

Research on the Application of Digital Technology in Social Work for Social Assistance

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ABSTRACT

With social development, social assistance programs face new challenges and transformational demands, where digital technology has emerged as a pivotal driving force. This paper provides an in-depth analysis of digital technology applications in social assistance work, covering its implementation methods and effectiveness across multiple dimensions including beneficiary identification, resource allocation, and service delivery. While highlighting how digital technology enables precision and efficiency in social assistance, the study also examines challenges such as the digital divide and data security issues encountered during implementation. Targeted solutions and future development directions are proposed to enhance the quality of social assistance and refine the social assistance system, offering both theoretical support and practical guidance for its advancement.

KEYWORDS

Social assistance; Digital technology; Social work; Precision assistance

1 Application of digital technology in the identification of social assistance objects

1.1 Multi-source data integration and analysis to determine the recipients

Traditional social assistance identification primarily relies on voluntary applications and limited manual verification, which often leads to incomplete or inaccurate information, resulting in missed or incorrect aid distribution. With digital technology, blockchain and other technologies enable encrypted data sharing, allowing civil affairs, healthcare, public security, human resources, and housing authorities to establish comprehensive databases covering all personal characteristics. For instance, Shanghai's Xuhui District has developed a smart assistance system that integrates multi-departmental data including income, assets, medical expenses, and housing conditions. Through data mining and analytical algorithms, this system accurately identifies eligible individuals and those at risk of needing aid from massive datasets. A regional case demonstrates how multi-source data integration has newly identified [X] households previously excluded due to fragmented information, significantly enhancing the comprehensiveness and precision of assistance identification^[1].

1.2 Dynamic monitoring and evaluation to keep track of the situation of the recipients

The status of social assistance recipients evolves over time, making traditional periodic verification inadequate for timely monitoring. Digital technology enables real-time tracking of beneficiaries' conditions. For instance, Shandong Dezhou's population dynamic monitoring system employs big data analytics to continuously track income fluctuations, family changes, and employment status. When anomalies are detected, the system automatically triggers alerts, prompting staff to verify and adjust assistance plans promptly. For families experiencing sudden income drops due to unemployment, the system swiftly identifies these cases, reminding staff to reassess eligibility criteria and adjust benefit amounts accordingly. This ensures that assistance aligns with actual needs, enhancing both precision and timeliness in social support delivery.

1.3 Intelligent portrait construction improves the scientificity of object recognition

Digital technology enables intelligent profiling of assistance recipients by integrating multidimensional data including historical aid records, consumption patterns, and social activities to create comprehensive characteristic models. For instance, a region employs machine learning algorithms to analyze daily consumption data of disadvantaged groups. When identifying households consistently purchasing low-cost daily necessities in designated areas with disproportionately high medical expenditures, combined with income analysis, potential assistance needs can be determined. This intelligent profiling approach overcomes the limitations of traditional single-indicator identification by leveraging multi-dimensional data correlations to uncover recipients' true circumstances. It enhances scientific rigor and objectivity in identification, reduces human judgment biases, and significantly improves the accuracy of assistance recipient recognition.

2 The application of digital technology in the allocation of social assistance resources

2.1 Optimize the resource allocation scheme according to the algorithm

Social assistance resources are limited and require rational allocation. Digital algorithms generate tailored relief plans for different beneficiaries based on multiple factors such as the causes of hardship, severity of difficulties, and family needs. In Guangzhou's "Suijiuyi" smart service platform, algorithms precisely allocate resources like minimum living allowances, medical assistance funds, and education subsidies by analyzing family demographics, health conditions, and educational expenditures. For families impoverished due to illness, increased medical aid resources are allocated; for those with children in school, educational support becomes the primary focus. After optimizing resource distribution through algorithmic optimization, the utilization rate of relief resources has significantly improved, leading to more effective assistance outcomes.

2.2 Promoting cross-departmental coordination and integration of relief resources

Social assistance programs involve multiple government agencies, but historically suffered from fragmented resources and poor coordination^[2]. Digital technologies now empower internal integration within public sectors and facilitate collaboration between public-private partnerships. A prime example is Jing'an Temple Subdistrict in Jing'an District, which has developed a smart integrated system for social assistance. By leveraging the "One Network for All" framework, this system connects data from housing authorities, medical insurance agencies, disability services, human resources departments, and civil affairs bureaus. Through multi-dimensional analysis of beneficiaries' profiles and comprehensive evaluation of key assistance areas, it enables centralized allocation of resources. In employment support initiatives, civil affairs departments collaborate with human resources agencies to provide career guidance and job placement services for eligible individuals. This integration of training resources and job listings enhances resource coordination efficiency, creating a synergistic approach to social assistance.

2.3 Dynamic allocation of resource supply and demand forecast

By leveraging big data and artificial intelligence technologies to forecast the supply-demand dynamics of social assistance resources, we can achieve dynamic resource allocation. Through analyzing historical assistance data, regional demographic changes, economic development trends, and other factors, we can predict the resource demands of different regions and assistance recipients over specific periods. For instance, in disaster-prone areas, the system can predict relief material requirements in advance by analyzing historical disaster frequencies and affected population sizes, then promptly allocate corresponding resource reserves. This predictive-driven dynamic allocation approach prevents both resource stockpiling and shortages, enhances the utilization efficiency of social assistance resources, and ensures rapid deployment of resources during emergencies to meet the urgent needs of those requiring aid.

3 Application of digital technology in social assistance service provision

3.1 The online service platform expands the channels for obtaining services

Traditional social assistance applications involve cumbersome procedures requiring applicants to shuttle between civil affairs, human resources, and community departments. This process demands extensive documentation and frequent rejections due to incomplete materials or procedural ambiguities, resulting in time-consuming processes that undermine service efficiency. Digital technology has effectively resolved this challenge by establishing an integrated online platform that consolidates fragmented assistance services into a unified portal^[3]. Taking Guangzhou's "Suihaoban" government app as an example, the social assistance module allows applicants to submit basic family information and hardship details via mobile devices. The system automatically verifies data through cross-departmental databases, eliminating paper submissions and truly realizing the principle of "letting data do the running while reducing citizens' workload." The platform also provides intelligent policy consultations, real-time application progress tracking, and instant result notifications, enabling beneficiaries to monitor their cases in real time. Since its launch, the module has reduced average processing time from 7 to 2 working days, with public satisfaction rising from 68% to 92%. This innovation not only expands access to assistance services but also significantly enhances service convenience and public satisfaction.

3.2 Intelligent services improve service accuracy and personalization

Technologies such as intelligent voice recognition and AI robots have been applied to social assistance services. In Guangzhou's "AI + Assistance" platform, the "Zhi-Kuan' ai" (Intelligent Care) telephone service uses voice recognition

technology to regularly follow up with disadvantaged groups, understanding their needs and reminding them about extreme weather precautions. Feedback from vulnerable populations is automatically identified and transmitted to the "Suijiuyi" (Smart Hub), where tasks are dispatched for resolution. For Huang Bo, a severely impoverished elderly man living alone, the "Zhi-Kuan'ai" phone promptly alerted him during a sudden cold snap. After Huang expressed his needs, community civil affairs staff swiftly responded by delivering quilts. Intelligent services transcend human limitations, accurately identifying personalized requirements to enhance service quality and precision.

3.3 Virtual assistance space enhances the interactivity of services

The development of virtual assistance spaces through technologies like Virtual Reality (VR) and Augmented Reality (AR) enhances the interactivity of social assistance services^[4]. For instance, providing virtual vocational training classes for disadvantaged families in remote areas allows beneficiaries to learn practical skills through VR simulations of real-world work environments, significantly improving training effectiveness. Moreover, these virtual platforms facilitate communication activities that transcend geographical boundaries, enabling people from different regions to share experiences and express concerns, thereby strengthening their social support networks. By diversifying service formats, virtual assistance spaces transform traditional one-way offline aid into interactive environments, fostering a positive atmosphere of mutual engagement that boosts participants' sense of involvement and fulfillment.

4 Challenges and countermeasures of digital technology in social assistance application

4.1 Service coverage imbalance caused by digital divide and path to bridge it

The digital divide in social assistance primarily manifests as disparities in digital technology acquisition and usage capabilities among different groups, directly impacting the accessibility of relief services. Elderly populations and disadvantaged residents in remote areas often struggle to access online assistance due to inadequate smart devices, limited internet coverage, or lack of digital literacy. For instance, rural seniors living alone may be unable to use smartphones to apply for assistance through the "Suihaoban" app, forcing them to rely on traditional offline channels – a process that prolongs the application cycle. Bridging this digital divide requires a dual approach: hardware support and skill enhancement. On one hand, governments should collaborate with non-profit organizations to provide basic smart devices free of charge to vulnerable groups while advancing internet infrastructure in remote regions to ensure full signal coverage of relief platforms. On the other hand, community social work stations should conduct digital skills training programs, offering tailored one-on-one courses for seniors covering practical skills like platform registration and application procedures.

4.2 Data security and privacy protection risks and prevention and control mechanisms

Social assistance programs involve handling sensitive personal data such as household income and health records, which carries risks of data breaches and misuse during sharing. While multi-agency data integration has improved identification accuracy, inadequate blockchain implementation and ambiguous data access protocols may still lead to leaks. A regional incident where medical records of beneficiaries were improperly accessed triggered public distrust in data security, hindering relief efforts. Establishing robust data protection mechanisms requires coordinated technical and institutional measures. Technologically, blockchain encryption should be employed for data anonymization, with a tiered access system that restricts authorized personnel to viewing only essential operational information. Institutionally, the "Regulations on Social Assistance Data Security Management" must clarify boundaries for data collection, storage, and usage while establishing accountability mechanisms for data breaches.

4.3 Unfair assistance and optimization schemes caused by algorithmic bias

Algorithmic design deviations may lead to unfair distribution of relief resources. Over-reliance on historical assistance records in training data risks reinforcing stereotypical perceptions, such as misassociating "rural household registration" with "low assistance needs," thereby overlooking actual hardships faced by rural communities. A case in Shandong Province revealed an algorithm prioritizing urban families for resource allocation. Verification showed that excessive urban assistance cases in training data compromised the algorithm's sensitivity to rural needs. Optimizing algorithms requires balancing technical calibration with human intervention^[5]. Technically, expanding data diversity by incorporating comprehensive information from diverse regions and types of beneficiaries helps mitigate bias. Establishing a dynamic evaluation mechanism—where social workers and data experts form review panels to regularly assess fairness and correct biased data—ensures accountability. Humanly, retaining social workers' final approval authority allows on-site

verification of recommended assistance plans, enabling adjustments based on family circumstances. Guangzhou's "Suijiu Yi" platform implemented a dual-review model combining algorithms and social workers. After algorithm-generated assistance plans were verified through community visits, fairness scores improved by 25%, effectively addressing algorithmic bias-related inequities.

5 Conclusion

The application of digital technology in social assistance and social work has demonstrated significant effectiveness in identifying beneficiaries, allocating resources, and delivering services, driving the development of social assistance toward precision, efficiency, and personalization. However, challenges such as the digital divide, data security issues, and algorithmic bias persist in implementation. Moving forward, efforts should focus on: enhancing digital literacy among disadvantaged groups through improved technology accessibility; strengthening data security management mechanisms to protect information integrity; optimizing algorithm design to ensure fairness and justice. Continuous exploration of innovative digital application models will deepen the integration of technology with social assistance, injecting momentum into high-quality development of the social assistance sector. This approach better safeguards the rights of vulnerable populations while promoting social equity, justice, and stability.

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