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THE ROLE OF ARTIFICIAL INTELLIGENCE IN FORMULATING EFFECTIVE STRATEGIES IN MANAGEMENT AND MARKETING

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РОЛЬ ШТУЧНОГО ІНТЕЛЕКТУ У ФОРМУВАННІ ЕФЕКТИВНИХ СТРАТЕГІЙ В МЕНЕДЖМЕНТІ ТА МАРКЕТИНГУ

Актуальність дослідження зумовлена тим, що сучасний світ зазнає стрімких технологічних змін, а висхідна конкуренція, пов'язана з впровадженням нових технологій, моделей обслуговування та виробництва, створює нові виклики для менеджерів і маркетологів. У цьому контексті роль штучного інтелекту (ШІ) набуває все більшої значущості, оскільки він відкриває нові горизонти для розробки ефективних управлінських і маркетингових стратегій. Метою цієї статті є аналіз ролі штучного інтелекту у формуванні ефективних стратегій у менеджменті та маркетингу, а також дослідження його впливу на процеси прийняття рішень, управління ресурсами та взаємодію з клієнтами. У межах дослідження зазначено, що штучний інтелект (ШІ) стає потужним інструментом, який революціонізує підходи до стратегічного менеджменту та маркетингу. Доведено, що штучний інтелект впливає на формування стратегій у менеджменті та маркетингу через свої базові функції, серед яких: аналітична (забезпечує збір та аналіз даних з різних джерел), прогностична (дозволяє приймати обґрунтовані рішення та адаптуватися до змін), персоналізація (коригує пропозиції відповідно до потреб кожного клієнта), автоматизація (налагоджує виконання ряду рутинних завдань) та оптимізація (допомагає встановити найвигідніші характеристики для рекламних кампаній, каналів та поведінки аудиторії). Поліфункціональність сфер застосування штучного інтелекту в менеджменті та маркетингу дозволяє користувачам використовувати чат-боти, рекомендаційні системи, системи персоналізації, системи автоматизації та системи оптимізації маркетингових кампаній. При цьому кожен з напрямків використання штучного інтелекту є складником ефективної стратегії розвитку, яка реалізується в менеджменті та маркетингу. Процес синтезу чат-ботів, рекомендаційних систем, систем персоналізації, автоматизації та оптимізації маркетингових кампаній забезпечує інтегрований стратегічний підхід до розвитку бізнесу. Цей підхід сприяє посиленню

взаємодії з клієнтами, оптимізації бізнес-процесів, прийняттю більш обґрунтованих рішень та підвищенню конкурентоспроможності.

The relevance of the research is determined by the fact that, in the modern world, striking changes in technology and increasing competition, driven by the implementation of new technologies, services, or production models, pose new challenges for managers and marketers. In this context, the role of artificial intelligence (AI) is becoming increasingly significant as it opens new horizons for effective management and marketing strategy development. This article aims to analyze the role of artificial intelligence in shaping effective strategies in management and marketing, as well as to examine its impact on decision-making processes, resource management, and customer interaction. The research confirms that artificial intelligence (AI) is becoming a powerful tool that is revolutionizing approaches to strategic management and marketing. It has been proven that artificial intelligence influences the formation of strategies in management and marketing through its core functions, including analytical (which enables the collection and analysis of data from various sources), predictive (which ensures informed decision-making and adaptation to changes), personalization (which allows for adjusting offers according to each customer's needs), automation (which enables the streamlining of numerous "self-executing" routine tasks), and optimization (which helps to determine the most effective characteristics for advertising campaigns, channels, and audience behavior). The multifunctionality of AI applications in management and marketing enables users to implement chatbots, recommendation systems, personalization systems, automation systems, and marketing campaign optimization systems. At the same time, each area of AI application is an integral part of an effective development strategy implemented in management and marketing. The process of synthesizing chatbots, recommendation systems, personalization and automation systems, and marketing campaign optimization systems ensures an integrated strategic approach to business development. This approach enhances customer interaction, optimizes

business processes, enables more informed decision-making, and increases competitiveness.

Ключові слова: *взаємодії з клієнтами; систем персоналізації; системи автоматизації; стратегії розвитку; оптимізація маркетингових компаній ; бізнес-процеси.*

Keywords: *customer interaction; personalization systems; automation systems; development strategies; marketing campaign optimization; business processes.*

Problem statement. In today's world, striking technological changes and rising competition associated with implementing new technologies, service models, or production methods present new challenges for managers and marketers. In this context, the role of artificial intelligence (AI) is becoming increasingly significant as it opens new horizons for effective management and marketing strategy development. Artificial intelligence can analyze large volumes of data, identify consumer behavior patterns, and predict trends, making it a powerful tool for informed decision-making. It is important to note that the application of AI in management and marketing not only optimizes processes but also contributes to enhancing the efficiency of enterprises. The automation of routine tasks, personalization of consumer offerings, and improvement of communication strategies are just a few aspects where AI demonstrates its value. AI integration into management and marketing strategies requires a deep understanding of both technological capabilities and the specifics of the market in which the company operates.

The analysis of recent researches and publications. Effective marketing and management strategies development is the subject of research by many scholars. Domestic researchers (Sarychev V.I., Sapegina A.V., Bezsmertna O.V., Shmun Y.U.) have made significant contributions to the methodological foundations of strategic business management development. Aspects of digital

strategic management have been thoroughly researched by M.P. Butko and M. Yu. Ditkovska, S.M. Zadorozhna, and others. The issues of digital marketing have also been reflected in the works of K. Latychev, A. Puhach, and V. Moroz. However, despite the substantial amount of research, the role of artificial intelligence in shaping effective strategies in management and marketing remains insufficiently explored in the academic literature.

Purpose of the article. This article aims to analyze the role of artificial intelligence in shaping effective strategies in management and marketing, as well as to examine its impact on decision-making processes, resource management, and customer interaction.

The paper main body with full reasoning of academic results. The research confirms that artificial intelligence (AI) is becoming a powerful tool that is revolutionizing approaches to strategic management and marketing [2]. Its ability to process vast amounts of data, identify patterns, and predict future trends opens up new opportunities for optimizing business processes and enhancing the effectiveness of marketing campaigns. In particular, AI influences the formation of strategies in management and marketing through its core functions, including [2-3; 6; 8]:

1. Analytical enables the collection and analysis of data from various sources, the results of which are suitable for identifying hidden patterns in consumer behavior, market trends, and the effectiveness of marketing campaigns or business processes.
2. Predictive analytics enables the identification of future trends, product and service demand, and business development strategies evaluation for informed decision-making and adaptation to changes.
3. Personalization ensures the adjustment of offerings according to the needs of each customer to enhance their satisfaction and loyalty to the brand.
4. Automation allows streamlining a range of "self-executing" routine tasks, such as order processing, and responding to customer inquiries.

5. Optimization, which helps establish the most advantageous characteristics for advertising campaigns, channels, and audience behavior through systems that track their results in real time.

The multifunctionality of AI applications in management and marketing allows its users to implement such tools as chatbots, recommendation systems, personalization systems, automation systems, and marketing campaign optimization systems (Fig. 1). At the same time, each area of AI application is a component of an effective development strategy implemented in both management and marketing [2].

Areas of AI Application in Management	Areas of AI Application in Marketing
Decision Making Automation of Routine Management Tasks Optimization of Business Processes	Personalization of Interactions Automation of Routine Marketing Tasks Optimization of Advertising Campaigns

Figure 1. The role of artificial intelligence in shaping an effective management and marketing strategy

Source: formulated by the author based on [2-3; 5-6]

AI generally increases the effectiveness of management and marketing by helping with various tasks [2]. However, it is important to understand that AI is not a replacement for human intelligence but rather a complement to it. Human factor remains crucial for strategic planning, decision-making, and customer interaction.

So, AI-based chatbots allow for the optimization of customer service (specifically, providing quick and accurate answers to their questions) [2; 4]. This tool acts as the first point of contact for many customers with the company. Its ability to simulate human conversation and provide quick, personalized responses to customer inquiries significantly improves the experience of interacting with the brand and other management and marketing aspects (as evidenced by the data in Table 1).

Table 1. Characteristics of the role of AI in optimizing customer service through chatbots

Main aspects of chatbot impact	Characteristics of the main aspects of AI impact	Results of chatbot impact in management and marketing
Deep Learning	Thanks to deep learning technologies, chatbots are able to continuously improve by analyzing large volumes of data about user interactions.	Allows for understanding natural language, identifying the context of conversations, and providing more relevant responses/
24/7 Support	Chatbots operate around the clock, providing customers with support at any time that is convenient for them.	Enables continuous interaction with customers.
Reduced workload for Employees	Automation of routine tasks using chatbots, such as customer service, sales and marketing, and internal support	Allows employees to focus on more complex and creative tasks, increasing their productivity.
Data collection	Interaction with chatbots allows for the collection of large volumes of data about customer needs and preferences.	Enables employees to use data for further analysis and the development of new products or services.

Source: formulated by the author based on [1; 4]

A business development strategy based on chatbots has a significant impact on customer loyalty and the company's reputation [1; 4]. Implementing chatbots allows for the integration of measures into the company's strategic plans, such as providing detailed information about products and services, assisting with order placements, tracking deliveries, and resolving technical issues [1]. For example, in the banking sector, chatbots are already widely used to inform customers about banking products, assist with technical issues, and carry out simple transactions.

In the tourism sector, chatbots assist customers in booking hotels and airline tickets, obtaining information about travel destinations, and planning trips. Thus, chatbots are becoming an indispensable tool for automating many routine tasks and enhancing the efficiency of companies [4].

AI-based recommendation systems have become an integral part of modern digital marketing [1-2]. Their ability to analyze vast amounts of data on user behavior and provide personalized recommendations enhances customer engagement and stimulates sales (as evidenced by the data in Table 2).

A business development strategy based on the use of recommender systems allows for increasing the likelihood of purchases, saving users' time, and enhancing their satisfaction [7-8]. Recommender systems create opportunities for incorporating personalized advertising campaigns into strategic plans, as well as enabling inertia-based recommendations of products based on the user's purchase history, views, and interests.

Table 2. Characteristics of the role of AI in enhancing customer engagement and stimulating sales through recommendation systems

Key fspects of the impact of recommender systems	Characteristics of the main aspects of AI impact	The Impact of recommender systems in management and marketi
Data collection	Systems collect information about users from various sources: purchase history, search queries, viewed items, interaction with recommendations, etc.	The formation of personalized recommendations based on the similarity between products or services, and the similarity in behavior among different users*.
Data analysis	Algorithms become available that analyze the collected data, identifying patterns and correlations between various factors	
Model creation	Models are built that allow predicting which products or services might interest a specific user.	A combination of various modeling tools that allows for more accurate recommendations/
Providing recommendatio ns	The systems generate personalized recommendations that are displayed to the user on the website or in the mobile app.	

Note

For example, if two users purchased similar products, the first user might be recommended products that the second user bought.

Source: formulated by the author based on [1-2; 7-8]

Sentiment analysis is a part of modern management and marketing due to its ability to determine the emotional tone of text (positive, negative, or neutral) [1; 6; 8]. However, AI-based sentiment analysis allows for the examination of large volumes of textual data, such as customer reviews, social media posts, forum comments, etc., to understand what people think about your brand, product, or service (as evidenced by the data in Table 3).

Table 3. Characteristics of the role of AI in understanding customers, enhancing the quality of products and services, and hrotecting reputation through sentiment analysis systems

Key Aspects of the impact of sentiment analysis	Characteristics of the main aspects of AI impact	The impact of sentiment analysis in management and marketing
Natural language processing (NLP, sentiment analysis)	AI algorithms learn to understand the nuances of human language, including sarcasm, irony, and emojis.	Sentiment analysis helps to understand what customers think about your brand, their needs, and expectations. Analyzing feedback allows companies to identify areas that need improvemen
Polarity detection	The algorithms determine whether feedback is positive, negative, or neutral.	
Entity recognition	AI can identify what exactly is being discussed in the feedback (product, service, brand).	
Cause identification	Some algorithms can even identify the reasons behind positive or negative feedback.	

Source: formulated by the author based on [1-2; 6; 8]

A business development strategy based on sentiment analysis systems allows for a better understanding of customers, improving the quality of products and services, and protecting one's reputation [1-2]. Such systems create opportunities for incorporating measures into strategic plans that adapt the business to market changes (including demand forecasting for products or services and optimizing production and inventory [3]). In this regard, sentiment analysis is ideal for developing measures to optimize pricing in management (through the analysis of data on competitor prices, product demand, etc. [8]).

AI-based automation systems, as modern management and marketing elements, facilitate routine tasks such as order processing and responding to customer inquiries, allowing employees to focus on more creative and strategic tasks (as evidenced by the data in Table 4).

A business development strategy based on an automation system allows for easier execution and management of key business processes [2-3]. Automation systems create opportunities for incorporating the selection of appropriate AI technologies and tools for automation into strategic plans, establishing a structure for data collection, storage, and processing, preparing employees to work with new

technologies, and setting up monitoring of system performance and their optimization [2; 6].

Table 4. Characteristics of the role of AI in easing routine tasks through automation systems

Key Aspects of the impact of automation	Characteristics of the main aspects of AI impact	The impact of automation in management and marketing
Increased productivity	Freeing employees from routine tasks allows them to focus on more complex assignments that require creative approaches and analytical skills.	Increased operational efficiency, the ability of the company to respond more quickly to market changes, and the development of innovative products and services.
Improved accuracy	Minimizing the number of errors related to human factors increases the accuracy of task execution.	Reducing the number of product returns, enhancing customer service quality, strengthening trust in the brand
Increased processing speed	Automation enables the processing of large volumes of data and the completion of tasks much faster than manual processing would allow.	Rapid response to customer inquiries, reducing order fulfillment time, increasing competitiveness
Improved customer service quality	Quick and accurate responses to customer inquiries enhance satisfaction and loyalty.	Increasing the number of loyal customers, raising the percentage of repeat purchases, positive reviews about the company
Cost reduction	Automation helps reduce labor costs and other resources required for performing routine tasks.	Increasing the company's profitability, optimizing the budget

Source: formulated by the author based on [2-3; 5-6]

AI-based marketing campaign optimization systems help optimize advertising campaigns by selecting the most effective channels and audiences, as well as tracking results in real-time (as evident from the data in Table 5) [2; 5].

Considering the impact of artificial intelligence on business development strategy leads to a focus on using marketing campaign optimization systems, providing businesses with more effective and personalized interactions with customers [2]. In particular, such systems create opportunities for incorporating measures into strategic plans for optimizing product and service pricing, such as optimizing the supply systems for advertisements and promotion channels [1].

Table 5. Characteristics of the role of AI in facilitating routine tasks through marketing campaign optimization

Key aspects of the impact of marketing campaign optimization	Characteristics of the main aspects of AI impactAutomation of Payments for Clicks and Impressions of Advertising Materials	The result of the impact of marketing campaign optimization in management and marketing
Precise targeting	Analysis of large datasets about users to create detailed profiles of the target audience	Effective Audience Profiling
	Dynamic adaptation of advertisements and promotion channels for each specific user.	Rapid dynamic optimization
Personalization of advertising messages	Allows for the creation of personalized advertising messages that resonate with the individual needs and desires of each user.	High-quality individual Offers
	Advertising materials change in real-time based on user behavior.	Dynamic content generation
Automation of payments for clicks and impressions of advertising materials	Automatic adjustment of bids per click to achieve the best results within a specified budget.	Quick Bid management
	Analysis of the effectiveness of different advertising material options and automatically selects the best ones.	Fast optimization of advertising content

Source: formulated by the author based on [2; 4-5; 8]

The synthesizing chatbots, recommendation systems, personalization systems, and marketing campaign optimization systems provide an integrated strategic approach to business development through AI use.

Conclusions from this study and prospects for further exploration in this direction. Within the framework of the study, it noted that artificial intelligence (AI) is becoming a powerful tool that revolutionizes approaches to strategic management and marketing. To specify the outlined statements, the following conclusions have been made:

1. Artificial intelligence (AI) influences the formation of strategies in management and marketing through its core functions, which include analytical (providing the collection and analysis of data from various sources), predictive (enabling informed decision-making and adaptation to changes), personalization

(adjusting offerings according to the needs of each customer), automation (facilitating the establishment of a range of 'self-service' routine tasks), and optimization (helping to determine the most advantageous characteristics for advertising campaigns, channels, and audience behavior).

2. The multifunctionality of AI applications in management and marketing allows users to utilize chatbots, recommendation systems, personalization systems, automation systems, and marketing campaign optimization systems. Each AI use area is a component of an effective development strategy implemented in management and marketing.

3. The synthesizing of chatbots, recommendation systems, personalization systems, automation systems, and marketing campaign optimization systems provides an integrated strategic approach to business development. This approach enhances customer interaction, optimizes business processes, enables more informed decision-making, and increases competitiveness.

Based on the conclusions drawn and the overall trend in the development of artificial intelligence, potential areas for further research have been identified, focusing on a deep analysis of the impact of AI on the development strategies of various business sectors.

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