

## IMPACT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ON BUSINESS PROCESSES

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**Methods.** The article is based on a theoretical review of the impact of artificial intelligence and machine learning on changing business models. In the course of study, the methods of scientific abstraction were used – when establishing the relationship between artificial intelligence and machine learning, analysis and synthesis – when determining the advantages of using artificial intelligence in business.

**Results.** The article examines the essence of artificial intelligence and machine learning, shows the relationship between them. The impact of these new digital tools on economic processes and, above all, on the dynamic aspects of the functioning of business structures is characterized. The opinion of experts is presented, who predict that artificial intelligence will do everything that humans can do, but with much higher accuracy. Discussions on the ethical aspects of using artificial intelligence are analyzed.

It was determined that Business Operation allows organizations to quickly cope with their business opportunities, reduce the number of errors, increase the transparency of their activities and thus create favorable conditions for significantly improving the results of their economic activities. Along with this, companies get the opportunity to observe their workforce, on the basis of which to create favorable conditions for improving its quality and introducing innovative content. This allows to significantly increase the innovative activity of companies, since the use of artificial intelligence allows forming requirements for teams, as it allows seeing the first obstacles to the development of innovative solutions. At the same time, if businesses maintain a better erudition about artificial intelligence, they will be able to modernize their business early and succeed.

**Novelty.** The study demonstrated important aspects of the interconnection between artificial intelligence and machine learning and their impact on changing business models.

**Practical value.** The study demonstrated important aspects of the relationship between artificial intelligence and machine learning and their impact on changing business models.

**Keywords:** artificial intelligence, machine learning, business, learning algorithms, hologram technologies.

**Statement of problem.** Technological developments in artificial intelligence (AI) include industrial robots, self-driving cars, fitness watches and online courses. Artificial intelligence is embedded in our daily lives and affects people, society and business.

Virtually all modern organizations are now changing their strategy and business models to incorporate AI into every business function. Machine learning (ML) is a type of artificial

intelligence (AI) that allows software to improve the accuracy of its predictions without design.

The artificial intelligence business platform model applies to AI solutions such as customer relationship management (CRM) and enterprise resource planning (ERP) business systems. Allowing artificial intelligence in the digital data space helps improve business incrementally.

**Analysis of recent papers.** According to Russell and Norvig «Artificial intelligence: a modern approach» emphasizes the fact that the algorithm is based on computer science, which is constantly evolving, and that the accuracy of the algorithm has increased in direct proportion to the amount of data contained in it» [1, p.52].

Bean in his research paper «How Big Data Is Empowering AI and Machine Learning at Scale», notes that the convenient supply of larger volumes of information sources is a sanctioning opportunity in AI and machine learning [2, p.8].

Big data is now powering AI in several ways: state-of-the-art information technology, access to vast data sets, and machine learning at scale. Here, artificial intelligence technologies are incorporated with «augmented» techniques such as continuous neural networks and deep learning. According to Alhashmi et al, AI and machine learning models are computational and mathematical algorithmic models that perform operations on data and humanoid experiences to make a decision that an expert would make given the same information [3, pp. 393–405].

Various enterprises that have evaluated the use of artificial intelligence with the latest tools and business models have confirmed that it is changing the business. Machine learning is the process of data analysis using mathematical techniques (algorithms). Its purpose is to find valuable patterns in different data sets.

Business intelligence and artificial intelligence are some of the latest methods and tools for automated systems for business innovation. These latest tools are useful for design, invention and advertising.

According to Armour et al, the growth opportunity for AI business models has been increasing over the years through data and business intelligence. Artificial intelligence has helped many businesses to improve production cost, productivity, technological synchronization and automatic renewal, and to solve the global economy in the business world [4, pp. 27–46].

Artificial intelligence is now competent enough to reconstruct business strategy and trade worldwide. Industrialization and technology development. Innovation, synchronization of various communication

channels with 4G LTE, 5G technology enhances the business culture. Since the last few decades, artificial intelligence and machine learning algorithms have been used effectively in business.

We can conclude that AI has significant implications for corporate economic growth, cybersecurity/privacy, and achieving income equality. As a result, AI has the ability to improve the global business model. Artificial intelligence will continue to evolve in the future, transforming the commercial landscape.

Millions of industries around the world and high-profile companies are combining the power of AI and Applied Artificial Intelligence (AAI). Most business industries detect fraud using machine learning algorithms in nanoseconds to improve customer satisfaction.

Top companies such as Microsoft, Facebook, Apple, Google, Amazon, Mynta, Flipkart and IBM are funding research and development of applied intelligence and artificial intelligence for the benefit of the company and consumers.

The need for artificial intelligence-oriented processors is the motive behind the increase in AI-enabled chips. To speed up the performance of AI applications, chip manufacturers such as Intel, AMD, NVIDIA and Qualcomm are making special AI chips. These chips will be optimized for scenarios such as NLP computing, vision and speech recognition.

According to Ghoreishi et al, the Hologram technology (HT) with artificial intelligence (AI) is now new innovative trends for business and marketing (5, p.602).

Samsung in their white paper (6) address the concept of hologram technology and its impact on next-generation business. Samsung white papers address the issues of 5G vs 6G technology appearance and its appropriate influence on cutting edge business.

While AI and hologram have the latent to renovate businesses, state-of-the-art business models, and trade across the globe [7, pp. 161–162]. Don't let industry write the rules for AI.

According to Fountaine et al, AI can sustain three important business issues: automated business process computerization from business activities; Gaining intuition through data analysis; and customer relations [8, pp. 62–73]. The paper is based on issues



typically uses a logistic function to estimate the probabilities [12, pp. 191–201]. According to Pedregosa et al, the regularization (L1 and L2) techniques can be used to avoid over-fitting in such scenarios [13, pp. 25–30].

It can overfit high-dimensional datasets and works well when the dataset can be separated linearly:

$$r(x) = \frac{1}{1 + \exp(-x)} \quad (1)$$

Logistic Regression can be used for classification.

*Regression Analysis:* According to Han et al, regression analysis includes several methods of machine learning that allow to predict a continuous ( $y$ ) result variable based on the value of one or more ( $x$ ) predictor variables [14, pp. 15–18].

The most significant distinction between classification and regression is that classification predicts distinct class labels, while regression facilitates the prediction of a continuous quantity. Some overlaps are often found between the two types of machine learning algorithms.

*Simple and multiple linear regression* is one of the most popular ML modeling techniques as well as a well-known regression technique. In this technique, the dependent variable is continuous, the independent variable(s) can be continuous or discrete, and the form of the regression line is linear. Linear regression creates a relationship between the dependent variable ( $Y$ ) and one or more independent variables ( $X$ ) using the best fit straight line. It is defined by the following equations:

$$y = a + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + e \quad (2)$$

where  $a$  is the intercept,  $b$  is the slope of the line, and  $e$  is the error term. This equation can be used to predict the value of the target variable based on the given predictor variable(s).

Regression models are now widely used in a variety of fields, including financial forecasting or prediction, cost estimation, trend analysis, marketing, time series estimation, drug response modeling, and many more.

In general, the effectiveness and the efficiency of a machine learning-based solution

depend on the nature and characteristics of the data, and the performance of the learning algorithms.

**Conclusions.** The paper outlined the theoretical ethical basis of AI in the business model that will take over the market in the near future. It shows how AI technology is transforming the business model and changing business dynamics through many discussions.

According to Muthusamy et al, business companies gradually observe workforces that can modernize and that have an innovative approach, as they diagnose requirements for teams that see the first obstacles to develop innovative solutions [15, pp. 108–109].

According to Ciuriak et al, if enterprises maintain a better erudition about artificial intelligence and the use of artificial intelligence that surrounds their stack, it will support ambitious modernization in their business [16, pp. 37–42].

The research findings suggest that executive influences performance a precarious starring role in modeling the progression of digital business model modernization.

These issues will help the company define the gap between existing operational techniques and emerging methodologies that use machine learning and artificial intelligence in business operations.

Business Operation allows organizations to quickly deal with their business opportunities, reduce errors, improve transparency and significantly increase revenue. Experts have predicted that artificial intelligence will do everything that humans can do and with better accuracy.

This study describes how artificial intelligence is changing digital platform business models. Data from companies that have revolutionized their business models using artificial intelligence show its promising impact. The paper shows how managers can develop an AI-based innovation ethos that reframes the progress of AI-based business model modernization.

Businesses that effectively use artificial intelligence can drive disruptive changes around their new digital business models and practices, giving them the opportunity to change the global economic business landscape.

AI thus has profound implications for governments, society, industry and individuals. AI has proven to be beneficial to businesses as it increases productivity. It saves time and money, reduces human error, enables faster decision making, predicts customer preferences and expands sales through automation and data analysis.

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## ВПЛИВ ШТУЧНОГО ІНТЕЛЕКТУ ТА МАШИННОГО НАВЧАННЯ НА БІЗНЕС-ПРОЦЕСИ

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**Методологія дослідження.** Стаття побудована на теоретичному огляді впливу штучного інтелекту та машинного навчання на зміну моделей функціонування бізнесу. Під час дослідження було використано методи наукової абстракції – при встановленні взаємозв'язку між штучним інтелектом і машинним навчанням, аналізу й синтезу – при визначенні переваг застосування штучного інтелекту в бізнесі.

**Результати.** У статті розглянуто сутність штучного інтелекту і машинного навчання, показано взаємозв'язок між ними. Охарактеризовано вплив цих нових цифрових інструментів на економічні процеси і, передусім, на динамічні аспекти функціонування бізнес-структур. Наведено думку експертів, які передбачають, що штучний інтелект буде робити все те, що можуть зробити люди, але з набагато вищою точністю. Проаналізовано дискусії щодо етичних аспектів використання штучного інтелекту.

Визначено, що Business Operation дозволяє організаціям швидко впоратися зі своїми бізнес-можливостями, зменшити кількість помилок, підвищити прозорість своєї діяльності та



у такий спосіб створити сприятливі умови для значного покращення результатів своєї економічної діяльності. Поряд з цим компанії отримують можливість спостерігати за своєю робочою силою, на основі чого створювати сприятливі умови для покращення її якості та наповнення інноваційним змістом. Це дозволяє суттєво підвищити інноваційну активність компаній, оскільки застосування штучного інтелекту дозволяє сформулювати вимоги до команд, так як дозволяє побачити перші перешкоди для розробки інноваційних рішень. Разом з цим, якщо підприємства будуть підтримувати кращу ерудицію щодо штучного інтелекту, то зможуть завчасно здійснити модернізацію свого бізнесу і досягти успіху.

**Новизна.** Дослідження продемонструвало важливі аспекти взаємозв'язку штучного інтелекту і машинного навчання та їхнього впливу на зміну бізнес-моделей.

**Практична значущість.** Результати дослідження утворюють розуміння позитивних наслідків застосування штучного інтелекту і машинного навчання на підвищення ефективності бізнесу, а саме: економію часу і ресурсів, зменшення помилок людського фактора, більш швидкий спосіб прийняття управлінських рішень, можливість більш точного прогнозу уподобань клієнтів, збільшення обсягів продажу товарів завдяки автоматизації та аналізу даних.

**Ключові слова:** штучний інтелект, машинне навчання, бізнес, алгоритми навчання, голограмні технології.

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