Ethical aspects of using artificial intelligence: challenges and prospects

Vilkhivska Olga[1]

Анотація. Розвиток технологій штучного інтелекту (ШІ) значно впливає на різні сфери життя, включаючи медицину, фінанси, транспорт та освіту. Автоматизація процесів, підвищення ефективності роботи та створення інноваційних рішень відкривають нові горизонти у науці, економіці та повсякденному житті. У статті розглядаються ключові етичні аспекти використання ШІ. Особлива увага приділяється міжнародним ініціативам регулювання ШІ, спрямованим на забезпечення прозорості, безпеки та дотримання прав людини. Також аналізується поточний стан та перспективи впровадження етичних норм в світі та Україні, включаючи заходи щодо самоорганізації ІТ-компаній та роботу державних структур над нормативними документами. Дослідження наголошує на важливості розробки справедливих та безпечних ШІ-систем, що враховують принципи прозорості, підзвітності та недискримінації. В умовах стрімкого розвитку ШІ необхідно знайти баланс між технологічним прогресом та моральною відповідальністю, щоб мінімізувати потенційні ризики та забезпечити максимальну користь для суспільства.

Ключові слова: технологічний прогрес, штучний інтелект (ШІ), етика ШІ, регулювання ШІ, соціальні наслідки ШІ.

ETHICAL ASPECTS OF USING ARTIFICIAL INTELLIGENCE: CHALLENGES AND PROSPECTS

Annotation. The development of artificial intelligence (AI) technologies has a significant impact on various areas of life, including medicine, finance, transport and education. Automation of processes, increased efficiency and creation of innovative solutions open up new horizons in science, economics and everyday life. However, along with the benefits, AI brings a number of serious ethical challenges. Among them are the problem of responsibility for decisions made by machines, bias in algorithms, issues of autonomy and control, as well as the socio-economic consequences of its implementation.

The article considers the key ethical aspects of the use of AI, including potential risks, such as automation of jobs and possible growth of unemployment, the use of AI in the military sphere, threats of information manipulation (deep fakes), as well as issues of free will and control over self-governing systems. Particular attention is paid to international initiatives on

---

[1] PhD in Economics Simon Kuznets Kharkiv National University of Economics, https://orcid.org/0000-0003-4560-8231

AI regulation aimed at ensuring transparency, security and respect for human rights. The current state and prospects for the implementation of ethical standards in Ukraine are also analyzed, including measures for self-organization of IT companies and the work of government agencies on regulatory documents.

The study highlights the importance of developing fair and safe AI systems that take into account the principles of transparency, accountability, and non-discrimination. As AI advances rapidly, it is necessary to find a balance between technological progress and moral responsibility to minimize potential risks and maximize the benefits to society.

Keywords: technological progress, artificial intelligence (AI), AI ethics, AI regulation, social consequences of AI.

Introduction

Modern artificial intelligence (AI) technologies are rapidly evolving and finding applications in various spheres of life — from medicine and finance to transportation and education. Its capabilities enable the automation of processes, enhance work efficiency, and offer innovative solutions to complex problems. The development of AI technologies plays a key role in the digital transformation of society, opening new horizons for science, the economy, and everyday life.

Many renowned scientists are contributing to AI research, such as Yoshua Bengio, who explores AI ethics and its impact on society; Yann LeCun, who focuses on the development of convolutional neural networks (CNN) used in computer vision; Geoffrey Hinton, who works on backpropagation algorithms, forming the foundation of modern neural networks; Stuart Russell, specializing in AI safety and ethics, promoting the idea of "beneficial AI" that acts in the best interests of humanity; as well as Nick Bostrom, Wendy Hall, and Maria Shagouri, who are engaged in AI development, creating algorithms and models for data analysis, learning, and decision-making. They work on neural networks, machine learning, and other technologies applied in medicine, robotics, finance, and many other fields. Additionally, they study AI ethics, striving to make it safe and accessible for society. According to various studies, the global artificial intelligence market is growing at a rapid pace.

The purpose of this article is to study and analyze the key ethical aspects of the use of artificial intelligence (AI), identify the main challenges associated with its development, and consider possible approaches to regulating and creating safe and fair AI systems.

Objectives of the article:

−To characterize the current state of development of AI technologies and their impact on various spheres of life;

−To identify the main ethical issues associated with the use of AI, including issues of liability, algorithm bias, autonomy and control;

−To analyze the potential socio-economic consequences of the introduction of AI, such as automation of jobs and the risk of unemployment;

−To study international initiatives and legal approaches to regulating the ethical aspects of AI;

−To assess the current state of development of ethical standards and legislative regulation of AI in Ukraine;

−To propose possible solutions to ensure transparency, security and fairness in the use of AI.

Results

Modern artificial intelligence (AI) technologies are rapidly evolving and finding applications in various spheres of life — from medicine and finance to transportation and education. Its capabilities enable the automation of processes, enhance work efficiency, and offer innovative solutions to complex problems. The development of AI technologies plays a key

role in the digital transformation of society, opening new horizons for science, the economy, and everyday life.

In 2024, the global artificial intelligence market reached an estimated value of $298 billion. It is projected that by 2030, this figure will grow to nearly $2 trillion, indicating an annual growth rate of approximately 20% [1-2]. The AI market is growing at 20% per year (Figure 1).
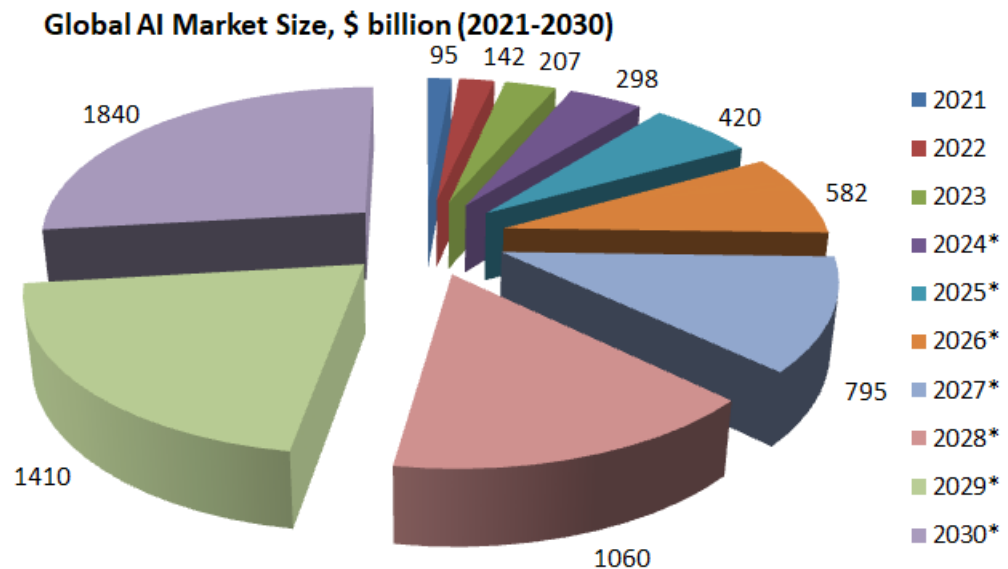

Figure 1. Global AI Market Size, $ billion (2021-2030) [1]

By 2025, the chat-bot market will reach approximately $1.25 billion.

For comparison, the market size in 2016 was $190.8 million. Thus, the chat-bot market growth over 9 years will be more than 6 times.

The annual revenue of the global artificial intelligence software market in 2024 exceeded $71 billion. Over the past five years, company revenues from the use of AI have grown 7 times (Table 1).

Table 1

AI Software Market Revenue (2018-2025) [1]

Year	AI Software Market Revenue (billion)
2018	$10.1
2019	$14.69
2020	$22.59
2021	$34.87
2022	$51.27
2023	$70.94
2024*	$94.41
2025*	$126

Around 4 out of 5 companies consider AI a top priority in their business strategy. A whopping 83% of companies say that using AI in their business strategy is a top priority.

Automated emails and chat-bots are two of the most common uses of AI in everyday business communications.
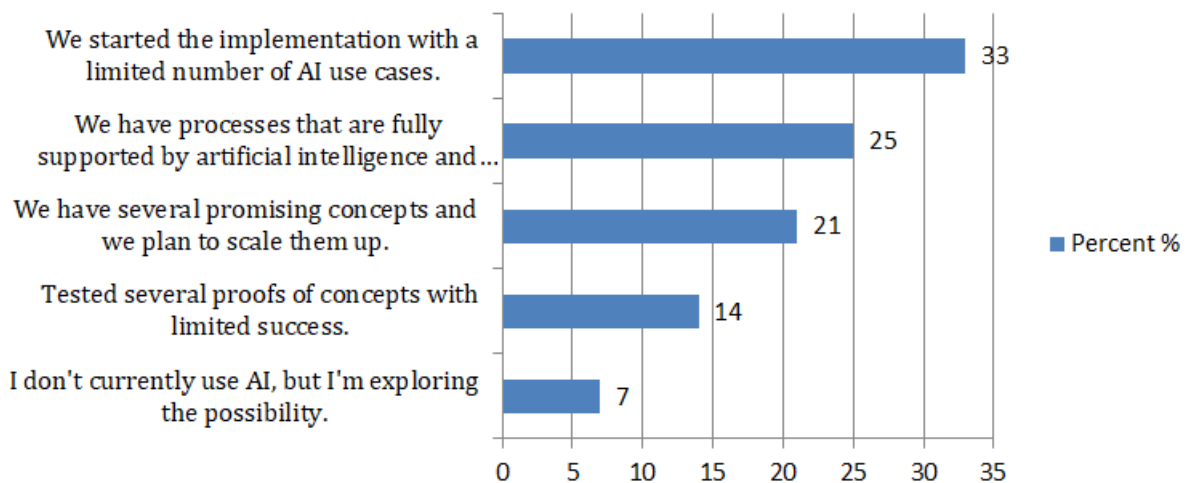
AI Use Cases in Companies

Figure 2. AI Use Cases in Companies

The AI industry has found its application in various business functions, from cloud computing for data sets to optimizing decision making in companies. Industry verticals that use AI technology include technology-related sales, insurance, banking, telecommunications, healthcare, manufacturing, retail, and marketing (Table 2) [1].

(Table 2)

Industry verticals using AI technology [1]

Industry	Basic level ($)	Additional Contribution of AI ($)
Accommodation and food services	1.5 trillion	489 billion
Agriculture, forestry and fisheries	554 billion	215 billion
Arts, Entertainment and Leisure	453 billion	87 billion
Construction	2.76 trillion	520 billion
Education	1.06 trillion	109 billion
Financial services	3.42 trillion	1.15 trillion
Healthcare	2.26 trillion	461 billion
Information and communication	3.72 trillion	951 billion
Production	8.4 trillion	3.78 trillion
Other services	535 billion	95 billion
Professional Services	7.47 trillion	1.85 trillion
Government services	3.99 trillion	939 billion
Social services	1.08 trillion	216 billion
Transportation and storage	2.13 trillion	744 billion
Public utilities	962 billion	304 billion
Wholesale and retail trade	6.18 trillion	2.23 trillion

Revenues from AI-related software, hardware, services, and sales are projected to grow 19% annually to reach $900 billion by 2026, up from $318 billion in 2020. By 2030, AI's contribution to the global economy will exceed $15 trillion.

According to Sprout Social, 71% of surveyed companies have integrated AI into their workflows, with 82% of them reporting a positive impact from these technologies. The most common applications include boosting productivity, precise targeting, and content curation. It is expected that by 2026, 90% of online content will be generated using AI technologies [1-2].

Regarding Ukraine, a survey conducted by Kantar Ukraine in February 2024 revealed that 79% of Ukrainians are aware of artificial intelligence, but only 29% have experience using it. Among young people aged 18–29, this figure is higher at 41%. According to the State Statistics Service of Ukraine, as of the end of November 2024, only 5.2% of Ukrainian enterprises use AI technologies. For comparison, big data analytics and ERP systems are employed by 15.2% of enterprises [3].

Ukrainian IT company "Intellias" reported that in 2024, the number of client orders related to artificial intelligence nearly tripled compared to 2023 and increased almost fivefold compared to 2022. Ukraine has around 307,000 AI specialists, placing it second in Eastern Europe after Poland, which has 600,700 specialists [4].

These figures reflect both global trends in AI development and the unique aspects of its adoption and perception in Ukraine.

With AI advancements come not only numerous new opportunities but also significant ethical challenges that must be addressed, including [5]:

-Job automation. AI development leads to the replacement of human workers in certain professions. While this can increase business efficiency, it may also result in social issues such as mass unemployment.

-AI in military applications. The use of AI in weapons and military operations raises questions about moral responsibility for decisions made by machines. Can AI independently determine who poses a threat?

-Deepfakes and information manipulation. Deep learning technologies enable the creation of highly realistic fake videos and audio recordings, which can be used for disinformation and blackmail.

-Free will and AI control. As AI systems become more autonomous, the question arises of how much control humans will have over them and how to prevent unintended consequences.

Considering these ethical challenges associated with AI development, it is crucial to analyze AI systems themselves. Understanding their types and manufacturers provides deeper insight into the technologies underpinning modern solutions and the key players shaping the future of artificial intelligence. The types of AI systems and their manufacturers are presented in Figure 3.

Many renowned scientists are contributing to AI research, such as Yoshua Bengio, who explores AI ethics and its impact on society; Yann LeCun, who focuses on the development of convolutional neural networks (CNN) used in computer vision; Geoffrey Hinton, who works on backpropagation algorithms, forming the foundation of modern neural networks; Stuart Russell, specializing in AI safety and ethics, promoting the idea of "beneficial AI" that acts in the best interests of humanity; as well as Nick Bostrom, Wendy Hall, and Maria Shagouri, who are engaged in AI development, creating algorithms and models for data analysis, learning, and decision-making. They work on neural networks, machine learning, and other technologies applied in medicine, robotics, finance, and many other fields. Additionally, they study AI ethics, striving to make it safe and accessible for society. According to various studies, the global artificial intelligence market is growing at a rapid pace.
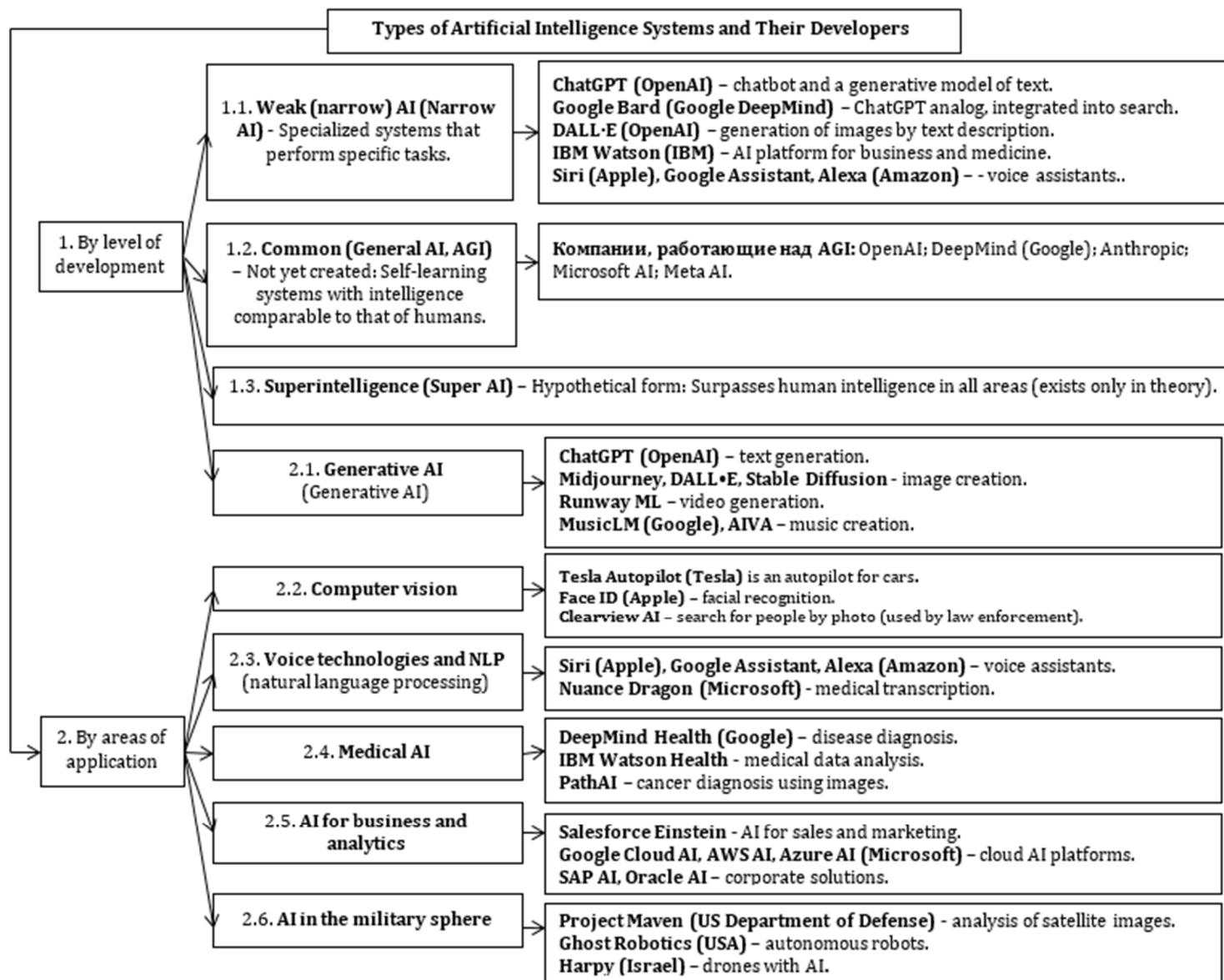
Types of Artificial Intelligence Systems and Their Developers

1. By level of development

1.1. Weak (narrow) AI (Narrow AI) - Specialized systems that perform specific tasks.

- **ChatGPT (OpenAI)** – chatbot and a generative model of text.
- **Google Bard (Google DeepMind)** – ChatGPT analog, integrated into search.
- **DALL·E (OpenAI)** – generation of images by text description.
- **IBM Watson (IBM)** – AI platform for business and medicine.
- **Siri (Apple), Google Assistant, Alexa (Amazon)** – - voice assistants..

1.2. Common (General AI, AGI) – Not yet created: Self-learning systems with intelligence comparable to that of humans.

- **Компании, работающие над AGI:** OpenAI; DeepMind (Google); Anthropic; Microsoft AI; Meta AI.

1.3. Superintelligence (Super AI) – Hypothetical form: Surpasses human intelligence in all areas (exists only in theory).

2. By areas of application

2.1. Generative AI (Generative AI)

- **ChatGPT (OpenAI)** – text generation.
- **Midjourney, DALL•E, Stable Diffusion** - image creation.
- **Runway ML** – video generation.
- **MusicLM (Google), AIVA** – music creation.

2.2. Computer vision

- **Tesla Autopilot (Tesla)** is an autopilot for cars.
- **Face ID (Apple)** – facial recognition.
- **Clearview AI** – search for people by photo (used by law enforcement).

2.3. Voice technologies and NLP (natural language processing)

- **Siri (Apple), Google Assistant, Alexa (Amazon)** – voice assistants.
- **Nuance Dragon (Microsoft)** - medical transcription.

2.4. Medical AI

- **DeepMind Health (Google)** – disease diagnosis.
- **IBM Watson Health** - medical data analysis.
- **PathAI** – cancer diagnosis using images.

2.5. AI for business and analytics

- **Salesforce Einstein** - AI for sales and marketing.
- **Google Cloud AI, AWS AI, Azure AI (Microsoft)** – cloud AI platforms.
- **SAP AI, Oracle AI** – corporate solutions.

2.6. AI in the military sphere

- **Project Maven (US Department of Defense)** - analysis of satellite images.
- **Ghost Robotics (USA)** – autonomous robots.
- **Harpy (Israel)** – drones with AI.

Figure 3. Types of Artificial Intelligence Systems and Their Developers

However, along with the benefits that AI brings, numerous ethical issues arise regarding its use. Scientists are actively discussing the ethics of artificial intelligence (AI), as its development raises many moral and social questions. The main issues highlighted in scientific circles are presented in Figure 4.
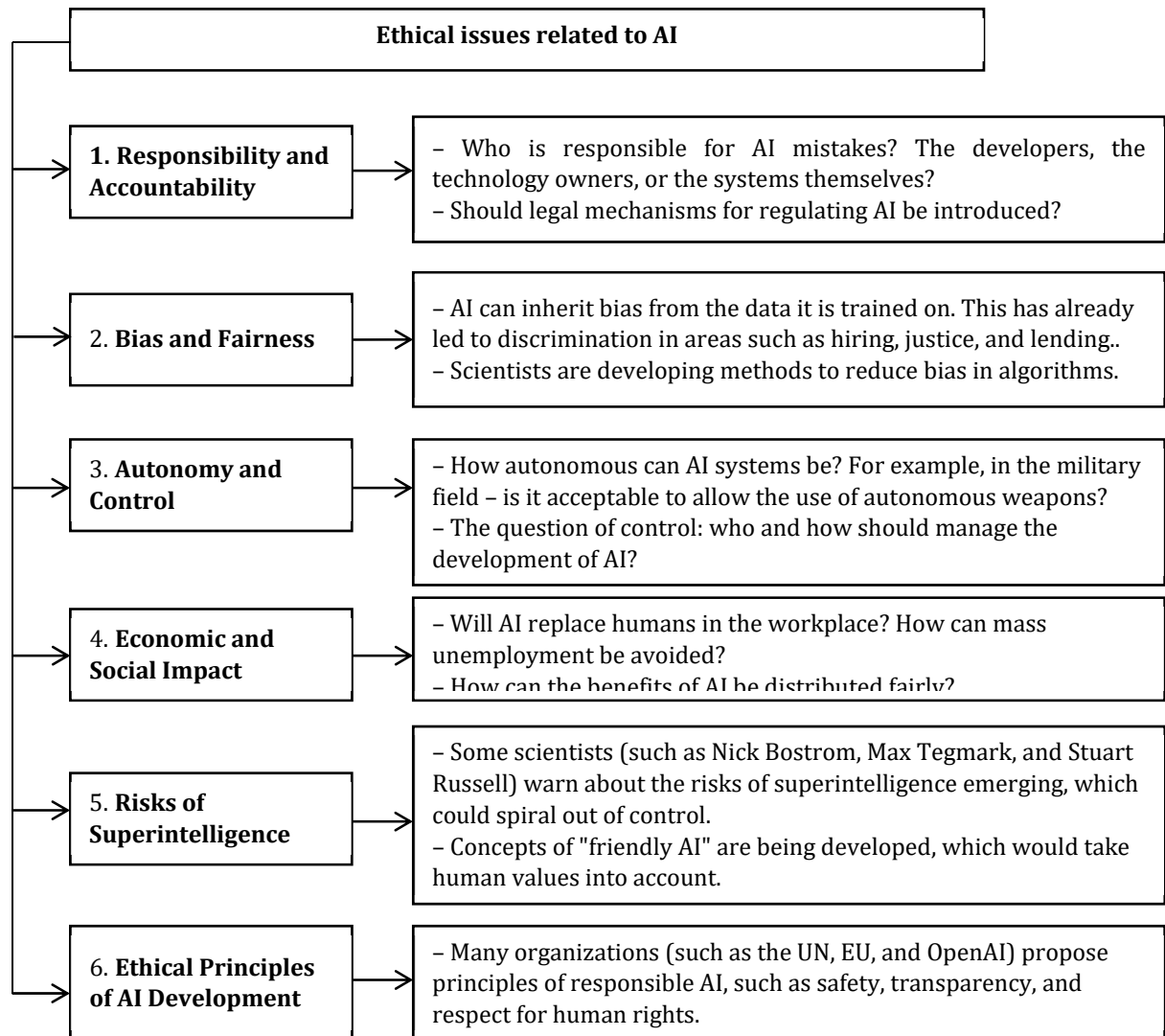

Ethical issues related to AI	
1. Responsibility and Accountability	– Who is responsible for AI mistakes? The developers, the technology owners, or the systems themselves? – Should legal mechanisms for regulating AI be introduced?
2. **Bias and Fairness**	– AI can inherit bias from the data it is trained on. This has already led to discrimination in areas such as hiring, justice, and lending.. – Scientists are developing methods to reduce bias in algorithms.
3. **Autonomy and Control**	– How autonomous can AI systems be? For example, in the military field – is it acceptable to allow the use of autonomous weapons? – The question of control: who and how should manage the development of AI?
4. **Economic and Social Impact**	– Will AI replace humans in the workplace? How can mass unemployment be avoided? – How can the benefits of AI be distributed fairly?
5. **Risks of Superintelligence**	– Some scientists (such as Nick Bostrom, Max Tegmark, and Stuart Russell) warn about the risks of superintelligence emerging, which could spiral out of control. – Concepts of "friendly AI" are being developed, which would take human values into account.
6. **Ethical Principles of AI Development**	– Many organizations (such as the UN, EU, and OpenAI) propose principles of responsible AI, such as safety, transparency, and respect for human rights.

Figure 4. Ethical issues related to AI

Ethical issues surrounding AI are actively discussed by scientists, lawyers, and technology companies to establish principles and laws for the responsible development of AI. AI ethics encompasses principles that guide the creation and application of AI responsibly, ensuring it does not harm people. Key concepts central to AI ethics discussions are presented in Figure 5.

In Ukraine, AI ethics is becoming increasingly relevant, and a number of scientists and specialists are actively engaged in this field. In February 2025, the Ministry of Digital Transformation of Ukraine announced the creation of the Artificial Intelligence Competence Center. The goal of the Center is to develop and implement AI technologies across various sectors, including defense and healthcare, as well as to draft corresponding legislation. The Center is headed by Lev Shevchenko, a well-known AI specialist [7].

Oksana Krasovska, an expert analyst at the Ukrainian Institute of Politics, actively participates in discussions about AI implementation and regulation in Ukraine. She emphasizes the need to raise public awareness about the opportunities and risks associated with AI usage [8].
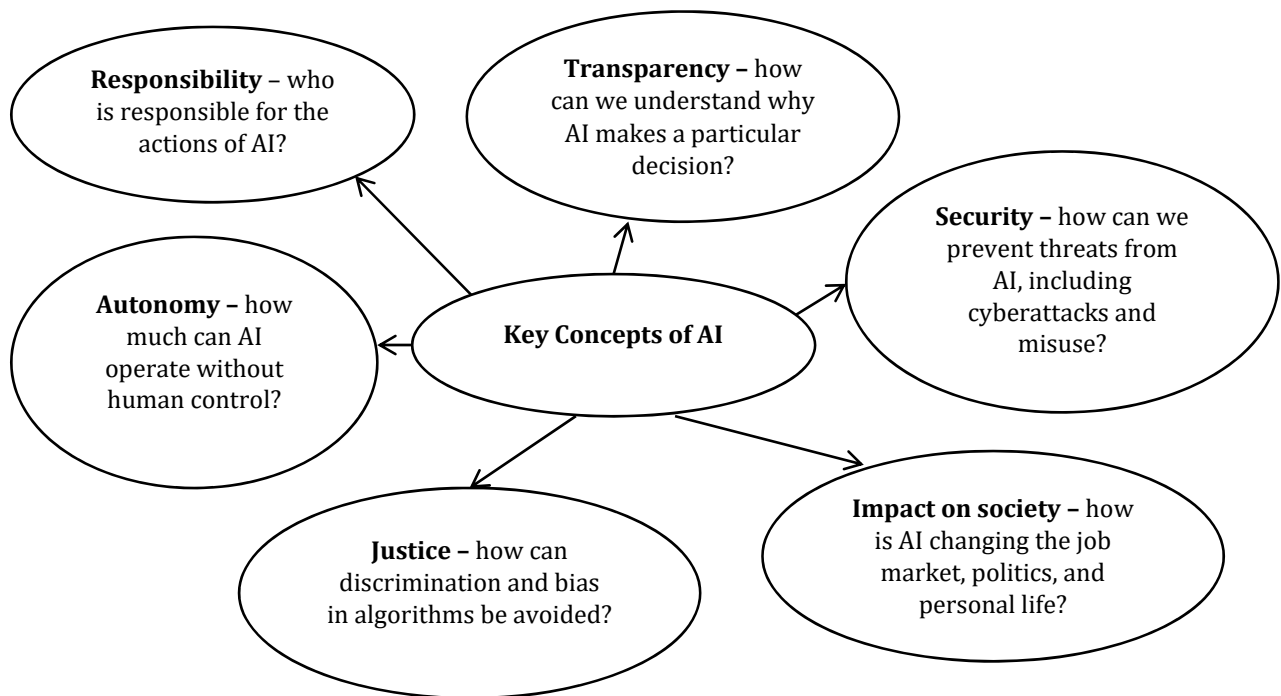

Figure 5. Concepts that play a key role in the discussion of AI ethics

Ethical issues surrounding AI are actively discussed by scientists, lawyers, and technology companies to establish principles and laws for the responsible development of AI.

In Ukraine, there are currently no specialized laws regulating AI ethics, but significant efforts are underway to create the necessary legal framework and implement ethical standards in this field. On December 2, 2020, the Cabinet of Ministers of Ukraine approved the Concept for the Development of Artificial Intelligence, aimed at integrating AI into various sectors of life and the economy. Although this document does not set specific ethical norms, it lays the foundation for future AI regulation [9].

In October 2024, nine leading Ukrainian IT companies signed the Declaration on Self-Regulation in the Field of Artificial Intelligence. Within three months of signing, they plan to develop rules for the ethical use of AI to guide the creation of innovative products [10].

The Ministry of Digital Transformation of Ukraine is actively working on forming a regulatory framework for AI. In August 2023, work began on AI legislation involving experts, officials, members of parliament, and lawyers [11]. In April 2024, the Ministry presented the "White Paper," outlining AI regulation strategies in Ukraine. This document is being developed in collaboration with the European Commission and aims to gradually implement AI regulation, taking into account European practices.

Legislation plays a crucial role in shaping the rules for AI use, but its application must align with fundamental ethical principles to ensure fairness and safety. Experts highlight the following principles [5-10]:

1. Transparency and explainability. AI algorithms should be understandable and explainable. Users and developers must be able to comprehend how decisions are made, especially in critical areas such as healthcare and justice.

2. Fairness and non-discrimination. AI should operate fairly without creating or reinforcing social inequality. It is essential to prevent algorithmic bias, which may arise from distorted or incomplete data.

3. Privacy and data protection. AI relies on processing vast amounts of data, including personal information. Strong data protection and compliance with privacy laws, such as GDPR, are crucial.

4. Accountability. There must be clearly defined entities responsible for AI actions. If an algorithm makes a mistake or causes harm, it should be clear who is accountable - developers, system owners, or end users.

5. Security. AI systems should be designed with cybersecurity in mind to prevent manipulation, hacking, and unintended consequences, such as autonomous decisions posing risks to humans.

Considering these principles, it is vital to summarize and outline measures to ensure the responsible and fair development of AI.

Conclusions

The advancement of AI ethics is an integral part of technological progress. Without ethical guidelines, AI could become a threat rather than a tool for improving lives. To minimize AI-related risks, clear legislative norms and international agreements must be implemented. Many countries are already developing AI ethics codes, including rules for transparency, oversight, and human rights protection. As technology evolves, ethical standards will also progress. Striking a balance between innovation and moral responsibility is crucial to ensure AI benefits society rather than posing a danger.

Many renowned scientists are contributing to AI research, such as Yoshua Bengio, who explores AI ethics and its impact on society; Yann LeCun, who focuses on the development of convolutional neural networks (CNN) used in computer vision; Geoffrey Hinton, who works on backpropagation algorithms, forming the foundation of modern neural networks; Stuart Russell, specializing in AI safety and ethics, promoting the idea of "beneficial AI" that acts in the best interests of humanity; as well as Nick Bostrom, Wendy Hall, and Maria Shagouri, who are engaged in AI development, creating algorithms and models for data analysis, learning, and decision-making. They work on neural networks, machine learning, and other technologies applied in medicine, robotics, finance, and many other fields. Additionally, they study AI ethics, striving to make it safe and accessible for society. According to various studies, the global artificial intelligence market is growing at a rapid pace.

List of References

1. 54 NEW Artificial Intelligence Statistics (Jan 2024) [Electronic resource] - Access mode: https://explodingtopics.com/blog/ai-statistics

2. Trends in the development of artificial intelligence in Ukraine and the world [Electronic resource] - Access mode: https://gwaramedia.com/tendenczii-rozvitku-shtuchnogo-intelektu-v-ukraini-ta-sviti/

3. How piece intelligence is changing the consumer goods market in Ukraine: clicks for practitioners [Electronic resource] - Access mode: https://finance.ua/goodtoknow/yak-shtuchnyi-intelekt-zminiuie-rynok-pratsi-v-ukraini

4. How vikorists fight in Ukraine III. Millions of investments, coverage and information channel 24 [Electronic resource] - Access mode: https://24tv.ua/ru/iskusstvennyj-intellekt-v-ukraine-gde-nauchitsja-kakie-zarplaty-kakie-kompanii-ispolzujut-24-kanal_n2579649

5. Adamson G., Havens J.C., Chatila R. Designing a Value-Driven Future for Ethical Autonomous and Intelligent Systems // Proc. IEEE. 2019. T. 107. № 3. P. 518–525.

6. Miller A. The intrinsically linked future for human and Artificial Intelligence interaction // Journal of Big Data. 2019. № 1 (6).

7. Ministry of Digital Transformation has launched a Center for Piece Intelligence in Ukraine: why and who to protect? [Electronic resource] - Access mode: https://24tv.ua/ru/iskusstvennyj-intellekt-v-ukraine-kak-i-zachem-mincifra-zapustila-centr-ii-kto-vozglavil-ego-24-kanal_n2745568

8. Piece intelligence: calls and opportunities for Ukraine [Electronic resource] - Access mode: https://uiamp.org/isled/iskusstvennyy-intellekt-vyzovy-i-vozmozhnosti-dlya-ukrainy

9. UN report: Electronic order 2024 [Electronic resource] - Access mode: golaw.ua

10. Ukrainian IT companies will formulate the rules of ethical behavior II: who signed the declaration [Electronic resource] - Access mode: https://24tv.ua/tech/ru/ukrainskie-it-kompanii-obedinilis-chtoby-sozdat-jeticheskie-standarty-iskusstvennogo-intellekta-tehno_n2658971

11. Ministry of Digital Development published the "White Book", which describes the regulation strategy II in Ukraine: what is known about the document and when to follow it [Electronic resource] - Access mode: https://dev.ua/ru/news/bila-knyha-1712211427