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Emerging Industry Trends Shape the Business and Economic Research and Analysis in 2022 and Beyond

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Abstract

In the era of digital economy research and analysis, the industry is prepared for tumult. The multiple topics evolved towards modern business approaches that led to several disruptions that can be observed a few years back and would continue to see this segmentation down the line. Many countries at the macro level and organizations and individuals at the micro-levels are changing their methods to solve their day-to-day problems through a different modern set of behaviors and technology. During COVID-19 individuals were having technology anxiety but now they are in the learning process to use the advanced technological systems. These emerging business practices are being driven by big data, artificial intelligence, and deep learning that might be advert trends that shape the research approaches and analysis in 2022 across industries. This in turn abets researchers and analysts to derive important information that may alternate the look of every key sector of the economy. Similarly, these new trends forced researchers and analysts to conduct different studies and report the new trends in the best practices for the modern world. One of the key purposes of this conceptual paper is to highlight the tendencies of the corporate world that shape the research and analytical techniques in 2022 and afar specifically in the

business and economic research areas. Nevertheless, to draw the attention of theorists, researchers, and practitioners to develop systematic reflections, investigations, and taking action to deal with embryonic research and analysis approaches.

Keywords: Best Practices, Business Research, Economic Research, Modern World, New Trends

1. New trends in business and economic research

Although, the development of research and analysis has been powered by the time and high-technic research-oriented mindset and analytical techniques. The move towards more contemporary, data-based surveys and emerging research and analysis techniques that rely on human behavior and spending patterns are becoming more ordinary. Social media analytics, online communication channels, mobile surveys, etc. are regularly finding a bigger spectator.

1.1 Use of virtual and augmented realities in business

Augmented reality is the virtual experience of the user where the programmer designs or allows the user-generated inputs e.g., sound to video to enhance the user experience. While virtual reality is the computer-generated virtual environment to make the feelings that the things are going in surroundings. Nowadays a lot of companies are using augmented reality to enhance the experience of their customers. IKEA is a very famous brand of home interiors all around the world. So, IKEA implemented virtual reality and augmented reality to enhance the experience of their customers. There are a number of videos available on the internet regarding the practical demonstration of how IKEA is using these technologies in the business. So, a lot of researchers conducted research studies on these immersive technologies of virtual and augmented realities in 2022.

Kozinets (2022) introduced an immersive netnography approach for service experience research in the contexts of the metaverse, virtual reality, and augmented reality. While, Trunfio, et al. (2022) conducted a study on the applications of virtual

reality and augmented reality for innovating the cultural heritage museum service to enhance the overall visitor experience and satisfaction. On the other hand, Leone, Pietronudo & Dezi (2022) described the theory and practices that how the business models can be improved through augmented reality. Likewise, Sharma (2022) examined how sales and marketing practices can be improved through augmented reality. Pietronudo & Leone (2022) examined the power of augmented reality for business process management. Similarly, Panjaitan (2022) found that through augmented reality we can improve the production performance of SMEs. Chen, et al. (2022) examined the relationship of marketing activities associated with augmented reality to extend the customer experience. In the same lines, Hilken et al. (2022) examined how online experiential retailing can be improved through the combined effect of augmented and virtual reality.

1.2 Internet of thinks (IOT) and smart city project

The concept of the internet of things means the application of software, hardware, networking, databases, and internet with the physical objects. Many advanced countries have implemented IoT in smart city projects to digitize their roads, schools, colleges, universities, shopping centers, security, etc. to facilitate the citizens. Green city solutions, smart corridors, sidewalk labs, electric vehicle stops, etc. are different examples of smart city projects.

Liu & Ke (2022) developed a model of cloud-assisted Internet of things Intelligent Transportation System (CIoT-ITS) to solve traffic problems. Li, et al. (2022) conducted big data analysis in smart city internet of things. Chen, et al. (2022) proposed a model based on the internet of things in a smart city for the prediction of flooding process prediction. Similarly, the studies of Alahi, et al. (2022) and Riđić, et al. (2022) are available on the internet of things and smart city projects.

1.3 User-generated content and voice of social media

In the era of the digital economy, every societal member become more social all around the globe. They may access countless social media groups and generate

different content e.g., videos, audios, pictures, text, blogs, etc. However, these individuals share with each other various content, particularly with their family and friends on different social media platforms. The notion of social media marketing is becoming quite mature in 2022 and most of the business community is becoming dependent on social media marketing, and social e-commerce after the social media analysis and the dependability/validity of its findings. Through different customer networks, a business community approaches the relevant customers in a very quick and effective way. A lot of research papers were published on social media marketing, social network analysis, social media business etc.

Kitsios, et al. (2022) conducted, a study on how digital tourism services can be improved through User-Generated Content behavior. Similarly, Mondo, Perinotto, & Souza-Neto (2022) applied TOURQUAL model to examine the impact of User-Generated Content Analysis on the Quality of Restaurants. While Musto & Dahanayake (2022) reported different quality characteristics for user-generated content. Likewise, the studies of Zhao, Zhang, & Lee (2022), Naeem, & Ozuem (2022), Lucia (2022), Khan & Abir (2022) are available on user-generated content, social media marketing, and business activities.

1.4 Digital platforms of business after COVID-19

After the Covid19 pandemic, a lot of physical markets have been converted into digital markets. Now, the business community is doing a lot of business activities digitally. They are buying digitally, and they are selling digitally. Moreover, a lot of businesses have shifted to ERP systems. They integrated the different departments of the enterprises through the ERP system. So, the output of one department becomes the input for another department. ERP system not only integrates different departments but also automates different core business processes.

Fedushko & Ustyianovych (2022) conducted a study to examine the E-Commerce Customers Behavior Research, particularly in the context of COVID-19. Alshanqiti et al. (2022) also conducted a case study in the context of COVID-19 in Saudi Arabia. While, Simjanović, Zdravković, & Vesić (2022) identified the factors of a successful

e-Commerce platform. Likewise, the studies of Dewalska-Opitek, Bilińska & Cierpiał-Wolan (2022), Md Saad & Yaacob (2022), Gopakumar, Suresh & Dutta (2022), Bimantaka, Banurea & Nurbaiti (2022) are also available for e-Commerce, the new trends in e-commerce, and the challenges in e-Commerce.

2. New trends in data collection: business and economic research perspectives

At present the most advancement for data collection and analysis industry is joined cloud computing system. The corporate world is discovering the value of digitizing in their entire operations while new way collecting data that may help with decision-making and strategic expansions. In the same line artificial intelligence on the other hand, seems to become tailor-made for the demands of data and analysis industry. Devising to deal with huge datasets than just specific data purposes, artificial intelligence is permitting the front-runners for better tomorrow to safeguard the quality whereas endorsing strategic corporate decision making processes. Most of organizations are defining their data insight with precision, allowing them to delve deeper into consumer patterns and figure out market trends.

2.1 Data collection using amazon mechanical Turk ™

This is the new platform of collecting primary data through crowdsourcing marketplace. We can distribute the jobs virtually over Amazon Mechanical Turk to the individuals or organizations. Amazon charges money against providing the digital platform. There are a lot of people on different communities from different countries. So, for the collection of data we need to select a particular sector or community to target. We need to give financial incentives for example 0.25 cents to the respondent who will fill one questionnaire. So, in this way we can collect data from four individuals by spending 1$. A lot of research papers were written where researchers applied this new virtual platform of data collection.

In the recent studies of Lee, Tang, Moon & Song (2022), Moon, et al. (2022), Collins, et al. (2022), Parvez, et al. (2022), Shin & Jin (2022), Lee, et al. (2022), Sthapit, et al. (2022) data was collected through Amazon Mechanical Turk ™.

2.2 Online survey through surveymonkey.com ®

SurveyMonkey.com ® is the large online facility for the collection of qualitative or quantitative data through online digital network. There are many wonderful features of SurveyMonkey.com e.g., we can create online survey questionnaire and share the link for the collection of data. A lot of templates are available for the beginners on their website. The most interesting thing of SurveyMonkey.com ® is that it automatically draws diagrams and charts on the collected data. Moreover, the data file generated through SurveyMonkey.com ® can easily be imported in different software for further analysis e.g., SPSS, AMOS, Smart PLS, NVivo, etc. Many organizations use this facility for conducting marketing research to get the customer experience and feedback.

For getting more understanding regarding the application of online surveys, these studies are strongly suggested: Cobanoglu, et al. (2022), Hossny (2022), Moldoveanu (2022), Raimi (2022), Yang, Xun & Chong (2022), Charnley, et al. (2022), Sharma, et al. (2022), Spennemann (2022).

2.3 Biometric research techniques

The biometric research technique is also a new technique of data collection, particularly in market research. Different marketing experiments are applied to the customer and then data is collected through different machines regarding the heart rate monitoring, respiration monitoring, monitoring of the skin muscle activities, and monitoring of brain activities through functional MRI tests.

For getting more understanding regarding the application of biometric analysis, these studies are strongly suggested: Rush & Osborne (2022), Ho, Nguyen & Vuong (2022), Soto-Beltrán, Robayo-Pinzón & Rojas-Berrio (2022).

2.4 Tools for online interviews and focus group discussions

All around the world in every sector of the economy, Online meeting tools become common business practices during Covid-19 e.g., Google Meet, Zoom, Microsoft Teams, etc. for the online meetings particularly conducting online interviews and focus group discussions irrespective of the country, time, and place of the participants.

For getting more understanding regarding the application of Google Meet, Zoom, Microsoft Teams, etc. for the online interviews and focus group discussions, these studies are strongly suggested: Altamira (2022), Ha (2022), Shiu-Yee, et al. (2022), MinThein (2022), Karupiah (2022), Shaqsi & Syed (2022), Ng, et al. (2022), Falter, et al. (2022), Schulze, et al. (2022), Humagain (2022).

3. New trends in data analysis: business and economic research perspectives

It might be safely contended, that customers in the near future will be inspired by custom-made and dynamic acumens that may help them extract the most value out of their data. The corporate world may foresee this trend that could have a significant impact on their business practices by offering that kind of functionality to their customers. For this purpose, data analytics in 2022 and beyond e.g., sentiment, bibliometric, automation, and machine learning are making fast progress, especially in the field of data analytics from the perspective of business and economics. It not only augments human capabilities and also improves the dependability of research-based solutions to business problems.

3.1 Sentiment analysis using machine learning and deep learning

Sentiments mean feelings, attitudes, throughs, opinions, judgments, etc. which can be positive or negative while sentiment analysis is the language processing text mining technique which is commonly based on machine and deep learning. There is different software available which provides the facility to analyze the qualitative data by applying sentiment analysis e.g., NVivo, Leximancer etc. We just need to

put the textual data in the software and then software automatically assesses the positive or negative sentiments from the statements and extract different frequency, connections, correlations, trends in different sentiments.

For getting more understanding regarding the application of text mining and sentiment analysis these studies are strongly suggested: Hansen & Borch (2022), Li, et al. (2022), Softic & Lüftenegger (2022), Upadhyay, Rai & Shukla (2022), Kim, et al. (2022), Wang, Guo & Wu (2022), Samah, et al. (2022), Hong (2022), Singh, et al. (2022).

3.2 Bibliometric analysis using VOS viewer

In the bibliometric analysis, we analyze what are the journals which have the greater impact in various research areas, what are the new trends and growth of knowledge, what are the potential research collaboration opportunities, what are the impacts of research output. In other words, we assess research performance at micro or macro levels and also forecast future publishing trends. Bibliometric indicators are the numeric measurements that provide quantitative information about research performance e.g., authors, departments, institutions, countries, journals, documents, subject areas, and categories. There are different data sources in bibliometric research e.g., Web of Science (ISI). We apply different search techniques e.g, Booleans, Quotation Mark, Parenthesis, Use of Wild Cards or Truncation to extract the relevant data from the database. To visualize the trends, citations, connections of keywords and authors etc. we apply VOS viewer software or similar kind of tools.

These studies applied bibliometric analysis on the different topics of business and management: Mukherjee, et al. (2022), Mohammad Saif & Islam (2022), Mukhopadhyay, Pandey & Rishi (2022), Farooq (2022), Effah, Asiedu & Otchere (2022), Effah, Asiedu & Otchere (2022), Monge, et al. (2022), Ho, et al. (2022), Anuar, et al. (2022).

3.3 Application of partial least square based structural equation modeling (pls-sem) using smart pls

PLS-SEM is a very famous technique to analyze quantitative data particularly collected through questionnaires. Smart PLS is the worldwide most famous and user-friendly software tool for applying the PLS-SEM technique. PLS has two steps 1) testing measurement models and 2) testing path/relationship models. In the first step we test the reliability and validity of the scale and then we move toward testing of study hypothesis in the relationship model. PLS – SME also allows the researchers to test multiple mediations and moderations in a single model. We can also perform multi-group analysis in Smart PLS software.

These studies applied partial least square based structural equation modeling (PLS-SEM) to the quantitative data in the different areas of business and management: Deb, Mohanty & Valeri (2022), Nabila, et al. (2022), Widyana & Ginting (2022), Singagerda, Fauzan & Desfiandi (2022), Waty, So, Indrajit & Abdinagoro (2022), Akkaya & Bagieńska (2022), Mory, Cordero, Astudillo & Serrano (2022), Maftuchach, Rohman & Darda (2022), Al Shawabkeh, Alhawari & Al-Kharabsheh (2022).

3.4 Thematic analysis using Nvivo

Thematic analysis using Nvivo is also a big trend in the research of 2022. Braun and Clarke (2006) published a paper on six-step approach of thematic analysis. Up till now, this paper has more than 125000 citations. Previously researchers applied the six steps manually but in the year of 2022 a lot of papers were published where these six steps were applied with the help of Nvivo software.

These studies applied thematic analysis suggested by Braun and Clarke (2006) using NVivo software on the qualitative data in the different areas of business and management: Tomasella (2022), Suarez, Adair, Doherty & McCormack (2022), Suarez, Adair, Doherty & McCormack (2022), Arabzamani, Arab Mofrad, & Rajabi Esterabadi (2022), Ahmed, et al. (2022), Johnston, O'Reilly, Scholz & Mitchell (2022), Chaiechi & Eijdenberg (2022), Oguntegbe, Di Paola & Vona (2022), Cameron, et al. (2022).

3.5 Multilevel modeling using Mplus

Every organization or country has different levels. For example, in an organization the first level is the individual level, then the second level is the group/departmental level and the third level is the overall organizational level. Unfortunately, a lot of researchers ignored to address different levels separately particularly when they applied the structural equation model technique with multiple variables relating to different levels. They treated all the variables equally. However, Mplus software allows the researchers to apply multilevel modeling based on different variables of different levels i.e., individual, departmental, or organizational.

Wang, He, Sheng & Yao (2022), Loske & Klumpp (2022), Qin (2022), Mol-Gómez-Vázquez, Hernández-Cánovas & Koëter-Kant (2022), Griep, et al. (2022). Zhang & Cao (2022). Zhang, Wang, & Jia (2022).

Final thoughts

The core of new trends in business and economic research is all about sympathetic consumer behaviors, habits, and routines, and getting foresight on what's next. Albeit, 2022 reiterated the significance of sprightly, ongoing insights as all needed to navigate the business and economic research trends that evolve from the landscape of high-tech and consumer demands.

However, the emerging trends in research and analysis in the context of business and economics may permit the theorists, researchers, and practitioners to assess their theoretical insights [what, why & how] and practical technology [applications]. These new trend trends in research approaches may need to be watched carefully with the eyes of their usefulness. It might be inferred the current generation is living with third-wave business and economics research which is based on high-tech and humans.

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Development of Entrepreneurship as a Main Priority in Ensuring Youth Employment

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Abstract

International practices show that systematic state support of the development of youth entrepreneurship gives a chance to talented and ambitious young people with potential and promising business ideas to become entrepreneurs and will ensure the development of entrepreneurship in the country, which, in turn, will lead to economic growth, increase in employment, investment attractiveness, and social stability of society. The purpose of a research paper is to consider the priorities of ensuring effective youth employment. The areas of youth entrepreneurship development are one of the tools for increasing youth employment, which there should be taken into account in the current situation in youth entrepreneurship in Kazakhstan. Method of graphical representation of data is used as a statistical tool. The originality of the research is that the authors tried to examine the improvement of institutional frameworks that contribute to increasing the potential for the formation of full employment, which should include a complex improvement of the conditions for the labor market functioning in such areas as improvement of the system of employment promotion institutions and advanced training of labor force; improvement of the efficiency of the information infrastructure of the labor market; improvement of the regulative infrastructure of the labor market in terms of regulating the relations of the market players and stimulating the creation of new jobs.

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Keywords: Youth labor market, youth employment priorities, entrepreneurship, new jobs, youth employment.

Introduction

One of the most serious global problems that politicians have had to face over the past two decades has been the growth of youth unemployment (Liotti G., 2021). This is also due to the fact that the transition from study to work is seen as a difficult period for young people since they often have to deal with periods of job search, inconsistencies in professional activities, and flexible contracts (Muja, A., 2019).

An active state policy in the field of employment contributes to an increase in the level of decent living, social and economic integration, self-realization, and social development of young people. Policy effectiveness also contributes to employment analysis and research, employment-generating investments, and employment policy formulation.

Nowadays, the role of youth entrepreneurship in ensuring effective youth employment is significant and actual. According to the Global Entrepreneurship Monitor Consortium (2021), approximately 300 million young people aged 18-30 all over the world either do not have a permanent job or are unemployed. About 20 % of them have great abilities to start their own business, but, for various reasons, only 5 % of them decide to do so.

International practices show that systematic state support of the development of youth entrepreneurship gives a chance to talented and ambitious young people with potential and promising business ideas to become entrepreneurs, and will ensure the development of entrepreneurship in the country, which, in turn, will lead to economic growth, increase in employment, investment attractiveness, and social stability of society (Guide on Measuring Decent Jobs for Youth, 2018).

It should be noted that in our country, the development of youth entrepreneurship is a priority area in the development of small and medium enterprises in general, which, in turn, can ensure the development of competitiveness in the country.

Article 11 of the Law of the Republic of Kazakhstan "On State Youth Policy" of February 9, 2015, No. 285-V stipulates the development of measures for the development of entrepreneurial activities, which are carried out by youth, and the implementation of interaction and cooperation with youth organizations on the development of youth entrepreneurship by a competent entrepreneurial authority (the Law of the Republic of Kazakhstan "On State Youth Policy", 2015). Thus, in Kazakhstan, support and assistance in the development of entrepreneurial activities among young people are provided at the legislative level.

In any country, the development of youth entrepreneurship could have its strong and weak sides. In Kazakhstan there are the advantages of youth entrepreneurship, also disadvantages exist, which have an effect on the development of this area. These weaknesses should be taken into account in the development measures in solving the mentioned problem.

Kazakhstan supports the development programs on small entrepreneurship among the young generation. However, a young entrepreneur meets various barriers in this direction: certain expenses, lack of experience in business and financial issues, competition, high-risk level, lack of education, the need to make own decisions, lack of information, etc.

The purpose of a research paper is to consider the priorities of ensuring effective youth employment. The areas of youth entrepreneurship development are one of the tools for increasing youth employment, which there should be taken into account in the current situation in youth entrepreneurship in Kazakhstan. In this study, the authors tried to examine the improvement of institutional frameworks that contribute to increasing the potential for the formation of full employment, which should include a complex improvement of the conditions for the labor market functioning.

Literature review

According to the definition of the United Nations, "youth" is people aged 15 to 24 years. There are 541 million young workers in the world today, accounting for more than 15% of the global workforce (ILO, 2021). These include students who work in their spare time, students, interns, young professionals, young people who have not completed compulsory education, young family business workers, young employers, and self-employed workers.

The reports of the International Labour Organization state that today every fifth young person in the world does not have a job, education, or vocational training, while three out of four of them are women (ILO, 2021). According to the ILO Director-General Ryder G., "Opening up opportunities for young people is a priority on the political agenda in all regions of the world and for the ILO tripartite community (ILO, 2021).

In Kazakhstan, according to official statistics, youth employment in 2020 reached 96% of 2.2 million people aged 15 to 28 years. However, most of the jobs from this figure are in the informal sector with unstable earnings and low social guarantees (Seit A., 2020).

Experts' forecasts predict a significant deterioration in the situation in the coming years, as new generations of citizens will enter the market and face a shortage of jobs. Recall that Kazakhstan ranked 1st in the world in terms of the increase in the share of children in the population structure over the past 10 years (Vlast, 2021).

Thus, according to the Ministry of Labor and Social Protection of the Population, in 2025 the able-bodied population will increase to 12.1 million people, and the annual influx of young people into the labor market will increase to 256 thousand people (Vlast, 2021).

The pandemic caused by the SARS-Cov-2 coronavirus had a great impact on youth employment in 2020. According to the ILO, every 5th young person in the world has lost his job. The same data for Kazakhstan.

The current economic policy of our country is focused on industrial and innovative development amid the increasing competitiveness of the national economy and sets conditions for improving the system of training and assistance in the entrepreneurship of citizens. This issue is especially critical for young staff whose potential will provide labor resources to economic sectors (Gustafsson M., 2020)..

Special attention to the problems faced by young people when entering the labor market is paid in the ILO report "Global youth employment trends in 2020." This information is based on recent studies of the transition from academic to labor activities (ILO, 2022).

The authors, recognizing that unemployment and youth employment are of serious concern to politicians, governments, and academic researchers, prepared an overview of regional and national problems of the youth labor market, and investigated regional employment programs in the UK (Wrigley L., 2019).

We were particularly interested in the chapters of the study, which analyze, respectively, entrepreneurship development programs, internships, and volunteering. Moreover, the development of youth entrepreneurship is considered separately for students, and separately for graduates who have not been able to find a job in their specialty for a long time. Internships are also considered on the basis of social classes, the significance and impact of volunteer programs on further employment are separately investigated.

Methodology

The research methodology includes general scientific, private, empirical and theoretical research methods using the data of the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan*, International Rating Agencies, the United Nations, etc. Method of graphical representation of data is used as a statistical tool.

Findings and discussion

Like any type of entrepreneurial activity, the development of youth entrepreneurship has its strengths and weaknesses, which are summarized in Figure 1. It shows that along with the advantages of youth entrepreneurship, there

are also disadvantages significantly affecting the development of this area. In this regard, these weaknesses should be taken into account in the development of the above measures.

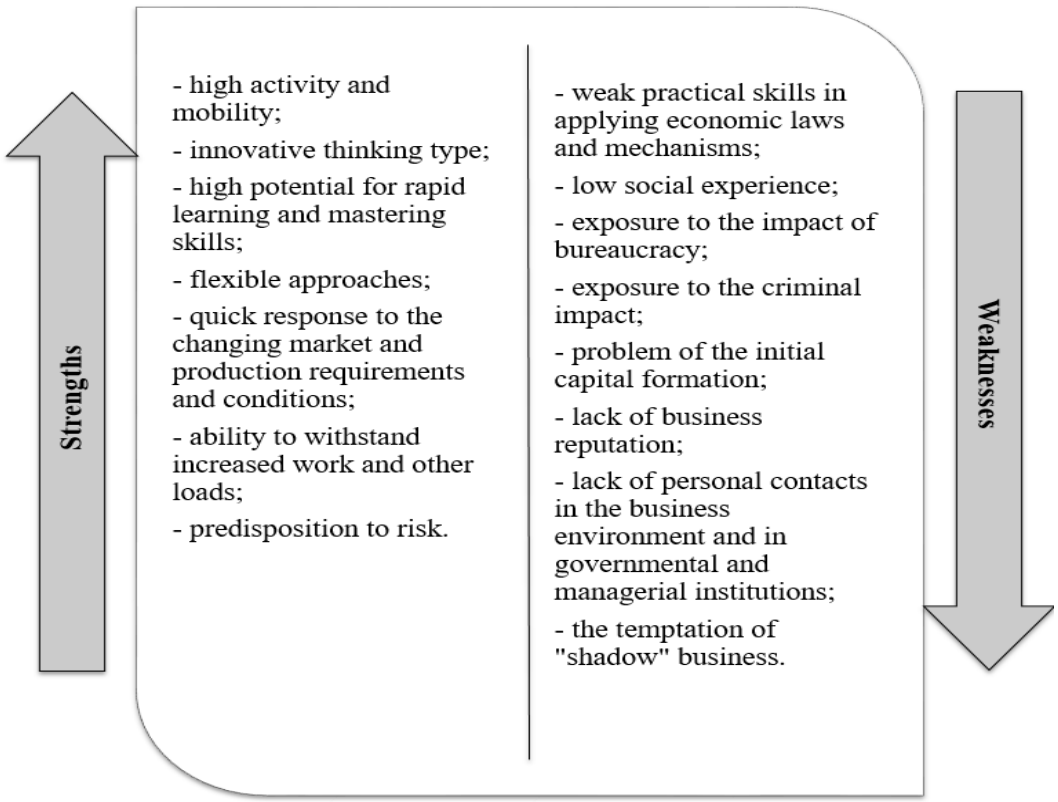

Figure 1. Strengths and weaknesses of youth entrepreneurship

Note. The figure was prepared by the authors using the data of the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan (2019).*

Youth entrepreneurship in the Republic of Kazakhstan has its own history of formation, which includes four main periods. Each period has its specific characteristics, which are shown in Figure 2. For example, during the period from 1991 to 2002, there was a search and creation of a social mechanism for the development of not only youth entrepreneurship, but the country's economy as well. The development was influenced by various factors, such as social, economic,

and legal ones. The lack of sustainable support and infrastructure for the business activities of young people at the formation stage had a particularly significant impact (Maguire S., 2020).

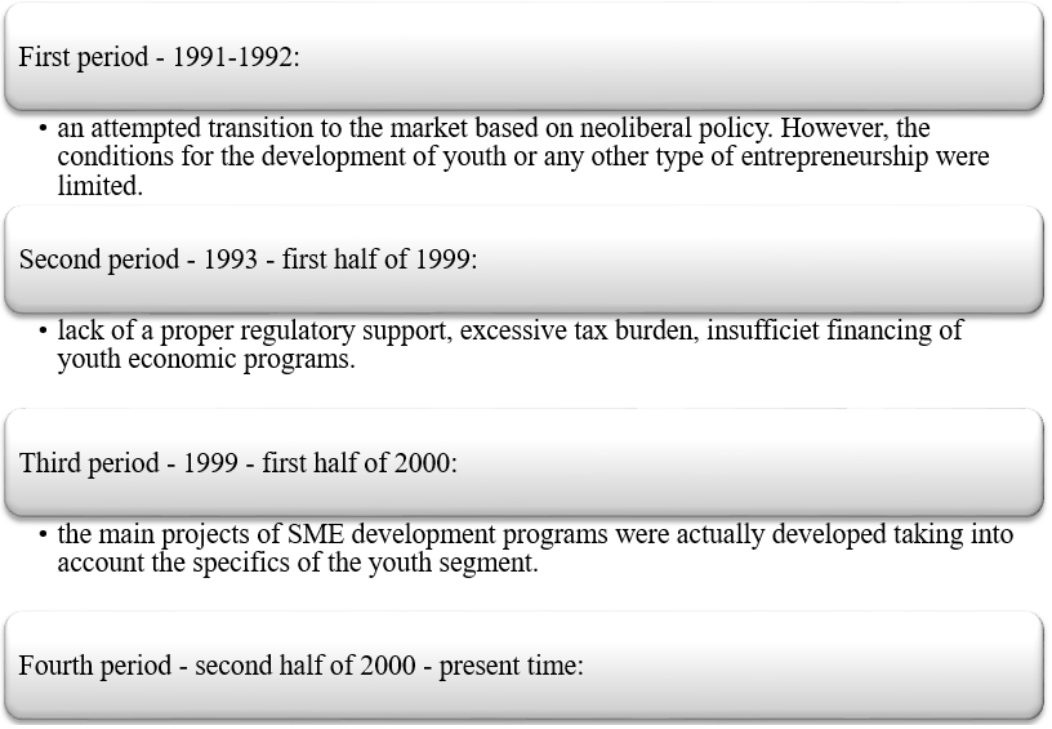

Figure 2. History of youth entrepreneurship in the Republic of Kazakhstan

Note. The figure was prepared by the authors using the data of the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan (2019).*

Currently, Kazakhstan supports the development of small enterprises among young people by implementing the productive employment and mass entrepreneurship development program (which also covers other areas of employment promotion), the programs of the Damu Entrepreneurship Development Fund, Development Bank of Kazakhstan, the National Agency for Technological Development (creation of technological parks and business incubator), etc., including the international ones (the program of the European Bank for Reconstruction and Development) (ILO, 2019).

In Kazakhstan, a young entrepreneur faces a number of challenges: certain expenses, lack of experience in business and financial issues, competition, high-risk level, lack of education, the need to make own decisions, lack of information, etc. One of the main problems of young entrepreneurs who wish to start their own business is poor financing of business development programs among young people, as well as a lack of infrastructure. The modern problems of youth entrepreneurship in the republic are systematized in Figure 3.

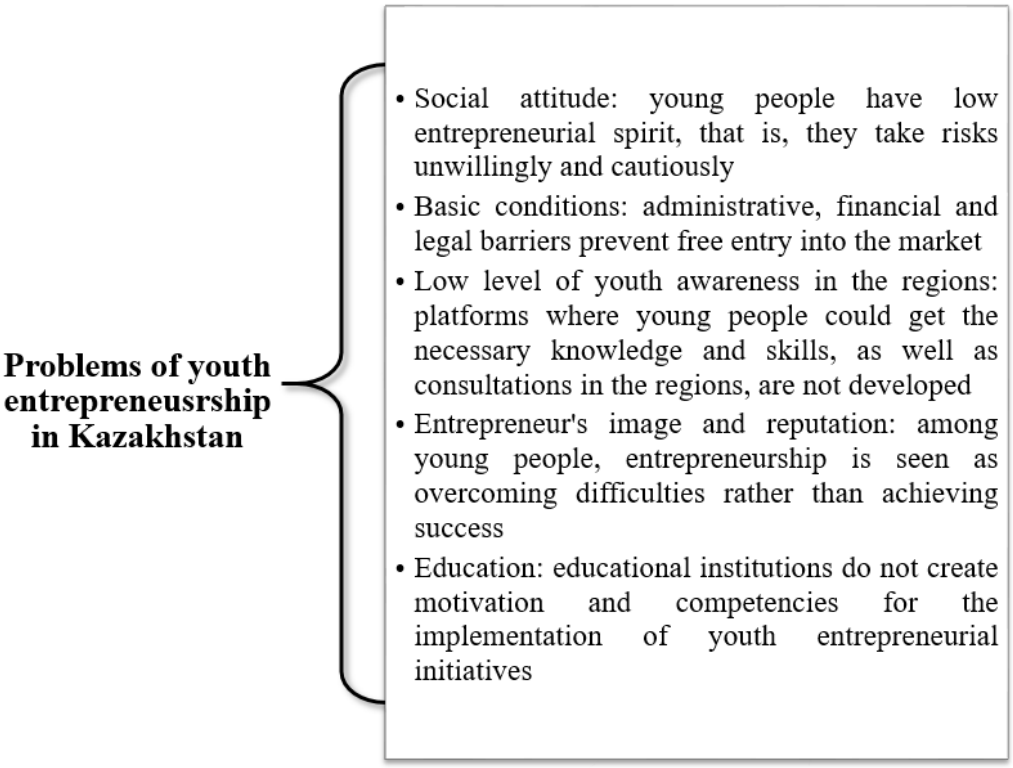

Figure 3. Modern problems of youth entrepreneurship in Kazakhstan

Note. The figure was prepared by the authors using the data of the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan (2019).*

According to the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan*, currently, only 11,9% of officially employed young people aged 14-29 are doing business, that is, 270 thousand of

2259 thousand people are entrepreneurs, 1,5 million people (64,3%) are employees. The data are shown in Figure 4 (Bureau of national statistics of the Agency for strategic planning and reforms of the Republic of Kazakhstan, July 18, 2019).
However, despite the above problems and data from official statistics, the materials of the sociological survey conducted by the Youth research center show the increasing role of the entrepreneur profession among our younger generation.

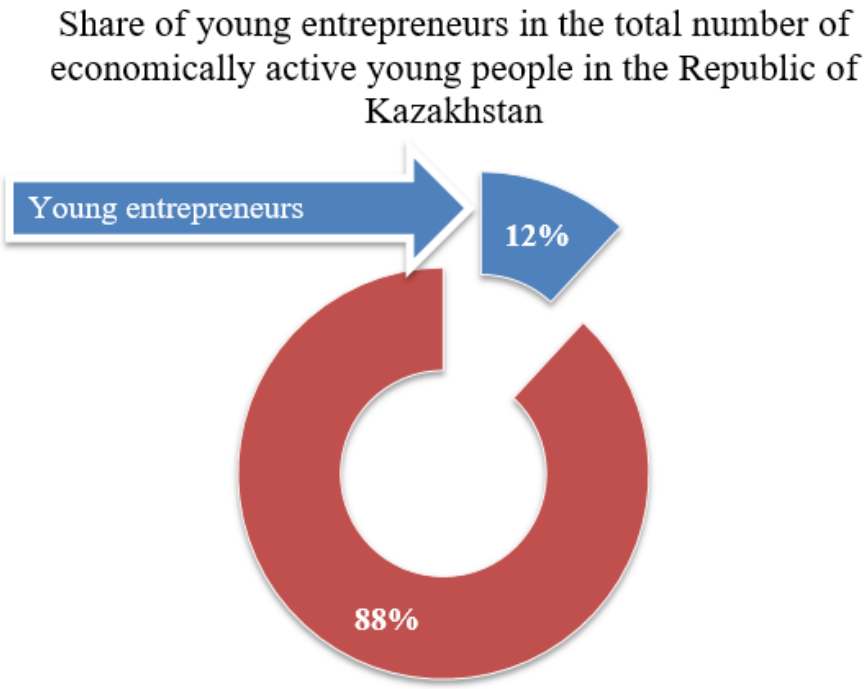

Figure 4. Share of young entrepreneurs in the total number of economically active young people in Kazakhstan, %

Note. The figure was prepared by the authors by using the data of the Bureau of *National Statistics* of the Agency for Strategic Planning and Reforms of the *Republic of Kazakhstan*

For example, most of the respondents answered that they would like to do business. However, they mentioned the lack of financial resources, as well as the lack of relevant knowledge, skills, and information in this field as obstacles. Taking into

account these peculiarities, the measures for youth entrepreneurship promotion should be aimed at overcoming these obstacles and preparing decisions on their elimination. The survey results are given in Figure 5.

It should be noted that many respondents do not have sufficient knowledge to start their own business. Thus, here is another direction for the development of entrepreneurship among young people through their training. There are private initiatives in Kazakhstan aimed at activating youth entrepreneurial initiatives. As an example, we can mention Business Bastau business school. However, despite the free workshops held by Nursily (2019), the school head, the training is paid for, and not all young people can afford themselves training in this area.

It would be most effective to develop more affordable options for business training by conducting free training, offering flexible payment terms, and providing discounts for training.

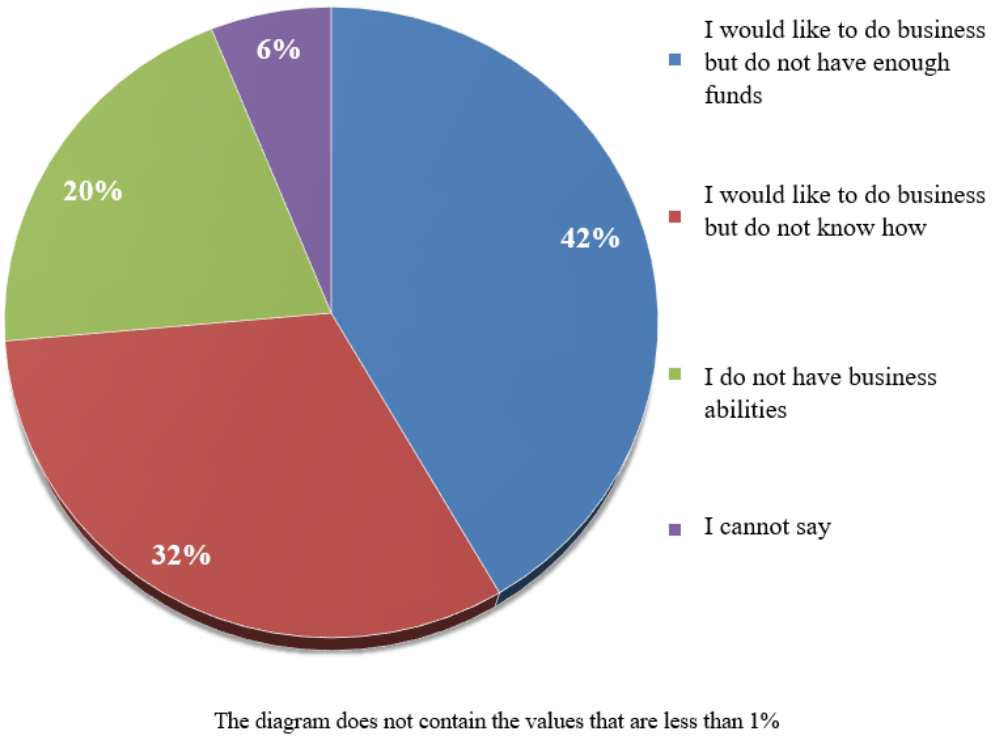

Figure 5. The attitude of young people to entrepreneurship in Kazakhstan, in %

Note. Data of the Ministry of Labor and Social Protection of the Republic of Kazakhstan (2019)

The successful experience of foreign countries in this area has been mentioned many times. In our opinion, the following is advisable:

- the targeting of specific measures to certain social groups that suffer from certain barriers in the labor market, such as women;

- offering packages of measures with a wide range of services, and not just providing managerial training or financial support, seems more effective;

- taking into account a lack of reliable data, conducting an assessment based on an approach with the involvement of a control group is mandatory;

- inclusion of entrepreneurship in the curriculum as a subject;

- the creation of service for working with young people in rural areas. Considering the fact that most of them are self-employed, it would be advisable to improve this mechanism already supplemented by the development of entrepreneurship in rural areas. This can be represented in the form of the scheme given in Figure 6.

As follows from Figure 6, the first step is to apply to a special service created to support youth entrepreneurship. A young candidate applying to the service fills out a questionnaire, submits an application, and an employee of the service identifies his/her need and the level of business education. After this, the experts consider the questionnaire and the application and send the person for training. If the applicant has not yet decided on his/her business field or idea, he/she is placed to the beginner level to study the basics of entrepreneurship. If a candidate has come with an idea, he/she is trained in business processes, preparing his/her own business plan, financing opportunities, etc.

The next step involves the preparation of own business project as you approach the end of the educational program. For the implementation, several ways can be chosen. So, the next step may include both participation in the competition of business projects and independent implementation. Obtaining preferential loans

or searching for investors is also possible, and is the next step. The service may also arrange the engagement of businesspersons and investors, who would finance the business of a young entrepreneur on a contractual basis on the terms of equity participation (% of the profit), that is, according to a certain contractual scheme that would be provided for by the contract.

A mandatory step is to monitor the activities of these business entities for six months to determine the effectiveness and success of the services and this measure of support and development of youth entrepreneurship in general. A separate scheme of transparent financing and crediting of business projects, as well as a system for assessing the activities of the service employees, should be created.

The service shall provide consulting support for young entrepreneurs in the fields of law, accounting, administration, etc. For those who apply for the first time, such service is provided for free for six months, and upon expiration of this period – for a fee.

It should also be possible that existing business entities can also apply to the service for obtaining the necessary service, whether it is training, participation in a competition, preferential loans, or business consulting services.

Training in the basics of entrepreneurship under the Bastau Business project - Modern trends in economic development place special demands on the development of the business management style and on the structure, level, and quality of training of entrepreneurs. Currently, training in entrepreneurial skills is provided as part of the Program under the Bastau Business project, which includes training in the principles of forming agricultural cooperatives, as well as support for their business projects (The unified accumulative pension fund of Kazakhstan, 2019).

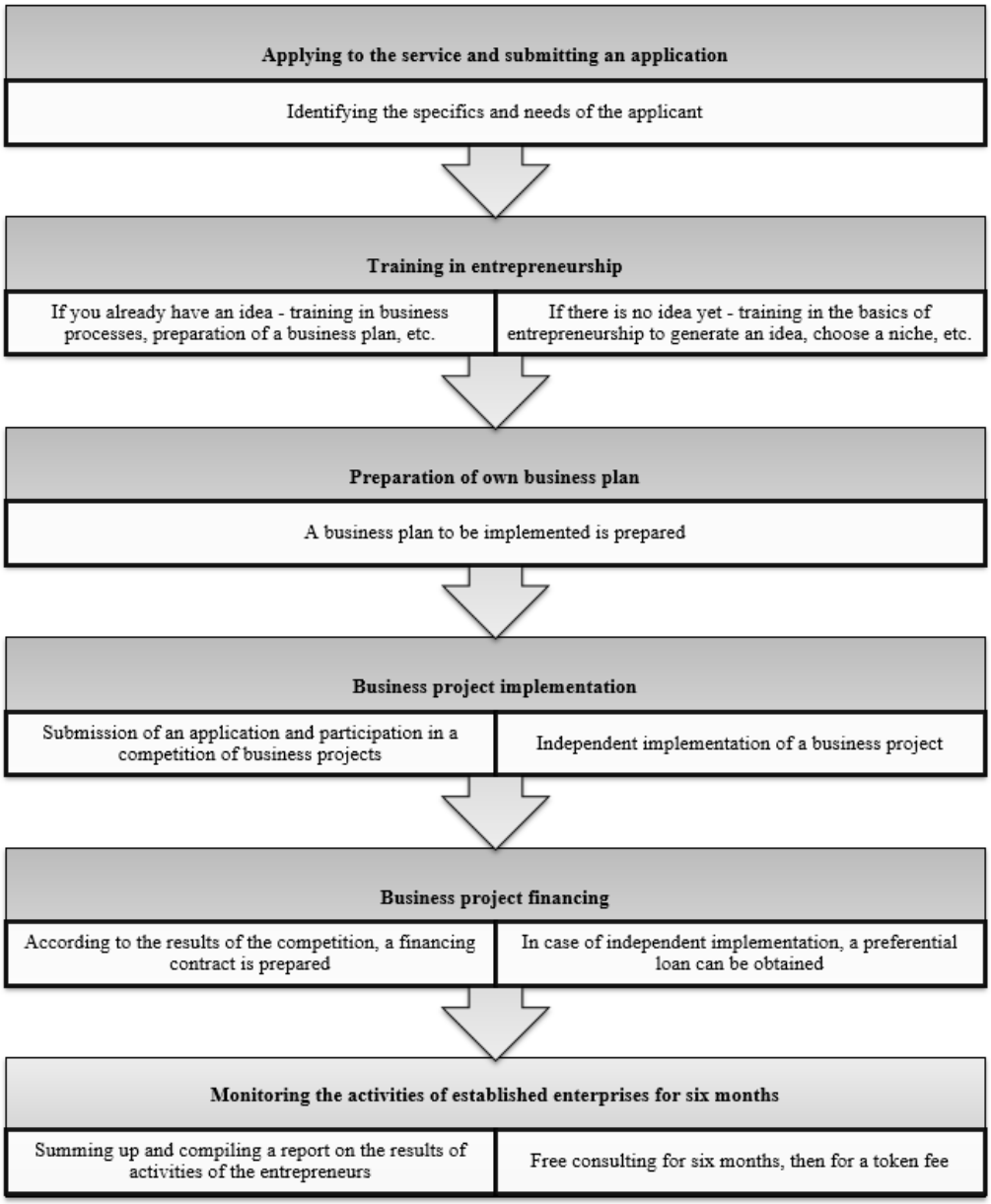

Figure 6. Youth entrepreneurship promotion mechanism

Note. The figure was prepared by the authors

During the training, the participants are given recommendations for doing business and structured knowledge of the basics of entrepreneurship. The participants are also informed of the measures of financial support for entrepreneurship. The total duration of the training process does not exceed 25 calendar days, except for online training. The participants, except for those who

receive online training, are provided a scholarship equal to the scholarship provided in VET institutions.

Atameken NCE organizes training of Bastau Business participants in the direction of the employment service according to the list of candidates for training and/or online applications submitted through the AIS of Atameken Academy. As part of this project, over 159,8 thousand people were placed for training for the period from 2017 to 2020. During these four years, 151,5 thousand people have completed training, of which 118,5 thousand people have defended their business plans, while the remaining 33 thousand people have received valuable business knowledge. As a result, over 44 thousand people among those whose business plans were approved received loans, and 89 thousand people received lump-sum grants (from 100 to 200 MCIs) to start their own businesses (Bureau of Statistics of the Republic of Kazakhstan, 2019).

Training in the basics of entrepreneurship under the Bastau Business project includes the following stages:

1) testing;
2) practical training in groups based on the business mentorship principle and individual counseling or online training through a web portal;
3) preparation for the defense (presentation) of a business project;
4) assistance in building a distribution chain (conclusion of preliminary contracts);
5) support in the implementation of a business project for a term of up to 12 months, and for the members of low-income and/or large families – up to 18 months (Taldau information and Analytical System, July 25, 2019).

As part of this project, over 159,8 thousand people were placed for training for the period from 2017 to 2020. During these four years, 151,5 thousand people have completed training, of which 118,5 thousand people have defended their business plans, while the remaining 33 thousand people have received valuable business knowledge. As a result, over 44 thousand people from among those whose business plans were approved received loans, and 89 thousand people received lump-sum

grants (from 100 to 200 MCIs) to start their own business (Youth of Kazakhstan-2018", August 23, 2019).

As the data for 2020 show, almost half of the participants of the Bastau Business project are young citizens aged 30-49 years. Three quarters of the project participants were unemployed.

In 2020, in connection with the coronavirus pandemic, the basics of entrepreneurship under the Bastau Business project were taught online through the AIS of Atameken Academy by providing online lessons, notes and modules in electronic form, as well as individual consultations for the attendees.

According to the data of Atameken NCE, the training was focused on embedding the projects of the attendees in the distribution chains around large enterprises, that is, providing the project participants with sales and processing companies - with the sources of raw materials.

The main difference of the project in 2020 compared to the previous one is the focus of the training program on mastering practical skills for doing business. The participants managed to enhance their knowledge of the production process, livestock management, processing and production of the end products.

According to the data, in 2020, after completing training under the Bastau Business project, 8,809 people were engaged in agricultural businesses, and 5,588 people were engaged in non–agricultural ones. Among the agricultural business types, the most popular areas are dairy cattle breeding and sheep breeding, and among non-agricultural ones – sewing shops, beauty salons, hairdressing salons, and catering services (Bureau of national statistics of the Agency for strategic planning and reforms of the Republic of Kazakhstan, 2020)

The share of persons who have obtained loans after completing training varies depending on the region. For example, in 2020, 95% of persons who have completed training in the West Kazakhstan Region have obtained loans, while in the capital this indicator was only 7%.

One of the reasons for the low level of microlending based on the results of training is the applicant's failure to fulfill the obligations assumed. Currently, training is carried out without assessing the financial capacities of the citizens who cannot get approval for lending and apply the obtained knowledge in practice in the future.

Conclusion

To sum up, we would like to note once again the importance and special role of the activation of youth entrepreneurship in increasing the full employment of young people. Considering the experience and lessons of foreign countries, as well as the lessons from the history of youth entrepreneurship development in Kazakhstan, the above measures may not only facilitate the improvement of the situation in the labor market but also solve many social and economic problems of modern youth.

Taking into account the current situation in youth entrepreneurship, which is one of the tools for increasing youth employment, we consider it practical to highlight the following areas of youth entrepreneurship development:

- the creation of conditions for the development of entrepreneurial activities to overcome administrative barriers to the creation and development of business.

- promotion of entrepreneurial culture and corporate citizen values among young people in order to improve the status of an entrepreneur in society. This includes such events as educational and training courses, raising awareness among young people about state programs for supporting young entrepreneurship and various kinds of business competitions, social advertising, and programs aimed at forming a positive attitude to entrepreneurship, etc.

- encouraging the creation and activity of international youth chambers, associations, and unions, which develop youth leadership skills and social responsibility.

- selection of young people who have an aptitude for entrepreneurial activities and are able to generate business ideas on the basis of special procedures, such as

interviews, as well as expert evaluation of business ideas and business plans for further implementation of their potential.

- the creation of the School of young entrepreneurs with specialized training for mastering business skills.

- development and implementation of certain privileges for young entrepreneurs, in particular, the creation of preferential lending schemes, and tax concessions for the enterprises registered and managed by young people.

- creation and implementation of a system of registering young entrepreneurs and a system of criteria for assessing the effectiveness of the development of youth entrepreneurship in Kazakhstan.

- the creation of specialized service centers in the regions to support, advise and provide a wide range of necessary services for young entrepreneurs.

- it is important to pay special attention to the entrepreneurial initiatives of young people in factory towns and rural areas with a focus on the priority sectors of the country's economy.

The potential for increasing youth employment effectiveness should be implemented through the measures and tools of improving the quality of the labor market, implementing new forms of employment for self-employed people, and improving the institutional frameworks.

The improvement of institutional frameworks that contribute to increasing the potential for the formation of full employment should include a complex improvement of the conditions for the labor market functioning in such areas as improvement of the system of employment promotion institutions and advanced training of labor force; improvement of the efficiency of the information infrastructure of the labor market; improvement of the regulative infrastructure of the labor market in terms of regulating the relations of the market players and stimulating the creation of new jobs.

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Formation and Development of Digital Hubs in Kazakhstan: Risks, Drivers, and Mechanisms

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Abstract

The purpose of this study is to analyze the best foreign experience in the formation and development of digital hubs, as well as to identify the principal risks, drivers, and mechanisms of their formation in the regions of Kazakhstan. Based on the conducted literary review, the author's vision of the digital hub is given, and its main features are identified. The methodological basis of the research was the scientific works of domestic and foreign scientists, analytical reports, the results of scientific and practical publications. The authors revealed that various programs for the formation and development of digital hubs are being implemented in European countries, thereby demonstrating the experience of introducing and applying digital technologies in manufacturing, industry, and business. The analysis showed that various digital technology development programs are being implemented in Kazakhstan. Still, the possibilities of forming a digital hub and its development depend on the quality of the ICT infrastructure. In particular, the authors identified possible risks and presented their classification, which may arise during the implementation of the activities of the digital hub. The drivers of forming a digital hub are proposed, creating the foundation for sustainable development through the adaptation of existing knowledge. The main mechanisms for forming digital

hubs that can create conditions for their expansion have been developed: structural, technological, innovative, investment, institutional and social. The proposed mechanisms, if applied systematically, will contribute to the effective formation and development of digital hubs in Kazakhstan.

Keywords: Digitalization, Digital Platform, Digital Hub, Digital Technologies

Introduction

Today, both society and business are changing, influenced by an important technological trend such as digitalization (Leviäkangas, 2016; Parviainen et al., 2017). Digitalization has affected aspects such as innovation, industry, economic growth, technology, organizational efficiency, and the civilization of society (Alekseeva, 2021). Rapidly developing countries are using advanced digital strategies and digital technologies in almost all areas of their lives. However, many companies still find it difficult to implement innovation through digital technology under pressure from already developed countries, as these countries are already making great strides in this area while developing countries have only adopted programs to implement and embed digitalization in all areas of society (Kohli & Melville, 2019). The specifics of innovation in the context of digitalization are a driving force of economic processes (Gorfinkel', 2021). In order to implement and implement these programs of activities, investment and investment are essentially required, without which it is difficult to start certain activities (Ahmad & Murray, 2019).

Through the introduction of new digital technologies in organizations, digitalization has given impetus to the consolidation and facilitation of organizations such as universities, companies, technology centers, research institutes, and others. Digitalization is carried out in companies through the introduction of technologies that include processes: 1) creating digital business models; 2) value chain integration processes and digitalization of processes; 3) digitalization processes of services and products (Oztemel & Gursev, 2018).

There is an urgent need to create a digital space that will be conducive to fruitful work, the development of digital technologies, and create opportunities for

learning digital skills. Digital hubs can be used to solve such issues. In addition, according to the Message of the President of the country Kassym-Jomart Tokayev dated September 1, 2021, the head of state set an important task Kazakhstan should become a central digital hub in a significant part of the Eurasian region.

One of the main trends of the last decades is the increasing role of digital transformations in the economy created on the interaction standard. In this case, we are talking about the so-called "digital hub" or "technology hub". The term "digital hub" is close to the concept of "cluster" in the sense that both concepts represent a set of interacting entities to exchange ideas and knowledge. The difference between them is that the digital hub has quarrying teams, ICT centers, data centers, etc. While a cluster is a place for interconnection of relatively equal participants, interconnected by location on the same territory.

The European Commission has launched the EDIH program, whose main task is to support industry, and businesses in the regions to implement the digital transformation (Maurer, 2021).

There are different models for configuring a portfolio of services provided by digital hubs, one of the reference models is Data-driven Business-Ecosystem-Skills-Technology (Sassanelli, C. et al 2021).

The main objective of this study is to identify possible risks, drivers, and mechanisms for the formation of digital hubs in the regions of Kazakhstan based on the study of foreign experience.

Literature Review

Now the term "digital hub" is usually used mainly for digital platforms based on which feedback is constantly active and public events are held (for example, workshops, lectures, seminars, conferences, and other events). In the USA, such digital spaces are becoming a substitute for universities, being a powerful tool for learning and knowledge exchange. Successful examples of such digital hubs are companies and organizations formed around such digital platforms as Alibaba,

Amazon, and Wildberries, e-commerce services. However, it is not necessary to attribute to the participants of the hub all entities whose activities are based on such services. Accordingly, various types of actors can join the digital hub: banks, telecom operators, technology companies, developers, etc.

The notion of "virtual cluster" is used in the scientific environment (Kostrykin, 2009). The author applies it to the association in the virtual space of organizations involved in the innovation process and development of digital technology. The term "virtual cluster" is also used to characterize one of the stages of formation of a "real" cluster, ensuring the transition from the venture project to the production of goods and services (Lapygin et al., 2020). Nevertheless, it is advisable to use the term "digital hub" that combines the concepts of the virtual and conventional clusters, due to the fact that the understanding of the cluster as an economic structure tied to a certain geographical space has gradually lost its relevance.

Digital hubs represent the coordinating space of a region with partners at the center of the digitalization and innovation ecosystem. The ecosystem implies the involvement of organizations in hub activities, such as chambers of commerce, universities, incubators, technology organizations, research centers, regional development agencies, and national digitalization programs, for example, the Digital Kazakhstan program in our country, the government, and others. The ecosystem organizational model has considered the range of services that digital hubs offer in the process of digitalization and digital transformation to support companies in obtaining efficiency from certain activities (Antonopoulos, 2020). As defined by the European Commission: digital hubs are one-stop centers that provide services in the development of competitive business processes, products, or services using digital technologies. Through digital hubs, companies can gain access to new technologies, new knowledge, prior experience to support the projects of a particular company that has requested assistance from a digital hub, where in turn experimentation, testing of this knowledge, experience, and technology with digital innovations take place. In some cases, it is also possible to support funding certain innovations for the business. One of the objectives of digital hubs is to strengthen the local innovation ecosystem as well as to act as the

first point of contact in the region. In the interaction between businesses and financial actors, factors such as type of organization, financial and business models, origin, scope, and readiness of digital technologies are considered.

The study of technology hubs shows that users have a very high appreciation of such hubs, which provide access to experts in the field and technology as well as the use of ICT in business. The formation of technology hubs has shown its value, where new ideas and new technologies are offered.

Managing the formation of digital hubs implies a set of management functions, such as planning, organizing, motivating, and controlling networks of technology organizations, universities, research organizations, technology providers, and others that join forces to improve and offer tailored solutions to different companies (DEI, 2017). The virtual selection environment, which is an association of different organizations that complement each other with resources and certain skills, can be called digital hubs (DEI, 2017). To date, there are six hundred and sixty-four active digital innovation hubs in thirty-nine countries in Europe. These digital hubs are listed in the European Union Directory of Digital Innovation Hubs (Digital Innovation Hubs Catalogue, 2021). As bringing agents, technologies, and research centers together is a complex and lengthy process due to location, there are certain ways of doing this. The main purpose of digital hubs is to identify and select a specific business model to solve the problems encountered. A business model is a logically structured schematic description of the business processes running in a particular company, the purpose of which is to create value for all stakeholders (Kiel et al., 2017). A business model includes such areas of the organization as value proposition, customers, financial viability, and infrastructure (Erik, 2010). The business model canvas is a visual representation in the form of a structure, through which it is possible to identify the elements that are critical for the further functioning of a particular business (Pigneur & Fritscher, 2014). However, it is not easy to assess the performance of digital hubs, as digital hubs are complex organizations with their own technological specializations that are regionally based, taking into account the needs of a given region, with digital hubs being a space for

a set of different actors with different interests and different business strategies (Hervas-Oliver et al., 2020).

As part of a European, national, and regional digitization policy initiative with access to a variety of resources, facilities, services, and expertise, benefiting significantly, digital hubs work to organize, provide and develop a set of services for organizations and companies that are experiencing digitization difficulties and challenges (INEDIT, 2021). It is important to note that it is the collaboration that the digital hubs benefit from. The essence of digital hubs is to create synergies whereby organizations are created and supported to compete effectively in the digital environment. One of the critical factors of which is the continuous improvement of a service, program, or product. Managing the formation and development of digital hubs is a complex activity that consists of providing services to improve certain activities, increase competitiveness, growth, innovation, application of digital technology and innovation in the production value chain, as well as access to innovation, new knowledge, experience, networking opportunities, testing of digital technologies (Butter et al., 2020).

Thus, the term "digital hub" is close to the concept of "digital platform" because both concepts represent a set of interacting entities to exchange ideas and knowledge. These stakeholders are interlinked and strengthen supportive relationships, collaborate, substitute, and complement each other. Essentially, they are equipped with human resources, technological resources, and intellectual resources. Based on the above information, a digital hub is a hub that ensures the exchange of strong links with service providers not only in its region, but also beyond, and serves customers, mainly companies in the spectrum of digital transformation (Fischer et al., 2020). Hence, it is possible to give the author's vision that a digital hub is a set of economic entities whose interaction is based on the ubiquitous spread of ICT and digital technologies operating in the digital space and having a relatively stable character.

The services provided by digital hubs should be considered as work on the business plan of the organization, work on the formation of the vision, mission, and strategy. In addition, based on the review, it follows that special attention is paid to

marketing activities, research in the field of economics, financing opportunities, work on the coordination of certain plans, coaching-coaching, work on finding investments; the ability to access infrastructure, the ability to access the network, awareness development, assessment, experiments, certain digital needs of the organization, access to both online laboratories and physical laboratories (Digital Innovation Hubs (DIHs) in Europe, 2021; Zabala, 2019; Rissola & Sörvik, 2018).

According to recent studies in the formation and development of digital hubs, conclusions have been made on the application of robotics in improving product quality, predictability of production; in the application of artificial intelligence and the Internet of Things in improving the transparency of the supply chain (Lanz, M. Et al 2021).

In the studies previously studied the stages of management of the formation of digital hubs, the importance of the business model in the formation of digital hubs, the formation of sustainable digital hubs, digital technologies but not clearly shown the possible risks of formation of digital hubs, drivers of digital hubs and mechanisms for the formation of digital hubs.

Research Methods

The methodological basis of the study are the achievements of world economic science, related industries, the results of scientific and practical research. Various programs for the formation and development of digital hubs are being implemented in European countries, thereby showing the experience of implementation and application of digital technologies in manufacturing, industry and business. In Kazakhstan, the program "Digital Kazakhstan" is being implemented, according to which Kazakhstan also opened digital hubs "Parasat" in Kostanai, "Caspian Digital Hub", technoparks "Astana Hub" and "Almaty Hub".

In this article, we decided to analyse the formation and development of digital hubs in countries such as Germany, France, Spain, the Czech Republic, Lithuania. These digital hubs were chosen according to the studies of scientists who considered them more developed.

The proposed methodology contains possible risks, drivers, and mechanisms for the formation of digital hubs in the regions of Kazakhstan. In developing the methodology, more than 26 studies were studied. This methodology allowed us to develop a model for the formation of digital hubs.

The model of a digital hub based on the works of Antonopoulos, Keramidas & Tsakanikas (2020) can be represented in figure 1.

Figure 1. The model of a digital hub

The activities of digital hubs can be represented as this model in which a company approaches a digital hub with its problem that it cannot find a solution for or wants to find the most effective solution, which is carried out by analyzing experience in a particular industry, conducting technological expertise, analyzing experience with a business model, whereupon the digital hub selects a particular business model or a particular solution to the problem.

There is the following classification of categories of digital hubs (Table 1).

Table 1. Classification of categories of digital hubs

Category	Definition
Scope - specific sectors or technologies (expert hubs)	A particular region or area and more; Digital technology and digital adapters
Business model and funding model	A mixed model that combines tangible and intangible services; Tangible services (private finance)
Technology readiness of companies	All 9 levels of technological readiness; Some levels only

Origins of sponsors/founders	Higher education institutions; Research institutes; Associations by industry; Private organisations and others.
Type of company - public or private partnership	Private companies; Public organisations; Informal associations and others.

Compiled by the author from the source (Alberto & Arnold, 2020)

The study of technology hubs shows that users have a very high appreciation of such hubs, which provide access to experts in the field and technology as well as the use of ICT in business. The formation of technology hubs has shown its value, where new ideas and new technologies are offered.

Findings and Discussions

In Kazakhstan, there is a technopark of IT startups Astana Hub, which in 2020 presented its own digital hub astanahub.com. In the digital version of the Astana hub, all processes have been automated: from accepting applications for participation in programs to filling out online reports for residents receiving tax and visa preferences. The main idea of the project is to provide users with all the necessary digital resources. Thus, Astana Hub is developing its export potential of technological products and is also trying to achieve in this direction an indicator of 500 million US dollars by 2025. By 2021, Astana Hub's IT startups have already attracted 34.5 billion tenge. In 2019-2021, the participants of the technopark saved 7.7 billion tenge. In addition, the digital park is changing the approach to the formation of a critical mass of ICT entrepreneurs, and the development of human capital, and digital skills.

It is important to note that these services can be carried out using digital technologies, artificial intelligence, advanced automation, modeling, cyber-

physical system, machine learning, text analysis using artificial intelligence, network analytics, information retrieval, Internet of things, user experience, robotics, and others. Examples of industry digital hubs are represented in table 2.

Table 2. Experience of foreign digital hubs

Location and name of the digital hub	Management	Specialization, Offer	Services
France, Paris DIGIHALL	An industry cluster together with a research and technology organization.	Artificial intelligence, cyber-physical systems, cybersecurity	Assessment of digital maturity, testing, and analysis of equipment, training in digitalization skills, and access to finance.
Germany, Dortmund, Digital Hub Logistics	Fraunhofer Institute, Technical University of Dortmund, Duisburger Hafen AG, Efishnz cluster	Extensive ecosystem, for contact with players, testing collaboration in a special space,	Contract and applied research, product development methodologies, and idea development.
Spain, Bilbao, BDIH	Vocational training Center, regional state institutions, research organizations	Robotics, cybersecurity, 3D printing	Testing, technological evaluation, project scaling, testing infrastructure,

			and startup development.
Lithuania, Vilnius Lithuanian Hub of Digital Innovations in the field of Robotics	Lithuanian Robotics Association, Startup Department.	Internationalization, robots	Search for possible financing, technological audit, access to researchers and suppliers of technologies in the field of robotics.
Czech Republic, Ostrava IT4Innovations	Universities of Ostrava	Computer technology	Access to computer infrastructure, research activities.

Compiled by the author from the source (Alberto & Verbeek, 2020)

As can be seen from this table, five digital foreign hubs are presented here. In their practical activities, they use advanced digital technologies such as artificial intelligence, robotics, computer programs, computer technology, cybersecurity, cyber-physical systems, additive technologies, and others. The practical experience of these digital hubs shows successful application and results. The experience of the formation and development of foreign digital hubs can be applied taking into account the region of the country where it is necessary to form a digital hub. It is necessary to develop a business model that will fit exactly the characteristics and needs of the region. To begin with, let's consider the digital literacy of the country since the services provided by digital hubs will take place in a digital format, and accounting for the digital literacy of the population is an important indicator of the country's readiness for digitalization.

Table 3 shows the possible risks that any digital hub can face.

Table 3. Possible risks that can occur in a digital hub

No.	Risk	Characteristics
1	Phishing attack	This is a scam tactic through sending emails and trying to trick users into clicking on a malicious link to steal their personal data and information. *Measures to counteract this:* the defenses can include tracking various key phishing indicators, looking for unregistered domains, detecting changes in MX records, and checking DNS reputation.
2	Prioritization of vulnerabilities	Manually correlating error and vulnerability data in real time becomes very difficult. *Measures to combat* vulnerability management controls (monitoring), aimed at detecting and classifying vulnerabilities and at eliminating or mitigating their exploitation, can be used as a defense.
3	*DarkNet*	A segment of the darknet internet is hidden from public view, with the controlling DDoS attack servers hidden away to make them harder to find. Darknet tricks can hide user data and spoof IP addresses. *Measures to combat this*: automated DRP vulnerability harvesting, which constantly monitors darknet activity, can be used as a defense.
4	Potential for leaks of confidential data	This is a fraudulent attack tactic aimed at deliberately collecting personal customer data, intellectual property, sensitive credentials, and sensitive documents. *Measures to combat this:* DLP (Data Loss/Leak Prevention) technology can be used as a defense to prevent confidential data leaks.

5	Cyberfraud	This is a cyber-attack tactic aimed at causing material or other damage by stealing a user's personal information using new technologies (e.g. stealing bank accounts, passport data, codes, passwords, etc.). *Measures to counteract this*: anti-virus protection (installation of anti-virus software and anti-virus hardware), firewalls, gateways, IDS/IPS and malware detection systems, etc. can be used as defences.

Note – compiled by authors

In order to implement a policy of shaping and developing a digital hub based on best practice research, we propose to put forward the necessary attributes "drivers" that adapt general knowledge to sustainable development.

1) Research problems should be relevant, address existing gaps or solve problems, take into account different perspectives, data, and evidence to form conclusions.

2) Develop a methodology to assess readiness to form a digital hub, supported by a multidisciplinary team of skilled professionals including government, academia, industry, and civil society.

3) Continuously increase the number of stakeholders in terms of numbers and sectors.

4) Collaboration with local academics or research institutes, supported by international experts.

5) Research on successful best practices of digital hubs to be used for benchmarking purposes. Best practices should include examples from two types of cities. The first type is hubs with similar conditions in the local context. The second type is hubs that have excelled in a particular area of interest to the local constituency.

6) Identifying and seeking locations for a digital hub at regional, national and international levels.

7) Support for digital start-ups and advanced ICT companies.

A comprehensive model covering the main and innovative findings:

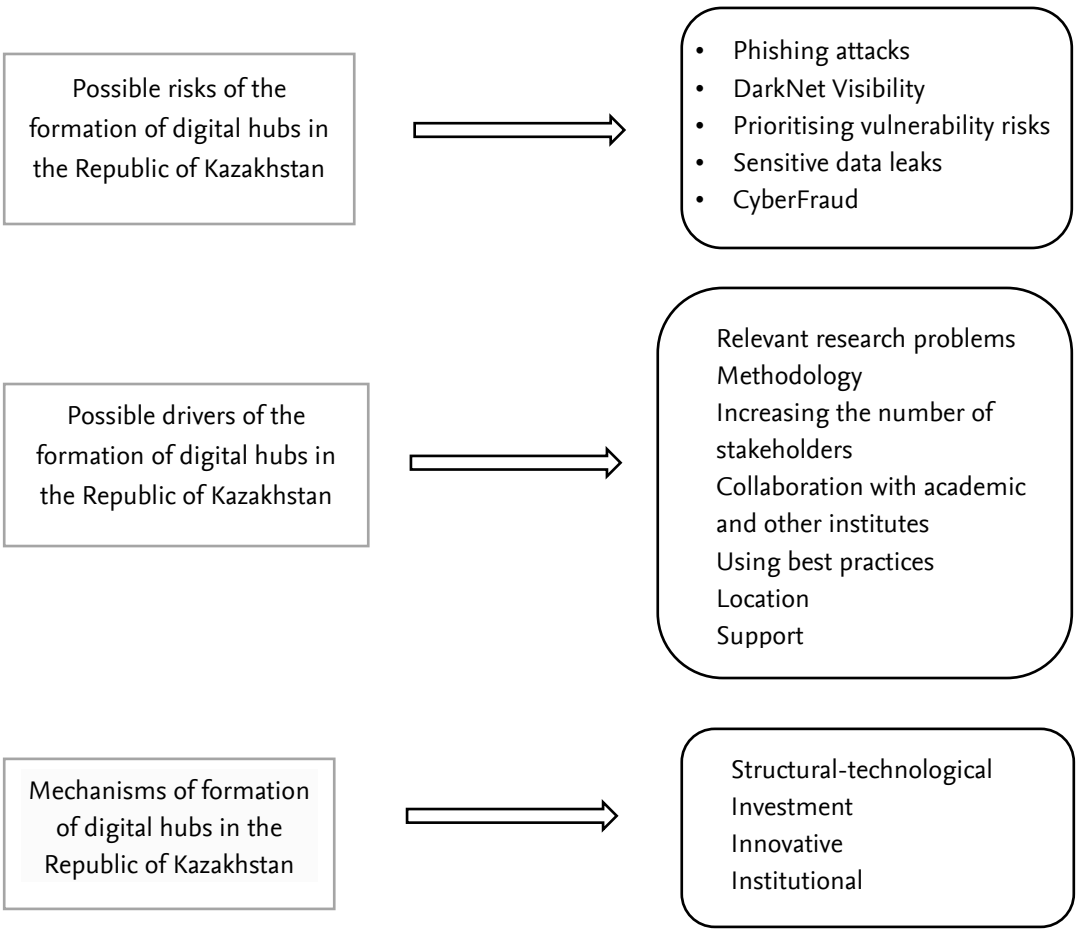

Figure 2. The comprehensive model covering the main and innovative findings

Note compiled by authors

Next, it is useful to consider in more detail the main mechanisms for regulating the formation and development of digital hubs in Kazakhstan. In particular, we identified structural-technological, innovative, investment, institutional and social mechanisms. The above list of implementation mechanisms is not exhaustive, but shows a certain system, within which in the future, the policy of Kazakhstan for the development of a central digital hub can be conducted. Table 4 details the regulatory mechanisms for the formation and development of digital hubs in Kazakhstan.

Table 4. Regulatory mechanisms for the formation and development of digital hubs in Kazakhstan

Mechanism	Purpose	Implementation mechanisms
Structural and technological mechanism	Orienting the digital hub space towards the renewal of the structure of industries and the transition to a new industrial revolution, Industry 4.0.	Creation of a qualitatively new type of structural-industrial specialization of the region. Diversification of the region's industrial production. Development of favorable conditions for investment spillovers, support for fundamental research and commercialization of R&D.
Innovative mechanism	Enabling innovation and new industries through digital technologies.	Accelerating the innovation process. Supporting and targeting knowledge-intensive industries. Creating conditions for modernization of the region's industrial sectors through the digitalization of production processes. Development of "smart" technologies (Smart Solution), the emergence of compact "smart cities".
Investment mechanism	Attracting different sources of financing and creating a favorable climate for potential investors.	Effective redistribution of investment flows. Creation of incentives oriented towards accelerated development of the digital hub. Search for non-standard schemes to attract external financing. Support of projects through state grant programs (grants,

		conditionally repaid loans, equity financing, etc.).
Institutional mechanism	Creating conditions for the development of institutional environment.	Creation of starting conditions and stimulation of digital hub development. Development of state support and socio-economic development programs.

Note – compiled by authors

As can be seen from the table, structural-technological, innovative, investment and institutional mechanisms for regulating the formation and development of digital hubs in Kazakhstan should be highlighted. The application of the above mechanisms in the management of the formation of digital hubs in Kazakhstan will accelerate the innovation process in Kazakhstan.

Conclusions

To summarize the above, smart infrastructure is a robust and secure digital and technological framework that can withstand information-related disruptions. It can include digital and ICT infrastructure, including the latest innovations, sensors, and control systems, data centers, data bases that will help accumulate, store and transmit any data and provide equitable access to digital hub consumers. Today, digital hubs bring together people working in the ICT sector. As digital technology has evolved, hubs have become centers of attraction for entrepreneurs and creatives. Many organizations from Google, Apple, Uber, Facebook, and Slack can rightly be considered successful digital hubs. However, in order to work for such companies, many skilled professionals are forced to give up half of their salary for housing close to their work.

Possible risks that can arise in a digital hub are phishing attacks, prioritizing vulnerability risks, darknet visibility, the possibility of sensitive data leaks, and cyber

fraud. Highlighting risks is an important factor in the management of digital hubs, they reflect solutions to all kinds of problems as well as prevent them.

Structural-technological, innovative, investment, and institutional mechanisms for regulating the formation and development of digital hubs in Kazakhstan are highlighted. The proposed mechanisms, if applied systematically, will contribute to the effective formation and development of digital hubs in Kazakhstan.

The drivers' attributes are a set of components that will give impetus and enable the implementation of the digital hub initiative. The proposed drivers are part of the context of the digital hub and are likely to change with the context. A number of research papers provide additional characteristics, describe possible approaches, and, in some cases, provide specific values for the attributes of smart hub infrastructure development.

Management issues of the formation and development of digital hubs remain actual and require further research. Features of management of the formation of digital hubs and mechanisms for the development of digital hubs in the regions of Kazakhstan are relevant today.

The information in the article will be useful to researchers in the field of digitalization, teachers, students, graduate students, doctoral students of universities of the economic profile, as well as anyone interested in this topic.

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Analysis of Innovation Activity in the Industrial Market of Kazakhstan

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Abstract

The growth of innovative potential is becoming the main driver of the competitiveness of the national economy. It is obvious that economic growth can be achieved only through the development of industrial and innovative achievements, the introduction of new technologies, and the use of modern computer technologies in production. Unfortunately, in Kazakhstan, the development of innovations is not sufficiently developed now. We see a small number of innovative developments and a small number of patents. Science is not related to business. All this confirms the fact that it is necessary to develop innovative potential in Kazakhstan and stimulate the demand and supply of innovations. Obviously, innovation is a key driver for the development of any enterprise. Only a wide assortment and high quality cannot ensure competitiveness; it is necessary to introduce innovations and new technologies. At the same time, innovative activity should be permanent and not be a one-time event. It is necessary to analyze the innovation market by conducting a regression analysis. Regression analysis is a method of modeling measured data and examining its properties. To analyze the influence of the main indicators of innovative activity, 7 variables were selected, and the data were considered in the context of 14 regions and two cities: Nur-Sultan (Astana) and Almaty.

Keywords: innovation, innovative potential, innovative activity, industrial market

Introduction

Industrial policy, as the core of the general economic policy of the state, should be associated, first, with the implementation of innovative restructuring of industrial production. In 2017, work was carried out to develop measures for the technological re-equipment of industry, including elements of the fourth industry of the revolution. On the ground, plans are being developed for the digitalization of regions with different implementation periods until 2025 (Ishchenko-Padukova & Movchan, 2017). To increase competitiveness, large, export-oriented domestic enterprises have begun to implement the technologies of the fourth industrial revolution in their industries. In general, it should be noted that the measures taken to stimulate the transition of industry to Industry 4.0 will contribute to an increase in the share of large and medium-sized enterprises that have introduced digital technologies to 11% in 2022. Measures have been developed that are aimed at creating the necessary ecosystem to support our enterprises' planning digitalization and stimulate more active adoption of digital technologies. These measures were included in the state program "Digital Kazakhstan".

Innovations in Kazakhstan are implemented within a complex dynamic system, the effectiveness of which depends on the use of internal capabilities. Many factors influence the innovative activity of enterprises. To form a strategy for the development of the innovative activity, it is necessary to understand what criteria exactly influence its activity. Such indicators as the number of enterprises with innovations, the level of activity in the field of innovations, the number of organizations that carried out R&D, and the volume of domestic costs have a significant impact on the level of innovation activity in the country. At the same time, it should be considered that for the proper development of innovative potential in the country, special attention should be paid to the growth in the number of employees who performed research and development, as well as the number of developed innovations. However, the importance of these factors and

the degree of their influence must be carefully researched and dependencies between these variables identified.

The transfer of the economy of Kazakhstan to an innovative path of development is one of the main priorities of state policy aimed at ensuring the sustainability of the national economy in the face of global competition (Bizikova & Pivovarova, 2017). The competitiveness of the national economy directly depends on the growth of innovative potential in society. This means that economic growth should be carried out mainly due to industrial and innovative achievements, the introduction of scientific and technological progress, the use of a computer, and resource-saving technologies (Bastl et al., 2012).

Objective. Now, the development of innovation processes in the country is at a low level. This is expressed by a small number of innovative developments of enterprises, weak patent activity, science is divorced from business, and functions within the framework of an industrial model. In Kazakhstan, for the development of innovative potential, it is necessary to carry out work on stimulation and supply and demand, to develop competitive market mechanisms (Almerekov & Kashkimbaeva, 2018). The innovative activity must be present in any manufacturing enterprise. This is because without modern technologies, increasing the range and improving the quality of products, the enterprise will not be able to increase its competitiveness in the markets. Moreover, to maintain competitiveness, it is necessary for innovation to become an ongoing process, rather than a one-off event. The common problem of low innovation activity is not only the lack of funding but also the general understanding of the infrastructure for the development of innovative potential. World practice shows that high budgets do not always become the key to success in innovation, and therefore it is important to study the factors that affect the level of innovation activity.

Literature Review

According to the research of innovative activity in Kazakhstan by such authors as Mamraeva (2017), Abylkasymova (2020), Seitzhanov (2020) in Kazakhstan there is a

progressive trend in the development of licensed trade in intellectual property, but, nevertheless, many enterprises are still characterized by low innovative activity, which is confirmed by the fact that only 3 to 6 percent of registered invention contracts in the country find their practical implementation. The share of innovative products in the country's gross domestic product is less than 1%. In the course of the literature review, it becomes obvious that in Kazakhstan there is a lack of empirical research, which is an assessment of the contribution of various factors to the development of innovative potential, their relationship with the volume of innovative activity, and research in the field of the behavior of innovative organizations. In this area, such well-known publications as Onyusheva (2017), Smirnova (2016), Tumalavičius et al. (2017), Tsaurkubule et al. (2020), Vigliarolo (2020) revealed the main problems.

As can be seen from Figure 1, the dynamics of changes in internal costs for innovation since 2011 have a positive trend. During this period, the cost of innovation has doubled from 33,466 thousand tenge in 2011 to 68,884 thousand tenge in 2018. However, they slightly decreased during the pandemic to 61,005.1 thousand tenge in 2021.

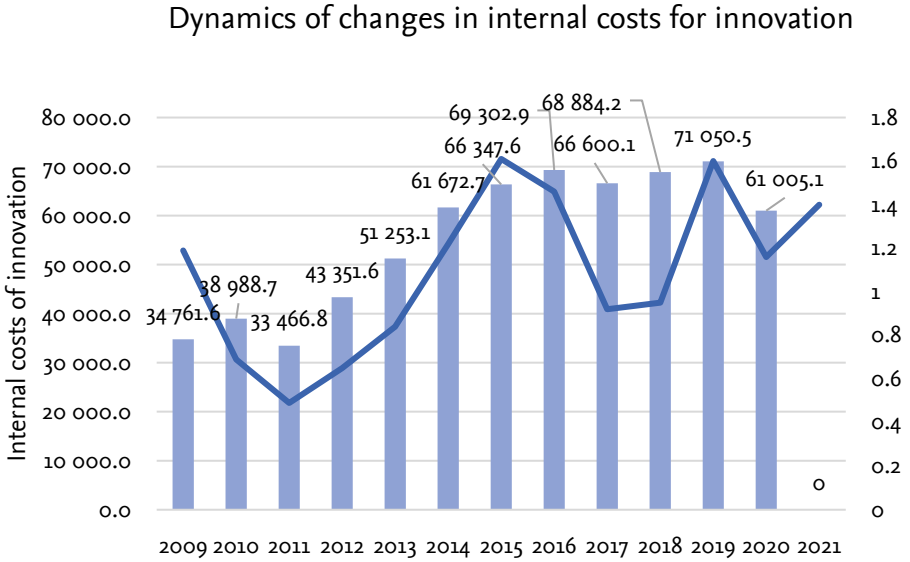

Figure 1. Dynamics of changes in internal costs for innovation, 2009-2021.
Source: Compiled by the author based on data from (Statgov, 2022)

The volumes and indices of industrial production in the regional aspect reveal that the indicators in some regions have a slight increase, therefore, in the case of the intensification of the use of innovative marketing in certain industrial sectors of the country, its results could be the stimulation of the general activity of local and regional industrial entities, an increase in competitiveness. individual large enterprises and sectors of the economy, and the intensification of the processes of participation of Kazakhstani brands in world commodity markets, in international spaces (Caurkubule et al., 2020).

Currently, the problems of modernization and innovative restructuring of the economy are key areas of socio-economic transformation Kazakhstan. Innovation processes in the Kazakh economy are significantly hampered by the institutional problems of the national innovation system. Commercialization and transfer of innovations have not experienced significant growth due to insufficient links between science, education, and business.

By 2017, the situation became more complicated, in which the seven leading countries of the world possess 46% of macro technologies and control more than 80% of the market for high technology products, incl. USA more than 20%, Japan - more than 14%, Germany - more than 10%. The position of Kazakhstan in the world market of innovative products in 2017 was insignificant: its share by type of activity ranges from 0.15 to 0.75%, while this indicator for the USA is 36%, Japan - 30%, China - 1% (Bozhko, 2010). The key indicator of innovation activity that characterizes the potential for technological modernization of the country is the activity of enterprises in the field of technological innovation. The level of innovation activity of the Kazakhstani economy lags far behind such innovatively developed countries as Germany - 70%, Canada - 65%, Denmark, Ireland, and Finland - 57%. This situation has arisen because in the enterprises of Kazakhstan, innovative activities, as a rule, are realized through the acquisition of technologies and equipment from foreign production, but their own innovations are not created Figure 2).

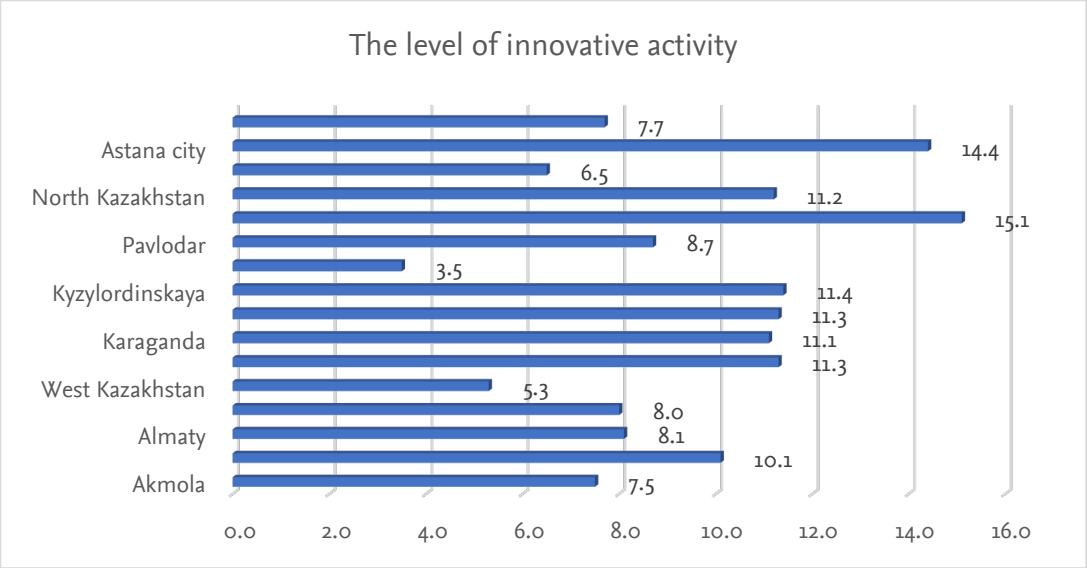

Figure 2. The level of innovative activity

Note: compiled by the author based on the source

In recent years, the main elements of the innovation infrastructure have been created in Kazakhstan, however, significant progress has not yet been achieved: innovation processes have little effect on the development of the economy (Maldynova, 2018).

Research Methodology and Design

Regression analysis was used to identify links between the factors of innovative activity. Regression analysis is a method of modeling measured data and examining its properties. Data consists of pairs of values for the dependent variable and the independent variable. The model of given regression is a function of the independent variable and parameters with an added random variable (Bengtsson, 2014). These variables were selected based on the experience of previous studies (Kravchenko & Marchenko, 2016) and are presented in the Table 1.

Table 1. Key indicators of innovation

Region	The volume of innovative products, million tenge	Enterprises with innovations	The level of activity in the field of innovations, in%	Number of organizations that carried out R&D	Internal costs, million tenge	The number of employees who performed research and development	Number of developed innovations
	Y	X1	X2	X3	X4	X5	X6
Akmola	15 721,9	98	7,5	11	898,2	678	24
Aktobe	39 442,0	116	10,1	16	839,1	362	32
Almaty	12 624,2	146	8,1	11	871,1	968	66
Atyrau	5 768,0	92	8,0	10	3 637,7	474	27
West Kazakhstan	18 122,1	49	5,3	8	298,5	323	11
Zhambyl	50 854,7	96	11,3	11	1 024,3	377	35
Karaganda	32 048,0	257	11,1	29	3 488,1	1 360	72
Kostanay	91 502,6	167	11,3	14	1 176,5	569	52
Kyzylordinskaya	5 505,8	89	11,4	8	506,3	229	23
Mangystau	294,9	40	3,5	6	8 043,5	696	13
Pavlodar	177 881,5	112	8,7	11	335,7	654	43
East Kazakhstan	80 472,0	303	15,1	34	5 000,5	2 325	76
North Kazakhstan	13 804,9	115	11,2	5	185,2	93	34
South Kazakhstan	125 231,6	162	6,5	19	924,2	1 090	113
Astana city	149 277,5	582	14,4	62	16 297,5	3 062	117

Almaty city	26 183,3	550	7,7	131	25 357,8	8 821	240
Note: compiled by the author based on the source (Statgov, 2021)							

To analyze the influence of the main indicators of innovative activity, 7 variables were selected, and the data were considered in the context of 14 regions and two cities: Nur-Sultan (Astana) and Almaty. Data for the analysis were selected from statistical data published on the website www.egov.stat.kz. For the analysis, the dependent variable Y was determined - Volume of innovative products (goods, services), million tenge. The dependent variable (Y) is a variable that describes the process you are trying to predict or understand. In the regression equation, this variable is always to the left of the equal sign. While you can use regression to predict the dependent quantity, you always start with a set of well-known y-values and use them to calibrate the regression model. Known Y-values are often referred to as observables (Costa et al., 2012). The data for the selected variables are current for the current period, covering a period of 3 years.

The explanatory variables (X) are variables used to model or predict the values of the dependent variables. The dependent variable is a function of the independent variables. The following indicators were selected as independent variables:

X1 - Enterprises with innovations, and units.

X2 - The level of activity in the field of innovation, %.

X3 - Number of organizations carrying out R&D, units.

X4 - Internal costs, million tenge.

X5 - The number of employees who performed research and development, people.

X6 - Number of developed innovations, units.

The number of observations n = 18. The number of independent variables in the model is 6, and the number of regressors considering the unit vector is equal to the number of unknown coefficients (Industrialization, 2021). Considering the attribute

Y, the dimension of the matrix becomes equal to 8. The matrix of independent variables X has dimensions (Table 2).

Table 2. Matrix of paired correlation coefficients R

-	y	x_1	x_2	x_3	x_4	x_5	x_6
y	1	0.4284	0.4463	0.1913	0.1281	0.1323	0.3311
x_1	0.4284	1	0.5552	0.8873	0.8506	0.8316	0.8695
x_2	0.4463	0.5552	1	0.2642	0.1756	0.1843	0.309
x_3	0.1913	0.8873	0.2642	1	0.9338	0.987	0.9372
x_4	0.1281	0.8506	0.1756	0.9338	1	0.9251	0.8272
x_5	0.1323	0.8316	0.1843	0.987	0.9251	1	0.931
x_6	0.3311	0.8695	0.309	0.9372	0.8272	0.931	1
Note: compiled by the author when analyzing the data							

Findings

As a result of the calculations, the multiple regression equation was obtained:

Y = 5250.0463 + 335.6906X1-975.245X2-850.1251X3-11.5795X4-5.479X5 + 850.9919X6.

Multiple linear regression, which models the relationship between multiple input variables and an output dependent variable. The model remains linear because the output value is a linear combination of the input values.

As a result of the analysis, we can make the following economic interpretation of this model:

- an increase in X1 (Enterprises with innovations, units) by 1 unit of measure. leads to an increase in Y (Volume of innovative products, million tenge) by an average of 335.691 units;

- an increase in X2 (the level of activity in the field of innovation, in%) by 1 unit of measure. promotes reduces in Y by an average of 975.245 units;
- an increase in X3 (Number of organizations that carried out R&D, units) by 1 unit of measure. promotes reduces in Y by an average of 850.125 units;
- increase in X4 (Internal costs, million tenge) by 1 unit of measure. leads to a decrease in Y by an average of 11.58 units;
- an increase in X5 (the number of employees who performed research and development, people) by 1 unit of measure. leads to a decrease in Y by an average of 5.479 units;
- an increase in X6 (Number of developed innovations, units) by 1 unit of measure. Leads to an increase in Y by an average of 850.992 units.
- According to the maximum coefficient β1 = 1.008, we conclude that the factor X1 has the greatest influence on the result Y, that is, the more enterprises that have innovations, the greater the volume of innovative products. Figure 3 illustrates the dynamics of changes in the volume of innovative products for 2009-2018. Until 2015, there is an increase in the volume of innovative products, then within two years there is a decrease in volumes, which, according to the author, is associated with economic changes in the market, then in 2018 the volume of innovative products increased significantly (Sadyrova, Yusupov & Imanbekova, 2021).

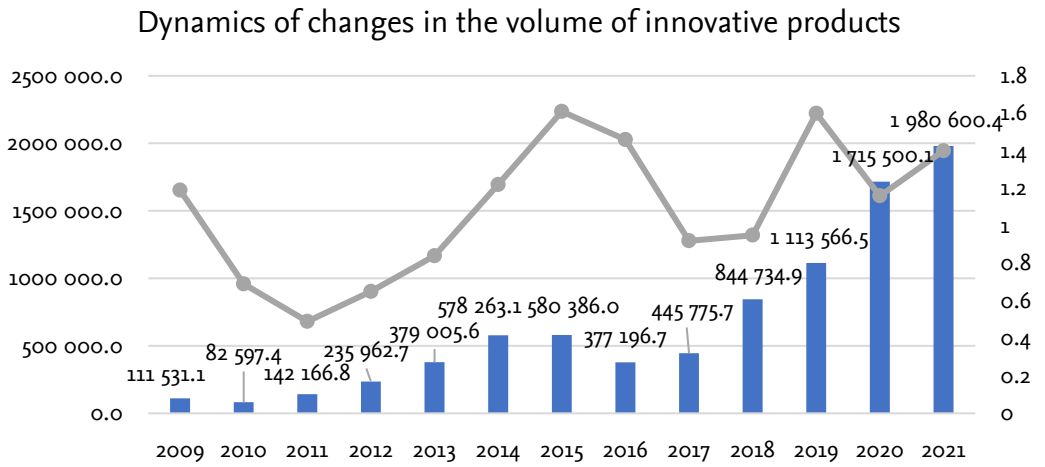

Figure 3. Dynamics of changes in the volume of innovative products, 2009-2021

For a deeper analysis of the main indicators of innovation activity in Kazakhstan, it is important to consider the data not only in the context of territorial regions, but also to analyze the innovation activity in time (Lisenkov, 2021).

Thus, a table of indicators of innovative activity in Kazakhstan was formed in the period from 2009 to 2021 (Table 3).

Table 3. Indicators of innovative activity in Kazakhstan

Year	Share of innovative products in GDP,%	Internal costs	Level of activity in the field of innovations, in%	Volume of innovative products	Number of organizations that carried out R&D
	Y	X1	X2	X3	X4
2009	1,19	34 761,6	2,1	111 531,1	421
2010	0,69	38 988,7	2,3	82 597,4	414
2011	0,49	33 466,8	3,4	142 166,8	424
2012	0,65	43 351,6	4,8	235 962,7	412
2013	0,84	51 253,1	4,8	379 005,6	345
2014	1,22	61 672,7	4,0	578 263,1	341
2015	1,61	66 347,6	4,0	580 386,0	392
2016	1,46	69 302,9	4,3	377 196,7	390
2017	0,92	66 600,1	5,7	445 775,7	383
2018	0,95	68 884,2	5,7	844 734,9	384
2019	1.6	71 050,5	10	1 113 566,5	386
2020	1.16	61 005,1	8.1	1 715 500,1	373
2021	1.4	75020.4	8.9	1 980 600,4	265

Note: compiled by the author based on data (Statgov, 2021)

As a dependent variable (Y) for this analysis, the indicator of the share of innovative products in GDP,% (Boldyrevskiy & Kistanova, 2014)

In this case, the independent variables are as follows:

X1 - Internal costs, million tenge.

X2 - The level of activity in the field of innovation, %.

X3 - Volume of innovative products, million tenge.

X4 - Number of organizations carrying out R&D, units.

The number of observations n = 12. The number of independent variables in the model is 4, and the number of regressors, considering the unit vector, is equal to the number of unknown coefficients. Considering the attribute Y, the dimension of the matrix becomes equal to 6. The matrix of independent variables X has dimensions (Table 4).

Table 4. Matrix of paired correlation coefficients R

-	y	x_1	x_2	x_3	x_4
y	1	0.862	0.5411	0.6587	0.7215
x_1	0.862	1	0.8464	0.8502	0.775
x_2	0.5411	0.8464	1	0.7836	0.6456
x_3	0.6587	0.8502	0.7836	1	0.4603
x_4	0.7215	0.775	0.6456	0.4603	1

Note: compiled by the author when analyzing the data

As a result of calculations, the multiple regression equation was obtained: Y = 0.193-5.1E-5X1-0.1921X2-4.0E-6X3-0.02519X4.

Multiple linear regression, which models the relationship between multiple input variables and an output dependent variable (Jaakkola & Hakanen, 2013). The model remains linear because the output value is a linear combination of the input values.

According to the results of the analysis, the following economic interpretation arises:

– Increase in variable X1 (Internal costs, million tenge) by 1 unit of measure. leads to a decrease in Y by an average of 5.1E-5 units;

– Increase in X2 (the level of activity in the field of innovation, in%) by 1 unit of measure. leads to a decrease in Y by an average of 0.192 units;

– Increase in X3 (Volume of innovative products, million tenge) by 1 unit of measure. leads to a decrease in Y by an average of 4.0E-6 units;

– Increase X4 (Number of organizations that carried out R&D, units) by 1 unit of measure. leads to a decrease in Y by an average of 0.0252 units.

According to the maximum coefficient $\beta 1 = 1.387$, it can be concluded that the factor X1 has the greatest influence on the result Y (Volume of innovative products, million tenge). The statistical significance of the equation was tested using the coefficient of determination and Fisher's test. It was found that in the studied situation - 45883.62% of the total variability in Y is explained by a change in the factors Xj.

Discussion

The reasons for the low innovativeness also lie in the fact that the level of susceptibility of the republic's economy to innovations is low. Demand is not adapted to the use of advanced technologies (Vasilyev & Vasilyev, 2016). A feature of all post-Soviet innovation systems is a high share of the public sector of research and development with a small number of large science-intensive corporations and a relatively weak development of small innovative business (Kozhakhmet et al., 2020). As a result, the accumulated potential of scientific and technical solutions remains unclaimed, scientific institutes and scientists are limited in the possibility

of obtaining additional income for the development of research and can only rely on state funding (Spring & Araujo, 2014).

This study allows us to identify the main factors influencing the level of innovation activity, to determine the most important of them. The results of the study can be applied in the development of a strategy for the development of innovative potential. Of particular interest is the ability to study relationships on an annual basis and identify long-term relationships.

The problems of stimulating and developing innovation activity in the country have existed for several years. According to statistics, only a small part of innovations finds its practical implementation. For the period from 2009 to 2021, 4,531 license agreements and patent assignment agreements were registered. Among the reasons for the low level of commercialization of innovations are: the minimum demand for small innovative businesses; personnel problem; financial mechanisms for innovation; lack of accurate data on innovative enterprises; low motivation of researchers. Kazakhstan took only 50th place in the list of the most innovative states. Another rather serious reason for the low innovation susceptibility of the country's economy is the problem of the development of science in general in Kazakhstan, and fundamental.

Conclusion

The strategic necessity in the development of any enterprise in the industrial sector and the most reliable way to increase its competitiveness is the implementation of innovations to timely fulfill the needs of consumers, which is impossible without the implementation of the concept of servitization as a marketing strategy (Denyer & Tranfield, 2006). The continuous process of development and application of the most advanced technologies, the expansion of international cooperation require continuous improvement of nationwide statistical reporting forms and instructions for filling them out, as well as revision of the methodology for science and innovation statistics, studying the experience of other countries to ensure comparability of statistical data in the international arena (Bustinza et al., 2017). In

Kazakhstan, as in many countries, it is necessary to opportunities to increase the number of resources devoted to timely collection of relevant high quality scientific and technical data based on international methodology (Maldynova et al., 2018).

The purpose of the study was to identify the relationship between the level of innovation activity and the factors influencing it. As a result of the analysis, it was revealed that the volume of innovative products is mainly influenced by such factors as the level of innovative activity in each of the regions of Kazakhstan, the number of innovations developed, and the number of innovations developed at the enterprises of Kazakhstan as a whole. This study is widely used, so it can be applied to a separate enterprise if data are available. A repeated study on the same factors is of particular interest in the future, as it will allow us to establish the dynamics of changes in innovative activity and its causes. The innovative activity must be present in any manufacturing enterprise. This is since without modern technologies, increasing the range and improving the quality of products, the enterprise will not be able to increase its competitiveness in the markets. Moreover, to maintain competitiveness, it is necessary for innovation to become an ongoing process, rather than a one-off event.

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On the development of an innovative type of entrepreneurship in the field of waste in Kazakhstan

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Abstract

The purpose of the research is to analyze the opportunities for the development of innovative business in the field of waste management as a promising direction of Kazakhstan's transition to a Green Economy. The research methodology is based on comprehensive analysis of the waste management sphere to identify the potential for the development of a Green Business. The study revealed that the existing business models and waste management system are inefficient. Certain measures stimulating the waste recycling business, which will contribute to the "greening" of the economy of Kazakhstan were suggested. The originality of the research lies in the fact that an innovative approach to the development of entrepreneurship in the waste management field is scientifically justified. Using the example of foreign experience in waste disposal, the expediency of recycling and recycling of waste to obtain specific types of finished products are clearly shown. The results obtained can be used in the development of regulatory documents on the problems of waste management, measures to support small and medium-sized businesses in this area; in the practical activities of government agencies and entrepreneurs; in the educational process when teaching the disciplines of Green Economy, Green Business. Therefore, it is necessary to strengthen state regulation of the sphere of industrial and household waste, create conditions for the

development of waste disposal and recycling business and the use of new business models in the activities of waste recycling enterprises.

Keywords: Green Economy, circular economy, solid household waste, municipal waste, industrial waste, waste recycling, Green Business.

Introduction

In modern conditions, all countries of the world are looking for new models of economic development that will allow finding solutions to a number of issues (environmental, food, financial, economic, climatic). Scientific research and experience of developed countries in Asia (South Korea, Japan, China), Europe (EU countries), and America (USA) have shown that in order to achieve stable economic growth, increase incomes and employment while preserving natural capital, ecosystems, and biodiversity, a course towards the Green Economy and sustainable development is necessary.

Sustainable development presupposes such a model of socio-economic development, "in which the satisfaction of the vital needs of the current generation of people is achieved without future generations being deprived of such an opportunity due to the exhaustion of natural resources and environmental degradation" (UNEP, 2011). The essence of sustainability is to achieve harmony between economic growth, social stability, and ecological balance in any state, regardless of the level of its economic development. According to scientists, the concept of the Green Economy is designed to promote sustainable growth. In this regard, we quote the statement of the expert on the Green Economy: "only the Green economy is able to stabilize economic systems and balance the interests of man, nature, and the efficient use of resources" (Kennett, 2010). The goal of the Green economy is to use sustainable production methods, obtain more products and provide more services, along with reducing the number of resources used and waste generated, and pollution (Lipina et al., 2016).

As for Kazakhstan, the modern economy of the country is unstable, since its growth is achieved through the extraction of oil, gas, and solid minerals, which depend on

the conjuncture of the world market of raw materials. At the same time, the country's extractive industries negatively affect the environment, cause deterioration of the ecological situation and increase in production and consumption waste. For Sustainable Economic Growth, the Concept of Transition of the Republic of Kazakhstan to the Green Economy was adopted in 2013. However, a radical change in the current situation in the country has not yet occurred. In the world ranking according to the Green growth index (GGI) in 2019, Kazakhstan was ranked 26th out of 33 Asian countries; according to the environmental efficiency index (EPI) in 2020, it was ranked 85th out of 180 countries. These indicators indicate the need to find ways to effectively implement the Concept of transition to the Green Economy in the Republic of Kazakhstan. In this regard, the problem of this publication is relevant - research of opportunities for the development of innovative business on a circular basis in the field of industrial, municipal and solid household waste for the transition to a green economy.

Literature Review

Among foreign authors, the problems of the Green Economy and waste have been actively investigated.

According to Kudelas et al. (2018), the transition to the Green Economy will increase the well-being of the population and help preserve natural resources and reduce environmental risks. However, to ensure sustainable development, it is necessary to coordinate activities in all spheres of the economy, an active position of the state and regional authorities, as well as the development of an appropriate organizational and economic mechanism.

According to Lin & Wang, (2019), the transition to the Green Economy is relevant for developing countries that have faced complex environmental problems in the process of industrialization. A study of 39 countries showed that Europe is a leader in the accumulation and use of clean technologies in industrial production, Asia is just beginning to use innovation as the main factor of Green Growth, America is using their experience in the development of a green economy. The authors

concluded that innovation and the pursuit of technical leadership are necessary to ensure stable Green Economy Growth.

Capasso M. et al. (2019), identified the driving forces and barriers to Green Growth. The authors came to the following conclusions: 1) green growth requires competencies that will cope with non-standard situations; 2) technological progress should be focused on obtaining environmentally friendly technologies so that investments are not directed to brown technologies in order to make a profit in the shortest possible time; 3) when assessing opportunities for the Green Economy Growth, market failures should be taken into account, structural and transformational systems; 4) it is necessary to pay more attention to multiscale geographical measurements.

Stevenson et al. (2019), notes that despite many competing concepts (sustainable development, Green Economy, Green Growth, social well-being, etc.), there is no common scientific understanding of the combination of economic growth and environmental sustainability. In his article, the author conducted a survey of 173 respondents on sustainable economic development, and identified and analyzed the main areas of international debate and their differences.

According to Khoshnava et al. (2019), the Green Economy is closely linked to sustainable development and can increase the well-being of the population, social justice, while significantly reducing environmental risks. In the study, the authors developed a hybrid methodology using mathematical methods to select the most effective criteria for the Green Economy and sustainable development.

Merino-Saum et al. (2020), note the contradictory nature of the concept of the Green Economy, in connection with which they investigated various definitions of the Green Economy (95) and sustainable development (35). The authors identified the main similarities and differences by encoding descriptive concepts into a numerical format. As a result, they came to the conclusion that the green economy is a more appropriate concept for solving socio-environmental problems.

Nandy et al. (2022), are concerned about the uncontrolled growth of waste in the world and the forecast of their further growth, which negatively affect human health

and the environment. The authors analyzed the formation of plastic waste, medical and electronic waste, which can create big problems for a sustainable future; as well as ways to dispose of them. To solve these problems, it is proposed to introduce a closed-loop economy using green technologies (Green economy).

Recently, much attention has been paid to the research of processing agricultural and food waste in a closed-cycle economy and their issues. Huiru *et al.* (2019) research the possibility of processing and reuse of organic fertilizers, as well as obtaining energy from biomass. Zhang *et al.* (2020) the problem of reducing food waste, conducted an analysis of the reuse and recycling of food waste efficiency. Wang *et al.* (2021) found that in the food supply chain, the greatest losses and spoilage occur at the stages of production and consumption and proposed a circular model to reduce them. Lu et al. (2022) conducted an analysis of the production, consumption, and processing of food waste for the period from 2008 to 2016 in the EU countries and proposed a new three-stage model to study the impact of food waste processing on the efficiency of agricultural production in the circular economy.

Kharola et al. (2022) investigated the problem of food waste management on the example of India: they evaluated and ranked 30 criteria that lead to the reduction in food waste and found that the best criterion is training producers. The authors concluded that it is better to prevent the formation of waste at the initial stage of the food supply chain than at the final stage.

Kurniawan et al. (2022) analyzed the situation of solid waste management in St. Petersburg, identified problems hindering the reform of the waste management system, and proposed an integrated waste recycling model based on digitalization.

Bin Zhang et al. (2018) researched the impact of the introduction of processing of industrial waste from the chemical industry in China on the financial performance of the corporation and revealed an increase in sales growth for the year.

Correa et al. (2019) conducted research about the possibility to recycle plastic waste and came to the conclusion that polyvinyl chloride waste is potentially suitable for reuse.

A lot of publication activity has been revealed in Russia - 19.5 thousand scientific publications have been identified on the Google Scholar platform. When writing the article, the works of the following authors were used:

According to Ivanova and Levchenko (2017), the Green Economy should be considered in two aspects: 1) as a trend in economic science, involving the simultaneous preservation and development of the biosphere and civilization; 2) as a way of conducting economic activity, which is aimed at improving the well-being of people without risks to the biosphere. The authors identified 7 areas of the Green Economy system and developed recommendations for "greening" the Russian economy.

Osipov and Kozyreva (2018) recommended adopting the best practices of developed countries in Europe and the USA on waste disposal and recycling to solve the problem of garbage in Russia.

Selisheva, (2018) justified the relevance of the transition of the countries of the Eurasian Economic Union (EAEU) to the Green Economy and revealed the features and problems of forming strategies for the transition to a "green" economy in the EAEU. The author notes that to develop a green economy, it is necessary to invest in green technologies.

Patina and Gorbanev (2019) suggested introducing the Green Economy ideas in Russia and CIS countries using foreign experience. The authors consider it necessary to form financing mechanisms for green development, which allows assessing the needs of society in the development of environmental infrastructure, taking into account losses from natural disasters and environmental damage from anthropogenic activities. They note that the transition to a resource-efficient low-carbon economy is at the heart of national environmental management strategies, which does not cover all aspects of the transition to a green economy but contributes to the search for new opportunities for the practical implementation of this concept.

Shamova et al. (2019), based on the analysis of the municipal solid waste (MSW) industry, identified its problems and threats to further development. The authors

concluded that the measures taken to reform the industry will not give the necessary effect, due to the lack of a nationwide waste sorting system. They believe that the absence of government intervention will lead to a decrease in the efficiency of the MSW processing industry - one of the most important elements of the Green Economy of Russia in the near future.

Vega et al. (2020) identified factors affecting the effectiveness of waste recycling projects, developed an organizational and economic model for the implementation of waste recycling processes, and formulated measures to stimulate the development of this area by the state.

Among Kazakh authors, the following can be noted. Kulumbetova (2017) conducted an analysis of unresolved environmental problems in the Republic of Kazakhstan (RK) and identified opportunities and prerequisites for the transition to the Green Economy, as well as problems hindering the development of green business in the country. The author proposed a comprehensive approach to overcome environmental and economic problems in order to successfully transition Kazakhstan to a green economy.

Tlepova and Mukhazhanova, (2017) identified important environmental problems of the Republic of Kazakhstan and priority areas for their solution with the help of the green economy at the first stage, which involves optimizing resource consumption and the development of environmental activities.

Nurseitov et al., (2018) justified the need to introduce the Green Economy in Kazakhstan. The authors analyzed the components of the resource base of Kazakhstan, investigated possible mechanisms and ways of introducing the Green Economy in the country, developed specific recommendations for the development of the Green Economy in Kazakhstan.

Yessirkepova et al., (2018) assessed the current state of the textile industry of the Republic of Kazakhstan from the production waste management perspective, focusing on the possibility of recycling textile industry waste from the perspective of the basic principles of the Green Economy.

Baizholova and Orynkanova, (2019) conducted a comparative analysis of the "green" and "brown" economies, and showed the advantages of a resource-saving model of the economy over an extensive export-raw materials. The authors, based on a SWOT analysis of the development of the Green Economy in Kazakhstan, identified promising areas for further formation of the Green Economy in Kazakhstan.

Laktionova & Iztaeva, (2019) analyzed the current status of the transition to a Green Economy, including the development of renewable energy, green construction, environmentally friendly transport, waste management, sustainable organic agriculture and rational use of water resources. The authors paid attention to the key risks, problems, and obstacles to the development of the Green Economy in Kazakhstan, and also developed recommendations for solving existing problems.

Seidakhmetov et al., (2019) formulated recommendations for the creation of an integrated waste management system in the enterprises of the textile industry of the Republic of Kazakhstan in the transition to the Green Economy.

According to Nurgisaeva et al., (2020), the Green Economy is a tool for achieving the sustainable development goals, while Green Growth is considered as a strategy for the development of the Green Economy. The authors identified common trends in understanding the concept of the Green Economy, Green Growth and sustainable development, and differences in representing the relations of the economy, society, and the environment in terms of the traditional economy and the model of the Green Economy.

In most scientific works, the general issues of the Green Economy (the formation of the theory, the essence, principles, problems), the experience of foreign countries, problems of agriculture, energy efficiency, and renewable energy sources are investigated. However, at the same time, there is not enough attention paid to the analysis of the current state and prospects of such a priority direction of the Concept for the transition of the Republic of Kazakhstan to the Green Economy as waste management.

Research Methodology

The object of the study is the waste sector of the Republic of Kazakhstan, while the subject is organizational and economic relations for the development of Green Business in this area. The literature review was conducted on the following keywords Green Economy and waste in the title, keywords, and annotation of the document in various databases such as Google, Google Scholar, Scopus, https://cyberleninka.ru, https://www.dissercat.com, etc.

The following methods were used in the course of the study: content analysis allowing to systematize scientific research on the Green Economy and waste sphere; analysis and synthesis which allowed to assess the state of the waste sphere and identify problems; comparative analysis of the level of solid waste processing which showed that Kazakhstan lags far behind the leading countries of the world while having the potential in the field of solid waste for development Green Business; graphical and tabular methods made it possible to visualize the results of the study. Moreover, the data of expert assessments, regulatory and policy documents, reporting, and statistical materials were also used.

Findings and Discussion

The Green Economy term first appeared in 1989 in the report for the Government of the United Kingdom "Blueprint for a Green Economy" (Pearce et al., 1989), but the definition and essence of this concept were not disclosed. To date, many different definitions of the Green Economy, which are presented in Table 1, have appeared.

Table 1. Various approaches to the definition of the Green Economy

№	Organization, document	Definition of the Green Economy
1	The concept of Kazakhstan's transition to a	"an economy with a high level of quality of life of the population, careful and rational use of natural resources in the interests of present and future generations in

	"green" economy (Zakon.kz, 2013)	accordance with the international environmental obligations adopted by the country"
2	UNEP (2009)	"These are economic activities related to the production, distribution and consumption of goods and services that lead to an improvement in the well-being of people in the long term, at the same time, without exposing future generations to significant environmental risks and reducing the shortage of environmental resources"
3	UNCTAD (2011)	"it is an economy that seeks long-term social benefits in short-term activities and leads to improved human well-being and reduced inequality without exposing future generations to significant environmental risks and environmental deficits"
4	Coalition for a Green Economy (2012)	"it is a sustainable economy that provides a better quality of life for everyone within environmental constraints"
5	International Chamber of Commerce (2011)	"an economy in which economic growth and environmental responsibility mutually reinforce each other while simultaneously supporting progress and social development"
6	United Nations Division for Sustainable Development (2011)	"a green economy is an economy that focuses on using opportunities to simultaneously advance economic and environmental goals"

Sources: Zakon.kz (2013), UNEP (2009), UNCTAD (2011), Green Economy coalition (2012), ICC (2011), UNDESA (2011).

In our opinion, the interpretation of the Green Economy in the Kazakh Concept given in Table 1 is generalized and vague; the other definitions of the Green Economy are very similar to the concept of sustainable development (SD) in the corresponding Concept recognized in the world and in Kazakhstan. In accordance with the objectives of our research, the following definition is the most successful: "Green Economy is an economy aimed at preserving the well–being of society through the efficient use of natural resources, as well as ensuring the return of end-use products to the production cycle" (Khamzina et.al., 2015). Thus, the Green Economy is based on closed cycles of resource use, where waste from one production is considered a resource for another. The main criteria for the transition to the Green Economy are the reduction, reuse, and processing of industrial products (Nandy et al., 2022).

Waste management is a priority task of the Concept for the transition of the Republic of Kazakhstan to the Green Economy, according to which by 2030 the share of solid waste processing in the country should be 40% of the total volume of their formation. Experts and the public of the country express concern that by now a large amount of production and consumption waste has been generated in Kazakhstan, which leads to environmental pollution and destruction of natural ecosystems. For example, carbon dioxide emissions from landfills in the republic, according to the International Center for Green Technologies and Investment Projects, reach 5.4 million tons per year. It should be noted that most of the waste without sorting and neutralization is simply transported to open landfills, 97% of which do not meet sanitary and environmental requirements. Along with this, in 2020, 8884 spontaneous garbage dumps were detected in the country with the help of space monitoring.

This negatively affects the health of the country's population, causing serious diseases, including cancer. In addition, when waste is generated, there is a significant loss of both material and energy resources of the republic.

The results of the marketing research of the NCO «Atameken» (Atameken.kz, n.d.) showed that there are a number of problems in the waste sector of the Republic of Kazakhstan (Figure 1).

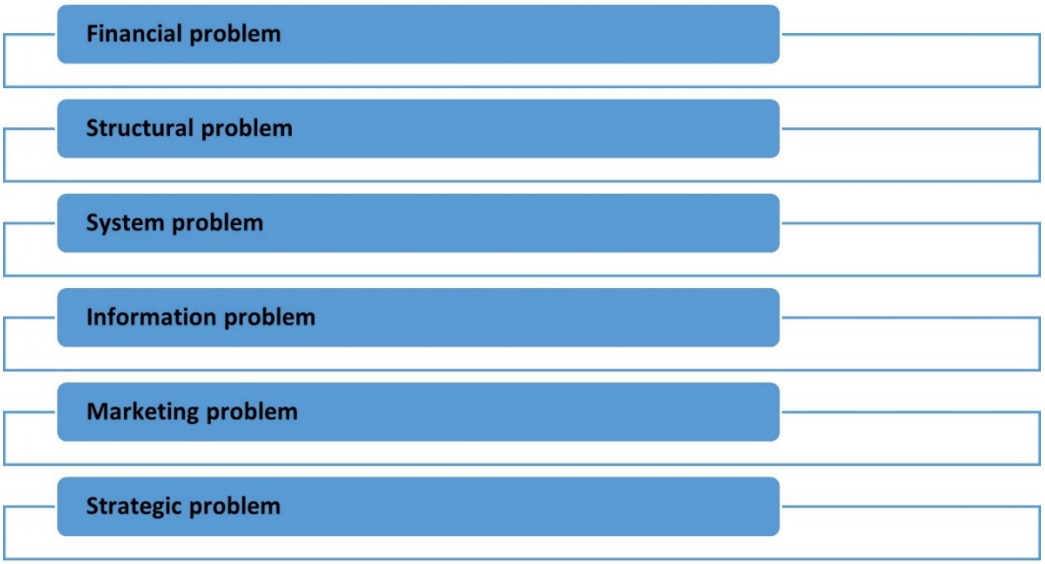

Figure 1. The main problems of the waste sector of the Republic of Kazakhstan

Source: Atameken.kz. (n.d.).

1. The financial problem lies in the fact that the main source of compensation for the costs of removal and disposal of solid waste is the payments of the population, low tariffs for waste disposal do not even cover the costs of removal and disposal of waste. Even though subsidies from their state budget are allocated, housing and communal services enterprises do not have the funds to create a proper system of separate collection. Along with this, there is no differentiation of the tariff for the disposal of separately collected garbage.

2. Structural problem. Most of the companies that carry out the disposal and processing of solid waste in the Republic of Kazakhstan are unprofitable; they spend their income mainly on urgent purposes and do not invest in innovative technologies to create modern waste management systems.

3. System problem. Currently, there is no comprehensive MSW management system in the country: several different, unrelated ministries deal with issues in this

area. During the study, we came across the fact that the statistics they provide on the formation, collection, and processing of waste vary significantly. In general, this prevents the proper solution to the problem of waste recycling. For example, in the EU countries, waste management activities are carried out by a single body – the Environmental Protection Agency.

4. Corporate problem. In the EU countries, MSW management is carried out by private companies together with municipal authorities, in Kazakhstan, the activities of private companies in the field of waste are limited to monopolistic companies. The experience of European countries shows that thanks to the mobility of private enterprises that can attract foreign investment to build a waste recycling plant, an effective waste management system has been created.

5. Information problem. A non-systematic approach to carrying out information and explanatory work on separate waste collection, and installation of containers. At the same time, there is an insufficient level of environmental awareness and culture of the main part of the country's population, which greatly affect the effectiveness of the separate collection of household garbage and hinder the development of entrepreneurship in the field of waste.

6. The marketing problem is associated with a fairly limited market for secondary raw materials: most waste processors have problems selling raw materials obtained from household waste. In certain countries such as: Germany, Austria, Belgium, Netherlands, and Sweden, in order to expand the recyclable market, a number of measures are applied: preferential lending to waste recycling enterprises; mandatory use of secondary raw materials in the production of new goods (in %); a certain advantage in the public procurement system for manufacturers and suppliers of products from recyclable materials or with its use.

7. The strategic problem lies in the absence of real plans for the long-term use of solid waste, indicating prescribed goals, measures to achieve them, deadlines, resources, and those responsible at the district level. This leads to non-systemic, episodic actions that do not make it possible to obtain tangible results to reduce waste generation and increase recycling.

We have analyzed the sphere of waste management into three main types: solid waste, municipal and industrial waste (Table 2).

Table 2. Waste generation and recycling in the Republic of Kazakhstan for the period 2015-2020

	Unit of measurement	2015	2016	2017	2018	2019	2020
Solid household waste							
SHW generation	thousand tons	5467,3	5400,9	4864,3	4319,2	4736,6	4551,7
Share of recycling and reuse	%	1,8	2,6	9,0	11,5	14,9	18,6
Municipal waste							
Municipal waste generation	thousand tons	3235,5	2813,6	3415,0	3692,0	3674,0	3708,5
Share of recycling and reuse	%	11,5	12,3	13,0	11,6	10,Э9	20,5
Industrial waste							
Industrial waste	thousand tons	982236,4	792860	737342,6	830271	868646	759905

generation							
Share of recycling and reuse	%	23,1	26,8	30,9	32,2	34,0	36,0
Hazardous waste							
Hazardous waste generation	thousand tons	251565,7	151391,1	126874,6	149962,4	180506,7	137828
Share of recycling and reuse	%	29,6	22,2	-	20,0	20,3	22,0

Source: Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2020).

Table 2 shows that an average of about 5 million tons of solid waste and 828 million tons of industrial waste, including hazardous waste, are generated annually in Kazakhstan. In 2020, on average, 242.7 kg of SHW and 40,516 kg of industrial waste accounted for one citizen of Kazakhstan. At the same time, there is a rather low level of processing of production and consumption waste. Despite a slight increase in the share of recycling compared to 2015, in 2020 these indicators remain at a fairly low level: for solid waste - only 18.6%, for municipal waste – 20.5%, for hazardous – 22%, for industrial – 36%.

For comparison, 66% of waste was recycled in Germany, 57.6% in Austria, 53.5% in Belgium, 53.1% in the Netherlands, 48.9% in Sweden, 45% in Japan, 41.7% in France (Tishchenko, 2018).

Foreign experience shows that waste recycling is a source of profit and the emergence of additional jobs. According to Frost&Sullivan, in 2018, the volume of the global market for processing solid waste, industrial and construction waste reached 282.1 billion US dollars (Chernysheva, 2019). For example, in Germany, the annual income of the waste recycling industry amounted to about 40 million euros, more than 200 thousand people worked in this industry (Shalginsky, 2022). There are over 56 thousand waste processing enterprises operating in the USA, with an annual income of about 240 billion US dollars (TASS, 2022, March 24).

From the above data, it can be seen that waste recycling is a fairly profitable type of environmental entrepreneurship, the so-called "green" business. In this regard, it is necessary to create conditions for the development of small and medium-sized businesses in the waste sector of Kazakhstan. The development of "green" business will allow, on the one hand, to solve the main problems of this industry and improve the environmental situation in the country; on the other, to rationally use the available natural resources and improve environmental protection measures of the Republic of Kazakhstan.

It should be noted that the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan plans to burn garbage to reduce the volume of waste, followed by electricity generation and transmission to the city power grid according to the Waste to Energy mechanism. 185 billion tenge of investments will be allocated from the state budget for the construction of six incinerators with a total capacity of 100.8 MW, which will be put into operation in 2025 (Abylgazina, 2021).

Analysis of publications and expert opinions has shown that incineration is not the only and far from safe method of waste disposal (Gordyshevsky, 2020; Kusanova, 2021). The best practices of the EU countries, the USA and Japan indicate that the most optimal is a combined method of waste management: recycling of recyclable waste and incineration of the remaining. Burial at landfills, especially those that do not meet the requirements, as is customary in our country, is characteristic of lagging countries.

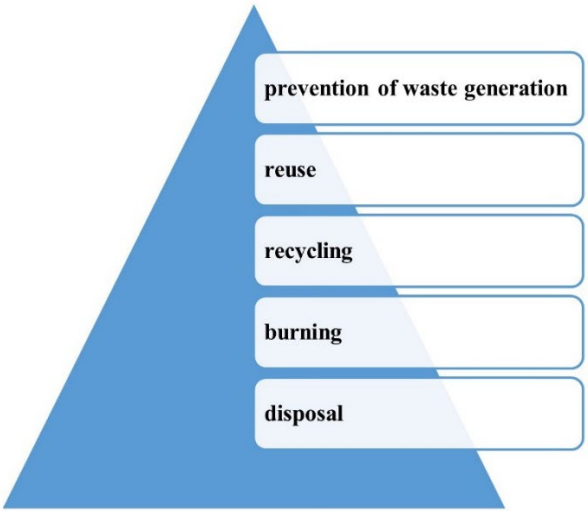

Figure 2. European model of the hierarchy of waste management methods

Source: Compiled by the author based on Directive of the European Parliament and of the Council on waste (2008/98/EC).

For example, in the EU countries, a Waste Hierarchy is used Framework Directive, which includes different methods of step-by-step waste management (Figure 2).

Figure 2 shows that the most preferred way of waste management is to prevent their formation. This is followed by pre-processing, which facilitates their reuse. Then the waste is sent for processing to obtain secondary material resources if there is no such possibility – for processing to obtain energy. And, finally, the last option for waste disposal is the direction for placement (burial) at landfills.

In Europe, incineration and burial are considered the least preferred methods of waste disposal, as they negatively affect the state of the environment. In addition, during incineration, a certain threat is created for residents of settlements that are located near the incineration complexes.

It is recommended for Kazakhstan is to adopt the experience of those countries of the world where waste is divided into fractions and processed into secondary raw materials with further production of finished products. Table 3 shows how the problem of the growth of agricultural, industrial; livestock, and solid waste can be solved by converting them into various types of energy, including biofuels.

Table 3. Foreign experience in waste processing into energy

№	Type of waste	Processing methods	Output Products	Usage, countries
1	Agricultural waste	- physical (drying, pressing, granulating) - chemical (roasting, gasification, carbonization)	Biofuel pellets, biochar, Biogas	Heat supply (Taiwan, Denmark)
2	Industry waste	-chemical (gasification, combustion, pyrolysis) - biological method (biomass processing)	Thermal energy, electricity Biogas (methanol)	For National Energy Center (Taiwan)
3	Animal waste	-chemical (gasification, combustion) -biological (fermentation, fermentation,)	Thermal energy, electricity Biogas (H_2, methanol)	Biogas production (Germany, Sweden)
4	Municipal solid waste (MSW)	- chemical (burning) -biological (fermentation, fermentation, composting)	Thermal energy Biogas (H_2, methanol)	For district energy centers (USA, Taiwan)

Source: (Osipov, et al. 2018).

Based on the conducted research, we concluded that the effective waste management in Kazakhstan, it is necessary to take several measures of state support for business in this area:

- adopt the Law of the Republic of Kazakhstan "On Waste", which will regulate activities in the field of waste management;

- introduce safe waste disposal with the help of stricter requirements for landfills;

- more actively involve the population in the separate collection of household waste;

- strictly control the separate collection of hazardous waste to prevent their disposal and disposal in landfills;

- instead of incineration and disposal of waste, encourage entrepreneurial activities for waste recycling using circular business models;

- motivate manufacturers to reuse waste as recyclable materials until the full extraction of useful components;

- create opportunities for entrepreneurs to;

- to carry out waste disposal at the expense of the manufacturer (Huseynova, 2022).

Conclusion

A comprehensive analysis of the literature has shown that most countries of the world, including Kazakhstan, have chosen a course for a Green Economy to solve ecological and economic problems and sustainable development. Based on the analysis of various definitions of the Green Economy, the approach is justified from the standpoint of multiple uses of resources, when waste from one production becomes raw materials for another.

The study revealed that the existing waste management system in Kazakhstan is inefficient. The country is experiencing an annual increase in the volume of formation and accumulation of solid household waste (in 2020 - over 4.5 million tons) and industrial waste (over 759 million tons). Most of the waste without prior sorting and separate collection is exported to landfills, the total area of which

occupies 16 thousand hectares of land. Experts note that most of the existing landfills (97%) do not meet the requirements of sanitary and environmental standards. Along with this, 8884 spontaneous garbage dumps have been identified with the help of space monitoring.

It should be noted that despite the presence of waste collection points, separate collection, and sorting of waste into different types and fractions has not been established in most of the country. This fact complicates the development of entrepreneurial activities for the processing of waste and secondary raw materials, the level of processing of industrial waste is 36%, and solid waste is 18.6%, whereas in developed countries of the world it is over 60%.

The problems inherent in the waste sphere (financial, structural, systemic, corporate, informational, marketing, strategic) are identified and characterized. A set of measures to stimulate entrepreneurial activity in the waste sector of the Republic of Kazakhstan is proposed.

Limitations and Suggestions for Future Research

However, this study has some limitations: there is no proper state support and economic incentives for the full development of a business for recycling waste into secondary raw materials, producing finished products from waste, or using waste. Not all entrepreneurs know the principles and innovative business models of the circular economy. In this regard, further research is needed to develop a mechanism for state support and stimulation of the waste recycling business, and an analysis of the possibilities of using principles and business models in the waste sector of the Republic of Kazakhstan.

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