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Constraints and solutions for the digital transformation of urban ethnic affairs: A stakeholder perspective

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Abstract. The relevance of the study is a result of the growing imperative of the digital transformation of public governance and the challenges posed by such transformation to ethnically diverse urban populations. The purpose of this study was to develop a stakeholder-centred framework for identifying institutional constraints on the digital transformation of ethnic affairs governance in urban China and Canada. The study employed comparative document analysis, stakeholder mapping, and multi-level governance analysis of legal and policy frameworks in China and Canada. The results demonstrate that China and Canada have developed fundamentally different models of ethnic affairs governance, whose limitations are structural rather than individually resolvable. China's centralised model ensures high operational efficiency and a unified digital infrastructure, yet generates deficits of legitimacy across input, throughput, and output dimensions. These deficits stem from the exclusion of ethnic community organisations from platform co-design, weak interoperability between the National State Commission for Ethnic Affairs and national data systems, and the managerial role of major technology corporations without independent oversight. The adoption of the National Unity and Progress Act has further reinforced the concentration of governance within party-based structures, reducing the availability of culturally sensitive digital services at the municipal level. Canada's decentralised model, by contrast, demonstrates strong input legitimacy grounded in constitutionally recognised multicultural and Indigenous rights. However, it exhibits persistent coordination failures and outcome legitimacy deficits due to fragmentation across federal, provincial, municipal, and Indigenous governance levels. Evidence from Toronto and Vancouver highlights both variation in participatory mechanisms and enduring accountability gaps between Indigenous self-government institutions and municipal digital service provision. The findings of this research can be applied to other countries with similar governmental models for ethnic affairs and contribute to the existing scholarly literature on the topic of digital transformation and ethnic affairs governance

Keywords: subsidiarity; interoperability; participatory legitimacy; governance models; Indigenous groups; multicultural

INTRODUCTION

In the transforming digital age and in the consideration of the growing ethnic diversity within urban populations, the digital management of ethnic affairs has become one of the most pressing challenges for both municipal and national governments. The transition from analogue to digital governments and the relationships between those governments and the populations they govern have raised questions regarding the digital governance of various topics and services. One of the groups of individuals whose governance presents challenges for digital governments has been those of ethnic backgrounds and populations, as the digital governments have yet to formulate approaches to the digital governance of ethnic affairs.

As indicated by the research on stakeholder engagement in governance processes, the effectiveness of many initiatives for institutional reform relies upon the degree of engagement of the communities that are to benefit from those initiatives. O. Pasko *et al*. (2021) established through

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their research that engaging the stakeholders that are to utilise the sustainability reports that are published by an institution can led to improvements in the institution and its outputs. Additionally, T.O. Zinchuk *et al*. (2021) indicated that the inclusion of both entrepreneurial and governmental stakeholders in the management of rural economies can lead to outcomes that are both more sustainable and coherent than those that are established through governing bodies alone. O. Pelyukh *et al*. (2021) provided a means of analysing the stakeholders of an organisation, such as in the management of sustainable forests, and found that providing such an analysis as a foundation for the establishment of governing bodies for that organisation can lead to better outcomes than if that organisation attempted to manage the stakeholders themselves. This same methodology is utilised in the efforts of this research to provide an analysis of the ethnic affairs governing bodies of urban areas.

The institutional dimensions of the challenge of ethnic affairs digital governance have also been elaborated in research on the governance frameworks for post-transition societies. For instance, A.J. Nair *et al*. (2024) proposed an institutional analysis and reconfiguration framework for sustainability governance, focusing on the importance of aligning an institution with the expectations of the people that utilise it – an issue that is analogous to the problem of legitimacy in the context of the centralised governance of ethnic affairs. In the specifically digital dimension of governance, R. Creemers (2022) conducted a thorough analysis of China's data protection framework. Author indicated that the digital governance infrastructure that has been developed within China is based upon a high degree of centralisation in its regulatory authority, which impacts the ability of the country to share the data of its ethnic and minority communities.

The interaction between digital technology and governance has also been examined in other comparative cross-national analyses. T. Qin *et al*. (2022) performed an analysis of the digital transformation of agricultural governance within China and the European Union, discovering differences in the approaches that each nation has taken that are similar to the comparison of centralised government models to decentralised government models examined in this study. R. Heeks *et al*. (2024) conducted a review of the expansion of digital technology within China's Global South nations, discovering that the digital governance models that China has implemented into these nations are based upon high levels of technical capability yet with limited means of allowing the communities to participate in those digital governance models, a finding related to the analysis of China's urban ethnic affairs governance model. Additionally, H.P. Ebrahimi *et al*. (2021) performed a study of the development of a framework for the inclusion of digital agriculture stakeholders within Canada's agricultural sector, finding that the effectiveness of digital technologies within agricultural sectors is correlated with the inclusion of stakeholder participation within the creation and implementation of those digital technologies – a finding that can help to understand the shortcomings of Canada's decentralised ethnic affairs digital governance model. Finally, J. Xiao *et al*. (2022) performed a study of the perspectives of various digital governance stakeholders within Canada regarding the implementation of a national governance framework, finding that the effectiveness of national governance frameworks is correlated with the accommodation of the diversities within individual Canadian actors responsible for the implementation of those frameworks – a finding that relates to the ethnic affairs digital governance model established within Canada's decentralised government architecture.

Despite a substantial body of empirical and theoretical research on digital governance, stakeholder engagement and ethnic minority policy, the existing literature has generally examined these domains in isolation rather than as an integrated governance challenge. Studies of digital government transformation have focused primarily on technological infrastructure and service delivery efficiency without adequately addressing the participatory and legitimacy dimensions of governance in ethnically diverse contexts. In contrast, research on ethnic minority policy has focused on the recognition of normative frameworks and rights without systematically examining the institutional and technical conditions necessary for the digital operation of those frameworks. The purpose of this study was the comparative analysis of the digital ethnic affairs governance models of China and Canada in order to identify the dominant institutional constraints.

MATERIALS AND METHODS

This study employed a mixed-methods approach wherein one method was qualitative and the other quantitative. The qualitative method involved the analysis of official documents, while the statistical data provided an overview of the digital governance initiatives implemented in China and Canada. These statistics were used in a descriptive manner to discuss the digital governance initiatives of these countries. The legal documents were analysed to determine the distribution of power between the levels of government, as well as the degree of accountability that exists within each level of government regarding ethnic affairs and digital services. To compare the digital governance models of ethnic affairs of China and Canada, a comparative analysis framework was developed. The selection of China and Canada as countries to include in the research study was based on three criteria: the representativeness of their models of governance of ethnic affairs (centralised versus decentralised); the existence of a framework for the governance of ethnic affairs in both countries; and the presence of digital transformation initiatives at the national and municipal levels in both countries. A framework was established that includes four different analytical dimensions: institutional and legal dimension, stakeholder power dimension, technical infrastructure dimension, and participatory governance dimension.

The study applies an analysis of the governance of ethnic affairs in the digital space. Such an analysis involves examining the decision-making and coordination mechanisms of the organisations involved in the digital governance of ethnic affairs. The ethnic affairs digital governance involves the interaction of the government at various levels, technology companies, and ethnic representatives. Furthermore, particular attention is paid to identifying the different coordination mechanisms involved in the digital governance of ethnic affairs. Finally, an analysis of the governance allows for the identification of any imbalances

in the digital governance models and their effects on the digital governance of ethnic affairs. The study proceeded in two stages. The first stage comprised the collection of empirical sources regarding the digital ethnic affairs governance models in Canada and China. Two categories of documents were collected for each country. The first category consisted of legal documents. For China, the legal documents included the Law of the People's Republic of China "On Regional National Autonomy" (2016), the Law of the People's Republic of China "On Promoting National Unity and Progress" (2026), and the The State Council's guiding opinions on accelerating the development of "Internet Plus Government Services" (2016). For Canada, the legal documents included the Canadian Multiculturalism Act (1988); Section 27 – Multicultural heritage (Government of Canada, 2025); and the Indigenous Languages Act (2019).

The second category comprised programmatic and strategic documents published by the governments. For China, the 14th Five-Year Plan for the Development of the Digital Economy (National Development and Reform Commission, 2022) and the National human rights action plan (2021-2025) (State Council Information Office..., 2021) were collected. For Canada, the Annual Report on the Operation (Government of Canada, 2024) and the CAN/DGSI 103-0 (Digital Governance Council, 2025). A third category of municipal-level governance documents was additionally compiled to capture the operational dimension of ethnic affairs digital governance below the national level, including Toronto's Data for Equity Strategy (City of Toronto, n.d.) and Vancouver's UNDRIP Municipal Action Plan (Vancouver City Council Decision, 2024).

The second stage consisted of two phases that were interconnected. The first of these phases consisted of the analysis of the documents and frameworks that were compiled during the first phase in order to determine the configurations of the stakeholders that exist within each of the countries, as well as the limitations that those stakeholders face within each of those countries. Each of the documents that had been compiled during stage one was analysed to determine the main governance mechanisms that existed within each of the countries, to code those as they related to the four analytical dimensions, to map the relationships of accountability between the various actors within the governance of each of the countries, and to determine any failures within the governance of each of those countries. Each of these governance weaknesses in each country was then named, categorised, and presented in a matrix, where each weakness is categorised not only as one that exists in each country but also as one that should be addressed within the governance reforms proposed for those countries.

The second phase was dedicated to formulating a new integrated governance model for ethnic affairs institutions based on three principles: subsidiarity, interoperability, and participatory legitimacy, whose aim was to simultaneously resolve the institutional deficiencies identified in both national models. The model was developed through a structured analytical procedure applied to the findings of the first phase and was subsequently operationalised across the institutional, technical, and participatory dimensions of ethnic affairs governance to produce concrete reform proposals calibrated to the specific governance context of each country. The application of the analyses of each of these models allowed the determination of each of the different aspects of the digital ethnic affairs governance models in both Canada and China.

RESULTS

Stakeholder configuration and institutional power in digital ethnic governance

The concept of legitimacy requires operationalisation before it can become an effective analytical instrument. According to V.A. Schmidt (2013), legitimacy can be broken down into three different components. The first is known as input legitimacy, which the National Immigration Administration defines as a political criterion that relates to the ability of citizens to participate in the government and for the government to respond to the preferences of the citizens. The second is known as output legitimacy, which evaluates the effectiveness of the policies that are created by the government. The third is throughput legitimacy, which measures the quality of the governance processes, particularly in regard to the accountability of the policymakers that make up the government and the transparency, inclusiveness and openness of those processes. Each of these components is essential to the functioning of a government; the quality of throughput legitimacy is not a substitute for either the input or output legitimacy of a government, regardless of how good its processes may be. Each of these components can therefore help to determine which specific component of legitimacy is failing within each of the national models of digital governance of ethnic affairs.

The stakeholders involved in the digital governance of ethnic affairs in China are different from those involved in Canada in relation to the structure of the countries. The governance of ethnic affairs in China is organised within a hierarchical institutional structure whose legal foundations determine the distribution of decision-making power within that governance structure. Law of the People's Republic of China "On Regional National Autonomy" (2016) established that the regional governments would be responsible for the development of infrastructure and the delivery of public services within the respective autonomy regions, while the central government within the State Ethnic Affairs Commission (SEAC) would retain oversight of the autonomous regions. In this way, the ethnic affairs offices for individual municipalities were established as institutions that were to be answerable to the provincial and central government authorities, rather than to the ethnic communities that were within those regions. Furthermore, in 2018, the SEAC was placed under the purview of the United Front Work Department of the Communist Party of China through the Plan for Deepening the Reform of Party and State Institutions, which transferred the management of ethnic affairs from an agency dedicated to the provision of government services to an agency within the Communist Party that was responsible for the integration of the nation's diverse groups. Finally, the Law of the People's Republic of China "On Promoting National Unity and Progress" (2026) required that a variety of Chinese enterprises, public-service institutions, and technology companies work to promote ethnic unity within the nation and in its regions, though it did not establish any authorities within the companies to regulate their data and technology-related practices. In the digital space, the 14th Five-Year

Plan for the Development of the Digital Economy (National Development and Reform Commission, 2022) and the National human rights action plan (2021-2025) (State Council Information Office…, 2021) indicated the means through which the government intended to implement these legal structures. The 14th Five-Year Plan mandated the construction of a digital government that would allow for the provision of all public services through a digital platform, while the Human Rights Action Plan committed the government to the development of digital platforms and services that were dedicated to the cultural and educational services that were provided to ethnic minorities within China, such as the establishment of a smart library system and a public culture cloud platform within the nation. These plans indicate that decisions regarding the digital services that are to be provided to ethnic populations within China are to be made by the central government, with the municipalities' offices for ethnic affairs being tasked only with their implementation.

The governance role of technology companies within China's digital ethnic affairs system is another dimension of the governance system that is not described within the institutional framework of the government. The technology companies that provide digital government services within China – Alibaba, Tencent, and Huawei – do not readily fit within either the private or public sector. Each of these platforming companies has become an essential part of the nation's infrastructure, blurring the lines between the public and private sectors. As a result of the extensive power that these companies have within China, the government has begun to increase its regulation of these platforming sectors to address their monopolistic status within the country (Mao & Zhu, 2025). Thus, decisions regarding the structure of digital government platforms and the eligibility of ethnic groups to access these platforms is made within a space that is not publicly accountable to the ethnic groups that are governed by the digital platform and without any means of oversight of those decisions by the ethnic groups.

The governance role of the technology companies within the ethnic affairs digital governance framework in China was established through a specific set of institutional arrangements that dictated both the conditions of their participation in the framework and any mechanisms or the absence of any mechanisms through which they could be held accountable for their participation. The provincial and municipal governments in China tasked Alibaba and Tencent with the co-development of their digital government service platforms as a means of procuring their digital government services under the directives of the "Internet + government services" directive of the Chinese government, which required all of China's 31 provinces to establish their own m-government platforms (The State Council of the People's Republic of China, 2022).

The contractual terms of these engagements assigned both the state and the technology company to making decisions regarding the architecture of the platform and the data standards to be followed on the platform. While the municipalities had responsibility for the implementation of the platform, they did not have any authority over the architecture and data decisions made by the technology companies. The WeChat City Service and Alipay platform, which provided ethnic and municipal residents with government services like social insurance, taxes, housing, transportation, and education were overseen by a partnership between the government and the technology company, of which the ethnic minority communities had no part. The accountability for this governing partnership was one-way; the technology companies were accountable to the central and provincial governments, but there was no independent governmental body responsible for overseeing the technology companies' practices related to their ethnic minority data (The State Council of the People's Republic of China, 2022).

The co-development of the health code by Alibaba and Tencent in Hangzhou and Shenzhen demonstrates the terms of the accountability relationship between the state and private sector companies during the COVID-19 pandemic. The companies were able to produce the health code in only a few weeks, indicating the effectiveness of their partnership, but the lack of any oversight by the community indicates that the health code was developed directly between the government and the companies, without considering the preferences of the communities. Similarly, the same companies that do not have oversight from the ethnic communities are also developing technology with ethnic identification capabilities. For instance, both Alibaba has developed offerings for the Uyghur community as a service, and Huawei developed a patent for their technology to perform facial recognition according to their race in 2018. Thus, the government and the private companies have essentially created a technology that is meant to provide services to the communities y*et al*so allows for the surveillance of those same ethnic minorities. The governance of these companies has changed between 2015 and 2026. For instance, in 2016 the government directed the private companies to develop "Internet + government services" programmes, which would be implemented throughout the province and municipal governments (New government service…, 2021).

The implications of this type of technological arrangement for the ethnic minority groups within China are particularly significant, as there are already documented instances of the capabilities of these technology companies being utilised for the purpose of identifying the ethnicity of individuals, rather than providing services to those of ethnic minority groups. For instance, a patent application jointly filed by Huawei and the Chinese Academy of Sciences in July of 2018 proposed the use of facial recognition technology to automatically identify the race of an individual. Thus, the technology that is utilised to provide digital services to the ethnic minority groups within China is also a technology that can recognise and monitor those same groups. Therefore, the Chinese government's current framework for digital ethnic affairs management does not appear to consider the implications of this inherent problem within the current system regarding the throughput of ethnic minority groups through such digital services; there are no provisions within the processes of the technology companies for the digital ethnic affairs management groups to limit the capabilities of their digital platforms to those relating to the delivery of services to the ethnic minority groups. The municipal level of ethnic affairs digital governance within China featured four different

configurations that developed out of the interaction between the ethnic compositions of the cities and the digital governance regulations that were mandated for each city by the central government of China. A comparison of the digital governance of two of China's largest cities, Shanghai and Chengdu, reveals the reasons why a single national platform for digital governance of ethnic affairs may not be able to meet the demands of the country's ethnically diverse urban centres.

In terms of decision-making autonomy, both cities have certain provisions that limit the autonomy of local authorities to make decisions regarding ethnic affairs. In Shanghai, the ethnic affairs are administered by the Shanghai Municipal Bureau of Ethnic and Religious Affairs, which is jointly supervised by both the municipal government and the United Front Work Department, restricting the municipality's ability to adapt services according to the needs of its ethnic minorities (Shanghai Municipal People's Government Cooperation and Exchange Office, 2025). In Chengdu, while the city has granted discretion to the managers within each management grid to report on and manage administrative and security-related matters within their grids, no such discretion is provided for ethnic affairs services to be adapted to the needs of the city's ethnic minorities (Qingdao Agricultural University, 2022).

The failures of each of the cities to coordinate their efforts were similarly distinct in character. For Shanghai, the failure was horizontal in that the General Office of the Shanghai Municipal People's Government was responsible for public data and the planning of electronic government affairs independently of the Bureau of Ethnic and Religious Affairs. For Chengdu, the failure was vertical in that the grid management system collected data from communities to the county information centres and then to the municipal government but did not distribute coordinating powers from the municipal government to the city's ethnic minority groups. The integration of digital systems into ethnic affairs governance also diverged significantly between the two cities. Shanghai had developed a Bureau of Ethnic and Religious Affairs that was specifically in charge of managing online religious and ethnic affairs within the city; however, the bureau was not connected to the Digital Government Office. In contrast, Chengdu had developed an Information and Communication Technology (ICT)-based government platform that could collect data from various levels of government within the city; however, the platform did not include any component regarding ethnic affairs governance (Chengdu Metropolitan Area..., n.d.).

The most consequential divergence between the two cities, however, concerned stakeholder participation. Neither city had institutionalised mechanisms through which ethnic minority communities could exercise meaningful influence over digital platform design or service delivery standards, but the absence took different forms. In Shanghai, the institutional architecture for ethnic affairs governance existed without a community input channel: the Bureau managed ethnic affairs through administrative directives rather than co-design processes, and the technology companies co-developing the city's digital platforms, primarily through the WeChat City Service infrastructure, operated without ethnic community oversight (Ethnic and Religious Affairs Office of Pudong New Area, 2025). In Chengdu, the absence was more fundamental: the digital governance system that had the greatest operational reach into community life, the grid management platform, had not been designed with ethnic affairs governance in mind at all, meaning that the question of community participation in ethnic digital governance had not yet been institutionally posed, l*et al*one answered (Qingdao Agricultural University, 2022).

China's model of governance of its ethnic affairs has enabled the development of digital infrastructure on a vast scale. The national social governance platform infrastructure allows for the collection of data from various areas of administration, providing a foundation for digital services that are currently in demand yet that the decentralised systems of many other nations struggle to develop. The model has been successfully implemented at the municipal level in cities like Shanghai. Nevertheless, the centralised model of governing ethnic affairs within China does have some constraints. The main issue with the centralisation of such affairs is that the digital service platforms that are implemented are built according to a standard that does not necessarily account for the specific needs of the ethnic communities that exist within the nation. A second constraint of the centralised model of managing ethnic affairs is the fact that the municipalities that manage such affairs are accountable to higher levels of government rather than to the communities that they oversee. Therefore, the digital technologies that are implemented according to a standard that each municipal government establishes may not account for factors that are significant to the ethnic communities within those municipalities. Finally, another constraint on the model is the fact that digital technologies that relate to the ethnic affairs of central Chinese communities are directly managed by the central authorities of China (Mao & Zhu, 2025). The complex and diverse ethnic communities that live within major cities in China may benefit from a governance model that enables communities to manage their own affairs and to implement digital technologies that may best benefit those specific communities.

The governance of ethnic affairs in Canada is provided for in a multi-level constitutional structure. The Canadian Multiculturalism Act (1988), the first of its kind in the world, is a law passed by the federal government to recognise and celebrate the multicultural heritage of Canadian society with the goal of preserving that heritage and promoting the participation of all individuals of diverse origins in the society. Section 27 – Multicultural heritage (Government of Canada, 2025) requires that the rights provided for in the Charter be interpreted in a way that considers and recognises the multicultural heritage of Canada and its citizens. Additionally, the Indigenous Languages Act (2019) Ethnocanadian affairs in Canada are governed through a constitutional structure that includes federal, provincial, municipal, and Indigenous self-governing governments – all of which provide the constitution of the government for ethnic affairs governance y*et al*so prevent ethnic affairs from being effectively operationalised within the digital government context. The Canadian Multiculturalism Act states that not just the departments within the federal government that are responsible for matters related to multiculturalism are to ensure that ethnic minorities can fully participate in government; all

government agencies, departments, and Crown corporations are to participate in the development and implementation of strategies that ensure that ethnic minorities can fully participate in government. While the Act assigns ethnic affairs and digital ethnic affairs to a variety of government actors, there is no legislation that ensures that those actors are to coordinate with one another in the development of digital government. Furthermore, while Section 27 of the Canadian Charter of Rights and Freedoms declares that the Canadian government must recognise the diversity of its population, the section provides no means of ensuring that the government must take steps to provide for ethnic minorities within the Charter. Finally, while the Indigenous Languages Act, supported by a commitment of the Canadian government to provide USD 1.1 billion in funding to Indigenous Canada, institutes the concept of Indigenous data sovereignty and creates the Office of the Commissioner of Indigenous Languages, there is no legislation that defines any relationship between this office and municipal governments. Thus, while the Constitution of Canada assigns various governments the responsibility for ethnic affairs and digital ethnic affairs governance, the Canadian constitution provides no means of ensuring that those governments coordinate their digital governance efforts. was established to support the Indigenous peoples of Canada in their efforts to reclaim and strengthen their languages, including the creation of the Office of the Commissioner of Indigenous Languages and the commitment of providing adequate and long-term funding to fulfil such a purpose.

The municipal level of ethnic affairs governance in Canada has a diversified structure according to the number and compositions of ethnic and Indigenous peoples that live within each of the country's cities. A comparison of the ethnic affair's digital governance structures in two Canadian cities – Toronto and Vancouver – reveals the ways in which the same basic structure of the Canadian Constitution creates different structures within each municipality. A comparison of Toronto and Vancouver along the same four parameters reveals that while there is some level of development in each of the cities in relation to their ethnic affairs governance models, the normative frameworks for inclusion are developing at a faster rate than the digital and administrative frameworks required to implement those suggested frameworks for inclusion at a large scale.

In terms of decision-making autonomy, both cities had a higher degree of autonomy than China's counterparts, but within certain boundaries to their governance effectiveness. Toronto had autonomy over the development of their Data for Equity (DEF) Strategy and the First Nations, Inuit and Métis Data and Technology Circle (City of Toronto, n.d.; 2022), but only in relation to their municipal divisions. Decisions regarding provincial and federal digital services were outside of municipal Toronto's autonomy entirely. Vancouver had autonomy over the development of their United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) Municipal Action Plan in cooperation with the Musqueam, Squamish, and Tsleil-Waututh Nations, who had a higher degree of recognition within the plan than Toronto had provided to their Indigenous communities, but also had no autonomy over provincial and federal digital services within the same municipality (Vancouver City Council Decision, 2024).

The failures of coordination within each city were similar in nature but existed within the institution of each city. The primary failure of coordination within Toronto existed in the vertical coordination between the municipal government's Indigenous Affairs Office and Data and Technology Circle and both the provincial and federal levels of government. Therefore, a citizen of Toronto may encounter three different digital spaces that serve the same purpose but were established by each of the three levels of government, yet there is no coordination between them. Similarly, while Vancouver established a government-to-government relationship with the First Nations that exist within the region as a means of fulfilling its UNDRIP action plan, there was no digital coordination between the city and those Nations. The integration of digital systems into ethnic affairs governance within these two cities diverged most significantly in terms of the scope of their integration as opposed to their level of sophistication. While Toronto had developed the more technically advanced digital infrastructure for ensuring equity in its city, it had also established both the Data for Equity Strategy and the Digital Infrastructure Strategic Framework to ensure equity in the design of its digital systems. In contrast, Vancouver had a more limited integration of digital systems into its ethnic affairs governance with technical specifications that were limited to the physical infrastructure. In both cities, however, there was no established means of integrating its digital frameworks governing ethnic affairs within government with the digital systems of higher levels of governance within the city.

The most revealing of these differences was in the model of governance that each city employed for its stakeholder participants. Toronto established a means of providing legitimacy to its ethnic and Indigenous communities through the establishment of an advisory body that would have a degree of influence over the data governance decisions of the municipality. Vancouver, in contrast, established a means of providing legitimacy to its Indigenous communities through the establishment of a government-to-government treaty commitment, a higher-order means of providing input legitimacy to those groups. In both cases, however, the outcomes of such efforts were the same: each city's participatory models provided for those ethnic and Indigenous communities to have an influence over the city's governance decisions, but without any improvement in the digital service landscape that it provided to those same ethnic and Indigenous minorities in all levels of governance. Thus, while these two cities' efforts to establish a form of governmental governance that would provide legitimacy to their ethnic and Indigenous minorities were among the most developed in North America; their failure in any outcomes of such efforts was the governing failure that the principles of interoperability and subsidiarity were intended to fix. Inherent within the current structure of governmental IT and digital service governance in Canada is an issue of the deficiencies of the design.

The governance role of technology companies within Canada's digital ethics affairs architecture operated through fundamentally different institutional arrangements than those characterising the Chinese model yet produced an analogous accountability gap by different means. The municipalities of Canada approached the procurement of information technology vendors through competitive

processes that did not require the municipalities to co-develop those technologies with the vendors. The contracts between the municipalities and those vendors did not include any requirements regarding the management of ethnic affairs data. The most advanced such contract was the Digital Infrastructure Strategic Framework that was established by the City of Toronto in 2025 (Toronto Municipal Code, 2025), which required the vendors to perform impact assessments of the potential impacts of their proposed IT systems upon the city's citizens' privacy and established a Digital Citizen Advisor programme that would allow volunteers to provide feedback to the vendors regarding the digital services that the city was developing (City of Toronto, 2022). While these requirements introduced a level of accountability of the vendors that was absent from the majority of information technology vendor contracts that existed within Canadian municipalities, these responsibilities were limited to the City of Toronto's vendors and did not extend to the information technology vendors of the provincial and federal governments, which provide digital services to those same ethnic minority populations.

The conditions under which technology companies were engaged in the delivery of digital services to Indigenous communities revealed the accountability gap most acutely. Outside of the First Nations communities, public health research and the programmes that were to be implemented into those communities were conducted by non-Indigenous researchers and government agencies. As a result, the Indigenous communities were often required to negotiate with those researchers and government agencies in order to gain access to data relating to their own communities. Those agreements between the government agencies and the technology companies regarding the data of the Indigenous communities often did include an agreement regarding the governance of that data, which can provide some means of ensuring that there is transparency and accountability of the technology companies towards those Indigenous partners and communities. However, the accountability of the Indigenous communities to establish an agreement with an interested and responsible party that would commit to the data agreements was something that was lacking in the non-First Nations communities overall. The accountability structure governing the technology company in relation to Canada's ethnic affairs thus exhibits the opposite pathology to that of the Chinese model. The structure of accountability within China is characterised by a partnership between the government and the technology company that excludes any possibility of oversight by the ethnic population. In contrast, the structure of accountability in Canada is established through the fragmentation of oversight power to the technology company among the private, public, and community organisations that are tasked with resolving the digital governance challenges across the Canadian provinces and territories; none of these organisations have the power to impose ethical governance standards upon the technology company.

The governance dynamics that exist between technology companies and the ethnic affairs departments of Canadian governments between 2015 and 2026 are indicative of steps that have been taken to address the issue of accountability but without any resolutions to that issue. The framework for digital governance confidence, established by the Digital Governance Council (2025), does provide for the application of its principles to technology companies but requires their voluntary application to ethnic affairs departments and does not include any provisions relating to Indigenous data sovereignty. Thus, while the legislative level has begun to incorporate provisions that ensure data sovereignty for Indigenous peoples, no binding national standard has been created that requires technology vendors to provide for such data sovereignty within the terms of their contracts with ethnic affairs departments – an issue to be resolved by the interoperability principle of the framework proposed in this research study: the establishment of a standard for ethnic affairs data governance that must be met by all technology vendors that wish to operate within the Canadian digital ethnic affairs governance architecture.

Furthermore, there are also ethnic minority groups within the country that actively take part in the governance of Canada. Organisations such as the Assembly of First Nations (AFN), Inuit Tapiriit Kanatami (ITK), and the Métis National Council (MNC) are three of the better organised ethnic groups within the country. Additionally, there is a network called the Federal-Provincial-Territorial Network of Officials Responsible for Multiculturalism, Inclusion, and Anti-Racism (FPTORMIA), which shares information amongst itself to better collaborate on the goal of increasing diversity and equity within Canada (Government of Canada, 2024). These ethnic groups have a right to participate in the governance of their own communities, which is another feature of the Canadian government that differs from other governing models. The analysis of stakeholder power has shown different ways in which stakeholders are structured in ethnic affairs governance processes in China and Canada. The stakeholder landscape for China includes government agencies, technology providers, and community and minority stakeholders, with the first two groups having a higher level of power in the system than the third group. In the stakeholder landscape for Canada, several different groups have power in the system: municipal governments, provincial governments, community organisations, and Indigenous communities, all of which have some level of power in the system. Each of these different stakeholder groups creates certain types of constraints on the ability of that country to digitally transform its ethnic affairs governance system. The following sections discuss these constraints for each country.

While the ethnic affairs in Canada are decentralised, the structure of the Government of Canada (2024; 2025) creates challenges for the digital transformation of the municipal governments that provide services to ethnic minorities in the country's major cities. The digital services that are provided to ethnic minorities in cities like Toronto and Vancouver are provided by the municipal, provincial, and federal levels of the Government of Canada, yet each of these levels has different digital platforms and methods of providing services to these ethnic minorities. For instance, the Data for Equity Strategy that is established in Toronto to provide data regarding Indigenous peoples in the city is separate from the digital services provided by the Government of Ontario or the Government of Canada. Similarly, while the municipality of Vancouver has established a government-to-government relationship with the Musqueam,

Squamish, and Tsleil-Waututh Nations, there is no digital relationship established between the city and those Indigenous nations. Thus, the ethnic minorities in these Canadian cities are provided with a fragmented and inequitable experience in the use of the digital government services that are established for them. Another challenge to the digital transformation of these municipal governments is the governance of Indigenous data by these municipalities. While the Indigenous communities have the power to self-govern themselves and their own communities, there is no relationship between the Indigenous communities and the municipal governments of most Canadian cities. For instance, Vancouver does establish the Urban Indigenous Peoples' Advisory Committee, which provides input to the city's council and staff regarding issues that affect Indigenous peoples in the city, but there is no formal relationship between the city and those Indigenous communities. Similarly, while organisations such as Calgary's Urban Aboriginal Initiative and the Metro Vancouver Executive Aboriginal Council are considered partnership tables between those cities and their Indigenous peoples, there is no formal relationship between these municipalities and their Indigenous communities.

Finally, the complex structure of government in Canada creates significant transaction costs for municipalities that wish to implement digital transformation initiatives. These municipalities must interact with federal, provincial, and municipal governments to secure funding for digital transformation initiatives. These interactions create significant administrative costs for municipalities. Based on the stakeholder analysis conducted above, it is possible to understand how the governance of ethnic affairs in China and Canada are not organised in different ways within their respective countries but according to different overall governing models. Each of the dimensions of those models allows for the determination of the digital transformation capabilities and limitations of each of the countries regarding its ethnic affairs. Table 1 presents a comparison of each of these aspects of the models of each country to allow for a better understanding of their digital transformation capabilities and limitations in the management of their ethnic affairs.

Table 1. Comparative table of structural characteristics of models of China and Canada

Dimension	China (Centralised model)	Canada (Decentralised model)
Locus of decision-making	Central and provincial governments	Federal, provincial, municipal, and Indigenous authorities
Primary governing body	SEAC+United Front Work Department	Heritage Canada+municipal ethnic affairs offices
Role of municipal government	Implementation of central policy	Co-governance with significant local discretion
Role of ethnic/Indigenous organisations	Advisory; limited formal power	Formal participation rights; self-governance recognised
Digital infrastructure	Nationally integrated; large-scale	Fragmented city-level frameworks
Data governance approach	Centralised collection and management	Emerging Indigenous data sovereignty frameworks
Key strength	Operational scale and efficiency	Inclusiveness and community legitimacy
Key weakness	Exclusion of ethnic community voice	Coordination failure and service fragmentation

Source: compiled by the author based on Canadian Multiculturalism Act (1988), The State Council's guiding opinions on accelerating the development of "Internet Plus Government Services" (2016), Law of the People's Republic of China "On Regional National Autonomy" (2016), Indigenous Languages Act (2019), State Council Information Office of the People's Republic of China (2021), National Development and Reform Commission (2022), Government of Canada (2024; 2025), Digital Governance Council (2025), M. Alméstar *et al*. (2025), X. Bai & L. Yang (2025), I.A.P. Nirmani (2025), N.Y. Singgir *et al*. (2025), Law of the People's Republic of China "On Promoting National Unity and Progress" (2026)

The structural comparison between the two models reveals the different theories on which they are built. The Chinese model aims to use the government's digital technology to serve its ethnic groups, while the Canadian model recognises the autonomy and self-governance of these ethnic groups. Each model is blind to the other's concerns. The difference in the theories leads to different practical outcomes for China's and Canada's ethnic minorities. Despite China's development of digital platforms for its citizens, these platforms do not effectively serve the country's ethnic minorities. Similarly, despite Canada's recognition of the self-governance and rights of its Indigenous and ethnic minorities to participate in the governance of the country, there is no digital infrastructure in place to effectively serve these groups. China and Canada have a paradoxical structure in that they have the necessary technical skills or legitimacy to serve their ethnic minorities, but they lack the other component. For the digital governance of ethnic groups to be effectively implemented in these countries, the synthesis of both models is required.

An input-throughput-output legitimacy assessment exposes the specific governance failures of each model. China's core problem is exclusion: ethnic minority organisations have no role in shaping digital governance processes, and those processes operate without transparency or accountability to the communities they affect. The result is a technically capable system that lacks the legitimacy to serve minority needs effectively. Canada's core problem is fragmentation: while input legitimacy is strong the absence of coordination between decentralised digital governance bodies produces inconsistent service delivery and no mechanism for system-wide accountability. Individual municipalities vary significantly in performance, yet no overarching body ensures coherence or enforces standards. The stakeholder analysis presented above allows to identify the various stakeholders involved in each of the countries' ethnic affairs digital governance systems. However, it does not analyse the relationships between those stakeholders. Table 2 maps the various governing relationships within each of the countries' digital governance systems, including their governing bodies, their relationship to the digital technology companies involved in providing those digital systems for ethnic affairs, and their relationships to the digital technology and digital ethnic affairs transformation

itself. Table 2 utilises the information presented within the country analyses, the municipal analyses, and the analyses of the governing relationships within each of the countries to create a table that helps to reveal the various governing relationship dynamics within each of the countries' digital ethnic affairs governance systems.

Table 2. Comparative mapping of governance mechanisms in digital ethnic affairs

Governance parameter	China (Centralised model)	Canada (Decentralised model)
Primary decision-making authority	Central government; SEAC as implementing body	Distributed: Heritage Canada (federal), provincial ministries, municipal ethnic affairs offices
Municipal decision-making discretion	Implementation only; no authority to adapt centrally designed platform standards	Significant local discretion within jurisdictional boundaries; no binding coordination across levels
Resource control	Central and provincial governments; technology company partnerships through preferential procurement	Federal funding allocation to provinces and municipalities; municipalities dependent on higher-level transfers
Accountability direction	Vertical upward: municipal offices accountable to provincial and central authorities	Mixed: municipalities accountable downward to residents and upward to provincial/federal funders simultaneously
Technology company role	Co-regulator: Alibaba, Tencent, Huawei co-develop platforms under state mandate without independent community oversight	Vendor: municipal IT contractors deliver platforms under procurement agreements with limited ethnic community oversight
Technology company accountability	State-directed; no independent audit mechanism for ethnic data practices	Procurement-based; no binding ethnic affairs data governance standards for vendors
Community participation mechanism	Absent at platform design level; ethnic organisations hold advisory status only	Formalised in leading municipalities (Toronto's FNIM Circle, Vancouver's UNDRIP partnership) but not extended to provincial/federal levels
Conflict resolution between levels	Central directive prevails; municipal implementation gaps treated as compliance failures	Political negotiation between governments; no formal adjudication mechanism
Indigenous data governance	Not recognised as a distinct governance category	Formally recognised (Indigenous Languages Act (2019), UNDRIP commitments) but not operationally enforced at municipal level

Source: compiled by the author based on Canadian Multiculturalism Act (1988), The State Council's guiding opinions on accelerating the development of "Internet Plus Government Services" (2016), Law of the People's Republic of China "On Regional National Autonomy" (2016), Indigenous Languages Act (2019), State Council Information Office of the People's Republic of China (2021), National Development and Reform Commission (2022), Government of Canada (2024; 2025), Digital Governance Council (2025), M. Alméstar *et al*. (2025), X. Bai & L. Yang (2025), I.A.P. Nirmani (2025), N.Y. Singgir *et al*. (2025), Law of the People's Republic of China "On Promoting National Unity and Progress" (2026)

The findings of the table indicate that the differences between China and Canada relate more to the organisation of the e-government institutions rather than their effectiveness. Such an insight is crucial in understanding the identified limitations and the need for certain reforms within the current structures of these countries' e-government models. China's models are highly centralised, as most of the powers of the government are concentrated within the vertical organisational structure. This limits the possibilities of the participation of the communities of interest in the country and their ability to exercise control over the use of data within the government. In Canada, the division of powers between the federal and state governments creates complications in the coordination of their government agencies and the holistic implementation of their policies. Furthermore, the discrepancy between the level of accountability and control over resources between the different levels of government impacts the ability of local governments to consider the needs of different groups within their populations. Each of the principles identified within the study is associated with specific institutional limitations within the government models of both China and Canada. These principles aim to ensure the coherence of government levels, the interoperability of digital government systems, and the consideration of stakeholders in policymaking. Thus, these principles are elements of a single framework for analysing each of the current models of e-government.

The constraints of both models of digital governance of ethnic affairs are complementary to one another. The strengths of the centralised model of digital governance are also the weaknesses of the decentralised model of digital governance of ethnic affairs. The Chinese model has high operational capacity but lacks inclusiveness. In contrast, the Canadian model ensures that the ethnic and indigenous groups are included in the governance of their affairs but lacks coherence in its management of digital services for these groups. Neither model optimally balances the technological and governance requirements of ethnic affairs. Therefore, the development of an integrated model of digital governance of ethnic affairs that includes the elements of both the Chinese and Canadian models may present a solution to the existing problems of both the Chinese and Canadian models of digital governance of ethnic affairs.

A hybrid institutional model for digital ethnic governance

Based on the analysis of each of these models, the effective model for the governance of ethnic affairs of Chinese and Canadian citizens living in urban areas of China and Canada, respectively, was a model based on three key principles: subsidiarity, compatibility, and participatory legitimacy. These three principles aim to address the specific shortcomings of each of these governance models, but each of these principles is only effective in the context of its

implementation in conjunction with the others. The principle of subsidiarity suggests that governance functions should be performed at the lowest level of government that is capable of performing them effectively (Hüther & Vogel, 2021). In the context of ethnic affairs digital governance, this principle suggests that the national and central governments should focus upon establishing standards and guarantees for the ethnic affairs digital services that are provided to their citizens, but that the municipal governments and ethnic organisations within each country should have the flexibility to create ethnic affairs digital services according to the needs of the ethnic communities with whom they are most familiar. In the Chinese context, this suggestion for subsidiarity would suggest the establishment of ethnic affairs digital platforms and standards at the national level, but with flexibility for the municipal governments and ethnic organisations within each province to create digital ethnics. While the current structure of the ethnic affairs digital governance structure in China does provide for an ethnic affairs digital council that oversees the efforts of the county-level ethnic affairs offices, the establishment of digital councils within each province that include representatives of those counties and ethnic organisations may provide for a more effective distribution of responsibilities among the different levels of government (National Development and Reform Commission, 2022).

In Canada, the principle of subsidiarity would suggest the need for the federal government to establish a digital infrastructure framework for ethnic affairs services. The federal government has, to date, attempted to address the fragmentation of government services across the country through the implementation of national technical standards and frameworks. These efforts could be expanded to the development of a framework for ethnic affairs digital services, with particular provisions made for the recognition of Indigenous data sovereignty (Government of Canada, 2024; 2025). The principle of interoperability requires that digital governance platforms enable the exchange of data and coordination of services between different organisations while retaining the autonomy of those organisations (Margariti *et al.*, 2022). Such a principle would require a technical architecture for ethnic affairs governance that can accommodate the diversity of technical architectures and governance frameworks that exist within the multi-level governance of ethnic affairs. In both of the countries, the principle of interoperability will require the development of an open technical architecture for ethnic affairs governance.

In China, such a technical architecture already exists in the governmental system as a whole, but it does not yet have interoperability with other organisations in charge of ethnic affairs. An application programming interface (API) that allows for other organisations with ethnic affairs mandates to access and contribute to the data systems of the government would help to enable such interoperability. In China, such a technical architecture already exists in the governmental system as a whole, but it does not yet have interoperability with other organisations in charge of ethnic affairs. China has made significant investments in building an integrated digital government infrastructure at the national level. A series of national policies issued since 2016, including frameworks for data sharing, "Internet Plus government services", and integrated big data systems, have laid the foundation for a unified, collaborative digital government at the macro level, with one of the central challenges being the breaking down of entrenched data silos across departments (The State Council's guiding..., 2016). In Canada, interoperability will require the establishment of a common technical standard for ethnic affairs governance, as there is no such standard established at this time. A national Ethnic Affairs Digital Governance Standards Framework that establishes the requirements that all digital ethnic affairs governance platforms must meet in order to be implemented would provide a solid framework for establishing interoperability (Digital Governance Council, 2025). Since most communities served by ethnic affairs platforms are linguistically diverse (e.g., Inuit communities in Nunavut), it is essential to ensure that digital platforms are multilingual (Inuit Tapiriit Kanatami, 2018). This requirement implies the need to involve community translators in the platform development team.

The principle of participatory legitimacy holds that social processes and outcomes are only equitable and legitimate if those who are to benefit from such processes have a genuine and substantive opportunity to influence the process by which such outcomes are achieved (Stratu-Strelet *et al.*, 2021). Within the context of digital ethnic affairs governance, this principle means that the ethnic minority communities and organisations should be institutionalised as a means of co-creating the digital solutions that are to emerge from such a digital governance system. Digital governance initiatives that have occurred within these two contexts have indicated that co-creating digital solutions with ethnic minority communities has provided benefits to the digital governance initiatives, such as an increased likelihood of platform adoption by the targeted communities, more accurate identification of the needs of those communities, and increased willingness of those communities to share data with the government as a means of creating effective ethnic affairs plans.

For China, the institutionalisation of these co-creation units within the ethnic affairs offices would provide benefits to the country's already-powerful digital governance system. By working with the ethnic minority communities and organisations to create digital platforms and services, the country can increase the likelihood that the digital system will effectively respond to the needs of all of its citizens and ethnic groups. For Canada, while co-creation is recognised as a value of the country's government and its ethnic affairs offices, the actual implementation of those values is inconsistent. The creation of dedicated co-design units within the municipal ethnic affairs offices and the allocation of funds to these units would provide benefits to the country and its ethnic minority groups. After analysing each of the governance models presented above, shortcomings of the governance models in each of these countries were identified. Both countries are experiencing the same challenge of digitising their ethnic affairs, but in each country the failures of those models of governance are of a different nature. Table 3 helped to name and categorise each of those failures and the interventions that may help to address those failures within each country.

Table 3. Institutional pathologies and reform interventions in digital ethnic affairs governance

Type of governance failure	Manifestation in China	Manifestation in Canada	Proposed intervention	Expected outcome
Participatory deficit	Ethnic communities excluded from platform co-design	Co-creation inconsistently implemented	Institutionalised co-design units	Increased platform adoption and data sharing
Coordination failure	SEAC data siloed from national platform	Federal-provincial municipal misalignment	API integration; subsidiarity framework	Coherent multi-level service delivery
Standards vacuum	Ethnic affairs excluded from national digital standards	No national ethnic affairs digital framework	Inclusion in national data governance policy	Interoperable, multilingual platforms
Legitimacy deficit	Top-down design reduces community trust	Participation rhetoric without resources	Funded co-design; community translators	Increased trust and service uptake

Source: compiled by the author based on Canadian Multiculturalism Act (1988), The State Council's guiding opinions on accelerating the development of "Internet Plus Government Services" (2016), Law of the People's Republic of China "On Regional National Autonomy" (2016), Indigenous Languages Act (2019), State Council Information Office of the People's Republic of China (2021), National Development and Reform Commission (2022), Government of Canada (2024; 2025), Digital Governance Council (2025), M. Alméstar *et al*. (2025), X. Bai & L. Yang (2025), I.A.P. Nirmani (2025), N.Y. Singgir *et al*. (2025), Law of the People's Republic of China "On Promoting National Unity and Progress" (2026)

What Table 2 revealed is that the failures in both China and Canada have an inverse structure to one another yet, yet share the same symptom of the inability to effectively deliver digital services to ethnic minorities. The failures in China are present at the intersection between the government and civil society, yet the government appears to have all of the technical means to allow for civil society to have a role in the implementation of the government's decisions. The failures within Canada, however, are at the intersection between the different levels of the government, yet the government appears to have the will to include ethnic minorities in their decisions but does not have the means to enable that will to be expressed through coordinated governmental efforts. The inversions of the failures within these two nations indicate that the means of fixing the digital ethnic failures in each of these countries will be different. The failures within China, therefore, suggest that the interventions that should be made to fix the country's digital ethnic failures will be made at the governmental level prior to those that are related to technology. The interventions that will be made within Canada, however, will occur in the opposite order – there is an indication of the will of the Canadian government to include ethnic minorities in their digital services, but there are no technical interventions made to enable those ethnic minorities to be included in the country's digital services. The concept of a "governance failure" within the context of China and Canada relates to the interaction between the technical, governmental, and cultural elements of the countries' governments. Thus, attempts at applying the same solutions within each nation's digital ethnic issues will likely be ineffective unless they are tailored to each nation's specific type of failure.

The proposed three-component framework indicated that the key constraint on the digital governance of ethnic affairs in both China and Canada is not the availability of digital technologies but the institutional structures within which those technologies could be effectively employed to provide services to ethnic communities. A comparison of the national models of ethnic affairs governance reveals an inverse configuration of constraints. In China, despite the availability of an integrated digital infrastructure on a national scale, there are limited mechanisms for incorporating the positions and interests of ethnic communities in governance. In Canada, in contrast, there are institutional mechanisms for the participation of ethnic communities in governance, but the lack of coordination among governing authorities limits the availability of digital governmental services to those ethnic communities. The type of failures of the institutional structures of China are of the type associated with limited participation by ethnic communities in governance processes, while the failures of the institutional structure of Canada are of the type associated with the fragmentation of governing authorities. The proposed framework can be employed in the assessment of the effectiveness of digital governance in both China and Canada. In China, the institutional structure should be reorganised to grant more discretion to lower levels of governance and to permit the incorporation of the positions of different societal groups into the governance process. In Canada, the main task facing the governing authorities is to coordinate the activities of the different authorities that are currently engaged in governance of ethnic affairs. The attempt to apply identical solutions to the problems of the two countries reduces the effectiveness of digital governance of ethnic affairs.

DISCUSSION

The results of this study showed that the digital transformation of ethnic affairs in both China and Canada has arisen from the competition between centralised and decentralised governance models in the context of both countries' developments in digital government. Each country's governing model was found to be effective in managing ethnic affairs within its government, not as a result of the individual components of its digital government model, but in relation to its ability to address the challenges that are created by each model's foundational structure. Overall, then, these findings indicated that the digital transformation of ethnic affairs in China and Canada should be approached as a governance model challenge rather than a technical challenge.

The findings of this study were brought into dialogue with the conceptual conclusions of J. Hu & X. Zhang (2024), who examined the digital governance of China with a focus on the management of disputes and the maintenance of stability within the country. The analysis conducted for this study helps to confirm the applicability of the

conclusions of J. Hu & X. Zhang to the context of China's ethnic affairs. Furthermore, while J. Hu & X. Zhang proposed that the structure of China's digital governance model reflects a country that generally prioritises stability and efficiency in its governmental entities and services, the findings of this study suggest instead that such a model is vulnerable within the context of China's ethnic communities and their distinct cultural and societal characteristics. Overall, these conclusions are in alignment with the findings of J. Große-Bley & G. Kostka (2021), who also investigated the implementation of smart cities within China's city of Shenzhen and found that the gap between the digital governance "big data dreams" of China versus the digital governance experiences that actually exist within the nation is due to the inherent issues with the country's attempt to integrate digital technologies into its ethnic communities in ways that respect their established cultural communities and social structures. Thus, as with China's efforts to integrate digital technologies into its ethnic communities in general, the findings of this study suggest that China's digital governance model is deficient in the absence of the digital governance frameworks proposed within this study.

These results can also be situated in the context of existing research on China's digital engagement with its ethnic and diasporic communities. For instance, M. Thunø & Y. Wang (2024) have published research showing that China's smart diasporas are utilised as a means of extending the country's system of social control into areas outside of its borders – indicating the means by which the country has historically managed its ethnically distinct populations. Each of these findings is consistent with the findings of this research study as to the participatory elements that are lacking within China's system of urban ethnic affairs governance, leading to the conclusion that such co-creation is actually required within that governmental body. Another related study that is more directly applicable to China's systems of ethnic minority governance is that of L. Huang *et al*. (2023), who discovered that digital technology implemented within regions of Guangxi that contain ethnic minorities experienced improvements to the provision of services to those ethnic minorities if the technology was adapted to the ethnic minorities of those areas, but that such adaptations are outside of the centralised governance system of China. K. Ma & H. Zhang (2023) published a similar study, finding that while the digital economy of China has resulted in a reduction in income inequality between the ethnic minorities and the remainder of the country's citizens, such benefits are provided inconsistently to those ethnic minorities. Finally, J. Yu (2022) published a study of the use of digital technology in the educational systems of China's ethnic minority communities, discovering that the same benefits began to emerge for those communities if the technology was adapted to their cultures and languages, but only inconsistently within the current governance structure of the nation.

Of significant interpretive value for the results of this study were the studies by authors including C. He *et al*. (2024) and H. Jia (2024), who investigated, respectively, the innovation and optimisation of grassroots governance in China in general and the impact of digital infrastructure improvements upon the ability of China's migrant populations to access its public health services. Each of these studies indicated that the vertical structure of China's government creates constraints upon the digital empowerment of the country's sub-national populations, as well as upon the ability of those sub-national populations to become integrated with the remainder of the country's digital infrastructure. The results of this study indicate a correspondence between these findings and those of the studies by C. He *et al*. and H. Jia, suggesting both that the vertical structure of China's government contributes to the deficiencies in the ability of China's municipal offices for ethnic affairs to provide digital services to its ethnic populations, as well as to the structural failures in the integration of those ethnic populations with the country's digital platforms that can be resolved through the implementation of the governance model proposed in this study.

In discussing the results that relate to the Canadian decentralised model, a study by V. Singh & J. Chobotaru (2022) on the barriers to online government services in Canada revealed that the digital divide in Canada exists due to the fragmented nature of the government services that exist at the federal, provincial, and municipal levels. These findings confirm the coordination failure that exists within Canada's current governmental model, y*et al*so provide support for the proposed solution to that failure. The consequences of fragmentation in relation to the digital services that are provided to Canadian citizens extend beyond the inefficiencies in the government's service provision. Some of Canada's ethnic and diasporic communities that exist within its digitally advanced nations have established their own digital spaces and platforms for organisation and communication, as well as for the development and management of their own self-organised digital spaces and platforms that exist independently of those established and managed by the government (Boichak & Kumar, 2022). The implications of such findings regarding these ethnic communities' autonomous and self-organised digital spaces and platforms are significant in the context of Canada's fragmented government and digital government platforms and services. Specifically, the lack of digital government platforms for various ethnic groups and communities creates the opportunity for those groups to initiate and manage their own digital platforms and spaces to serve their communities, indicating that those ethnic groups have begun to effectively fulfil the role of the government itself within these communities. Thus, one suggestion for the framework for improving Canada's governmental digital platforms for ethnic affairs is to consider both the coordination between the different levels of the government (federal, provincial, and municipal) and the coordination between those ethnic communities and their self-organised digital spaces and platforms. This dual recommendation is supported by the findings of authors Y. Chen *et al*. (2020), which determined that decentralised digital platforms for ethnic communities create the most value for those communities if the autonomy of each individual digital platform is preserved but if those digital platforms are also able to coordinate with each other. The absence of such coordination between ethnic communities' self-organised digital platforms is reflected in the fragmentation and inequalities within the digital spaces of those communities and their digital platforms, indicating a need

for each of those digital platforms to be incorporated into an overarching framework for managing and supervising ethnic affairs in Canada.

The dimensions of the framework that relate to the concept of stakeholder engagement and co-production in the digital domain have been examined through research studies on the topic. The aspects of participation that will be studied within the framework will relate to the study of stakeholder engagement and co-production within digital governance. In order to effectively co-produce the delivery of public services through the implementation of digital technologies and platforms, a governance architecture is required, as discussed by E. Not *et al*. (2024). In their study, the authors noted that any governance architecture for digital platforms must be able to satisfy a variety of requirements of the institutions that employ those platforms, such as requirements related to transparency, accountability, accessibility to the public, and administrative coherence. The authors also noted, however, that if these requirements are not fully integrated into the governance architecture for the digital platform, the resulting platform will only provide efficiency to the administration of the public service but will neglect the requirements of the communities from whom those administrators receive necessary resources to provide those services. The results of this study are consistent with these findings. As such, the deficiencies within both the Chinese and Canadian models of digital governance that relate to the concept of participation cannot be fixed through the implementation of co-design initiatives alone; rather, the models would need to be adjusted to incorporate participation in a manner similar to the three-principal model of digital governance that was proposed within this study. Furthermore, while each of these governance models has some similarities in regard to the requirements for participatory digital platforms, there are also some differences; China's model has primarily focused upon the decentralisation of co-design authority from the upper levels of the government to the citizens, while Canada's model has focused upon the coordination of co-design initiatives that already exist within each Canadian province but that have no relation to one another.

The main requirement for China is the creation of mechanisms for the downward decentralisation of co-design authority, while for Canada the challenge is the horizontal coordination of processes that already exist within the country but that have no relation to the co-creation of digital governance of ethnic affairs. An additional perspective from which to analyse the failures of digital governance of ethnic affairs in both countries is that of the relational theory of stakeholders. Most models of governance make an assumption of the independence of the stakeholders involved in the governance of a certain object or process, assuming only that each stakeholder is either present or absent in that governance (Corazza *et al*., 2023). The failures of governance in both China and Canada manifest not in the lack of stakeholders in the digital governance of ethnic affairs in either country but in the failures of interdependence between those stakeholders. The Chinese model for managing ethnic affairs fails due to the exclusion of ethnic organisations from the decision-making processes regarding digital governance of ethnic affairs, while the Canadian model for digital governance of ethnic affairs fails despite the presence of the various ethnic stakeholders in the governance process but due to a lack of coordination among those stakeholders. Both of these failures, either in coordinating the efforts of the stakeholders or in the participation of the stakeholders in the digital governance process, are equally likely to lead to ineffective digital governance of ethnic affairs; the failure to recognise this in either Canada or China has led to the ineffective establishment of digital governance of ethnic affairs in both countries.

A study of the digital governance models for flood mitigation in Sri Lanka by K. Mendis *et al*. (2024) reveals that one of the critical success factors for such a system is the presence of a means of including the voice of the local community. The lack of means of providing feedback on the digital system leads to a gap between the digital system's functioning and the needs of the local population. Similar trends are present in the digital governance models managing ethnic affairs in both China and Canada. In both of these countries, the digital systems used to manage ethnic affairs systematically marginalise ethnic minorities. However, as found in the studies of ethnic affairs management in these two countries, there are significant differences in how these countries include (or exclude) ethnic minorities in their digital systems. The Chinese system completely lacks means of allowing for interaction of ethnic minorities, while Canada has such a system in place, but it is underfunded. The discussion of the results of the research presented in this paper indicates that the conclusions that can be drawn from the research are both consistent with and extend the conclusions of existing research in the area. The research confirmed that the effectiveness of digital governance models is based not on the digital and legislative aspects of the models but, instead, on the aspects of legitimacy and coordination of the governance actors within the model. Furthermore, the analysis of the failures of the centralised and decentralised models for ethnic affairs indicates that the creation of a framework that is based upon the synthesis of the two models provides an effective new model for reforming the ethnic affairs governance structures in both China and Canada.

CONCLUSIONS

The results of this research demonstrate that each of these two countries has indeed created a governance model for its ethnic affairs, but also that the deficits of each model are not resolvable within the model itself, but only through the synthesis of the strengths of each of those models. The centralised model that prevails in the governance of China is characterised by a high level of operational capacity and a developed digital infrastructure. The presence of digital platforms that serve hundreds of millions of users and the implementation of smart city solutions at the municipal level ensure effective governance. However, the model features significant imbalances in the aspect of legitimacy of governance. The government formulates policies without the participation of ethnic minorities, and there are no mechanisms to take into account the cultural and linguistic diversity of Canadians in the governance process. Thus, despite the high level of coordination in the governance of China, the governance model is insufficiently adaptive to the diversity of Canadians.

The decentralised model that prevails in the governance of Canada features the opposite characteristics of the centralised model of China. The model features a high level of legitimacy in the participation of citizens in the governance process. The municipal governments and indigenous peoples participate in the decision-making process in the formulation of digital governance tools. However, the lack of mandatory coordination between the federal, provincial, and municipal governments results in fragmented digital governance systems. The problems resulting from the lack of interoperability of digital governance systems between municipal and Indigenous self-government authorities result in difficulties implementing common governance standards. The structural complementarity between these two models of government helped to frame the three-principle integrated governance framework that was proposed within this paper. Each of these principles was founded as a resolution to the recognised deficiencies within each of these government models. Further studies in these areas could investigate in what ways the ethnic minorities in each of these countries have embraced the digital government platforms that have been created by their governments, as well as in what ways the principles of this proposed governance framework may lead to improvements to the legitimacy and equity in the digital government platforms that are established in other similar contexts for urban governance of ethnic minorities.

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Обмеження та рішення для цифрової трансформації міських етнічних справ: погляд зацікавлених сторін

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Анотація. Актуальність дослідження зумовлена зростаючою необхідністю цифрової трансформації державного управління та викликами, які така трансформація створює для етнічно різноманітного міського населення. Метою цього дослідження була розробка орієнтованої на зацікавлені сторони системи для визначення інституційних обмежень цифрової трансформації управління етнічними справами в міському Китаї та Канаді. У дослідженні використовувався порівняльний аналіз документів, картування зацікавлених сторін та багаторівневий аналіз правових та політичних рамок управління в Китаї та Канаді. Результати демонструють, що Китай та Канада розробили принципово різні моделі управління етнічними справами, обмеження яких є структурними, а не індивідуально вирішуваними. Централізована модель Китаю забезпечує високу операційну ефективність та єдину цифрову інфраструктуру, проте породжує дефіцит легітимності в усіх аспектах вхідних, пропускної та вихідних даних. Ці дефіцити виникають через виключення організацій етнічних громад із спільного проектування платформи, слабку сумісність між Національною державною комісією з питань етнічних справ та національними системами даних, а також управлінську роль великих технологічних корпорацій без незалежного нагляду. Прийняття Закону про національну єдність та прогрес ще більше посилило концентрацію управління в партійних структурах, зменшивши доступність культурно чутливих цифрових послуг на муніципальному рівні. Децентралізована модель Канади, навпаки, демонструє сильну легітимність вхідних даних, що ґрунтується на конституційно визнаних мультикультурних та корінних правах. Однак вона демонструє постійні провали в координації та дефіцит легітимності результатів через фрагментацію на федеральному, провінційному, муніципальному та корінному рівнях управління. Дані з Торонто та Ванкувера свідчать як про відмінності в механізмах участі, так і про постійні розриви у підзвітності між інституціями самоврядування корінних народів та муніципальним наданням цифрових послуг. Результати цього дослідження можуть бути застосовані до інших країн з подібними урядовими моделями у справах етнічних меншин та внести свій вклад у існуючу наукову літературу з теми цифрової трансформації та управління справами етнічних меншин

Ключові слова: субсидіарність; сумісність; партисипативна легітимність; моделі управління; корінні групи; мультикультуралізм