

Artificial Intelligence Empowering Social Work: Opportunities, Challenges, and Integration Development Paths

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Abstract. The rapid development of artificial intelligence technology has brought unprecedented opportunities for transformation to the field of social work. Its applications in data processing, service provision, risk early warning, and other aspects have significantly improved the efficiency and accuracy of social work. However, behind technological empowerment lie ethical controversies, privacy risks, and tensions regarding professional values. Based on the theory of technological empowerment and the theory of social service innovation, and integrating typical domestic practical cases, this paper systematically analyzes the current application status of artificial intelligence in fields such as community services, assistance for special groups, and social assistance. It examines core challenges including algorithmic bias, privacy leakage, and ambiguity in human-machine collaboration boundaries, and proposes a path for integrated development from three dimensions: the construction of ethical norms, optimization of technological adaptation, and upgrading of social workers' capabilities. This aims to provide some theoretical references and practical guidance for promoting positive interaction between artificial intelligence and social work.

CCS Concepts: Social and professional topics → Computing and society → Social services

Keywords: Artificial Intelligence; Social Work; Integration Development Paths

1. Introduction

1.1. Research Background and Significance

The "Intelligent Era" refers to a new era of social governance supported by technologies such as 5G, the Internet, the Internet of Things, big data, cloud computing, blockchain, and artificial intelligence. With the rapid development of information technology, artificial intelligence has become a core driving force leading the new round of scientific and technological revolution

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and industrial transformation, and its application fields are constantly expanding, ranging from industrial production and financial services to medical care, education, and all aspects of social life.

Social work, as a professional service activity aimed at helping others, based on scientific knowledge and using scientific methods, plays an important role in addressing social issues, meeting social needs, and promoting social equity and harmony.

At present, Chinese society is in a period of transformation, with profound changes in social structure and profound adjustments in interest patterns. Social problems are characterized by complexity and diversity, and the traditional social work model faces many challenges in terms of service efficiency, coverage, and accuracy. The emergence of artificial intelligence has brought new development opportunities for social work. It can improve the effectiveness of social work through data processing, intelligent analysis, and automated services, but at the same time, it has also triggered controversies in ethics, privacy protection, and professional values.

Against this background, in-depth research on the integrated development of artificial intelligence and social work, exploration of the application opportunities and potential challenges of artificial intelligence in social work, and construction of a scientific and reasonable integration path are of important theoretical value and practical significance for promoting the professionalization and intelligent development of social work, improving the quality of social services, and better responding to social needs.

1.2. Domestic and Foreign Research Status

Foreign research on the integration of social work and artificial intelligence started relatively early. Initially, it mainly focused on exploring the feasibility of artificial intelligence technology in the field of social services. With the development of technology, it gradually turned to in-depth research on ethical issues and technology integration. Coeckelbergh (2019) discussed robot ethics in *Robot Ethics*, arguing that the introduction of AI in social work requires redefining the "helping relationship" to avoid the loss of humanistic care caused by technological alienation[1]. Christopher Alexander (2022) pointed out in *Artificial Intelligence and Social Work Practice* that AI can automate paperwork in case management, freeing social workers from repetitive tasks and allowing them to focus on high-value services such as emotional support [2]. Brian Perron from the University of Michigan proposed the "three-stage model of AI empowerment research", dividing the application of AI in social work into three levels: data assistance, decision support, and autonomous intervention, and emphasizing the

control of ethical risks in each stage.

Domestic research, focuses more on discussions at the application level, paying attention to the practical application of artificial intelligence in specific social work fields such as community services, elderly care services, and targeted poverty alleviation. Liu Jiaqian proposed to construct a service model of "artificial intelligence + social workers"[3]. Li Yingsheng and Fang Shu (2020), taking targeted poverty alleviation as an example, put forward a collaborative model of "AI + social workers", which identifies poverty characteristics through an intelligent system, and then social workers provide personalized assistance[4]. The "General Practitioner Social Worker · AI Assistant" project in Baoshan, Shanghai (2024) uses large language models to assist young social workers in handling complex issues such as neighborhood disputes and elderly care services, shortening the growth cycle of new recruits by 50%[5]. However, it is also found that excessive reliance on technology may weaken social workers' on-the-spot response ability.

In recent years, with the popularization of artificial intelligence technology, domestic scholars have also begun to pay attention to the ethical risks and professional challenges brought by technology application, but the overall systematic and in-depth research on the integration of the two still needs to be strengthened.

In general, domestic and foreign research has provided a certain theoretical basis and practical reference for this paper, but there is still room for expansion in the construction of an integration theoretical framework, the summary of localized practical models, and the proposal of targeted solutions.

1.3. Research Methods and Innovations

This paper mainly adopts the literature research method. By sorting out domestic and foreign literatures on artificial intelligence, social work, and their integration, it grasps the research status, theoretical basis, and practical achievements, so as to provide theoretical support for the writing of the paper. Meanwhile, the case study method is employed. Typical cases of the application of artificial intelligence in social work at home and abroad are selected to conduct in-depth analysis of their application models, effectiveness, and existing problems, so as to enhance the practical relevance of the research.

The innovations of this paper are as follows: Firstly, at the theoretical level, it attempts to construct a systematic analysis framework for the integration of artificial intelligence and social work, integrating the theory of technological empowerment and the theory of social service

innovation to provide a more comprehensive theoretical explanation for their integration. Secondly, at the practical level, combined with the latest domestic application cases, it summarizes localized integration experiences and proposes more operable strategies for integrated development in response to current problems.

2. Theoretical Basis of Artificial Intelligence and Social Work

2.1. Overview of Artificial Intelligence Technology

2.1.1. Definition and Development History of Artificial Intelligence

Artificial Intelligence (AI) is a new technical science that studies and develops theories, methods, technologies, and application systems for simulating, extending, and expanding human intelligence. Its core goal is to enable machines to possess intelligent behaviors similar to humans, such as perception, learning, reasoning, and decision-making.

The development history of artificial intelligence can be roughly divided into the following stages:

Embryonic Period (1950s - 1960s): In 1956, the concept of "artificial intelligence" was formally proposed at the Dartmouth Conference, marking the birth of the discipline of artificial intelligence. During this period, research mainly focused on general problem solvers and other areas, achieving some initial results. However, due to technical limitations, development was relatively slow.

Trough Period (1970s - early 1980s): Due to technical bottlenecks and funding shortages, AI research entered a "winter," with limited progress.

Renaissance Period (1980s - 1990s): The successful application of expert systems brought a revival to AI research, achieving certain practical value in fields such as medical care and finance, but limitations still existed.

Rapid Development Period (since the 21st century): With breakthroughs in technologies such as big data, cloud computing, and deep learning, AI has entered a stage of rapid development, making significant progress in speech recognition, image recognition, natural language processing, and other fields, with increasingly rich application scenarios.

2.1.2. Key Technologies and Their Applications in Multiple Fields

The main technologies of artificial intelligence include machine learning, natural language processing, computer vision, robotics, etc.

Machine learning: As one of the core technologies of artificial intelligence, it enables computers

to learn from data and improve their performance. For example, in the financial field, machine learning algorithms can identify fraudulent behaviors by analyzing large amounts of transaction data; in the medical field, they can be used for auxiliary diagnosis of diseases, improving the accuracy of diagnosis by learning case data[6].

Natural language processing: It is committed to enabling computers to understand, interpret, and generate human language. Common applications include intelligent customer service, which can interact with users in natural language and answer their questions; and machine translation, which can realize rapid conversion between different languages.

Computer vision: It allows computers to "see" images and videos. In the security field, it can be used for face recognition and behavior analysis to ensure public safety; in the industrial field, it can conduct product quality inspection to improve production efficiency.

Robotics: It combines mechanical design, sensors, artificial intelligence and other technologies, enabling robots to perform various complex tasks. For instance, industrial robots perform automated operations on production lines, and service robots provide services in homes, hotels and other places.

2.2. Professional Connotation of Social Work

2.2.1. Definition and Goals of Social Work

Social work is a professional helping activity guided by altruism, based on scientific knowledge, and carried out using scientific methods. It aims to help individuals, groups, and communities solve practical problems, enhance their social functions, promote social equity and justice, and drive the harmonious development of society[7].

The goals of social work are multi-level:

Direct goals: To help service recipients alleviate current difficulties, such as resolving life predicaments, improving interpersonal relationships, and relieving psychological pressure.

Intermediate goals: To enhance the capabilities of service recipients, enabling them to better cope with future challenges and achieve self-development.

Ultimate goals: To promote social equity and justice, build harmonious social relations, and advance the overall progress of society.

2.2.2. Working Methods and Value Ethics

The main working methods of social work include case work, group work, and community work.

Case work: Taking individuals or families as service objects, it helps them solve problems and improve abilities through one-on-one professional relationships and the application of professional knowledge and skills.

Group work: Forming groups with service objects who have similar problems or needs, it promotes mutual support, learning, and growth among members through group interactions and activities.

Community work: Taking communities as the work object, it improves the community environment, enhances community cohesion, and promotes community development by organizing residents to participate in community affairs and carry out community services.

The value ethics of social work are the soul of social work practice, mainly including principles such as respect, justice, confidentiality, acceptance, and self-determination[8]. It requires respecting the personality and rights of service recipients, regardless of their race, gender, or wealth; maintaining a fair attitude and treating each service recipient equally; strictly abiding by the principle of confidentiality to protect the privacy of service recipients; accepting the differences and shortcomings of service recipients; and respecting the right of self-determination of service recipients, allowing them to make choices and decisions independently.

2.3. Theoretical Basis for the Integration of the Two

2.3.1. Theory of Technological Empowerment

The theory of technological empowerment holds that technology can bring positive impacts to individuals, organizations, or society by changing resource allocation, improving efficiency, and expanding capabilities. In the field of social work, artificial intelligence, as an advanced technology, can empower social work.

Artificial intelligence can automate the processing of a large number of repetitive and transactional tasks, such as data entry and information statistics, saving social workers' time and energy. This allows them to devote more time to in-depth interactions with service recipients, professional assessments, and personalized services. At the same time, the data analysis capability of artificial intelligence can help social workers understand the needs and problems of service recipients more comprehensively and accurately, providing a basis for formulating scientific service plans and improving the precision and effectiveness of services.

2.3.2. Theory of Social Service Innovation

The theory of social service innovation emphasizes improving the quality and efficiency of social services through innovating service models, methods, and mechanisms to meet the ever-

changing social needs. The integration of artificial intelligence and social work provides new impetus and approaches for social service innovation[9].

This integration can break the time and space constraints of traditional social services. Through online intelligent service platforms, services can be provided anytime and anywhere, improving service accessibility. In addition, artificial intelligence can promote the innovation of service models, such as precision service models based on big data analysis and intelligent risk early warning and intervention models. These innovations can better meet diverse and personalized social needs and enhance the overall level of social services[10].

3. Application Status and Case Analysis of Artificial Intelligence in Social Work

3.1. Application Fields and Methods

3.1.1. Data Collection and Analysis

In social work, accurate and comprehensive data form the foundation for service delivery. Artificial intelligence has provided new approaches and tools for data collection and analysis.

With intelligent questionnaire systems, social workers can distribute questionnaires through online platforms, allowing service recipients to fill them out conveniently online. The system can automatically collect and organize data, significantly improving the efficiency of data collection. Additionally, sensor technology is applied in data collection—for example, in elderly care services, sensors installed in the residences of the elderly can monitor their activities and physiological indicators in real time, enabling timely tracking of their health and safety status. Wilson argued that in child social work, AI can analyze children's academic performance data, campus behavior records, and family environment data to accurately identify their needs for psychological growth and educational support, providing a scientific basis for timely intervention and enhancing the scientificity and foresight of needs identification.

In terms of data processing, AI algorithms can conduct in-depth mining and analysis of massive collected data to discover hidden patterns and trends. For instance, analyzing community residents' demand data can identify key community issues and service gaps, providing a scientific basis for community service planning; analyzing adolescents' behavioral data and psychological assessment data can predict the risk of psychological problems or delinquent behaviors[11].

3.1.2. Construction of Intelligent Service Systems

Artificial intelligence plays a significant role in building intelligent service systems, providing diverse services for different groups.

Intelligent chatbots are common intelligent service tools. They can interact with service recipients through natural language processing technology, answering questions related to policy consultation, psychological counseling, and resource connection. In the field of mental health services, for example, some intelligent chatbots can provide users with preliminary psychological assessments and emotional counseling to alleviate their psychological stress[12]. For special groups, AI technology has enabled the construction of barrier-free service systems[13]. Examples include intelligent voice navigation systems developed for the visually impaired to facilitate their mobility, and real-time subtitle translation systems for the hearing impaired to achieve instant language conversion, making communication with others easier. These intelligent service systems have improved the quality of life and social participation of special groups.

3.1.3. Risk Prediction and Intervention

By analyzing relevant data, AI can predict certain social risks, supporting early intervention to reduce the likelihood and harm of such risks.

In predicting juvenile delinquency risks, AI can collect data on adolescents' family environments, school performance, and social networks, and use algorithmic models to predict the risk level of delinquent behaviors. For high-risk adolescents, social workers can intervene early by providing family counseling, psychological intervention, and behavior correction services to prevent delinquency.

In predicting domestic violence risks, analyzing data such as a family's historical dispute records and family members' behavioral characteristics can predict the likelihood of domestic violence. Relevant departments can take timely intervention measures based on the prediction results, such as providing legal aid and family therapy, to protect the rights and interests of victims[14].

3.2. Specific Case Analysis

3.2.1. Application of AI Digital Social Workers in Community Work

The introduction of AI digital social workers in Dongluchi Community, Linpu Town, has brought significant changes to community work. In terms of notification issuance, traditional community notifications required social workers to visit each household door-to-door or post them on bulletin boards, which was not only time-consuming and labor-intensive but also made

it difficult to ensure the arrival rate and awareness rate of the notifications. AI digital social workers can quickly and accurately send notifications to community residents through multiple channels such as community WeChat groups and text messages, and can track residents' reading status to ensure effective communication of the notifications.

In data collection, communities need to gather data such as residents' basic information and needs. The traditional manual collection method is inefficient and prone to errors. AI digital social workers collect data through online forms, allowing residents to fill in and submit information independently. The system can automatically verify and organize the data, greatly improving the accuracy and efficiency of data collection. In addition, AI digital social workers can analyze community data to support the development of targeted community services, such as organizing community activities suitable for residents based on their age structure and needs.

3.2.2. "AI + Social Workers" Safeguarding the Health of Epilepsy Patients

Xinqiao Hospital has adopted the "AI + social workers" model to provide services for epilepsy patients, achieving good results. AI technology is mainly used for patient condition monitoring and management. Through intelligent wearable devices, it can real-time monitor patients' physiological indicators such as brain waves and heart rate. When abnormal conditions are detected, it can promptly send warnings to patients' families and medical staff to facilitate timely treatment.

Social workers play a role in providing psychological support and helping patients adapt to society. By communicating with patients and their families, social workers understand their psychological state and needs, providing psychological counseling and emotional support. At the same time, social workers help patients connect with social resources, such as rehabilitation training institutions and employment support, to assist them in better integrating into society. The "AI + social workers" model combines technology with humanistic care, improving the treatment effect and quality of life of epilepsy patients.

3.2.3. Jinan's "AI Social Workers" Assisting in Proactive Community Governance

The Third Community of Dianliu Xincun Street, Lixia District, Jinan City, Shandong Province, has introduced an AI "avatar" of Yang Tianyu, the community party secretary—named Yang Xiaoyu. "Yang Xiaoyu" has four major functions: asking, listening, speaking, and doing, serving as a 24-hour online "AI social worker". When the public consults questions, this "AI social worker," equipped with a localized and personalized "knowledge base" formed through professional training, can quickly and accurately provide information on beneficial policies, government services, and daily life convenience. This not only improves the efficiency and

satisfaction of the public in obtaining information but also reduces the workload of community workers in repeatedly answering questions.

When the public feeds back issues such as "the light in Unit 3 of Building 2 is broken" in the group, the "AI social worker" can immediately "hear" it and push the information to community workers, who can then reply and handle it as soon as possible. Moreover, through in-depth analysis of public feedback, the "AI social worker" can perceive changes in public emotions and potential expectations, intervene in advance to resolve conflicts, and promote the establishment of a mechanism of "handling issues before complaints and proactive governance". In addition, the background of the "AI social worker" can generate a "visit list" based on the data records of special groups in the community, reminding community workers to conduct visits and care for special groups such as the elderly and the disabled, achieving targeted care for them.

3.3. Capability Matrix of Artificial Intelligence in Social Work

To systematically sort out the application capabilities of artificial intelligence in social work, the following capability matrix is constructed, integrating dimensions such as core capability dimensions, technical support, application cases, practical effects, and references:

Table 1. Capability Matrix of Artificial Intelligence in Social Work

Capability Dimension	Technical Support	Application Cases	Practical Effects and Value
Data Processing and Analysis	Natural Language Processing (NLP), Machine Learning, Intelligent Algorithms	Collection of basic community information, dynamic monitoring of residents' needs, management of data ledgers for special groups. Examples: Dongluchi Community in Linpu Town uses AI digital social workers' online forms for data collection with automatic verification and sorting by the system; Jinan's "AI Social Worker" Yang Xiaoyu generates "visit lists" based on community data ledgers.	- Data collection accuracy increased to over 95% - Repetitive work of community workers reduced by 40%-60% - Provides data decision support for precise services
Communication, Coordination and Response	Multimodal Interaction, Intelligent Customer Service, Real-time	Policy consultation and answers, response to residents' demands, cross-departmental collaborative communication. Examples: Digital social worker system in Shanghai	-Resident consultation response time shortened to within 5 minutes - Efficiency of

	Communication Technology	Tangqiao Street for automatic task assignment; Hengshui's "Community AI" embedded in WeChat groups to answer real-time policy questions on medical care, employment, etc.	cross-departmental collaboration processes improved by 50% -Public satisfaction increased by 20%-30%
Analysis, Decision-Making and Early Warning	Large Model analysis, Risk Prediction Algorithms, Dynamic Sensing Technology	Prediction of conflict resolution, early warning of risk events, optimization of resource allocation. Examples: Jinan's "AI Social Worker" identifies residents' emotional changes through semantic analysis; Domestic violence risk prediction system predicts risks based on historical data.	- Detection rate of potential conflicts increased by 40% - Response speed to risk events improved by 80% - Accuracy of resource allocation enhanced by 30%
Service Provision and Support	Intelligent Recommendation, Personalized Service Engine, Automatic Generation Technology	Policy interpretation and service guidance, psychological support, assistance for special groups. Examples: Xinqiao Hospital's "AI + Social Worker" model monitors physiological indicators of epilepsy patients; Intelligent voice navigation systems assist visually impaired people in traveling.	- Accuracy of policy answers increased to over 90% - Response time for patient treatment shortened to within 10 minutes - Service coverage for special groups expanded to 95%
Resource Integration and Linkage	Knowledge Graph, Cross-Platform Data Interoperability, Intelligent Matching Algorithms	Linking social resources, cross-departmental collaboration, optimization of service networks. Examples: Community AI systems integrate resources from civil affairs, medical care and other departments; "Social Work Smart Brain" matches assistance resources for children in distress.	- Accuracy of resource matching increased to 85% - Cross-departmental collaboration processes shortened by 50% - Coverage of service networks expanded by 30%

This matrix clearly demonstrates the capability performance of artificial intelligence in different dimensions of social work. Each capability dimension supports each other, jointly promoting the intelligent and precise development of social work services, and also provides a reference framework for evaluating the application effects of artificial intelligence in social work.

4. Opportunities and Advantages Brought by Artificial

Intelligence to Social Work

4.1. Improving Service Efficiency and Quality

4.1.1. Automating Processes to Save Time

Social work involves a large number of repetitive and transactional tasks, such as document sorting, data entry, and information verification, which consume a great deal of social workers' time and energy. The automation function of artificial intelligence can free social workers from these tedious tasks.

For example, intelligent office systems can automatically process document classification, filing, and retrieval, significantly improving office efficiency; data entry systems can automatically recognize information on paper documents through OCR recognition technology and input it into computers, reducing errors and time costs caused by manual entry. Social workers can allocate the saved time to in-depth communication with service recipients, the provision of professional services, and service evaluation, thereby improving the overall service efficiency[15].

4.1.2 Precise Services to Meet Needs

In social work practice, accurately identifying the needs of service recipients is a prerequisite for providing effective services. Traditional needs identification relies on social workers' interviews, observations, and experience judgments, which are prone to strong subjectivity and potential omission of hidden needs. Artificial intelligence can gain an in-depth understanding of the needs and characteristics of service recipients through data analysis, laying a foundation for providing precise services.

Based on big data analysis, social workers can develop personalized service plans for service recipients. For instance, in poverty alleviation work, by analyzing data such as the income sources, family structure, and causes of poverty of poor families, targeted assistance measures (e.g., industrial support, employment training) can be formulated for each family, improving the precision and effectiveness of poverty alleviation. In educational assistance, by analyzing students' academic performance and learning habits, their learning difficulties and needs can be identified, and personalized tutoring and support can be provided.

4.2. Expanding Service Scope and Accessibility

4.2.1. Breaking Time and Space Constraints

Traditional social work services mainly rely on offline face-to-face interactions, which are limited by time and space. As a result, some service recipients in remote areas or with mobility

difficulties struggle to obtain timely services. The application of artificial intelligence technology has broken such constraints.

Through online intelligent service platforms, social workers can provide remote services to service recipients, such as online consultation, online training, and online group activities. Service recipients can access the platform via the Internet at any time and from any location to obtain the required services. For example, residents in rural areas can consult urban social workers about policies and resources through online platforms; elderly people with mobility difficulties can communicate with social workers via online video to receive psychological counseling and life guidance.

4.2.2. Covering More Vulnerable Groups

In the traditional model, some vulnerable groups find it difficult to have their needs identified and thus fail to receive corresponding services due to information isolation and lack of channels for expression. Artificial intelligence technology can help social workers identify and cover these vulnerable groups more extensively[16].

Big data analysis can reveal hidden vulnerable groups, such as homeless people and children in distress. For instance, by analyzing urban surveillance data and rescue information, the activity trajectories and distribution of homeless people can be identified, allowing social workers to carry out targeted rescue services. In addition, the popularization of intelligent service systems enables vulnerable groups to access service information and resources more conveniently, increasing their chances of obtaining services.

4.3. Promoting Professional Development and Innovation

4.3.1. Driving Innovation in Social Work Methods

The integration of artificial intelligence has brought new ideas and innovation directions to social work methods. Traditional methods such as case work and group work have evolved into new service models after combining with artificial intelligence technology[17].

For example, virtual social support groups gather service recipients with similar experiences through online virtual platforms, allowing them to communicate, interact, and share experiences and feelings in a virtual environment. This model breaks the limitations of offline groups in terms of number of participants and geographical location, enabling more people to participate in group activities. In addition, scenario simulation training based on virtual reality technology has been applied in social work training. Social workers can practice skills for dealing with various complex situations in virtual scenarios, thereby improving their

professional capabilities.

4.3.2. Cultivating Interdisciplinary Social Work Talents

The integration of artificial intelligence and social work has put forward new requirements for social workers' professional capabilities, promoting the cultivation of interdisciplinary social work talents. In the context of the intelligent and digital era, artificial intelligence has provided new opportunities for the professional development of social work and created new prospects for social workers, with emerging fields such as "digital social work" and "online social work" becoming promising areas for the development of social work.

The core of cultivating interdisciplinary social work talents through artificial intelligence lies in the reshaping of social work practice models by artificial intelligence, which has spawned the demand for dual capabilities of "professional competence + technical literacy" and thus forced the reform of talent training systems.

After artificial intelligence, as a technical tool, interprets service recipients' data, social workers need to provide corresponding professional services for service recipients according to specific situations. This binding of "technical tools - service scenarios" makes it difficult for a single professional background to meet practical needs, prompting social workers to supplement technical knowledge such as basic machine learning and intelligent system operation, forming a composite knowledge structure of "social work + data science".

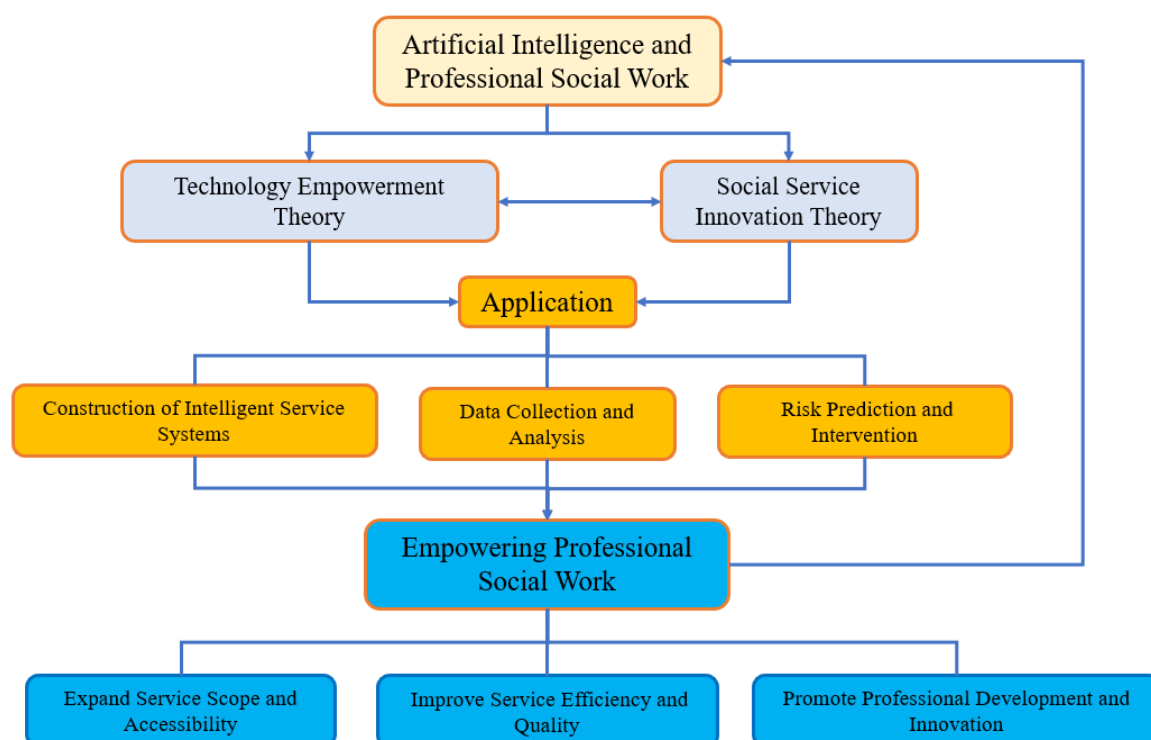


Figure 1. Application and Empowerment of Artificial Intelligence in Social Work.

This technical demand has forced colleges, universities, and training institutions to adjust the training of social work professionals by adding content related to artificial intelligence, such as data analysis and intelligent service system operation, and even establishing simulated practice bases. At the same time, in-service social workers are continuously improving their technical application capabilities through participating in special training, becoming interdisciplinary talents who understand both social work and technology. This helps improve the overall service level of social work., as shown in Figure 1.

5. Challenges in the Application of Artificial Intelligence in Social Work

5.1. Ethical and Moral Dilemmas

5.1.1. Algorithmic Bias and Unfair Treatment

Artificial intelligence algorithms are trained based on data. If the training data contains biased or discriminatory information, the algorithms may generate biases, leading to unfair treatment of certain groups. In the identification of social assistance needs, algorithms may produce unfair assessments of ethnic minorities and low-income groups, violating the principles of fairness and justice in social work[18].

For example, in the screening of social assistance recipients, if the training data contains more negative information about a certain region or group, the algorithm may tend to exclude members of that region or group from the scope of assistance, resulting in unfair outcomes. Additionally, the design of algorithms may be influenced by the subjective factors of developers, leading to implicit biases in the decision-making process and affecting the fairness of services.

5.1.2. Opaque Decision-Making and Trust Crisis

The decision-making process of artificial intelligence is often complex with poor interpretability. Complex algorithm models operate like black boxes, making it difficult for social workers and service recipients to understand the basis for service recommendations or needs assessments, which hinders the establishment of service trust and ethical supervision

When service recipients do not understand the basis of artificial intelligence decisions, they may question the results, reducing their trust in the services. For instance, in mental health assessments, if an intelligent system concludes that a service recipient is at high risk based on a certain algorithm but cannot explain the specific evaluation basis, the service recipient may not accept the result, thereby affecting subsequent intervention services. This opacity in

decision-making is prone to triggering trust crises and impeding the application of artificial intelligence in social work.

5.2. Difficulties in Privacy Protection

5.2.1. Data Security Risks

Data privacy and security are core concerns. In the application of artificial intelligence, a large amount of personal data of service recipients needs to be collected and stored, which includes private information such as personal identity information, health data, and family situations. These data are exposed to security risks in all links of collection, transmission, storage, and processing[19].

For example, data may be intercepted and stolen by hackers during transmission; data storage systems may be attacked due to technical vulnerabilities, leading to data leakage; improper operation or lack of security awareness among staff may also cause accidental data leakage. Once such private data is leaked, it may bring reputational damage, property loss, or even personal safety threats to service recipients. For instance, personal health information could be exploited by criminals for fraud.

5.2.2. Inadequate Privacy Protection Measures

Currently, there are still many deficiencies in privacy protection measures for the application of artificial intelligence in social work[20]. On one hand, relevant laws and regulations are not well-developed. There are no clear and detailed provisions on the scope of data collection, usage rights, storage duration, etc., resulting in blurred boundaries of data usage in practice and making it prone to excessive collection and abuse of data. On the other hand, some social work institutions are deficient in technical investment and management mechanisms. They lack professional data security protection technologies and equipment, and have not established strict data management processes and accountability systems, making it difficult to effectively safeguard the privacy and security of service recipients.

5.3. Professional Capability and Technical Gap

5.3.1. Insufficient Technical Capabilities of Social Workers

The application of artificial intelligence technology has put forward new requirements for the technical literacy of social workers, but currently, many social workers have obvious deficiencies in this aspect. Most social workers have professional backgrounds in social work, psychology, sociology, and other fields, lacking systematic learning and understanding of artificial intelligence technology. When faced with intelligent data processing systems and

algorithm models, they often feel at a loss.

For example, they cannot skillfully use intelligent data analysis tools to explore the potential needs of service recipients, fail to effectively interpret the results output by algorithms to guide service practice, and even have difficulties in the basic operation of intelligent systems. This greatly limits the full application of artificial intelligence tools in social work.

5.3.2. Regional Differences in Technical Resources

There are significant imbalances in economic development levels and the distribution of technical resources between different regions in China, and this disparity is particularly prominent in the integrated application of artificial intelligence and social work. Developed regions have more sufficient funds, more advanced technical equipment, and richer technical talent resources, enabling them to introduce and apply artificial intelligence technology in social work services at an early stage. For instance, communities in some first-tier cities have widely used intelligent service platforms.

In contrast, underdeveloped regions, especially remote rural areas and economically backward areas, due to factors such as fund shortages, weak technical infrastructure, and lack of professional technical support, can hardly enjoy the technical dividends brought by artificial intelligence. This leads to a large gap in the efficiency and quality of social work services between these regions and developed regions, further exacerbating the unfairness of social services.

6. Strategies for Promoting the Integrated Development of Artificial Intelligence and Social Work

6.1. Strengthening Ethical Education and Supervision

6.1.1. Conducting Training on Artificial Intelligence Ethics

Incorporate artificial intelligence ethics into the continuing education and training system for social workers. Through various forms such as special lectures, case studies, and simulation training, help social workers deeply recognize the potential ethical risks in the application of artificial intelligence, such as algorithmic bias and privacy infringement.

The training content should include the specific connotations of ethical principles, methods for identifying ethical issues, and strategies for addressing ethical dilemmas. For example, by analyzing cases where service injustice is caused by algorithmic bias, social workers can understand the importance of algorithmic fairness and learn to conduct ethical reviews of

algorithm results in practice. Meanwhile, cultivate social workers' ethical decision-making capabilities, enabling them to adhere to the value ethics of social work in the process of technological application and always prioritize the interests of service recipients.

6.1.2. Establishing and Improving Supervision Mechanisms

Relevant government departments should collaborate with social work industry associations, experts in the field of artificial intelligence technology, and other stakeholders to jointly formulate ethical guidelines and industry norms for the application of artificial intelligence in social work. These norms should clarify the boundaries of technological application, standards for data usage, and requirements for algorithmic fairness.

For example, it should be stipulated that in decisions involving major rights and interests of service recipients (such as identification of social assistance eligibility, evaluation of child custody rights, etc.), the results of artificial intelligence algorithms cannot serve as the sole basis. They must undergo professional evaluation and manual review by social workers. Meanwhile, a dedicated supervisory agency or platform should be established to conduct regular supervision and evaluation of the application of artificial intelligence in social work. Acts that violate ethical guidelines and norms should be severely dealt with to ensure the legality and ethics of technological application.

6.2. Strengthening Privacy Protection Measures

6.2.1. Adopting Advanced Technologies to Ensure Data Security

Social work institutions should actively introduce advanced data security protection technologies. For example, data encryption technology can be used to encrypt the collected private data of service recipients, ensuring that the data is not illegally obtained during transmission and storage. Data anonymization and de-identification technologies can be adopted to remove information that can identify service recipients while retaining the value of data analysis, thereby reducing the risk of data leakage.

In addition, network security protection devices such as firewalls and intrusion detection systems should be deployed to prevent hacker attacks and malware intrusions, ensuring the safe and stable operation of data systems.

6.2.2. Improving Data Management and Usage Systems

Strict data management processes and access permission systems should be established to clarify the purposes, scope, and methods of data collection. It is necessary to ensure that only necessary information related to services is collected, and excessive collection is prohibited.

For instance, when providing services for the elderly, irrelevant private information of the elderly's children should not be collected. Meanwhile, strict authorization should be implemented for data access and usage. Different permissions should be assigned based on the responsibilities and work needs of staff, and only authorized personnel can access corresponding data. All data operations should be recorded for traceability. In addition, a reasonable data storage period should be set, and data that is no longer needed should be safely destroyed in a timely manner to avoid potential security risks caused by long-term data retention.

6.3. Enhancing Social Workers' Technical Capabilities

6.3.1. Optimizing Professional Curriculum Systems

Institutions of higher education should reform the curriculum of social work programs by incorporating knowledge related to artificial intelligence. Courses such as "Artificial Intelligence and Social Work," "Application of Data Science in Social Services," and "Operation and Application of Intelligent Service Systems" should be offered[21].

The curriculum content should balance theory and practice: it should introduce the basic principles of artificial intelligence, core technologies, and their application prospects in social services, while also focusing on cultivating students' practical skills in using intelligent tools. For example, students can be taught to process service data using data analysis software and conduct online services through intelligent platforms. Additionally, universities should strengthen school-enterprise cooperation by establishing "AI + Social Work" training bases with AI enterprises and social work service institutions, providing students with opportunities to participate in practical applications of AI technology and enhancing their technical application capabilities.

6.3.2. Conducting Continuous Training and Further Education

For in-service social workers, industry associations, training institutions, or employers should organize diverse AI technology training and further education activities.

Training content should be designed based on social workers' actual needs and technical foundations, progressing from basic skills such as intelligent device operation, data entry, and sorting to more complex ones like data analysis methods and algorithm result interpretation. For instance, technical experts can be invited for on-site guidance to help social workers master advanced functions of intelligent service systems; ethical frameworks, workforce training; social workers can be organized to participate in collaborative projects with AI technicians, learning technical application skills in practical work. Furthermore, social workers should be

encouraged to engage in self-directed learning, updating their knowledge structures and improving technical literacy through online courses, professional books, and other channels.

7. Conclusion and Outlook

7.1. Research Summary

This paper focuses on the integrated development of artificial intelligence and social work. Firstly, it elaborates on the research background, significance, domestic and foreign research status, methods, and innovations, laying a foundation for the study. Through an analysis of the theoretical basis of artificial intelligence and social work, it clarifies the possibility and theoretical support for their integration. Subsequently, combined with specific cases, it discusses in detail the application status of artificial intelligence in social work fields such as data collection and analysis, construction of intelligent service systems, and risk prediction and intervention. It also constructs a social work capability matrix for artificial intelligence, systematically presenting the core capabilities of AI in social work.

Meanwhile, this paper highlights the opportunities brought by artificial intelligence to social work, including improving service efficiency and quality, expanding service scope and accessibility, and promoting professional development and innovation. It also conducts an in-depth analysis of the challenges in the integration process, such as ethical and moral dilemmas, difficulties in privacy protection, and gaps in professional capabilities and technology. Finally, in response to these challenges, it proposes strategies to promote their integrated development, such as strengthening ethical education and supervision, enhancing privacy protection measures, and improving social workers' technical capabilities.

In general, the integration of artificial intelligence and social work is an inevitable trend of the times. Although it faces many challenges, effective response strategies can realize the complementary advantages of the two, driving social work towards a more efficient, precise, and high-quality direction.

7.2. Future Development Outlook

Looking ahead, the integration of artificial intelligence and social work will present the following development trends:

At the technical application level, with the continuous advancement of artificial intelligence technology, its application in social work will become deeper and more extensive. For example, more advanced natural language processing technology will enable intelligent chatbots to have

stronger emotional recognition and empathy capabilities, providing more humanized services; virtual reality and augmented reality technologies will be more widely used in social work training and services, such as simulating community work scenarios through virtual reality to enhance social workers' practical abilities; blockchain technology may be introduced into data management to further enhance data security and traceability.

At the service model level, the collaborative service model of "artificial intelligence + social work" will become more mature. Artificial intelligence will mainly undertake tasks such as data processing, basic services, and risk early warning, while social workers will focus more on emotional support for service recipients, value guidance, and solving complex problems that require humanistic care and professional judgment, forming an efficient service combination of "technological empowerment + humanistic care". Meanwhile, personalized and precise services based on big data and artificial intelligence will become mainstream, capable of providing customized service plans according to the unique needs and characteristics of each service recipient.

At the industry development level, the integration of artificial intelligence and social work will promote the standardization and institutionalization of the social work industry. By establishing unified intelligent service data standards and process specifications, it will facilitate the sharing of service resources and collaborative cooperation between different regions and institutions. At the same time, it will also give birth to new professional positions and fields, such as social work technology consultants and artificial intelligence ethics assessors, injecting new vitality into the development of the social work industry.

However, in the future development process, it is still necessary to continuously pay attention to new problems and challenges brought by technological applications, and constantly improve relevant theoretical research, policies and regulations, and practical strategies to ensure that the integration of artificial intelligence and social work always moves in the direction of improving the quality of social services and promoting social fairness and justice. Only by organically combining the advantages of technology with the professional values and ethical norms of social work can we truly realize the empowerment of artificial intelligence to social work and contribute to building a harmonious society.

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