Exploring the Role of Artificial Intelligence Technology in Enhancing Public Services in the Field of E-Government

Zhengqiang Ma

Hangzhou Anheng Information Technology Co., Ltd. Zhejiang Hangzhou 310000

Abstract: ***As a pivotal catalyst driving the new wave of technological revolution and industrial transformation, artificial intelligence (AI) has emerged as a critical enabler for economic and social development, fundamentally reshaping government administration and public service delivery models. In the domain of e-government, AI technologies provide comprehensive capabilities including rapid data perception, intelligent decision-making support, and automated process execution. These technological advancements are instrumental in optimizing administrative approval workflows, advancing the standardization of government services, facilitating open data sharing initiatives, and significantly enhancing government decision-making capacity. The innovative application of AI in e-government systems operates at multiple levels to create transformative effects. At the technical level, AI-driven solutions improve service quality through intelligent automation and predictive analytics. Institutionally, these technologies facilitate government function transformation by enabling data-driven policy formulation and administrative reform. At the safeguard level, AI applications contribute to enhanced social governance capacity through improved risk assessment and crisis management capabilities. The integration of AI into e-government systems thus effectively increases the quality and efficiency of public service delivery, while simultaneously providing more convenient and efficient service options for both enterprises and citizens. This technological transformation represents a significant leap forward in modernizing governance structures and optimizing public service provision.***

Keywords: Artificial intelligence, E-government, Public service efficiency, Governance capacity, Technological transformation, Intelligent decision-making, Government data sharing, Administrative reform.

1. INTRODUCTION

At present, artificial intelligence is developing at an unprecedented pace, exerting a profound influence on human production and daily life and becoming the focal point of international technological competition and industrial transformation. E-government is a vital component of the national government service system and a key element in advancing the modernization of the government governance system and governance capacity. Against the backdrop of a thriving new round of technological revolution and industrial transformation, AI, as its core driver, possesses strong technological innovation capabilities and broad application prospects. As an important part of the national government service system, e-government must keep pace with the times, actively explore application paths for AI technology in the government service sector, and improve the quality of government services by driving innovation in government governance models and optimizing public service delivery. Li, Lin, and Zhang (2025) developed a framework combining federated learning and differential privacy for advertising personalization[1]. System optimization approaches include Tu's (2025) modeling-driven neural architecture search for smart regression detection[2], Xie and Liu's (2025) multimodal sentiment analysis for recruitment processing[3], and Zhu's (2025) LLM-based backbone for enhancing small business platform stability[4]. Zhang Yuhan (2025) further contributed to business applications through reinforcement learning for automated ad campaign optimization[5]. Industry-specific AI applications are extensively explored, with Tan (2024) analyzing AI trends in automotive production[6], Zhuang (2025) examining digital transformation in real estate marketing[7], and Han and Dou (2025) proposing a hierarchical graph attention network for user recommendation[8]. Advanced learning techniques are represented by Yang et al.'s (2025) RLHF fine-tuning for conversational recommenders[9] and Zhang Jingbo et al.'s (2025) AI-driven sales forecasting in gaming[10]. Yang Yifan (2025) focused on web performance improvement through component-based architecture[11], while Cheng et al. (2025) investigated the relationship between executive human capital and stock volatility[12]. Computer vision research includes Chen et al.'s (2022) gaze-estimation based object referring[13] and Tong et al.'s (2024) hybrid framework for credit approval prediction[14]. Tian et al. (2025) introduced cross-attention multi-task learning for digital advertising[15], and Chen Yinda et al. (2023) developed vision-language pretraining for medical segmentation[16]. Financial and environmental applications feature Zhang Zongzhen et al.'s (2025) deep learning approach for carbon market forecasting[17]. The domain generalization field is advanced by Peng, Zheng, and Chen's (2024)

dual-augmentor framework for 3D pose estimation[18], Pinyoanuntapong et al.'s (2023) self-aligned domain adaptation for gait recognition[19], and Zheng et al.'s (2025) motion-aware diffusion framework for human mesh recovery[20].

2. OVERVIEW OF ARTIFICIAL INTELLIGENCE TECHNOLOGY

2.1 Concept of Artificial Intelligence Technology

Artificial intelligence technology is an emerging discipline developed on the basis of computer science, information technology, and mathematical sciences. It encompasses the collection, storage, and analysis of data and information, with its core being the construction of intelligent machines. To a certain extent, AI technology is an extension and expansion of human intelligence: by learning, analyzing, and summarizing traditional social experience and knowledge, it builds its own knowledge system through a series of complex algorithms, ultimately achieving intelligence. In terms of development, AI technology has been widely applied across various industries, including industry, agriculture, medicine, and transportation. As an emerging discipline, AI will have even more applications in the future, which is of great significance for the development of China’s e-government sector.

2.2 Classification of Artificial Intelligence Technologies

Artificial intelligence technologies can be categorized into different types according to various classification criteria, including by application domain, algorithmic model, and system structure. By application domain, AI technologies mainly include smart home, smart transportation, and smart healthcare. From the perspective of algorithmic models, AI technologies primarily encompass machine learning and expert systems. In terms of system structure, AI technologies mainly consist of expert systems, neural networks, and genetic algorithms.

2.3 Applications of Artificial Intelligence Technology in the Field of E-Government

Applications of artificial intelligence technology in e-government mainly cover five areas: first, intelligent government services, which primarily use AI to optimize e-government service processes and provide the public with more convenient and efficient public services; second, intelligent decision support, which mainly employs AI to rapidly collect and analyze various types of information in socioeconomic development, offering reliable evidence for government decision-making; third, intelligent decision assistance, which mainly leverages AI to assist government management departments in decision-making, improving work efficiency and quality; fourth, intelligent execution, which mainly utilizes AI to automatically execute government department workflows, promoting more standardized and normalized government services; fifth, intelligent service innovation, which mainly uses AI to innovate and transform social governance models.

3. OVERVIEW OF E-GOVERNMENT SERVICES

3.1 Concept of E-Government Services

E-government is the use of modern information technology to build within government a system and platform capable of effectively transmitting information, conducting administrative management, and realizing the transformation of government functions. The core of e-government is "service" and the focus is on the "public," carrying out social management and public services online, with the ultimate goal of enabling citizens to handle all government administrative affairs online. E-government service is a new service model whose core value lies in using technological means to provide citizens with more convenient, efficient, and high-quality public services. The essence of e-government service is to use the Internet, mobile communications, and modern information technology to improve the way government offices operate, establishing a new form of communication between government and citizens so that citizens can obtain various public services provided by the government more conveniently and quickly.

3.2 Characteristics of E-Government Services

E-government services have four characteristics: first, they can effectively reduce administrative costs and improve administrative efficiency; second, they can realize the transformation of government functions and further strengthen government management and service functions; third, they can enhance government credibility and promote harmonious and stable social development; fourth, they can innovate public service methods and

continuously improve the quality and level of public services.

E-government services have four characteristics: first, they are holistic and comprehensive; second, they are convenient and efficient; third, they are open and shared; fourth, they are low-cost and high-efficiency. In e-government services, we must adhere to a people-centered approach, follow the requirements of "online government, transparent government, efficient government," continuously innovate public service methods, and enhance public service levels.

3.3 Current Development Status of E-Government Services

The main drivers of e-government service development come from three aspects: first, public demand; second, the government's own need for development; and third, the push of technological innovation. In recent years, with the rapid development of Internet, cloud computing, big data, and artificial intelligence technologies, China's e-government services have achieved remarkable results. The primary driver of e-government service development is the growing public demand for government public services. In the new stage of China's economic and social development, traditional government public service methods can no longer meet citizens' ever-increasing needs for public services. Leveraging its advantages of convenience, efficiency, and sharing, e-government service has become an important direction for the construction and reform of China's government public service system.

4. THE ROLE OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN THE FIELD OF E-GOVERNMENT

4.1 Improving the Efficiency of Government Services

In the field of e-government, artificial intelligence technology can accurately collect citizens' information and data, then transform these data into usable knowledge. By leveraging this knowledge, services can be better delivered to citizens, making them more convenient. For example, in China's e-government, using AI technology to collect citizen information is a very important task. By employing AI technology, citizen information can be classified, organized, and stored, and then this information can be used to help government departments improve work efficiency, which is of great significance to government affairs.

4.2 Optimizing the Government Service Experience

In the field of e-government, artificial intelligence technology can analyze citizens' needs and provide corresponding services based on those needs. In addition, AI technology can offer better services tailored to individual citizens. For instance, in providing traffic control measures, AI can intelligently plan routes according to citizens' requests, helping them travel more smoothly; in providing educational resources, AI can supply educational content based on citizens' specific needs.

4.3 Enhancing the Quality of Government Services

In the field of e-government, artificial intelligence technology can provide citizens with services that match their needs, thereby greatly improving the quality of government services and better serving the public. For example, during administrative licensing procedures, AI can generate more accurate application materials based on citizens' basic information and personal requirements, and then deliver the corresponding services through the approval process. This makes approvals more efficient and simultaneously raises the work efficiency of government staff.

5. CASE STUDIES OF ARTIFICIAL INTELLIGENCE TECHNOLOGY APPLICATIONS IN THE FIELD OF E-GOVERNMENT

5.1 Intelligent Customer Service Systems

"Digital Zhejiang" is the provincial government's unified service platform, built on "Internet Plus," driven by digital reform, and aimed at "one-stop service." It integrates full-service applications via the Zhejiang Government Service Portal, Zheli Ban, and Zhe Zheng Ding. "One-stop service" streamlines procedures and requirements, leveraging big data and cloud computing to make processes more rational and efficient. Zheli Ban is a

comprehensive platform based on digital government, Internet Plus, and digital tools, designed to boost public satisfaction. Over 90 departments and 339 application systems are now connected.

5.2 Intelligent Decision Support System

China's e-government covers infrastructure, information sharing, business applications, and public services, with infrastructure and sharing as its two cores. A unified infrastructure integrates, pools, and shares data across agencies and enterprises, supporting other domains. Unified data-exchange and sharing platforms enable inter-departmental and inter-government data exchange. A unified service portal delivers online processing, real-time queries, and feedback for all public services.

5.3 Intelligent Data Analytics Applications

Government services rely on big data and cloud computing to mine and analyze administrative data. AI algorithms—deep learning, NLP—imbue the data with "human-like thinking," linking it to user needs. This enables intelligent perception of service data and supports decision-analysis models, allowing intelligent assessment of public-service quality.

6. CHALLENGES AND COUNTERMEASURES OF AI IN E-GOVERNMENT

6.1 Data Privacy and Security

AI has transformed how government information is collected, processed, and used, raising privacy and security concerns. While AI boosts e-government efficiency and service quality, it also creates new privacy risks that demand serious attention.

6.2 Technical Standards and Standardization

The application of artificial intelligence technology in the field of e-government requires standardization in data, technology, processes, security, and other aspects; only in this way can the smooth application of AI in e-government be ensured. It is necessary to promptly establish standards for data management and exchange, technical standards, management standards, and security standards to achieve data standardization and normalization; to explore the creation of an AI-based data openness and sharing mechanism to realize open data sharing; to explore the establishment of an AI-based government service standardization system to achieve standardized government service processes and normalized service delivery; and to explore the creation of an AI-based public safety and risk assessment mechanism to enable effective utilization and secure sharing of government information resources.

6.3 Talent Development and Recruitment

In the process of applying AI technology in e-government, attention must be paid to the cultivation and recruitment of relevant technical talent. Efforts should be intensified to train technical personnel, increasing the cultivation of AI talent within e-government to ensure the effective application of AI technology. At the same time, the recruitment of AI professionals should be strengthened through various channels, such as collaborating with universities to develop relevant disciplines and partnering with enterprises to conduct related research projects.

6.4 Institutional Environment and Policy Support

In the e-government domain, it is necessary to strengthen the institutional environment and policy safeguards to provide institutional guarantees for the effective application of AI technology. A sound legal and regulatory framework should be established to offer a legal basis for the effective use of AI in e-government. The responsibilities and obligations of relevant departments in the application of AI in e-government must be clearly defined, with strict management and regulation of AI applications to ensure the implementation of relevant laws and regulations. An AI application evaluation mechanism should be set up to assess the effectiveness of AI applications in e-government, identify issues, and resolve them promptly.

6.5 Security Management and Emergency Response

In the e-government field, a comprehensive security management and emergency response system must be established to enhance the security of AI applications. Relevant laws and regulations should be strengthened to clarify legal responsibilities and obligations for data, information, and privacy protection, define security management entities and responsible parties, and formulate relevant security management systems and measures. Emergency plans should be developed to improve the ability to respond to sudden incidents. A sound security management mechanism for AI applications in e-government should be established, the data security assurance system improved, data security risks analyzed and assessed, and a data security protection system built to ensure data security.

6.6 Legal Liability and Risk Allocation

In the field of e-government, the strong algorithmic black-box nature of artificial intelligence technology introduces significant risks. Therefore, when applying AI in e-government, full consideration must be given to relevant laws, regulations, and ethical issues to ensure they are observed and enforced.

7. CONCLUSION

The development of artificial intelligence has profoundly influenced government governance and public services. In e-government, AI can make services smarter and more intelligent, optimize public-service processes, and raise efficiency. Its application can drive innovation in governance models and provide businesses and citizens with more convenient and efficient public services.

REFERENCES

[1] Li, X., Lin, Y., & Zhang, Y. (2025). A Privacy-Preserving Framework for Advertising Personalization Incorporating Federated Learning and Differential Privacy. arXiv preprint arXiv:2507.12098.
[2] Tu, Tongwei. "ProtoMind: Modeling Driven NAS and SIP Message Sequence Modeling for Smart Regression Detection." (2025).
[3] Xie, Minhui, and Boyan Liu. "EvalNet: Sentiment Analysis and Multimodal Data Fusion for Recruitment Interview Processing." (2025).
[4] Zhu, Bingxin. "ReliBridge: Scalable LLM-Based Backbone for Small Business Platform Stability." (2025).
[5] Zhang, Yuhan. "Learning to Advertise: Reinforcement Learning for Automated Ad Campaign Optimization for Small Businesses." (2025).
[6] Tan, C. (2024). The Application and Development Trends of Artificial Intelligence Technology in Automotive Production. Artificial Intelligence Technology Research, 2(5).
[7] Zhuang, R. (2025). Evolutionary Logic and Theoretical Construction of Real Estate Marketing Strategies under Digital Transformation. Economics and Management Innovation, 2(2), 117-124.
[8] Han, X., & Dou, X. (2025). User recommendation method integrating hierarchical graph attention network with multimodal knowledge graph. Frontiers in Neurorobotics, 19, 1587973.
[9] Yang, Zhongheng, Aijia Sun, Yushang Zhao, Yinuo Yang, Dannier Li, and Chengrui Zhou. "RLHF Fine-Tuning of LLMs for Alignment with Implicit User Feedback in Conversational Recommenders." arXiv preprint arXiv:2508.05289 (2025).
[10] Zhang, Jingbo, et al. "AI-Driven Sales Forecasting in the Gaming Industry: Machine Learning-Based Advertising Market Trend Analysis and Key Feature Mining." (2025).
[11] Yang, Yifan. "Web Front-End Application Performance Improvement Method Based on Component-Based Architecture." International Journal of Engineering Advances 2.2 (2025): 24-30.
[12] Cheng, Ying, et al. "Executive Human Capital Premium and Corporate Stock Price Volatility." Finance Research Letters (2025): 108278.
[13] Chen, J., Zhang, X., Wu, Y., Ghosh, S., Natarajan, P., Chang, S. F., & Allebach, J. (2022). One-stage object referring with gaze estimation. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 5021-5030).
[14] Tong, Kejian, et al. "An Integrated Machine Learning and Deep Learning Framework for Credit Card Approval Prediction." 2024 IEEE 6th International Conference on Power, Intelligent Computing and Systems (ICPICS). IEEE, 2024.
[15] Q. Tian, D. Zou, Y. Han and X. Li, "A Business Intelligence Innovative Approach to Ad Recall: Cross-Attention Multi-Task Learning for Digital Advertising," 2025 IEEE 6th International Seminar on Artificial Intelligence, Networking and Information Technology (AINIT), Shenzhen, China, 2025, pp. 1249-1253, doi: 10.1109/AINIT65432.2025.11035473.

[16] Chen, Yinda, et al. "Generative text-guided 3d vision-language pretraining for unified medical image segmentation." arXiv preprint arXiv:2306.04811 (2023).
[17] Zhang, Zongzhen, Qianwei Li, and Runlong Li. "Leveraging Deep Learning for Carbon Market Price Forecasting and Risk Evaluation in Green Finance Under Climate Change." Journal of Organizational and End User Computing (JOEUC) 37.1 (2025): 1-27.
[18] Peng, Qucheng, Ce Zheng, and Chen Chen. "A Dual-Augmentor Framework for Domain Generalization in 3D Human Pose Estimation." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2024.
[19] Pinyoanuntapong, Ekkasit, et al. "Gaitsada: Self-aligned domain adaptation for mmwave gait recognition." 2023 IEEE 20th International Conference on Mobile Ad Hoc and Smart Systems (MASS). IEEE, 2023.
[20] Zheng, Ce, et al. "Diffmesh: A motion-aware diffusion framework for human mesh recovery from videos." 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV). IEEE, 2025.