IRSTI 19.71 https://doi.org/10.26577/HJ.2022.v64.i2.08

S.M. Ayapova, A.I. Skripnikova*

Al-Farabi Kazakh National University, Kazakhstan, Almaty,
*e-mail: sai.kz@mail.ru

AI AND HUMAN CREATED MEDIA TEXTS: EXPERIMENT RESULTS

Abstract. Many journalists and experts are concerned about how widespread of AI-machines may affect the world of information. Changes can affect both the journalists themselves and the audiences. There are already a number of projects in Kazakhstan introducing the AI usage, however, they do not relate to journalism. Texts created by AI are still not typical for the domestic media sector. In order to understand how Kazakhstani consumers of information relate to such texts, we conducted an experiment based on an electronic questionnaire (the main research method). There was no data in the domestic scientific literature on the question whether people are able to distinguish the text written by AI from the text written by a real journalist. This research question formed the basis of our experiment.

The purpose of the study is to determine the qualities of a journalistic text that make it possible to distinguish it from a robotic text. The scientific significance is due to the relevance of the topic, the interdisciplinary direction of work. Practical significance lies in the ability to use data in several scientific fields. The results show that the majority of media consumers (135 participants out of 153) were able to distinguish two texts and identify which of them belongs to the robot. Additionally, according to the answers, Kazakhstani mediaconsumers are not ready for the appearance of AI texts in the mass media, they consider them poor quality, incomprehensible, logically unrelated and, in principle, respondents prefer texts written by a person – a professional journalist. Most likely, this trend will continue over the next several years. This work contributes to solving the problem of using AI in the media sphere.

Key words: journalism, AI, media text, mass media, robo-journalism.

С.М. Аяпова, А.И. Скрипникова*

Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан

*e-mail: sai.kz@mail.ru

Жасанды интеллект және адам әзірлеген БАҚ мәтіндері: эксперимент нәтижелері

Түсініктеме: көптеген журналистер мен сарапшыларды ақпарат әлеміне, жасанды интеллектінің (ЖИ) таралуы алаңдатып отыр. Сөзсіз өзгерістер журналистердің өздеріне және аудиторияға әсерін тигізеді. Қазақстанда жасанды интеллектіні пайдалануға, бірқатар жобалар жүзеге асырылды, бірақ олар журналистика сапасын қарастырмайды. Машиналар жасаған мәтіндер, әлі күнге дейін отандық медиа секторы үшін қолайлы емес. Қазақстандық ақпаратты тұтынушылардың мұндай мәтіндерге көз қарасын түсіну үшін электронды сауалнама негізінде эксперимент жүргіздік (негізгі зерттеу әдісі). Жазған мәтінді, жасанды интеллект, немесе журналист жазғанын, қарапайым қазақстандықтардың айыра алатындағы, бұған дейін, отандық ғылыми әдебиеттерде мәліметтер тіркелмеген. Әрине, бұл зерттелу сұрағы біздің жасалған экспериментімізге негіз болды. Зерттеу Мақсаты – журналисттік мәтіннің саласын анықтау, оны роботтандырылған мәтіннен ажырату.

Ғылыми маңыздылығы, тақырыптың өзектілігі мен жұмыстың пән аралығына негізделген. Оның практикалық маңыздылығы деректерді бірнеше ғылыми салаларда қолдануға болатындығы. Нәтижелер бойынша көптеген отандық медиа тұтынышылар (153 қатысушыдан 135-і) екі мәтінді ажыратып, соның ішінде қайсысының робот жазғанын анықтай алғанын көрсетті. Сонымен қатар, алынған мәліметтерге сәйкес, қазақстандық аудитория, жасанды интеллект мәтіндерінің бұқаралық ақпараттар құралдарында пайда болуына дайын емес, оларды сапасыз, түсініксіз, логикалық байланысы жоқ деп санап, респонденттер кәсіби журналист жазған мәтіндерді жоғары бағалап ерекше көреді. Бұл тенденция шамасы алдағы бірнеше жылда сақталады.

Түйін сөздер: журналистика, жасанды интеллект, медиа-мәтін, БАҚ, робо-журналистика.

С.М. Аяпова, А.И. Скрипникова*
Казахский национальный университет имени аль-Фараби, Казахстан, г. Алматы,
*e-mail: sai.kz@mail.ru

Медиатексты, созданные искусственным интеллектом и человеком: результаты эксперимента

Многие журналисты и эксперты обеспокоены тем, как широкое распространение искусственного интеллекта (ИИ) может повлиять на мир информации. Неизбежные изменения коснутся как самих журналистов, так и аудиторий. В Казахстане уже внедрен ряд проектов по использованию ИИ, однако они не затрагивают сферу журналистики. Тексты, созданные машинами, все еще нетипичны для отечественного медиасектора. Чтобы понять, как казахстанские потребители информации относятся к подобным текстам, мы провели эксперимент, базирующийся на электронном опроснике (основной метод исследования). Ранее в отечественной научной литературе не было зафиксировано данных о том, способны ли рядовые казахстанцы отличить текст, написанный ИИ, от текста, написанного реальным журналистом. Этот исследовательский вопрос и лег в основу нашего эксперимента**. Цель** исследования – определить качества журналистского текста, которые позволяют отличить его от роботизированного текста. **Научная значимость** обусловлена актуальностью темы, междисциплинарным направлением работы. **Практическая значимость** заключается в возможности использовать данные в нескольких научных областях. Результаты свидетельствуют, что большинство медиа-потребителей (135 участников из 153) смогли различить два текста и определить, какой из них написан роботом. Кроме того, согласно полученным ответам, казахстанская аудитория не готова к появлению в СМИ ИИ-текстов, считает их некачественными, непонятными, логически несвязанными и, в принципе, респонденты отдают предпочтение тексту, написанному человеком – профессиональным журналистом. Скорее всего, эта тенденция сохранится в ближайшие несколько лет. Данная работа вносит вклад в решение проблемы использования ИИ в медиасфере.

Ключевые слова: журналистика, искусственный интеллект (ИИ), медиатекст, СМИ, робо-журналистика.

Introduction

From year to year, the world is rapidly moving towards technological progress, which affects many areas of life and radically changes them. Machines are more productive than humans are. This is one of the main reasons for their significant spread in almost all areas of production.

Automation algorithms are already around us, detecting fraudulent use of our credit cards, determining what you see in your social media feed, and displaying shoe ads that follow you around online (Keefe, Zhou & Merill, 2021). Based on similar existing algorithms and artificial intelligence (AI), the so-called robotic journalists have been created; most often, they are simply called AI machines or just AI.

The term AI is a somewhat catchall term that refers to the different possibilities offered by recent technological developments. From machine learning to natural language processing, news organizations can use AI to automate a huge number of tasks that make up the chain of journalistic production: detecting, extracting and verifying data, producing stories and graphics, publishing and automatically tagging articles (Dierickx, 2021).

Artificial intelligence – the new addition to the journalistic stable – further changed the news terrain. Using algorithms and machine intelligence helps deliver machine-written content fast (van Dalen, 2012). This reduced content creation costs for publications and enabled the delivery of personalized news (Wu, Tandoc, & Salmon, 2019). All of the above facts "help" AI to spread faster and faster in professional journalism practice; however, not in all countries evenly and everywhere because of the significant difference in technical support.

News automation is the most visible aspect of the phenomenon, and it has undoubtedly given rise to the most heated debates within the journalistic profession (Dierickx, 2021).

There are already dozens of robo-journalists in the world, such as Heliograf, News Tracer, CrowdTangle, Crossstown and many others. Of course, they cannot completely replace a human, but they can play a role as a tool for more productive work.

AI-powered tools can do many different tasks. They can trawl through tons of spreadsheets. They can spot oddities – a massive expense by local council, unseasonably high or low temperature in your region, or a rapid surge or fall in admissions in local hospital. The machines can help verify and even write content. They can automatically publish it and personalize the web page or newsletter for the

readers (McCarthy & Kunova, 2021). The economic factor is a significant constraint on the growth of AI in editorial offices. Of course, none of these programs are free. Only wealthy media outlets can afford to use them. On the other hand, the amount of work that AI can perform can recoup the costs in several years.

For example, global news wire service, the Associated Press (AP) in conjunction with Automated Insights, a natural language generation technology company, produced automated recaps for the Minor League Baseball game in 2016. Aided by AI, AP now produces 3,700 quarterly earnings reports during the earnings season, representing a 12-fold increase in its earnings coverage compared to what it did manually earlier (Galily, 2018).

According to one previous research on the use of AI in journalism, three areas are most prevalent:

Many editorial offices use AI for "augmenting reporting capacity" These projects comb through large document archives with machine learning, detect breaking news events in social media, and scrape Covid-19 data from government websites.

AI is used in journalism for "reducing variable costs". That includes tools that automatethe process of transcription, tagging of images and videos, and story generation.

AI is used for "optimizing revenue" – including dynamic paywalls, recommendation engines, and the digitization of a news organization's archives (Keefe, Zhou & Merill, 2021). Consequently, AI brings significant cost savings to the media.

It can be noted that the difference in the spread of AI in journalism by country depends not only on the financial capabilities of the media, but also on the language in which information is published. English is the priority here.

If talk about specific examples, we can cite a few of the most significant. The BBC recentlyintroduced a synthetic voice to read aloud the articles published on its website; last year Reuters launched an automated video system to cover sports matches (Dierickx, 2021).

As for The Republic of Kazakhstan, there are also the first steps in introduction of machines into the media system. For example, the forum "Digital Almaty 2021 – Digital Reboot: a leap into a new reality" was held in Kazakhstan in February 2021, together with the President of Kazakhstan K.– J. Tokayev. At the forum, questions about attracting investments for the development of artificial intelligence for five years in the amount of 500 billion tenge and 1 billion US dollars were raised (Sarsenova, 2021).

Moreover, in the near future, the Data Driven Government decision-making ecosystem will be created in the Republic of Kazakhstan to analyze the huge values of industry data, which will allow building more effective models for forecasting and preventing risks. Based on Nazarbayev University, together with the World Bank, the process of creating an AI cluster and a data processing center is underway.

In Kazakhstan, as in other countries of the region, AI-powered tools can scrape public datasets and store content in the cloud. Humans then turn that data into narratives that address people's concerns around topics as varied as crime, traffic, air pollution or coronavirus (McCarthy& Kunova, 2021).

It should be noted that the process of introducing machines into the media sphere of the Republic of Kazakhstan is at an initial stage. Nevertheless, speaking about the field of journalism, there is not such a progressive movements in Kazakhstan as in the USA and Europe. It is more correct to say that we do not yet have the presence of machines in the field of journalism. Even after typing the keywords, such as: "AI, journalism, Kazakhstan" in the Google search engine, alas, your query will not be satisfied, since there is no introduction of robots as such.

No matter how the headlines in the Internet resources are full, there is no technical progress at all. This has a negative impact on the work of domestic professionals. According to V. Polovinko, who is a reporter for Azattyk in the Almaty Bureau, Kazakhstani journalism has no task to change the world; it has a task to survive (Trocenko, 2021).

Kazakhstani journalism is developing, but it needs additional resources in the form of competent specialists, economic support and, of course, the introduction of AI as tool that will help. It can cope with the processing of huge amounts of data, notify about events and provide drafts of texts for future publication; optimization of news coverage in real time; personalization of the context and providing information according to the interests of the audience, their location, age, and so on (Dierickx, 2021).

Of course, it is only in theory, but how will it look in practice? If no one is arguing that AI can help the media with big data processing, then can AI also replace a real journalist in creating media texts? Is there a real threat to the extinction of the profession? How effective will be the introduction of AI for the audience and whether they will be able to understand the differences between texts written by robots and journalists. Therefore, we decided to conduct an experiment to find answers to these research questions.

Methods & methodology

There is no data in the domestic scientific literature on the question whether people are able

to distinguish the text written by AI from the text written by a real journalist. We decided to create a survey via Google Forms, which contained seven questions, concerning gender, age, place of residence, level of Russian language proficiency, level of education, etc. The most important question regarding the comparison and analysis of two texts (created by AI and by human) was placed in the end.

The survey was opened from July 14, 2021 to September 19, 2021. Responses from 153 participants were collected. The link to the survey was published in different social networks and sent out via messengers and mail services. All interested adult citizens of the Republic of Kazakhstan could take part in the survey.

We choose Internet-based questionnaire because it low cost and practical for a large sample (Check & Schutt, 2012). In addition, electronic questionnaires can help reduce measurement error (i.e., lack of validity or reliability) and help ensure a better response rate (Dillman et al., 2014). However, we understand that people who do not use the Internet were not included in the study. Though, given the fact that AI-generated media texts circulate mainly on the Internet, people who are not active consumers of information from websites are not from the category of those who will encounter the texts in question.

Since Covid-19 is now widespread, without risking people's health, the survey method is convenient, since any online user can give answers at any time of the day from any corner of Kazakhstan. All respondents completed the survey voluntarily, participation in the survey was not paid. The survey with analysis took on average 20 minutes.

The problem arose when answering the 7th question from the questionnaire, where a detailed description of the choice of a particular text is needed. It was very difficult to get a detailed answer to the question, because not everyone wanted to spend time on a description, as well as on a full reading of the texts. This is partly why the results obtained must be taken into account with allowance for the error.

Research & results

Usage of AI machines already widely used in Europe. Many journalists and experts are concerned about how their widespread may affect the world of information. Changes can affect both the journalists themselves and the audiences.

There are already a number of projects in Kazakhstan introducing the AI usage. However, they do not relate to journalism. Texts created by AI are not typical for the domestic media sector. Partly for this reason, texts created by machines in neighboring Russia always attract the attention of Kazakhstani Internet users. In order to understand how Kazakhstani media consumers relate to texts created by AI, we conducted a study.

The main task of the study is to understand how ordinary consumers of information in Kazakhstan will accept the appearance of such texts in the domestic media, and in general, such a technological future.

As mentioned above, the publication of such texts is not practiced among the Kazakhstani media, so we took foreign AI texts for the research.

The staff of "The Economist" (Great Britain, 2017) also conducted an experiment at one time. They collected all the articles previously written by the editorial team and uploaded them into one common database, testing the limits of AI capabilities. A robot with a built-in AI, indeed,wrote an article in English from the data provided for it. As a result, AI did not meet expectations (The Economist magazine, 2017), which delighted the journalists.

The Russian business newspaper "Vedomosti" decided to publish the same article written by AI on its website, but did not translate it from English into Russian, allowing to do this to the program "Translate. Google". The program coped well with the task assigned to it, making the translation of all the words (Overchenko, 2017). The editors made only minor edits. Link to the original source "The Economist has published an article written by artificial intelligence about technologies" in Russian is https://www.vedomosti.ru/technology/articles/2017/12/21/746085-economist-iskusstvennii-intellekt-napisat-statyu.

The text we are considering is devoted to an alternative to electric cars. Taking it as a basis, we decided to attach a similar text to it, which was written by a real journalist.

At the beginning of the survey, we asked respondents to indicate: gender, age, place of residence, level of proficiency in Russian language, the presence of higher or secondary education, as well as the presence of interest in literature on this topic.

The main task of the research was to understand the differences between perception of the texts written by a robot and a real journalist.

Summing up the results of the study, according to the data provided, 100 women (65.3%) and 53 men (34.6%) participated. Thus, we can state the fact that women were more actively involved.

A significant majority of the participants are young people aged 20 to 30 years (54.9%). The second largest category is from 30 to 40 years, which

is almost twice less than the first and is 20.9%. It is followed by the 50+ category, where 20 people took part (13.1%). 10 people (6.5%) took part in the 40-50 category, and the smallest category is 17-20 years old (4.6%).

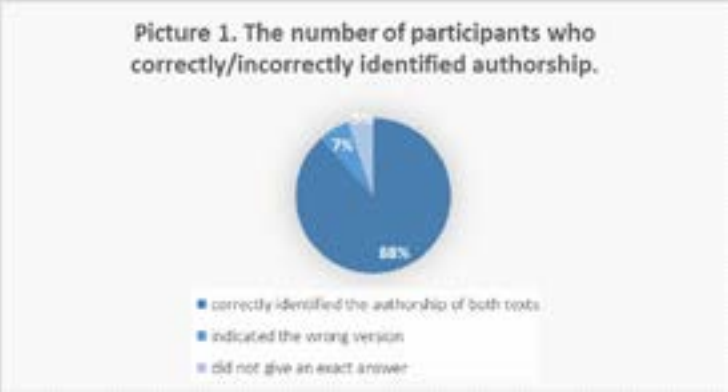
The obtained data of the second question show that the greater number of respondents were from Almaty and Almaty region – 108 people. Other cities show less activity. On the second place is Aktobe – 14 participants (9.1%), the third place – Nur-Sultan – 11 people (7.1%), then Uralsk – 5 people(3.2%), Semey – 4 people (2.6%), Alakol – 3 people (1.9%), Ushtobe – 2 people (1.3%), Karaganda – 2 people (1.3%) and the other cities (0.6% They are: Aktau, Atyrau, Kostanay).

The next equally important factor is the knowledge of the Russian language. The final data clearly shows that 94 people (61.4%) are native speakers. Next, 32 people (20.9 %) have anadvanced level of language proficiency, 24 people (15.7%) have a conversational level, and only 3 people (2%) have a basic level. These data give us the right to say that the majority of respondents speak the language in which they were provided with texts.

The educational level of the survey participants was also important for our study. A significant number of people – 123 (80.4%) have higher education, 20 people (13.1%) have secondary education and 10 people (6.5%) have postgraduate professional education. The collected data indicate a high degree of education of the respondents, which, in turn, allows them to understand the complex topic of the proposed texts.

The next important criterion that we considered is how often the respondents read articles on news portals. A large share is accounted for by people who visit news portals couple times a month – this is 46 participants (30.1%), next in number are those respondents who read the news a couple times a week – 43 (28.1%). Next are those who never read the news, this is 36 people (23.5%), and the last smallest number of respondents are those who read news online every day, this is 28 people (18.3%).

Next, in the questionnaire, we asked the participants to read two texts. AI generated the first text, and the second was written by a real journalist. The respondents had to determine whose the text was. It should be noted right away that 135 people (88%) correctly identified the authorship of both texts; ten of them (7%) indicated the wrong version and eight (5%) did not give an exact answer. See Pic.1.



The data obtained allows us to say that most people can still identify text generated by AI. On what basis did they draw their conclusions?

Here are the most interesting answers from participants who easily identified the AI text (grammatical errors and narrative logic are preserved; the answers of the experiment participants were not edited):

«The machine is still far away from the human language. The first text was written by AI. Very incomprehensible use of the lexicon, just written words that are not readable in the context, and in principle are not compatible".

«In my opinion, the first text was generated by AI. Since there was no soul in the text being presented, turns, comparisons and simple words that an ordinary person uses when transmitting information. There are such moments in the text that are difficult to digest (due to the volume of paragraphs) and are not remembered. There are a lot of professional words and expressions that many people will not understand (people not from this field). This format would be suitable for a scientific article, but not for an article in the media for ordinary people. A journalist would not write such a complex text for his audience».

"Text 1, in my opinion this is AI, because the text is not written quite coherently. Fragments of certain words that seem to belong to the same text sometimes have different meanings when they are used. Text 2 is written by a journalist, because there is a certain style, morality, conclusion. At least, they brought it to him, there are arguments about the dangers of petroleum products and about the automotive industry in general!»

– "I think that the first text – AI, as it uses a lot of terminology and inanimate words; the second text is divided logically into paragraphs and the whole text is like something created by man. There is some humanity in it".

As the above passages suggest, participants identify AI-generated text by several key traits. Among them, we can single out: lack of connection between sentences, lack of context, grammatical errors, inconsistency of the text, use of too many complex words, lack of morality.

According to the results of the survey, the following conclusion can be drawn: most of the respondents successfully determined which text the robot wrote. This fact suggests that even advanced modern technologies with the use of AI can not yet be compared with the work of a real journalist. This means that AI machines in Kazakhstan are not able fully compete with correspondents. At a minimum, in relation to large voluminous, logically complex texts.

According to a recent 2019 study, scientist proved that he can create a short AI fake text that is so realistic that government agencies are unable to distinguish it from a real comment on their official website. He then did a test to see if humans trained on spotting natural language processing could tell the difference between bot and human text. They were right about 50% of the time (Weiss, 2019). The results of our study are different. The reason for this is, in our opinion, the volume and complexity of the text.

Discussion

If we start the discussion section with the limitations of this work, it can be marked that some respondents maybe were not quite clear about the task when answering the basic question, since they are people in the older age group. They had further explain the existence of AI, before they would give their answer. Therefore, the weak side of this survey can be the lack of knowledge on the topic of AI among the respondents of the older category, and the limited number of answers that have to be based on.

We also cannot completely exclude possible technical failures when passing the survey on the part of the respondents, as a result of which incomplete answers could be received.

Despite the disadvantages, the work has many advantages. This is the first study in Kazakhstan comparing texts written by human and robot. Such experiments have not been conducted before. Hence follows a high scientific novelty. Due to the growing interest in AI, the research topic is very relevant for the republic.

In our opinion, these results are quite applicable for further research, with compliance with the application and changing all the shortcomings, future success in continuing the study is possible.

In general, the task was confirmed and successfully completed. The prospect of future research may be studied after the initial introduction of robots into the field of journalism in Kazakhstan, to test their effectiveness and efficiency, with the repetition of this experiment, but on a more extensive scale and with a large number of respondents.

Conclusion

The relevance of the topic was confirmed on the basis of a survey that we conducted. This survey, which we created, showed that the majority of media consumers (135 people, 88.2%) were able to distinguish two texts, and identify which of them belongs to the robot. Despite the fact that the introduction of AI has not yet been proposed in the field of journalism in Kazakhstan, people are able to recognize it.

Firstly, robots have not reached the maximum that the human brain is capable of; they do not have a well-coordinated system of typing words, as a person could beat it. Because our brain is plastic and is able to generate not already laid down schemes, but to work out ideas itself and translate them into reality. As researcher I. Bezukladnikov said: "I distinguish two main differences between the human brain and artificial intelligence. First, it is the density of neurons. There are significantly more neurons in the human brain than in the neural network of the machine's intelligence. Secondly, the performance of the human brain is much higher. It is quite difficult to find an artificial intelligence that has been trained for at least 30 years, unlike the brain" (Bezukladnikov, 2021).

Secondly, the introduction of AI in the field of journalism remains in the future, today there are no specific confirmations, and we are talking specifically about Kazakhstan. Yes, robots are superior to humans in speed and power, but this has been proven only in other areas not related to journalism, as it will go in the future in our industry, it remains only a prospect for research.

Thirdly, we have a shortage of specialists and economic opportunities for the introduction of AI

in journalism in Kazakhstan. There are a number of tasks that cause a deviation from journalism, flowing to problems with algorithms, databases and mandatory machine learning. Most journalists are not specialists in the field of IT, and they are not concerned about how artificial intelligence works.

The larger organizations have more resources, in time, people, and money, to devote to innovation and experimentation. They also may have larger upsides for those investments (Keefe, Zhou & Merill, 2021). There are not so many such large players in the Kazakhstani media market, and they express uncertainty about the beginning of the use of AI. Another serious obstacle for AI programs in the domestic media sector is the specific Russian "Kazakh" language. It is characterized by the use of kazakhisms like: "dastarkhan", "kelin", "tokal", "uyat", etc., but this is a separate question for research. In any case the widespread use of robots in the field of journalism remains only a matter of time. The digital sphere is still close to the generation of buzzers. Still, it is worth noting that according to Yu. Harari author of the book "21 lessons for the 21st century", progress will go towards machines and it will be inevitable (Harari, 2020).

However, AI can help journalists do their job better, so that they can focus on what they do best: telling stories (MacCarthy, 2021).

It is impossible to give unambiguous forecasts for the future, at present Kazakhstani media consumers are not ready for the appearance of AI texts in the media, they consider them poor quality, incomprehensible, logically unrelated and, in principle, respondents prefer texts written by a person – a professional journalist. Most likely, this trend will continue over the next several years. It will also take several years for the domestic media to be able to afford the introduction of AI from a financial point of view.

References:

Barbara, G. Facts, fakes, figures: artificial intelligence and journalism//Goethe Institute. Retrieved from https://www.goethe.de/prj/one/ru/lin/22042768.html.

Check J., Schutt R. K. (2012) Survey research. In: J. Check, R. K. Schutt., editors. Research methods in education. Thousand Oaks, CA: Sage Publications. – 2012. – Pp. 159–185.

Dierickx, L. (06.04.2021). Artificial intelligence and journalism: a race with machines// EqualTimes. Retrieved from https://www.equaltimes.org/artificial-intelligence- and?lang=en#.YW5yDRpBw2w.

Dillman D. A., Smyth J. D., Christian L. M. (2014) Internet, phone, mail, and mixed-mode surveys: The tailored design method. Hoboken, NJ: John Wiley & Sons, Inc. – 2014.

Economist (23.12.2017). How soon will computers replace The Economist's writers?// The Economist. Retrieved from https://www.economist.com/science-and-technology/2017/12/19/how-soon-will- computers-replace-the-economists-writers.

Galily, Ya. (2018). Artificial intelligence and sports journalism: Is it a sweeping change? //Technology in Society. 10.1016/j.techsoc.2018.03.001.

Keefe, J., Zhou, Y., Merill, J. (12.05.2021). The present and potential of AI in journalism// Knight Foundation. Retrieved from https://knightfoundation.org/articles/the-present-and- potential-of-ai-in-journalism/.

McCarthy, I., Kunova, M. (26.05. 2021). How artificial intelligence can help solve journalism's problems// Journalism.co. Retrieved from https://www.journalism.co.uk/news/how- artificial-intelligence-can-help-solve-journalism-s-problems-/s2/a825693/.

Overchenko, M. (21.12.2017). The Economist publishes an AI-written article on technology// Vedomosty. Retrieved from https://www.vedomosti.ru/technology/articles/2017/12/21/746085- economist-iskusstvennii-intellekt-napisat-statyu.

Sarsenova, M. (5.02.2021). National cluster of artificial intelligence will appear in Kazakhstan// Kapital. Retrieved from https://kapital.kz/tehnology/93211/natsional-nyy-klaster- iskusstvennogo-intellekta-poyavit-sya-v-kazakhstane.html.

Trocenko, P. (9.04.2021). Вячеслав Половинко: «У казахстанской журналистики нет задачи поменять мир, есть задача выжить» [Vyacheslav Polovinko: «Kazakh journalism has no task to change the world, there is a task to survive»]// Radio Azattyq. Retrieved from https://rus.azattyq.org/a/kazakhstan-dialogi-polovinko-interview/31193579.html.

van Dalen, A. (2012). The algorithms behind the headlines//Journalism Practice, 6:5-6. – 2012. – Pp. 648-658. DOI: 10.1080/17512786.2012.667268.

Weiss M. (2019). Deepfake bot submissions to federal public comment websites cannot be distinguished from human submissions//Technology Science. – 121(801). – 2019. Retrieved from https://techscience.org/a/2019121801/.

Wu, S., Tandoc, E. C. & Salmon, C. T. (2019). When journalism and automation intersect: assessing the influence of the technological field on contemporary newsrooms. Journalism Practice, 13(10), 1238-1254. https://dx.doi.org/10.1080/17512786.2019.1585198.

X media (22.06.2021). Experts have compared the human brain and artificial intelligence// X-media.

Retrieved from https://www.iksmedia.ru/news/5844239-Eksperty-sravnili-chelovecheskij.html.