

Mechanisms for overcoming departmental barriers in the digitalisation of ethno-national policy: From “information silos” to integrated governance

Yuli Chen*

Deputy Director

Hainan Provincial Institute of Ethnic Studies

570000, 9 Guoxing Ave., Haikou, People's Republic of China

<https://orcid.org/0009-0006-7186-7084>

Abstract. The purpose of the study was to identify management models that can ensure consistent data exchange in the context of digital transformation of the public sector. The methodology was based on an interdisciplinary combination of tools of public administration, digital governance, analysis of information systems, and ethno-political studies, which allowed tracing the features of the functioning of state registers, mechanisms of interdepartmental interaction, and data management practices during 2015-2025 through comparative analytical and institutional approaches. The results of the study showed that “information silos” in ethno-national policy are formed through the differentiation of competencies between statistical, migration, educational, and security institutions. Comparison of national models showed that the Ukrainian digital governance system ensured the development of service platforms (dozens of registries were integrated through the Diia system, the number of users exceeded 21 million, and the Trembita platform processes millions of transactions every month), but has not formed a complete analytical consolidation between state registers. It was established that the centralised control model of China provides a high speed of analytical processing of information (more than 90% of large cities have implemented elements of smart city governance), but is accompanied by risks of excessive digital control and strengthening of supervisory functions of the state. Estonia's experience has shown that the combination of interoperability, cryptographic protection, and transparent audit of data access creates a more balanced system of interagency coordination: more than 1,000 organisations and more than 3,000 services interact through the X-Road platform, and 87.59% of the population uses electronic public services. The study confirmed that the regulation of personal data protection simultaneously performs the function of legal protection and becomes a factor of institutional isolation between state structures. The study found that overcoming information fragmentation in the field of ethno-national monitoring requires a transition from a model of data accumulation by individual departments to a management system based on standardised exchange protocols, unified metadata, and access audit mechanisms. The practical significance of the results lies in the possibility of their use by public authorities, digital governance structures, analytical centres, and developers of state information systems for the development of safe models of interdepartmental data exchange in the field of ethno-national policy and public administration

Keywords: personal data protection; interoperability; once-only principle; predictive management; federal data management

● INTRODUCTION

The expansion of digital infrastructures in the public administration system is accompanied by an increase in data sets and an aggravation of contradictions between the subjects of power responsible for the accumulation,

processing, and use of information resources. This is clearly manifested in ethno-national politics. The need to harmonise demographic, migration, language, social, and security registers complicates management processes, since

Article's History: Received: 02.03.2026; Revised: 14.07.2026; Accepted: 01.09.2026; Published: 29.09.2026

Suggested Citation:

Chen, Yu. (2026). Mechanisms for overcoming departmental barriers in the digitalisation of ethno-national policy: From “information silos” to integrated governance. *Development Management*, 25(3), 27-42. DOI: 10.63341/devt/3.2026.27.

*Corresponding author (yuli_chen@outlook.com)



Copyright © The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (<https://creativecommons.org/licenses/by/4.0/>)

such systems operate within different administrative models and are regulated by different regulatory regimes. The introduction of digital public administration platforms has not eliminated the disunity of information flows. On the contrary, the autonomy of departmental databases, the asymmetry of technological updates, and the incompatibility of classification approaches in some cases contributed to its strengthening. Under these circumstances, interagency data exchange in the field of ethnic and national monitoring remains isolated even with high rates of service digitalisation. An additional factor is the combination of cybersecurity requirements, personal data protection, and analytical integration, which creates a contradiction between system interoperability and privacy modes. The development of algorithmic tools for state analytics has also updated the risks of reproducing administrative inequalities of historical origin when working with sensitive ethno-national data. The problem of “information silos” has acquired an institutional scale. Its content covers the managerial, legal, analytical, and political dimensions of the functioning of the digital state.

In the systematic review of N. Mendoza Castaneda (2026), coordination violations in the field of public policy were interpreted as a consequence of systemic institutional fragmentation and the existence of “information silos”. The study showed a high level of spread of such phenomena. More than 80% of the analysed studies recorded gaps between information structures of public administration, while stable interdepartmental interaction was traced in less than a third of collaborative practices. The established link between coordination failures and the management fragmentation architecture formed the basis for further analysis of the issues of “data silos” in the public sector. D.V. Thanh (2024) examined changes in research approaches to the investigation of ethnic diversity in the digital age. The researcher proved that digitalisation of ethno-national policy transforms not only the administrative tools, but also the methodological foundations of working with information about indigenous peoples and ethnic minorities. The author’s argument was based on the need to use a variety of research approaches that can combine technological means with the requirements of cultural sensitivity and ethics. K. Oldbury (2022) described digital mobility platforms as a factor in changing urban governance models. The analysis showed that the integration of platform services led to a revision of the boundaries between physical and digital infrastructure, as a result of which traditional regulatory mechanisms lost some of their effectiveness. Another pattern has also been identified: platform piloting processes hide the real scale of power and technological dependencies between public and private actors.

The legal basis of ethno-national policy through the prism of international standards for the protection of the rights of national minorities and indigenous peoples was investigated by A.V. Panov (2023). The materials of the Balkan states helped to identify the trend of expanding models of autonomous communities as a tool for maintaining the stability of the multicultural environment. The results obtained showed that the effectiveness of ethno-national policy is determined not only by the quality of legal norms, but also by the state’s ability to ensure the

integration of socio-cultural groups into the public administration space. N. Odinka *et al.* (2022) proposed the interpretation of regulatory requirements as an element of strategic management of infrastructure projects. It was established that the combination of information systems with strategic planning mechanisms reduces the likelihood of conflicts between project participants and contributes to strengthening institutional trust. The conclusion formulated by the authors expanded the understanding of data governance, taking it beyond technical optimisation. The study by O.S. Sunday & O.O. Awoyomi (2026) analysed interagency data integration based on materials from federal social assistance programmes in the United States. None of the existing integration models – centralised, federated, or predictive analytics – provided simultaneous scalability, transparency, and an appropriate level of privacy. The solution proposed by the authors involved the use of a hybrid model that combines centralised control with federal analytics when working with sensitive information.

J. Guan (2025) developed a multi-level medical data management concept that clearly distinguishes between data management and data management. Technical compatibility of information systems does not guarantee effective information exchange. Consistency of legal norms, ethical principles, and the distribution of roles among stakeholders is crucial. The results of the study showed the dependence of the stability of data exchange systems on institutional design and its integrity, and not just on the level of technological renewal. The geopolitical dimension of data management in relations between the EU and China was the subject of analysis by C. Nalbantoğlu (2022). The researcher showed that differences in approaches to access and control over data form political conflicts along with technical contradictions in the field of cyberspace. The involvement of civil society institutions in digital policy development has helped to reduce confrontational risks and create more balanced cyber governance models. M. Matteby (2025) explored the digital transformation of inter-municipal cooperation as a process of institutional entrepreneurship. An increase in the risk of forming unstable or “stillborn” institutions in the conditions of concentration of managerial functions in a narrow circle of actors is established. The effectiveness of digital transformation was associated with the gradual involvement of a wider range of participants in the development of common norms and practices of interaction. Despite the number of studies on digital governance, interagency integration, and data management, the specifics of “information silos” in the field of ethno-national policy as a complex combination of institutional, regulatory, semantic, and cybersecurity barriers remained insufficiently conceptualised. The purpose of the study was to identify the structural features of “information silos” in the system of ethnic and national monitoring to overcome interdepartmental fragmentation in the context of digital governance.

● MATERIALS AND METHODS

The research was carried out within the framework of an interdisciplinary approach that combines the tools of public administration, digital governance, data governance, ethno-political studies, and information systems analysis. The choice of chronological boundaries of 2015-2025 was

conditioned by the fact that this period covered the active phase of digital transformation of the public sector, the development of interoperability, the spread of AI analytics in public administration, and the institutionalisation of integrated databases in the EU, North America, and Asia. For individual cases, retrospective data were used to explain the genesis of digital systems, in particular regarding, the 2001 Ukrainian population census (Smutchak *et al.*, 2025), the EU migration crisis of 2015-2016 (European Migration Network, 2020), cyber attacks on Estonia in 2007 (Ansari, 2025), and the evolution of federal data management in the United States (U.S. Department of Education, 2026).

The methodological basis of the study was a systematic approach used to analyse public administration as a set of interrelated information, regulatory, and institutional contours. System analysis was used to treat digital registries, interoperability mechanisms, API architectures, interagency analytical platforms, and predictive management algorithms as elements of holistic data-based management architecture, rather than as isolated technological solutions. Through this approach, the interdependence between the structure of state information systems and the effectiveness of ethnic and national monitoring was investigated. The method of functional and structural analysis was used to assess interdepartmental barriers to digitalisation of ethno-national policy. It was used in the development of a comparative classification of organisational, regulatory, technical, analytical, cybersecurity, semantic, and political institutional barriers. The materials for the analysis were selected by the European Commission (n.d.), General Data Protection Regulation (2016), Organisation for Economic Co-operation and Development (2019). The criteria for the analysis were: the level of interagency coordination, the degree of regulatory compatibility of data access modes, metadata governance standards, the level of integration of API solutions, the scale of data duplication, the presence of unified dashboards, and the ability to anticipatory governance. The analysis was carried out by comparing the manifestations of each type of barrier, its institutional consequences, and impact on the monitoring of ethno-social processes.

A comparative analysis of national digital governance and data management models was used to compare data governance architectures and integration models of government information systems. The main comparative analysis was carried out on the example of three countries that represent different types of digital governance: Estonia (interoperability-oriented governance with decentralised registries and standardised data exchange via X-Road), China (centralised control model with integration of AI analytics, predictive governance and social monitoring systems), and Ukraine (a transition state with a fragmented registry architecture and accelerated digital transformation after 2022). In addition, individual examples from the United States, Canada, France, and Finland were used for analytical context, illustrating the features of federal data management, federal management architecture, and inter-state interoperability. The comparative method was used to compare models of digital ethno-national governance in Ukraine, China, and Estonia. The comparison criteria were: data architecture, integration model, the degree of implementation of the once-only principle, the level of

application of artificial intelligence (AI) and predictive management, digital maturity of the public sector, the data access control model, the level of personal information protection, crisis resistance, structural problems of the system, and the potential of ethno-national monitoring. The comparative model drew on material from the Delegation of the European Union to Ukraine (2021), the Ministry of Digital Transformation of Ukraine (2024) and the European Commission (2024). They were also at the heart of the analysis by S. Marak (2025) and China Academy of Information and Communications Technology – CAICT (2026). The comparison was carried out on the principle of cross-case analysis with the identification of structural differences between centralised, fragmentary, and interoperability-oriented models.

The policy analysis method was used to analyse the regulatory framework for digital governance and personal data protection. Within this stage, the European Interoperability Framework (European Commission, n.d.), General Data Protection Regulation (2016), EU Artificial Intelligence Act (2021). The crisis management analysis method was used to assess the effectiveness of interdepartmental integration during periods of migration, humanitarian, and security crises. For this purpose, materials were used by the European Migration Network (2020), Organisation for Economic Co-operation and Development (2023), International Organization for Migration (2025), Ontario Community Health Profiles Partnership (n.d.), Statistics Canada (2024; 2025). The problems of multiple registration of individuals, delays in interagency information exchange, difficulties of real-time monitoring, and the effectiveness of integrated analytical platforms in crisis conditions were analysed. Source processing methods included content analysis, topic grouping, critical matching, secondary data analysis, and comparative synthesis.

● RESULTS

Theoretical and institutional foundations for overcoming interdepartmental barriers in digitalisation of ethno-national policy

The concept of “information silos” in the theory of public administration and information systems comes from organisational science and corporate management, where it referred to isolated divisions that accumulate data without their horizontal integration. In the public sector, the term has acquired analytical meaning in the context of digital transformation of governance and data-based governance. In the theoretical dimension, “information silos” is considered as a consequence of the institutional differentiation of the state, where each administrative unit functions as a relatively autonomous decision-making system and, accordingly, forms its own information infrastructure (Jeel-Ojuade, 2024). From the standpoint of the theory of organisational cybernetics, such autonomy creates the effect of “information entropy” – an increase in the uncertainty of management decisions due to the lack of an integral information field (Parizek, 2013).

For ethno-national policy, the problem of information fragmentation is important. Analysis of ethnic processes requires a combination of data of different nature. Demographic trends, migration movements, characteristics of the linguistic environment, socio-economic indicators,

and security parameters form a single field of factors, the interaction of which determines the dynamics of ethno-social changes. In the absence of integrated access mechanisms, public administration relies on disparate information arrays, which limits the possibility of holistic interpretation of processes in a multiethnic environment. The reason lies in the distribution of competencies between different sectors of the state apparatus. Population and migration changes are the responsibility of demographic services, information on language practices and access to education is concentrated in educational institutions, indicators of integration of socially vulnerable categories of the population are accumulated by social authorities, while security structures monitor radicalisation and interethnic tension. Functional specialisation ensures the division of powers. In a digital environment, such an organisation is accompanied by the development of isolated information contours, which is why issues of interoperability and interagency use of data become central, rather than the mere accumulation of data (Organisation for Economic Co-operation and Development, 2019).

The assessment of ethnic mobility, linguistic transformation or the level of integration of minorities is beyond the scope of a separate registry. This is where the consequences of information disunity manifest themselves. Data on internal migration, when taken in isolation from educational and social contexts, are insufficient to determine the nature of the adaptation of displaced ethnic groups or to track changes in the linguistic environment at a local level. Such restrictions arise when analysing the birth rate or employment, if the corresponding indicators do not correlate with the ethno-demographic characteristics of the population. Long-term forecasting under such conditions loses the necessary level of reliability. Simultaneously, the problem is not limited to a lack of information. Differences in classifiers, accounting methods, and the frequency of updating information give rise to statistical discrepancies between state registers. The same accounting object may receive different identification parameters depending on the departmental system. Incompatibility of personal data recording standards exacerbates these difficulties. For example, the use of different first and last name recording formats makes it impossible to automatically compare information between migration, educational, and social databases (Van Rossem & Pelizza, 2025).

The impact of information fragmentation is not limited to the analytical dimension. The consequences are also reflected in the speed of development of management decisions. This dependence is clearly manifested during crisis processes related to mass migration, humanitarian movements of the population, or the aggravation of the ethno-political situation. In the absence of an integrated information environment, state institutions lose the ability to quickly form an analytical picture of events. The migration crisis of 2015-2016 in the EU countries demonstrated the consequences of a lack of interoperability of databases and insufficient digital processing of information, which made it difficult to verify information and contributed to multiple registration of the same persons (European Migration Network, 2020). Similar difficulties were found during the COVID-19 pandemic. According to the Organisation for Economic Co-operation and Development (2023), 50%

of ministries in the Czech Republic recorded problems with collecting information to support urgent management decisions. The determining factors were the technical incompatibility of data and the lack of sustainable practices of interdepartmental information exchange. The non-integration of migration, social and medical registers form a time gap between the emergence of a crisis phenomenon and the state's response. This makes it more difficult to assess the scale of ethno-demographic changes and narrows the possibilities for preventing social tensions.

After that, the European management discourse focused on "whole-of-government data governance" and integrated digital platforms. For example, Finland has a system Suomi.fi Data Exchange Layer (Digital and Population Data Services Agency, 2022), integrated with Estonian infrastructure within the X-Road Trust Federation. Organisation for Economic Co-operation and Development (n.d.) considers this case as the first example of an interstate federation of digital ecosystems, where government agencies of both countries exchange data on population, business, and tax processes in real time. For ethno-national governance, this model takes place in the context of cross-border population mobility, labour migration, and multicultural regions. In Canada, the problem of fragmentation of government data is primarily related to the federal governance structure. Provinces have autonomy in the areas of social policy, healthcare, and education, which makes it difficult to build a single information space. That is why the Canadian model focuses not on centralising databases, but on creating compatibility standards and coordination mechanisms between government levels (Marcovitch & Moffatt, 2024). This approach is defined in the literature as a "federal management architecture", where there is not control over data, but standards for their exchange (Dudoit *et al.*, 2026).

In the United States, the problem of "information silos" is conventionally viewed through the prism of federal data management. After the adoption of the Foundations for Evidence-Based Policymaking Act and Federal Data Strategy (U.S. Department of Education, 2026) US government agencies have begun to move to an integrated data management model focused on interagency analytics. It is ethnic and migration data that remains one of the most complex segments due to different methods of collecting information between the Census Bureau, the Department of Homeland Security, the Department of Education, and social services. For example, the Census Bureau uses 1,500 detailed racial categories, while Department of Homeland Security uses only aggregated groups in immigration forms, which makes it impossible to directly compare data (Congressional Asian Pacific American Caucus, 2023). Another example is that social services and health systems have barriers to systematically collecting information about a patient's race, in particular non-standardised categories and limitations of information systems, making it difficult to analyse racial disparities (Institute of Medicine, 2009). International experience shows that overcoming "information silos" in the field of ethno-national policy requires a transition from the departmental logic of data accumulation to the "governance-based data management" model. Its characteristics include standardised interoperability, unified access protocols, digital

identification, data usage audit, and the creation of unified analytical environments (Dudoit *et al.*, 2026). In the absence of such mechanisms, digitalisation does not eliminate the fragmentation of public administration, but only

translates it into a new technological form. The specific types of interagency barriers that arise as a result and their impact on the effectiveness of public administration are shown in Table 1.

Table 1. Types of interdepartmental barriers to digitalisation of ethno-national policy and their impact on the effectiveness of public administration

Barrier type	Manifestations in the public administration system	Institutional implications for ethno-national policy	Impact on the quality of monitoring of ethno-social processes
Organisational	Autonomous functioning of ministries and agencies; lack of a single coordination hub; duplication of functions between statistical, migration, educational, and social structures; different information update cycles	Development of parallel systems for managing ethno-political processes; low speed of interdepartmental coordination; lack of a unified crisis response model	Fragmentary tracking of changes in the language, migration and social structure of the population; delay in identifying regional hotbeds of social tension
Regulatory and legal	Different legal modes of access to personal data; lack of uniform data governance standards; restrictions on interdepartmental transfer of sensitive data; contradictions between the legislation on digitalisation and privacy protection	Slowdown of the integration of registries; administrative isolation of individual databases; development of “closed” information contours	Incomplete access to data on ethnic, linguistic, and migration groups; limitations on building integrated models of social integration
Technical	Incompatibility of data formats; different metadata standards; lack of API architecture; use of outdated local systems; lack of interoperability layer	High costs for manual integration of information; dependence on departmental IT solutions; low scalability of digital platforms	Statistical discrepancies between registries; duplication of records; inability to generate real-time monitoring systems
Analytical	Lack of unified dashboards and predictive analytics systems; isolation of statistical and social databases; weak use of AI and Big Data analytics	Predominance of reactive rather than predictive management; limited capacity of the state for predictive governance	Inability to predict interethnic risks, migration changes, and territorial concentration of social vulnerability
Cybersecurity	Different standards of cybersecurity governance between departments; low level of synchronisation of security systems; risks of unauthorised access to sensitive data	Distrust between authorities on information exchange; slowdown of digital integration	Restriction of access to real-time data; reduction of analytics completeness due to access segmentation
Semantic	Different criteria for classifying ethnic, linguistic and migration categories; different methods of statistical accounting	Incompatibility of indicators between state institutions; difficulties of international comparative analysis	Distortion of the assessment of the size and social status of individual ethnic groups
Political and institutional	Competition of government bodies for control over data; use of information resources as an element of bureaucratic influence	Slowdown of interoperability reforms; development of an “information monopoly” of individual departments	Incomplete integration of state analytics; fragmentation of policymaking

Note: IT – information technology

Source: compared by the author based on General Data Protection Regulation (2016), European Commission (n.d.), Organisation for Economic Co-operation and Development (2019), A.Z. Spyropoulos & V. Tsiantos (2025), A.N. Kasiwi *et al.* (2025), W. Van Rossem & A. Pelizza (2025)

The analysis of barriers has shown the multidimensional fragmentation of state registers in the field of ethno-national policy. The sources of the problem go beyond the technological characteristics of the digital infrastructure. The division of departmental powers is combined with differences in regulatory regulation of access to information, and the lack of general requirements for interoperability increases the isolation of information contours. Even in countries with developed digital services, the accumulation of large amounts of information does not ensure the development of a single analytical space. The data exists in parallel. For ethnic and national monitoring, this situation is important, since the analysis of migration mobility, language changes, and the level of social integration requires the simultaneous use of demographic, educational, social, and security registers. The origins of these restrictions are related to the history of the development of state information systems. Their creation took place in different periods and under the influence of departmental priorities. The

result was heterogeneity of the architecture, information classification principles, and information exchange procedures. After a large-scale digital modernisation of migration, demographic and social services in the EU countries during the 2010s, the problem took on a new scale: individual information resources began to duplicate identical arrays of information without automated matching mechanisms (Szymańska, 2018). In this context, the European Interoperability Framework considers interoperability as a set of several interrelated levels – legal, organisational, management semantics, and technical interaction (European Commission, n.d.). The subject of standardisation covers not only the structure of information, but also the rules of access, use procedures, and distribution of responsibility between participants in information exchange.

A certain complexity is created by combining the integration of registers with the requirements for protecting personal information. Ethno-national data is classified as sensitive data because it contains information about ethnic

origin, linguistic identity, religious affiliation, or migration status. The General Data Protection Regulation (2016) refers ethnic and racial characteristics to special categories of personal data for which a separate legal processing regime and enhanced protection mechanisms are established. The practice of EU states demonstrates the mixed consequences of this approach. In France and Germany, restrictions on the collection of ethnic information limit the possibilities of statistical analysis of migrant integration and research on structural discrimination. The French tradition of republican universalism has long held back the official accumulation of ethno-racial statistics, which has become the subject of scientific discussion on assessing social inequality (Léonard, 2023). Canadian practice shows a different model. Statistics Canada (2025) uses advanced collection of demographic diversity data, combining it with anonymisation procedures and controlled access mode through the Research Data Centres network. There is an institutional contradiction. The desire for integrated digital monitoring is accompanied by restrictions on interagency information exchange due to the high requirements of privacy protection. Under such conditions, cybersecurity and legal protection mechanisms perform not only a security function, but also the function of delineating information spaces. This issue became one of the central issues during the implementation of European Health Data Space in 2022-2024, when EU member states expressed reservations about the cross-border use of sensitive personal information even in the presence of standardised digital protection tools (de Frutos Lucas & Haugo, 2024). Similar challenges are typical for the ethno-political sphere.

The search for a balance between secure information exchange and registry integration has led to the development of new models of digital interaction. An example is the Estonian X-Road platform. Its architecture does not provide for centralised accumulation of information. Interaction between autonomous registries is provided through digital authentication, cryptographic protection, and a system for registering information requests. A digital trace is generated for each operation. A citizen gets the opportunity to control access to their own personal data by state bodies. It is on this basis that the once-only principle is implemented, which excludes repeated requesting of information already available in state registers. The API architecture also performs a similar function. Its use provides automated interaction between different systems without the need for complete unification of the internal structure of platforms. Such a mechanism has become relevant in countries where digital infrastructure has been formed during various technological stages. Finland applies Suomi.fi Data Exchange Layer for integrating municipal and central public services without creating a single super register (Digital and Population Data Services Agency, 2022). The advantage of the model is the ability to gradually connect new information resources without large-scale restructuring of the digital architecture of the state.

Technological compatibility alone does not eliminate management constraints. The availability of state analytics tools is becoming crucial. Without them, even large information arrays remain a collection of isolated resources that are not suitable for forecasting and strategic planning. That is why integrated analytical platforms

focused on combining data from different registries within a single solution support environment have become widespread in Organisation for Economic Co-operation and Development (2023) countries. The Canadian experience demonstrates the practical effectiveness of this approach. Statistics Canada (2024), together with the Canadian Centre for Justice and Community Safety, uses integrated demographics, migration and social information to identify regional vulnerabilities and assess inequalities in access to public services among Indigenous communities and migrant populations. For the sphere of ethno-national policy, the importance of such mechanisms is determined by the interaction of demography, socio-economic development, and security. In the absence of cross-sectoral interaction, state information resources do not form a holistic analytical environment necessary for developing sound management decisions.

Cross-sectoral interaction algorithms change the architecture of relationships between central and regional government structures. Traditional bureaucratic systems operated through vertical channels. Regional administrations sent data up. Based on the information received, the centre made a decision. Digitalisation breaks the old hierarchy and current coordination is determined by horizontal connections. Local authorities, educational institutions, social services and security structures have direct access to analytical platforms. The transformation in the United States is evidenced by the Federal Data Strategy and the work of shared governance frameworks for social risk analysis (Seo & Kwon, 2023). Individual states have launched integrated databases that combine migration, social, and educational indicators to assess inequality and segregation. The concept of "evidence-based governance" has received a technological foundation in the form of interdepartmental think tanks and unified dashboards. The main task of the tools is to visualise information to speed up the management response (Balabukha, 2026). The experience of the city of Sonnam in South Korea serves as an indicator of effectiveness. There, the authorities combined tax, administrative, and mobile data, which made it possible to quickly identify the locations of potential crises (Jung, 2020). The Canadian project Ontario COVID-19 Heterogeneity compared medical statistics with the results of the population census (Ontario Community Health Profiles Partnership, n.d.). The unified dashboards application provides automatic updating of indicators in real time. The new approach minimises time delays between the appearance of a problem and the actions of officials (Kulkarni *et al.*, 2025). The described technologies are of strategic importance for border areas, internal migration zones, or areas with high social polarisation.

Scaling artificial intelligence in public administration raises risks of institutionalising algorithmic bias. The problem is acute in areas with high socio-ethnic sensitivity. Programmes of the predictive systems class analyse old statistics. As a result, mathematical models copy and consolidate historical forms of discrimination. Migration service databases, social assistance registers, and police archives contain errors, as different groups of the population had unequal access to services or were subjected to excessive control. Artificial intelligence perceives mathematical correlations as real causal relationships. Therefore, there is

a dangerous phenomenon – statistical induction of risk for individual ethnic communities. An example was the Correctional Offense Management Profiling for Alternative Sanctions system in US legal proceedings. The algorithm produced false predictions of relapses due to the defendant's race, leading to large-scale academic criticism of risk scoring models (Klarmann, 2025). A similar situation has developed in the UK due to the predictive policing system from Metropolitan Police Service. Mathematical risk assessment tools automatically increased the number of patrols in minority neighbourhoods. This is how the vicious circle, or “feedback loop”, works – the programme requires increased attention to the area based on previously collected reports, which it itself provoked (dos Santos, 2025). During 2022–2024, the topic of racial bias in algorithms was analysed by the British Parliament during the development of the Public Authority Algorithmic and Automated Decision-Making Systems Bill of the UK (2024).

In the plane of ethno-national policy, this mechanism causes ambiguous consequences. Analysing migration mobility, receiving social benefits, or accessing education through forecasting systems without considering contextual variables (economic inequality, regional deprivation, or military movements) poses a danger. Under such conditions, there is a risk of reducing complex social processes to group statistical features. This approach lays the foundations for digital discrimination, because management decisions begin to rely on probabilistic models of group behaviour instead of analysing individual characteristics of a person. Regulatory counteraction to such threats is unfolding simultaneously at the level of the EU and individual countries. The main tool is the EU Artificial Intelligence Act (2021). The document introduces a risk-based classification of AI systems. The regulation explicitly classifies programmes that can influence access to social rights or assess citizens' risks as high-risk AI systems. Developers of such software should ensure data transparency, algorithm explainability, human oversight, and regular audit. The assessment of new approaches indicates a profound transformation of the concept of intelligent public administration.

Early GovTech models (2010–2018) aimed mainly at optimising the speed of array processing and automating services (Charalabidis *et al.*, 2019). The current stage (2021–2025) develops around a clear triad: analytical efficiency, ethical regulation, and algorithmic accountability (Wang *et al.*, 2026). Cross-sectoral interaction algorithms create a new architecture for public administration. Within the updated system, information is transformed into a tool for predictive coordination, leaving the function of ordinary administrative accounting in the past. However, the success of innovation is determined not only by the technological parameters of Big Data or AI analytics. Interoperability standards, the level of interagency coordination, the accuracy of primary data, and the effectiveness of mechanisms to prevent digital discrimination play a crucial role. In the absence of such conditions, predictive management may not reduce social risks, but institutionalise them digitally.

Comparative analysis of models of integrated digital management of ethno-national policy

The fragmentation of state registers in Ukraine has arisen as a result of the long-term institutional autonomy of

government bodies. Digital systems were developed for the specific functional needs of individual departments, and not as elements of a single public administration architecture. In the plane of ethno-national policy, this problem becomes of maximum complexity. Monitoring of ethno-social processes requires a simultaneous combination of demographic, migration, educational, social, and territorial information arrays. But the Ukrainian model of digital administration has long been based on the departmental principle, in which each institution functioned exclusively within its own information contour. The contemporary system of collecting and analysing ethno-demographic information in Ukraine has a high level of institutional disunity. There is no proper integration between the State Statistics Service, the State Migration Service, the Ministry of Education and Science, the Ministry of Social Policy, the Ministry of Digital Transformation, and local self-government bodies. Each structure operates with isolated registers that reflect only a separate fragment of the general ethno-social situation. The State Statistics Service accumulates demographic indicators. The State Migration Service controls migration processes and document flow. The Ministry of Education and Science records language and educational indicators. The Ministry of Social Policy is responsible for data on social support and internally displaced persons. The organisational isolation of departmental databases blocks the possibility of comprehensive risk forecasting. Simultaneously, there were no stable mechanisms for automated data exchange and unified interoperability standards between these systems for a long time (Sarioglu & Korzhunova, 2026).

An additional factor complicating the situation was the long absence of an up-to-date population census. The national census in Ukraine was last conducted in 2001. The result was a lack of relevance of ethno-demographic data at the level of state statistics. The State Statistics Service documents have repeatedly noted that population calculations are based mainly on administrative registers and demographic models, and not on the results of comprehensive census accounting (Smutchak *et al.*, 2025). Under these conditions, the assessment of ethnic population structure, language changes, and the extent of internal mobility, the intensity of which increased after 2014 and sharply increased after the full-scale invasion of 2022, is carried out based on disparate information sources (Valenti & Yasukawa, 2024). The problem goes beyond the statistical deficit. The lack of an up-to-date census narrows the possibilities for forming evidence-based ethno-national policies and limits the quality of management decisions. Without the integration of demographic accounting, it is difficult to determine territorial changes in the ethnic composition of the population, the scale of language transformations, and the concentration of internally displaced persons in the regional context. The greatest uncertainty is typical for border and de-occupied territories, where the war caused changes in the ethnic and social structure of the population.

The problem of integrating state registers acquired a new meaning after 2022. Mass internal displacement of the population has significantly increased the burden on the state accounting system. According to the International Organization for Migration (2025), as of 2024, there

were more than 3.7 million internally displaced persons in Ukraine. Their registration is carried out by several institutions simultaneously: the Ministry of Social Policy, local administrations, educational and medical institutions. Consistency between the respective databases remains limited. This creates differences in determining the number of internally displaced persons, assessing the level of integration and access to public services. A similar situation can be traced in the educational sphere. The movement of a large number of children and young people has affected the language and educational characteristics of the regions, but the state monitoring system does not provide an automated combination of information about the place of residence, internally displaced persons status, educational trajectory, and social support (Valenti & Yasukawa, 2024). Military conditions have accelerated the digital transformation of the public sector. After 2022, the development of digital governance in Ukraine was more focused on interdepartmental interaction and integration of register resources instead of supporting disjointed information contours (Vasylieva *et al.*, 2025). The central place in this process is occupied by the Ministry of Digital Transformation and the Diia ecosystem. At the initial stage of operation, the platform mainly provided access to digital services. Further development expanded its functions. Diia has gradually become a tool for integrating state registers and standardising information exchange. According to the Ministry of Digital Transformation of Ukraine (2024), as of 2024, dozens of state registers and digital services were connected to the ecosystem, and the number of users exceeded 21 million. The changes also affected the model of public administration. The digital platform began to serve as a single interface for accessing distributed government data, which set the stage for the development of an integrated data governance system.

One of the elements of interagency interaction was the Trembita system, created with the support of the EU and Estonia based on the X-Road architecture (Delegation of the European Union to Ukraine, 2021). Its purpose is to ensure the electronic exchange of information between state resources. Millions of transactions pass through Trembita every month. For the field of ethno-national monitoring, such an infrastructure opens up the possibility of combining social, migration, and demographic information arrays within a common analytical environment. Despite the progress made, the level of integration of state registers remains heterogeneous. Some authorities use API solutions and automated data exchange, while other institutions continue to operate through local or semi-closed systems (Sarioglu & Korzhunova, 2026). Additional restrictions create uneven digital capacity of communities, especially in frontline regions and territories with damaged infrastructure. The lack of a single ethno-national monitoring centre remains a problem. The existing system mainly records demographic and social changes after their occurrence. The possibilities of predictive governance, which aims to identify early risks of social segmentation, linguistic polarisation, and territorial inequality, remain limited. Development prospects are associated with the creation of an integrated analytical platform. Its architecture can combine data from the State Statistics Service, the State Migration Service, educational registers, social protection systems,

and geographic information services. The combination of such resources forms the prerequisites for the transition from fixing the consequences to forecasting ethno-social processes and supporting strategic management.

The Chinese model of digital ethno-political governance has evolved as a component of the state's data-driven governance strategy, where digital technologies are used not only to modernise administrative procedures, but also to implement social monitoring and maintain political stability (Yun, 2025). In the field of ethno-national policy, this approach was accompanied by a transition from conventional administrative practices to a multi-level digital infrastructure that integrates demographic registers, public security systems, behavioural data analysis tools, and mechanisms for predicting social risks. The role in this architecture is played by the interaction of platforms of the Ministry of Public Security of China, the social governance system, local administrative networks, and digital services related to internal mobility of the population. European approaches to interoperability are based on the coordination of autonomous institutions through decentralised data exchange mechanisms. The Chinese model has a different logic for organising information flows. It is based on the vertical integration of state information resources. Data on population, migration processes, employment, education and security risks are concentrated in centralised public administration platforms, which provides an operational assessment of the situation in regions of ethnic sensitivity. This practice was most developed in the Xinjiang Uygur Autonomous Region, where digital management systems were combined with preventive security monitoring tools (Orazzo & Cappelletti, 2025). Scientific papers record the use of the Integrated Joint Operations Platform, a system that integrates information from video surveillance cameras, biometric registers, mobile applications, and administrative databases to assess the "risky behaviour" of the population (Lee *et al.*, 2025). The platform's operation is based on an automated comparison of information from various sources, including data on the movement of persons, religious activity, and the structure of social contacts.

The concept of "digital intelligence governance" in China is focused on the development of a management system in which AI analytics is used to identify latent patterns of social behaviour and improve the effectiveness of government regulation (Zhang & Zhang, 2025). The practical implementation of this model involves combining information from social security systems, population mobility platforms, educational resources, and public security structures within common analytical environments. In the largest cities of the country, there are digital urban management centres organised on the principle of unified governance platforms. Their purpose is to integrate data on traffic flows, social services, migration processes, and public safety in real time. A component of the Chinese model was the large-scale implementation of smart city governance elements using AI and Big Data. By 2019, the corresponding programme covered more than 500 cities in China (Guo & Zhou, 2025).

The development of digitalisation of ethno-political governance is characterised by a clear regional differentiation. The eastern coastal provinces of Guangdong, Zhejiang, and Jiangsu show the highest rates of digital integration.

This distribution is associated with the concentration of financial resources, technological infrastructure, and high-tech businesses. Mobile services for ethnic minorities, digital public service platforms, and AI monitoring tools for interethnic relations have become widespread in cities in the eastern part of the country. The western territories show a different level of development of digital governance. Here, digitalisation mainly focuses on administrative accounting and is not accompanied by the development of integrated analytical systems. Asymmetry is also evident between certain areas of state activity. The highest level of digital transformation is typical for the areas of administrative and social services, where algorithmisation of processes does not cause significant difficulties: population registration, migration registration, employment, and the provision of benefits. The integration of digital technologies into the practices of interethnic mediation, cultural interaction, and preservation of ethno-cultural heritage is slower. The explanation is the high level of contextuality of the corresponding processes, which limits the possibility of their formalisation in the form of algorithmic models (Yihan & Zhenlin, 2024).

Despite advances in digitalisation of governance, the Chinese model operates with a number of structural limitations. A big problem is the phenomenon of “data islands”. This phenomenon prevents state bodies from creating a coordinated information space. The problem arose due to the historical practice of departments to develop autonomous information systems. Individual ministries have launched their own digital platforms, ignoring common architectural standards and compatibility. As a result, state arrays broke up into fragments, which blocked the interdepartmental exchange of information. Organisational difficulties are compounded by uneven access of citizens to digital services. At the end of 2025, the Internet reached 80.1% of Chinese residents, and the total number of users was 1,125 billion people (China Internet Network Information Center, 2026). However, access to digital resources and the possibilities of their practical use remain unequal. Rural areas lag behind in terms of digital participation. Even after increasing internet coverage to 69.5%, farmers do not use services and receive fewer socio-economic benefits from technology. These facts confirm the existence of a qualitative digital gap along with a quantitative one (Ran *et al.*, 2026). Scaling of digital services turns them into the main channel of interaction between the population and the state. In such circumstances, the low digital literacy of older people, residents of remote regions, and parts of ethnic minorities hinders their right to administrative services. An additional challenge is the dependence of digitalisation on the old institutional development trajectory. A significant part of projects simply transfers existing bureaucratic procedures online without changing their organisational logic. The government changes the form of management processes, but leaves the old content. The creation of new platforms in itself does not modernise the mechanisms of interdepartmental coordination and interaction between the state and the population (China Academy of Information and Communications Technology, 2026).

Estonia has formed a different model of digital governance, which has become one of the most integrated in world practice. The country refused to collect state data within a

single centralised storage facility. Instead, the developers have ensured continuous interoperability of autonomous information systems. Departments have maintained their institutional independence. Coordination is guaranteed by a standardised information exchange infrastructure, based on which government agencies interact in real time without duplicating information. The basic element of the architecture was the X-Road platform. It organises secure data exchange between state registers, municipal systems, and individual private services. X-Road works as a data exchange layer, not as a centralised storage of information. Each institution independently administers its own databases, and access to information is provided by standardised APIs and cryptographically secure interaction channels. The architecture helped to avoid the emergence of new “information silos” and maintained a high level of information security. As of 2024, more than 1,000 organisations and more than 3,000 electronic services interact through X-Road (Marak, 2025). The annual volume of transactions between state information systems is hundreds of millions of transactions, and the vast majority of administrative procedures are carried out by officials without using paper documents. The conceptual basis of the Estonian digital model is the once-only principle, which is also supported by the EU’s digital governance policy (Boyli, 2022). It requires a citizen or organisation to provide the necessary data to the state system only once. Further use of information is provided by integrated mechanisms of interdepartmental exchange. As a result, the authorities reduced administrative duplication and eliminated statistical discrepancies between registers.

The practical work of this model is demonstrated by the use of registry data in social policy and demographic forecasting. Social Services and Benefits Data Register (Health and Welfare Information Systems Centre, n.d.) coordinates the activities of local authorities and central state institutions in the provision of social services in real time. To do this, the programme collects information about income, family status, place of residence, and social needs of citizens. Integration with other state registers eliminates the re-collection of information and speeds up obtaining state support. The Regulation of the Republic of Estonia No. 20 “On the Establishment and Statutes of the Register of Children and Teachers in Pre-School Education” (2025) has a similar principle. It accumulates data on educational trajectories, language training, and regional indicators of education development. Thus, analysts quickly respond to demographic changes and migration processes. The Estonian model does not use the rigid ethnic profiling of the population typical of individual centralised systems. But integrated registers allow for a multi-factor analysis of language integration, territorial mobility of the population, access to education and social services.

A security element is the distributed data storage architecture. Unlike centralised systems, where compromising a single node poses a threat to the entire infrastructure, the Estonian model minimises systemic risks through a decentralised registry organisation. After a large-scale cyberattack in 2007, Estonia strengthened its cyber defence system, and digital security became one of the basic priorities of public policy (Ansari, 2025). In 2024, Estonia retained its status as one of the most

digitalised states in the EU. According to Eurostat (2026), about 87.59% of the country's citizens have used websites or mobile applications of public authorities in the previous 12 months, which exceeded the EU average of 70.01%. However, even the Estonian model has certain limitations. Deep integration of registries requires constant updating of interoperability standards, continuous investment in cyber defence, and high digital competence of the state apparatus. The existing dependence on data-based management creates risks of over-technologisation of policymaking, when complex social processes begin to be

evaluated solely through quantitative indicators. Comparative analysis of digital ethno-national governance models has shown that the effectiveness of state policy in the field of monitoring ethno-social processes directly depends not only on the level of digitalisation, but primarily on the nature of interdepartmental integration and data governance architecture. Ukraine, China, and Estonia represent three different models of digital management organisation: fragmentary and decentralised, centralised and control, and interoperability-oriented, the comparison of which is shown in Table 2.

Table 2. Comparative model of digital ethno-national governance

Criteria	Ukraine	China	Estonia
Data architecture	Distributed ledgers + interagency integration via Trembita	Centralised government platforms with vertical integration	Decentralised registries + X-Road
Integration model	API-integration (service-oriented)	Unified state data governance	Event-based interoperability
Once-only principle	Partially implemented – fragmentary in e-services Diia) – number of services: 100+	Limited (data is duplicated between control systems)	Fully implemented; once-only scoring >90%
AI/predictive management	Limited use (primarily Diia service solutions)	Large-scale application (state risk analytics, smart policing)	Moderate (data-driven policymaking, without mass surveillance AI)
Digital maturity level (DESI / GovTech proxy)	Below the EU average	High in the public sector, but without open indexes	Top 3 EU by eGovernment
Data access control	Regulatory-European (General Data Protection Regulation alignment)	State-centred	Cryptographic-log control (audit trail)
Level of personal data protection	General Data Protection Regulation-aligned (EU approximation 2023)	Security-first governance	General Data Protection Regulation-native model
Crisis resilience	High (due to flexible digital infrastructure during the war)	Very high (centralised data management)	High (institutional stability of the system)
Main structural problems	Data silos, registry fragmentation	Excessive centralisation and opacity	Dependence on cyber resilience
Potential of ethno-national monitoring	Medium (limited data integration)	Very high (but risk of politicisation)	High (balance of analytics and rights)

Source: compiled by the author based on Delegation of the European Union to Ukraine (2021), Ministry of Digital Transformation of Ukraine (2024), European Commission (2024), K. Ansari (2025), H. Yun (2025), S. Marak (2025), T. Vasylieva *et al.* (2025), A. Orazzo & A. Cappelletti (2025), V. Sarioglo & N. Korzhunova (2026)

A comparative analysis of the three models showed that the level of interagency integration does not have a linear correlation with democracy or efficiency, but describes a nonlinear trajectory depending on the data governance architecture. Chinese digital architecture has a maximum level of integration, close to the concept of a single state data lake, so that the authorities instantly make analytical decisions. However, the developers provided a similar effect through the vertical concentration of information. Within this configuration, the state's security infrastructure completely absorbs ethno-national monitoring, which creates a threat of algorithmic discrimination. Ukraine occupies an intermediate position. Digital tools have formed a convenient service level, but analytical interaction between registries is still limited. The main problem is the lack of stable data linkage communication between the State Statistics Service, the Ministry of Education and Science, the State Migration Service, and social registers. As a result, the state system functions as a set of interrelated but isolated information contours. The Estonian model demonstrates a structural balance. The X-Road platform creates an event-based exchange system instead of accumulating a single database. This approach guarantees a high level of interoperability, while maintaining the institutional autonomy of departmental registers. Additionally, there is a transparent

auditability mechanism, in which the system records each fact of access to data and opens a report to a citizen. The described tool maintains a unique balance between the effectiveness of public administration and the legal protection of personal information.

Ethnic monitoring requires, first and foremost, the ability to integrate existing data into analytical models without breaching legal safeguards, rather than the accumulation of vast amounts of information. China provides maximum analytical power, but creates high risks of building surveillance governance. Ukraine demonstrates high adaptability, but the country lacks analytical consolidation of departmental bases. Estonia has found the optimal combination of interoperability, legal protection, and analytical functionality. The level of integration of departments directly determines the accuracy of monitoring ethnic processes. Fragmented systems, similar to the Ukrainian one, force various institutions to collect unrelated data sets. This blocks the prediction of social dynamics and provokes the appearance of statistical discrepancies. Centralised models, on the other hand, allow government agencies to create comprehensive digital population profiles and conduct real-time analysis. However, excessive concentration of information can turn ethno-national monitoring into a tool of total digital control. Models of the

interoperability-oriented type occupy an intermediate position, because developers ensure data integration without eliminating the institutional autonomy of registers.

Administrative efficiency and democratic guarantees have different ratios depending on the chosen political course. The Chinese model guarantees the highest speed of decision-making, but has zero transparency of algorithms and completely rejects public control. The Ukrainian system, despite its weak integration, retains a fragmented structure of data access. Organisational disunity partially hinders the excessive concentration of Information power, although simultaneously reduces the quality of analytics. Estonian architecture has achieved the most balanced balance between efficiency and protection of citizens' rights. Success was ensured by cryptographic protection, transparent logging of registry requests, and system interoperability. Transition-type states should abandon blind copying of other people's digital solutions and focus on forming universal principles of integrated governance. Comparative analysis confirms that an effective digital ethno-national policy should be based on several basic principles. These include standardised interoperability between registries, unified metadata standards, real-time interagency analytics, and transparent rules for accessing information. It is also mandatory to combine AI analytics with legal guarantees to protect privacy and create independent institutions to audit algorithms against digital discrimination against ethnic groups.

The interoperability-oriented model, adapted to the conditions of military and post-war management, is more suitable for Ukrainian society. Total centralisation of data on the Chinese model completely contradicts the European vector of the country's development and creates a threat of excessive concentration of digital power in one hand. But the Estonian experience has proved the possibility of successfully combining a decentralised structure of state registers with a high level of coordination of departments. This approach is of strategic importance for monitoring the internal movement of citizens, tracking regional language transformations and social integration of people during the post-war reconstruction. Digital management is subject to a universal trend – the shift from the mere accumulation of data to intelligent management based on integrated analytics. As part of this process, overcoming “information silos” is not a technical, but a systemic institutional task. It is the quality of interaction between state institutions that will determine the ability of the authorities to effectively respond to ethnic and social challenges, while maintaining a balance between security, digital efficiency, and democratic standards.

● DISCUSSION

The results of the study showed that the problem of “information silos” in the digital management of ethno-national policy is not limited to the technical incompatibility of information systems, but arises as a complex combination of institutional, regulatory, semantic, and analytical barriers. The results obtained partially correlate with the approach of M. Romano & J. Albrecht (2026), who considered silo structures as a source of communication gaps between emergency management professionals and the IT sector. The analysis confirmed that interdepartmental

fragmentation in the field of ethno-national monitoring also arose due to different managerial logic of state structures. However, if the authors focused mainly on the professional and communication dimension of the problem, the results of the study showed a more complex configuration. Structural isolation occurs simultaneously at the level of regulatory regimes for access to data, semantic incompatibility of classifiers, and political competition between institutions for control over information resources. The identified list of seven types of interagency barriers expanded the interpretation of silo fragmentation in comparison with the model of researchers, since the problem was interpreted not as a communication gap between professional groups, but as a systemic deformation of the data governance architecture. Simultaneously, the provision on the need for cross-sectoral coordination, regular training of personnel and the development of a common operational environment is consistent with the conclusion of the study on the critical role of unified dashboards and integrated analytical platforms in overcoming the fragmentation of state registers.

Conclusions of M.V. Kurniawati *et al.* (2025) on interagency data exchange in government structures also correlate with the results obtained. The analysis proved that technical integration without changing the management model does not provide a full-fledged overcoming of “information silos”. That is why the thesis of researchers on the transformation of interdepartmental data exchange from a technical procedure into a strategic tool of evidence-based policymaking coincides with the established need to move from data accumulation to “governance-based data management”. The study showed that even in the presence of developed framework structures, registry integration remains limited due to contradictions between interoperability and privacy protection. This contradiction was not a central element of the authors' research, but in the new analysis it determined the main reason for the institutional isolation of data in the field of ethno-national policy. The results showed that high standards of personal data protection, in particular within the framework of the General Data Protection Regulation-oriented governance, objectively complicate the interagency exchange of sensitive data, namely in relation to ethnic, linguistic, and migration information. Thus, the conducted research supplemented the framework approach with an institutional and legal dimension, which directly affected the possibility of integrating state analytical systems.

Approach of O. Nepomnyashchyy *et al.* (2022), based on a cluster analysis of the digitalisation of Central and Eastern European countries, generally confirmed the conclusions about the unevenness of digital transformation in the region. The study also recorded the intermediate state of Ukraine between service digitalisation and incomplete analytical integration of registers. The results allowed detailing the structural reasons for this position. If researchers interpreted the low level of efficiency of public administration mainly due to the general level of digitalisation, then the analysis revealed the key role of the data governance architecture. It was demonstrated that even the active development of the Diia and Trembita platforms did not provide full synchronisation between the State Statistics Service, the State Migration Service,

the Ministry of Education and Science, and social registers. As a result, the digitalisation of administrative services was not automatically transformed into an integrated system of ethnic and national monitoring. Thus, the results expanded the authors' cluster approach, since the effectiveness of digital transformation is not related to the number of technological solutions, but to the level of interagency interoperability and the ability of the state to form a single analytical environment.

The paper by M. Di Giulio & G. Vecchi (2021) considered digital technologies as mechanisms of organisational integration, the implementation of which was accompanied by conflicts and negative feedback. The study confirmed this pattern in the context of digital ethno-national governance. It was found that technological modernisation without transforming institutional logic does not eliminate structural fragmentation, but only transfers it to the digital environment. This conclusion correlates with the thesis on the need to coordinate ICT solutions with the management system. The analysis detailed the mechanisms of this discrepancy. In particular, in the case of Ukraine, digital platforms created a service level of interaction with the state, but interdepartmental analytics remained limited due to different metadata standards, different data access modes, and the lack of complete data linkage between state systems. Thus, the results of the study confirmed that digitalisation does not have a linear effect of improving management efficiency, but depends on the degree of adaptation of the organisational structure of the state to the new coordination model. The findings of T.C. Nguyen (2025), dedicated to the X-Road Platform, almost coincide with the conclusions of a study conducted on the Estonian interoperability-oriented model. In both studies, X-Road was interpreted not as a centralised data warehouse, but as an infrastructure for standardised exchange between autonomous registries. The analysis confirmed that it is this architecture that provides a balanced combination of efficiency and privacy protection. The results detailed the importance of audit accountability and cryptographic logging of data access as tools for maintaining institutional trust. If the author focused on the socio-technical nature of X-Road and its role in strengthening the legitimacy of digital governance, the current study showed that it was the event-based interoperability mechanism that helped to avoid the establishment of new "information silos". In addition, it was shown that the Estonian model turned out to be the most relevant for transition states, since it combines a decentralised registry structure with a high level of analytical coordination without concentrating information power in one centre.

Approach of H.Y. Quek *et al.* (2023), devoted to the problem of fragmentation in digital twin ecosystems, found a conceptual affinity with the results of the study. The researchers emphasised the role of semantic integration and bidirectional data flows, while in the analysis, the semantic barrier was identified as one of the factors of fragmentation of state registers. It was found that different criteria for classifying ethnic, linguistic and migration categories actually made it impossible to automatically compare data even within the same country. That is why the conclusion by the authors regarding the need for an active role of the state in the development of digital

integration standards correlates with the result of the study, where interoperability was interpreted as a combination of technical, organisational and semantic levels of interaction. However, the study went further, since the problem of semantic incompatibility is associated not only with technological blockages, but also with political and regulatory regimes for accounting for ethnic data. F.C. Okolo *et al.* (2022) identified the main problems of data integration as "data silos", inconsistency of standards, and complexity of interagency management. The study actually confirmed the situation, but showed that in the field of ethno-national policy, the consequences of fragmentation were deeper. If researchers analysed transport and infrastructure systems where data integration mainly affected the effectiveness of coordination, then in the current study the isolation of registers directly affect the ability of the state to predict ethnic and social dynamics and respond to interethnic risks. It was proved that the lack of synchronisation between demographic, social, migration, and educational bases makes it impossible to form complex models of social integration. The findings of F.C. Okolo *et al.* correspond to the conclusion about the need for standardised data exchange protocols, but the current study showed that this is not enough for ethnic and national monitoring without creating mechanisms for analytical coordination and algorithmic audit.

The results of A. Kirilenko (2025), devoted to the reform of public administration of Ukraine in the context of war, correlate with the conclusions on the transformation of the Ukrainian digital model after 2022. The study found that the war was a catalyst for the accelerated integration of state registers and the development of digital coordination through Diia and Trembita. The study showed that even in the context of large-scale digitalisation, the problem of "data silos" was not completely overcome. This is evident in the field of accounting for internally displaced persons, where various government agencies use incompletely synchronised data sets. Thus, the results of A. Kirilenko on the need for long-term reform strategies are consistent with the conclusion that service digitalisation cannot replace data governance system integration.

The opinion of P.K. Pemmasani & M.A. Nasaruddin (2022) on the need for an integrated approach to data management was also confirmed by the results of the study. The researchers considered centralised data management models and AI-based threat detection as security and accountability tools. However, the study showed that in the field of ethno-national policy, excessive centralisation creates risks of surveillance governance and algorithmic discrimination. It was on the example of the Chinese model that it was shown that maximum analytical power can be combined with a high level of digital control and concentration of information power. Thus, the results partially coincide with the conclusions of researchers regarding the role of interagency coordination and AI analytics, but the study revealed the need for additional mechanisms of human oversight, explainability and algorithmic audit, which showed that the effectiveness of digital governance is determined not by the amount of data collected, but by the ability to integrate analytical efficiency with democratic guarantees and legal protection of sensitive information.

● CONCLUSIONS

The conducted research confirmed that the concept of “information silos” in the field of ethno-national policy acquires specific features that differ from its classical interpretation in organisational science. Unlike corporate management, in public administration, data fragmentation is compounded not only by departmental autonomy, but also by the distribution of competencies between statistical, migration, educational, and security structures. The paper systematised seven types of interagency barriers – organisational, regulatory, technical, analytical, cybersecurity, semantic, and political institutional – which explains why even a high level of digitalisation does not guarantee data integration. It was proved that in the field of ethno-national monitoring, the consequence of such barriers is not just a statistical discrepancy, but the impossibility of building a comprehensive model of ethno-social dynamics due to the lack of synchronisation of demographic, language, migration, and social registers. It was established that the correlation between the integration of registers and the protection of personal data creates an institutional contradiction: the General Data Protection Regulation and similar regulations aimed at protecting sensitive information objectively complicate interagency exchange, turning into an additional factor of isolation. The result was a conclusion about the inefficiency of both complete data centralisation and purely technical solutions without changing the management logic.

Based on a comparative analysis of three models – fragmentary and decentralised (Ukraine), centralised and control (China), and interoperability-oriented (Estonia) – it was revealed that the Ukrainian system was in an intermediate position: the service level of digitalisation through Diia and Trembita was formed (the Diia system integrated dozens of registers, the number of users exceeded 21 million, and millions of transactions are made through

Trembita every month), but the analytical consolidation of data between the State Statistics Service, the State Migration Service, the Ministry of Education and Science, and social registers remained incomplete. The Chinese model demonstrated maximum analytical power (more than 90% of large cities have implemented smart city governance elements), but with high risks of turning ethno-national monitoring into a digital control tool. Simultaneously, the Estonian X-Road architecture provided the most balanced combination of interoperability, cryptographic protection and transparent access logging: more than 1,000 organisations and more than 3,000 services interact through X-Road, and 87.59% of the population uses electronic public services, which exceeds the European average of 70.01%. The result was the determination that overcoming “information silos” requires a transition from the departmental logic of data accumulation to the “governance-based data management” model, where standardised exchange protocols, unified metadata, and audit mechanisms are integrated rather than the databases themselves. In addition, it was found that cross-sectoral interaction algorithms reproduce structural inequalities embedded in historical administrative data without proper supervision, which forms the prerequisites for digital discrimination of ethnic groups. Prospects for further research consist in the development of a methodology for assessing algorithmic bias in state monitoring systems for ethnic processes.

● ACKNOWLEDGEMENTS

None.

● FUNDING

None.

● CONFLICT OF INTEREST

None.

● REFERENCES

- [1] Ansari, K. (2025). A project of regionalism in international relations entitled cybersecurity in regional integration efforts: Learning from Estonia’s cyber attack and its impact on the Baltic region. *SSRN*. doi: 10.2139/ssrn.5219190.
- [2] Balabukha, K. (2026). Digital maturity and the quality of data-driven management decisions: The experience of developing countries. *Investments: Practice and Experience*, 5, 205–214. doi: 10.32702/2306-6814.2026.5.205.
- [3] Boyoli, K. (2022). *Facing the digital divide in E-stonia: A field study on the inclusion of senior citizens in the digital society of Estonia*. Lund: Lund University.
- [4] Charalabidis, Y., Loukis, E., Alexopoulos, C., & Lachana, Z. (2019). The three generations of electronic government: From service provision to open data and to policy analytics. In I. Lindgren, M. Janssen, H. Lee, A. Polini, M. Pedro Rodríguez Bolívar, H. Jochen Scholl & E. Tambouris (Eds.), *Electronic government* (pp. 3–19). Cham: Springer. doi: 10.1007/978-3-030-27325-5_1.
- [5] China Academy of Information and Communications Technology. (2026). *Government digital and intelligent transformation development research report (2025)*. Retrieved from https://www.caict.ac.cn/kxyj/qwfb/ztbg/202603/t20260309_715551.htm.
- [6] China Internet Network Information Center. (2026). *57th statistical report on China’s Internet development*. Retrieved from <https://www.ecns.cn/news/cns-wire/2026-02-05/detail-ihczyiy1140391.shtml>.
- [7] Congressional Asian Pacific American Caucus. (2023). *CAPAC Chair commends 2020 Census data product*. Retrieved from <https://capac-chu.house.gov/press-release/capac-chair-commends-2020-census-data-product>.
- [8] de Frutos Lucas, J., & Haugo, H.T. (2024). Moving forward with the European health data space: The need to restore trust in European health systems. *The Lancet Regional Health – Europe*, 40, article number 100906. doi: 10.1016/j.lanepe.2024.100906.
- [9] Delegation of the European Union to Ukraine. (2021). *With EU support, the Trembita system helps develop digital governance in Ukraine*. Retrieved from https://www.eeas.europa.eu/node/94854_en?s=232.
- [10] Di Giulio, M., & Vecchi, G. (2021). Implementing digitalization in the public sector. Technologies, agency, and governance. *Public Policy and Administration*, 38(2), 133–158. doi: 10.1177/09520767211023283.

- [11] Digital and Population Data Services Agency. (2022). *Suomi.fi data exchange layer*. Retrieved from <https://www.suomi.fi/services/suomi-fi-data-exchange-layer-digital-and-population-data-services-agency/4ab88971-b9fb-443c-99aa-bc361bac7548>.
- [12] dos Santos, M.T. (2025). Algorithmic bias and place of residence: Feedback loops in financial and risk assessment tools. *Global Journal of Human-Social Science*, 25(1), 17-30. doi: 10.34257/GJHSSFVOL25IS1PG17.
- [13] Dudoit, A., Labillois, T., & Hubert, A.M. (2026). *Public sector data interoperability in Canada: Building a shared, sovereign capacity to serve citizens*. Montreal: CIRANO.
- [14] EU Artificial Intelligence Act. (2021). Retrieved from <https://artificialintelligenceact.eu/>.
- [15] European Commission. (2024). *Estonia 2024 digital decade country report*. Retrieved from <https://digital-strategy.ec.europa.eu/en/factpages/estonia-2024-digital-decade-country-report>.
- [16] European Commission. (n.d.). *New European interoperability framework: Promoting seamless services and data flows for European public administrations*. Retrieved from <https://surl.li/umkcoe>.
- [17] European Migration Network. (2020). *Accurate, timely, interoperable? Data management in the asylum procedure*. Retrieved from <https://surl.li/xivdvt>.
- [18] Eurostat. (2026). *E-government activities of individuals via websites*. Retrieved from https://ec.europa.eu/eurostat/databrowser/view/isoc_ciegi_ac_custom_15335971/bookmark/table?lang=en&bookmarkId=e2a0291b-a8a1-4a5e-944f-ece75240fb4b.
- [19] General Data Protection Regulation. (2016, April). Retrieved from <https://gdpr-info.eu/art-9-gdpr/>.
- [20] Guan, J. (2025). Data sharing governance and management framework. In J. Guan (Ed.), *Governance and management of medical scientific data sharing and application* (pp. 37-68). Singapore: Springer. doi: 10.1007/978-981-95-2806-6_2.
- [21] Guo, M., & Zhou, Y. (2025). Boosting sustainable urban development: How smart cities improve emergency management – evidence from 275 Chinese cities. *Sustainability*, 17(15), article number 6851. doi: 10.3390/su17156851.
- [22] Health and Welfare Information Systems Centre. (n.d.). *Social services and benefits data register*. Retrieved from <https://www.tehik.ee/sotsiaalteenuste-ja-toetuste-andmeregister-star>.
- [23] Institute of Medicine. (2009). *Race, ethnicity, and language data: Standardization for health care quality improvement*. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK219748/?report=printable>.
- [24] International Organization for Migration. (2025). *Migration in Ukraine: 2024 facts and figures*. Retrieved from https://ukraine.iom.int/sites/g/files/tmzbd11861/files/documents/2026-03/iom-ukraine_facts-2024-eng.pdf.
- [25] Jeleel-Ojuade, A. (2024). The role of information silos: An analysis of how the categorization of information creates silos within financial institutions, hindering effective communication and collaboration. SSRN. doi: 10.2139/ssrn.4881342.
- [26] Jung, J. (2020). *Seongnam-si checks floating population every 5 minutes with big data technology*. Retrieved from <https://gam.newspim.com/news/view/20200501000050>.
- [27] Kasiwi, A.N., Wahyuni, H.I., & Ratminto. (2025). Digital transformation and cross-organizational interoperability in electronic-based government systems. *Journal of Governance and Development*, 21(2), 64-76. doi: 10.32890/jgd2025.21.2.5.
- [28] Kirilenko, A. (2025). *Public administration for sustainable development: Mechanisms and strategies of state and regional administration in the conditions of war and reconstruction of Ukraine*. Mariupol: Mariupol State University.
- [29] Klarmann, J.P. (2025). *Algorithmic bias and fairness on trial: Discussing the future role of AI systems like COMPAS in EU criminal justice*. Retrieved from <https://www.diva-portal.org/smash/get/diva2:2048951/FULLTEXT03.pdf#page=102>.
- [30] Kovnyi, Y., Roshkanyuk, V.M., Panov, A.V., Vovk, M., & Dubova, K. (2023). Legal regulation of ethno-national policies (national minorities, indigenous peoples, multiculturalism). *Cuestiones Políticas*, 41(77), 158-171. doi: 10.46398/cuestpol.4177.11.
- [31] Kulkarni, A., Bassin, P., & Srinivasa, S. (2025). From dashboards to do-boards: A data-driven architecture for policy support systems. In A. Kő, F. Buccafurri, G. Kotsis, A.M. Tjoa & I. Khalil (Eds.), *Electronic government and the information systems perspective: EGOVIS 2025* (pp. 175-189). Cham: Springer. doi: 10.1007/978-3-032-02225-7_12.
- [32] Kurniawati, M.V., Zulmy, M.F., & Ruldeviyani, Y. (2025). The optimizing data quality in interagency data sharing: A framework. *Jurnal Ilmu Komputer dan Informasi*, 18(1), 47-66. doi: 10.21609/jiki.v18i1.1310.
- [33] Lee, J.S., Jun, J.H., Kim, D.H., & Oh, S.J. (2025). Implementation of a patient risk behavior monitoring system using real-time sensor data and AI. *IEEE Access*, 20, 177907-177918. doi: 10.1109/ACCESS.2025.3617960.
- [34] Léonard, M.N. (2023). Counting racial diversity: Naming and numbering. In *Racial diversity in contemporary France: The case of colorblindness* (pp. 66-85). Bristol: Bristol University Press. doi: 10.46692/9781529208023.005.
- [35] Marak, S. (2025). *X-Road technology: A digital backbone of Estonia's cyber security and DPI*. Future Shift Labs. Retrieved from <https://futureshiftlabs.com/x-road-technology-a-digital-backbone-of-estonias-cyber-security-and-dpi/>.
- [36] Marcovitch, I., & Moffatt, F. (2024). Information management standards in Canadian public safety and security: Enhancing interoperability, collaboration and resilience. In F. Moffatt & B. Rector (Eds.), *Information management capabilities in public safety and security: Challenges, strategies and frameworks* (pp. 37-59). Cham: Springer. doi: 10.1007/978-3-031-68146-2_4.
- [37] Matteby, M. (2025). *From silos to synergy: Institutional entrepreneurship in collective digital transformation in the public sector*. Retrieved from <https://ceur-ws.org/Vol-4127/paper15.pdf>.
- [38] Mendoza Castaneda, N. (2026). Challenges in public policy coordination. *Sustainability Transitions: Economics, Policy & Society*, 3, article number 18. doi: 10.65835/steps.2026.3.18.

- [39] Ministry of Digital Transformation of Ukraine. (2024). *21+ million Ukrainians use Diia*. Retrieved from <https://diia.gov.ua/news/21-mln-ukraintsiv-korystuiutsia-diieiu>.
- [40] Nalbantoğlu, C. (2022). EU – China relations and data governance policies: The role of civil societies in overcoming geopolitical challenges in cyberspace. *Deusto Journal of European Studies*, 5, 51-73. doi: 10.18543/ced.2555.
- [41] Nepomnyashchyy, O., Radchenko, O., Marusheva, O., Prav, Y., & Shandryk, V. (2022). The public policy implementation mechanisms in the context of digitalization. *Economic Affairs*, 67(4), 787-794. doi: 10.46852/0424-2513.4s.2022.12.
- [42] Nguyen, T.C. (2025). Estonia's X-Road and the digital state: A socio-technical approach to public governance transformation. *GRADUS*, 12(2), 1-8. doi: 10.47833/2025.2.ART.015.
- [43] Odinaka, N., Okolo, C.H., Chima, O.K., & Adeyelu, O.O. (2022). Translating regulatory risk into strategic opportunity: A policy-to-strategy mapping toolkit for U.S. infrastructure projects. *Journal of Frontiers in Multidisciplinary Research*, 3(1), 607-617. doi: 10.54660/JFMR.2022.3.1.607-617.
- [44] Okolo, F.C., Etukudoh, E.A., Ogunwole, O., Osho, G.O., & Basiru, J.O. (2022). Policy-oriented framework for multi-agency data integration across national transportation and infrastructure systems. *Journal of Frontiers in Multidisciplinary Research*, 3(1), 140-149. doi: 10.54660/IJFMR.2022.3.1.140-149.
- [45] Oldbury, K. (2022). *Pilots and digital platforms: Insights into public capacity to plan and govern smart mobility towards sustainable urban mobility*. In M. Albrecht, S. Sidorenko, H. Nielsen, J. Kortelainen & L. Poikolainen (Eds.), *Multiple Nordic geographies: Book of abstracts* (p. 129). Kuopio: University of Eastern Finland.
- [46] Ontario Community Health Profiles Partnership. (n.d.). *Ontario COVID-19 heterogeneity project*. Retrieved from <https://www.ontariohealthprofiles.ca/mobilitytool/index.php>.
- [47] Orazzo, A., & Cappelletti, A. (2025). Digital mediation and the reshaping of interethnic relations in contemporary China: AI surveillance and grid governance in Xinjiang. *Journal of Contemporary China*. doi: 10.1080/10670564.2025.2605235.
- [48] Organisation for Economic Co-operation and Development. (2019). *The path to becoming a data-driven public sector*. Retrieved from https://www.oecd.org/en/publications/the-path-to-becoming-a-data-driven-public-sector_059814a7-en/full-report/component-5.html.
- [49] Organisation for Economic Co-operation and Development. (2023). *Czech Republic*. Retrieved from <https://surl.li/odihlg>.
- [50] Organisation for Economic Co-operation and Development. (n.d.). *X-Road Trust Federation for cross-border data exchange*. Retrieved from <https://oecd-opsi.org/innovations/x-road-trust-federation-for-cross-border-data-exchange/>.
- [51] Panov, A.V. (2023). Legal regulation of ethno-national policies (national minorities, indigenous peoples, multiculturalism). *Questiones Políticas*, 41(77), 123-139. Retrieved from <https://dspace.uzhnu.edu.ua/jspui/handle/lib/52302>.
- [52] Parizek, M. (2013). *The organizational-cybernetic approach to international institutions*. Prague: Charles University.
- [53] Pemmasani, P.K., & Nasaruddin, M.A. (2022). *Strengthening public sector data governance: Risk management strategies for government organizations*. *International Journal of Modern Computing*, 5(1), 108-118.
- [54] Public Authority Algorithmic and Automated Decision-Making Systems Bill of the UK. (2024). Retrieved from <https://surl.li/iivyfh>.
- [55] Quek, H.Y., et al. (2023). The conundrum in smart city governance: Interoperability and compatibility in an ever-growing ecosystem of digital twins. *Data & Policy*, 5, article number e6. doi: 10.1017/dap.2023.1.
- [56] Ran, X., Chen, G., & Guo, B. (2026). A narrower access gap, yet persistent divides: The digital inequality among China's urban-rural older adults. *BMC Public Health*, 26, article number 1733. doi: 10.1186/s12889-026-27131-8.
- [57] Regulation of the Republic of Estonia No. 20 "On the Establishment and Statutes of the Register of Children and Teachers in Pre-School Education". (2025, August). Retrieved from <https://www.riigiteataja.ee/akt/422082025024>.
- [58] Romano, M., & Albrecht, J. (2026). How knowledge silos affect emergency management application development. *Humanities and Social Sciences Communications*, 13, article number 175. doi: 10.1057/s41599-025-06450-y.
- [59] Sarioglu, V., & Korzhunova, N. (2026). Information support for socio-economic policy in Ukraine: From fragmented data to evidence-based decisions in the context of European approaches. *Demography and Social Economy*, 63(1), 61-79. doi: 10.15407/dse2026.01.061.
- [60] Seo, J.E., & Kwon, H.Y. (2023). Study on government data governance framework: Based on the national data strategy in the US, the UK, Australia, and Japan. In R. Lee (Ed.), *Big data, cloud computing, and data science engineering* (pp. 133-144). Cham: Springer. doi: 10.1007/978-3-031-19608-9_11.
- [61] Smutchak, Z., Tsinaridze, R., Burlaienko, T., & Dubinina, O. (2025). Demographic security and sustainable development of Ukraine in the conditions of active migration of the population. *Problems of Sustainable Development*, 20(2), 71-85. doi: 10.35784/preko.7140.
- [62] Spyropoulos, A.Z., & Tsiantos, V. (2025). Interoperable semantic systems in public administration: AI-driven data mining from law-enforcement reports. *Computers*, 14(9), article number 376. doi: 10.3390/computers14090376.
- [63] Statistics Canada. (2024). *Disaggregated data action plan: 2024-2025 accomplishments report – from commitment to continuity* (Catalogue no. 11-627-M). Retrieved from <https://www.statcan.gc.ca/en/about/transparency/disaggregated-data-accomplishments/disaggregated-data-accomplishments-2024-2025.pdf>.
- [64] Statistics Canada. (2025). *Disaggregated data action plan (DDAP)*. Retrieved from <https://www.statcan.gc.ca/en/trust/modernization/disaggregated-data>.
- [65] Sunday, O.S., & Awoyomi, O.O. (2026). Cross agency data fusion and predictive intelligence to reduce fraud across U.S. benefits programs. *World Journal of Advanced Research and Reviews*, 30(2), 101-111. doi: 10.30574/wjarr.2026.30.2.1167.

- [66] Szymańska, J. (2018). *Information systems in EU migration management*. Retrieved from <https://surl.li/ckvwnx>.
- [67] Thanh, D.V. (2024). Diversity and inclusion in indigenous ethnic research during the digital age. In D. Van Thanh, M. Ashwill & H. Anh Tuan (Eds.), *Vietnamese higher education at a crossroads* (pp. 127-143). Cham: Springer. doi: 10.1007/978-3-031-61838-3_6.
- [68] U.S. Department of Education. (2026). *Foundations for evidence-based policymaking*. Retrieved from <https://www.ed.gov/research/foundations-evidence-based-policymaking>.
- [69] Valenti, C., & Yasukawa, L. (2024). Missing education data on internally displaced people (IDPs). In M. Delprato & D.D. Shephard (Eds.), *Achieving equitable education* (pp. 103-119). Cheltenham: Edward Elgar Publishing. doi: 10.4337/9781035313839.00012.
- [70] Van Rossem, W., & Pelizza, A. (2025). Bridging silos or adding friction? The data work behind re-identification across interoperable data infrastructures. *Big Data & Society*, 12(4). doi: 10.1177/20539517251388349.
- [71] Vasylieva, T., Zakharkin, O., & Yarovenko, H. (2025). *Digital transformations of Ukraine's cybersecurity system in wartime*. Hamburg: The Academic Research and Publishing. doi: 10.61093/978-3-911748-05-6/2025.
- [72] Wang, C., Yin, Y., & Hu, H. (2026). The rise of algorithmic governance and the dual revolution: Applications, challenges, and governance of artificial intelligence in public administration. *Technology in Society*, 86, article number 103264. doi: 10.1016/j.techsoc.2026.103264.
- [73] Yihan, X., & Zhenlin, L. (2024). Digital transformation and the frontier of China's state governance. *Social Sciences in China*, 45(2), 70-91. doi: 10.1080/02529203.2024.2367313.
- [73] Yun, H. (2025). China's data sovereignty and security: Implications for global digital borders and governance. *Chinese Political Science Review*, 10(2), 178-203. doi: 10.1007/s41111-024-00269-9.
- [74] Zhang, W., & Zhang, Y. (2025). *Digital urban governance in China: Foundations and applications*. Singapore: Springer. doi: 10.1007/978-981-96-6325-5.

Механізми подолання міжвідомчих бар'єрів у процесі цифровізації етнонаціональної політики: від «інформаційних силосів» до інтегрованого управління

Юлі Чен

Заступник директора

Провінційний інститут етнічних досліджень Хайнаня

570000, просп. Гуосін, 9, м. Хайкоу, Китайська Народна Республіка

<https://orcid.org/0009-0006-7186-7084>

Анотація. Метою дослідження було виявлення моделей управління, здатних забезпечити узгоджений обмін даними в контексті цифрової трансформації державного сектору. Методологія базувалася на міждисциплінарному поєднанні інструментів державного управління, цифрового врядування, аналізу інформаційних систем та етнополітичних досліджень, що дозволило простежити особливості функціонування державних реєстрів, механізми міжвідомчої взаємодії та практики управління даними у 2015-2025 рр. за допомогою порівняльно-аналітичного та інституційного підходів. Результати дослідження показали, що «інформаційні силоси» в етнонаціональній політиці формуються через розмежування компетенцій між статистичними, міграційними, освітніми та безпековими установами. Порівняння національних моделей показало, що українська система цифрового врядування забезпечила розвиток сервісних платформ (через систему «Дія» було інтегровано десятки реєстрів, кількість користувачів перевищила 21 мільйон, а платформа «Трембіта» щомісяця обробляє мільйони транзакцій), але не сформувала повної аналітичної консолідації між державними реєстрами. Було встановлено, що централізована модель управління в Китаї забезпечує високу швидкість аналітичної обробки інформації (понад 90 % великих міст впровадили елементи управління «розумним містом»), але супроводжується ризиками надмірного цифрового контролю та посилення наглядових функцій держави. Досвід Естонії показав, що поєднання взаємосумісності, криптографічного захисту та прозорого аудиту доступу до даних створює більш збалансовану систему міжвідомчої координації: понад 1 000 організацій та понад 3 000 служб взаємодіють через платформу X-Road, а 87,59 % населення користується електронними державними послугами. Дослідження підтвердило, що регулювання захисту персональних даних одночасно виконує функцію правового захисту та стає чинником інституційної ізоляції між державними структурами. У ході дослідження було встановлено, що подолання фрагментації інформації у сфері етнонаціонального моніторингу вимагає переходу від моделі накопичення даних окремими відомствами до системи управління, заснованої на стандартизованих протоколах обміну, уніфікованих метаданих та механізмах аудиту доступу. Практичне значення отриманих результатів полягає в можливості їх використання державними органами, структурами цифрового управління, аналітичними центрами та розробниками державних інформаційних систем для розробки безпечних моделей міжвідомчого обміну даними у сфері етнонаціональної політики та державного управління.

Ключові слова: захист персональних даних; взаємосумісність; принцип одноразового введення даних; прогнозне управління; федеральне управління даними