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THE INTEGRATION OF ARTIFICIAL INTELLIGENCE IN GEORGIA: SOCIO-ECONOMIC IMPACT, INSTITUTIONAL CHALLENGES, AND POLICY RECOMMENDATIONS

Abstract

Digital technologies and Artificial Intelligence (AI) are **transformative forces** profoundly shaping Georgia's economic, social, and governance landscapes. While Georgia endeavors to bolster national competitiveness through technological progress, **systemic challenges persist** concerning digital infrastructure, regulatory frameworks, and a cohesive national strategy. These impediments hinder comprehensive digital transformation and constrain economic growth.

This study investigates AI and digital technology integration within Georgia's private and public sectors, analyzing **key institutional barriers** and proposing recommendations for sustainable development. Employing a qualitative methodology, the research utilizes semi-structured interviews with government and business experts, complemented by open-source analysis.

Findings reveal that AI integration in Georgia is in its **nascent, fragmented, yet promising stages**. Primary barriers include:

- Absence of a unified strategic and legal framework, deterring investment and rapid innovation dissemination.
- Significant regional disparities in digital access, exacerbating economic differentiation and limiting inclusive growth.
- Ongoing challenges in data governance and cybersecurity, elevating operational risks and impacting business reliability.

The paper concludes that establishing a **long-term, inclusive national digital strategy is imperative**. Such a strategy should prioritize critical investments in digital infrastructure, foster research and development, develop robust regulatory and ethical frameworks, and deepen public-private partnerships. Crucially, it must specifically address regional digital divides to ensure equitable access and maximize nationwide economic benefits. This approach will facilitate AI's full potential for GDP growth, enhanced public sector efficiency, and elevated international competitiveness, preparing Georgia for future challenges.

Keywords: Artificial Intelligence, Digital Transformation, Economic Growth, Innovation, Digital Strategy, Georgia, Institutional Barriers, Regulatory Frameworks.

Introduction

The dynamic evolution of digital technologies and the global integration of Artificial Intelligence (AI) are fundamentally transforming economic, social, and governance systems worldwide (Kagermann, 2015; Murugesan et al., 2023). AI is widely recognized as an essential mechanism for enhancing competitiveness and productivity across both private and public sectors.

Georgia, as a developing economy and a post-Soviet, EU-aspirant country, is progressively integrating into this global digital transformation. The nation demonstrates increasing adoption of digital services and nascent attempts to implement AI elements, which are vital for boosting competitiveness and economic efficiency. The third wave of digital governance, marked by advanced digital tools and AI integration, is already reshaping institutional architectures globally, significantly improving public service efficiency (Dunleavy & Margetts, 2023). While these processes are at an early stage in Georgia, burgeoning initiatives are laying the groundwork for substantial potential macroeconomic benefits (Civil Service Bureau of Georgia, 2020; UNDP, 2023).

However, this promising trend is concurrently challenged by significant institutional and socio-political obstacles. Insights from other developing countries reveal that digital transformation failures frequently stem from organizational, cultural, and leadership deficiencies, coupled with immature regulatory frameworks and weak innovation ecosystems that deter investment (El Ghozail et al., 2024; Gamage et al., 2022). These pervasive challenges impede AI adoption and sustainable economic diffusion, negatively impacting the country's long-term economic growth trajectory.

This study seeks to answer the following key research questions:

1. What are the primary institutional and socio-political barriers hindering the effective integration of Artificial Intelligence and digital technologies within Georgia's private and public sectors?
2. How do these identified barriers impact Georgia's socio-economic development and national competitiveness?

Research Gap: While established theories like Diffusion of Innovations (Rogers, 2003) and Institutional Theory (DiMaggio & Powell, 1983) elucidate technological adoption, empirical research specifically addressing the structural and institutional barriers to AI implementation within developing country contexts, such as Georgia, remains limited. This study aims to bridge this critical gap by thoroughly investigating the institutional and socio-political factors influencing AI integration within Georgia's business and public sectors. The research employs a qualitative methodology, utilizing semi-structured interviews with industry experts, to provide both theoretical contributions and actionable policy recommendations for sustainable economic growth and comprehensive digital transformation.

1. Literature Review and Theoretical Framework

This study is grounded in two primary theoretical frameworks: Diffusion of Innovations Theory (DOI) and Institutional Theory. These complementary theories enable a multifaceted analysis of technological transformation processes, encompassing both the dynamics of innovation adoption and the contextual and organizational barriers to such adoption.

1.1. Diffusion of Innovations Theory (DOI)

Developed by Everett Rogers (Rogers, 2003), the Diffusion of Innovations Theory (DOI) explains how new ideas, practices, or technologies (in this research, AI and digital technologies) spread and are adopted within a social system. At its core, DOI suggests that the speed and extent of adoption depend on how people perceive the innovation itself. Key factors influencing adoption include: whether the innovation is seen as better than what it replaces (**relative advantage**); its consistency with existing values and needs (**compatibility**); how difficult it is to understand and use (**complexity**); if it can be experimented with on a limited basis (**trialability**); and if its results are visible to others (**observability**). DOI is frequently applied to assess technological adoption readiness and identified barriers in developing contexts (Akoh Atadoga et al., 2024; Gamage et al., 2022).

Relevance to this study: DOI provides a crucial framework for analyzing the process of AI adoption and diffusion in Georgia's context, ultimately determining the economic outcomes of technological progress. Of particular significance are the innovation's perceived complexity and its compatibility with existing systems, as these often serve as fundamental sources of institutional barriers in a developing economy like Georgia.

1.2. Institutional Theory

Institutional Theory, particularly aspects of organizational institutionalism (DiMaggio & Powell, 1983), focuses on how organizations conform to external pressures to gain legitimacy and stability rather than solely pursuing efficiency. Organizations often adopt practices and structures that are widely accepted or expected in their environment to ensure survival and success.

The theory highlights three main types of isomorphism—a process where organizations become more like others in their environment:

- **Coercive Isomorphism:** This occurs when organizations are forced to change due to external pressures from powerful entities or societal expectations, often driven by laws, regulations, policies, or government mandates.
- **Mimetic Isomorphism:** This happens when organizations imitate successful or legitimate organizations in response to uncertainty or ambiguity. When faced with unclear goals or new technologies like AI, organizations might copy what others are doing to reduce risk or achieve similar success.
- **Normative Isomorphism:** This stems from the influence of professional groups, educational institutions, or industry associations that define and disseminate standards, best practices, and qualifications, pushing organizations towards certain norms.

In developing country contexts, institutional barriers—such as incomplete legislative frameworks, regulatory vacuums, and governmental weaknesses—frequently impede AI implementation and digital transformation, leading to direct economic losses (Krook et al., 2025; Soliman et al., 2024).

Relevance to this study: Institutional Theory is critical for understanding the structural and contextual barriers, such as legal voids and organizational conservatism, that impact AI implementation in Georgia. It helps explain why the digital transformation process is often fragmented and slow, especially within the public sector, where adherence to established norms and a lack of clear top-down directives (coercive isomorphism) can hinder rapid adoption.

1.3. Digital Transformation and AI: Institutional and Regulatory Barriers

Global AI integration is frequently hampered by common barriers, including data quality issues, infrastructure limitations, and cybersecurity risks (Akoh Atadoga et al., 2024; Krook et al., 2025). Digital transformation in the public sector is often driven by **coercive isomorphism** (DiMaggio & Powell, 1983) and necessitates clear ethical guidelines, transparency, and accountability (Krook et al., 2025; INTERPOL & UNICRI, 2024).

In Georgia, the implementation of AI and digital technologies is in its nascent stages. Public sector adoption primarily stems from central government initiatives, exemplifying typical **coercive isomorphism** (e.g., the "Justice House" concept; UNDP, 2018). **The "Justice House" model, a unified public service delivery platform, serves as a prime example in Georgia where centralized government mandates (coercion) drove the adoption of digital processes across various state agencies to improve public service efficiency.** Entities like the Digital Development Agency and Georgia's Innovation and Technology

Agency represent attempts at **coercive** and **normative isomorphism**, aiming to establish standards and foster technological advancements.

Nevertheless, AI implementation in the Georgian public sector faces numerous institutional barriers. These include incomplete legal and regulatory frameworks and underdeveloped data protection and ethical standards. This vacuum creates institutional uncertainty, which hinders effective innovation diffusion and its legitimization. The conservatism of state agencies and their resistance to change also act as an institutional barrier, as this impedes the **compatibility** (Rogers, 2003) of innovation with existing bureaucratic structures, **contributing to a significant institutional inertia that slows down comprehensive digital transformation.**

Methodology

This study adopts a qualitative approach, which is essential for an in-depth analysis of the current state of AI integration and its associated institutional and socio-political barriers within Georgia's private and public sectors. Qualitative research is ideal for contextual understanding of complex phenomena (Creswell & Poth, 2017). The study employs an exploratory and descriptive research design to comprehensively represent the facets of this domain (Maxwell, 2013).

Data Collection: Data was collected using two primary instruments:

- **Semi-structured Interviews:** Eight in-depth interviews were conducted with leading experts in the field. Respondents were selected using purposive sampling to ensure high competence in AI and digital transformation issues (Flick, 2019). Selection considered their institutional and sectoral representation (private sector, public sector, regulatory bodies, academia) to gain a multifaceted perspective on institutional barriers to AI integration. These interviews focused on key themes such as existing digital infrastructure, regulatory gaps, national strategic vision, and the socio-economic impacts of AI adoption. For instance, interview questions explored respondents' perceptions on the biggest challenges to AI adoption in Georgia, how current regulations (or lack thereof) impact investment in AI, what role they believe the government should play in fostering AI development, and specific examples of successful or unsuccessful AI initiatives they've observed.
    - **Four interviews were conducted verbally**, either via online platforms (e.g., Zoom) or direct phone calls, with the recorded audio subsequently transcribed for analysis. The average duration for these verbal interviews was **approximately 30-40 minutes**.
    - **The remaining four interviews were conducted via email**, where respondents completed and submitted their answers to the semi-structured questionnaire in writing.
- **Content Analysis of Open Sources:** The study also drew upon a systematic analysis of secondary data, including official reports, policy documents, and academic research relevant to Georgia's digital policy and innovation (Mah, 2024).

Data Analysis: Data from interviews and open sources were analyzed using content analysis and thematic analysis methods (Flick, 2019; Braun & Clarke, 2006). Particular emphasis was placed on themes directly related to the impact of regulatory frameworks, institutional inertia, leadership, ethical dilemmas, and other socio-political factors on AI integration.

Ethical Considerations: All respondents received full information regarding the study's objectives and data utilization. Participants' identities were recorded with their consent, except for two respondents who preferred anonymity. Adhering to ethical research standards, including obtaining informed consent and ensuring confidentiality, is crucial in qualitative studies (Bell & Bryman, 2007).

3. Research Results and Discussion

The analysis of semi-structured interviews conducted within this study reveals key trends, challenges, and opportunities related to the implementation of Artificial Intelligence (AI) and digital technologies in the Georgian context. The findings are analyzed using principles from Rogers' Diffusion of Innovations Theory (2003) and DiMaggio and Powell's Institutional Theory (1983), with a particular focus on their economic impact.

3.1. Regulatory Environment and Institutional Vacuum: Impeding Investments

Interviews clearly indicated that AI and digital technology implementation is hindered by the absence of appropriate regulatory frameworks and a coherent national strategy. This is a common challenge for many developing economies, where legislation often lags behind technological progress (Soliman et al., 2024; Karimi et al., 2024). This regulatory uncertainty escalates investment risks and discourages private sector initiatives.

David Narmania (Chairman of GNERC) noted that "the public sector tends to be more conservative and cautious... there is no specific regulation, and implementation proceeds slowly." **This conservatism, rooted in established bureaucratic processes and a cautious approach to new, unregulated technologies, exemplifies the classic absence of coercive isomorphism (DiMaggio & Powell, 1983) and often results in significant delays.** According to Nino Taganashvili (Head of Data Protection and Strategic Planning at Georgia's Innovation and Technology Agency), "ethical and responsible AI use is a distinct value for Georgia, but this necessitates the creation of regulations based on international standards." This finding underscores the potential for **mimetic isomorphism** (DiMaggio & Powell, 1983)—imitating international practices like the European Commission's AI Act (Robles & Mallinson, 2025; INTERPOL & UNICRI, 2024). An anonymous respondent, **a Head of AI Products Department at a leading Georgian bank,** also stated, "Currently, there is no law on artificial intelligence in Georgia, which is a serious hindrance. This regulatory vacuum not only deters foreign direct investment in nascent AI ventures but also inhibits local businesses from scaling AI-driven solutions, fearing future compliance uncertainties."

3.2. Multi-Sectoral Collaboration and Systemic Vision: The Economic Need for Institutional Coordination

Beyond regulatory gaps, interviews highlighted a deficit in systemic vision and multi-sectoral collaboration, which significantly impedes AI implementation. This is critical from an **Institutional Theory** (DiMaggio & Powell, 1983) perspective, as sustainable digital transformation requires coordinated efforts from diverse institutional actors. A lack of coordination leads to inefficient resource allocation, duplication of initiatives, and a slowdown in overall economic growth. International analyses also show that the success of national AI strategies heavily depends on a coordinated approach involving government, academia, and the private sector (Mah, 2024; Abdulla et al., 2024).

Narmania's view that the state should play a leading role in defining technological policy underscores the importance of **coercive isomorphism**. Taganashvili's assertion that startups often require collaboration with academic circles emphasizes the potential of **normative isomorphism**. Zviad Gabisonia (Expert from the Ministry of Education) pointed to "the absence of regulation, which creates an imbalance between technology use and legal responsibility," further confirming the negative impact of an institutional vacuum on innovation **compatibility** (Rogers, 2003). An anonymous sales sector representative also noted the lack of coordination: "In principle, innovations are discussed, but this is quite fragmented, and there is no unified state policy." This fragmentation often means that successful pilot projects in one ministry or

company don't easily scale or integrate across the broader public or private sector. Furthermore, several respondents emphasized that this lack of a unified vision severely disadvantages Georgia's regions, where digital infrastructure and AI literacy lag significantly behind the capital, creating a growing divide in access to digital opportunities and economic potential. The Head of Operations at Rooms Hotel (anonymous respondent) pointed to a "lack of information" in the business sector and the need for "more discussion and publicity," highlighting a low level of **mimetic isomorphism** (DiMaggio & Powell, 1983) and a general **hesitancy to adopt new, unfamiliar technologies without clear examples or guidance.**

3.3. Service Improvement and Competitiveness: Realizing the Economic Advantage of Innovation

Despite the challenges, interviews revealed that the implementation of digital technologies and AI is already having a positive impact on service quality and competitiveness. This demonstrates the realization of innovation's **relative advantage** (Rogers, 2003). Such positive outcomes align with global experience, where AI enhances operational efficiency and customer satisfaction across various sectors (Murugesan et al., 2023; McKinsey & Company, 2022).

David Narmania's example of GNERC's pilot project, where AI automatically answers consumer inquiries on utility company hotlines, provides a clear instance of **observable** (Rogers, 2003) results: increased customer satisfaction and operational efficiency. The Head of AI Products Department at TBC Bank (anonymous respondent) emphasized AI's importance for improving business efficiency: "For us, AI is a means to improve our business efficiency, reduce costs, and increase satisfaction. AI implementation with us already allows for more accurate analytics on customer needs, prevention of fraudulent activities, and improved service." This directly illustrates AI's relative advantage and its **observable** (Rogers, 2003) financial outcomes. Beyond these, interviews with various business representatives consistently highlighted specific applications: for instance, some smaller Georgian enterprises are adopting AI-powered chatbots for customer support to handle common inquiries, freeing up staff for complex issues and improving response times. Others are exploring AI-driven inventory management or demand forecasting tools in logistics to reduce waste and optimize supply chains. While often in initial phases and not yet formally measured, these tangible efforts reflect a growing recognition of AI's potential for cutting operational costs and enhancing client interaction in the Georgian market.

4. Conclusion and Recommendations

Based on the qualitative insights derived from this study, the following conclusions and recommendations offer foundational perspectives on AI integration in Georgia. While inherently qualitative, these findings provide a robust basis for further dialogue and strategic policy development, even as they warrant validation through broader empirical research.

4.1. Key Research Findings and Theoretical Implications

The landscape of Artificial Intelligence (AI) and digital governance in Georgia is at a pivotal developmental stage, yet persistent systemic barriers hinder sustainable progress. The study identified the following critical findings, analyzed through the lenses of Rogers' Diffusion of Innovations Theory (2003) and DiMaggio and Powell's Institutional Theory (1983):

- **Regulatory Voids and Institutional Uncertainty:** The absence of a cohesive national AI strategy and comprehensive legislation in Georgia notably lessens the impetus for **coercive isomorphism**, consequently impeding investment and innovation (Krook et al., 2025; Soliman et al., 2024). Furthermore, the emulation of international best practices (**mimetic isomorphism**) remains

inconsistent, slowing overall technology adoption.

- **Disjointed Initiatives and Strategic Deficiencies:** Digital initiatives frequently operate in isolation, often prioritizing short-term projects. This approach obstructs the consistent **diffusion of innovation** (Rogers, 2003) and the development of a unified national vision. The consequence is often inefficient resource allocation and a diminished realization of digital transformation's broader economic benefits (Mah, 2024).
- **Regional Disparities and Digital Inclusion Challenges:** Significant imbalances in digital service access and infrastructure exist between regions. These disparities critically impede the **equitable dissemination of AI** (Rogers, 2003), thereby constraining regional economic potential and hindering inclusive national growth.

In summary, Georgia's digital transformation is navigating a transitional period, necessitating focused and collaborative efforts to surmount economic obstacles and fully leverage AI's capabilities.

4.2. Recommendations

To accelerate Georgia's digital transformation and AI development, based on the study's findings, the following recommendations are presented:

4.2.1. Respondent Recommendations:

- **Strengthen Public-Private Partnerships:** Fostering closer collaboration between public and private sectors is paramount for efficient innovation and optimal resource utilization, which in turn enhances the potential for attracting investment (Mah, 2024; Abdulla et al., 2024).
- **Elevate Digital Strategy to the Policy Level:** Digital initiatives must evolve from isolated project-based endeavors to integrated, strategic policies. This shift is crucial for ensuring their long-term sustainability and cultivating a predictable investment climate (Rogers, 2003; DiMaggio & Powell, 1983).

4.2.2. Author Recommendations:

- **Fortify Legal and Institutional Foundations for Public-Private Partnerships:** Implementing a clear legal framework and establishing robust institutional mechanisms (e.g., dedicated inter-agency working groups, transparent guidelines for joint ventures) are essential for fostering effective and transparent collaboration, thereby building trust and enhancing the viability of innovative projects (Mah, 2024).
- **Develop a Long-Term and Adaptive Digital Governance Strategy:** Digital transformation should be guided by a politically supported, adequately resourced, and continually monitored strategic framework. This framework must clearly delineate roles and responsibilities for both government bodies and private sector engagement (Karimi et al., 2024; OECD, 2021).
- **Establish a Comprehensive Legal and Ethical Framework:** A well-defined legal and ethical framework is critical for regulating technology use, bolstering data protection, and ensuring a human-centric approach to AI development and implementation (INTERPOL & UNICRI, 2024; Robles & Mallinson, 2025; Abdulla et al., 2024).
- **Enhance Regional Infrastructure and Public Awareness:** Substantial investment in regional infrastructure (e.g., improved internet connectivity, establishment of technology hubs) is vital to mitigate digital inequality. Simultaneously, increasing public digital literacy is necessary to ensure broad digital inclusion (Rogers, 2003; UNCTAD, 2023).

4.3. Study Limitations and Future Research Directions

The qualitative nature of this study and the limited number of respondents (8 interviews) inherently restrict the broad generalizability of its findings. Furthermore, focusing primarily on the public and private sectors does not fully encompass all actors within Georgia's digital ecosystem. Future research could expand this analysis by employing quantitative methods (e.g., large-scale surveys) and incorporating other sectors (e.g., healthcare, agriculture) that hold significant economic potential for AI implementation. Comparative studies with other countries in the region and detailed case studies of specific AI projects would also be valuable for identifying best practices. Crucially, future research should investigate the broader theoretical implications of Georgia's case for Diffusion of Innovations and Institutional Theory, exploring how these established frameworks might be refined or challenged in a post-Soviet, EU-aspirant context. Additionally, a deeper examination of the potential social impact of AI, including labor market changes, ethical challenges, and citizens' perceptions of the technology (Schiff, 2022), is vital for sustainable and inclusive economic integration of AI.

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