
ARTIFICIAL INTELLIGENCE AND PUBLIC GOVERNANCE IN PAKISTAN: A CASE STUDY OF NADRA

Muhammad Naseer Ahmad Taib

Assistant Professor

Department of Political Science,
Government College University Lahore

mnaseergcu22@gmail.com

Fahim Ur Rehman

Research Scholar

Department of Political Science
Government College University Lahore

fahiiimrehman2000@gmail.com

ABSTRACT

This research paper studies the impact of artificial intelligence (AI) on public governance in general and Pakistan in specific. This study revolves around the National Database and Registration Authority (NADRA) and its operation model. The present study analyses how the usage of AI can make its work better and efficient. This study helps to design a practically workable model to make it more open to provide better services to promote social inclusion and give citizens more power. The research incorporates Algorithmic Governance Theory (AGT) to illuminate how this system transforms the institutional working framework, impacts decision-making, and its outcomes. The study explains both opportunities and challenges of AI usage in NADRA. It is an acknowledged fact that AI has become a potential system to enhance accountability, financial inclusion, accessibility and innovation. However, it simultaneously suggests concerns related to ethical oversight, data privacy, structural inequality and algorithmic opacity. The present study offers a comprehensive understanding of AI-based governance, especially with reference to developing-states like Pakistan. It helps the institution to utilize policy documents, international frameworks and institutional reports.

KEYWORDS

Data Privacy, Artificial Intelligence (AI), Accountability and Transparency, Digital Governance, Financial Inclusion, Algorithmic Governance Theory (AGT), Citizen Services and NADRA (National Database and Registration Authority).

INTRODUCTION

Artificial Intelligence in public governance has become a disruptive force that changes the modes of citizen participation, service delivery, and institutional procedures. Different tools of Artificial Intelligence (AI) like automated decision-making systems, predictive analytics and machine learning algorithms are being used by governments to enhance efficiency and efficacy of the system to boost administrative governance. It also helps to lessen bureaucratic hold-ups, and enhance transparency and openness. It is an acknowledge fact that the correlation of AI and governance has attained recognition worldwide. Technologically advanced states are using AI in governance to promote transparency and public accountability, while developing states are on their way to adopt such modern gadgets in governance. It is quite unfair to compare both developed and developing states because they have disparities in all aspects and contexts. The present topic helps to highlight opportunities and challenges for Pakistan in digital governance.

Global institutions like UNESCO, the World Economic Forum, OECD, and Google have suggested digital governance as a global framework to enhance ethics, inclusivity and accountability to promote social justice (WEF, 2025; OECD, 2024; UNESCO, 2021; Google, n.d.). Adoption of DGF (Digital Governance Framework) is essential for developing states because it strongly stress on the value of 'openness in decision-making' which is an essence of democratic governance. Democratic governance ensures effectiveness in governance to promote social justice that establishes moral standards in society.

India introduced the Aadhaar system, which is the largest biometric digital identity program in the world. It gives unique identification to more than 1.3 billion citizens by iris and fingerprint scans. This programme helps the government to detect fraud, digital authentication, and welfare delivery (UIDAI, 2023). Similarly, Kenya integrated M-Pesa and Huduma Namba digital ID systems with AI to evaluate creditworthiness and monitor transactions to provide social protection and benefits to far-flung populations (Safaricom, 2023). Brazil also used Bolsa Família program with AI to analysis data to find out low-income and needy families to monitor adherence program for social service deliverance (World Bank, 2023). These are some examples which clearly show how states in global south use AI-driven projects to improve governance.

Adoption of artificial intelligence (AI) in governance in Pakistan is a very recent subject to address socioeconomic issues to establish inclusive, citizen-centric and accountable mode of governance. AI tools can improve financial inclusivity, citizen identity, legal justice system, and social welfare delivery through institutional accountability. NADRA is to be revamped with AI based tools for public administration. Pakistan is witnessing larger push toward digital governance through AI that has been revolutionizing NADRA. According to

Tariq Malik, Chairman of NADRA, in his article Digital ID for Development and Smart Governance: Policy Lessons from My Second Spell with NADRA, published by the Center for Global Development, said that Pakistan's digital system is very helpful to identify citizen and their services to enhance governance. He also highlights that with the adoption of such highly sophisticated working models can create different institutional and administrative challenges. The National Sex Offender Registry is one of the unique NADRA's AI-integrated applications for legal oversight and public safety (Pakistan Automated Fingerprint Identification System, 2024). After the establishment of Pakistan's digital authority, it was further revamped to enhance digital governance that will be very helpful for the establishment of digital maturity in working. Adoption of ID infrastructures, universal registration, online business facilitation, police portals and other integrated social protection portals are some of the important steps taken by the government of Pakistan to establish the culture of digital governance. The ASAAN mobile app and the Tasdeeq service were adopted in 2022 to increase financial inclusion. It further strengthened digital governance when the Pak-ID mobile app was adopted (NADRA, n.d.; Tasdeeq, 2025). In 2023, AI-based applications were launched for census operations, inheritance management, succession certificates, biometric verification and social protection programs (World Bank, 2025). Additionally, NADRA also revamped refugee registration systems that would be very helpful in stopping illegal immigration. Alongside these technological progresses, these reforms ensure public trust, privacy protection, accountability and transparency. All these things made NADRA a newly transformed institution from a conventional record-keeping organization to a fully AI-enabled institution that increases accountability, transparency and administrative effectiveness.

Another mode to understand the role of AI in the governance of Pakistan is through the inclusion of AGT (Algorithmic Governance Theory) that emphasis how AGT ensures accountability, transparency, decision-making and institutional autonomy and authority. In the context of Pakistan's governance, NADRA has established an example of algocracy. It is an acknowledge fact that AI tools are not neutral rather, they operate under the directives given to them, such as constraints, principles and goals. In addition, AI helps to improve the working of NADRA through economic inclusion and participation to address issues like infrastructural barriers, transparency and social equity. These AI tools are transforming NADRA as one of the tech based institution to make its services more reliable, accessible and faster.

LITERATURE REVIEW

It is an acknowledged fact that artificial intelligence is one of the emerging fields in the world that has its own implications and complications both in service

provision and public governance. It has the capabilities to increase administrative efficiency, efficacy and transparency to lessen administrative expenses. Adoption of AI in Pakistan simply means inclusive governance to address socio-economic and demographic issues. A number of reports and studies have highlighted that there is an integration of AI in different state departments in Pakistan to deal with practical and policy aspects.

In 2022, Pakistan sought to benefit from AI in different fields of governance. In the context, the National Artificial Intelligence Policy Consultation was Drafted that presents Pakistan's strategic vision regarding the integration of AI in both public and private sectors. It is an acknowledge fact that Pakistan is among those states having a majority young population that is habitual of using digital tools in their day-to-day life, and they are also in the habit of using the internet to get all kinds of assistance in their lives. These are some of the factors which are pushing the state of Pakistan to adopt AI-enabled technologies. The draft shows that AI is a technical tool that establishes inclusivity in service delivery to enhance efficiency and efficacy in governance. The draft also acknowledges that there is a lack of regulatory mechanisms, low AI literacy and poor digital infrastructure. At the end draft also suggests that a multi-pillar approach is to be adopted to address the issues. This policy will bring a sectoral transformation in the fields of law enforcement, education, healthcare, awareness, market facilitation, and trust-building. In this regard, some practical steps were suggested, like creation of a National AI Fund, moral AI, centers of AI Excellence, educational initiatives and promotion of inclusivity in policy matters. Some of its aspects are initially implemented in NADRA. Now Pakistan is at the door of adopting AI in governance and going to the part of global governance movement (National Artificial Intelligence Policy, 2022).

Volume 12, Issue I of the UNDP report highlights that Pakistan is ready to adopt AI in socio-economic sectors to transform them to a new level of horizons. The report also suggests that AI presents inclusivity in development and governance through STEM. It also empowered Pakistan in the fields of technology, digital literacy and formal education sectors (United Nations Development Programme [UNDP], 2025). The UNDP report presents that with the application of algorithmic governance would enhance inclusivity, transparency and accountability in NADRA.

Comparative studies and global frameworks provide superfluous insights to understand the concept of governance in the context of AI for Pakistan. The World Economic Forum presents its Generative AI Governance report to look at governance strategies across the globe. The report has identified four main models such as principles-based, rules-based, risk-based, and outcomes-based to understand AI governance. It is understood that every strategy has advantages and disadvantages. To ensure inclusivity and safety in the adoption of AI, the report

has suggested to have cross-sector flexible regulatory, regulatory sandboxes and cooperation, regulatory (World Economic Forum, 2024). These propositions are extremely relevant to Pakistan because the major hindrances to integrating AI are produced by human capacity and infrastructure.

The Google Agenda Report 2024 offers a wide-ranging, inclusive framework for responsible AI in governance for the developing states. It provides five pillars: Responsibility, Innovation, Prosperity, Safety and Inclusion. It also presents methods how to avoid algorithmic bias to ensure fair representation in the datasets (Google, 2024). Safety can be ensuring through transparency, accountability and data privacy. Whereas, prosperity can be achieved only through fostering AI because it provides effective public governance. Innovation gives its adoptability with the changing environment. At the end, accountability establishes public trust. It has been observed that there are significant practical gaps between achievements and the adoption of AI in Pakistan's AI governance. All these reports only present the achievements and hide the risks and undesirable results. Issues like ownership of data, political and bureaucratic opposition, corruption, accountability and transparency are rarely mentioned. The studies also overlook the issues of unemployment erupted due to automation and the inclusion of AI in governance (UNDP, 2025). It has been acknowledged by the researcher that the literature review extensive use the policy documents and institutional reports, which may be partial. Efforts have been made to include some of the independent peer reviews and critical analyses to make the study beneficial for the academics and people who are sitting at the helm of the affairs of the state (Malik, 2025).

It is an acknowledge fact that algorithmic governance in Pakistan has multi-dimensional issues, and they are very significant to understand AI governance. It has been observed that AI is hampered by inadequate and poor digital infrastructure, a lack of regulatory frameworks and low AI literacy (WEF, 2025). Adoption of AI governance is a bit slow in Pakistan because of political and bureaucratic opposition. There is no doubt that risks also arise in the engagement of AI in governance through the issues of security and privacy of digital ID systems. (Malik, 2025).

RESEARCH METHODOLOGY

Present research uses qualitative research methodology because it provides a more exclusive understanding of the subject. It also helps to understand multivariate governance aspects. The research is based on secondary data like normative tools, institutional documents and policy guidelines to understand its working in the context of AI. There are different research methods to analysis the secondary data but thematic analysis has been used to understand the above subjects. This method helps to understand different themes operating under the above subject. Thematic analysis helps to developed different themes to conceptualize and

reconceptualize AI with the help of NADRA as a case study. Following are the skimmed documents which are used to develop themes to understand the subject of study. These documents also help to develop a global framework to understand the working of NADRA and how it manages the risks of AI to boost its governance.

1. Google, 2024
2. UNDP, 2025
3. National AI Policy, 2022
4. WEF, 2024
5. World Economic Forum, 2024

THEMATIC ANALYSIS

S R. N O	THEME S	KEY INSIGHTS FROM GLOBAL POLICY CONTEXT	PAKISTAN INITIATIVES: NADRA	ANALYSIS	OUTCOME
01	Citizen Services and Social Inclusion	<ul style="list-style-type: none"> • Equitable access • Reducing digital divides • Citizen-centric service delivery 	<ul style="list-style-type: none"> • Pak-ID app • Tasdeeq Mobile Account, • Digital census, • BISP/NSER registry. 	NADRA uses to <ul style="list-style-type: none"> ▪ Reduces delays ▪ Empowers citizens 	<ol style="list-style-type: none"> 1. Inclusivity 2. Effectiveness 3. Data safety 4. Innovation 5. Public welfare 6. Global Ethics
02	Governance and Algorithmic Management	Algorithmic Management	<ul style="list-style-type: none"> • Verification • Fraud detection • Biometrics • Digital ID management. 	AI improves in NADRA <ul style="list-style-type: none"> ▪ Efficiency ▪ Strengthen accountability ▪ Strengthen institutional control. 	
03	Digital Economy and Innovation	<ul style="list-style-type: none"> ▪ Ethical experimentation ▪ Sandboxes ▪ Pilot projects to foster AI innovation 	<ul style="list-style-type: none"> ▪ Fin-tech integration ▪ Sandbox ▪ Nishan Pakistan ▪ E-payments, POS terminals ▪ RDA for diaspora engagement. 	<ul style="list-style-type: none"> ▪ Encourages startups ▪ Economic modernization ▪ Entrepreneurship through AI. 	

04	Economic growth and Financial Inclusion	<ul style="list-style-type: none"> ▪ Responsible AI governance ▪ Technology Linkages 	<ul style="list-style-type: none"> ▪ ASAAN Mobile RDA, Integrated databases, Mobile wallets. ▪ tax 	<ul style="list-style-type: none"> ▪ Expands banking access ▪ Diaspora engagement ▪ Tax compliance ▪ Strengthens the digital economy.
05	Risk Management and Accountability	<ul style="list-style-type: none"> ▪ Safety, Transparency ▪ Ethical AI 	<ul style="list-style-type: none"> ▪ Biometric verification ▪ Secure systems ▪ Political resistance ▪ Infrastructure gaps ▪ Privacy issues 	<ul style="list-style-type: none"> ▪ Partial alignment with accountability ▪ Highest need for stronger oversight ▪ Risk management.

GLOBAL FRAMEWORK AND NADRA

DISCUSSION

1. Inclusivity

NADRA is the classical case study whenever the relationship between AI and governance is studied in Pakistan because it has been lowering the need of human involvement in decision-making. AI digital tools like Pak-ID mobile app, ASAAN mobile account and Tasdeeq service are used to avoid bureaucratic delay in public governance and make identity verification and banking procedures easy and transparent. Algocracy, as a governing procedure, has been formulated by the computational processes in which an AI system of algorithms has been used to perform routine tasks. These programmes ensure social inclusion, even for an elderly rural woman, is not beyond reach. The same methodology can be applied to any member of marginalized groups. Any person anywhere in Pakistan can open an account through the ASAAN mobile app and start the financial activates without even going to banks physically. They can even register their entities while using the Pak-ID app. The above-mentioned arguments

have demonstrated that how AI ensures inclusivity and access to necessary services for even underrepresented groups that is boosting efficiency in public governance.

2. Effectiveness

AI works as a catalyst to enhance the efficiency and effectiveness of NADRA to provide public services and set the grounds for digital governance in Pakistan. In the recent past error-prone and slow system was used, and it was not sufficient enough to meet the growing needs. Due to poor automation, there were issues of verification that would be resulted into fraud, corruption and extremism. Now different AI tools have been used by NADRA to have transparent service delivery and accurate data collection for BISP. These tools also ensure the correct calculation of the population to ensure judicious distribution of resources among different federating units of the state. Algorithmic governance used by NADRA maximizes its administrative issues and establishes public confidence on the governance of Pakistan.

3. Data Safety

NADRA is a state institution that is handling a large amount of sensitive data, biometric data, identity record and financial information through its different AI projects. These tools ensure effective data governance by safeguarding security to citizen consent; secure storage, privacy, ethical use and accuracy. AI is a helpful instrument to open new vistas of digital governance that can enhance economic activities and participation, especially for marginalized groups like women, minority and the diaspora. The initiatives like Pak-ID, ASAAN mobile account and Roshan Digital Account are transforming the economic landscape of the state because people are very satisfy with the data security measures taken by the government. These initiatives are also lessening inequality because they have been streamlining verification, banking, and financial accessibility.

4. Innovation

Without innovation, no system adopted the policy of sustainable governance. NADRA is an institution that has to adopt different means and methods to upgrade its efficiency. So, public trust should be established for its sustainable governance. Adoption of AI encourages innovation and digital economy for growth and development. Nishan Pakistan gives AI based verification that has brought revolution in the field of e-commerce and digital services to enhance new startups. These

innovative initiatives are helpful in promoting economic development through lessening the entry barriers.

5. *Public Welfare*

AI is an unbiased and objectively operated system that establishes humanitarianism to give social protection, locating unclaimed bodies, and assessing disasters to ensure public welfare. AI tools are like miracles especially for marginalized and vulnerable populations in Pakistan. Tools like biometric guarantee to the access to timely and accurate services to the people to do their day-to-day assignments. This proves that how algorithmic mode of governance translate the socio-economic spheres to establish the state power and improving citizen's. This study also illustrates that algorithms are not neutral rather; they demonstrate the goals and their optimization. AI in governance has the potential to increase public trust, equity, and citizen empowerment to ensure public welfare.

6. *Global Ethics*

It is pertinent for all states to learn the global ethical values in the operationalization of governance in their respective spheres to harmonize global governance. Ethical framework, policy procedures and global values serve as a working roadmap for the gradual incorporation of AI in governance. NADRA is one of the state organization in Pakistan that has progressively adopted different procedures in compliance with global norms and traditions and ethical values to service delivery, inclusion, accountability and, and transparency. It is a great achievement on the part of Pakistan that NADRA, a state institution, has adopted algorithmic governance to optimize operationalization through different programs to ensure biometric identification, inclusion, and identity verification to promote digital governance. The adoption of a highly modernize system of governance unleash opportunities and challenges for public governance in Pakistan.

CONCLUSION

Conclusively, it is stated that AI is transforming public governance in Pakistan but long way to go. National Database and Registration Authority (NADRA) is an institution that is adopting modern gadgets to ensure privacy and effectiveness in governance. Present analysis argues that AI has improved transparency, service delivery, and administrative efficiency. On the other hand, it also opens new avenues for institutional development and modernization, citizen inclusion and financial participation. Present research also identifies different significant obstacles in adoption of AI in governance in Pakistan especially with reference of

NADRA because it is a very sensitive institution of the state. Being an institution of high prestige has shown concerns regarding privacy and security of data and information. The conclusions of this study highlight that AI is a system that has the potential to transform the relationships between the people and the government. NADRA has taken different steps in areas of digital identification, financial inclusion and social protection to revamp it with international trends and standards. But it is also concluded that there are different administrative holes in regulatory supervision, ethical protections and infrastructural development. The study also concluded that reforms process is very slow because of the political opposition and institutional capabilities limitations. The above mention problems exhibit that even Pakistan is progressing toward the adoption of global norms for digital governance, but long way to go to achieve the objectives like accountability, transparency and public trust. Findings of the study show that there are both risks and opportunities in the adoption of AI in governance specifically in the department owning and operating the sensitive data bases. While living in the age of AI, it is important to weed out the fear and struggle hard to establish the values like exclusion, protection, privacy, justice, accountability and transparency to boost the socio-economic growth and development.

REFERENCES

Aneesh, A. (2006). Virtual migration: The programming of globalization. Duke University Press. <https://www.jstor.org/stable/j.ctv125jms5>

APP. (2022, February 9). NADRA launches centralised complaint management system. The News International. <https://www.thenews.com.pk/print/932001-nadra-launches-centralised-complaint-management-system>

Arain, G. S. (2024, May 16). NADRA expands digital identity card services to post offices, trans people. BiometricUpdate. <https://www.biometricupdate.com/202405/nadra-expands-digital-identity-card-services-to-post-offices-trans-people>

Center for Global Development. (2025, August). Digital ID for development and smart governance: Policy lessons from my second spell with NADRA. https://www.cgdev.org/publication/digital-id-development-and-smart-governance-policy-lessons-my-second-spell-nadra?utm_source=chatgpt.com

Daily Times. (2023, February 28). Pakistan's first-ever digital census launched with great success. <https://dailytimes.com.pk/1067339/pakistans-first-ever-digital-census-launched-with-great-succes/>

Google. (2024, September 2). An AI opportunity agenda for Pakistan. Google Public Policy.

https://static.googleusercontent.com/media/publicpolicy.google/en//resources/pakistan_ai_opportunity_agenda_en.pdf

Iqbal, N., & Bhatti, B. M. (2025, April). A digital solution for simplified business registration in Pakistan (Viewpoint No. 47). Pakistan Institute of Development Economics (PIDE). <https://file.pide.org.pk/pdfpideresearch/pv-47-a-digital-solution-for-simplified-business-registration-in-pakistan.pdf>

Jamal, N. (2022, October 3). Bank accounts the asaan way. Dawn. <https://www.dawn.com/news/1713132>

Katzenbach, C., & Ulbricht, L. (2019). Algorithmic governance. Internet Policy Review: Journal on Internet Regulation, 8(4), 1–18. <https://policyreview.info/concepts/algorithmic-governance>

Khan, I. A. (2023, April 1). NADRA opens dedicated helpline on transgender day of visibility. Dawn. <https://www.dawn.com/news/1745219>

Macdonald, A. (2023, May 25). NADRA launches Nishan Pakistan platform, lets startups leverage digital identity stack. BiometricUpdate. <https://www.biometricupdate.com/202305/nadra-launches-nishan-pakistan-platform-lets-startups-leverage-digital-identity-stack>

Ministry of Human Rights. (n.d.). Zainab Alert Response and Recovery Agency (ZARRA). https://mohr.gov.pk/Detail/NDViOGQ3YWUtZWl0MC00YjgyLWJiYWQ0t0GU0NDA0MTk2Yjk4?utm_source=chatgpt.com

NADRA. (n.d.). Latest news. Ministry of Interior, Government of Pakistan. <https://www.nadra.gov.pk/>

NADRA. (n.d.). Pak Identity. <https://www.nadra.gov.pk/pakIdApplications>

National Artificial Intelligence Policy. (2022). National AI Policy Consultation Draft 2022. Government of Pakistan.

O'Reilly, T. (2018). WTF?: What's the future and why it's up to us. Harper Business.

Safaricom. (2023). Safaricom unveils fintech 2.0 upgrade to expand M-Pesa's reach. Ecofin Agency. <https://www.ecofinagency.com/news-finances/2409-48969-safaricom-unveils-fintech-2-0-upgrade-to-expand-m-pesa-s-reach>

Tasdeeq. (2025). Pakistan's largest background verification platform. <https://tasdeeq.org/>

The Express Tribune. (2023, March 3). NADRA introduces 'Ijazat Aap Ki' service: Service will enable citizens to give their consent before verification of CNIC. <https://tribune.com.pk/story/2404125/nadra-introduces-ijazat-aap-ki-service>

UIDAI. (2023). Aadhaar brochure. Unique Identification Authority of India. https://uidai.gov.in/images/Aadhaar_Brochure_Feb_23.pdf

United Nations Development Programme (UNDP). (2025, April). Development Advocate Pakistan: Volume 12, Issue 1 – Artificial Intelligence: Transforming the Future. UNDP Pakistan. https://www.undp.org/sites/g/files/zskgke326/files/2025-04/dap_volume_12_issue_1-artificial_intelligence.pdf

World Bank. (2023). Lifting families out of poverty in Brazil: Bolsa Família program. World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/105731468006311178>

World Bank. (2025). Rebuilding lives, restoring trust: Social protection for displaced families in Pakistan. <https://www.worldbank.org/en/news/feature/2025/06/11/rebuilding-lives-restoring-trust-social-protection-for-displaced-families-in-pakistan>

World Economic Forum. (2024). Generative AI governance: Shaping a collective global future. AI Governance Alliance: Briefing Paper Series. https://www3.weforum.org/docs/WEF_Generative_AI_Governance_2024.pdf

Yeung, K., & Lodge, M. (Eds.). (2019). Algorithmic regulation. Oxford University Press.