

Artificial Intelligence-Enabled Volunteer Services: Intrinsic Logic, Practical Dilemmas, and Adjustment Strategies

Shihan Yuan

School of Information Engineering, Wuhan University of Technology, Wuhan 430070, China

ABSTRACT

In the context of Digital China and the broader drive toward Chinese modernization, artificial intelligence has emerged as a critical catalyst for advancing volunteer services. This paper examines how AI promotes efficiency through digital intelligence empowerment, reinforces ethical practices via mechanism innovation, and fosters collaborative synergy through platform construction. Despite these advancements, challenges such as value conflicts, coordination gaps, and uneven resource distribution continue to impede progress. To address these issues, a three-dimensional strategy encompassing conceptual, mechanistic, and resource-based adjustments is proposed to facilitate sustainable integration. This study provides both theoretical insights and practical guidance for the digital transformation of volunteer services and the modernization of social governance.

KEYWORDS

Artificial Intelligence; Volunteer Services; Digital Empowerment; AI for Good

1. INTRODUCTION

In the context of rapid advancements in digitalization and artificial intelligence, the integration of AI technologies into volunteer services has emerged as a critical area of research within social governance, public welfare, and social innovation. The widespread application of artificial intelligence has significantly enhanced societal efficiency, while volunteer services—serving as a cornerstone of social governance—are increasingly undergoing digital transformation and intelligent evolution. Continuous progress in AI offers new technical capabilities and developmental pathways for volunteer initiatives (Liu, 2024). The State Council's 2025 "Opinions on Deeply Implementing the 'AI+' Action" explicitly calls for leveraging AI to strengthen interpersonal networks, provide emotional support and companionship, assist in elderly care, childcare, disability support, and promote national fitness. This directive not only underscores the transformative potential of AI in social care and public service delivery but also catalyzes innovation in volunteer service models. Furthermore, the 2024 "Opinions on Improving the Volunteer Service System in the New Era," jointly issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council, emphasizes deep integration between volunteer services and digital technologies, advocating for comprehensive digital empowerment across all stages—including volunteer registration, demand identification, service matching, dispatch coordination, performance evaluation, feedback mechanisms, and public outreach—thereby accelerating the intelligent advancement of volunteer systems.

In light of these developments, it is crucial to assess the innovative value of AI-empowered volunteerism, address the practical challenges associated with technology, ethics, and management, and develop effective strategies for optimizing AI applications in this context. This paper aims to explore the precise and intelligent application of AI in volunteer service contexts, analyze the

challenges and limitations inherent in such applications, and offer actionable recommendations for advancing the digital transformation of volunteer systems. Ultimately, the goal is to contribute to the deep integration and sustainable development of AI within volunteer services, fostering a new era of efficient, intelligent, and inclusive social governance.

2. THE INTRINSIC LOGIC OF ARTIFICIAL INTELLIGENCE AND VOLUNTEER SERVICES

The construction of a digital China has continuously advanced Chinese-style modernization. Enabled by artificial intelligence, the modernization of social governance has seen significant improvement. In the domain of volunteer services, AI-driven digital and intelligent empowerment has effectively propelled the sector toward greater intelligence, professionalism, and sustainability, emerging as a key driver for high-quality development in volunteerism (Gao & Li).

2.1. Efficiency Enhancement: "Digital and Intelligent Empowerment" as Technical Infrastructure for Volunteer Services

Currently, the volunteer service sector faces persistent challenges, including insufficient professional competence among volunteers, fragmented management within volunteer organizations, low alignment between service supply and demand, and limited timeliness in service delivery. However, with AI-enabled digitalization, volunteer services can progressively achieve enhanced volunteer capabilities, a scientifically structured management system, precise matching of services to needs, and effective mechanisms for supervision and performance evaluation—thereby playing a critical role in optimizing social governance.

2.1.1. Artificial intelligence optimizes resource allocation and project matching, enhancing the precision and participation in volunteer services

Leveraging substantial data computing power, AI can not only deeply identify the needs of service recipients but also accurately analyze volunteers' subjective and objective attributes, including their skill levels, practical preferences, and service motivations. By systematically matching recipient needs with volunteer profiles, AI enables a scientifically grounded assessment of volunteer-service suitability, providing critical support for personalized service design. This facilitates precise demand-supply alignment, efficient resource allocation, and streamlined service delivery, thereby improving the adaptability, responsiveness, and professionalism of volunteer initiatives. Furthermore, through digital tools that comprehensively analyze activity planning, service implementation, and outcome feedback, AI enhances the evaluation mechanism of volunteer service effectiveness—contributing to the refinement and institutionalization of the broader volunteer service system (Bouarar et al, 2023).

2.1.2. Artificial intelligence lowers participation barriers and innovates service delivery models, thereby expanding the reach and societal impact of volunteer services

By leveraging advanced technologies such as natural language processing, computer vision, and virtual reality, artificial intelligence enables low-barrier or even barrier-free participation in volunteer services, thereby enhancing their inclusivity and accessibility. For instance, "AI + Elderly Assistance" employs intelligent voice assistants to help older adults access information and maintain communication with family and friends; "AI + Environmental Protection" utilizes image recognition technology to facilitate public identification of waste types, reducing the challenges associated with proper garbage classification; and "AI + Agriculture" applies data analytics to assess seedling survival rates and monitor pest and disease outbreaks, supporting intelligent agricultural management. In critical domains such as education and healthcare, AI transcends spatial and temporal constraints by enabling remote and virtual volunteering—including online tutoring, cloud-based medical consultations, and AI-driven science outreach—thus engaging a broader and more diverse range of

participants. Through continuous innovation in volunteer service delivery models, artificial intelligence accelerates the widespread adoption of digital and intelligent technologies across multiple sectors of society (Wang & Xie).

2.2. Ethical Norms: "Mechanism Innovation" Provides Governance Support for Volunteer Services

The deep integration of artificial intelligence and volunteer services hinges on robust ethical norms. The sustainable development of digitally empowered volunteer initiatives demands enhanced protection of critical data and personal privacy, as well as strengthened security protocols governing data operations. Comprehensive regulations must be established across source governance, process oversight, and output management; otherwise, volunteer services risk encountering significant ethical dilemmas.

2.2.1. Artificial intelligence enhances the standardization and transparency of volunteer service management, thereby strengthening credibility and long-term sustainability

Through the strategic application of technologies such as blockchain and smart contracts, every stage of data handling in volunteer service management systems—including data sourcing, processing, and utilization—can be systematically governed. By safeguarding personal privacy, these measures significantly mitigate the security risks associated with data use. This not only supports informed organizational decision-making, government procurement of services, and efficient allocation of social resources but also lays the foundation for a transparent, equitable, and trustworthy volunteer service credit system.

2.2.2. Artificial intelligence advances the humanization and scientific rigor of volunteer service models, fostering the convergence of technological governance and humanistic care

Artificial intelligence and human volunteers operate synergistically. Volunteers excel in delivering emotional companionship and crisis intervention, embodying empathy and compassion throughout service delivery. In contrast, AI excels in information aggregation, generating professional, actionable insights, and automating repetitive tasks—thereby alleviating volunteer workload. Their complementary strengths enable a collaborative model that balances empathy with efficiency, enhancing both service recipient satisfaction and volunteer work efficacy. This synergy improves the responsiveness and warmth of grassroots social governance and establishes “technology for good” as a core principle guiding the high-quality development of volunteer services in the intelligent era.

2.3. Ethical Norms: "Mechanism Innovation" Provides Governance Support for Volunteer Services

The deep integration of artificial intelligence and volunteer services necessitates the development of systematic, ecosystem-oriented platforms. The 2023 “Guiding Opinions on Accelerating Scenario Innovation to Promote High-level Application of Artificial Intelligence and High-quality Economic Development,” jointly issued by six departments including the Ministry of Science and Technology, explicitly encourages “the application of AI-driven scenarios in fields such as volunteer services.” Continuous refinement of platform governance systems not only facilitates the integration of fragmented resources but also cultivates a collaborative governance framework involving multiple stakeholders. This transition enables volunteer services to evolve from ad hoc activities to structured projects, and from isolated initiatives to systematized operations, thereby allowing branded volunteer programs to achieve greater impact and sustainable implementation (Yang, 2024).

2.3.1. Artificial intelligence-powered volunteer service platforms enable data integration and resource sharing, enhancing systemic coordination

AI-driven one-stop volunteer platforms advance the deployment of large-scale AI models for public benefit, helping to break down data silos across government administration, education, healthcare, culture, and other sectors. By accelerating data sharing and integrated applications, these platforms unlock the value of public data as a strategic resource. In volunteer management, they facilitate the establishment of unified mechanisms for registration and certification, training, task allocation, as well as incentive and protection systems. For instance, the “Volunteer China” information system has preliminarily achieved nationwide interoperability of volunteer service data. With the integration of artificial intelligence, it accelerates the aggregation and sharing of volunteer resources and enables advanced functionalities such as regional service demand heat mapping, real-time monitoring of service quality, and intelligent early warning and dispatch for emergency volunteer responses. The “Volunteer Hub” platform additionally provides services such as industry exchanges and volunteer benefits, fostering sincere communication and mutual growth among volunteers.

2.3.2. Artificial intelligence-powered volunteer service platforms facilitate knowledge accumulation and cross-model learning, accelerating project replication and scaling

By systematically organizing and analyzing volunteer service cases across domains, AI systems can effectively identify and summarize key patterns and characteristics, contributing to the construction of comprehensive volunteer service databases and knowledge graphs. These resources provide actionable references for practitioners. Through intelligent Q&A and interactive systems, volunteers can generate tailored and operationally viable service plans based on the specific needs and profiles of service recipients. Furthermore, by interpreting policies, explaining proven models, and analyzing contextual scenarios, these platforms expand volunteers’ knowledge base and enhance their professional competencies. Simultaneously, they help identify a cohort of high-impact, replicable, and scalable volunteer service brand projects, laying the groundwork for broader dissemination and institutionalization.

3. PRACTICAL DILEMMAS OF AI-EMPOWERED VOLUNTEER SERVICES

Artificial intelligence has achieved significant breakthroughs and reached new frontiers in the domain of volunteer services, accelerating their integration and transforming the operational model of volunteering. This synergy presents critical opportunities for advancing digital China, empowering high-quality economic and social development, and supporting the progress of Chinese-style modernization. However, volunteer services are encountering persistent practical challenges, including misalignment of value paradigms, difficulties in establishing effective coordination mechanisms, inequitable resource distribution, and barriers to enhancing volunteer competencies. The volunteer service system and mechanism urgently need to be improved, which has become a problem that must be faced and solved for the high-quality development of volunteer services.

3.1. Value Discrepancy: The Incompatibility between Technological Rationality and Humanistic Care

The operational mechanism of artificial intelligence, centered on data-driven processes and algorithmic optimization, inherently prioritizes standardized procedures and theoretical analysis, aiming for precision and efficiency. In contrast, volunteer service is fundamentally grounded in altruism and social responsibility, emphasizing human-centered, context-sensitive engagement. As a result, while AI seeks to resolve issues through generalized, model-derived solutions, volunteer service relies on authentic interpersonal interaction to identify nuanced needs and deliver

personalized support. These fundamental divergences in value orientation and decision-making logic inevitably lead to challenges in compatibility and integration.

3.1.1. The humanistic core of volunteer service is increasingly eroded by technological rationality.

In practice, artificial intelligence emphasizes modular workflows, proceduralized solutions, and quantifiable outcomes. However, the intervention and involvement in volunteer service processes are difficult to manage in a standardized manner. Usually, services are carried out based on on-site situations through experience, intuition, and moral choices, such as emotional support for vulnerable groups and love aid for stray animals. These acts rarely admit a single “optimal” solution. The process of volunteering itself carries irreplaceable social and educational value, which cannot be adequately captured or evaluated through efficiency metrics or outcome-based data alone.

3.1.2. The data-driven paradigm of artificial intelligence constrains the intrinsic value development of volunteer culture.

Currently, AI applications in volunteer service are largely confined to foundational tasks such as demand forecasting, task assignment, and service hour tracking, primarily serving management efficiency and operational optimization. Yet its contribution to the spiritual and cultural dimensions of volunteering remains limited. For volunteers, AI offers minimal enhancement to their sense of belonging or perceived efficacy. From the perspective of volunteer culture development, fostering civic consciousness and altruistic values represents an essential goal of the sector’s qualitative advancement. However, the prevailing data-centric and efficiency-first principles of AI risk reducing volunteerism to instrumental utility and undermining its humanistic essence—a trend that may lead to the “instrumentalization” and “dehumanization” of volunteer culture.

3.2. Mechanism Gap: Insufficient Integration between Collaborative Governance and Service Ecosystem

Empowering volunteer services with artificial intelligence is not a mere technological transplant or additive tool deployment, but a complex, systemic social endeavor involving multiple stakeholders, diverse institutional frameworks, multi-tiered policies, and heterogeneous technological platforms. Persistent challenges—such as stakeholder fragmentation, conflicting objectives, institutional barriers, and data silos—highlight that the core obstacles to AI-enabled volunteering have evolved beyond technical implementation to encompass broader issues of social governance modernization.

3.2.1. Goal divergence, interest conflicts, and absence of shared consensus among stakeholders

Technology enterprises prioritize technological innovation, business model viability, and return on investment; volunteer service organizations emphasize maximizing public welfare, fulfilling social missions, and improving beneficiaries’ well-being; government agencies focus on policy innovation outcomes and governance performance; while communities and service recipients value service relevance to actual needs and operational timeliness. These divergent priorities reflect fundamentally different value orientations (Thewes et al, 2024). As a result, motivational misalignment and coordination failures arise, undermining collaborative efforts. The lack of a unified vision and difficulty in achieving collective rationality present significant barriers to the effective integration of AI into volunteer services.

3.2.2. Institutional safeguards and policy frameworks lack effective support and strategic direction

Although China has introduced a series of policy initiatives promoting “Internet + Volunteer Services,” which repeatedly advocate leveraging internet and big data technologies for sectoral advancement, there remains a critical absence of targeted guidelines for AI-specific applications in volunteering.

Clear directives on implementation protocols, data interoperability standards, ethical principles, evaluation mechanisms, and accountability frameworks are still lacking. Furthermore, existing policies often suffer from low operational feasibility, leading to widespread ambiguity in rights and responsibilities during implementation. This institutional void constrains the full realization of AI's potential, limiting its dynamic application and innovative deployment in the volunteer service domain.

3.3. Resource Misallocation: Structural Imbalance between Technological Supply and Service Demand

The empowerment of artificial intelligence relies on fundamental resources such as data, algorithms, computing power, hardware, talent, funding, and domain knowledge (Tu et al, 2020). However, within the specific context of volunteer services, a structural asymmetry persists between the supply of technological resources and the practical needs of volunteer service organizations, resulting in a significant mismatch.

3.3.1. Volunteer service organizations generally lack the capacity to access, absorb, and apply advanced technologies.

Most nonprofit and public welfare organizations operate with limited scale, constrained budgets, and low levels of professionalization. Consequently, their investment in AI-related infrastructure is minimal, technical teams are underdeveloped or absent, and long-term data operation and maintenance capabilities are inadequate. This challenge is particularly pronounced in grassroots, rural, and central-western regions, where digital foundations are weak, financial sustainability is compromised, operational support is lacking, and awareness of digital transformation remains limited. As a result, technological empowerment struggles to take root, potentially exacerbating pre-existing disparities in service resource distribution, widening the digital divide, and deepening regional development imbalances.

3.3.2. The absence of robust data governance mechanisms creates serious challenges for lawful and ethical data use.

AI models depend heavily on high-quality, large-scale datasets and substantial computational capacity. However, volunteer service-related data are typically fragmented, highly sensitive, and deeply personal, while suffering from inconsistent standards, insufficient mechanisms for compliant data sharing, and the absence of trusted data environments. On one hand, the scarcity of accessible public data and poor data quality constrain the accuracy of model training and service personalization. On the other hand, the collection, utilization, transfer, and dissemination of such data pose significant risks to data security and privacy—risks that fundamentally conflict with the altruistic principles underpinning volunteerism.

4. CALIBRATION STRATEGIES FOR AI-EMPOWERED VOLUNTEER SERVICES

Artificial intelligence has demonstrated significant effectiveness in advancing the high-quality and intrinsic development of volunteer services. However, persistent challenges related to value alignment, institutional design, and resource support remain. To address these structural barriers, it is essential to establish a multi-layered, end-to-end calibration framework that shifts AI application from mere data-model assistance toward deep systemic integration. This transition aims to achieve organic convergence between AI and volunteer services in value orientation, institutional coherence in governance design, and rational allocation in resource coordination.

4.1. Conceptual Calibration: Establishing the Guiding Principle of "AI for Good and Humanistic Collaboration"

Empowering volunteer services with artificial intelligence must transcend instrumental rationality by recentering on the core mission of volunteering—altruism, care, and social solidarity. It requires building a human-centered, ethically grounded, and sustainable technological ecosystem. This endeavor extends beyond technical refinement; it constitutes a comprehensive transformation involving value reconstruction and paradigmatic renewal.

4.1.1. Promote the guiding principle of "AI for Good and Service to the People"

The deployment of artificial intelligence in volunteer contexts should prioritize enhancing social impact and embedding humanistic values as its primary objectives. Ethical considerations must be integrated throughout the technology lifecycle—from research and development to implementation. Actively promote the establishment of an artificial intelligence volunteer service ethics committee, formulate industry-specific “Ethical Guidelines for Empowering Volunteer Services with Artificial Intelligence”, establish a data model review mechanism and social benefit assessment mechanism, and ensure that the intelligent development of volunteer services always serves the promotion of volunteer spirit and the improvement of service efficiency, achieving the goal of intelligence for good (Woodruff, 2025; Pereira, 2025).

4.1.2. Advance the synergistic integration of efficiency enhancement and meaning preservation

AI empowerment should not be limited to process automation and precision targeting but must also strengthen volunteers’ sense of participation, belonging, and psychological fulfillment. This can be achieved by developing AI support systems based on affective computing and natural language processing to dynamically detect emotional states of both volunteers and beneficiaries and provide context-sensitive interaction guidance. Additionally, a value visualization and narrative platform should be constructed—leveraging data storytelling, service journey mapping, and impact tracing—to deepen volunteers’ perception of purpose and sustain long-term motivation. Crucially, intelligent systems must preserve essential human interactions and emotional connections. In sensitive domains such as elderly companionship and child education, clear boundaries should be established under the principle of “technology-assisted, human-led” service delivery to prevent the dehumanization, social disconnection, and emotional erosion of volunteer practices.

4.2. Mechanism Optimization: Building a "Diverse and Collaborative, Rule-Clear" Governance Ecosystem

To address the challenges of subject collaboration and institutional lag, it is necessary to establish an open, inclusive, incentive-compatible, and orderly collaborative governance mechanism for artificial intelligence. This is not only the fundamental guarantee for technological empowerment but also the institutional prerequisite for achieving long-term sustainable development.

4.2.1. Improve the multi-level cooperative governance system of "government guidance - enterprise support - social organization collaboration - public participation"

The government should strengthen top-level design and policy integration, take the lead in formulating the “Medium and Long-Term Development Plan for Artificial Intelligence Empowering Volunteer Services” and the corresponding technical standard system, clarify the responsibility boundaries and collaboration norms of each subject. Encourage technology enterprises to lower the threshold for technology use through measures such as opening technology platforms, sharing pre-trained models, and providing inclusive computing resources; support volunteer service organizations in deeply participating in the design of technical needs, application feedback, and effect evaluation to ensure that technical solutions are in line with real service scenarios (Angela, 2022). Pilot

construction of a number of artificial intelligence volunteer service joint laboratories, common technology platforms, and regional application demonstration bases can be carried out. Through an entity operation mechanism, promote the effective connection between technology supply and demand, reduce cooperation frictions and resource internal consumption.

4.2.2. Strengthen institutional innovation and policy support.

It is suggested to study and issue special policy documents such as the “Implementation Opinions on Promoting Volunteer Services with Artificial Intelligence”, clarify the ownership of data rights, the determination of algorithm responsibility, the bottom line of privacy protection, and safety supervision rules, and provide stable legal expectations for cross-border cooperation. Promote the establishment of a policy coordination mechanism among science and technology, civil affairs, cyberspace administration, and industry and information technology departments, set up a special support fund for artificial intelligence volunteer services, and include intelligent volunteer service facilities in the category of new infrastructure construction. Through service procurement, tax incentives, innovation vouchers, and other means, mobilize the enthusiasm of enterprises to continuously participate, and at the same time explore the establishment of an “Artificial Intelligence Public Welfare Index” and an enterprise contribution evaluation system to guide technology enterprises to incorporate technology empowerment of volunteer services into their core social responsibility topics.

4.3. Resource Integration: Advancing a Support System for "Data Sharing and Capability Alignment"

To address the challenges of resource misallocation and capacity deficits, it is essential to systematically strengthen the supply and adaptive alignment of critical resources, thereby enhancing the inclusiveness and sustainability of AI empowerment. Effective resource integration extends beyond hardware and data to encompass the coordinated matching of talent, knowledge, and financial support.

4.3.1. Strengthen digital capacity development in volunteer service organizations

Promote the establishment of the “Artificial Intelligence Empowerment Plan for Enhancing Volunteer Service Capacity” and establish regional technical support and service centers dedicated to delivering technical diagnostics, tool customization, cloud service integration, data literacy training, and digital transformation guidance to small, medium, and grassroots volunteer service organizations. Encourage leading technology enterprises to develop low-threshold, lightweight artificial intelligence public welfare toolkits and open-source solutions—such as volunteer matching algorithm libraries, natural language interaction modules, and public welfare data annotation platforms—to significantly reduce both technological adoption costs and operational complexity. Implement the “Technology Public Welfare Partner Program” to foster sustained technical collaboration between IT volunteers and nonprofit organizations, ensuring that technological empowerment narrows, rather than exacerbates, existing digital divides.

4.3.2. Build a standardized, orderly, and public-interest-driven data governance framework

Establish a volunteer service data resource consortium to develop unified standards for data collection, openness, sharing, and security protocols. Build national or regional public data platforms for volunteer services that enable authorized and secure circulation of data elements while safeguarding privacy and confidentiality. Emphasize the co-creation and shared use of high-value datasets—including service demand heatmaps, resource distribution maps, and volunteer skill tagging systems. Institutionalize mechanisms to ensure algorithmic fairness and transparency by promoting the adoption of explainable artificial intelligence (XAI) in volunteer service applications. Conduct regular audits and bias assessments on core algorithmic models to prevent inequitable service recommendations or resource allocation resulting from data imbalances or model limitations. These

measures help ensure that AI-driven empowerment aligns with the fundamental principles of equity, inclusion, and justice that underpin volunteerism.

5. CONCLUSION

This study explores the multifaceted dynamics involved in the integration of artificial intelligence and volunteer services. Findings indicate that while digital intelligence empowerment has substantially enhanced the efficiency, scalability, and precision of volunteer services through technological tools, it simultaneously introduces tensions between technological rationality and humanistic values, encounters systemic challenges such as fragmented multi-stakeholder collaboration and unclear governance frameworks, and reveals a structural misalignment between technological supply and societal demand at the resource level. The integration of AI into volunteer services is not merely a technical transfer; rather, the high-quality development of volunteering requires a deep, reciprocal embedding and a symbiotic relationship between artificial intelligence and the core ethos of volunteerism.

The primary contribution of this study lies in the development of an integrative analytical framework that bridges technical logic, social values, and institutional contexts—addressing the limitations of prior research, which predominantly emphasizes technological deployment. By systematically examining the interplay of convergence and conflict across value, mechanism, and resource dimensions, this work provides novel theoretical insights and practical guidance for understanding how intelligent technologies can empower social welfare initiatives. Methodologically, the study combines comprehensive literature analysis with systematic policy document review, ensuring both robust theoretical synthesis and actionable policy relevance.

Nevertheless, several limitations remain. The analysis primarily operates at the macro level, focusing on institutional design and strategic formulation, with limited empirical validation or data-driven examination of concrete AI applications in volunteer contexts. Furthermore, variations in technology adoption patterns and empowerment outcomes across different types of volunteer organizations have not been fully explored. Future research should incorporate comparative case studies and quantitative methods to test the validity and generalizability of the proposed framework. Special attention should be paid to grassroots volunteer organizations, whose lived experiences, operational constraints, and innovative adaptations in the context of technological empowerment warrant deeper investigation.

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