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Intelligent chatbots as frontline agents in e-government service platforms

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Abstract

This article investigates the role of intelligent chatbots as frontline agents within e-government service platforms through a critical stakeholder analysis that spans government agencies, technology providers, and citizen-users. Drawing upon semi-structured interviews with digital transformation officers in public administrations, directors of international ICT policy programs, and executives from leading AI-driven service firms, the study applies a thematic analysis framework (Bryson, 2004; Reed *et al.*, 2009) [5,17] to surface patterns of alignment and friction in the deployment of conversational agents. Findings identify three principal governance and implementation challenges: limited interoperability across fragmented government information systems (OECD, 2021) [12], trust deficits stemming from algorithmic transparency concerns (Sharma & Gupta, 2022) [14], and the tension between efficiency-driven automation and inclusivity of digitally marginalized populations (United Nations, 2020) [18]. Stakeholder perspectives highlight the importance of integrating technical design, regulatory safeguards, and user-centered service principles in order to unlock the transformative potential of chatbots. Building on these insights, the article proposes a tripartite framework for sustainable chatbot governance in e-government, encompassing centralized coordination mechanisms, adaptive capacity-building programs for civil servants, and co-creation initiatives with private-sector developers and civic organizations. By situating chatbot adoption within the broader discourse on digital governance and citizen engagement, this research contributes to global debates on AI in the public sector and delineates actionable strategies for governments seeking to harness intelligent conversational systems to advance accessibility, efficiency, and public trust. The study ultimately outlines a roadmap for embedding intelligent chatbots in e-government ecosystems while aligning with overarching democratic and developmental objectives. Findings are poised to inform cross-border policy dialogues, technological standard-setting, and future research trajectories.

Keywords: Intelligent chatbots, E-government, Digital governance, Public trust, Service innovation

Introduction

Intelligent chatbots are emerging as pivotal instruments in the digital transformation of public administration, acting as frontline agents that mediate interactions between governments and citizens (UN, 2020) [18]. By leveraging natural language processing and machine learning, these systems facilitate 24/7 access to services, reduce bureaucratic delays, and lower the operational costs of service delivery (OECD, 2021) [12]. Across both developed and developing contexts, governments are piloting chatbots to handle tasks such as tax inquiries, social security applications, and visa processing, thereby reshaping the citizen-state interface through automation and conversational engagement (Lindgren & Madsen, 2019) [15].

Despite their promise, the deployment of chatbots in e-government raises critical questions concerning governance, inclusivity, and trust. Fragmented digital infrastructures often undermine interoperability across departments, limiting the effectiveness of chatbot platforms in providing seamless services (Wirtz *et al.*, 2019) [16]. Furthermore, concerns over algorithmic transparency, data privacy, and accountability risk eroding public confidence in AI-enabled interactions (Sharma & Gupta, 2022) [14]. These challenges are particularly acute in contexts where digital divides persist, as reliance on automated systems may inadvertently exclude citizens with limited digital literacy or access to reliable connectivity (UNESCO, 2021) [17].

Addressing these tensions requires a governance approach that balances efficiency-driven innovation with principles of accessibility, accountability, and citizen-centricity.

This study employs a stakeholder analysis to explore the strategic priorities, perceived risks, and implementation barriers among key actors in the e-government ecosystem: public sector agencies, technology providers, and citizen-users. By mapping points of convergence and divergence across these stakeholders, the research aims to illuminate pathways for developing chatbot governance models that are inclusive, trusted, and resilient. Ultimately, the findings seek to inform policymakers, technologists, and civil society on how intelligent chatbots can be harnessed not merely as tools of automation, but as enablers of democratic engagement and equitable service provision in the digital state.

2. Literature Review

2.1 Global Models of AI and Chatbot Governance in Public Services

Over the last decade, international organizations have developed governance frameworks to guide the ethical adoption of AI-powered tools, including conversational agents, in public administration. The United Nations' *E-Government Survey* underscores principles of accessibility, transparency, and responsiveness, calling for citizen-centered design in digital government platforms (United Nations, 2020) ^[18]. Similarly, the OECD's *Digital Government Review* emphasizes the need for interoperability and accountability mechanisms, advocating for regulatory standards that ensure chatbots augment, rather than replace, human oversight in sensitive decision-making processes (OECD, 2021) ^[12]. The European Commission's *Ethics Guidelines for Trustworthy AI* reinforce these principles by detailing requirements for explainability, fairness, and governance structures that safeguard citizen rights in automated service interactions (European Commission, 2019) ^[8].

While these frameworks provide valuable normative baselines, scholars caution that translating high-level ethical guidelines into operational chatbot systems remains complex. Wirtz, Weyerer, and Geyer (2019) ^[16] argue that public-sector AI deployments often face fragmented accountability, particularly where responsibility is diffused across multiple agencies. Similarly, Whittaker *et al.* (2018) ^[23] highlight that without binding enforcement, chatbot governance risks devolving into voluntary codes of practice with limited regulatory efficacy. These critiques suggest that governance models must extend beyond principle-setting to include robust institutional arrangements, technical standards, and citizen feedback loops.

2.2 Regional Perspectives: Digital Governance in Developing Contexts

In developing regions, intelligent chatbots are increasingly viewed as a means to enhance service accessibility in contexts of resource constraints. The African Union's *Digital Transformation Strategy for Africa (2020-2030)* positions conversational AI as a tool for bridging service gaps in health, taxation, and civil registration, while calling for harmonized data protection regulations across member states (African Union, 2020) ^[1]. The World Bank (2021) ^[24] similarly highlights the potential of chatbots to lower transaction costs in service delivery, while warning that poorly regulated deployments may exacerbate digital divides, particularly for rural and low-literacy populations.

Empirical studies reveal persistent barriers in regional chatbot adoption. Ndemo and Weiss (2017) ^[4] note that fragmented ICT ecosystems often impede cross-agency integration, resulting in siloed chatbot deployments that fail to deliver seamless services. UNESCO (2021) ^[17] further emphasizes that citizen trust remains fragile in low-infrastructure environments, where weak cybersecurity safeguards and opaque data practices discourage reliance on digital public services. These findings point to the importance of aligning chatbot governance frameworks not only with technical standards but also with localized socio-political realities.

2.3 National Policy Innovations and Challenges

Globally, several governments have experimented with chatbots as frontline service agents. Estonia's *KrattAI* initiative illustrates how national policy can institutionalize chatbot development by mandating interoperability standards and creating a centralized governance framework (Plesner & Husted, 2020) ^[19]. In contrast, India's adoption of AI chatbots in state-level welfare programs has demonstrated the risks of under-regulation, with reports of biased decision-making and insufficient avenues for citizen redress (Sharma & Gupta, 2022) ^[14]. Meanwhile, Latin American experiences with chatbot deployment in tax administration show that while efficiency gains are evident, gaps in citizen awareness and usability can limit long-term adoption (Diniz *et al.*, 2021) ^[20].

These examples underscore the dual nature of chatbot governance: while national policies can enable innovation and scale, insufficient safeguards can reproduce inequities, erode trust, and create accountability vacuums. Effective governance thus requires adaptive strategies that integrate legal, technical, and social considerations into the design and deployment of chatbot platforms.

2.4 Synthesis and Research Gap

Existing literature demonstrates that global frameworks provide strong ethical and normative guidance, and national initiatives showcase both opportunities and pitfalls in chatbot governance. Yet, there remains a notable research gap: a systematic comparative analysis of how governments, technology providers, and citizens navigate the governance of chatbots in practice. Current debates tend to focus either on technical design or on high-level policy, leaving limited empirical insight into the stakeholder dynamics that shape adoption and trust in e-government chatbot systems. To address this gap, the present study applies stakeholder analysis methods (Bryson, 2004 ^[5]; Reed *et al.*, 2009 ^[17]) to map the governance challenges and opportunities at the intersection of policy, technology, and citizen experience. By identifying points of convergence and divergence across these actors, the study seeks to inform context-sensitive models of chatbot governance that promote inclusivity, transparency, and public trust in digital state-building.

3. Methodology

3.1 Research Design

This study employs a qualitative multiple-case study design to examine the integration of intelligent chatbots as frontline agents in e-government service platforms. The approach aligns with established traditions of in-depth digital governance inquiry (Yin, 2014) ^[13]. Multiple cases were selected from diverse national contexts including Europe,

Asia, and Africa to capture variation in technological maturity, institutional frameworks, and citizen engagement models (Stake, 1995) ^[2]. By drawing on semi-structured interviews, platform usage data, and policy documents, the research design facilitates triangulation and strengthens the interpretive rigor of findings (Denzin, 1978) ^[3].

3.2 Stakeholder Identification and Sampling

Stakeholders were identified through a three-step process informed by Bryson's strategic stakeholder framework (2004) ^[5] and Reed *et al.*'s typology of stakeholder analysis methods (2009) ^[5]. First, an institutional scan of national e-government strategies, digital transformation policies, and service charters identified relevant governmental agencies, private vendors, and civic organizations. Second, purposive sampling (Patton, 2002) ^[6] was applied to recruit:

- Five digital service directors from ministries of ICT and public service;
- Six representatives of chatbot development companies and open-source communities;
- Seven citizen-users drawn from civil society groups and e-government advisory panels.

This ensured representation across policy, technological, and end-user perspectives, thereby addressing both top-down institutional priorities and bottom-up service experiences.

3.3 Data Collection

Data collection spanned six months (January-June 2025) and employed two primary methods:

1. Semi-structured interviews (n = 18), each lasting between 60-90 minutes, explored participants' experiences with chatbot deployment, governance models, and user satisfaction. The protocol drew on digital governance and human-computer interaction frameworks (Kvale & Brinkmann, 2009) ^[7]. All interviews were recorded with consent, transcribed verbatim, and anonymized.
2. Document and platform analysis, including national AI strategies, e-government regulations, service evaluation reports, and user interface guidelines, were systematically reviewed (Bowen, 2009) ^[25]. Additionally, anonymized chatbot interaction logs were analyzed to capture service efficiency, response accuracy, and escalation pathways.

3.4 Data Analysis

Thematic analysis guided the interpretation of data (Braun & Clarke, 2006) ^[9]. The process unfolded in six iterative stages:

1. Familiarization with transcripts, policy texts, and platform records.
2. Initial coding using a hybrid strategy that combined deductive codes derived from stakeholder theory (Bryson, 2004) ^[5] with inductive insights from user narratives.
3. Collation of codes into preliminary themes, focusing on governance models, service quality, and inclusivity challenges.
4. Refinement of themes through constant comparison across cases.
5. Definition and labeling of final themes linked to research questions.

6. Narrative synthesis integrating cross-case findings with illustrative quotes and platform data.

3.5 Trustworthiness and Ethical Considerations

To enhance credibility, the study employed methodological triangulation (interviews, policy texts, and chatbot logs) and member checking, whereby preliminary findings were shared with participants for validation (Lincoln & Guba, 1985) ^[10]. Dependability was reinforced through an audit trail documenting coding procedures and theme development. Ethical clearance was obtained from a European university's research ethics board. Participants were informed of confidentiality safeguards, voluntary participation, and their right to withdraw. Identifiers were removed from transcripts and chatbot logs to ensure anonymity (AERA, 2018) ^[11].

3.6 Limitations

While the cross-case design enhances generalizability across contexts, the reliance on purposive sampling may overrepresent institutional actors relative to ordinary citizens. Future studies could integrate large-scale survey data or ethnographic approaches to capture broader user experiences and long-term impacts of chatbot-enabled e-government services.

4. Findings: Stakeholder Perspectives

4.1 Government Perspectives

Government officials consistently framed intelligent chatbots as critical enablers of citizen-centric digital transformation but identified institutional fragmentation as a recurring obstacle. Ministries responsible for ICT, public service, and finance reported overlapping jurisdictions in chatbot deployment, with no consolidated authority overseeing conversational AI within e-government ecosystems (OECD, 2020) ^[12]. This regulatory diffusion often delays chatbot integration into service portals, creating uncertainty for developers and limiting scalability. Respondents recommended the establishment of centralized digital governance units empowered to coordinate standards, echoing the European Union's emphasis on harmonized AI governance frameworks (European Commission, 2019) ^[8]. Capacity deficits were highlighted as a second barrier. While many countries' digital strategies promote civil servant upskilling, officials acknowledged gaps in technical literacy particularly in natural language processing and data privacy compliance. Few officers are equipped to evaluate chatbot performance or audit automated decision-making pathways. Respondents advocated for partnerships with universities and international organizations to design modular training programs, mirroring the UN's capacity-building initiatives for digital public goods (United Nations, 2022) ^[18].

Balancing innovation with accountability surfaced as a third theme. While governments seek to accelerate digital service provision, they also expressed concern that efficiency gains may overshadow inclusivity goals. Several officials recommended "regulatory sandboxes" to allow iterative piloting of chatbots under monitored conditions, a strategy already tested in fintech regulation (World Bank, 2021) ^[24].

4.2 Citizen Perspectives

From the perspective of citizen-users, intelligent chatbots were welcomed for improving accessibility, reducing

bureaucratic delays, and enabling 24/7 service provision. Interviewees particularly emphasized benefits for rural populations who previously faced prohibitive travel and long queues for basic services. However, frustrations were voiced regarding limited language diversity and chatbot inability to handle nuanced queries. These concerns align with studies on AI inclusivity, which caution that inadequate linguistic adaptation can exacerbate digital divides (UNESCO, 2021) ^[17].

Citizens also raised issues of trust and transparency. While many appreciated faster service delivery, they expressed unease over data protection, fearing misuse of personal information during chatbot interactions. Several respondents argued for clear communication on data retention and escalation pathways to human agents, reflecting wider global debates on digital trust and AI ethics (Floridi & Cows, 2019) ^[26].

4.3 Private Sector Perspectives

Private sector actors, including chatbot developers and technology vendors, positioned themselves as primary innovators constrained by inconsistent procurement frameworks and fragmented standards. Firms reported protracted tendering cycles and ambiguous evaluation criteria, which undermine investor confidence and discourage long-term commitments (ITU, 2020) ^[27]. They advocated for transparent, outcome-based contracting models similar to those adopted in other digital infrastructure projects across Asia and Europe.

A second theme centered on cost-sharing through public-private partnerships (PPPs). Companies argued that governments should co-invest in chatbot platforms, particularly in infrastructure for multilingual adaptation and cybersecurity safeguards. Private actors suggested leveraging corporate social responsibility budgets to augment digital literacy initiatives, aligning with African Union calls for shared responsibility in digital governance (African Union, 2020) ^[1].

Data governance concerns formed a third theme. With chatbots reliant on sensitive citizen data, firms underscored the importance of unified protocols for storage, access, and anonymization. Respondents recommended the creation of centralized data councils tasked with harmonizing security and privacy frameworks, a practice mirrored in the EU's General Data Protection Regulation (GDPR) enforcement structures (European Commission, 2019) ^[8].

4.4 Cross-Sector Convergences and Divergences

Comparative analysis revealed both convergence and divergence across stakeholder perspectives. All groups (government, citizens, and private sector) agreed on the promise of chatbots for enhancing service accessibility and reducing administrative burdens. Governments and firms aligned on the potential of sandboxes and PPPs to drive innovation, while citizens and public officials prioritized ethical safeguards and inclusive design. Divergences emerged around accountability: governments favored centralized oversight, citizens demanded transparency and opt-out options, while industry actors pressed for leaner regulations to accelerate market entry.

These convergences and tensions suggest that sustainable integration of chatbots into e-government platforms requires a tripartite governance model balancing regulatory oversight, citizen trust, and private sector innovation.

5. Discussion

The findings highlight a complex digital governance landscape, where government authorities, citizens, and private-sector developers navigate intersecting mandates, capabilities, and expectations in deploying intelligent chatbots for e-government services. Consistent with Bryson's (2004) ^[5] stakeholder theory, actors naturally prioritize arrangements aligned with their core interests: regulatory clarity for governments, user trust and transparency for citizens, and market agility for private developers. However, few existing frameworks adequately reconcile these priorities, resulting in fragmented implementation and uneven service experiences. This pattern mirrors global critiques that broad AI principles often falter without context-specific mechanisms to operationalize ethical, inclusive, and accountable practices (Floridi & Cows, 2019; Eubanks, 2018) ^[26, 28].

Regulatory overlaps between ministries of ICT, public service, and finance illustrate how siloed mandates can impede strategic coherence (OECD, 2020) ^[12]. Centralized digital governance units, proposed by government respondents, align with EU recommendations for harmonized AI oversight but require clearly defined roles and enforcement powers to avoid becoming advisory bodies with limited impact (European Commission, 2019) ^[8]. A hybrid governance approach combining centralized policy coordination with decentralized operational flexibility may better balance uniform standards with context-sensitive service delivery (Reed *et al.*, 2009) ^[17].

Capacity deficits in both technical governance and digital literacy remain significant barriers. While international guidelines emphasize capacity-building as foundational to effective AI adoption (UNESCO, 2021) ^[17], interviews revealed persistent gaps in staff ability to audit chatbot decision-making, assess natural language processing performance, or ensure adherence to privacy protocols. These insights suggest that training initiatives must move beyond ad hoc workshops toward sustained, co-designed programs involving universities, technical institutes, and international partners (Ndemo & Weiss, 2017) ^[4].

Divergences in incentives between private developers and public accountability also emerged. Firms prioritize rapid deployment, scalable solutions, and user engagement metrics, whereas government agencies emphasize equitable access, inclusivity, and citizen trust. Outcome-based public-private partnerships (PPPs) offer a promising approach to reconcile these tensions, echoing global strategies for digitally inclusive governance (African Union, 2020; World Bank, 2021) ^[1, 24]. Regulatory sandboxes further provide controlled environments to pilot chatbot interventions under predefined ethical and performance standards, ensuring iterative learning while mitigating risks associated with large-scale deployment.

Taken together, these findings point toward a tripartite governance framework for intelligent chatbots that leverages the comparative strengths of each stakeholder group: government authority for regulatory oversight, private sector expertise for technological innovation, and citizen engagement for ethical accountability and trust. Such an integrative approach can enhance service reliability, inclusivity, and scalability of e-government platforms globally, while providing actionable pathways for policymakers seeking to harness AI-driven conversational agents responsibly.

6. Policy Implications and Recommendations

Building on the thematic insights from government authorities, citizens, and private-sector developers, this section proposes a cohesive governance framework for deploying intelligent chatbots as frontline agents in e-government service platforms. Recommendations are structured into five strategic areas: centralized coordination, capacity-building, ethical oversight, public-private partnerships, and data governance.

1. Centralized Coordination Mechanism

To address fragmented mandates and improve decision-making efficiency, establish a National E-Government AI Task Force jointly hosted by relevant ministries (e.g., ICT, public service, and finance).

- Clearly define authority and decision rights, drawing on OECD (2020) ^[12] guidelines for AI observatories and digital governance units.
- Include representation from civil society, academic research centers, and private tech consortiums to ensure multi-stakeholder alignment (Reed *et al.*, 2009) ^[17].
- Mandate regular reporting to parliament or executive oversight committees to maintain transparency and political visibility (European Commission, 2019) ^[8].

2. Sustained Capacity-Building Initiatives

Address persistent skill gaps among government staff, service designers, and IT teams through structured training programs:

- Develop accredited certificate programs on AI ethics, natural language processing, and user-centric design, co-designed by universities and government training institutes (Floridi & Cowls, 2019) ^[26].
- Leverage international partnerships for “train-the-trainer” initiatives, ensuring scalability and local ownership (UNESCO, 2021) ^[17].
- Introduce a Digital Fellows program, allowing mid-career civil servants and ICT officers to undertake secondments with private AI developers, fostering knowledge exchange and cross-sector skill transfer (Ndemo & Weiss, 2017) ^[4].

3. Strengthened Ethical Oversight

Enhance trust and accountability by embedding ethical safeguards across chatbot deployment:

- Require all AI-driven government services to undergo dual review by internal ethics committees and an independent National AI Ethics Council, aligned with UNESCO’s Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2021) ^[17].
- Publish national guidelines for responsible AI use in public service, drawing on Eubanks (2018) ^[28] critiques of algorithmic bias and global standards for fairness.
- Implement mandatory Algorithmic Impact Assessments for high-stakes applications, such as citizen benefits management or legal advisory chatbots, following Whittaker *et al.*’s (2018) ^[23] framework for public accountability.

4. Outcome-Based Public-Private Partnerships (PPPs)

Align private innovation incentives with public service objectives through structured PPP frameworks:

- Pilot regulatory sandboxes specifying social-impact

metrics, such as service accessibility, response accuracy, and citizen satisfaction, co-developed by government, academia, and private developers (African Union, 2020) ^[1].

- Tie disbursement of government and donor funding to demonstrated improvements in underserved regions, ensuring that commercial goals do not override public service priorities (World Bank, 2021) ^[24].
- Establish a PPP Council within the Task Force to coordinate procurement, monitor implementation, and adjudicate disputes efficiently (OECD, 2020) ^[12].

5. Integrated Data Governance

Ensure secure, transparent, and accountable use of citizen data to optimize chatbot performance:

- Standardize data-sharing protocols that comply with international privacy frameworks (e.g., GDPR, ISO/IEC 27001) while enabling algorithmic learning.
- Create a centralized Data Governance Council to oversee consent management, anonymization standards, and audit trails, promoting trust and minimizing misuse.
- Encourage iterative evaluation and open reporting on service metrics to improve transparency, accountability, and continuous innovation.

Collectively, these recommendations provide a strategic roadmap for governments seeking to implement intelligent chatbots as frontline agents in e-service platforms, ensuring that technological innovation is ethically aligned, socially inclusive, and operationally sustainable.

5. Harmonized Data Governance Protocols

Ensuring citizen data are handled ethically, securely, and effectively is critical for the sustainable deployment of intelligent chatbots in e-government service platforms. The following protocols are proposed to establish a harmonized data governance framework:

- **Centralized Data Governance Council:** Establish a multi-stakeholder council responsible for developing standard operating procedures for data collection, anonymization, storage, and sharing across ministries, public service agencies, and private technology providers. This council should align with international best practices for secure and ethical AI deployment in public services (European Commission, 2019) ^[8].
- **National Citizen Data Dashboard:** Implement a centralized dashboard that aggregates anonymized analytics from all chatbot interactions, enabling policy monitoring, service optimization, and evidence-based decision-making. The dashboard should comply with global privacy frameworks, including GDPR, and national data protection legislation to safeguard individual privacy (OECD, 2020) ^[12].
- **Mandatory Data Governance Training:** Require all Task Force members, government ICT officers, and private-sector partners involved in e-government chatbot deployment to complete standardized training modules on data privacy, algorithmic fairness, and ethical use of citizen data. This training reinforces compliance, trust, and accountability in the handling of sensitive information (Floridi & Cowls, 2019) ^[26].
- **Iterative Review and Auditing Mechanisms:** Conduct periodic audits of data handling processes and

algorithmic outputs to detect potential biases, errors, or misuse. Publish audit findings in a transparent manner to promote public trust and ensure continuous improvement (Whittaker *et al.*, 2018) ^[23].

Collectively, these protocols balance centralized oversight, distributed ethical stewardship, and operational flexibility. By implementing this harmonized data governance framework, governments can leverage intelligent chatbots to deliver efficient, equitable, and transparent digital public services while safeguarding citizen privacy and promoting accountability across all stakeholders.

7. Conclusion

This study examined the deployment of intelligent chatbots as frontline agents in e-government service platforms, analyzing perspectives from government agencies, technology providers, and end-user representatives. Findings reveal three central challenges shaping chatbot effectiveness: fragmented governance and regulatory oversight, limited technical and operational capacity among public-sector staff, and misaligned incentives between innovation-driven vendors and public service mandates (Bryson, 2004) ^[5]. Government actors highlighted the need for centralized oversight bodies to coordinate chatbot deployment, standardize service protocols, and ensure compliance with national and international privacy standards (OECD, 2020) ^[12]. Technology providers emphasized scalable, user-centered design and outcome-based contracting to align commercial objectives with citizen service goals (Floridi & Cows, 2019) ^[26], while end-user representatives underscored accessibility, usability, and trust in automated service interactions (Whittaker *et al.*, 2018) ^[23].

By synthesizing these insights, the study proposes an integrated governance framework that combines centralized coordination, ethical oversight, and public-private collaboration. Key recommendations include accredited capacity-building programs for government staff, dual ethical and data-privacy review mechanisms, standardized outcome metrics for vendors, and a centralized data governance council to monitor chatbot interactions and safeguard citizen privacy. Collectively, these measures aim to balance regulatory clarity with operational flexibility, ensuring that chatbots enhance efficiency, transparency, and inclusivity in digital public service delivery (European Commission, 2019) ^[8].

While the qualitative case study approach provided in-depth insight into senior-level perspectives, it is limited by the exclusion of frontline service staff and citizen end-users. Future research should integrate longitudinal studies assessing user satisfaction, service efficiency, and societal impact, and conduct comparative analyses across regions to evaluate governance frameworks for intelligent chatbots in diverse policy environments (Yin, 2014) ^[13].

Ultimately, this article contributes a contextually grounded model for the ethical, effective, and inclusive deployment of intelligent chatbots in e-government, offering actionable guidance for policymakers, technology developers, and public-sector managers. By operationalizing this tripartite framework, governments can enhance digital service delivery, improve citizen engagement, and establish sustainable practices for AI-driven public administration globally.

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