Artificial Intelligence to Improve the Business Efficiency and Effectiveness for Enterprises in Kazakhstan

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Abstract - The main objective of the research is identifying the effectiveness of artificial intelligence in the business sphere of Kazakhstan. The urgency of this problem is due to the fact that the Kazakhstani market for artificial intelligence is at the initial stage of development. The main obstacle to the introduction of artificial intelligence is the unpreparedness of managers of small and medium-sized businesses for the application of artificial intelligence technologies and, of course, the high cost of their implementation. In the study, we proceeded from the key thesis that business in Kazakhstan is striving for digital transformation.

We set a goal to determine the attitude and degree of readiness of Kazakhstani business to the implementation and practical application of artificial intelligence, to describe the cases of using artificial intelligence by Kazakhstani business, to identify the main questions that arise in business at this stage, to study the legal aspects of using artificial intelligence in business and to present the big picture compliance / inconsistency of the existing legal framework with the goals and objectives of the development of artificial intelligence, provide recommendations for eliminating existing barriers and stimulating businesses to implement the technology.

Within the framework of this study, the concept of artificial intelligence is defined in its broadest sense - as a set of technologies for processing various types of data and information, in particular those capable of interpreting such data, extracting knowledge and using it to achieve certain goals.

Keywords – Artificial intelligence, digital transformation, artificial intelligence in business, applications, technologies.

1. Introduction

Artificial intelligence (hereinafter - AI) is widely used in many areas of human life: in household appliances, “smart” electronics, financial management, data analysis, and programming.

Artificial intelligence refers to the ability of software to perform manipulations similar to actions carried out under the control of the human brain. [2]

Artificial intelligence is an information system designed to empower computers with human-imitating abilities: hearing, vision, and learning. Thus, artificial intelligence is an information-computer system built on the basis of human brain and perceptual activity and capable of perceiving the environment, information, learning and responding to external influences, imitating a person [4].

However, while artificial intelligence mimics human behavior, terms such as "intelligence" and "consciousness" are not identical. The concept of "consciousness" means goal-setting, self-will, self-awareness, the ability to build cause-and-effect relationships, emotions and intuition. Business seeks to use robots instead of people and to attract investment for the robotization of production processes at an enterprise for various reasons. For example, such as ensuring consistently high-quality products; reduction of the production cycle; growth in production volumes; increased technological
flexibility of production; saving of production space; reduction of staff turnover and minimization of problems associated with the human factor; maximizing profits by saving on costs [6]. Entrepreneurs have a need to use this tool to maintain competitiveness and develop their subsystems, which prompts states to join the technological race in order to stimulate the economy, strengthen their geopolitical positions, and improve the living standards of the population. This opinion is shared by the leaders of states, as well as the heads of the largest corporations [10].

In February 2019, Donald Trump announced the American AI Initiative program to develop the field of artificial intelligence, which is extremely important for the preservation of the economic and national security of the United States. CPC General Secretary Xi Jinping is also confident of the enormous potential of AI technology, stating, "By 2030, we must have the theory, technology and application of artificial intelligence at the leading global level."

The business models that exist today lead us to further use the collected information for making management decisions, for entering the business into the digital economy and virtual environment. To date, interest in artificial intelligence has grown significantly, and therefore, financial investments in this area have also increased [8].

The role of AI in the entertainment and media industries is noteworthy. PwC’s worldwide survey of the industry notes that this technology is needed for two reasons. First, it is the creation of new products, services and platforms: the set of media products used by content consumers is already based on input from data analysis by computer programs. For example, the recommendation system on the Spotify music platform is built using artificial intelligence technologies [7]. Second, the role of demand: consumers value customization and personalization in the process of consuming content, communicating with companies and engaging in commercial relationships with them. As part of research conducted in the European Union, more than 55% of millennial respondents say that when choosing media products, they want to be guided by the list compiled using artificial intelligence technologies or using a bot [5].

In the entertainment and media business, there is no clear strategy for implementing artificial intelligence technologies. The key to understanding in what directions this technology can help, support, optimize processes and sometimes replace human labor lies in studying the practices used by other companies [6].

2. Method of Russian Experts

The use of artificial intelligence in the real estate sector has the potential to improve operational efficiency and change decision-making processes [1]. By recognizing interconnections and patterns in large data sets, it is possible to study in more detail the consequences of possible scenarios for future development. Subjective assessment is replaced by conclusions based on actual data, according to which informed decisions are made taking into account the specifics of a particular property. The so-called “smart contracts” allow us to extract the necessary information from contracts and documents and use it efficiently, reducing labor costs and the time of the transaction. Algorithms can check the completeness of virtual data warehouses or, if the database is sufficiently developed, identify suitable investment targets in accordance with the portfolio matrix. In asset management, AI applications range from personalized customer contracts and contract management to intelligent construction services management. Possible applications of artificial intelligence include: simplified interaction, transactions between participants, supply chain management and data management [6].

The retail industry is seeing significant changes in the shopping experience. Many manufacturers are using AI to improve the quality of interactions with a large number of consumers in a mobile environment. Algorithms that can help a shopper choose a product based on past interactions are driving revenue for retailers. In 2018, 35% of all revenue came from AI-based recommendation, which is 25% more than in 2017. Most importantly, this 35% of revenue comes from 6% of shoppers on holidays, meaning shoppers who receive the right recommendations make a significant proportion of their purchases. In addition, research from Salesforce.com shows that 82% of customers are willing to provide information about themselves in exchange for combining personal and online experiences.

We have reviewed about 50 different articles on the EbscoHost database. And we found a very interesting article that is perfect for research on our topic.

At the beginning of 2019, RAEC and NRU HSE, with the support of Microsoft, conducted a study on the use of technologies and solutions based on artificial intelligence by Russian business “Digital economy from theory to practice: how Russian business uses artificial intelligence”. The study showed that Russia is among the countries with a high potential for the introduction of artificial intelligence. Industries or leaders in the implementation and use of artificial intelligence in Russia are industrial production, banks, telecommunications and retail.
The study showed that 56% of Russian retailers are already using technologies and solutions based on artificial intelligence, and another 23% are planning to start within 5 years. Thus, by 2024, technologies and solutions based on artificial intelligence will be used by 87% of Russian retailers, entrepreneurs.

This study used quantitative and qualitative expert interview methods. Representatives of small enterprises acted as experts. This methodology helps to determine the effectiveness of using artificial intelligence in business, and also shows how promising it is.

At the same time, the work required for the full-scale implementation of artificial intelligence in the company's activities has been fully completed only for individual retailers: only 3% of respondents noted that their company has fully completed the development of procedures and processes for using artificial intelligence, 5% - identification of risks and 7% - identifying clear roles and responsibilities for implementing artificial intelligence. The greatest challenge for retailers is the development of policies, procedures and processes, and the designation of roles and responsibilities for implementation.

This methodology helps to determine the effectiveness of using artificial intelligence in business, and also shows how promising it is. The main challenges in the implementation of artificial intelligence for Russian entrepreneurs are the need to change existing business models - this is what 40% of respondents answered, as well as distrust of decisions made by artificial intelligence (29%) and financial constraints (25%).

We came to the conclusion that this methodology is very well suited to reveal and show the effectiveness of artificial intelligence in the business sphere of Kazakhstan. We came to the question: “How does AI affect business efficiency?” We are going to answer this question by drawing conclusions from the result of our research.

3. Qualitative Research

In the study, we proceeded from the key thesis that business in Kazakhstan is striving for digital transformation. We set a goal to determine the attitude and degree of readiness of Kazakhstani business to the implementation and practical application of artificial intelligence, to describe the cases of using artificial intelligence by Kazakhstan business, to identify the main questions that arise in business at this stage, to study the legal aspects of using artificial intelligence in business and present the big picture compliance / inconsistency of the existing legal framework with the goals and objectives of the development of artificial intelligence, provide recommendations for eliminating existing barriers and stimulating businesses to implement the technology.

Based on the research conducted by experts from Russia, we are planning to conduct interviews with experts in the field of retail.

Sample: For our research we are going to use 18 experts in retail or small businesses around Kazakhstan. Most of them are our friends. We are going to interview them online, as in nowadays it is much easier to do.

Methodology and method: for this study, we decided to use the methodology of our colleagues from Russia. The basic principle is to approach research with a descriptive research method, where we plan to conduct the interview, and then show the results in charts and graphs.

4. Research design: Interviews

For this study, we decided to choose a descriptive research method. It is a scientific method that involves observing and describing a participant's behavior without influencing them in any way.

We are going to use quantitative and qualitative expert interview methods. We will also analyze the secondary data. The study experts will be representatives of Kazakhstani online and offline retail.

The qualitative part of the study includes:

- one group focused interview with 10 experts.
- 8 individual focused interviews the average interview duration is 30 minutes.

Interviews were taken either face-to-face or online using Skype. The quantitative part of the study includes an online survey conducted from January 20 to January 27, 2021. The number of completed interviews is 30/50. The total number of questions in the questionnaire is 6. The average filling time is about 10 minutes. At the moment, 56% of respondents are offline and online retail, 29% are online retail, 13% are offline retail, and 2% are analyst experts in the field of retail and e-commerce.

The main questions from the interview, which we will further be revealed:

- What are the three main challenges related to the development of artificial intelligence in the state sector of the Kazakhstani economy?
- What are the three main challenges related to the development of artificial intelligence in your industry?
- What are the risks of introducing artificial intelligence technologies, in Kazakhstani companies?
- Should the development, implementation and use of artificial intelligence technologies stay at the state level?
How do you think development should be regulated, the introduction and use of artificial intelligence technologies?

What tasks, in your opinion, the regulation should solve artificial intelligence?

The results of these questions are presented graphically in the research results. These questions will help determine how effective artificial intelligence is in the business area. The interviewed candidates answered the questions based on their extensive experience.

5. Research Results and Analysis: AI’s Effectiveness in Business Sphere of Kazakhstan

Kazakhstan retail companies are actively introducing AI into their business processes. According to the results of the survey, 42% of Kazakhstani retailers are already using technologies and solutions based on AI, another 35% plan to use them within the next 5 years.

Thus, it is expected that by 2024, 77% of Kazakhstani retailers will use technologies and solutions based on AI in their activities. The pace of adaptation of AI by Kazakhstan retail coincides with global trends: according to a global survey of 1900 retailers in 23 countries of the world, conducted by the IBM Institute for Business Value and Oxford Economic, today 40% of retailers around the world use AI-based technologies and solutions, in 5 years this number will reach 79%.

The main incentives for the introduction of AI by Kazakhstani retail are market stimulation, increased requirements for the quality of service from consumers, as expected, the introduction of artificial intelligence on companies and the industry as a whole. Despite the fact that the degree of adaptation of solutions and technologies based on AI in Kazakhstan retail is quite high, the research data show that complex projects for the introduction of AI are still in the early stages of implementation. In a third of the companies surveyed, systematic work on assessing the risks and benefits of introducing AI technologies, drawing up plans and reorganizing business processes has just begun or less than half of the work has been done.

Only 2% of respondents indicated that their company has fully completed the development of procedures and processes for using AI, 3% - identification of risks and 4% - designation of clear roles and responsibilities for the implementation of artificial intelligence. Kazakhstan retail companies have advanced the most in studying practical examples of using AI - in 28% of them, work is close to completion or fully completed.

This means that today AI in Kazakhstan retail is used rather fragmentarily, without a systemic reorganization of the business. However, under the influence of digital transformation in the next 5 years, we can expect the full-scale use of AI in various business processes, including those requiring intersystem integrations and external interaction. Experts emphasize segmentation in relation to the use of AI among Kazakhstani retail companies. At the top of the pyramid are large players, companies that have been involved in the digitalization process for a long time and have accumulated large amounts of data. They also have a staff of specialists with the necessary competencies in order to implement and develop solutions based on AI.

If we compare the degree of readiness for the integrated implementation of AI of Kazakhstani retail companies and Kazakhstani business in general, we can conclude that Kazakhstani retail is more involved in the digital transformation process.
The results of the survey showed that Kazakhstani retail is more likely to use AI in internal business processes, while Kazakhstani businesses are more likely to use AI in interaction with customers. The most common area of application of AI among Kazakhstani retailers is the accumulation of knowledge: this direction was indicated by 24% of respondents. Research and development are in second place in the use of AI - 19% of respondents, in third - predictive analytics (forecasting demand and stocks, preventive maintenance, etc.) - 16% of respondents. Also, among the most frequently mentioned areas of use, Kazakhstani retailers indicate personnel management, finance and accounting, legal functions, while, according to the study "Digital Economy from Theory to Practice: How Kazakhstani Business Uses Artificial Intelligence", Kazakhstani business in general is more less common uses AI in these areas.

Only 8% of Kazakhstani retailers use AI for profiling, target audience analysis, finding new customers, etc., 5% use AI in the field of customer service (individual offers, discounts, product selection, etc.). On the contrary, among companies in Kazakhstan business, customer service and customer service are one of the main areas of using AI in the company's activities. Interviews with experts confirmed and clarified the thesis that the use of AI in working with clients is currently an important area only in large companies, in which various types of data have been successfully collected and digitized for a long time, on the basis of which AI solutions are subsequently implemented. In the next 5 years, the field of predictive analytics will come out on top in the use of AI among Kazakh retailers - 42% of respondents say about the use of AI in this area. The accumulation of knowledge and research and development will take 2-3 places in terms of application. 38% of respondents speak about their use in 5 years. The most widely used AI technology in Kazakhstani retail today is intelligent decision support. The use of this technology in the company was indicated by 21% of respondents.

The most frequently used AI-based solution in Kazakhstan retail is personalization. 26% of respondents said that they were using this solution. 56% of Kazakhstani retailers see improved business communications as the main benefit of using AI technologies.
To date, there is no single approach to assessing the effectiveness of the implementation of artificial intelligence technologies in Kazakhstan retail companies. Various evaluation criteria are used, the most common of which are the satisfaction of customers, partners and/or investors (36% of respondents indicated that this criterion was used), and also achieving the expected return on investment (ROI), which is used in companies by 32% of respondents.

The main challenge associated with the use of AI for Kazakhstani retailers is the need to change existing business models. That was the answer of 35% of the surveyed experts.

According to the results of a survey of Kazakhstani retailers, in the next 5 years, artificial intelligence will have a significant impact on the innovative development of Kazakhstani retail: 84% of respondents expect the activation of innovative processes, the introduction of new ways of doing business and the emergence of new areas for realizing potential, 76% predict such changes in companies.

According to the predictions of the respondents, AI will have the least impact on job creation: only 38% expect new jobs to be created in their companies. However, with 52% of respondents say that, new jobs will appear in the retail industry.

We assume that the more significant the impact of AI on employment in the retail industry in relation to individual companies is associated with the emergence of new businesses and new professions due to expanding the use of AI and developing the digital transformation process in Kazakhstan.

6. Research Discussions: Artificial Intelligence is Effective

The study showed that 42% of Kazakhstan retailers are already using technologies and solutions based on artificial intelligence, and another 35% are planning...
to start within the next 5 years. Thus, by 2024, technologies and solutions based on artificial intelligence will be used by 77% of Kazakhstan retailers. At the same time, the work required for the full-scale implementation of artificial intelligence in the company's activities has been fully completed only for individual retailers: only 2% of respondents noted that their company has fully completed the development of procedures and processes for using artificial intelligence, 3% - identification of risks and 4% - identifying clear roles and responsibilities for implementing artificial intelligence. The greatest challenges for retailers are the development of policies, procedures and processes, as well as the designation of roles and responsibilities for the implementation of appropriate technologies and solutions.

In a third of the companies surveyed, systematic work on assessing the risks and benefits from the introduction of artificial intelligence technologies, drawing up plans and reorganizing business processes has just begun, or less than half of the work has been done. This means that today artificial intelligence in Kazakhstani retail is used rather fragmentarily, without systemic business reorganization. However, according to the study, in the next 5 years, we can expect the full-scale use of artificial intelligence in various business processes, including those requiring intersystem integrations and external interaction. The most popular AI-based solution among Kazakhstan retailers is personalization: 26% of respondents noted that personalization is used in their companies. Also widely used are solutions such as virtual assistants and chatbots (23% of respondents), intelligent decision-making systems and predictive analytics (20% of respondents). In a five-year perspective, the majority of respondents plan to use analytical solutions based on artificial intelligence to identify patterns and deviations (36%), despite the fact that today only 13% of companies use them. Solutions for personalization (35%) and chatbots (35%) will remain relevant. Among the main risks of implementation, 39% of respondents identified reputational risks (the impact on the brand image of unsuccessful cases, the consequences of decisions made by artificial intelligence, etc.).

The same number of respondents (39%) pointed to the security risk of using artificial intelligence.

Research "Artificial Intelligence in Retail: Business Practice" 28% of respondents noted the risk of inconsistency between the benefits received from the implementation of artificial intelligence and the costs of the implementation project. The main challenges in the implementation of artificial intelligence for Kazakhstan retailers are the need to change existing business models - this is what 35% of respondents answered, as well as distrust in the decisions made by artificial intelligence (33%) and financial constraints (30%).

Industrial enterprises are actively introducing tools to automate internal and production processes. Recommender services are used at all stages of the production process both to monitor current processes and to predict future events. Experts believe that the main advantages of introducing artificial intelligence technologies for Kazakhstan business are the optimization of business processes - 58% of respondents chose this option, the development of new products and services - 49%, an increase in labor productivity - 41%. Expectations for the development of artificial intelligence in the public sector are associated primarily with improving the quality of public services - 65% of respondents, as well as improving interaction with citizens, increasing their satisfaction - 51%.

This study has shown that that, despite of fact that Kazakhstan below than other developed countries developed on the path AI transformation, the current level of AI penetration in Kazakhstani retail is close to the global one. Trends and processes that are observed in global retail can be traced and in Kazakhstan companies in this industry.

State support is a significant incentive for development of AI in Kazakhstan. On the other hand, the business itself is aware of the need implementation of intelligent solutions, and the emergence of successful domestic cases attracts the use of AI those companies that previously belonged to him with distrust. Kazakhstani companies are beginning to use AI consciously, realizing the benefits and benefits from implementation and taking into account existing risks. This means that Kazakhstan has every opportunity to become one of the world leaders in the field of artificial intelligence.

7. Research Conclusions: The future of Artificial Intelligence

Today in Kazakhstan, as in the whole world, the interest in artificial intelligence is huge: the leading countries of the world are developing strategies for the development of AI, technology is discussed at all possible levels - from scientific conferences to social networks. At the same time, there is no generally accepted understanding and unified definition of what artificial intelligence is. As a result, the attitude of society and industry towards technology is still ambiguous: questions remain regarding the safety of the use of technology, its impact on social well-being and human rights (in particular, the right to privacy). Business and government structures in Kazakhstan have already come to understand the benefits that the introduction of artificial intelligence technology
brings, but most business representatives do not yet fully understand how exactly the technology should be applied in order to achieve the results they need. The situation is gradually changing with the start of discussion of this topic at the highest government levels, as well as with the emergence of various successful cases of using artificial intelligence [9].

Like any new technology, the market for which is in the development stage, artificial intelligence technology needs support rather than total regulation. Considering the pace of development and breadth of application of this technology, as well as the complexity of defining the universal term for artificial intelligence, a more adequate approach to its regulation today seems to be an approach aimed at regulating specific systems and areas of application of artificial intelligence and eliminating existing regulatory barriers to the development of technology. [3] At the same time, a framework concept for the development of artificial intelligence can be created with the introduction of basic provisions that are universal: security; basic criteria and rules related to the creation and functioning of artificial intelligence systems; liability and risk insurance issues. When developing standards for artificial intelligence at the national level, it is necessary to ensure their harmonization with international standards in this area. To streamline the use of robots and devices that use artificial intelligence systems, it is necessary to introduce clear criteria for issuing permits (licenses) for their use. It is necessary to consolidate in Kazakhstan legislation within the framework of public consensus of the regime for protecting commercial secrets and patents for algorithms (by analogy with the regimes protection of medicinal drugs).

At this stage of development of artificial intelligence, the task of the state is, first of all, to find together with the expert community, the best option for regulating the field of artificial intelligence, which would not only contribute to the development of technologies, but also minimize the risks associated with the use of artificial intelligence [6]. Answering the most important question of our research, we can confidently state that artificial intelligence has an effective impact on business. Based on the results of the work done, in particular the interviews, we can see that the potential of artificial intelligence in our country is quite high. Even now, many organizations and small businesses are using artificial intelligence to improve their efficiency. We assumed what could happen in 5 years, therefore the questionnaire included questions concerning the future of artificial intelligence in Kazakhstan. The results were positive. Therefore, we can conclude that artificial intelligence has an effective impact on the business sphere of Kazakhstan and will flourish in the next 5 years.

References

[1] Brooks, R. A. (1991). Intelligence without representation. Artificial intelligence, 47(1-3), 139-159. https://doi.org/10.1016/0004-3702(91)90053-M
[2] Chernov, A., & Chernova, V. (2019). Artificial Intelligence In Management: Challenges And Opportunities. Economic and Social Development: Book of Proceedings, 133-140.
[3] Nilsson, N. (2010). The quest for artificial intelligence: A history of ideas and achievements. Cambridge University Press. https://doi.org/10.1017/CBO9780511819346
[4] Al-Zahrani, A., & Marghalani, A. (2018, April 25). How Artificial Intelligent Transform Business. Retrieved from: https://ssrn.com/abstract=3226264 [accessed: 10 December 2020].
[5] El Namaki, M. S. S. (2016). How companies are applying AI to the business strategy formulation. The Conversation. https://doi.org/10.19085/journal.siibpo50801
[6] Noponen, N. (2019). Impact of artificial intelligence on management. Electronic Journal of Business Ethics and Organization Studies, 24(2).
[7] Nordlander, T. E., & Nordlander, T. E. (2001). AI surveying: Artificial intelligence in business. Department of Management Science and Statistics-Montfort University.
[8] Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2019). Impact of artificial intelligence on businesses: from research, innovation, market deployment to future shifts in business models. arXiv preprint arXiv:1905.02092.
[9] Voronina, K. (2015, November 6). An operating system with artificial intelligence has been developed in Kazakhstan. Retrieved from: https://www.kazpravda.kz/interviews/view/dios/ [accessed: 15 December 2020].
[10] Wamba-Taguimdje, S. L., Wamba, S. F., Kamdjoug, J. R. K., & Wanko, C. E. T. (2020). Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects. Business Process Management Journal. https://doi.org/10.1108/BPMJ-10-2019-0411