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on the topic: «**THE NECESSITY OF A BALANCING PRINCIPLE IN NAVIGATING THE GLOBAL ARTIFICIAL INTELLIGENCE RACE»**

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INTRODUCTION

The relatively new technological development of the Artificial Intelligence (AI) tool has proven to be truly transformative in terms of the impact it has brought to a number of fields. And, actually, due to the fact that this technology has significant potential in its implementation and use, it arouses increased interest among countries that are now allocating their resources to its development. To comprehensively outline the rapid and significant involvement of countries competing for dominance in the new promising field of AI, the term 'Global race of Artificial Intelligence' will be used. The increasing competition that has been observed in recent years requires a comprehensive look at it. That is, to take into account what strategic goals the states are aiming for, ethical and security issues, and how the technology is directly managed – which requires a balanced approach in ensuring reliable AI navigation. The work on the chosen topic, which explores the concept of AI race between countries, considers this phenomenon through the prism of the need to implement the principle of balancing within its framework, as an approach that will ensure AI navigation is ethical, safe, and oriented towards the development of cooperation.

The problem of research is insufficient awareness of the complexity of the development of AI and its consequences, which leads to the creation of strategies that do not take into account all dimensions that are affected by the technology, which in turn leads to aggravation of competition in the global dimension.

The object of this study is the competitive battlefield in the global dimension, which consists of a combination of different approaches of states and rapid technological progress. Thus, the subject of research is the principle of balancing, which constitutes a strategic basis for managing the implementation of AI technologies on a global scale and their development, which would be useful for societies.

The purpose of this study is to define the strategic importance of the balancing principle in the global AI race. This involves finding potential ways of its implementation, which would combine the cooperative factor, ethical principles, and at the same time be consistent with competing national interests.

Research objectives include following: identify how the historical evolution of AI has shaped current global politics; single out what changes have taken place in the paradigms of countries in key areas due to the development of AI; determine the main visions on the development of AI through an overview of the key global players – the US, the EU and China; determine why countries' one-vector approaches to the development and implementation of AI technologies ('AI for profit', 'AI for control', 'AI for society') are ineffective; determine why states should focus on the principle of balancing instead; single out the main recommendations for the implementation of the principle of balancing.

In order to comprehensively research the topic and solve the tasks set in the work, various sources were used for the analysis. In particular, the works of Adler "Seizing the Middle Ground: Constructivism in World Politics" (1997), Finnemore and Sikkink's "International Norm Dynamics and Political Change" (2005), Wendt's "Social Theory of International Politics" (1999). To form a better understanding of the competition between the USA and China, the book "AI Superpowers: China, Silicon Valley, and the New World Order" by Kai-Fu Lee (2018) was used. Floridi's "AI4People—An ethical framework for a good AI society" (2018) also served as an important resource for understanding the key norms that are important to follow to develop AI. Also, Russell and Norvig's work "Artificial Intelligence: A Modern Approach" provided fundamental knowledge about AI technology. In addition to academic sources and books, the literature review also covered articles and documents issued by the governments of countries and organizations. For instance, State Council of China (2017, 2019), Executive Office of the President (2019, 2020), The European Commission (2019, 2021, 2023) – which constituted an important resource base in the analysis of the approaches of the USA, EU and China.

The research methodology used is a combination of 'desk research' and 'case studies', that were interpreted through the theory of constructivism. The theoretical basis provided by this theory primarily helped to thoroughly analyze the strategic interaction arising as a result of the development of AI. In addition, constructivism that emphasizes the importance of the roles of norms and values has contributed to a comprehensive study

of how different states approach managing and navigating the global AI race. Also, the theory served as an important basis for confirming the need for the principle of balancing.

In the context of the work, ‘desk research’ consists of reviewing the key literature that exists on the topic of artificial intelligence and documents of organizations and state institutions in order to form a theoretical base on the basis of which the empirical research was carried out. In addition, a review was made of such works as, for example, “AI: The balancing Act Between Technological Advancement and Global Governance” (Ringell, 2023) and “Competition and cooperation in artificial intelligence standard setting: Explaining emergent patterns” (Nora von Ingersleben-Seip, 2023), in which the authors have already partially outlined the importance of maintaining a balance between innovation and ethical development of AI. Which was important for the further construction of a more valuable awareness of the ‘balancing principle’ in navigating AI. ‘Case studies’ included an overview of the strategic approaches of countries (namely, such key global players as the USA, the EU and China) to their implementation of AI technologies, how they differ, and what common elements underlie them. This in the end made it possible to systematize and single out the elements inherent in the strategies of aggressive expansion and – in contrast, those that are characterized by a more ethical attitude towards it.

In conclusion, it is important to highlight why the topic “The necessity of a balancing principle in navigating the Global Artificial Intelligence Race” is crucial for consideration. And first of all, its relevance lies in the growing role of technologies on a global scale, because all new developments aimed at the development of AI fundamentally change the way such areas as: education, science, labor market, and politics itself, are functioning. In case of politics – it is undergoing a lot of changes in the context of new needs and goals in the formation of state policies considering an existing competition between countries, and how at the same time they jointly interact to form a complex navigational base in AI management issues. Also, the theme of the work emphasizes the importance of the principle of balancing, where the term itself foresees the need for a kind of coordination between various elements that form a comprehensive idea of how new developments should be managed in an increasingly technological

world. This approach encourages interdisciplinary research, which becomes crucial for solving the problems that arise because of AI. In addition, this topic takes into account the duality of motivations and approaches of states to the development of the field of AI. Namely how powerful players are trying to gain primacy in the AI race, but at the same time, with the emergence of new threats, how they also seek interstate cooperation on this issue. Thus, the topic is truly relevant, as it is aimed at considering current threats and also gives recommendations for their elimination or minimization.

CHAPTER 1. THEORETICAL FRAMEWORK OF THE RESEARCH ON THE GLOBAL AI RACE

1.1. Definition of key terms in studying the Global AI Race

1) Artificial Intelligence (AI): Russell and Norvig (2016) explain AI as a branch of computer science that deals with the development of systems that can perform tasks that would normally require human intelligence (Russell and Norvig, 2016; Brooks, 1991). Among such tasks, the following can be distinguished: learning, reasoning, problem solving and language comprehension (Russel and Norvig, 2016). In addition, artificial intelligence systems can also be divided into two key categories: narrow or weak AI (for example, used for face recognition), and general or strong AI (applied in a wider range of tasks, and in such a way that mimics human capabilities) (Kaplan and Haenlein, 2019). In summary, AI is a technology that allows computers and machines to simulate human intelligence and problem-solving abilities (IBM, 2024).

2) Global AI Race: The term refers to an environment where the government and/or large corporations compete with each other in an attempt to achieve an advantage over other players in the development of AI technologies. According to Taddeo and Floridi (2018), in the political dimension, this competition is intensifying in view of the possibility of AI to change the economy, military potential and also global power structures (Taddeo and Floridi, 2018; Nora von Ingersleben-Seip, 2023). Thus, due to the potential provided by this technology, countries are investing significant funds in the development of the field, trying to gain economic advantages, strengthen their own security and take leadership positions (Levy, 2021). ‘Global AI Race’ is a complex concept that, in addition to the growth of innovations, changes in geopolitical strategy, also raises the issue of ethical considerations. After all, as Lee noted in work “AI Superpowers: China, Silicon Valley, and the New World Order” (2018), due to rapid technological progress, problems related to regulatory frameworks and, on a global scale – the balance of power in international relations, are critical in terms of their influence on the formation of these ethical norms.

3) Balancing principle (or principle of balancing): In the context of this work, the term is used to define a strategic approach as an alternative to the strategies ‘AI for profit’, ‘AI for control’, ‘AI for society’, and is a tool for harmonizing a variety of considerations related to ethical norms, economic competitiveness and national security – which arise from the risks and threats caused by AI (EU Science Hub, 2020). This principle combines the creation of a regulated environment, but one that takes into account its dynamism (King, 2024). It includes the need for the development of international cooperation, the ethical development of AI technologies and the fair distribution of benefits, combining this with risk mitigation. For example, those risks that Jobin (2019) mentions in his work “The global landscape of AI ethics guidelines” are: militarization of AI, violation of privacy rules and deepening of socio-economic differences. In general, the principle of balancing involves the development of policies that include not only support for the introduction of new innovations and technologies, but also ensure their development along with their compliance with accountability and inclusiveness, which will stimulate the positive impact of AI on society (King, 2024; Cath, 2018).

4) Strategic dynamics: In the global AI race, strategic dynamics is a complex interaction between different strategies of countries and corporations aimed at advancing their positions in the development of AI technologies (Buccino, 2023). It includes a set of ideas, tactics, and resources that players use to achieve their goals in the technological development. Also, in addition to these factors that belong to the technological dimension, strategic dynamics also include government cooperation and regulatory efforts – which are used to influence the global AI landscape (Horowitz, 2018; Tegmark, 2017). To determine the dynamics, the assessment of the achievements of national interests, competitive positioning, reaction and response to the strategic steps of other participants in this area are considered (Scharre, 2018).

5) AI Governance: The term encompasses a set of policies, regulations, and mechanisms designed to regulate the development, implementation, and use of AI technologies in a manner consistent with security and ethical standards and the one that ensures transparency and accountability (Mucci and Stryker, 2023). This concept means trying to maintain balance between rapid technological development and identification

and elimination of the risks associated with it, in order to ensure a positive and safe impact of new technologies on society (King, 2024; Jobin, Lenca and Vayena, 2019). Also, effective governance of AI includes cooperation between different players: civil society, governments, academics and others, to form such principles and frameworks that, while recognizing the broad impact on society, can at the same time adapt to the country's chosen pace development (Floridi and Cowls, 2019). In "'Good Society': the US, EU, and UK approach" (Cath, 2018) it was also noted that AI governance is critical for the global AI ecosystem to develop sustainably and ethically, promote international cooperation, and harmonize international norms that exist for managing the consequences arising under the influence of AI development.

6) Technological sovereignty: This concept means that nations are able to develop, manage, and use their technological infrastructure independently and without excessive external influence (Edler, 2023). When this concept is applied specifically to the field of AI, then it also includes the autonomy of states in the development of AI technologies and their regulation, which corresponds to the countries' goals in the areas of protecting national interests, economy, and political dimension (Khan, 2022; Edler, 2023). Also for this concept it is also important that technological sovereignty ensures that a particular state has strategic control over important technological sectors. This means that it has its own capabilities for the development of AI technologies and is able to regulate them within the framework of its own national priorities and ethical and security standards – which, in combination, makes it possible not to exacerbate excessive dependence on foreign developments, which can potentially pose a threat for security matters, or go against national goals and principles (Edler, 2023; Kuziemski and Misuraca, 2020). Finally, as Larsen notes in his work "The Geopolitics of AI and the Rise of Digital Sovereignty", technological sovereignty is of key importance in the global AI race, as it is in an era when digital innovation is essential for development and gaining advantages over competing players on the global stage – which affects a country's geopolitical position, its economic competitiveness, as well as social well-being of its citizens (Larsen, 2022).

7) Ethical AI: The concept refers to the development and use of AI technologies in a way that is based on the observance of moral norms and values and, accordingly, promotes technological developments that are transparent, accountable, inclusive, and respect the rules of privacy and human rights in general (Jobin, 2019). This way, it ensures that new technologies do not go against ethical principles and do not worsen existing inequalities (Floridi and Cowls, 2019). Thus, the concept of ethical AI is a concept aimed at minimizing the risks arising from rapid technological development and one that resolves moral dilemmas by ensuring that this technological progress will develop in such a way that will have positive impact on social dimension (Hagendorff, 2020).

8) 'AI for profit', 'AI for control', 'AI for society' (EU Science Hub, 2020):

'AI for profit' – refers to the economic dimension, namely how AI technologies are used for the purposes of businesses (for example, help to increase the efficiency of their operation); stimulation of innovations; and obtaining economic benefits (Kippes, 2022; Brynjolfsson and McAfee, 2014). The main focus of this approach is on increasing profitability, competitive advantage in the market, which is achieved through the use of AI. The technologies of which help with the optimization of operations, personalization of customer experience, attraction of new customers, and creation of new services and products (Taddy, 2018).

'AI for control' – involves the use of AI technologies by governments or corporations for the purpose of monitoring and controlling the population through methods such as surveillance, and the use of AI in public administrations to manage and maintain security and stability (Zuboff, 2019). Important in the context of the interpretation of this approach are the concerns arising from its use of methods that conflict with privacy and civil liberties. After all, AI technologies used in this approach can increase the concentration of state power and exercise control both over certain individuals and over citizens (Harari, 2020).

'AI for society' – means the implementation of ethical practices in the creation and management of AI developments, which is primarily aimed at increasing the welfare of society and making a positive social impact (Crawford, 2021). Examples of the use of this approach can be improvements implemented with the help of technologies in the

areas of health care, education, ecology, social security (O'Neil, 2016). Thus, this approach constitutes the use of AI to promote equality and inclusion and is the one where the deployment of AI is based on ethical principles.

1.2. Research methods of studying the Global AI Race

To write this work, a research approach was used, which is a combination of 'desk research' and 'case study', which together helped to comprehensively cover the topic of the work and explore both theoretical and practical dimensions contained in it.

Starting with the 'desk research' component, it is a thorough review of the existing literature on the topic of AI, which includes academic sources, scientific works, as well as program documents of countries and organizations. Among the key works considered is "Artificial Intelligence: A Modern Approach" by Russell and Norvig (2016), in which the authors provided a comprehensive overview of key applications of AI technologies and contributed to a more in-depth review of regulatory and implementation strategies of AI technologies. Also, "A Unified Framework of Five Principles for AI in Society" by Floridi and Cowls (2019) helped with the study of what impact AI has on society, what can be considered ethical AI and what ethical principles are important to follow in the development and regulation of AI. In addition, in the context of the aggravation of problems existing in cyberspace, the work of Taddeo and Floridi "Regulate artificial intelligence to avert cyber arms race" (2018), which touches on the need to ensure international regulation of AI – as a tool to prevent a cyber arms race, helped to strengthen an argument about the importance of the principle of balancing. According to which cooperation and interstate cooperation is an important aspect. Also, for the third chapter, which was devoted to the consideration and analysis of the strategic dynamics of AI in the Global Race, examples of country policies were considered. Due to this, such works as, for example, Lee's "AI Superpowers: China, Silicon Valley, and the New World Order" (2018) served as an important source for studying the dynamics of competition between large states. Finally, the program documents of the countries were considered as an equally important resource for the work: for the USA – official documents of the White

House, for China – documents of the State Council of China; and as for organizations: in the case of EU – documents of the European Commission were considered, and for UNESCO – official documents were taken into account. Where each of them included strategic visions and goals for the development of AI, as well as normative and ethical principles.

As for the second component – 'case studies', it was used to review and determine the differences and potential commonalities that exist in the AI development strategies of the key players in the Global Race of Artificial Intelligence, namely – USA, EU, and China. For the purpose of the study, the cases of these players were chosen because, firstly, they play a primary role both in the development of AI technologies and in the formation of regulatory frameworks regarding AI regulations and its application; secondly, subsection 3.2. of this work examines three key visions of the Global AI Race ('AI for profit', 'AI for control' and 'AI for society'), where each of the players selected for research serves as an example for the practical implementation of one or another vision. Based on this, conclusions are made on the effectiveness of each of the approaches and recommendations are given aimed at the development of the 'balancing principle' - as an alternative to one-sided visions. For conducting 'case studies' an analysis of key documents, initiatives and visions was made. For example, "American AI Initiative" (2020), Chinese "Plan for the development of artificial intelligence of the new generation" (2017), and European "Proposal of the Regulation on the European Approach to Artificial Intelligence" (2021). The conducted analysis, within the 'case study', made it possible to outline the variety of approaches and dynamics characteristic of these players. After all, if China is engaged in quite aggressive expansion and the desire to rapidly increase its own potential in the development of AI, in contrast, the EU is characterized by a more cautious policy focused on ensuring social welfare and compliance with ethical principles and standards (Anitoiu, 2023). In the case of the USA, it is largely focused on promoting innovations that will contribute to achieving success in the business field and other economic areas. As a result, the 'case study' made it possible to explore more deeply the multidimensionality of the Global AI Race and provided support for further argumentation regarding the importance of the 'balancing principle'.

Therefore, this double methodological research method, consisting of ‘desk research’ and ‘case study’ provided a reliable theoretical base and allowed to form a holistic view of the Global AI Race. With its help, it was possible to reinforce theoretical ideas with practical examples, which collectively contributed to the enrichment of the discussion about what principles countries should use in their approaches to navigating AI technologies, and how the ‘balancing principle’ is a successful strategy in this regard.

1.3. Constructivism theory for analyzing the ‘balancing principle’ in the Global AI Race

Considering the complexity and multidimensionality of the Global Race of Artificial Intelligence and how important the changes arising as a result of rapid technological development are – for a comprehensive study of this topic, the theory of constructivism was used. Which emphasizes the importance of ideas, beliefs, and identities in their influence on the formation of the behavior of states – which points out that, in addition to material factors, these social structures also co-create international dynamics (Wendt, 1999). Considering the fact that the cases of the USA, the EU and China were used for the analysis in the work, where the EU introduces a ‘value component’ – the theory of constructivism contributes to the understanding of how states conduct and position themselves in the Global AI Race through the prism that takes into account not only technological competition, but also how different identities and norms interact with each other, which is a crucial element for this work.

In “Seizing the middle ground: Constructivism in world politics” (1997), Adler points out that the identity and interests of states are not fixed, but on the contrary, have the ability to be formed and changed through social interaction. That is, as already noted, in addition to material factors, ideas, beliefs, and identities that form the states’ behavior also affect the formation of the international system. After all, since these aspects are important for how states perceive their interests, this, accordingly, contributes to how they perceive their actions (Finnemore and Sikkink, 2005). In the context of the Global AI Race, this means that the strategies and policies of states are influenced by their

identities and how they perceive the implications of technological developments for the international order.

The case studies of the US, the EU, and China discussed in Chapter 3 clearly demonstrate this conclusion, as each of the players has their own visions of AI, based on the characteristics of their identities and values. For example, the US focuses on the importance of the innovation aspect and the market approach; China is mainly concerned with control issues; social and ethical dimensions are priorities for the EU (Buccino, 2023). The differences underlying these approaches are not solely a deliberate strategy, but rather stem from the identities and beliefs specific to each of the players, and how they evolved over time (Jasanoff, 2004).

The interpretation of the 'balancing principle' through the theory of constructivism consists of a way that involves combining existing approaches to the navigation of AI ('AI for profit', 'AI for control', 'AI for society' (EU Science Hub, 2020)) to ensure a stable and safe international environment, and to promote cooperation. Also at the basis of the 'balancing principle' is the realization that in the context of the Global Race of Artificial Intelligence, in addition to trying to get ahead of one's competitors, it is also important to cultivate cooperation. Thanks to which it is possible to form and establish rules which would be common for each of the players, which will also be able to receive own benefits. Thereby, through the prism of the constructivism theory – it can be explained that the principle of balancing can contribute to the reconciliation of norms and identities, and the formation of a common position resulting from the combination of principles shared by each of the parties (Katzenstein, 1996). This can be achieved by conducting a global dialogue between states in international forums, where countries will be able to share their own visions and agree on common norms, relying on which AI development can be guided.

In addition, the principle of balancing also includes the ways the states are acting in conditions of global competition; how they respond to threats from other states, in order to maintain stability and security; and measures to prevent the growing dominance of one of the players, as this may lead to an imbalance of forces (Behravesh, 2011). Also, from the point of view of the theory of constructivism, the reaction of states to the Global Race

of AI can be characterized by the totality of their awareness of the risks and advantages of AI, and the norms on which they rely, and which regulate the aspect of behavior in the international system. Finnemore and Sikkink in “International Norm Dynamics and Political Change” (2005) focus on the importance of the role of norms that evolve and influence the behavior of states. In the dimension of AI – the principle of balancing can potentially constitute a norm that states will use to achieve effective interaction in the development of technologies. In fact, it can provide a transition from purely competitive strategies to cooperative actions.

Moreover, steps towards such a positive shift can be seen already, particularly with the creation of the Global Partnership on AI (GPAI) – which demonstrates how, firstly, states are able to come together to create a balanced approach in navigating AI; and, secondly, how the existence of this initiative embodies the principles of the existence of common norms and collective identity (Nora von Ingersleben-Seip, 2023). Also, another example can be the EU, as the Union tries to influence the global discourse on AI, relying on the promotion of ethical and social principles that should be universal for players in the context of the development and implementation of AI (The European Comission, 2021).

Therefore, within the framework of the topic of the Global AI Race, the theory of constructivism makes it possible to expand the awareness of: 1 – the principles of policy development; and 2 – the reactions and actions of countries in relation to the development of AI. Since theory allows to look at these two aspects not only as those that are formed in view of economic opportunities, but also as such, which depend on certain social constructions. In addition, the theory provides a comprehensive review of the ideas underlying the ‘balancing principle’ and provides a foundation for arguing why this principle is the most promising for navigating the Global AI Race, with advice for its implementation. Which includes enhanced cooperative action between countries and the development of a common understanding on the development of AI.

CHAPTER 2. HISTORICAL BACKGROUND OF AI AND APPROACHES TO ITS DEVELOPMENT

2.1. The genesis and evolution of Artificial Intelligence

In order to provide a further detailed and constructive description and analysis of the impact of AI on the international dimension, and how its development is perceived by different countries in the context of potentially gaining more benefits due to technological advancements, it is first necessary to outline how the technology developed and what main stages it consisted of.

First of all, the beginning of the countdown for the development of AI is considered to be the Dartmouth Conference held in 1956, which can now be perceived as the event that launched research in the field of AI as a separate field of study (Moor, 2006). Such researchers as McCarthy, Minsky, Rochester and Shannon played a key role in this, because they co-organized this conference and formulated the "Proposal for the Dartmouth Summer Research Project on Artificial Intelligence", in which it was stated that aspects of learning and, in general, other features that characterize and are inherent in intelligence can be described so precisely that a machine can then be created that can simulate them (Crevier, 1993; McCarthy, 2006). This was a truly revolutionary statement, as it actually changed the approach to understanding the direction in which AI can develop. It also determined the trajectory of research in this area. In addition, the very term 'artificial intelligence' was coined by John McCarthy, who comprehensively outlined the idea embedded in it (that this technology can simulate human intelligence), and which was later conveniently used at conferences and in academic works (Knight, 2006). Although there were no immediate breakthroughs after the Dartmouth conference, it marked an important event for developments in the field of AI, laid the foundation for future cooperation in this direction, and became a platform for pioneers in this field (Probo AI, 2023).

After the Dartmouth Conference, which was the starting point, it was followed by periods of exaltation and ambitious visions of AI progress, which served to make new

breakthroughs, that were periodically switching to the stages of disappointment, or the so-called ‘AI winters’ (Probo AI, 2023; Stöckle, 2019). Such changes reflect a certain cyclical nature of understanding and approaching AI (Stöckle, 2019).

So, the initial progress associated with the Conference, where researchers set ambitious goals, and where early research led to such developments as: the creation of Frank Rosenblatt's first artificial neural networks and the development of logic-based programs, in particular the ‘General Problem Solver’, later encountered the first ‘AI winter’ in the 1970s (Rosenblatt, 1958; Probo AI, 2023). This happened due to the realization that existing AI models are not able to sufficiently learn from data and, accordingly, to solve the difficulties associated with the complexity of the real world (Probo AI, 2023). Because of this, finances directed to the industry were suspended due to a loss of interest among investors, which slowed down the development of the technology (Stöckle, 2019). The next ‘AI winter’ took place between the 1980s and 1990s for the same reasons. Firstly, inflated expectations that did not correspond to the real achievements that the technology could offer at its current state of development, due to which funding was again cut (Probo AI, 2023).

At the end of the 1990s and into the 2000s, there was a new rise due to the fact that neural network research was improved (Probo AI, 2023). This was an important factor because now the models could be effectively trained on the data, which had previously been a problematic task. However, a major breakthrough that occurred later and gave an even greater impetus to the development of neural networks and deep learning models was due to the fact that both data sets and computing power increased (Krizhevsky, Sutskever and Hinton, 2012). An example of this is the victory of AlexNet, a neural network in the ImageNet competition in 2012, which represented a turning point in the development potential of deep learning applied to image recognition in particular (Krizhevsky, Sutskever and Hinton, 2012). Also, along with the development of neural networks, progress has taken place in the field of machine learning, where their potential capabilities have been expanded (Probo AI, 2023). In general, in the context of breakthroughs in the development of AI, there were a number of other, which collectively demonstrate the speed of development of this field and the importance of achievements

that stimulate the growth of interest in the field of AI. In particular, from the side of the states, which have a strong interest in view of the new opportunities that opened up to them thanks to AI technologies.

To sum up, the historical development of AI can be characterized as a cyclical progress, which experienced periods of initial high expectations, followed by a decline, or a slowdown in development, which was then renewed again (Stöckle, 2019). Currently, thanks to industry advances, AI technologies are helping governments to shape their policies more thoughtfully, as AI helps in the analysis of large amounts of data (related to demographic, consumer, behavioral aspects) that help develop more targeted policies, make predictions, evaluate current successes and/or failures of current policies, which collectively open up an opportunity to optimize political activity (Gkikas and Theodoridis, 2022). In addition, AI tools are used to perform more effective operational tasks and optimize work within institutions. For example, a truly innovative solution to the problem of lack of human resources and the overall increasement of the efficiency of the carry out of daily tasks is the appointment of a digital person by Ukraine to provide information about consular issues (МЗС України, 2024). Among other areas where states are also interested in the implementation and use of AI technologies in them are the spheres of security, health care, environment and military.

2.2. Paradigm shifts in countries' approaches to the AI development

2.2.1. An ongoing controversy accompanying the development of AI

The previous subsection, which contained an overview of the historical development of AI and what main achievements were made in this field, gave an idea of the significant potential of its use. Given the fact that countries show considerable interest in the development of AI technologies and their application in various directions (economic, social, military, etc.). Therefore, what opportunities the development of AI opens for states, as well as what threats and risks are contained in the rapid growth of these technologies, will be considered further. Given that, it is also important to cover

what dilemmas do players face when trying to take the lead in the race in AI development. After all, along with the positive aspects of technological progress, there is a growing concern about the ethical, social and security consequences (Pazzanese, 2020).

Above all, the most obvious thing about the AI race is the economic advantage that AI can offer leaders. Such a researcher as Lee in work “AI Superpowers: China, Silicon Valley, and the New World Order” (2018) noted on this topic that AI can become a real driving force in the context of economic development and because of that, it will have significant implications for global competitiveness. However, despite the economic advantages that AI can provide – active technological developments increase the issue of compliance with ethical principles. Such researcher as O'Neil in “Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy” (2016) draws attention to the danger of uncontrolled AI, since the technology is capable of exacerbating the inequalities that exist in society. Risks can also include the threat to the confidentiality of personal data, the use of surveillance tools by governments, and the emergence of bias in the decision-making process (Ribakoff, 2024). Thus, all these factors encourage consideration of stricter ethical standards.

The dilemma also accompanies the military sphere, where, on the one hand, the integration of AI elements continues to grow, but on the other hand, this poses a challenge, which is the militarization of AI (Marwala, 2023). This is one of the major concerns in the international security debate, which was addressed in particular by the Stockholm International Peace Research Institute (Csernatoni, 2023), which emphasized the need to develop and enforce global norms and treaties to manage risks where AI is used in the military sphere.

Another area where AI plays an ambiguous role is the labor market. Where, in spite of help in solving the problems of insufficient number of labor force, or resources to maintain a large number of employees – there is a critical problem with the fact that there is a reduction in jobs, and the need for certain specialists is reduced, which leads to difficulties with employment (Ford, 2015). Ford notes this in his work “Rise of the Robots: Technology and the Threat of a Jobless Future” (2015), where he claims that if

not properly managed, AI and automation will lead to large-scale economic disruptions and inequality.

In sum, the Global AI Race contains not only the benefits afforded by technological progress, but also deep ethical, economic, security, and social concerns. This leads to changes in countries' approaches to how they respond to changes due to technological development and how they approach their own strategic vision of development in key areas. And as Bostrom points out in "Superintelligence: Paths, Dangers, Strategies" (2014), all these risks posed by AI require proactive management measures to ensure the safe deployment of the technology (Bostrom, 2014).

2.2.2. Changes in the paradigms of states

This subsection of the second chapter will examine six key paradigms (listed in Table 2.2.2 in 'Notes') that affect different aspects and how they have changed due to the development of AI:

1) Policy Frameworks:

First of all, there has been a shift from reactive to proactive policy frameworks (Beduschi, 2022; Murtagh, 2023). That is, if at first governments formulated their policies and regulations only after technologies became widespread, now they are focused on trying to predict risks and take the necessary measures to minimize them (GOV.UK, 2024). It also includes a comprehensive consideration of the impact of technological development, that is, how, while providing potential benefits for one area, it may have negative consequences for other dimensions (Khogali and Mekid, 2023). For example, as in the pursuit of economic benefits, improper adherence to ethical principles can lead to threats to one's own citizens. Also, in a reactive approach, issues such as algorithmic bias, job displacement due to increasing automation, and data privacy were addressed only after they became obvious and problematic (Chandrayigowda, 2024).

Recognition of the limitations of the reactive approach contributed to the transition of states to the implementation of proactive strategies (Calypso AI, 2024). Among the real examples that demonstrate this are Canada, Singapore, Taiwan, members of the

European Union and a number of other countries. In particular, the General Data Protection Regulation (GDPR) that was developed by the European Union, which establishes strict requirements for the processing of personal data and privacy, affects how AI systems that process personal data of EU citizens are developed and used – which is a clear reflection of a proactive measure in managing the consequences of AI for data protection (Lukács and Váradi, 2023; European Commission, 2018). The Canadian Government's Pan-Canadian AI Strategy is an initiative that, along with supporting AI research, also considers ethical standards in technological development (Crawford, 2021; Government of Canada, 2022). It also highlights the importance of establishing international norms for AI, and in general is a demonstrative example of a proactive approach that fosters innovation in a responsible manner.

Considering the changes that have taken place in the political framework – the transition to a proactive approach to their formation, although it carries numerous positive consequences, it also requires a certain balancing. In "AI Superpowers: China, Silicon Valley and the New World Order" it was noted that the competition between such powerful players as the US and China to dominate the field of AI due to its strategic importance demonstrates that both proactive and strategically calculated policy measures play a role in maintaining competitive advantage (Lee, 2018; Ristyawan, 2020).

All in all, the shift from reactive to proactive policy frameworks in AI governance marks a significant paradigm shift and serves as an approach that allows governments to respond more effectively to rapid technological progress and implement new developments while respecting security and ethical standards (Anitoiu, 2023; Beduschi, 2022). Also, the further development of a proactive approach will depend on cooperation between the governments and civil society, which will serve to adapt policies that potentially will promote both innovation and civic trust (Zuboff, 2019).

2) Economic Strategies:

Traditionally, economic strategies have focused on changing industrial sectors, such as agriculture, manufacturing, and services, through their incremental (or linear) technological improvement (Matthess and Kunkel, 2020). These strategies included direct infrastructure investment, subsidies for key industries, and the development of

policies aimed at protecting local markets (Kak and West, 2024). However, the introduction of the AI element changed such a traditional approach to a more innovative and dynamic one.

Now, thanks to technology, countries are using it to diversify their economies, create new market opportunities and achieve technological leadership on the global arena – underscoring the importance of AI element as key to economic diversification and transformation (Mishra, Zaccaria and Rodarte, 2024). This increases the interest of countries in integrating AI into their economic strategies. For example, the US and China are investing heavily in AI in sectors ranging from social to military (Hass and Balin, 2019). This includes financing of research clusters, implementation of incentives for the development of startups dealing with AI and initiatives in general with the aim of leadership in the technological field (Levy, 2021). The EU is also interested in increasing the competitiveness of the AI ecosystem, which is why it provides support to technology companies through grants and incentives for public-private partnerships (Brattberg, Csernatoni, and Rugova, 2020). For example, the EU program 'Horizon 2020' provides the introduction of investments in the technological development (European Commission, 2020).

Moreover, AI occupies an important place both in the development of modern advanced industries (intelligent robotics, personalized medicine, autonomous vehicles) and in traditional sectors (agriculture, banking) (Rayhan, 2023). Regarding the first component, these new directions stimulate demand for new skills and services, which contributes to broader economic transformation. As Lee points out in "AI Superpowers: China, Silicon Valley and the New World Order" (2018), the US and China see AI as a key element in gaining competitive advantage in the global economy, and thus one that will help ensure their economic dominance (Lee, 2018; Horowitz, 2018). Actually, this is where the increased investment in research and commercialization of AI comes from, which ensures the creation of new directions. The second component – AI is integrated into traditional sectors to revitalize and increase their efficiency. For example, AI is being used in agriculture to improve yield forecasting and resource use (Mana, 2024). The field

of finance is also undergoing change, where fintech innovations are now transforming banking services and personalizing the customer experience (Josyula, 2021).

However, despite the many opportunities that AI opens for the countries' economies, the technology also raises challenges, such as the displacement of jobs and labor (Filipsson, 2024). As it was emphasized by Susskind in "The Future of the Professions: How Technology Will Transform the Work of Human Experts" (2015), due to these problems there is a need to adapt educational systems that will correspond to the changes caused by AI, which will strengthen the preparation of the workforce for such realities of the labor market, where the role of technology is increasing (Susskind, 2015).

To sum up, the paradigm shift towards the integration of AI into the economic sphere changes pre-existing economic strategies. In which the use of technological potential contributes not only to the creation of new industries and the modification of old ones, but also the successful use of which can provide a path to global economic leadership.

3) Education and Workforce Development:

As mentioned in the previous point, which referred to the economic paradigm, AI is changing the needs of specialists in the labor market, which requires the introduction of changes in the educational sphere, which would be more adapted to the constantly changing technological landscape (Thomas, 2024). In general, educational policies have been slow to adapt to new needs in relation to AI, but their revision has nevertheless intensified (Thomas, 2024). In particular, thanks to this, in countries such as Finland and South Korea, programs have been developed to improve the skills of the current workforce in their work with AI tools (Digital Workforce, 2024; Song, 2022; Rainey and Anderson, 2017).

Because AI creates demand for new skills, this leads to the need for simultaneous changes in approaches to education and, at the same time, to the workforce (Levesque, 2018; Dignum, 2021). Since the educational dimension, which deals with the training of future specialists, does not properly include the development of skills that would serve as a kind of response to the challenges posed by AI (Levesque, 2018). Additionally, it is worth noting that the education industry and workforce development have been largely

reactive in nature as they have lagged behind the changing needs of a dynamic and changing technological landscape (Gleason, 2018). In particular, the educational sector was quite stable and did not undergo those changes that were of critical importance. After all, its models were standardized and focused on meeting needs in the conditions of a relatively stable, predictable world with established needs for workers – which did not address the fact that technological markets were setting new requirements (Gleason, 2018; Dignum, 2021). For example, if earlier the need for IT specialists was very large, now it is gradually decreasing due to the emergence of new programs capable of performing tasks that were traditionally performed by IT specialists, in particular: IT Service Management Tools ('BMC Remedy', 'Freshservice'), Low-Code/No-Code Development Platforms ('Mendix', 'Microsoft PowerApps'), Robotic Process Automation Tools ('UiPath', 'Blue Prism'), and a number of others. Instead, there is a demand for specialists from non-technical fields who would be engaged in training AI systems (Gleason, 2018). That is, now it is worth taking into account precisely this rapid change in the needs of potential employees, so that education provides an extensive and relevant toolkit for developing oneself as a sought-after professional.

Realizing that AI is now dictating the rules of the labor market and can make some occupations obsolete; while creating new occupational demands, governments are increasingly focusing on the introduction of skills development programs (Stropoli, 2023). Singapore is a direct example of this, as the country's government has initiatives to reskill the workforce for mid-level workers, who may be most affected by the irrelevance of their specialization and related layoffs, as part of the National Program for Artificial Intelligence (Wisskirchen, 2017). Also, countries such as Finland and South Korea are gradually integrating AI education into their national curricula (Rainey and Anderson, 2017). In particular, they introduced disciplines that contribute to the understanding of AI, its consequences and application possibilities in primary education, which can then serve as a basis for further layering of knowledge about it already at higher educational levels (Rainey and Anderson, 2017). Also interesting is the aspect of public-private partnership, which is a collaboration between technology companies and

educational institutions/government institutions that work together to develop educational programs that take into account today's changing context (Gleason, 2018).

However, despite the need for proactive approaches to the development of educational programs, they also contain certain challenges. One of these is the emergence of a ‘digital divide’, where only a certain part of the population has access to employment opportunities where knowledge of AI technologies is critical (Božić, 2023). However, this can be addressed by ensuring equitable access to education (ITN, 2024). In addition, another challenge is related to predicting the demand for skills that will be considered relevant in the future, due to the fact that the trajectory of the development of AI itself is very uncertain. However, the introduction of subjects that would convey key ideas to promote understanding of AI could partially eliminate the current gaps in knowledge on this issue. In summary, countries that will actively reform current education will gain advantages that will minimize social disruptions.

4) International Collaboration and Competition:

In this dimension, there has been a shift away from isolated, nation-centric approaches to technological development towards international cooperation and the development of common technological standards instead (UN, 2022; Latin American Economic Outlook, 2020). This is due to the fact that AI technologies have global implications. For example, the Global Partnership on Artificial Intelligence (GPAI), aims to promote the responsible development of AI on a global scale (GPAI, 2023). However, at the same time, competition continues to intensify, especially between countries that are encroaching on leadership in innovations (Levy, 2021).

Thus, the dichotomy between cooperation and competition reflects the duality of the impact of changes brought by AI (Nora von Ingersleben-Seip, 2023). Because countries have to take into account both the existing technological race (primacy in which can guarantee the acquisition of competitive advantages), and the need for cooperation in the field of ethical management and AI development (Horowitz, 2018). As such, countries are increasingly recognizing the benefits of technological cooperation, leading to the formation of new international alliances to standardize AI regulations (Kerry, 2021). And with that, competition continues to be a driving force in the development of AI, especially

among such powerful players as the US, the EU, and China, which continue to actively fund areas engaged in innovation – in order to gain a strategic advantage (Kerry, 2021). In the case of the US and China, which are actually the main competing forces, the quest for technological supremacy plays a significant role in shaping their geopolitical strategies (Lee, 2018).

Given this, the challenge arises to balance competition and cooperation by reconciling different national interests while simultaneously working to ensure the global good (Nora von Ingersleben-Seip, 2023). Because of this, it is necessary to develop new initiatives that would take into account such a need. And in fact, there are already such examples. For instance, the approach of the European Commission, which emphasizes compliance with ethical principles (transparency, accountability), but does not harm the continuation of the implementation of new innovations (The European Commission, 2019). Thus, this example sets a precedent for international standards that would balance ethics with technological developments (Anitoiu, 2023).

AI also creates an opportunity gap between developed and developing countries, so international efforts should also focus on ensuring equitable benefits from AI gains (Alonso, 2020). This includes another potential basis for cooperation, which could consist of technology transfer, creation of joint educational programs and infrastructure development – to ensure wider participation and involvement in reaping the benefits of AI (Okolo, 2023).

Consequently, there has been a paradigm shift towards a more integrated approach of competition and cooperation, which requires moving in the direction of balancing these two aspects. Thus, countries must realize the criticality of the threats, which will worsen in the absence of steps in the direction of creating joint inclusive strategies to navigate technological gains.

5) Security and Defense Strategies:

Traditionally, security and defense strategies relied on the key role of human personnel and use of conventional weapons systems (Saltini, 2024). Such strategies depended entirely on the decisions made by people and directly on the number of human resources. However, today’s security strategies are increasingly integrating AI to improve

surveillance and cybersecurity capabilities (Kello, 2019). For example, the USA is actively investing in the development of autonomous defense technologies (Klempner, Rodriguez and Swartz 2024). Defense strategies have also undergone changes related to the integration of AI into them, where the technology enables the development of unmanned systems and is used in intelligence operations, and in general has created such a problem as cyber warfare (Kello, 2019).

Scharre, in "Army of None: Autonomous Weapons and the Future of War" (2018), outlines in detail these new technological advances that are transforming the fields of security and defense. In particular, the author noted how these achievements increase work efficiency and reduce the risk to people's lives in conflict zones thanks to the built-in AI in unmanned systems, including drones and robotic soldiers. And also, how AI helps to carry out surveillance missions for remote detection of targets and their destruction without direct human control (Scharre, 2018). Also, machine learning algorithms allow the analysis of vast arrays of data from surveillance cameras, satellite images and intercepted communications in order to track certain patterns and highlight potential threats – a useful feature for intelligence operations and surveillance systems that can help implement security measures that act in advance (as preventive mechanisms) (PertSol, 2024; Verhelst, Stannat and Mecacci, 2020). In addition, AI is transforming cyber security, an aspect that carries significant importance given the context of the threats posed by cyber warfare (Kello, 2019). After all, these AI-based systems can monitor network traffic, predict potential cyber-attacks and respond to security threats in real time (PertSol, 2024).

The transition to the introduction of AI in security and defense strategies requires a review of ethical norms. After all, in particular, such researchers as Scharre (2018), Asaro (2020), Ertan (2022) emphasize the significant potential that AI technologies have for transforming the principles of warfare, automating processes and making them more effective due to a lower need for human resources, but they also note about difficulties with ethical issues. Because the responsibility and morality of using machines in combat roles (in the context of the potential for autonomous decision-making by AI systems), the threat of cyber-espionage, and the safety of civilians during military operations – are

particular concerns that need to be paid more attention to (Scharre, 2018; Asaro, 2020; Verhelst, Stannat and Mecacci, 2020; Ertan, 2022; Saltini, 2024). Actually, because of this, the work of international organizations – in particular the UN, which conducts discussions addressing these issues has intensified. At one of the meetings, which was dedicated to the "New Reality of Generative and Other Intelligence", expert on technological issues – Jack Clark noted that while AI has the potential to bring great benefits, it also poses a threat to peace, security and global stability (UN, 2023). In addition, he added that this is due to the risk of improper use of AI by people and the general unpredictability of this technology (UN, 2023). As an example of this, Clark used biology, where AI can help advance understanding of the field, but can also be used to create biological weapons (UN, 2023).

In summary, the paradigm shift of security and defense strategies towards the integration of AI systems into them increases their level of functionality and efficiency. However, there is also a threat to the development and application of developments in practice, which cannot happen unsupervised because it will lead to aggravation of ethical dilemmas (Ribakoff, 2024). Therefore, it requires the development of common principles on the basis of which the development of these innovations should be carried out.

6) Regulation and Ethics:

In general, the aspect related to regulation and ethics has already been partially covered in each of the previous paradigms, but it is worth summarizing what significant changes it has undergone. At first, the range of stakeholders interested in discussions about AI regulation was relatively small, and the changes due to AI were not so large-scale. However, this trend has changed due to the fact that technologies controlled by artificial intelligence have become more common and therefore their influence on society has increased significantly and therefore, the topic about AI regulation became widely discussed by the numerous participants (Whyman, 2023).

The regulatory approach was initially fragmented and reactive to problems as they arose. This therefore led to regulatory gaps – where the needs for privacy, transparency and accountability were initially ignored until they became an obvious problem (Rodrigues, 2020). Due to the limitations of such a reactive approach, there was an

awareness of the need for a comprehensive regulatory framework and taking a proactive position in addressing the development and threats associated with AI (Rodrigues, 2020). A key aspect related to the change in the development of the regulatory framework is the development of general ethical principles, which would take into account respect for human rights, and which would be based on principles that are safe for society. An example of this is the "Proposal of the Regulation on the European Approach to Artificial Intelligence" (2021), which was developed by the EU High-Level Expert Group and 'AI Act' (The European Commission, 2023). They outlined the requirements for reliable AI, which took into account the need for transparency, accountability and fair development (The European Commission, 2021, 2023). Also, with its Law on Artificial Intelligence, the EU became an example of the movement to introduce special legislation for the regulation of AI, which is aimed at creating a unified legal framework for the safe and ethical deployment of AI in the member states (European Commission, 2021, 2023). Also, this Law is interesting from the point of view that it represents a nuanced approach to AI management, as it contains a classification of AI systems according to their level of risk, on the basis of which it forms relevant regulatory requirements (Fernhout and Duquin, 2024). Also, given the global nature of the changes brought by AI, international cooperation is important. Here, for example, the UNESCO recommendation on the ethics of AI can be considered as an attempt to establish global norms and standards, which reinforces the importance of international cooperation (UNESCO, 2021).

Therefore, regulation and ethics are important dimensions where significant changes have taken place. Specifically, the transition to proactive regulation and the development of common ethical principles. It is also necessary to consider the need to balance the protection of public values and efforts to promote innovation, given the need to increase one's competitiveness in the global arena. However, the international nature of the deployment of AI has challenges due to the need to harmonize norms, but at the same time the difficulty of reaching a consensus for their formulation due to the diversity of ideas and identities of countries that see their participation and role in the implementation of AI in different ways. Although, regular international dialogues

involving both governments and civil society can contribute to the improvement and adaptation of ethical regulatory approaches.

CHAPTER 3. STRATEGIC DYNAMICS OF AI IN GLOBAL COMPETITION

3.1. AI significance in the context of global competition

The role of AI in the context of global competition is a factor successful development of which by countries can give them competitive advantages over others (Horowitz, 2018). After all, taking into account how powerful the factor of AI is in creating changes in economic, social and political dimensions, which requires the introduction of proactive regulatory approaches to the management of technological developments – there is no doubt that in connection with this, countries will try to adapt their policy priorities in a new way. And it also affects their positioning as players on the global arena. Because in the conditions of the growing potential of AI, as a technology that offers significant advantages for countries that are making progress in the development of innovations, this causes increased interest in states to become advanced in this direction (Taddeo and Floridi, 2018; Nora von Ingersleben-Seip, 2023).

Thus, based on the findings in the previous sections, the value of AI cannot be overstated. Since in the economic sphere, this technology fundamentally changes already existing industries by automating processes; reducing the need for human resources, which lowers production costs; improving logistics; optimizing supply chains; improving the efficiency of work in agriculture; simplifying financial transactions (Agrawal, 2018). It also introduces new directions of development: development of autonomous vehicles, personalization of receiving certain services, creation of ‘smart cities’. And collectively, such innovations form new markets and undermine existing ones – which changes the dynamics of competition in industries (Brynjolfsson, 2014). Given that, countries at the forefront of AI innovation have significant influence and control significant market shares (Brynjolfsson, 2014).

In the military and security realms, AI offers the potential to improve these dimensions. Because with the introduction of AI-based technologies, security and military programs can more effectively deal with complex and unpredictable threat environments than traditional systems that relied entirely on the human factor (Scharre,

2018). For example, autonomous defense systems and autonomous combat systems are able to fulfil the goals of certain operations without risking people's lives, and in a way that is able to take into account more information and factors (Scharre, 2018). Also in today's cyber security space, technology is key to protecting data and critical infrastructure from sophisticated threats, which is a critical aspect in the digital age.

Despite its significant importance for economic, military and security areas, the growing role of AI is also being monitored in global governance. After all, the leading states in technological development are able to establish global rules and norms that significantly affect the global dimension, which also poses risks. Indeed, in particular, in the work of Tallberg "The Global Governance of Artificial Intelligence: Next Steps for Empirical and Normative Research" (2023), it was stated that since "technological leadership created large benefits – it might lead international actors and private firms to overlook safety issues and create potentially dangerous AI applications" (Tallberg, 2023; p.6). With this in mind, those who will occupy leadership positions in the future are important to consider. After all, players who do not adhere to democratic principles in the policies they implement will pose a threat through, nevertheless, exerting influence in view of their technological advantage.

Among other things, as AI changes the work landscape, countries that are able to adapt to this and implement changes in education systems and labor policies will be better able to deal decisively with socio-economic shifts and ensure that they have a workforce that can also adapt to the achievements of AI (West, 2018). Also, success in the progress of AI development depends on the amount of data that is available to train AI models (Jaen, 2024). Therefore, countries and corporations with large amounts of data under their control will have a competitive advantage over opponents with lower access to the data sets in the sense that they are able to develop more powerful AI systems (Smith, 2019). Because of the understanding of this need to access data – this has led to security and privacy issues (Smith, 2019).

Therefore, the importance of AI in global competition, which is caused by the realization of the potential gain of advantages, is significant and multifaceted, as it actually affects all spheres. And countries-leaders in the development of innovations will

both set the technological pace and have key roles in the formation of strategies and regulatory frameworks.

3.2. Key visions on the Global Race for AI: 'AI for profit', 'AI for control', 'AI for society'

Key approaches to understanding and navigating the global AI race can be divided into 'AI for profit', 'AI for control' and 'AI for society' (EU Science Hub, 2020). Each of these perspectives is a set of certain practices, visions and goals. And, relying on the use of 'case studies' in order to comprehensively characterize each of the approaches, as well as highlight their advantages and disadvantages, examples of the USA, the EU and China were taken into consideration, as they are important players in the current arena of technological development.

The first vision – 'AI for profit' is mainly focused on the commercialization of AI technologies and is based on the potential of obtaining economic profits. In particular, the United States and China are leading countries in the use of 'AI for profit', thus contributing to the development of an environment in which technology giants and startups compete to monetize AI technologies (Lee, 2018; Tim, 2024). The development of AI in the 'AI for profit' model is driven by the market, where the directions of technological development are determined by needs, which, again, are dictated by prospective market trends (Fanti, Guarascio, and Moggi, 2020). The main stakeholders in this vision are investors and entrepreneurs, and success can be determined by financial indicators. Despite the fact that this model helps to stimulate rapid technological development and contribute to the increase of innovations, such a pursuit of obtaining first of all economic advantages causes the risks of uncontrollability of this process, which does not take into account ethical aspects (Ribakoff, 2024). Returning to the example of the USA – its technological giants (Google, Amazon, Meta) drive the AI industry and are at the center of technological developments. The 2019 American 'AI Initiative' demonstrates how the US is supporting this by fostering public and private sector investment (Executive Office of the President, 2019). And as previously mentioned,

giving such excessive autonomy to companies and techno-giants causes numerous risks, since they are primarily focused on increasing the intensity of technological development, during which they may not be taken into account, or violate fundamentally important ethical principles (Ribakoff, 2024). Using the example of the USA, this is demonstrated by the risk of creating biased or discriminatory algorithms. After all, in 2018, Amazon had to refuse to use an AI-based recruiting tool that was guided by gender-biased views on female workers when selecting candidates (Pazzanese, 2020). A similar gender bias in algorithms occurred in 2019, when users left many negative reviews of an Apple credit card operated by Goldman Sachs that gave female users a lower credit limit compared to men with similar financial profiles (Ozsevim, 2023).

The second vision – 'AI for society' emphasizes the importance of technological development on ethical basis and sees the potential of deploying AI for the public good (Nora von Ingersleben-Seip, 2023). An example of the implementation of this vision in practice is the Global Initiative on Ethics of Autonomous and Intelligent Systems (IEEE, 2019), which mission is "to ensure that every stakeholder involved in the development of autonomous and intelligent systems is educated, trained, and empowered to prioritize ethical considerations so that these technologies serve for the benefit of humanity" (IEEE, 2019; p. 3). In addition, Dignum, Schmidpeter and Altenburger (2023) in "Responsible Artificial Intelligence. Challenges for Sustainable Management" outlined the principles (on which 'AI for society' can also be considered to be based on), among which they emphasized the importance of deploying AI systems in compliance with the principles of accountability, transparency and inclusiveness. The positive side of this vision is that, unlike the previous one, it has a wider range of stakeholders, including the public sector, governments and non-governmental organizations; and promotes the implementation of technological development, focusing not on principles of immediate financial benefits, but on those that, in the long term, will be of broad benefit to society. The EU is a prime example of following this vision, as the Union focuses on a people-centered approach to the implementation and development of innovations (Euro Cities, 2024). In addition, its first priority is the protection of society from the risks generated by AI, which is why the EU concentrates on the development of a regulatory framework that protects human rights

(European Commission, 2019). In this context, the EU is capable of taking decisive action in case of violation of ethical principles by companies involved in the development of technologies. For example, when Brussels held talks and warned the media giants – TikTok, Meta – that they should make more efforts to protect Slovakia's elections from external influence, otherwise they would face significant fines (Scott, 2023). This happened in 2023 and this negotiation was due to the threat to the elections in Slovakia caused by the distribution of misinformative audio content about one of the candidates in social networks, which was implemented thanks to AI technology that can imitate the human voice (Scott, 2023). However, the disadvantage of the vision of 'AI for society' is that strict requirements for compliance with the ethical development of AI can limit its deployment and slow down this process, by which the technological development in the context of this strategy will lag behind the other ones (Oubělický, 2024; Brattberg, Csernatoni, and Rugova, 2020). This, in fact, will affect the level of obtaining competitive advantages.

The third vision – 'AI for control' can be defined as one where the use of AI is concentrated in the hands of governments' bodies, which use technology to monitor, control, regulate and manage the population. The implementation of such a vision in the military and security (in particular, the dimension of cyber security) spheres contributes to their development, as it can ensure the improvement of the effectiveness of these directions in response to potential threats. However, this vision provokes an ethical debate about when its application goes beyond attempts to strengthen national security and moves towards violations of civil liberties. This is noted by Zuboff in "The age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power" (2019), who discussed how AI is used by governments to monitor and surveil citizens in a covert way that instead represents it as security measures. This has direct consequences for the privacy and freedoms of individuals, which are under even greater threat if control is exercised by authoritarian governments, leading to the emergence of a kind of 'digital dictatorships' (Zuboff, 2019; Harari, 2020; p. 64). Here, an example to demonstrate the use of such a vision is China, which relies on AI to augment its surveillance systems (for example, facial recognition technology is widespread in a country) to monitor its citizens

(Grzanna, 2023). Similar tools are closely embedded in China's national security structures and management plans, for example "Governance Principles for the New Generation Artificial Intelligence--Developing Responsible Artificial Intelligence" (2019) or "Plan for the development of artificial intelligence of the new generation" (2017) by the State Council of China in which plans to take a leadership position in AI technologies by 2030 are indicated, and in addition, the integration of AI into the governance and security framework is also mentioned (State Council of China, 2017; Webster, 2017; China Daily, 2019). In general, these documents demonstrate the heavy reliance on the AI factor in China's strengthening of state control over both citizens and the economy. However, due to this increased control – it gives China more access to data, and, in fact, on the basis of this data array, it helps to implement the training of AI models (Ruan, 2018). This gives China an advantage in the ability to improve its technological developments faster, because countries that have limited access to such information bases, due to ethical considerations in the deployment of AI, cannot improve their own innovations with the same power (Ruan, 2018).

Therefore, each of these visions constitutes a unique strategy based on different approaches to the development of AI – and is inherent to players whose ideas coincide with the peculiarities of the principles embedded in each of the visions. In addition, after analyzing 'AI for profit', 'AI for control' and 'AI for society', it can be concluded that none of them, despite their advantages, is comprehensive enough.

3.3. The balancing principle as an effective approach to the Global AI Race

Considering the shortcomings of each of the visions discussed in the previous subsection: 'AI for profit', 'AI for control', 'AI for society' – the 'balancing principle' is an alternative to such one-sided approaches to the Global AI Race and in fact, it balances the pursuit of competitive advantage with cooperation, aimed at the joint formulation of principles and standards for the management of AI (Nora von Ingersleben-Seip, 2023; Anitoiu, 2023).

Therefore, within the framework of this principle, it is assumed to maintain a balance between the development of the regulatory framework and the aspiration to increase the development of AI. Since too strict regulatory frameworks and rules can become an obstacle in the development of innovations, and at the same time – an excessively soft approach threatens to create risks for compliance with ethical and safety principles (Timmers, 2019; Rignell, 2023). In this way, the optimal approach may be one that involves the development of technologies under the supervision of a kind of regulatory commissions, which would consist of various representatives. These can be lawyers, officials, social workers, non-governmental organizations and business representatives, scientists and technology experts. Or, in other words, AI development should be carried out in a so called 'regulatory sandboxes' settings where various stakeholders are involved (The European Comission, 2021). This would provide an integrated approach to the development of new AI technologies, which before their practical implementation would undergo a kind of verification. And such that would be a multilateral view of representatives of various fields, who, through the prism of their own expertise, could on the basis of consensus, give an assessment of the development, or recommendations for its improvement. Such an approach could at least partially minimize the risks that arise when AI is deployed in an uncontrolled manner. In addition, in general, an example of how to maintain a balance between the observance of ethical standards and the promotion of innovation is the EU, which combines this in its strategies (Anitoiu, 2023; Timmers, 2019).

Also, although in the context of the Global AI Race, countries pursue their own national interests, the development of global cooperation on standardization of the regulatory framework for the development of AI, which takes into account the key needs for compliance with ethics and security, is also important. And implementation of such approach as part of the 'balancing principle' could be done by supporting international agreements that do not harm the country's competitiveness, but at the same time contribute to the creation of an environment for cooperation (Floridi, 2018). This can include the creation of joint research initiatives, moreover, those that would be international and involve researchers from different countries. So, despite the fact that it

is competition that accompanies the formation of narratives around the development of AI, the data from the Stanford University report on the AI index indicates that cooperation in the areas of publishing research and holding conferences can contribute to a more even distribution of the benefits of AI and reduce risks (AI Index, 2019).

In addition, the principle provides a balancing moment between the economic benefits obtained through AI and the achievement of justice in a social context. Because although technological growth provides economic gains, the problems of worsening inequalities due to different access to technology must also be taken into account. The implementation of this approach requires the development of policies that would carry out a fair distribution of the benefits provided by AI (can be done through joint initiatives between developed and developing countries); and also as an element of securing own citizens (workers who may potentially suffer from large-scale reductions of work places due to automation), development of initiatives that would enable retraining of specialists is also necessary (Alonso, 2020; Brynjolfsson and McAfee, 2014).

Another need that can be met through the ‘balancing principle’ concerns the privacy of individuals and public safety. This implies that AI development must comply with privacy standards when analyzing data and conducting surveillance – which introduce security at both, global and national levels (Kerry, 2023). In the case of a significant violation of these rules and requirements by other parties, development of a system of punishments and fines should be considered, and such, that would be jointly formulated and formed by the countries, which would be equalized in their innovation development conditions due to this. The functioning of such a joint system could potentially reduce suspicions of the fair use and deployment of AI among countries that, in the context of the Global AI Race, are distrustful of other players, which only inflames uncontrolled innovation.

Therefore, the full implementation of the ‘balancing principle’ requires the development and observance of multifaceted strategies, with the inclusion of a number of actors: governments, commercial companies, civil society, scientists, etc. And the principles underlying them should be adaptive, inclusive and subject to periodic reviews.

Full adherence to, or at least an attempt to implement this principle could help national governments to navigate the Global AI Race more effectively (Filipsson, 2024).

However, steps towards the development of this principle can already be traced now (WSDA, 2024). In particular, the USA, characterized by the promotion of innovation mainly through the private sector, recognizes the need for the development of a more comprehensive management of such problems as the threat of privacy and data security, as well as the risk of biased algorithms (West, 2022). This, in particular, can be confirmed by such a document as the "American AI Initiative", which contains the US strategy for AI, which serves as a kind of ethical framework that, on the one hand, promotes the development of technologies, but at the same time emphasizes the importance of international cooperation on this issue and in general seeks to protect public values (Executive Office of the President, 2020). Regarding the EU, this player exemplifies the critical proactive approach to navigating AI risks. Because it focuses on the issue of compliance with ethical principles in the development of technologies to create a favorable environment for innovation and the safety of citizens, which is highlighted in "Proposal for a Regulation of The European Parliament and of The Council Laying Down Harmonized Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts" (The European Commission, 2021) – which contains requirements for the compliance of AI systems with established ethical standards (Haddad, 2023). In addition, China, which is trying to become a leader in the field of AI and rapidly pursues technological development, is also paying attention to the need for AI governance principles. This is covered in "Governance Principles for the New Generation Artificial Intelligence--Developing Responsible Artificial Intelligence" (China Daily, 2019). In addition to the previously considered players, the UK has created the Center for Ethics and Innovation (CDEI), an interesting initiative focused on studying and addressing ethical issues arising from the development of AI (Chandrayigowda, 2024). The country also promotes involvement of various stakeholders in the development of standards, which again, embodies an important element of maintaining a balance between encouraging innovation and preserving public safety (UK Government, 2018). Such an attempt to develop a balancing principle is also reflected in the Canadian

strategy, which funds institutions such as Canadian Institute for Advanced Research (CIFAR), which promote AI, based on respect for human rights and public participation (Government of Canada, 2022).

So, although it is already possible to detect the movements of countries in the direction of a balanced approach to the management of AI, they differ in the speed of their implementation, and also rely on the individual priorities of countries on this issue. Therefore, the ‘balancing principle’ still needs to be refined by the players, not only through unilateral efforts, but also through joint concerted actions through multilateral dialogue.

CONCLUSIONS

In view of the tasks set, it can be summarized that, firstly, the historical evolution of AI, which began with the Dartmouth Conference in 1956 and was cyclical in nature due to ambitious expectations at the beginning, which were later replaced by 'AI winters', when interest in research funding declined, and subsequently recovered again with new power through advanced breakthroughs, stimulating investment growth and reviving interest – has led to the fact that the field of research dedicated to AI has become an overriding area of interest for countries. After all, this technology has a transformative effect on a number of sectors – from economic to social, and in general is a certain driving force for gaining competitive advantages in the global arena. In addition, the development of technology takes place at a very intensive pace, which constantly changes market requirements, needs for specialists and their skills; creates new directions of development; increases the efficiency of already existing industries; creates new risks and challenges for society and security. In connection with this, it prompts governments to review the relevance of their current strategies and modify them to strengthen their own positions in the context of high competition. Thus, it was established that the global policy in relation to the evolution of AI is such that, on the one hand, is characterized by an increased level of competition between states in introducing the innovations, and on the other hand, tries to develop an element of cooperation to achieve at least a partial consensus on common ethical rules for AI development to address the growing risks and security/societal threats caused by the lack of control over technological developments.

Secondly, the main changes that occurred in the paradigms of countries in key areas in connection with the development of AI were determined. Six areas were identified (listed in Table 2.2.2 in the 'Notes') where in 'Policy Frameworks' there was a shift from reactive to proactive approaches to formulating policies and regulations; in 'Economic Strategies', the focus shifted from the improvement of existing industries and sectors exclusively to the creation of new industries and directions; in 'Education and Workforce Development' – at first educational systems and workforce policies were inflexible and slow to adapt to market demands in relation to the development of AI, which later

switched to the recognition of the need to integrate disciplines dedicated to AI into the education system. That will partially prepare specialists for the increasingly technologically controlled labor market. In ‘International Collaboration and Competition’ – there was a transition from isolated, nation-centric approaches to technological development to joint efforts to develop international cooperation on this issue. In ‘Security and Defense Strategies’ – over-reliance on human resources and conventional weapon systems has shifted to increasing implementation of AI in the development of such areas as intelligence, surveillance and direct integration of technology into the creation of new types of weapons that minimize human involvement and can often act as a tool for proactive detection and elimination of threats (especially in cyberspace). Finally, in ‘Regulation and Ethics’ – from discussions about the development of AI, which consisted of a very limited number of stakeholders, there has been a transition to an increasing number of stakeholders who consider the development of a common and comprehensive ethical framework an important goal to be achieved.

Third, it was determined that the main strategic visions that exist on the development of AI are: ‘AI for profit’, ‘AI for control’ and ‘AI for society’. The US example was used to define ‘AI for profit’, an approach that is focused on the commercialization of artificial intelligence technologies. That is, the primary goal within its framework is to obtain economic profit thanks to the development of AI. Thus, its main stakeholders are investors and entrepreneurs, and the development of AI is mainly driven by market needs. The EU served as an example of ‘AI for society’ – an approach that focuses on the development of AI on an ethical basis and is one that primarily emphasizes the importance of observing the principles of transparency, accountability and inclusiveness in the development of technologies. In addition, it covers a wider range of stakeholders, consisting of representatives of the government, public and non-governmental organizations, academia, businesses, etc. China was taken to outline ‘AI for control’. According to this principle, the main share of the use of AI falls on state bodies for the purpose of supervision, control and support of security.

Fourth, it was determined that such single-vector approaches to AI regulation: ‘AI for profit’, ‘AI for control’, ‘AI for society’ – are ineffective because each of them is not

sufficient to navigate the Global AI Race. After all, to one degree or another, they do not take into account the need for comprehensiveness to the development of technologies and solving the risks associated with this. Since in ‘AI for profit’ companies and techno-giants are given considerable autonomy to develop technologies, there is a lack of control over these developments, which threatens the safety of data and citizens, and AI-based mechanisms can violate ethical principles. In addition, in ‘AI for society’, considerable attention is paid precisely to the observance of ethical standards in the development of AI, which are clearly defined and mandatory for compliance, which slows down the very procedure of deployment and use of AI and thus, it leads to the fact that it becomes more difficult to achieve competitive advantages. Finally, through ‘AI for control’– primary efforts to strengthen national security can turn into violations of civil liberties, through the usurpation of the use of AI within the framework of government structures that carry out surveillance and control over citizens.

Fifth, it was determined that states need to follow the principle of balancing because it is a comprehensive and promising approach that can put players in a winning position when it comes to navigating AI-based technologies in the context of global competition. Moreover, this approach, in contrast to single-vector ones, is more nuanced and provides a more comprehensive vision for considering how technologies should be deployed by taking into account such spheres, as: 1 – development of a regulatory framework and increasing AI innovations; 2 – national interests and development of global cooperation; 3 – economic benefits and promotion of social justice; 4 – individual privacy and public safety.

Lastly, based on theoretical achievements, recommendations were singled out on how the principle of balancing can be implemented by countries. Thus, it can be made through trying to achieve the balance between previously mentioned four pairs of spheres. The first can be achieved through the development of technologies under the supervision of regulatory commissions, which would include various representatives, in particular: lawyers, officials, social workers, non-governmental organizations and businesses, scientists and technological experts. Achieving the second can be ensured by taking part in international agreements and initiatives that do not harm countries’ own priorities, but

at the same time contribute to the creation of an environment for cooperation. For example, the creation of joint international research initiatives can help in this regard. Fulfilment of the third point involves the development of policies that would carry out a fair distribution of the benefits provided by AI, as well as the development of government initiatives that would enable reskilling or retraining specialists to adapt them to a more AI-driven labor market. Within the fourth aspect it is needed to promote the development of AI on the basis of its compliance with privacy and ethical norms. In case of violation of which, a system of punishments and fines will be provided, which would be jointly formulated and formed by the countries.

In conclusion, taking into account the given recommendations, efforts to implement them by politicians or other parties involved in the global AI race can provide them with an effective toolkit for navigating the technological competition. Adherence to an inclusive approach based on the ‘balancing principle’ will help to respond to risks in a proactive way and, despite the challenges created by AI – to overcome them, and in a way that adheres to ethical principles that allow to act for the good of society.

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NOTES

Table 2.2.2:

Aspect	Earlier Approach	Paradigm Shift
1 Policy Frameworks	Countries formulate AI policies in a reactive way after the technologies already became widespread.	Shifting to proactive policy-making with AI-informed strategies considering AI impact, including comprehensive AI plans.
2 Economic Strategies	The focus is on improving existing sectors through incremental technological improvements.	Artificial intelligence is seen as a catalyst for new and old industries which promotes investments and raises overall support for AI startups.
3 Education and Workforce Development	Education and workforce policies have been slow to adapt to technological change.	Recognizing the need to modernize education for an AI-driven world, integrate studying of AI to education to ensure that the acquired knowledge corresponds to the needs of a current job market.
4 International Collaboration and Competition	International cooperation in the sphere of technological development was very limited and not globally promoted as an urgent need to address.	Shifting to more global AI collaboration (through initiatives like GPAI) and competition.
5 Security and Defense Strategies	Defense relied on human resources and conventional weapons in defense matters.	Incorporating artificial intelligence to enhance defense and security capabilities.
6 Regulation and Ethics	Discussions of artificial intelligence have been limited to the very low number of stakeholders.	A significant shift in the ethical implications of artificial intelligence, development of a comprehensive ethical framework.

АНОТАЦІЯ

Кваліфікаційної роботи

Тема “Необхідність принципу балансування в навігації глобальної гонки штучного інтелекту”

Студентка Іванюк Вікторія Віталіївна

Рік навчання, факультет_____4-ий, Факультет соціальних наук та соціальних технологій_

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Рецензент_____

(*вчений ступінь, вчене звання, прізвище та ініціали*)

Захищена “____”_____20_ р.

Короткий зміст роботи:

В умовах Глобальної Гонки Штучного Інтелекту держави зацікавлені в здобутті конкурентних переваг, які можуть досягнути завдяки збільшенню технологічних інновацій. Це призводить до загострення конкуренції в глобальному контексті, оскільки ключові гравці хочуть здобути першість у розвитку ШІ, що дозволить підвищити рівень власного впливу ти зміцнити свої позиції на міжнародній арені. Однак розвиток ШІ несе в собі як можливості, так і загрози. З огляду на таку подвійну роль, яку відіграє технологія - ефективне подолання викликів внаслідок її розгортання може бути забезпечено дотриманням «принципу балансування», що слугує ефективним і вичерпним способом навігації Глобальної Гонки ШІ. Крім того, в роботі було описано поточні спроби країн впровадити цей балансуючий принцип, і оглянуто ключові підходи, що існують для навігації Глобальної Гонки ШІ. Таким чином, в рамках роботи було визначено те, як історична еволюція ШІ сформувала поточну глобальну політику; з’ясовано які зміни відбулися у парадигмах країн у ключових сферах у зв’язку з розвитком ШІ; які основні стратегічні підходи існують до розвитку ШІ через огляд ключових глобальних гравців – США, ЄС та Китай; визначено чому одновекторні підходи країн до розробки та впровадження технологій ШІ («ШІ для прибутку», «ШІ для контролю»,

«ШІ для суспільства») неефективні та чому натомість державам слід зосередитися на принципі балансування; а також виокремлено основні рекомендації для втілення принципу балансування.

Short summary:
In the conditions of the Global Race of Artificial Intelligence, states are interested in gaining competitive advantages that can be achieved through increased technological innovation. This leads to intensifying competition in the global context, as key players want to gain primacy in the development of AI, which will allow to increase the level of their own influence and strengthen their positions in the international arena. However, the development of AI carries both opportunities and threats. Given the dual role played by technology, effectively meeting the challenges of its deployment can be ensured by following the 'balancing principle' that serves as an effective and comprehensive way to navigate the Global AI Race. In addition, the paper described current attempts by countries to implement such balancing approach and reviewed the key approaches that exist to navigate the Global AI Race. Thus, the paper identified how the historical evolution of AI has shaped current global politics; singled out what changes have taken place in the paradigms of countries in key areas due to the development of AI; determined the main visions on the development of AI through an overview of the key global players – the US, the EU and China; determined why countries' single-vector approaches to the development and implementation of AI technologies ('AI for profit', 'AI for control', 'AI for society') are ineffective and why states should focus on the principle of balancing instead; and the main recommendations for the implementation of the principle of balancing were singled out.

Keywords:
Artificial Intelligence (AI), global AI race, balancing principle, AI governance, ethical AI, 'AI for profit', 'AI for control', 'AI for society'.