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# ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE MARKETING PRACTICE OF RUSSIAN RETAIL COMPANIES

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## Abstract

The article presents the advantages and potential of introducing artificial intelligence into the business processes of Russian retail companies. The risks associated with the use of artificial intelligence in Russian retail companies have been identified. The analysis of the main directions of artificial intelligence development in terms of personalization, optimization and forecasting, understanding of customer behavior to ensure an effective omnichannel customer experience and improve the quality of interaction is carried out. The practical aspects of the use of artificial intelligence technologies in the marketing practice of retailers, which allows to form personalized offers to the target audience, are investigated. The collected empirical data showed that solutions based on artificial intelligence are guaranteed to help retailers improve economic performance, create non-standard personalized offers, launch more effective advertising campaigns, as well as analyze them better. Russian retail is one of the most promising industries with a high potential for the introduction of artificial intelligence technologies. Analytical data showed that Russian retailers use the capabilities of artificial intelligence to improve the quality of interaction with customers, in solutions in the field of personalized selection of goods, visual search, scanning shelves and creating robots for navigation in hypermarkets, as well as in optimizing warehouse logistics.

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## 1. Introduction

The changes taking place in the consumer behavior, combined with increased competition and the expansion of the Internet audience, contribute to the fact that artificial intelligence (AI) is widely used in the activities of companies in various industries (Boddu et al., 2021; Davenport et al., 2020; Huang & Rust, 2020; Verma et al., 2021). Retail business representatives nowadays have to solve a wide range of marketing tasks related to the need of attracting consumers and meeting all their demands and requests, the need for costs reduction and profits increase the need to maintain and strengthen their positions in a highly competitive environment.

Studies showed that the integration of innovative technological solutions based on artificial intelligence into the business processes of companies, which allows them to provide a better service, to understand better consumer preferences and to foresee demand, becomes a critical success factor and the main competitive advantage in the fight for the client and his loyalty (Gacanin & Wagner, 2019; Kopalle et al., 2021; Kumar et al., 2019; Vlačić et al., 2021; Wirth, 2018).

Artificial intelligence technologies, which allow making strategically correct marketing decisions and assessing the prospects for investment return, are already becoming a strong competitive advantage for companies and the main driver of innovations in the industry (Bharadwaj & Shipley, 2020; Boone et al., 2019).

## 2. Problem Statement

The main direction of retail development is the accumulation of a large amount of data about the consumer as the basis for creating predictive models, automatic real-time management and the ability to use the most convenient for the buyer distribution channels. The lack of skills in working with artificial intelligence based solutions and the inability to benefit from them for advertising, marketing and business processes will lead to the retailer leaving the market. According to the researchers, artificial intelligence technologies will reach full-scale application in various business processes of retailers in 1-3 years, so they should be implemented today (Bradlow et al., 2017; Balaji & Roy, 2017; Dekimpe, 2020; Seranmadevi & Kumar, 2019).

A large number of modern academic studies show the relevance of artificial intelligence analysis in world practice and the need to analyze the practice of using artificial intelligence technologies by Russian companies.

## 3. Research Questions

In course of the study the following questions were raised:

i.   What are the advantages and potential of introducing artificial intelligence into the business processes of Russian retail companies?
ii.  What are the risks of using artificial intelligence in retail?
iii. What are the directions of artificial intelligence development in terms of personalization, optimization and forecasting and improving the quality of customer interaction?

iv.    What are the results of the practical use of artificial intelligence technologies in the marketing practice of Russian retailers?

## 4.   Purpose of the Study

The purpose of this study was to systematize information characterizing the level of use of artificial intelligence in the marketing practice of Russian trading companies, to assess the prevailing trends and to determine the vectors of development of artificial intelligence technologies that affect the marketing of Russian retailers.

## 5.   Research Methods

Scientific and practical developments of domestic and foreign authors in the field of AI technologies in the world retail trade development built up the information and empirical framework for our research. In addition, secondary data from open Internet sources were analyzed. The empirical data collected make it possible to assess the of artificial intelligence penetration level into foreign and Russian retail sphere, as well as to study trends and make forecasts, to get the most complete picture of the benefits from integrating artificial intelligence-based solutions into practice for retail business representatives.

Such general scientific methods and techniques as systemic and logical-semantic analysis, generalization, synthesis of the information received, expert assessment method, graphical interpretation of empirical and factual information were used as research tools.

### 5.1.   Determining the Advantages and Potential of the Introduction of Artificial Intelligence in the Business Processes of Retail Companies

AI technologies are applied throughout the value chain, covering such areas of retailers' operations as sales and marketing, logistics and delivery, payments and payment services, customer interaction. Already, intelligent business process automation for retailers is strongly correlated with higher performance and higher revenue. So, according to the Drift and Marketing Artificial Intelligence Institute, 41% of marketers surveyed after the introduction of artificial intelligence noticed an increase in revenue and improvement in business performance, 40% received more useful insights, 38% began working on personalized customer experience. However, 30% of the respondents said that they did not see any improvement – these values can be explained by errors in data interpretation (see Figure 1).
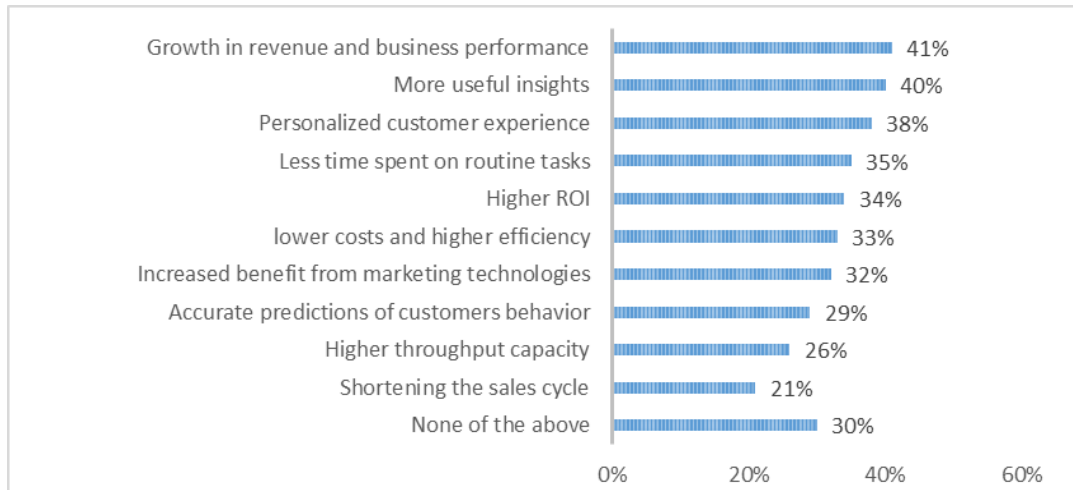
**Figure 1.** What benefits did the marketing department notice after implementing AI?

AI-powered solutions are proven to help retailers improve economic performance, offload employees, create innovative personalized offers, and launch more effective advertising campaigns, as well as better analytics. For example, Amazon's product recommendation system, which is largely based on artificial intelligence, generates 35% of the company's revenue.

According to Tractica's forecasts, the global revenues of companies from the use of artificial intelligence will grow to $38.8 billion by 2025. For comparison, in 2016 they amounted to $643.7 million. Such a jump is not surprising, given that artificial intelligence is emerging as an alternative to creating new jobs in many industries. Forrester expects cognitive technologies, including artificial intelligence and automation, to replace 7% of US jobs by 2025. It means that companies will be able to reduce personnel costs significantly as well as to optimize business processes. Most marketers (80%) believe that 1/4 of all marketing tasks will be automated by 2026, 43% think that by this time artificial intelligence will perform half of all business tasks.

The study conducted by Juniper Research revealed that global retail spending on artificial intelligence is increasing every year and will reach $12 billion by 2023. Experts estimate that more than 325,000 retailers will implement artificial intelligence technologies in the next five years, which will allow sellers to improve the efficiency of back-office operations that are not directly visible to end customers.

## 5.2. The Main Directions of the Development of Artificial Intelligence in the Marketing Practice of Companies

Analysts predict that retailers will use AI technologies to develop new types of goods, create promotional offers, but at the same time, demand forecasting will be a key tool to ensure effective omnichannel experiences and increase business profitability. As a result, the number of retailers using AI-assisted demand forecasting will more than triple between 2019 and 2023. With the rise in orders people pick up in stores and in one-time promotions like Black Friday, understanding of supply and demand chains is more important than ever, with artificial intelligence playing a central role.

During the Covid-19 pandemic, artificial intelligence technologies have reduced the interaction between shoppers and cashiers in offline stores, making the service faster and safer through the introduction of smart checkouts. A study by Juniper Research found that smart checkouts equipped with artificial intelligence technologies, such as computer vision, have a great future due to their convenience. By 2023, the annual volume of transactions using such cash registers will exceed 1.4 billion, compared with 42 million in 2019. Large retailers, including Amazon, are using high-tech cashier-less technologies in stores.

Currently, Russian retail is one of the most promising industries with a high potential for the introduction of artificial intelligence technologies. Russian retailers use the power of artificial intelligence to improve the quality of customer interaction, in the field of personalized selection of goods, visual search, shelf scanning and creation of robots for navigation in hypermarkets, as well as in optimizing warehouse logistics. By the end of 2021, artificial intelligence, augmented reality and the Internet of things will provide retailers using these technologies with an increase in customer satisfaction up to 20%, an increase in employee productivity up to 15% and an increase in inventory turnover up to 25 %.

Artificial intelligence makes it possible to process large amounts of data about buyers, their interests and preferences, the number of purchases, requests, etc. Companies with the most customer data will be able to become the most customer-focused by making personalized discounts and offers.

### 5.3. Identifying the Risks of Using Artificial Intelligence in Retail

According to a joint study by RAEC and the Higher School of Economics supported by Microsoft "AI in Retail: Russian Business Practice", published in December 2019, 42% of Russian retailers are already using AI-based technologies and solutions, and another 35% are planning to start the process within next 5 years. Thus, by 2024, 77% of Russian retailers will use technologies and solutions based on artificial intelligence.

The most popular AI-based solution for Russian retailers is personalization: 26% of respondents noted that personalization is used in their companies. Such solutions as virtual assistants and chatbots (23% of respondents), intelligent decision-making systems and predictive analytics (20% of respondents) are also widely used (see Figure 2).
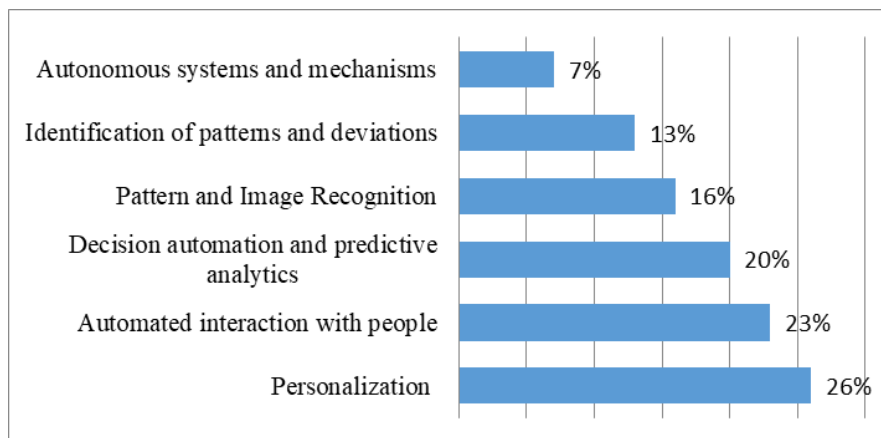


**Figure 2.** Use of AI-based solutions by Russian retail companies in 2019

In a five-year perspective, the majority of respondents plan to use artificial intelligence-based analytics solutions to identify patterns and deviations (36%), while today only 13% of companies use them. The relevance of solutions for personalization (35%) and chatbots (35%) will remain.

Among the main implementation risks, 39% of respondents identified reputational risks (the unsuccessful cases impact on the brand image, the consequences of decisions made by artificial intelligence, etc.). The same number of respondents (39%) indicated a security risk in the use of artificial intelligence. 28% of respondents noted the risk of a discrepancy between the benefits received from the introduction of artificial intelligence and the costs of implementing the project (see Figure 3).
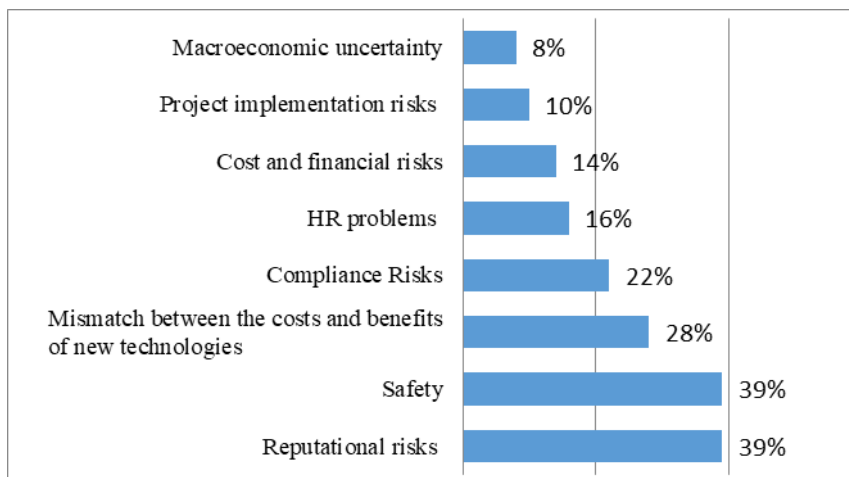


**Figure 3.** Risks associated with the use of AI in Russian retail companies in 2019

Thus, despite the increasingly complex and detailed retail structure, Russian companies are intensifying their efforts to use algorithmization mechanisms, as well as artificial intelligence technologies, realizing the advantages and benefits of their implementation and taking into account the existing risks.

## 6. Findings

Marketing solutions based on big data analysis have become one of the key trends in the field of artificial intelligence, which are actively developing in retail and allow processing a significant set of unstructured data to provide new information that is difficult to get using conventional methods. A thorough analysis of big data is the key to building a competent marketing retailer's policy and to more personalized offers.

Big Data analysis tools solve a wide range of marketing tasks related to dynamic pricing, loyalty programs increasing response, creating a consumer portrait and customer segmentation, identifying promising locations, forecasting consumer demand, optimizing the supply chain, etc. There are many examples of big data technologies use by retailers in their business processes. Due to data analytics X5 Retail Group increase the effectiveness of promotions, predict demand and reduce the delta between purchased and sold products. M. Video-Eldorado Group uses Big Data analysis tools and machine

learning to create customer experience. After the launch of personal prices in the M.Video mobile application, the conversion in it increased by 1.5 times.

The Internet of Things (IoT) plays an important role in providing information about customers. Research confirms that due to the use of IoT, 89% of trading companies are gaining more insight into customer preferences and behavior. 77% of retailers claim that IoT not only affects the customers experience, but also changes the shopping format and the structure of buyers. Internet-connected devices are gaining new capabilities to make life easier for users and transform the marketing activities of retail companies. If today the attention of sales professionals is focused on the consumers needs, then in the future there will be systems that will promote goods and services not to people, but to devices, taking into account the needs of their owners.

Today's consumers want a personalized experience, so retailers will widely use innovative marketing technologies based on artificial intelligence solutions to improve the shopping experience and build long-term relationships with customers.

After opening its own online marketplace, MEGA plans to combine online and offline customer information, using MEGACARD. The data will be sent to artificial intelligence for processing. As a result, members of the loyalty program and site visitors will get personalized offers.

On the base of the customer data that the outlet has, neural networks help to build demand elasticity goods curves for different groups of buyers. The machine is already helping supermarkets form the proper assortment of goods on the shelves. Customers see only fresh and necessary products in those places where they definitely won't miss them. Having tested the neural network (determining demand in stores and analyzing shelves with goods) representatives of Magnit stated that using artificial intelligence, they managed to increase the accuracy of consumers activity forecast by 3-5%.

Today any person, purchasing in an online or offline store, leaves behind a very long digital footprint. The totality of these "footprints", enriched with additional data on consumer behavior in a particular store, makes it possible to make a certain segmentation of buyers according to purchasing power. For example, Lenta retail chain has recently conducted a study of "average checks". Groups with different levels of demand were studied and the size of shopping baskets varied from 800 to 1290 rubles in average. These technologies are quite accessible nowadays, in the regions as well, and the demand for them is actively and steadily growing. Artificial intelligence helps the owners of retail outlets to understand their target audience, what set of goods is bought on average, the way consumer demand is shifting.

Chatbots and voice assistants are one of the highly effective AI-based tools in terms of automating routine processes in customer service. An intelligent chatbot responds to customer requests as quickly as possible, adapts to the situation in the dialogue, is proactive and constantly improves through extensive communication experience and automatic analytics. Moreover, in case of a negative consumer reaction, a chatbot is able to assess the situation instantly and make its own decision. For example, it can provide a discount coupon or perform another action regulated by the loyalty system. For example, X5 Retail Group uses robotic telephony in Pyaterochka, Perekrestok and Karusel retail chains. The voice assistant accepts incoming calls in call centers and helps with questions about loyalty cards, such as registration, blocking, transferring points, checking the balance. Every day, up to 50% of all loyalty requests at Pyaterochka are

managed by a robot, and the conversion to a targeted action exceeds 60%. At the same time, the costs for a bot are 5-7 times lower than for operators. The bot is also used for outgoing calls, as a part of NPS surveys.

Another way to use artificial intelligence in retail is the development of "No sellers store" format. For example, X5 Retail Group made its own digital self-service checkout. It can identify the buyer using face ID, track the entry of goods and simulate scanning. If a person "accidentally forgets" to scan a product, the checkout reminds him of this. X5 Retail Group has already launched a small store without salespeople, which can be accessed via a mobile application.

One of the fastest growing technological trends in the retail market is the introduction of augmented and virtual reality mechanisms in the industry, expanding the shopping experience and offering new ways for brands to interact with customers. Using augmented reality technologies, retailers can create goods catalogs with a preview. All you need is a smartphone. Such virtual catalogs are often used among clothing and footwear brands, as well as furniture brands, toys brands, jewelry and cosmetics brands.

Virtual fitting rooms are a separate area of "smart" retail technologies – they can recommend purchases remotely, having previously analyzed the silhouette of a person (Mirgorodskaya et al., 2020). For example, this is how the Belarusian startup Wannaby works, which selects shoes after a virtual shoe try-on. The system scans a person's foot, selects a sneaker model and allows you to see what it looks like on- foot.

The introduction of augmented reality technologies will inevitably lead to the development of "smart" store mechanisms in retail, which will make it possible to order goods remotely automatically in accordance with the needs of the buyer.

## 7. Conclusion

The future of the retail industry is determined by a set of tools, including the collection and analysis of information about both sales and customers, the introduction of innovative and contactless technologies, and the automation of marketing processes. The field of AI technologies is rapidly evolving, and the faster retailers adopt innovative marketing solutions based on artificial intelligence technologies to match the preferences of the target audience the best way, to personalize offers and build long-term relationships with customers, the greater their chances of strengthening their competitive position in the market.

Personalized shopping is currently one of the hottest trends in global online and offline commerce, so retailers will try to focus on the introduction of artificial intelligence and machine learning technologies to get more and more customer data. Indeed, it will take some time for businesses and consumers to adapt to new intelligent systems. But retail continues to be actively transformed under the influence of digitalization, and customers from all over the world are getting used to a better service. Thanks to the artificial intelligence, retail companies will be able to identify their customers not only online, but also in offline stores, which will allow the seller at any sales outlet to access information about the client, his purchase history and preferences.

# References

Balaji, M. S., & Roy, S. K. (2017). Value co-creation with the Internet of things technology in the retail industry. *Journal of Marketing Management, 33*(1-2), 7-31. https://doi.org/10.1080/0267257X.2016.1217914

Bharadwaj, N., & Shipley, G. M. (2020). Salesperson communication effectiveness in a digital sales interaction. *Industrial Marketing Management, 90,* 106-112. https://doi.org/10.1016/j.indmarman.2020.07.002

Boddu, R., Santoki, A., Khurana, S., Koli, P. V., Rai, R., & Agrawal A. (2021). An analysis to understand the role of machine learning, robotics and artificial intelligence in digital marketing, *Materials Today: Proceedings, 56*(4). https://doi.org/10.1016/j.matpr.2021.11.637

Boone, T., Ganeshan, R., Jain, A., & Sanders, N. R. (2019). Forecasting sales in the supply chain: Consumer analytics in the big data era. *International Journal of Forecasting, 35*(1), 170-180. https://doi.org/10.1016/j.ijforecast.2018.09.003

Bradlow, E. T., Gangwar, M., Kopalle, P., & Voleti, S. (2017). The role of big data and predictive analytics in retailing. *Journal of Retailing, 93*(1), 79-95. https://doi.org/10.1016/j.jretai.2016.12.004

Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science, 48*(1), 24-42. https://doi.org/10.1007/s11747-019-00696-0

Dekimpe, M. (2020). Retailing and retailing research in the age of big data analytics. *International Journal of Research in Marketing*, *37*(1), 3-14. https://doi.org/10.1016/j.ijresmar.2019.09.001

Gacanin, H., & Wagner M. (2019). Artificial intelligence paradigm for customer experience management in next-generation networks: Challenges and perspectives IEEE Network. *IEEE Network Magazine*, *33*(2), 188-194. https://doi.org/10.1109/MNET.2019.1800015

Huang, M. H., & Rust, R. T. (2020). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science, 49,* 1-21. https://doi.org/10.1007/s11747-020-00749-9

Kopalle, P. K., Gangwar, M., Kaplan, A., Ramachandran, D., Reinartz, W., & Rindfleisch, A. (2021). Examining artificial intelligence (AI) technologies in marketing via a global lens: Current trends and future research opportunities. *International Journal of Research in Marketing, 39*(2). https://doi.org/10.1016/j.ijresmar.2021.11.002

Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *California Management Review, 61*(4), 135-155. https://doi.org/10.1177%2F0008125619859317

Mirgorodskaya, O. N., Ivanchenko, O. V., & Dadayan, N. A. (2020). Using Digital Signage Technologies in Retail Marketing Activities. *Proceedings of the International Scientific Conference - Digital Transformation on Manufacturing, Infrastructure and Service. Association for Computing Machinery, New York, United States*. https://doi.org/10.1145/3446434.3446476

Seranmadevi, R., & Kumar, A. (2019). Experiencing the AI emergence in Indian retail–Early adopters approach. *Management Science Letters*, *9*(1), 33-42. https://doi.org/10.5267/j.msl.2018.11.002

Verma, S., Sharma, R., Deb, S., & Maitra D. (2021). Artificial intelligence in marketing Systematic review and future research direction. *International Journal of Information Management Data Insights, 1*(1). https://doi.org/10.1016/j.jjimei.2020.100002

Vlačić, B., Corbo, L., Costa e Silva, S., & Dabić, M. (2021). The evolving role of artificial intelligence in marketing: A review and research agenda. *Journal of Business Research, 128,* 187-203. https://doi.org/10.1016/j.jbusres.2021.01.055

Wirth, N. (2018). Hello marketing, what can artificial intelligence help you with. *International Journal of Market Research*, *60*(5), 435-438. https://doi.org/10.1177%2F1470785318776841