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# HYBRID INTELLIGENCE AS A TOOL FOR DIGITAL DEVELOPMENT OF CIVIC ENGAGEMENT IN PUBLIC ADMINISTRATION

**Abstract.** The article substantiates the peculiarities of civil society's digital development in implementing hybrid intelligence in public administration. The relevance of the topic is driven by the rapid growth of digital technologies that affect the decision-making process in the public sector, transforming classical forms of civic engagement and creating the need for new theoretical and methodological approaches to studying the interaction between an individual, the state, and algorithmic systems.

The article aims to identify the potential and risks of hybrid intelligence for civil society and explore ways to preserve human agency and democratic oversight in the digital era. The key theoretical approaches to the concept of hybrid intelligence are systematized. The phenomenon of algorithmic governance is analyzed as a form of delegating managerial functions to artificial intelligence systems, which define the main digital challenges for civic participation.

The methodological foundation of the study is based on general scientific methods of analysis, synthesis, comparison, generalization, and forecasting. These methods help identify the distinctive features of hybrid governance and its influence on digital participation, as well as analyze digital initiatives that either strengthen or weaken the agency of civil society. Special attention is given to the risks of algorithmic opacity, digital inequality, the delegation of responsibility, and the space restriction for public oversight.

The article also emphasizes the importance of the ethical dimension of digital governance. The development of digital literacy among the population, the implementation of open-source code, and mechanisms for explainable AI. In this context, successful international practices, including the vTaiwan project, are

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examined to demonstrate the potential of inclusive digital participation through crowdsourcing tools.

The conclusions substantiate that civil society should not only adapt to new conditions of hybrid governance but also actively shape regulatory, institutional, and technological frameworks for the functioning of the digital state. The concept of «hybrid intelligence democracy» is proposed, which envisions active participation of citizens in the creation, oversight, and ethical regulation of public administration algorithms.

**Keywords:** public administration; civil society; civic engagement; hybrid intelligence; algorithmic governance

**Introduction.** The study of hybrid intelligence — a symbiosis of human and machine reasoning in public administration decision-making — is particularly critical for modern science. Under such conditions, the society faces a dilemma. On the one hand, new technological opportunities arise for civil engagement; on the other hand, there are risks of losing human agency because of algorithmic governance and the opacity of digital processes. Therefore, it is essential to research methods to reconcile algorithmic accountability with digital ethics and identify tools to effectively delegate specific administrative functions to artificial intelligence systems and preserve human potential in public authority activities simultaneously.

**Problem statement.** The article aims to analyze the transformation of civil society while integrating hybrid intelligence into public administration and identify risks and opportunities for preserving and enhancing civic engagement in the digital era. The following objectives are addressed to accomplish this goal: systematizing theoretical approaches to the concept of hybrid intelligence and its impact on public administration, identifying the main challenges for civic engagement associated with automated decisions and algorithmic transparency; examining digital initiatives that strengthen or weaken the agency of civil society; developing recommendations on human responsibility preservation and democratic oversight in a hybrid governance environment.

**Methods.** The research employed a combination of general scientific and specialized methods; in particular, an analytical method was used to study hybrid intelligence's distinct features and implications and its impact on public administration. A synthesis method identified how hybrid governance technologies affect the digital participation of active civil society representatives. A comparative method allowed for the identification of advantages and drawbacks of applying the symbiosis of human governance and machine algorithms in the activities of public authorities that strengthen or weaken the civil society agency. A generalization method was used to systematize practices of applying digital initiatives, fostering the identification of main challenges for civic engagement, which are connected with automated decision-making and algorithmic transparency. A prognostic method was used to formulate conclusions and develop recommendations on further prospects of human responsibility preservation and democratic control over civil society in the hybrid governance environment.

Any transformations of civil society in the context of digitalization should be examined through the lens of multiple scientific discourses, namely digital governance, algorithmic policy, e-democracy, and technological ethics. Within the digitalization

framework, foreign scholars such as Patrick Dunleavy [1] and Helen Margetts [2] focus on gradually modifying traditional institutional entities due to ICTs. Academic literature pays special attention to electronic participation of citizens (e-participation), which is seen as an innovative means for activating society through online tools and criticized for creating an illusion of engagement [3]. With more complex digital systems emerging, decision-making algorithms and intelligent management technologies have created a new analytical field known as algorithmic governance.

Kujtese Bejtullahu-Michalopoulos and Marie-Valentine Florin question the fairness and accountability of algorithmic impacts on allocating resources, decision-making, and access to services [4]. In this sense, a growing concern is the closeness and non-transparency of such digital systems, as their decisions can be difficult to challenge or sometimes even understand.

The concept of hybrid intelligence [5] is being actively developed in computer science, business analytics, and cognitive science. In academic discourse, this concept is also evolving as the integration of human and machine reasoning in public administration processes. Applying hybrid intelligence in civil society engagement opens up a new dimension, uncovering how machine efficiency can be balanced with human ethics, responsibility, and participation.

In their studies of civil society transformation in the digital era, American scholars Lance Bennett та Alexandra Segerberg [6] focus on the rise of new forms of «networked activism», flexible structures of self-organization, as well as digital rights, in particular the rights to data, privacy, and online participation. However, current academic sources haven't addressed the impact of hybrid intelligence on citizens' political agency.

Thus, the relevance of this research implies the need to integrate the concept of hybrid intelligence into the development of civil society and public administration, considering positive and negative outcomes of such integration. Hence, unaddressed issues include the substantiation of a further role and agency of civil society representatives in public administration influenced by the application of hybrid intelligence technology.

**Results.** To comprehend the transformation of civil society in the context of hybrid intelligence implementation, it is necessary to examine several key concepts that enable a structured analysis of the interaction between an individual, the state, and digital governance systems.

In its traditional understanding, civil society is a collection of organizations, initiatives, and individuals independent of the state and exercising oversight, mobilization, and representation of citizens' interests [7]. In the digital context, this concept is complemented by new forms, such as networked activities, online activism, digital volunteering, and public engagement in the crowdsourcing of public policy [8]. From being a mediator between citizens and the state, civil society is evolving into an active participant in shaping public policy for digital development.

Hybrid intelligence is a system of interaction between humans and artificial intelligence, in which both sides complement each other in decision-making. In public

administration, this concept signifies the gradual delegation of certain administrative functions to algorithmic systems while maintaining human oversight. According to D. Dellermann [9], hybrid intelligence envisages cooperation, where algorithmic capabilities integrate with human ethics, emotional intelligence, and critical thinking.

Algorithmic governance involves using automated systems (AI, machine learning, and Big Data) for public administration analysis, forecasting, and decision-making. Algorithmic governance transforms power, as decisions may be made beyond human control or without ensuring adequate transparency [10]. In this configuration, questions arise regarding the need to ensure algorithmic responsibility, discrimination risks, and the accountability of such systems.

In theories of digital democracy, the concept of a technocratic society [10] is becoming increasingly significant. A technocratic society functions through citizens' ability to act, respond, and influence governance in digital interaction with the state. Participation in petitions, budgeting, governance through digital platforms, and knowledge of algorithms now continuously affect the lives of average citizens.

Thus, combining the classical understanding of civil society with modern concepts of hybrid intelligence and algorithmic governance allows for the exploration of the technological aspects of digitalization and the political and ethical consequences of such delegation of governmental authority.

The emergence of hybrid intelligence in public administration creates new tools for citizen engagement and challenges in maintaining democratic oversight, ethical responsibility, and social equality. Let us examine the key threats that civil society faces in this new, technologically advanced governance ecosystem.

1. Algorithmic opacity and loss of accountability.

Most algorithmic governance systems operate on the «black box» principle, meaning that the decision-making logic remains inaccessible to the public and, in some cases, even to the requesting authority (public servants). This can create a discriminatory situation, as the procedure for making a particular decision is unclear (for example, denying social benefits may lack sufficient justification).

2. Digital inequality, exclusion, and elitism.

While digital technologies can potentially expand citizens' access to participation, they may enhance certain forms of social inequality. Citizens who lack digital skills, adequate internet access, and modern devices — especially in remote areas — risk being excluded from new forms of participation. There is a growing risk of «digital elitism», where only those with technical knowledge and resources will have a meaningful voice in decision-making.

3. Delegation and diffusion of responsibility.

When some portion of governance decisions is delegated to algorithms, the issue of establishing responsibility for erroneous or discriminatory decisions arises. This creates the need for legal regulation of algorithmic accountability.

4. Restriction of space for public oversight.

The algorithmization of processes may narrow the scope of public influence and intervention, as automated decisions will be made without prior consultations, public

hearings, or feedback mechanisms. If the digital state operates as a technocratic system, civil society risks losing its influence and very purpose as a counterbalance to governmental autocracy.

5. Risk of manipulation and the spread of digital populism.

Hybrid intelligence, used for analyzing public opinion, social media, or survey participation, can be directed towards tactical, operational, and strategic planning. However, there is a risk of «algorithmic populism», where digital data creates an illusion of considering public opinion or even manipulating thereof.

*Table 1*

**THE IMPACT OF HYBRID INTELLIGENCE ON CIVIC ENGAGEMENT IN PUBLIC ADMINISTRATION**

| Area of Influence | Potential / Opportunities | Risks / Challenges |
|---|---|---|
| **Decision-making** | Improved speed and objectivity in data-driven analysis | Lack of transparency («black box» algorithms), difficulty in appealing decisions |
| **Civic participation** | New e-participation formats, crowdsourcing, participatory modelling | Digital inequality, exclusion of vulnerable groups |
| **Accountability and oversight** | Possibility of audit (open-source, explainable AI), involvement of civil society watchdogs | Delegation of responsibility, blurred lines between technical and political decisions |
| **Ethics of digital governance** | Ethical principles of algorithmization, new co-governance models | Risks of digital populism, manipulation via social media |
| **Role of civil society** | Shift from passive service consumption to active co-creation of policy | Reduced agency in technocratic governance structures |

*Source*: compiled by the authors based on the results of the study.

These challenges require a reassessment of the technical parameters of digital governance and the fundamental pillars of democracy in the digital age: transparency, participation, accountability, and fairness.

Despite numerous challenges posed by the digital transformation of public administration, hybrid intelligence creates new opportunities for civil society to evolve as an active contributor to policy-making. The effective integration of human and machine potential can optimize administrative processes and enhance civic engagement, but only with appropriate regulatory, institutional, and organizational frameworks.

Next-generation digital services, such as «GovTech» and «CivicTech», enable citizens to inform the state about their needs and directly influence administrative decisions through digital consultations, surveys, voting, and idea crowdsourcing. A successful example is Taiwan's «vTaiwan» (https://info.vtaiwan.tw), which

demonstrates the potential for meaningful participation, where digital tools serve as a platform for inclusive and rational dialogue between civil society and the state.

The development and implementation of open-source code and explainable AI enable civil society to audit digital processes. Several countries are already experimenting with independent auditing of algorithmic governance. The involvement of various NGOs, ethics committees, and digital ombudspersons in reviewing automated AI systems strengthens democratic oversight and restores trust in the digital state.

Civil society plays a key role in shaping digital literacy, critical thinking, and awareness of rights in the digital space. The development of digital emancipation signifies a transition from passive service consumption to active participation in the creation, improvement, and oversight of public governance algorithms. Digital education programs, public hackathons, and the promotion of ethical design in digital technologies are essential tools for strengthening civic engagement.

Innovative approaches to digital development policymaking involve engaging the public early in designing complex digital solutions. «Co-design» and «participatory AI» models enable the involvement of citizens, activists, experts, and developers in jointly creating algorithmic systems, reducing bias risks, and shifting the focus from technocratic efficiency to social justice.

In a hybrid environment, new communities of citizen self-organization are emerging, such as decentralized autonomous organizations, blockchain initiatives for managing shared resources, and collective crowdfunding platforms for local governance. These structures allow civil society to respond to digital policy making and generate alternative governance models-political networks that can compete with one another.

Thus, in the context of hybrid intelligence implementation, civil society is not merely a passive observer but an active participant and co-creator of digital development. It ensures ethical, inclusive, and other fundamental human values and maintains responsibility in a technocratic environment.

**Discussion.** The study's findings confirm that hybrid intelligence is reshaping the foundations of civic engagement in public administration. While global trends demonstrate the increasing role of algorithmic systems in decision-making, the Ukrainian context reveals both opportunities and systemic constraints in implementing hybrid governance.

In recent years, Ukraine has made considerable progress in digital government infrastructure, particularly through launching the Diia ecosystem and platforms for public participation, such as e-consultations and participatory budgeting initiatives at the municipal level. These tools create channels for interaction between citizens and public authorities, facilitating transparency and responsiveness. However, their potential remains underutilized in integrating hybrid intelligence to co-create policy or audit algorithmic decisions.

Moreover, challenges such as low digital literacy in rural areas, institutional fragmentation, and the lack of legal standards for algorithmic transparency continue to hinder the meaningful involvement of civil society in digital governance processes. While the concept of "digital state" is progressing, developing "digital citizenship" —

including rights to explainable decisions, algorithmic fairness, and ethical AI — remains nascent.

This discussion indicates the need to reframe public policy in Ukraine to support the co-design of hybrid intelligence systems with active citizen participation. Such co-creation must be based on open-source solutions, independent audits, and inclusive platforms that empower marginalized groups. Integrating digital ethics and participatory design into national digital strategies will enable Ukraine to modernize administrative functions and safeguard democratic accountability in the digital era.

**Conclusions.** The research has demonstrated that hybrid intelligence and algorithmic governance represent new forms of digital transformation in public administration, capable of radically altering the conditions for the existence and functioning of civil society institutions. On the one hand, they create new opportunities for citizen engagement, enhanced transparency, and innovative collaboration with the state. On the other hand, these forms introduce numerous challenges that question the foundations of democracy, accountability, and inclusivity in the digital age.

The primary risk identified is the gradual robotization of governance, where automated systems reshape established administrative procedures and the very mechanisms of public oversight. Under such conditions, civil society should adapt to the digital reality and play a strategic role in shaping it, as a defender of rights, freedoms, and transparency in the relationship between humans and machines.

Hybrid intelligence democracy is impossible without the active participation of citizens capable of understanding, evaluating, and influencing the algorithms that govern social development processes. The hypothesis is put forward that the future of public administration depends not only on technological innovations but also on an effective dialogue between civil society and the state regarding the boundaries, principles, and objectives of digital development.

A promising direction for further research involves the creation of models for co-government, audit mechanisms, hybrid governance, and ways for protecting digital rights and freedoms in the post-algorithmic society.

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## ГІБРИДНИЙ ІНТЕЛЕКТ ЯК ІНСТРУМЕНТ ЦИФРОВОГО РОЗВИТКУ ГРОМАДСЬКОЇ УЧАСТІ У СФЕРІ ПУБЛІЧНОГО УПРАВЛІННЯ

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**Анотація.** У статті обґрунтовано особливості цифрового розвитку громадянського суспільства в умовах впровадження гібридного інтелекту в практику публічного управління. Актуальність теми зумовлено стрімким розвитком цифрових технологій, які впливають на процеси прийняття державно-управлінських рішень у державному секторі, трансформуючи класичні форми громадської участі та викликаючи потребу в нових теоретико-методологічних підходах до дослідження взаємодії людини, держави та алгоритмічних систем.

Метою статті є виявлення потенціалу і ризиків гібридного інтелекту для громадянського суспільства, а також пошук шляхів збереження людської суб'єктності та демократичного контролю в цифрову епоху. Систематизовано ключові теоретичні підходи до поняття гібридного інтелекту. Проаналізовано феномен алгоритмічного врядування як форми делегування управлінських функцій системам штучного інтелекту, що визначають основні виклики цифровізації для громадянської участі.

Методологічну основу дослідження становлять загальнонаукові методи аналізу, синтезу, порівняння, узагальнення та прогнозування. За їх допомогою виявлено характерні риси гібридного управління, його вплив на цифрову партисипацію, а також здійснено аналіз цифрових ініціатив, які або посилюють та послаблюють суб'єктність громадянського суспільства. Особливу увагу приділено ризикам алгоритмічної непрозорості, цифрової нерівності, делегування відповідальності та звуження простору громадського контролю.

Стаття також наголошує на важливості етичного виміру цифрового врядування, розвитку цифрової грамотності населення, впровадження відкритого коду та механізмів explainable AI. У цьому контексті розглянуто успішні міжнародні практики, зокрема проєкт vTaiwan, який демонструє можливості інклюзивної цифрової участі через використання краудсорсингових інструментів.

У висновках обґрунтовано, що громадянське суспільство повинне не лише адаптуватися до нових умов гібридного управління, а й активно формувати нормативно-правові, інституційні та технологічні рамки функціонування цифрової держави. Пропонується концепція «демократії гібридного інтелекту», яка передбачає активну участь громадян у створенні, контролі та етичному регулюванні алгоритмів публічного управління.

**Ключові слова:** публічне управління, громадянське суспільство, громадська участь, гібридний інтелект, алгоритмічне управління

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