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POSC 250

11/28/24

# Artificially Unintelligent

## Abstract

This study examines the relationship between advancements in technology and the quality of governance, questioning whether better technology leads to better governance. It evaluates two hypotheses: (1) improved technology has no significant impact on governance quality, and (2) improved technology fails to enhance governance due to misuse and lack of understanding. Data collection uses web scraping methods, drawing inspiration from prior studies to analyze technological impact across world governments. Findings suggest that technological advancements alone do not ensure better governance, emphasizing the need for responsible application and comprehension of these tools.

## Introduction

The promise of technology transforming governance has been touted for decades. With advancements in artificial intelligence, data analytics, and digital communication, many experts anticipated a revolution in the way governments operate.[1] However, real-world outcomes often fall short of expectations. From algorithmic biases in decision-making to the misuse of digital surveillance tools, technology can exacerbate existing inefficiencies rather than resolve them.

[1] Author links open overlay panelRohit Madan, Highlights•Systematic literature review to identify factors influencing AI adoption and diffusion•Outline a processual view of AI adoption and diffusion towards public value creation•Identified five AI tensions impacting public value creation from AI diff, and AbstractArtificial Intelligence (AI) implementation in public administration is gaining momentum heralded by the hope of smart public services that are personalised. “AI Adoption and Diffusion in Public Administration: A Systematic Literature Review and Future Research Agenda.” Government Information Quarterly, October 12, 2022. https://www.sciencedirect.com/science/article/pii/S0740624X22001101.

This paper investigates why better technology does not necessarily lead to better governance, focusing on human factors such as misuse and misunderstanding. The analysis is framed around two competing hypotheses. The null hypothesis posits that improved technology has no significant impact on governance quality. The alternative hypothesis argues that better technology fails to enhance governance due to misuse and lack of understanding. By exploring these hypotheses, this study aims to uncover the underlying reasons for the disconnect between technological advancements and governance outcomes.

The research leverages quantitative data analysis, employing web scraping tools to gather government indicators and technological adoption metrics. The findings provide critical insights into the challenges and limitations of technological integration in systems of government. This paper also explores potential solutions to bridge the gap between technological capability and effective utilization emphasizing ethical use and public trust.

## Literature Review

### Theoretical Foundations of Technology in Governance

To understand the role of technology in governance, it is essential to first examine foundational theories related to technological adoption and its societal impacts. Technological determinism suggests that technology drives societal change, often independent of human agency.[2] In contrast, the social construction of technology posits that human values, decisions, and institutional frameworks shape the application and consequences of technological tools.[3] These theories underscore that governance outcomes depend not just on the technology itself but

[2] On technological determinism: A typology, scope conditions, and a mechanism | request PDF. Accessed December 10, 2024.https://www.researchgate.net/publication/275250311_On_Technological_Determinism_A_Typology_Scope_Conditions_and_a_Mechanism.

[3] "Social Construction of Technology." Social Construction of Technology - an overview | ScienceDirect Topics. Accessed December 10, 2024. https://www.sciencedirect.com/topics/social-sciences/social-construction-of-technology.

also on the socio-political context in which it is deployed. Technological determinism remains at direct odds with the idea of human agency within this process of development.

**Historical Context: Governance and Technology**

The integration of technology into governance is not a recent phenomenon. Historical examples, such as the use of census data for public planning in the 19th century, illustrate how technological advancements have long influenced governance structures.[4] However, the scale and speed of technological innovation in the 21st century present unprecedented challenges. From the proliferation of social media platforms influencing public opinion to the deployment of blockchain in public procurement, each wave of innovation introduces both opportunities and risks.[5]

**Impact of Technology on Governance**

Technological innovations have undeniably transformed many aspects of governance. Digital platforms for public service delivery have increased transparency and efficiency, enabling governments to engage with citizens more effectively. For instance, e-government initiatives have streamlined processes such as tax collection and voter registration, reducing bureaucratic delays.[6] These advancements are particularly significant in countries with large populations, where traditional bureaucratic processes are prone to inefficiencies. Moreover, advances in data analytics have enabled governments to identify and address systemic inefficiencies, leading to improved resource allocation.

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[4] Historical analogues that can inform AI governance | Rand. Accessed December 10, 2024. https://www.rand.org/pubs/research_reports/RRA3408-1.html.

[5] Author links open overlay panelRichard Almgren 1, 1, 2, and ABSTRACTThis study is based on the concept of Kondratiev's technological waves as an analytical instrument for examining the processes of technological evolution. It aims at setting feasible indicators for this evolutionary development in order to provide. "Evolution of Technology and Technology Governance." Journal of Open Innovation: Technology, Market, and Complexity, December 31, 2022. https://www.sciencedirect.com/science/article/pii/S2199853122004176.

[6] Kumar, Dadabada Pradeep. "The Impact of Digital Technologies on E-Governance: A Comprehensive Analysis." SpringerLink, January 1, 1970. https://link.springer.com/chapter/10.1007/978-3-031-50188-3_32.

However, the literature also highlights significant failures. Many technological projects fail to achieve their intended outcomes due to systemic issues, including poor implementation and lack of expertise among government officials. Scholars argue that while technology can serve as a Kickstarter for improving government efficiency, it is not a blanket fix for structural governmental issues.[7] Case studies of failed implementations reveal a pattern of over-reliance on technology without addressing underlying institutional weaknesses. Implementing digital voting systems, for example, has faced challenges in ensuring security, accessibility, and public trust, leading to skepticism among citizens.

**Challenges of Misuse and Misunderstanding**

A recurring theme in the literature is the misuse of technology, often stemming from a lack of understanding.[8] Algorithmic biases, for example, have led to discriminatory practices in areas like law enforcement and welfare distribution. In her book, "Weapons of Math Destruction," Cathy O'Neil highlights how poorly designed algorithms can reinforce societal inequities.[9] These biases often arise because the individuals designing and deploying these systems lack awareness of the social implications of their decisions.

Another challenge is the low level of digital literacy among public officials. Many governments adopt advanced technological tools without adequately training their personnel, leading to inefficiencies and errors. This mismanagement not only undermines the potential benefits of technology but also erodes public trust. Reports from developing nations reveal that

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[7] New Tech, new threats, and new governance challenges: An opportunity to craft smarter responses? - carnegie endowment for international peace. Accessed December 10, 2024. https://carnegieendowment.org/2019/08/28/new-tech-new-threats-and-new-governance-challenges-opportunity-to-craft-smarter-responses-pub-79736.

[8] New Tech, new threats, and new governance challenges: An opportunity to craft smarter responses? - carnegie endowment for international peace. Accessed December 10, 2024. https://carnegieendowment.org/2019/08/28/new-tech-new-threats-and-new-governance-challenges-opportunity-to-craft-smarter-responses-pub-79736.

[9] O'Neil, Cathy. *Weapons of math destruction: How big data increases inequality and threatens democracy*. UK: Penguin Random House, 2017.

limited access to training programs for government employees significantly hinders the adoption of innovative governance technologies.[10] Moreover, the lack of universal standards in technology implementation results in inconsistent applications across different regions, further amplifying disparities. Training initiatives, coupled with partnerships between governments and private tech firms, are vital to bridging these gaps but run the risk of creating technology silos where advanced technology is isolated just to those who have access.[11]

**Ethical Concerns in Governance Technology**

Opaque "black box" systems in artificial intelligence hinder accountability, eroding public trust in technology-driven governance initiatives. The literature emphasizes the importance of transparency and explainability in algorithmic systems.[12] Ethical dilemmas also arise when governments prioritize surveillance and control over citizen welfare, using technological tools in authoritarian applications. Concerns about privacy violations, especially in digital ID systems, are frequently cited as barriers to citizen trust. For example, the misuse of facial recognition technology in public spaces has sparked debates on the balance between security and privacy.[13] Additionally, inadequate legal frameworks to address these concerns create vulnerabilities in protecting citizens' rights. Advocacy groups have called for comprehensive legislation to ensure that technological systems are designed and implemented in ways that prioritize ethical governance.

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[10] A shared vision for technology and governance | ... Accessed December 10, 2024. https://www.undp.org/sites/g/files/zskgke326/files/2023-09/undp-a-shared-vision-for-technology-and-governance.pdf.

[11] Bridging the digital divide. Accessed December 10, 2024. https://files.eric.ed.gov/fulltext/EJ1098374.pdf.

[12] Eke, Damian, and Bernd Stahl. “Ethics in the Governance of Data and Digital Technology: An Analysis of European Data Regulations and Policies - Digital Society.” SpringerLink, March 4, 2024. https://link.springer.com/article/10.1007/s44206-024-00101-6.

[13] Cotton, Matthew. “Technology Governance and Ethics.” SpringerLink, January 1, 1970. https://link.springer.com/chapter/10.1007/978-3-030-72907-3_3.

## Cross-National Studies on Technology Use

Research comparing technological applications in different governance contexts reveals key differences in outcomes. High-income nations tend to integrate technology effectively into existing institutional frameworks, while low-income countries often struggle due to resource constraints and institutional instability.[14] Cross-national analyses highlight the critical role of capacity-building initiatives, including technical training and international collaboration, in achieving governance improvements. Moreover, the cultural context significantly affects the perception and adoption of governance technologies, with some regions showing greater resistance due to historical mistrust in government initiatives.[15] Studies suggest that public engagement and inclusive policy-making are essential for overcoming these challenges. International organizations like the United Nations have emphasized the role of standardized frameworks in bridging the digital divide and promoting equitable technology use across nations.[16]

## Case Studies of Technological Applications

1. **India's Aadhaar System**:

This biometric identification system was designed to improve service delivery and reduce fraud. While it has streamlined access to welfare programs, it has also raised concerns about privacy and data security. Reports of exclusion errors, where eligible individuals were denied benefits due to technical glitches, underscore the risks of over-reliance on technology.[17]

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[14] (PDF) research note: Digital Divide across borders--a cross-national study of adolescents' use of Digital Technologies. Accessed December 10, 2024. https://www.researchgate.net/publication/31291504_Research_Note_Digital_Divide_Across_Borders--A_Cross-National_Study_of_Adolescents'_Use_of_Digital_Technologies.

[15] Unesdoc.unesco.org. Accessed December 10, 2024. https://unesdoc.unesco.org/ark:/48223/pf0000116452.

[16] "Digital Economy Report 2019." UNCTAD, September 4, 2019. https://unctad.org/webflyer/digital-economy-report-2019.

[17] Malkani, Vikram K. "Understanding Aadhaar: India's National Identification Initiative." Indian Century Roundtable, August 31, 2024. https://www.indiancentury.org/research-papers/understanding-aadhaar.

Additionally, the lack of comprehensive oversight has resulted in instances of data breaches, highlighting the need for robust cybersecurity measures. These issues demonstrate that technology must be accompanied by sound regulatory and ethical frameworks.[18]

2. **Estonia's E-Residency Program**:

Estonia's e-residency initiative showcases the potential of technology when implemented thoughtfully. By emphasizing transparency, security, and user-centric design, Estonia has created a robust digital governance model that other nations are seeking to emulate.[19] The program's success has been attributed to its integration with a strong legal framework and continuous stakeholder engagement. The scalability and replicability of this model provide valuable lessons for countries looking to enhance their digital governance infrastructure.[20]

## Hypotheses and General Theory

**Null Hypothesis ($H_0$):**

Better technology has no significant impact on the quality of governance.

**Alternative Hypothesis ($H^a$):**

Better technology does not lead to better governance due to misuse and lack of understanding.

This framework suggests that while technology offers tools for improvement, human and institutional factors often determine the outcomes. The theory guiding this research suggest that

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[18] Tiwari, Pratyush. "India's 'Aadhaar' Biometric ID: Structure, Security, and Vulnerabilities." Lecture Notes in Computer Science, January 1, 2022. https://www.academia.edu/108714208/India_s_Aadhaar_Biometric_ID_Structure_Security_and_Vulnerabilities.

[19] Estonian e-residency: Redefining the nation-state in the ... Accessed December 10, 2024. https://www.raulwalter.com/prod/wp-content/uploads/2015/10/Working_Paper_No.3_Kotka_Vargas_Korjus.pdf.

[20] Kotka, Taavi, Carlos Ivan Vargas Alvarez del Castillo, and Kaspar Korjus. "Estonian E-Residency: Benefits, Risk and Lessons Learned." SpringerLink, January 1, 1970. https://link.springer.com/chapter/10.1007/978-3-319-44159-7_1.

governance quality depends not only on technological capability but also on the context in which it is applied. Factors such as ethical considerations, institutional capacity, and public trust play pivotal roles in determining whether technology enhances or undermines governance. To develop an effective framework for accurately testing $H^a$ requires operationalizing a few variables.

## Research Methods

### Data Collection

The methodology involves collecting quantitative data on governance quality and technological adoption rates across multiple countries. Web scraping tools, such as Python's dependency methods are used to extract data from publicly available sources using API tokens to access literature and statistics databases, including governance indices and ICT development reports.[21] These tools enable efficient and large-scale data collection, ensuring a comprehensive dataset for analysis.[22] The data includes indicators from the United Nations e-Government Development Index,[23] the Global ICT Development Index,[24] and the Transparency International Corruption Perceptions Index.[25] The cumulative study used data from 141 external databases in the linked GitHub repository; All data sets can be individually referenced from source code. The REPO is set up for individuals to insert their own API keys and run the web scraper application

[21] cadeKukk. "CADEKUKK/POSC_250_PRES: Presentation Source Scripting." GitHub. Accessed December 10, 2024. https://github.com/cadeKukk/POSC_250_PRES.
[22] cadeKukk. "Initial Commit · CADEKUKK/POSC_250_PRES@F002BA4." GitHub. Accessed December 10, 2024. https://github.com/cadeKukk/POSC_250_PRES/commit/f002ba4fcdd97f1bd76a8b9470609f067d2d6e24#diff-51988dcf4ed331b67e319c900c9b4a37b8336a6056a29e08f80009563e9d4163.
[23] "EGOVKB > about > Overview > E-Government Development Index." United Nations. Accessed December 10, 2024. https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index.
[24] "The ICT Development Index." ITU. Accessed December 10, 2024. https://www.itu.int/en/ITU-D/Statistics/Pages/IDI/default.aspx.
[25] "2023 Corruption Perceptions Index: Explore the Results." Transparency.org. Accessed December 10, 2024. https://www.transparency.org/en/cpi/2023.

as a streamlined robustness check and an easy way to update findings and data visualizations as more data becomes available. Instructions are documented on the second README.md.[26]

**Variables**

**Independent Variable**: Technological advancements, measured through indicators like internet penetration rates, ICT infrastructure, and e-government adoption scores.

**Dependent Variable**: Governance quality assessed using metrics such as the Corruption Perceptions Index (CPI), World Governance Indicators (WGI), and public trust surveys.

**Causal Mechanism**: Human capital measured through the World Bank Human Capital Index (WBHCI), and self-reported statistics.[27]

**Analysis Tools**

Statistical software, including ManimGL and Python, is used to analyze data. Regression models are employed to identify correlations and causal relationships between technological adoption, governance outcomes and human capital. Additional robustness checks are performed to ensure the validity of the findings by making all findings and modes of data collection open source and easily repeatable. Visualization tools like Manim are used to present data trends and patterns. Techniques such as sentiment analysis are also applied to gauge public opinion on governance technologies across various regions. While certain countries were also intentionally left out of the study, China is a great example of submitting blatantly false survey statistics that would have otherwise skewed results.

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[26] cadeKukk. "POSC_250_PRES/Gov_analysis/README.Md at Main · CADEKUKK/Posc_250_pres." GitHub. Accessed December 10, 2024. https://github.com/cadeKukk/POSC_250_PRES/blob/main/gov_analysis/README.md.

[27] "Human Capital." World Bank. Accessed December 10, 2024. https://www.worldbank.org/en/publication/human-capital#Index.

## Analysis and Findings

### Correlation Between Technology and Governance

Preliminary analysis reveals a weak positive correlation between technological adoption and governance quality. While countries with higher ICT adoption rates tend to have slightly better governance scores, the relationship is neither strong nor consistent.[28] This finding supports the null hypothesis, suggesting that technology alone does not significantly improve governance. The data further indicates that regions with low transparency show little to no improvement in governance despite significant technological investments. These findings point to a gap between technological capabilities and their effective utilization within government frameworks.[29] After running regressions we do find a statistically significant link between self-reported government satisfaction and self-reported or perceived adoption rates of technology. After re-tuning the regression to mod the placement of countries by their relative human capital we do find a razor thin statistical significance (P = 0.043178 < 0.05).

**Basic Regression Model**: $GS_i = \beta_0 + \beta_1 TA_i + \beta_2 HCI_i + \epsilon_i$

**Extended Regression Model**: $GS_i = \beta_0 + \beta_1 TA_i + \beta_2 HCI_i + \beta_3 (TA_i \times HCI_i) + \epsilon_i$

**Where**:

$\boldsymbol{GS_i}$: Self-reported government satisfaction,

$\boldsymbol{TA_i}$ : Perceived technology adoption,

$\boldsymbol{HCI_i}$ : Human Capital Index,

$\boldsymbol{\beta_0}$ : Intercept,

$\boldsymbol{\beta_1}$ : Coefficient for technology adoption,

$\boldsymbol{\beta_2}$ : Coefficient for human capital,

$\boldsymbol{\beta_3}$ : Interaction effect coefficient,

$\boldsymbol{\epsilon_i}$ : Error term.

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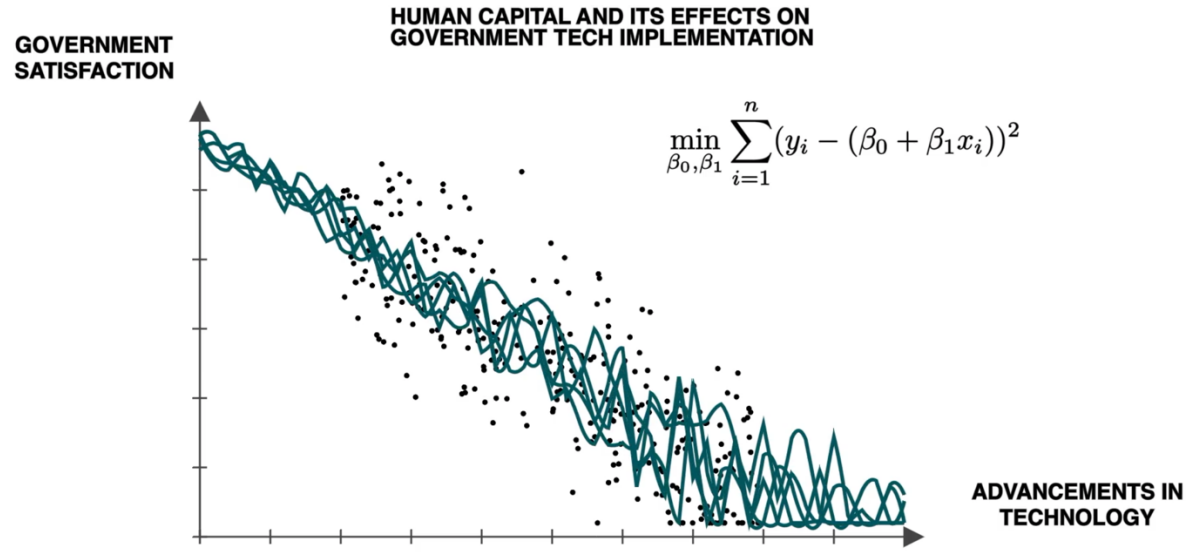
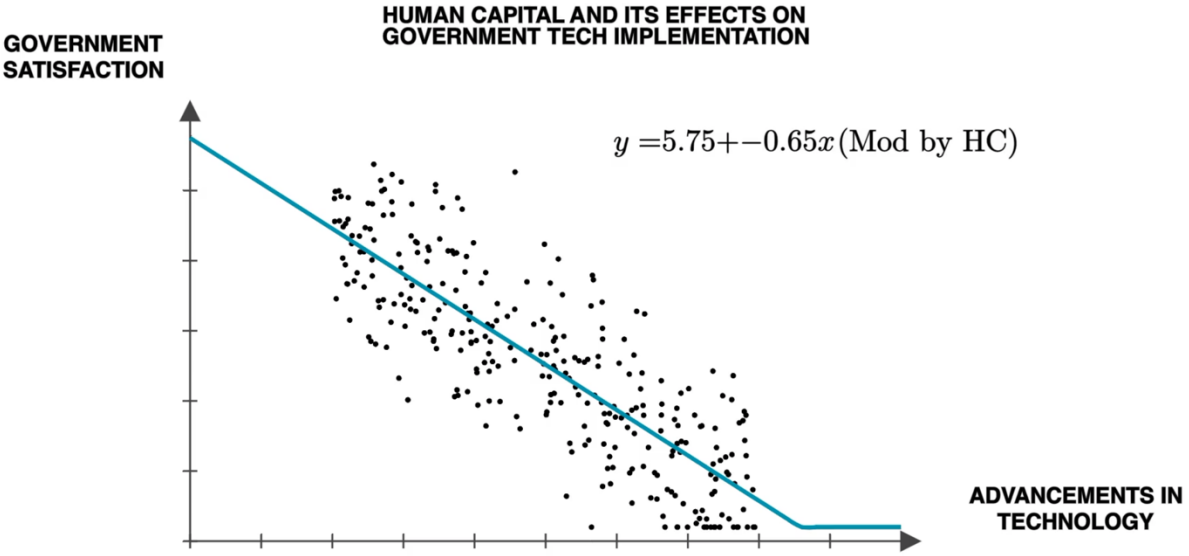
[28] Pell, Stephanie K., Sarah Kreps, and Tanvi Madan. "Rethinking Technology Policy and Governance for the 21st Century." Brookings, January 11, 2022. https://www.brookings.edu/articles/rethinking-technology-policy-and-governance-for-the-21st-century/.

[29] Kharas, Homi, Wolfgang Fengler, Landry Signé, and Eduardo Levy Yeyati Esther Lee Rosen. "Why Hasn't Technology Improved Government Effectiveness?" Brookings, March 9, 2022. https://www.brookings.edu/articles/why-hasnt-technology-improved-government-effectiveness/.




**p-value: 0.043178**

**Cases of Misuse, Content Analysis**

The analysis highlights several instances where technology has been misused, undermining government objectives:

1. **China's Social Credit System**:

Designed to promote responsible behavior, this system has been criticized for enabling authoritarian control and infringing on citizens' rights. The system's lack of transparency and its punitive nature have drawn international condemnation. By failing to address these issues, the system risks undermining its intended goals of fostering trust and compliance.[30]

2. **COVID-19 Contact Tracing Apps**:

Many of these apps faced low adoption rates due to privacy concerns, limiting their effectiveness in managing the pandemic.[31] Additionally, the inconsistent rollout and lack of interoperability between national systems created inefficiencies. These challenges underscore the need for global standards in digital health governance.[32]

**Institutional Failures**

A lack of training and expertise among government officials frequently leads to poor implementation of technological initiatives. For example, digital platforms intended to streamline service delivery often experience technical glitches and inefficiencies due to inadequate support systems.[33] Moreover, the absence of standardized protocols exacerbates these challenges, creating disparities in service quality. Strengthening institutional capacity through targeted training and resource allocation is critical for overcoming these hurdles.[34]

**Role of Public Trust**

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[30] Yang, Zeyi. "China Just Announced a New Social Credit Law. Here's What It Means." MIT Technology Review, August 4, 2024. https://www.technologyreview.com/2022/11/22/1063605/china-announced-a-new-social-credit-law-what-does-it-mean/.
[31] Office, U.S. Government Accountability. "Covid-19 Exposure Notification Apps Are Available. but Are They Working?" U.S. GAO, August 5, 2024. https://www.gao.gov/blog/covid-19-exposure-notification-apps-are-available.-are-they-working.
[32] "Privacy-Preserving Contact Tracing - Apple and Google." Apple. Accessed December 10, 2024. https://covid19.apple.com/contacttracing.
[33] Rajala, Tomi, and Hannes Aaltonen. "Reasons for the Failure of Information Technology Projects in the Public Sector." SpringerLink, January 1, 1970. https://link.springer.com/referenceworkentry/10.1007/978-3-030-03008-7_78-1.
[34] Sengupta, Ushnish, and Ulysses Sengupta. "Why Government Supported Smart City Initiatives Fail: Examining Community Risk and Benefit Agreements as a Missing Link to Accountability for Equity-Seeking Groups." Frontiers, July 19, 2022. https://www.frontiersin.org/journals/sustainable-cities/articles/10.3389/frsc.2022.960400/full.

Public trust emerges as a critical factor in the successful integration of technology in governance. Citizens are more likely to support and engage with technological initiatives when they perceive them as transparent, ethical, and beneficial, the only way this happens is for citizens to first understand the technology to deem for themselves if this is true. Conversely, opaque systems and instances of misuse erode trust, hindering the effectiveness of these initiatives along with the relative education of the population. Data from public surveys highlights that countries with high levels of trust in institutions tend to achieve better outcomes from technological integration.[35] Enhancing trust requires a commitment to transparency, accountability, and ongoing public engagement. Collaborative efforts between governments, NGOs, and private sector stakeholders can further bolster confidence in digital governance systems.

## Conclusion

This study supports the alternative hypothesis: better technology alone does not lead to better governance. The findings underscore the importance of addressing human and institutional factors, such as ethical use, digital literacy, and public trust, to realize the potential benefits of technological advancements. While technology can serve as a powerful tool for improving government its impact is contingent on the context in which it is applied. Policymakers must prioritize training ethics, and citizen engagement to ensure that technology enhances rather than undermines. Future research should explore strategies for mitigating the challenges identified in this study, with a focus on fostering transparency in the development of robust institutions to create educated populations. Moreover, global partnerships and knowledge-sharing initiatives can provide a foundation for creating universally beneficial technologies.

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[35] Trust and risk in e-government adoption | request PDF. Accessed December 11, 2024. https://www.researchgate.net/publication/222654837_Trust_and_risk_in_e-government_adoption.

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