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ENSURING SOVEREIGN AI FROM THE PERSPECTIVE OF THE GENERAL ECONOMIC THEORY OF STRATEGIZING [1]

The article explores digital sovereignty for small nations in the AI era. Using General Economic Theory of Strategizing (GETS), it justifies aligning interests between governments and global platforms. Key AI factors (energy, power, big data, and algorithms) are analyzed, identifying data scarcity as the primary challenge. A mechanism is proposed: trading market access for technology and investment. The study justifies regional digital alliances and local protectionism to pool resources. Scientific novelty lies in applying GETS to model state and platform-based TNCs interactions. This strategy shifts countries from passive consumers to active competitors, enhancing sovereignty through proactive big data management.

Keywords: *General Economic Theory of Strategizing (GETS), AI, digital sovereignty, regional digital alliances, local protectionism, platform-based TNCs.*

General description of the problem and its connection with important scientific or practical tasks

Artificial intelligence (AI), particularly large language models (LLMs), is considered a key driver of economic growth and one of the major technological innovations of the first half of the 21st century. According to the McKinsey Global Institute (2025) [2], generative AI could add between $2.6 trillion and $4.4 trillion to global GDP annually — an amount equivalent to the combined economic

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[2] McKinsey Global Institute (2025). Superagency in the workplace: Empowering people to unlock AI's full potential at work. 2025. https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/superagency-in-the-workplace-empowering-people-to-unlock-ais-full-potential-at-work (Accessed 2 April 2026).

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output of the United Kingdom and France. PwC (2025)[3] forecasts that AI adoption could boost global GDP by an additional 15 percentage points by 2035. AI assistants such as GPT, Grok, Gemini, and DeepSeek continue to expand their capabilities in natural language processing, code generation, data analysis, and business model development. These tools are increasingly integrated into everyday applications, ranging from virtual assistants to autonomous systems. At the same time, humanoid robots are becoming significantly more advanced, largely due to progress in AI technologies.

The development of these technologies is a focus not only for businesses but also for society, whose interests are represented by national governments. The issue is particularly acute for small economies and countries with relatively small populations. These nations have limited capacity to develop and use AI technologies in line with their sovereign interests. Therefore, the relevance of this study stems from the need to identify strategic priorities for economically and demographically small countries.

Analysis of recent studies and publications

The growing role of artificial intelligence (AI) is evident both in individual industries and in the economy as a whole, affecting a wide range of issues (Chika-Petegyrych, 2021). Recent studies increasingly focus on computational power and energy supply, emphasizing that training models such as GPT-4o requires clusters of tens of thousands of GPUs and energy consumption comparable to that of a medium-sized city.

Almost a decade ago, N. Srnicek (2017)[4] already highlighted the problem of platform monopolization and its contribution to rising inequality. If small countries continue to rely heavily on foreign AI services, they risk losing control over their data, facing economic stagnation, and increasing their geopolitical vulnerability — particularly in the event of restricted access to critical technologies.

Recent research[5] identifies three core cyber-physical factors essential for AI development: (1) energy consumption, (2) computational power, and (3) large datasets. A fourth, more intellectual factor can be added: (4) algorithms, which optimize the combined use of computational resources and data, including minimizing the time required for model training and retraining.

The availability, cost, and environmental sustainability of energy directly influence the scalability and economic viability of AI development. Energy demand is one of the main constraints on the size and frequency of model retraining. The importance of computational power (compute) drives the exponential growth in model performance in line with scaling laws. As noted by Maslej et al.[6] "Model scale continues to grow rapidly—training compute doubles every five months." For comparison, in 2012 AlexNet required approximately 470 petaFLOP for training, while OpenAI's GPT-4o (2024) needed 38 billion petaFLOP — more than 80 million times greater[7]. At the same time, the energy efficiency of machine learning hardware continues to improve by tens of percent annually[8], and the cost per unit of training is steadily declining. However, the collection and effective use of large datasets for AI training carry significant risks of data exhaustion between 2026 and 2032 (with an 80 % probability)[9].

Pekny et al. (2026) provide a detailed analysis of the interdependence between artificial intelligence development and energy infrastructure. Widespread AI adoption creates additional strain on power grids and electricity generation. For instance, data centers alone could account for up to 12 % of total electricity consumption in the United States by 2028. The authors argue that transitioning to nuclear energy, particularly through small modular reactors (SMRs), represents the optimal solution for powering data centers. SMRs are easier to deploy, reduce investment risks, and can supply both electricity and heat. Replacing fossil fuels solely with renewable sources (wind and solar) is considered extremely challenging due to

[3] PwC (2025). AI adoption could boost global GDP by an additional 15 percentage points by 2035. https://www.pwc.com/gx/en/news-room/press-releases/2025/ai-adoption-could-boost-global-gdp-by-an-additional-15-percentage.html (Accessed 2 April 2026).

[4] Srnicek, N. (2017). Platform capitalism. Cambridge, UK: Polity Press. https://mudancatecnologicaedinamicacapitalista.wordpress.com/wp-content/uploads/2019/02/platform-capitalism.pdf (Accessed 4 April 2026).

[5] Maslej N. et al. (2025). *Artificial Intelligence Index Report 2025*. Stanford Institute for Human-Centered Artificial Intelligence. https://hai.stanford.edu/assets/files/hai_ai_index_report_2025.pdf (Accessed 4 April 2026).

[6] Ibid., 4.

[7] Ibid., 57.

[8] Ibid., 71.

[9] Ibid., 60.

the enormous scale of construction and capital investment required. The study also emphasizes that AI itself can act as a catalyst for change by accelerating the energy transition — for example, by optimizing reactor design, managing plasma in fusion facilities, and improving resource allocation in energy networks.

The issue of digital sovereignty in the field of AI is thoroughly examined by Krishnamurthy (2026). The author concludes that in the current geopolitical climate, where leaders of major powers openly disregard international law, other countries understandably perceive technological dependence as a critical vulnerability. While achieving AI autonomy requires investments of hundreds of billions of dollars, severing economic ties simultaneously removes material incentives for maintaining stability and preventing conflicts (for example, if the United States and China no longer depend on Taiwanese semiconductors). Instead of building "digital fortresses", Krishnamurthy recommends that states focus on developing international legal frameworks capable of distinguishing legitimate technological influence from the illegal "weaponization of interdependence," while ensuring compliance among partners. However, this approach has a significant limitation, as it does not adequately account for differences in economic and military-political power among states.

The integration of AI and Big Data has fundamentally transformed business strategies, shifting them from retrospective analysis to predictive understanding and real-time response. The success of implementation depends not only on computational power but also on data quality, governance, and adherence to ethical standards (transparency and absence of bias) (Maddipatla, 2026). A strong synergistic effect emerges from combining Big Data with AI. Bajwa et al. (2025) demonstrate that the integration of AI and Big Data forms the foundation of Industry 4.0, enabling the transition from traditional automation to intelligent, adaptive, and predictive systems. Experimental evidence confirms that integrated AI and Big Data systems significantly outperform the use of these technologies separately in terms of prediction accuracy and operational efficiency. Consequently, the strategic integration of AI and Big Data can substantially reduce market uncertainty by enhancing predictive modeling capabilities and implementing proactive risk management strategies (Ge, 2026).

Artificial intelligence (AI), the Internet of Things (IoT), and Big Data are recognized not merely as supporting tools, but as primary drivers of innovation and economic growth (Ismaila and Beneke, 2026).

The institutional foundations of AI development, legal liability regimes for defective AI systems, and changes in economic calculation under the influence of big data directly affect the capacity of states to ensure digital sovereignty (Davidson, 2024; Buiten, 2024; Lambert and Fegley, 2023). This is particularly important for small countries, whose limited control over data, platforms, and regulatory instruments increases their dependence on external technological actors.

Formulation of the article's aim

Thus, the unresolved and highly relevant scientific problem is the identification of effective ways to ensure digital sovereignty in the context of using AI assistants as a factor in maintaining competitiveness and an adequate level of economic security. In light of this problem, ***the aim of this article*** is to substantiate the possibilities for ensuring digital sovereignty and competitiveness of small countries from the perspective of the general theory of economic strategizing.

Presentation of the main research material

The theoretical foundation of this study is the General Economic Theory of Strategizing (Vyshnevskyi, 2018; 2021). This theory emphasizes the primacy of strategizing in economic activity and requires the clear identification of actors, their main goals, and the means to achieve them in a coordinated manner. In the present research, the key actors are national governments and global platform companies.

All countries can be divided into three conditional groups. The first group (G2) includes the United States and China. The second group (G20) comprises the other 20 largest economies in the world following the G2. The final group, referred to as NG200, includes all remaining countries that do not belong to either G2 or G20.

A comparison of the presence of global platform companies across these groups reveals a clear pattern: the majority of truly global companies that generate or collect massive amounts of data are concentrated in the G2 countries (the United

States and China). The G20 group also contains a significant number of companies that aspire to a global scale, although most of them operate primarily at the regional level. In contrast, such companies are relatively rare in the NG200 group, despite its large number of countries (tabl. 1).

From the perspective of governments, the fundamental and self-evident goal is to ensure digital sovereignty and national security. In contrast, the primary interest of platform companies is profit maximization. These two sets of goals significantly influence each other. On the one hand, the absence of digital sovereignty can lead to critical external influence over the country's sociocultural and electoral sphere. This, in turn, may reshape public opinion and economic rules in favor of foreign capital associated with the provision of artificial intelligence services. On the other hand, the loss of competitiveness in high-technology sectors — which are now closely linked to AI — reduces the state's economic capacity, increases the risk of economic crisis, lowers government approval ratings among voters, and ultimately weakens its ability to protect the interests of domestic businesses in international economic relations.

To develop coherent policy directions in the field of AI, it is necessary to identify the critical factors that determine its development.

Four Critical Factors in the Development of AI Technologies

Analysis of previous studies shows that the development of artificial intelligence depends on four critical factors: (1) energy generation, (2) computational power, (3) training datasets, and (4) data processing algorithms. Computational capacity can be scaled through investments in hardware such as NVIDIA GPUs or Google TPUs, while energy is supplied through traditional and renewable sources. Plans to relocate these two factors — energy generation and data centers — into space are already under discussion. However, access to sufficiently large volumes of high-quality data remains the scarcest resource and a key determinant of competitiveness (table 2).

Big data generated by social networks, search engines, Internet of Things (IoT) devices, and user interactions have become a strategic asset, often compared to oil in the industrial era. At the same time, data rapidly become obsolete, making con-

Table 1. **Global Platform Companies Generating or Collecting Big Data**

Level of Countries	Macroeconomic Characteristics	Global Platform Companies Generating/Collecting Big Data
G2 (economic scale: 1)	GDP (PPP) share of global GDP: Total: ≈ 33,7 % Average per country: ≈ 16,9 % GDP (current USD) share of global GDP: Total: ≈ 42,3 % Average per country: 21,4 %	Alphabet Inc. (Google); Meta Platforms Inc. (Facebook, Instagram, WhatsApp); Amazon.com Inc.; Alibaba Group; Tencent Holdings; ByteDance Ltd. (TikTok); Baidu Inc.; JD.com.
G20 (excluding G2) (economic scale: $\approx 10^{-1}$)	GDP (PPP) share of global GDP: Total: ≈ 43 % Average per country: 2,2 % GDP (current USD) share of global GDP: Total: ≈ 39,6 % Average per country: 2 %	SAP SE, Shopify Inc., Rakuten Group, Reliance Jio, Samsung Electronics, Booking.com, Vodafone Group, Yandex, Telegram.
NG200 (countries outside G2 and G20) (economic scale: $<10^{-2}$)	GDP (PPP) share of global GDP: Total: ≈ 23,3 % Average per country: 0,1 % GDP (current USD) share of global GDP: Total: ≈ 19,3 % Average per country: 0,1 %	Bolt, Spotify (Sweden)

Source: developed by the authors based on the logic presented in (Katoikos (2016, September 14). G20 – Between G2 and G200. https://katoikos.world/editorials-op-eds/g20-between-g2-and-g200.html (Accessed 2 April 2026) and statistical data derived from World Bank indicators (World Bank. (2024). GDP, PPP (current international $). https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD (Accessed 2 April 2026); World Bank. (2024). GDP (current US$). https://data.worldbank.org/indicator/NY.GDP.MKTP.CD (Accessed 4 April 2026)).

tinuous updating essential. Thus, ensuring access to up-to-date data is a critically important factor.

Large economies of the G2 group, such as the United States (with platforms Google, Meta, and X) and China (with Baidu, WeChat, and Tencent), enjoy a significant advantage due to their ecosystems that collect petabytes of data daily. Small countries, including Ukraine, relative to the United States or China, risk falling into digital dependence if they do not purposefully develop their own national platforms. This dependence could later threaten their economic sovereignty. If a significant portion of professional activities becomes critically dependent on foreign AI assistants, any disruption in access (blockage, censorship, or tariff increases) could result in catastrophic economic losses. These risks are further amplified by ongoing deglobalization and rising protectionism.

A comparison of the availability of AI development factors on domestic and international markets (table 3) clearly shows the more limited opportunities available to countries outside the G20. The analysis indicates that economically and demographically small countries have the least capacity to stimulate AI development either domestically or through imports. The most problematic area is access to large volumes of data. All dominant AI assistants rely on national platforms as their primary source of data. Countries without developed social networks — that is, networks with a large number of active users — cannot effectively compete in AI training. Consequently, the greatest deficit for them lies in general-purpose big data, which cannot realistically be generated domestically due to their relatively small population, which serves as the ultimate source of raw primary data.

This situation creates a practical objective for governments of small countries: to actively form and maintain access to large volumes of data. To achieve this goal, it is necessary to examine what such governments can offer in exchange to global platform companies.

Since these companies are primarily motivated by profit derived from data, it is worth examining their business models in greater detail. The business models of companies such as OpenAI, xAI, Google, and DeepSeek combine limited free access with premium subscriptions, creating a cycle of expanded reproduction.

These companies invest substantial resources in developing and launching free versions of their AI systems to attract a broad audience and demonstrate the product's value. These investments cover infrastructure, model training, and marketing, laying the foundation for future growth. Free access enables rapid user acquisition, which is essential for

Table 2. **Factors of AI Development and Mechanisms for Ensuring Technological Sovereignty for Small Economies**

Factor of AI Development	Current Problems and Potential Risks for Small Economies (NG200)	Pathways to Sovereignty
(1) Energy consumption	1. Growth in data center energy demand will outpace the introduction of new generation capacity	1. Creation of additional capacity. 2. Implementation of "economic" operating modes for data centers to smooth daily and seasonal fluctuations (e.g., lower prices for AI queries at night)
(2) Computational power	2.1 Computational capacity must be adequate for the volume of data. Conceptually, a large country with an economy and population 100 times larger than a small one can process 100 billion units of global big data. A small country would require comparable computing power to achieve similar results	2.1 Formation of a shared pool of computational resources among groups of small countries
(3) Large datasets	3.1 Absence of global social networks and search engines	3.1 Purchase of access to big data. 3.2 Obtaining access to global big data in exchange for granting global companies regulated access to the national market
(4) Algorithms for processing big data	4.1. Lack of laboratories conducting research on cutting-edge algorithms for big data processing	4.1. (a) Development of national schools for studying algorithms and their application to big data. (b) Acquisition of algorithms together with AI assistants

Source: generated by the authors.

data collection and system improvement. Through interactions with the free version, companies collect vast amounts of data on user queries, preferences, and behavior. This data is anonymized and analyzed to identify patterns and refine algorithms. The continuous influx of information ensures ongoing enrichment of the knowledge base needed for further model training. As a result, the free version of the AI assistant is continuously improved. Based on the collected data, companies update and optimize the free version by adding new features, increasing accuracy, and improving speed. These enhancements make the product more attractive, stimulating further growth in the user base. Satisfied users of the free version are gradually encouraged to upgrade to premium subscriptions, which offer unlimited access, priority processing, and additional tools. This model generates stable revenue that offsets initial investments. The paid version strengthens user loyalty and creates barriers for competitors. Profits from premium subscriptions, along with additional sources such as API access and enterprise solutions, allow companies to recoup costs and generate positive cash flow. This financial stability supports further reinvestment. A portion of the profit is directed toward research and development (R&D), including the creation of new AI models and expansion of infrastructure. Scaling involves globalization of the product, integration with other services, and adaptation to new markets.

As soon as companies begin large-scale communication with users and receive information from them — which is later used to generate responses — they start influencing not only the economic but also the institutional and political sphere. At the same time, the activities of global platform companies are primarily regulated by the rules established by the governments of their countries of origin (typically G2 countries).

Thus, the critical area where the interests of governments and platform companies clearly intersect is the "collection of user data." Satisfying local demand often requires an understanding of local context. For example, a model trained primarily on users from Brazil may not provide relevant responses to users in Japan. It is also important to note that the very process of formulating a query itself forms part of the data collection process.

The situation described above is significantly influenced by the growing trend of deglobalization, which manifests itself in efforts to achieve politico-economic autarky or the creation of zones of direct control (for example, U.S. policy toward Venezuela or Greenland). Barriers are increasing not only in trade (such as tariffs introduced by the United States in 2025) but also in the use and access to data. For instance, the European Union's General Data Protection Regulation (GDPR) has been in force since 2018. These restrictions apply not only to data but also to chips (for example, U.S. export controls on semiconductors).

For countries outside the G2 and G20 groups, a policy of full digital protectionism aimed at creating a completely self-sufficient national AI ecosystem appears unproductive in the long term. This can be clearly illustrated by the example of Ukraine.

Opportunities for Aligning the Goals of Governments and Global Platform TNCs

Within the framework of the General Economic Theory of Strategizing (GETS) developed by O. Vyshnevskyi, the primacy of strategizing in economic activity implies not only the clear identifi-

Table 3. **Availability of AI Development Resources: Domestic Production versus Imports**

Factor of AI Development	Availability through Domestic Creation			Availability through Imports		
	G2	G20	NG200	G2	G20	NG200
1. Energy	5	5	3	5	4	3
2. Computational power	5	3	3	3	3	3
3. Large datasets	5	4	1	2	2	2
4. Algorithms	5	4	3	3	3	3
Total	20	16	10	13	12	11

Note: Scale of availability: 1 — very difficult to obtain; 2 — difficult; 3 — moderately difficult; 4 — relatively easy; 5 — very easy.
Source: created by the authors.

cation of actors, their goals, and the means to achieve them, but also the mandatory alignment of interests among all participants to ensure a sustainable and mutually beneficial outcome. In the context of ensuring digital sovereignty for economically and demographically small countries (the NG200 group), the key actors are, on the one hand, the governments of these states, representing national interests, and, on the other hand, global platform transnational corporations (PTNCs) such as OpenAI, xAI, Google (Alphabet Inc.), Meta Platforms Inc., Alibaba Group, Tencent Holdings, and others that dominate the generation, collection, and capitalization of big data for AI development.

As shown in the comparison of goals and outcomes presented in table 4, there exists both an objective opportunity and a necessity for aligning the interests of these actors. Governments of small countries pursue interrelated goals focused on preserving sovereignty and competitiveness, while PTNCs are primarily oriented toward profit maximization and market expansion. Alignment is achieved through an exchange mechanism — «market access in return for technology and data" — in which each party offers something valuable to the other and receives adequate "payment" in the form of resources, support, or regulatory preferences. Each goal is examined in detail below.

The first goal of the government is to ensure economic and political sovereignty. This is achieved through the protection of the national information space via regulatory measures, including data localization, mandatory storage of information on national servers, and restrictions on foreign influence over social networks and search engines. The outcome is a protected information environment free from external manipulation in the sociocultural and electoral spheres. The beneficiaries are the population (as the source of electoral legitimacy) and local businesses (as sources of taxes and innovation). In return ("payment"), the government receives electoral support and public approval from the population, as well as stable tax revenues from local businesses.

Without such protection, small countries risk losing control over their information space. As Krishnamurthy (2026) demonstrates, this turns technological dependence into a critical vulnerability amid deglobalization and the "weaponization of interdependence". Alignment with PTNCs in this area is not achieved through a complete ban, but through conditional access: the government is willing to grant regulated market entry

Table 4. **Alignment of Goals and Outcomes between Governments of Small Countries and Global Platform TNCs**

Actor	Goal	Means of Achieving the Goal		
		Value Proposition (Product)	Beneficiary	"Payment" from the Beneficiary
Government	Ensuring economic and political sovereignty (capacity for independent strategic planning)	Protection of the national information space	1. General Population 2. Local Business	1. Electoral support and public approval 2. Tax revenue from citizens and local enterprises
Government	Ensuring economic security and competitiveness via access to advanced AI technologies	Facilitating access to modern AI assistants, search engines, and social networks	1. General Population 2. Local Business	1. Electoral support and public approval 2. Tax revenue
Government	Technology and data acquisition in exchange for market access	Provision of domestic market access	PTNCs	Access to advanced AI assistants for the local population and business community
PTNCs	Profit maximization and market expansion	Provision of access to advanced AI assistants, search engines, and social networks	1. General Population 2. Local Business 3. Government	1. Subscription fees 2. Big Data 3. Regulatory frameworks ensuring legal domestic market access

Source: created by the authors.

only if national rules on data localization and algorithm transparency are observed. This allows PTNCs to gain legal access to part of the market, while the government maintains control and receives political support from citizens who value protection from external influence.

The second goal of the government is to ensure economic security and competitiveness by providing access to modern AI technologies. This is achieved by organizing access for the population and businesses to effective AI assistants, search engines, and social networks (such as ChatGPT, Grok, Gemini, DeepSeek, and others). The outcome is a technologically equipped economy in which AI is integrated into everyday processes – from code generation and data analysis to business model optimization and public administration (as seen in Ukraine's Diia ecosystem). The beneficiaries are again the population (improved quality of life and access to education and healthcare services) and local businesses (higher productivity, lower costs, and access to global markets). The "payment" from beneficiaries takes the form of electoral support, public approval, and increased tax revenues resulting from accelerated economic growth.

Alignment with PTNCs in this area is pragmatic. The government does not aim for full isolation ("digital fortresses") but offers PTNCs access to the national user market in exchange for guaranteed service quality, partial localization of computing resources, and knowledge transfer (for example, through joint R&D programs or the establishment of local data centers). This approach minimizes the risks of disconnection from foreign AI services, which, as noted earlier, could cause catastrophic economic losses for small countries with limited domestic resources.

The third goal of the government involves attracting technologies and data in exchange for regulated access to the domestic market. For PTNCs, the outcome is legal and predictable entry into the national market, represented by the population and local businesses. The beneficiary in this case is the PTNC. In return ("payment"), the government and its citizens gain access for the local population and businesses to modern AI assistants on competitive terms.

The goal of PTNCs is to generate monetary profit and expand their sales markets. This is achieved by providing access to modern AI assistants, search engines, and social networks. The beneficiaries are the population, local businesses, and the government (as regulator). The "payment" from the beneficiaries includes: (1) subscriptions and payments for premium features; (2) big data on user behavior, queries, and preferences (anonymized but highly valuable for model fine-tuning); and (3) regulatory policies that ensure legal market access and protection from arbitrary restrictions.

Thus, the alignment mechanism is based on a classic exchange. The government offers PTNCs regulated and stable access to raw national data, while PTNCs provide AI services in return. The government can establish "rules of the game" — such as mandatory localization of 30—50 % of data, joint data centers, and a minimum level of technology transfer — and receive in exchange not only access to global models but also the ability to fine-tune its own sovereign AI systems using combined datasets (national and global).

This approach avoids extremes: full protectionism (which is disadvantageous for small economies due to shortages of computing power and data) or complete openness (which threatens sovereignty). Instead, it forms a pragmatic "mixed strategy" that combines local protectionism (Vyshnevskyi, 2023) in key areas with international cooperation among small countries to create regional digital alliances capable of negotiating with PTNCs on more equal terms.

Ultimately, aligning goals transforms a potential conflict into synergy: the government preserves digital sovereignty and gains tools for competitiveness, while PTNCs expand their markets and data base without the risk of regulatory conflicts. Ignoring such alignment, as evidenced by trends in deglobalization (tariffs, GDPR, export controls on chips), will lead to the marginalization of small countries in the global AI economy. In contrast, proactive strategizing based on GETS will enable them to achieve sustainable development amid global competition for energy, compute, data, and algorithms. An example of such strategic interaction can be examined through the case of Ukraine.

Interstate Collaboration to Overcome the Challenges of Small Open Economies: The Case of Ukraine

Ukraine, as a typical representative of countries outside the G20 group, faces the full range of challenges inherent to economically and demographi-

cally small nations. These challenges are significantly exacerbated by the consequences of prolonged military conflict. On the one hand, there is a critical dependence on global platforms: Google search services hold nearly 90 % of the market[10], and their integration with Gemini is driving rapid growth in the latter's share, which has already taken second place after ChatGPT and continues to strengthen month by month[11]. This creates a situation in which a significant portion of professional, educational, and administrative processes critically depends on foreign AI assistants. Any restrictions on access — whether through disconnection, censorship, or tariff increases — pose direct risks of substantial economic losses. On the other hand, the destruction of energy infrastructure severely limits both industrial recovery and the construction or scaling of data centers needed for local training and operation of AI models. At the same time, the state, through the development of the Diia ecosystem, has become the central platform for activity, consolidating vast arrays of verified citizen data. This already represents a unique national asset, although it is currently used primarily for local administrative purposes.

At first glance, the most obvious solution to the problem of digital sovereignty appears to be full integration into the European digital market as part of Ukraine's European integration process. A key instrument in this approach could be a pilot project to create sovereign AI compliant with GDPR standards, which, if successful, could later be scaled across the entire European Union. However, this approach has fundamental limitations. The EU is a union of states developing at significantly different speeds: it includes powerful G20 economies (Germany, France, Italy) that possess their own global or regional platforms and substantial computing resources, as well as other small NG200 countries. As a result, the interests of the latter are often diluted in pan-European initiatives dominated by larger players. Moreover, even within the GDPR framework, small countries risk remaining in the position of "data suppliers" without real control over algorithms and computational capacity. This contradicts the principles of the GETS), which emphasize the need to align goals and means for independent strategizing.

Therefore, a more promising alternative is a combined strategy that integrates elements of local protectionism (Vyshnevskyi, 2023) with active interstate collaboration among small EU member states and associated countries. In this context, local protectionism does not imply isolation ("digital fortresses") but involves the use of regulatory tools to protect the national information space. These include mandatory localization of at least 40—60 % of data on national territory, requirements for PTNCs to establish local data centers as a condition of market access, and tax and administrative incentives for investment in national infrastructure. At the same time, cooperation with other small countries is developed to overcome the key limitations identified in tabl. 3 — namely, the low availability of big data and computational power within a single country.

Given geographic, economic, and technological proximity, regional digital alliances can be built in stages. At the first stage, it would be advisable to create a "core" consisting of Ukraine, Poland, Estonia, Latvia, and Lithuania. These countries already possess mature national e-government platforms: Diia (Ukraine), mObywatel (Poland), mRiik (Estonia), Elektroniniai valdžios vartai (Lithuania), and Valsts pārvaldes pakalpojumu portāls (Latvia). Each of these platforms accumulates verified citizen data, creating a foundation for forming a common regional pool of big data large enough to enable competitive fine-tuning of AI models. At the second stage, the alliance could expand to include Czechia, Slovakia, Austria, Hungary, Romania, Bulgaria, Slovenia, and Croatia, increasing the total population coverage to 120—140 million people and generating a critical mass for producing up-to-date data.

Within such an alliance, it becomes possible to address all four critical factors of AI development in practice (see tabl. 2). For factor (3) — large datasets — countries can pool their national datasets through secure exchange mechanisms that comply with GDPR-like standards, supplementing them with anonymized user data from the joint platform. For factor (2) — computational power — a regional pool of GPUs/TPUs can be created based on shared data centers financed through a common investment fund (similar to EU recovery funds but specifically targeted at AI infrastructure). Factor (1) — energy consumption — can be ad-

[10] Statcounter Global Stats. Search Engine Market Share Ukraine. https://gs.statcounter.com/search-engine-market-share/all/ukraine

[11] Statcounter Global Stats. AI Chatbot Market Share Ukraine. https://gs.statcounter.com/ai-chatbot-market-share/all/ukraine

dressed through joint projects to build small modular reactors (SMRs), as recommended by Pekny et al. (2026). This is particularly relevant for Ukraine, given its damaged but recoverable energy sector. Finally, for factor (4) — algorithms — joint research laboratories and specialist training schools can be established to develop localized models that take into account the region's specific characteristics (languages, legal norms, and cultural contexts).

On the alliance's multinational platform, it would be logical to host a unified search engine and a common AI assistant that operates using both national and pooled data. Drawing on the successful model of ProZorro in Ukraine, it is advisable to clearly separate the processing (back-end) and interface (front-end) components: data processing and model training would be carried out on shared infrastructure, while the user interface remains national, adapted to the language and services of each country. The existing Diia AI assistant, which currently serves mainly local administrative functions, could be significantly enhanced by fine-tuning it on the regional dataset, transforming it into a full-fledged sovereign tool capable of competing with Gemini or Grok in terms of response relevance for users in Central and Eastern Europe.

This approach substantially strengthens the negotiating position of small countries when dealing with PTNCs. In line with the goal-alignment mechanism (see table 4), the regional alliance acts as a single "market" comprising the population and businesses of several countries, offering global companies regulated access in exchange for technology transfer, infrastructure investment, and access to portions of global data. This prevents the situation in which each small country individually is forced to accept unfavorable terms. At the same time, the alliance preserves digital sovereignty and minimizes the risks of "weaponization of interdependence" highlighted by Krishnamurthy (2026).

Ultimately, interstate collaboration transforms the structural weakness of small open economies into a strategic advantage. It provides not only access to modern AI technologies and global market competitiveness but also genuine opportunities for independent strategizing in accordance with GETS principles. Ignoring this path will lead to further marginalization of NG200 countries amid deglobalization and technological protectionism. In contrast, the proactive creation of regional digital alliances will enable small countries, including Ukraine, to move from the role of passive data consumers to active participants in the global competition for key AI resources — energy, compute, data, and algorithms — while maintaining their economic and political sovereignty.

Conclusions and prospects for further research in this area

1. The problem of ensuring digital sovereignty in the context of the rapid development of artificial intelligence (AI) and big data is one of the most pressing scientific and practical challenges in the modern economy. Global competition for the key resources of AI development — energy, computational power, large datasets, and algorithms — intensifies inequality between countries and places economically and demographically small countries (the NG200 group) in a clearly vulnerable position.

2. From the perspective of the General Economic Theory of Strategizing (GETS), ensuring sovereign AI for small countries requires clear alignment of the goals of the state (digital and economic sovereignty, national security) with those of global platform companies (profit maximization through the collection and capitalization of data). Without such alignment, small countries risk losing control over their information space, sociocultural influence, and, ultimately, political sovereignty.

3. Analysis of the critical factors of AI development shows that the scarcest and strategically important resource for countries outside the G2 and G20 groups is big data. Major platform companies (primarily from the United States and China) possess ecosystems that generate petabytes of up-to-date data daily, giving them a decisive advantage in training and improving AI models. Small countries, including Ukraine, are unable to independently generate comparable volumes of data due to their limited population and the absence of global social networks and search engines.

4. To ensure competitiveness and digital sovereignty, small countries need to implement a combined strategy that includes local protectionism — involving regulatory protection of the national data market and stimulation of the development of national or regional platforms (as exemplified by the development of Ukraine's Diia ecosystem) — and

international cooperation through the creation of digital alliances with other small and medium-sized countries. Such alliances should focus primarily on the Central and Eastern Europe region: Ukraine, Poland, and the Baltic states at the first stage, followed by the Visegrád Group countries and the Balkans at the second stage. These alliances enable the pooling of data, computational resources, and infrastructure, as well as the joint development of sovereign AI solutions. They also facilitate mutually beneficial data exchange with global platform companies, based on the provision of regulated access to the national user market in return for access to global datasets and technologies.

5. The development of sovereign AI should not be reduced to complete isolation ("digital fortresses"). A more productive approach is to combine elements of protectionism in the domestic market with the active promotion of open competition principles in third countries. This will allow national and regional platforms to expand their presence. Particular attention should be paid to the capitalization of big data — transforming it from "digital waste" into a full-fledged financial and strategic asset through reasonable "enclosure," processing, and monetization.

6. Lagging behind in the development and use of AI carries a double risk for small countries: not only a slowdown in economic growth compared to global averages and technological leaders, but also the gradual loss of digital — and subsequently political — sovereignty. In the context of accelerating deglobalization and technological protectionism (restrictions on chips, data, and energy infrastructure), ignoring these challenges may lead to marginalization in the global AI economy.

7. The results of the analysis of goal alignment and interstate collaboration demonstrate that the proposed combined strategy (local protectionism + regional alliances) not only minimizes the risks of digital dependence and the "weaponization of interdependence," but also creates real preconditions for capitalizing big data as a full-fledged financial and strategic asset for small countries — analogous to oil in the industrial era. This opens new sources of revenue and additional economic growth.

8. In the context of accelerating deglobalization and technological protectionism, the consistent application of the GETS in the field of AI is a necessary condition for small NG200 countries to preserve not only economic competitiveness but also full political sovereignty. Ignoring these mechanisms will inevitably lead to the irreversible marginalization of such states in the global AI economy.

9. The scientific novelty of the research lies in the systematic application of the GETS to the issue of ensuring digital sovereignty for small countries (the NG200 group) in the field of artificial intelligence. Unlike previous studies, which have focused primarily on technical, energy-related, or legal aspects[12] (Krishnamurthy, 2026), this study is the first to develop and operationalize a mechanism for aligning the goals of governments and global platform TNCs. This mechanism is based on a detailed table comparing actors, goals, means, outcomes, beneficiaries, and forms of "payment." It transforms a potential conflict of interests into sustainable synergy through a pragmatic exchange: regulated access to the national market and national big data in return for modern AI technologies, infrastructure investment, and joint fine-tuning of models.

Furthermore, the novelty consists in substantiating a specific model of interstate collaboration among small countries in the form of phased regional digital alliances (using the example of Ukraine together with Poland and the Baltic states, with subsequent expansion to the countries of Central and Eastern Europe). This model enables the joint solution of all four critical factors of AI development through resource pooling (a shared pool of data, data centers, small modular reactors, and algorithm laboratories), the creation of a unified multinational platform with a clear separation of back-end and front-end components (following the ProZorro model in Ukraine), and a significant strengthening of negotiating power vis-à-vis PTNCs. This approach moves GETS from a purely theoretical plane into a practical tool for proactive strategizing, enabling small open economies to transition from the role of passive data consumers to active participants in the global competition for AI resources — energy, compute, data, and algorithms.

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ЗАБЕЗПЕЧЕННЯ СУВЕРЕННОГО ШІ З ПОЗИЦІЙ
ЗАГАЛЬНОЇ ЕКОНОМІЧНОЇ ТЕОРІЇ СТРАТЕГУВАННЯ

У статті досліджено критичну проблему забезпечення цифрового суверенітету малих країн в умовах стрімкої експансії технологій штучного інтелекту (ШІ) та економіки великих даних. На основі положень загальної економічної теорії стратегування (ЗЕТС) обґрунтовано необхідність переходу від реактивної моделі споживання цифрових послуг до проактивного стратегування національного розвитку. Актуальність дослідження зумовлена глибокою інтеграцією ШІ-асистентів, таких як ChatGPT, Grok, Gemini та DeepSeek, у соціально-економічні процеси, що створює нові виклики для держав, які не входять до групи світових лідерів (G2 та G20). Визначено та проаналізовано чотири фундаментальних чинники розвитку ШІ: енергозабезпечення, обчислювальні потужності, великі набори даних та алгоритмічну базу. Доведено, що для малих країн (поза групою G20) найбільш дефіцитним ресурсом є саме великі дані, оскільки обмеженість населення та відсутність власних глобальних платформ унеможливлюють самостійне навчання конкурентоспроможних моделей. Виявлено ризики «цифрової залежності», яка загрожує втратою контролю за інформаційним простором й електоральними процесами. Наукова новизна дослідження полягає в розробленні та операціоналізації механізму узгодження інтересів національних урядів і глобальних платформних транснаціональних корпорацій. Запропоновано модель прагматичного обміну: надання регульованого доступу до національного ринку в обмін на трансфер сучасних технологій, спільне донавчання моделей та інвестиції в локальну інфраструктуру (зокрема центри обробки даних). Особливу увагу приділено стратегії міждержавної співпраці малих країн. Обґрунтовано доцільність створення регіональних цифрових альянсів, які уможливлюють об'єднання ресурсів кількох держав для досягнення ефекту масштабу. На прикладі України описано поетапну модель формування такого альянсу з Польщею та країнами Балтії на основі інтеграції даних національних цифрових екосистем (зокрема «Дії» та mObywatel). Це дозволить малим країнам створити спільний пул обчислювальних потужностей і розробити суверенні ШІ-рішення, адаптовані до місцевого контексту. Доведено, що реалізація комбінованої стратегії, яка поєднує розумний локальний протекціонізм з активною міжнародною кооперацією, є необхідною умовою збереження економічної конкурентоспроможності та політичної суб'єктності малих держав в умовах деглобалізації.

Ключові слова: загальна економічна теорія стратегування (ЗЕТС), ШІ, цифровий суверенітет, регіональні цифрові альянси, локальний протекціонізм, платформні ТНК.