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Potentials and Limitations of Artificial Intelligence in Strategy Development

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Abstract

As one of the most integrative conceptual practices, strategy development requires capabilities to deal with the overwhelming complexity of the world in which we operate AI tools have proven useful in today's contexts for analysing large datasets, pattern recognition, performance prediction, and resource allocation optimisation. However, to find patterns, making its application in strategy development is questionable. The article examines AI's current potential in strategy development, focusing specifically on the risk assessment of the environment. The research is based on the analysis of contemporary security threats in Europe, specifically in terms of Russian aggression against Ukraine, which has been selected as a case study. To achieve results, various AI tools have been tasked with developing the building blocks of an optimal national security strategy. Overall, this research provides insight into the current potential of AI-based tools (e.g., ChatGPT, MS Copilot, Google Gemini, etc.) for strategy development. It identifies existing capabilities and future potentials, as well as the challenges that must be overcome in order for AI to provide relevant content for strategic documents. Furthermore, the paper discusses the fundamental legal issues surrounding the ethical aspects of strategy and its subsequent implementation.

Keywords

Artificial Intelligence, AI, Complex Problems Solving, Strategy Documents, ChatGPT

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Introduction

Navigating the overwhelming complexity of our modern world, which is characterized by numerous unknowns and an overload of information, is one of the primary challenges for strategists. At one level, AI adds to the complexity, but it also has the potential to be a tool that cuts through some of the clutter. The critical question is how AI can make life easier by providing more precise, timely insights. AI is changing our world, our societies, and our industries, much like the steam engine or electricity did in the past. Due to advancements in algorithms, data availability, and processing power, artificial intelligence has emerged as one of the 21st century's most important technologies. However, AI's role in strategy development is still developing, but it has enormous potential for businesses and the strategic profession. Making strategic decisions is critical to top executives' ability to influence their businesses, second only to assembling a strong leadership team. It's remarkable how little technology is currently utilized in this process. In the future, having executives who are knowledgeable about AI applications may become increasingly important for competitive advantage. This article investigates the current capacity of AI technologies (particularly generative AI) for strategy development. While the primary purpose of this research is the application of AI in strategy development, in the area of national defense, the technology (once matured) may be equally applied in the business domain.

Methodology

We first establish a theoretical framework that examines the concept and evolution of strategy, followed by a review of achievements in AI technologies, including legal and ethical aspects of AI use, which represents an vital effort to keep AI development under control. Following the theoretical considerations, we present some findings from the use of AI in horizon scanning (in terms of the security environment). The generative AI outputs are compared to the Ministry of Defense's standard risk assessment procedures. Finally, we draw conclusions about AI's current potential in strategy development.

Theoretical framework

On strategy and strategy development

Strategy originates from the Greek *stratos agein*, depicting the commandment of an army being pushed forward. Strategy is, therefore, the art of leading an army and, more generally, the art of command. This origin implies that strategy is not static, but rather intrinsically linked to movement and change. The role of strategist first appeared in Athens in the 5th century BC. Initially, a strategist was an official function, with ten strategists (*strategoi*) – comprised of experts, and leaders on military and security affairs – that were elected to that function for a year. Polyaenus distinguishes between *strategika*, which is associated with the concept of ruse and deception (the ability to outwit an opponent), and *strategemata*, clever deeds of generals that provide commanders with examples of planning and foresight (Brodersen, 2017). This distinction is relevant for later considerations of strategy as an art and a science.

The word strategist reappears in 1721 in Trévoux's dictionary (*The Dictionnaire de Trévoux*, also entitled *Dictionnaire universel françois et latin*) in the context of commanding the troops. While military strategy only emerged as one element among many during and after World War I, strategy in its current sense saw a resurgence in the 18th century. The Soviets were the first to develop what is now known as non-military strategy during that time. In the 1920s, Sir Basil Henry Liddell Hart spoke of a grand strategy that aimed to assess and develop the economic and demographic resources of the nation in order to support its military (Liddell Hart, 1929; Liddell Hart, 1991). Following that, the terms economic strategy, general strategy, enlarged strategy, and global strategy will appear (Coutau-Bégarie, 2008).

Hervé Coutau-Bégarie defines strategy as the dialectic of intelligence (of the wills) in a conflict environment based on the use or threat of using force for political ends (Coutau-Bégarie, 2008). He draws the contours of strategy as a concept, category of conflict, science, method, art and system. Strategy, perceived as a concept, refers to an idea, and as a category of conflict, it allows the analyst to classify it between politics and subordinate categories

(operations and tactics). Strategy as a science allows us to trace the history of strategic thinking and, as a method, is considered an approach. Any strategy is dependent on the means at its disposal and the ability to use them effectively. However, simply having the means of force is insufficient; one must also integrate them into real politics and understand how to convert force into power.

Strategy is unique in that it is both an art (the strategist's practice) and a science (in the broadest sense), as the strategist's knowledge. Russian terminology distinguishes, within the military domain, military theory and military practice. Russian theoreticians, such as General Genrykh A. Leer (1829–1904) divided strategy into ideal and practical (Vego, 2007). Generally, each sector and level of the military field is twofold: theoretical and practical. All practical activity is conducted taking into account the laws, principles, methods and processes established by the theory, as well as the teaching (the theory) learnt through practice. As a consequence, Hervé Coutau-Bégarie recognises two qualities of the strategist, thinker and doer. The strategist "thinker" (fr. *le stratégiste*) is the one who envisions and thinks, the one who must think globally and thoroughly. That one only uses reasoning and works from the comfort of his office, with time on his side. The strategist "doer" (fr. *le stratège*) is the one who acts and must remain focused on what is imminent, often based on insufficient and uncertain information, making his working environment stressful (Coutau-Bégarie, 2008).

Therefore, the theory (on strategy) is not a collection of recipes that can be applied in all circumstances. It seeks to clarify the judgement and to facilitate the decision. It is then up to the leaders to make the best use of the situation, whether by applying scientific principles or knowingly deviating from them. The Austrian Archduke Charles (1771–1847) pointed out that "*a great captain can only be formed by long experience and intense study: neither is his own experience enough – for whose life is there sufficiently fruitful of events to render his knowledge universal?*" (Bonaparte, 2015). This makes strategy difficult to "algorithmize" [1] even when all prior knowledge can be systematized and stored in databases.

1 To convert an informal description of a process or a procedure into an algorithm.

As described above, strategy emerged from the military milieu but found application in variety of fields, including business and corporate affairs. Although applied to different areas, the strategy has preserved its original purpose. It is about surviving and progressing in a particular environment, whether security or market. It is also about engaging limited resources towards goals set in the future, which inherently involve uncertainty and risk.

Strategy development may be broadly defined as a methodology used by an organisation or individuals to shape the way forward. However, our reality is so complex, diffuse and fluid that it is challenging to construct a comprehensive picture of our environment (from the market to the battlefield) that would serve as a solid foundation for predicting the future. Therefore, our action in "shaping the future" should begin with acknowledging that everything we do is based on an assumption, on a hypothesis. This turns our strategies, operational and tactical plans into hypotheses, and carrying them out becomes a hypothesis testing exercise. In this process of "testing" different options (*de facto*, strategic choice), it is crucial to have feedback that allows us to assess to what extent the decision represents a positive force (a force that changes and shapes). Feedback should tell us to what extent our assumptions were incorrect. Above all, they should help identify the reasons that caused the differences between our initial observations and our hypothesis test. Testing that hypothesis in real space and time is associated with many risks, so using tools and methods that can, at least partially, help obtain feedback is ideal.

The development of security and defense strategies is closely related to the competencies and capacity of strategists, and the skill aspect has a significant impact on the relevance and quality of the "output product." In general, the higher the strategy is on the taxonomy scale (from military strategy, through the defense strategy, to national security strategy and grand strategy), the more the balance between art and the scientific method favours art. Thus, strategy development as a method significantly enters the space of the intuitive and, to a significant extent, depends on the "talent" of the strategist. Acknowledging this assumption raises the question of methods and techniques that can provide substantial (adequate) support to strategists (decision-makers in the field of strategic choice) when deciding on goals and means for developing

a strategy. The problem statement for this article outlines specific requirements for strategy development, as well as the qualities that strategy developers need to possess. Since it generally deals with complex systems (international relations, geopolitics, markets), strategy development is a demanding endeavour for humans, let alone the technology that should (ideally) replace and (at least) augment people's cognitive capacity.

The core issue in developing the relevant military strategy is a reluctance or failure to recognise the dialectical nature of political or military conflict, which frequently favours a "linear approach" or an "administrative" perspective on war (Wirtz, 2014). In the early 19th century, Carl von Clausewitz compared war to a duel, implying that the outcome is determined by the interaction of opposing wills, politics, policies, and military forces. However, military institutions and their political leaders frequently focus solely on their role in the conflict, disregarding the adversary's motivations and the fact that the "interaction" within the conflict greatly determines outcomes. Colin S. Gray, one of the most influential theorists of military strategy, has repeatedly underscored the dangers of this linear approach to war and, by extension, strategy. Nonetheless, this shortcoming persists among strategists, often subtly, making strategy development in national security and defense more of an art than a science.

On artificial intelligence

To assess AI's potential role in strategy development, one must first understand current AI technology and trends. It is especially important to understand some major concepts (such as convolutional neural networks and generative AI), which aid in understanding what and how AI processes data and questions.

In general, Artificial Intelligence (AI) is a subfield of computer science concerned with developing systems capable of performing tasks that typically require human intelligence. One of the key tools in the field of AI is machine learning (ML), which enables computers to learn from experience without explicit programming. ML is based on the concept of algorithms that analyze data, identify patterns in that data, and use those patterns to make decisions

or predictions. Examples of ML applications span from image and speech recognition to product recommendations and data analysis (Wang and Siau, 2019).

Machine learning is characterized by its capability to automatically enhance system performance through experience. Instead of manual rule definition by programmers, ML algorithms utilize data to discern implicit patterns and regularities, then apply acquired knowledge to novel, previously unexplored situations (Janiesch, Zschech and Heinrich, 2021). There are three main types of ML: supervised learning, unsupervised learning, and reinforcement learning. In supervised learning, algorithms are trained on correctly labelled data, aiming to generalize learned patterns to new, unlabeled data. Unsupervised learning involves analysing data without labelled correct answers, with algorithms tasked with discovering hidden patterns and structures, such as clustering similar items or reducing dimensionality. In reinforcement learning, algorithms interact with the environment, adjusting their strategies based on feedback to maximize rewards or minimize penalties (Carleo *et al.*, 2019).

Deep learning (DL) is a unique and widely applicable subtype of ML, known for its ability to learn from highly complex datasets. Deep learning, like machine learning, identifies patterns in data using different techniques. Both methodologies (DL and ML) begin with training using sample data and models, during which they establish relevant connections between different data points. Following this, they undergo an optimization process to ascertain the most precise weight values for these connections and to ensure that the model matches the data as closely as possible.

The term "deep" refers to the use of artificial neural networks with multiple layers. These networks can recognize intricate patterns within data, enabling them to address highly complex tasks (Bengio, Lecun and Hinton, 2021). Rather than manually defining features or rules, deep neural networks learn implicit patterns and structures through data transformation layers. Each layer processes input data and generates output features, which then serve as input for subsequent layers, allowing for progressive abstraction and broader generalization of the data (Mu and Zeng, 2019).

Convolutional neural networks

Among the most commonly utilized neural networks are convolutional neural networks (CNNs) and recurrent neural networks (RNNs). CNNs are particularly efficient in analyzing images and video content because they use utilizing convolutional layers to extract local features and reduce the dimensionality of input data. RNNs, on the other hand, excel at dealing with sequential data such as text or time series, modeling temporal dependencies through recurrent connections between neurons (Janiesch, Zschech, and Heinrich, 2021).

CNNs have demonstrated outstanding performance in areas such as object recognition, image classification, face detection, medical diagnostics, and other domains that use visual data analysis. CNNs are distinguished by the use of convolutional layers, which are typically combined with pooling layers to reduce the model's dimensionality and computational complexity. The goal is to aggregate and summarize information from convolutional layers, allowing for more efficient feature processing and interpretation.

CNNs have the advantage of automatically learning hierarchical features from input data. In this sense, CNNs aim to simulate the functioning of living beings' central nervous systems, specifically the brain. CNNs, like biological systems, are made up of simple processing units that communicate with one another via numerous connections (Li *et al*., 2021). Instead of manually defining features or patterns, CNNs use data-driven learning through an iterative process of optimizing network weights to minimize prediction errors. An activation function (also known as a transfer function) is then used for further information transfer. Among the most common are the threshold function, piecewise linear function, and sigmoid function.

The technique of using CNNs has produced outstanding results in variety of tasks, sometimes outperforming human capabilities. It is applied in image recognition, object detection and segmentation, medical diagnostics, natural language translation, time series analysis, and many other applications, including autonomous driving through the analysis of geospatial data (Zhang *et al*., 2019).

However, it is important to emphasize that the level of accuracy and reliability of these techniques continue to vary depending on the presented data and the quality of the training process.

The following are some of the most common issues encountered by the mentioned techniques:

Data Bias: If the training dataset is not diverse or representative enough, the algorithm may learn biased patterns and produce unbalanced predictions. This phenomenon is common in real-world datasets due to natural variations or irregularities in the data collection process and can result in unfair models that favor dominant classes while ignoring or misclassifying less represented ones (Ntoutsi *et al*., 2020). The solution to this problem involves collecting a larger and more diverse dataset, along with additional data collection for less represented classes, and applying techniques such as data augmentation (generating new examples from existing data) or adjusting weights in learning algorithms to account for class imbalances in the sample (Bengio, Lecun and Hinton, 2021).

Overfitting: When a CNN becomes too tailored to the training dataset, it can lose the ability to generalize to new data. Dropout, early stopping, and gradient normalization are examples of regularization techniques used to address overfitting. Overfitting can occur for a variety of reasons, including the model's overcomplexity or having too many parameters in comparison to the amount of available data. Overfitted models have poor generalization ability to new data, resulting in poor performance in real-world applications. For example, if an overfitted model is used for image classification, incorrect predictions may occur when the model is applied to images that were not present in the training dataset (Surden, 2021). Fortunately, there are various strategies for addressing overfitting (if a larger training dataset is not available). One of the most common strategies is regularization, which involves adding additional constraints to the model to prevent overfitting.

Scarcity of Data. Acquiring a sufficient volume of data for training a CNN can be difficult in certain situations, particularly when dealing with constrained datasets such as those used in medical diagnostics, military applications, and so on. The scarcity of data can curtail CNN's capacity to learn general

patterns and structures (Janssen *et al*., 2020). An effective strategy to address this scenario involves employing transfer learning methodologies, wherein the model undergoes training on a comparable yet more expansive dataset.

Generative AI

Generative AI is an artificial intelligence technology capable of generating diverse content, including text, images, audio, and synthetic data. The current excitement surrounding generative AI stems from the ease with which new user interfaces can produce high-quality text, graphics, and videos in just seconds.

It's critical to understand that this technology isn't entirely new. The introduction of chatbots in the 1960s paved the way for generative artificial intelligence. However, it wasn't until generative adversarial networks (GANs) emerged in 2014, a machine learning algorithm, that generative AI could create highly realistic content (the text), images, videos, and audio of real people. Tools such as ChatGPT, WatsonX.ai, Bard, and Bing utilise what is known as Foundation Models to accomplish this. These are versatile and powerful language models known as Large Language Models (LLMs). LLM stands for Language Model, and it plays a crucial role in the world of generative AI. A language model is a program or algorithm trained on extensive text data, allowing it to "comprehend" language patterns and structures. It learns the statistical relationships between words and utilises that knowledge to generate coherent and contextually appropriate text.

Furthermore, Generative Pretrained Models (GPT) is a specific type of language model that has been pre-trained using large amounts of text data, such as websites, articles and books, articles, and books. GPT models are designed to generate text closely resembling natural human language, making them incredibly powerful for various applications like chatbots, language translation, and content generation. Working with pre-trained models requires a thorough understanding of the parameters required to run the model.

Legal and ethical aspects of the AI's use

Strategic decisions, as a general rule, have significant consequences. That is why, when using AI, it is critical to be transparent and understand why it is making a specific prediction and what extrapolations it makes based on which information. Following that, a user can determine whether or not they trust the prediction. They may also use artificial intelligence to track the evolution of the assumptions used to make that prediction.

NATO's Artificial Intelligence Strategy (NATO, 2021) reflects the alliance's efforts to maintain its technological edge while also emphasizing ethical, legal, and policy commitments that will govern the integration of AI into defense capabilities. The document includes explicit chapters on "Principles of Responsible Use of Artificial Intelligence in Defence" and "Ensuring the Safe and Responsible Use of Allied AI". One of the key principles is lawfulness: "AI applications will be developed and used in accordance with national and international law, including international humanitarian law and human rights law, as applicable."

In 2018, the European Union published the Artificial Intelligence for Europe Communication, which highlights how Artificial Intelligence is already a part of our daily lives. In addition to making our lives easier, Artificial Intelligence can help us solve some of the world's most pressing problems: such as treating chronic diseases and reducing mortality rates, road accidents, combating climate change and anticipating cybersecurity threats (EUR-Lex, 2018a). This Communication presents the European Initiative on Artificial Intelligence.

The stakes in AI use are high because the way societies approach AI will define the world we live in. Amid fierce global competition, a solid European framework is needed. In that way, the European Union (EU) should have a coordinated approach to make the most of the opportunities offered by AI and to address the new challenges that it brings. The EU can lead the way in developing and using AI for good and for all, building on its values and its strengths. It can capitalize on three main points: (1) world-class researchers, labs and startups. The EU is also strong in robotics and has a world-leading industry, notably in the transport, healthcare and manufacturing sectors that should be at the forefront of AI adoption; (2) the Digital Single Market.

Common rules, for example on data protection and the free flow of data in the EU, cybersecurity and connectivity help companies to do business, scale up across borders and encourage investments; and (3) a wealth of industrial, research and public sector data which can be unlocked to feed AI systems. In parallel to this Communication, the Commission is taking action to make data sharing easier and to open up more data – the raw material for AI – for re-use. This includes data from the public sector in particular, such as on public utilities and the environment, as well as research and health data.

European leaders have placed AI at the top of their agendas. On 10 April 2018, 24 Member States and Norway agreed to collaborate on AI. Building on this strong political endorsement, it is time for significant efforts to ensure Europe's competitiveness in the AI landscape, including bold investments that match its economic weight. This is about supporting research and innovation to develop the next generation of AI technologies, as well as deployment to ensure that companies – in particular, small and medium-sized enterprises which make up 99% of business in the EU – can adopt AI. Moreover, no one is left behind in the digital transformation. AI is changing the nature of work: new jobs will be created, others will disappear, and most will be transformed, even though modernization of education, at all levels, should be a priority for governments, as well. All Europeans should have every opportunity to acquire the skills they need and talent should be nurtured, gender balance and diversity encouraged. Furthermore, new technologies are value-driven, and the General Data Protection Regulation will become a reality.

It is a major step toward establishing trust, which is essential in the long run for both individuals and companies. This is where the EU's sustainable approach to technologies creates a competitive edge, by embracing change based on the Union's values. As with any transformative technology, some AI applications may raise new ethical and legal questions, for example, related to liability or potentially biased decision-making. The EU must therefore ensure that AI is developed and applied in an appropriate framework which promotes innovation and respects the Union's values and fundamental rights as well as ethical concerns, such as accountability and transparency. This is how the EU can make a difference – by championing an approach to AI that benefits both individuals and society as a whole.

Cooperation in the field of creating the regulatory framework began with the signing of the Statement on Cooperation in the Field of Artificial Intelligence, signed by 25 EU countries, including the Republic of Croatia was joined in 2018 (Jablanov, 2023:34). Within a few months of signing the statement, a High-Level Expert Group on Artificial Intelligence (AI HLEG) was appointed and launched the so-called AI Alliance. High-Level Expert Group on Artificial Intelligence (AI HLEG) has 52 members from academia, civil society and industry and drafted and published in April 2019 Ethical Guidelines for Reliable Artificial Intelligence in June 2019 (Šarolić Robić, 2019).

Several documents have been adopted in recent years, such as Communication entitled "Coordinated Agenda on Artificial Intelligence" 2018 (EUR-Lex, 2018b) and Communication entitled "Building Trust in Human-Centric AI" in 2019 (EUR-Lex, 2019), various studies and reports, recommendations and working documents, as well as resolutions of which we mention here several of the most significant – European Parliament resolution (2020/2016(INI)) of 6 October 2021 on artificial intelligence in criminal law and its use by the police and judicial authorities in criminal matters (European Parliament, 2021) and European Parliament resolution (2020/2266(INI)) of 3 May 2022 on artificial intelligence in a digital age (European Parliament, 2021).

Given that artificial intelligence is based on the processing of large quantities of personal data, the right to the protection of private life and the right to the protection of personal data apply to all areas of artificial intelligence and should fully comply with the EU legal framework for data protection and privacy; The EU has already set standards, data protection for law enforcement, which form the basis for any future artificial law intelligence used in prosecution and justice. The use and processing of personal data should be lawful and fair, the purposes of the processing should be clearly stated, explicit and legitimate, and processing should be appropriate, relevant and not excessive, to the purpose for which it is carried out, it should be accurate, up-to-date and incorrect data should be corrected or deleted unless restrictions apply.

The collected data is not should be kept longer than necessary, clear and appropriate deadlines should be established for the erasure or periodic review of the need to store such data, and they should be processed safely;

It is also important to prevent the possible identifying individuals using artificial intelligence that uses data that they were previously anonymised.

At the moment, AI is making the most intense penetration in the fields of automotive industry and transport, weapons and military sector, certain areas of health and medicine, financial sector and internet use (West & Allen, 2018). Current criminological literature recognizes different areas of potential risks, some of which have a higher degree of probability of output and a high degree of danger, and in this sense, we also talk about high-risk areas (Bikeev *et al*., 2019). The existing legal norms are mostly declarative and preventive in nature, they are not sufficient, and, in our point of view, the existing legal gaps should be filled in the future by introducing new legal rules in all branches of law, in particular criminal law, but first of all, it is necessary to approach the creation and adoption of national a strategy and action plan for artificial intelligence following the example of some of the EU Member States. Finally, the development of artificial intelligence should ensure a balanced approach taking into account advanced technologies and their accelerated development and on the other hand the need to develop certain legal, ethical and sociological standards that will guarantee legal certainty.

Results and discussion

Relevance of the ChatGPT as a tool

ChatGPT is an AI chatbot that generates written content on demand, including articles, social media posts, essays, code, etc. The abbreviation GPT stands for Generative Pre-trained Transformer, which describes how ChatGPT processes requests and formulates responses. The tool is available for any number and type of questions, including complex ones. However, ChatGPT still uses what we may call "historical data", so there is no knowledge of events and data after that year (see more at DataScienceTribe, 2023; Wolfram, 2023). For example, when asked (on 11 June 2024) about the data available for questions relevant to the national security strategy, ChatGPT answered that "*the data and insights used in outlining the national security strategy are based on information available up to June 2023.* "

Some general findings on the benefits of the usage of ChatGPT are:

- It is efficient because it handles "routinely" vast amounts of data, allowing users to focus on more complex problems.
- It saves costs because it is more profitable than hiring and training additional employees.
- It can be used as a virtual teacher.
- It is fast, as it provides almost instant answers.
- It is available 0-24.
- It supports many languages, including Croatian.
- It is personalised, as it adapts to user preferences and behaviours based on past interactions.

However, there are some restrictions, such as the following:

- It cannot cope with the complexity of human language, so its responses sometimes seem shallow and lack real insight.
- Certain words in the answers are overused because they are based on the next-word prediction. Consequently, users must edit the content it offers them.
- It summarises appropriately but needs to cite sources or analyze the data it offers. Even when it gives some statistics, it must explain what those statistics mean.
- It tries to follow the criteria for its analysis used in previous questions. For example, when asked, "*Is Russia a security threat?*" the answer started with: "*Russia's role as a security threat to Croatia and the broader region is nuanced and multifaceted* …" Although the question did not specify Croatia, the previous questions related to Croatia and its national security.

It is worth understanding how ChatGPT generates the content. The chatbot begins with the default words in the questions and then generates an appropriate word-for-word follow-up. Here, "reasonable continuation" means the generation of the next word as the one we expect someone to write as the next one after comparing their previous text with the texts on billions of web pages. For example, when ChatGPT had already generated the text "*Russia is a threat*", the next word could have been (which we verified by asking it): "*to regional stability*", "*to cybersecurity*", "*through energy dependency*", "*to national sovereignty*", "*to European security*", "*via military aggression*", "*by destabilising alliances, economically and politically*". As "explained "by ChatGPT, "*the next possible words could vary based on the context and the specifics of the discussion.* "

The role of data AI in strategy development

Data availability is vital for strategy development. However, the challenge is in the availability of systematically organized performance data. Resource allocation is inevitably defined by what one believes about the future, not necessarily past performance. This is why the result can be significantly biased. AI can provide a relatively objective prediction of performance based on data from the past and some indicators for the future.

AI-powered machines cannot replace humans in strategy development at this stage of technological development. The primary reason for this is that it cannot create and apprehend "the model of the world" (LeCun, 2022).

AI still does not "think" and lacks the "model of the world" that would enable it to go beyond statistics. However, there are many facets of strategists' work where advanced analytics (based on AI) tools can add immense value and augment what Colin S. Gray described as "the timeless principles of strategy" (Gray, 2010).

Organizations should use all of the capabilities of traditional analysis while increasing strategy automation, which can free up managers' or analysts' time and gradually introduce tools that can augment human thinking.

Only 7% of respondents to the McKinsey survey (Atsmon, 2023) about using AI said they use it in strategy or financial planning. In contrast, in areas like marketing, supply chain, and service operations, it's 25 or 30 per cent. Adoption is lagging because strategy is one of the most integrative conceptual practices.

Conclusion

The current level of AI-related technologies has still not reached the level that would allow to confidently replace humans in strategy development. This is because the generative AI continues to work (learn) from the existing datasets and formulates its answers on statistics rather than on what could be called comprehensive thinking. Strategy development is extremely demanding work, which requires knowledge, experience and the capacity to think broadly across time and space. It is also an art as it frequently requires audacity. While AI is highly useful in many aspects of human life, it does not "think" and lacks the "model of the world" required to go beyond statistics.

Organizations that base their strategies on a few major decisions using limited data are likely to benefit less from AI. Similarly, organizations exposed to high volatility and external vulnerabilities may not benefit as much as those with controlled and systematic portfolios. However, such organisations may still use AI to better predict external events and determine what they can and cannot control.

The speed at which decisions must be made also influences the value of AI. Most companies update their strategies every three to five years, which aligns with their annual budgets. Viewing strategy this way restricts AI's role to potentially speeding up the analyzes that feed into the strategy. However, some companies frequently reassess significant decisions based on assumptions about the world that may have changed, impacting the projected ROI of their initiatives. These changes affect how organisations allocate talent and executive time, spend money, and prioritize sales efforts. AI becomes particularly valuable when decisions are made close to the time of resource deployment, as it can indicate when previous assumptions have changed since the plan was created.

AI can be cost-effectively integrated into strategy development, constructing the foundational elements of the strategy. Altghough it may appear tactical, the impact can be substantial. For instance, rather than directly analyzing individual companies, a leading global investment firm has begun to use AI to detect specific patterns.

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Potencijali i ograničenja umjetne inteligencije u razvoju strategije

Sažetak

Kao jedna od najintegrativnijih konceptualnih praksi, razvoj strategije zahtijeva sposobnosti za suočavanje s ogromnom složenošću svijeta u kojem djelujemo, alati umjetne inteligencije pokazali su se korisnima u današnjim kontekstima za analizu velikih skupova podataka, prepoznavanje uzoraka, predviđanje izvedbe i optimizaciju raspodjele resursa. Međutim, za pronalaženje obrazaca, njegova primjena u razvoju strategije postaje upitnom. Ovim se radom ispituje trenutačni potencijal umjetne inteligencije u razvoju strategije, posebno se fokusirajući na procjenu rizika za okoliš. Istraživanje se temelji na analizi suvremenih sigurnosnih prijetnji u Europi, konkretno u kontekstu ruske agresije na Ukrajinu, koja je odabrana kao studija slučaja. Kako bi se postigli rezultati, razni alati umjetne inteligencije zaduženi su za razvoj sastavnih dijelova optimalne strategije nacionalne sigurnosti. Sve u svemu, ovo istraživanje pruža uvid u trenutačni potencijal alata temeljenih na umjetnoj inteligenciji (npr. ChatGPT, MS Copilot, Google Gemini itd.) za razvoj strategije. Identificiraju se postojeće sposobnosti i budući potencijali, kao i izazovi koje je potrebno prevladati kako bi umjetna inteligencija pružila relevantan sadržaj za strateške dokumente. Nadalje, u radu se raspravlja o temeljnim pravnim pitanjima koja se nameću o etičkim aspektima strategije i njezinoj kasnijoj provedbi.