened the first regional node of the Relcom network. The regional node started working on the protocol UUCP and provide only e-mail services [9]. International organization IANA registered a record of the top-level domain of the Republic of Kazakhstan - KZ. Historically, the system for providing Internet access services in the country is

divided into two levels. Primary companies - large ISP (Internet Service Provider) providers have their Internet access channels. These companies include Kazakhtelecom JSC, Astel, Beeline, TransTelecom, and SA Telcom. Second-tier providers own companies that lease access channels from first-tier companies. Since mid-2005, the national telecom operator Kazakhtelecom



JSC entered the market with a broadband Internet access service with a new brand – Megaline [17].

Thus, broadband access has provided users and organizations with an easy and fast connection to the Internet. In addition to telephone lines, cable television networks are another option for data transmission. The Alma-TV company offered its customers a new service - Internet access using its cable networks. The bandwidth of the networks is quite high - 44 MB/s. The development of the Internet is a common practice for cable TV networks. Worldwide proportions show that approximately 10-15% of cable TV customers start using cable Internet. Another option to reduce the cost of dedicated Internet access is the creation of local city networks. Today, three leaders are visible among the provider companies: Kazakhtelecom JSC, Nursat and Astel (Shared Registry System, SRS) [18]. The KZ top-level domain name support manager represents the Kazakh Network Information Center (KazNIC), which establishes the rules and procedure for registering domain names of the second and subsequent levels by the standards and rules for delegating domain names on the Internet. Currently, 13 companies have been accredited with the status of «Active Registrar»:

1. LLP «Internet Company PS», Almaty ([www.ps.kz](http://www.ps.kz)).
2. JSC “National Information Technologies”, Astana ([www.reg.gov.kz](http://www.reg.gov.kz)).
3. LLP “Registrar R01”, Almaty ([www.r01.ru](http://www.r01.ru)).
4. LLC “Ragtime”, Samara, Russia ([www.webname.ru](http://www.webname.ru)).
5. LLP “Internet Portal Nur”, Almaty ([www.nurhost.kz](http://www.nurhost.kz)).
6. LLP “CyberAge”, Almaty ([www.cnet.kz](http://www.cnet.kz)).
7. LLP “GFX” Almaty ([www.diy.kz](http://www.diy.kz)).

The two registrars hold a total of 89.65% of the Kazakhstan market. Now about the distribution of KZ domain names by countries of the world. 87.22% of them are located in Kazakhstan, since in 2010 the mandatory requirement to place KZ domains only on the territory of the Republic of Kazakhstan was introduced into the Domain Name Registration Rules for the KZ zone [19]. In Russia, 5.84% are located, in the USA - 1.24%.

### Conclusion

The information community of Kazakhstan is inseparable from the entire information community, world trends, and approaches to its development. Benchmarking of the global industry in the countries of the USA, EU, China, Russia, Central Asian countries, and the Eurasian Economic Union shows that the Republic of

Kazakhstan continues its development by global trends and follows the principles of creating an open and tolerant society. The main economic indicators of the development of the information environment in Kazakhstan are proof of this. The creation of the Eurasian Economic Union imposes obligations on Kazakhstan not only in economic matters but also in the general business space and is sometimes of paramount importance. Thus, the information field of Kazakhstan is of great interest to the USA, EU, Russia, and China, which have a significant impact on the country’s business environment and society. The current stage of development of the information society in Kazakhstan is characterized by the increasing and dominant role of the information environment, which is the most important factor in the economic development of the country. The analysis shows that the Kazakhstan information field has a significant impact on the creation of the economic foundations of the new economic policy, the promotion of Kazakhstan companies in the Internet space, the formation of public opinion, and interaction between the state and society [20]. The development of the information environment of Kazakhstan in the Internet space is an intersectoral, interdepartmental, and state task that requires coordination of the actions of many participants in this process. The current stage of development of the information society in Kazakhstan is characterized by the increasing and dominant role of the information environment, which is the most important factor in the economic development of the country. The analysis shows that the Kazakhstan information field has a significant impact on the creation of the economic foundations of the new economic policy, the promotion of Kazakhstan companies in the Internet space, the formation of public opinion, and interaction between the state and society. The development of the information environment of Kazakhstan in the Internet space is an intersectoral, interdepartmental, and state task that requires coordination of the actions of many participants in this process. The current stage of development of the information society in Kazakhstan is characterized by the increasing and dominant role of the information environment, which is the most important factor in the economic development of the country. The analysis shows that the Kazakhstan information field has a significant impact on the creation of the economic foundations of the new economic policy, the promotion of Kazakhstan companies in the Internet space, the formation of public opinion, and interaction between the state and society. The development of the information environment of Kazakhstan in the Internet space

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