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Practical Approaches and Development Strategies for Enhancing Local Industrial Capabilities through AI Empowerment

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Abstract

In the era of the digital economy, Artificial Intelligence (AI), as the core driving force of the new generation of information technology, has become a key support for promoting the transformation and upgrading of local industries and enhancing industrial core competitiveness. Currently, local industries in China are facing development bottlenecks such as homogeneous competition, low-end locking of industrial chains, insufficient innovation capability, and relatively low production efficiency. The deep integration of AI technology can effectively address these industrial development pain points and drive local industries toward intelligent, high-end, and green transformation. This article, based on the practical development of local industries, avoids experimental verification, dataset analysis, and review-style writing patterns, focusing instead on the practical logic, core pathways, and safeguarding strategies for AI to empower the capability enhancement of local industries. By combining typical local industry application scenarios, it clarifies AI's empowerment pathways in key fields such as agriculture, industry, and services. Through the use of charts to present key content, it provides actionable practical references for local governments and enterprises to promote deep integration of AI and industry and to enhance comprehensive industrial capabilities, thereby supporting high-quality local economic development. The AI empowerment practices of China's local industries summarized in this paper provide a reference model for the digital transformation of regional industries in emerging economies and offer a Chinese example for the global integration of digital technology and the real economy.

Keywords

Artificial Intelligence; Local Industries; Industrial Empowerment; Transformation and Upgrading; Practical Pathways; Core Competitiveness.

1. Introduction

Artificial intelligence-driven industrial digital transformation is a core topic in the development of the global digital economy. Existing international research mainly focuses on the AI application practices of large industrial clusters in developed countries [1][2], while exploration of AI empowerment paths for industries in small and medium-sized cities and counties in emerging economies is relatively lacking [3], and there is a shortage of practical solutions based on localized practices.

As the world's largest manufacturing country and the country with the most complete county-level economic system, China has carried out extensive policy exploration and practical attempts in the integration of AI with local industries [4], forming a development model characterized by China's unique approach of 'policy guidance, technology implementation, and scenario adaptation.' Based on the practical experience of China's local industries, this article sorts out the core logic and implementation paths of AI empowerment, filling the gap in

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research on AI empowerment of regional industries in emerging economies and providing practical reference for similar regions worldwide.

With the continuous advancement of China's digital economy, the 'AI industry' has become an important engine for promoting the optimization of local industrial structures and achieving high-quality development. Local industries, as the fundamental units of China's industrial system, cover multiple fields including agriculture, industry, and services, and serve as the core support for regional economic development [5]. However, their development levels are constrained by factors such as resource endowments, technical capabilities, and talent reserves, generally exhibiting problems such as low industrial tier, insufficient innovation drive, inefficient resource utilization, and weak risk resistance. Especially for industries in small and medium-sized cities and counties, they face prominent challenges such as intensified homogeneous competition, incomplete industrial chains, and lagging technological upgrades, which severely limit the sustainable development of regional economies [6].

In recent years, the country has placed great emphasis on the industrial application of AI technology, successively issuing policy documents such as the "Artificial Intelligence Action Guidelines" (the "Artificial Intelligence Action Guidelines" is a national-level policy document in China to promote the deep integration of artificial intelligence with the real economy, clearly specifying the application directions and support measures of AI in fields such as agriculture, industry, and services) and the "New Generation Artificial Intelligence Development Plan"[7]. These policies explicitly propose promoting the deep integration of AI with the real economy and empowering local industrial transformation and upgrading, providing clear policy guidance for enhancing local industrial capabilities. Leveraging its core advantages of autonomous learning, intelligent decision-making, and efficient computation, AI technology can penetrate the entire industrial process, including production, processing, sales, and services, achieving improvements in production efficiency, product quality optimization, industrial structure upgrading, and innovation capacity enhancement. It has become an important path for overcoming bottlenecks in local industrial development and enhancing the core competitiveness of industries.

Currently, domestic research on AI-enabled industries mainly focuses on large cities or key industrial clusters, while targeted studies on local small and medium-sized cities and county-level industries are relatively scarce. Moreover, most studies rely on experimental data, dataset analysis, or literature reviews, lacking practical exploration closely aligned with local industrial realities. Based on this, this paper focuses on the pain points in local industrial development, emphasizing the practical aspects of enhancing local industrial capabilities through AI. Drawing on the practical experiences of various local "Artificial Intelligence" initiatives, it clarifies the core logic, key areas, and implementation paths for AI-enabled local industries. Key contents are presented in combination with charts, without the need for experimental verification or dataset support, highlighting practicality and operability. The paper aims to provide practical guidance for local governments in formulating industrial policies and for enterprises in advancing technological upgrades, contributing to high-quality development of local industries while enriching the research on the integration of AI and local industries.

2. AI Empowering the Enhancement of Local Industrial Capabilities: Core Logic and Basic Conditions

AI empowers the enhancement of local industrial capabilities, which is not simply a matter of technological addition, but involves the deep integration of AI technology with the entire industrial process, restructuring production models, innovation models, and service models [8], achieving optimized allocation of industrial elements, comprehensive improvement of industrial efficiency, and significant enhancement of industrial competitiveness. Its core logic

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is a closed-loop progression of 'technology empowerment—efficiency improvement—structural optimization—capability upgrading,' which does not require complex experimental verification and can form a complete system through practical logical deduction and summarization of local application experiences.

2.1. Core Empowerment Logic

The core logic of AI empowering the enhancement of local industrial capabilities is reflected in three levels: First, technological empowerment—AI technologies (such as machine learning, computer vision, natural language processing, etc.) replace traditional manual operations, overcoming the limitations of high labor costs, low operational accuracy, and inefficiency, thereby promoting the intelligent upgrading of production, processing, and service segments in the industry; second, efficiency empowerment—through intelligent scheduling, precise control, and predictive analysis enabled by AI technologies, industrial production processes are optimized, resource waste is reduced, production efficiency and resource utilization are improved, and operational costs are lowered; third, innovation empowerment—AI technologies drive industrial technological innovation, product innovation, and model innovation, breaking through traditional industrial development bottlenecks, cultivating new industries, new business formats, and new models, promoting the high-end transformation of industries, and enhancing core industrial competitiveness. The above core logic can be clearly presented in Figure 1.

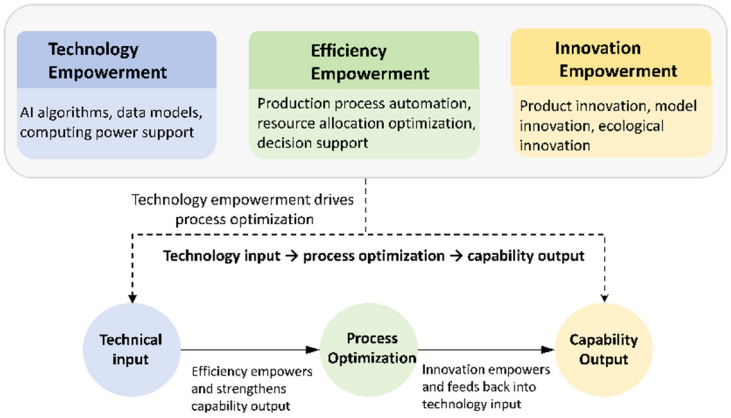

Figure 1. Core Logical Framework Diagram of AI Empowering the Improvement of Local Industrial Capabilities

2.2. Core Empowerment Logic

Based on the actual development of local industries, enhancing local industrial capabilities through AI requires three fundamental conditions, all of which are indispensable. This is also the core approach for local governments to promote the integration of AI with industries. The details are as follows, with a detailed summary in Table 1.

First is the condition of policy support. Local governments need to introduce targeted support policies, clearly define the development goals, key areas, and support measures for AI-enabled industries, increase financial investment, improve the policy guarantee system, and guide enterprises and research institutions to participate in the practice of AI and industrial integration, creating a favorable industrial development environment. For example, Gansu announced the first batch of 130 "artificial intelligence" application scenarios, and Shaanxi introduced 19 specific "artificial intelligence" measures, providing clear policy guidance for empowering local industries.

Secondly, regarding the technical infrastructure, local regions need to possess a certain foundation for AI technology applications, including basic network infrastructure, intelligent

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terminal devices, and technical service organizations [10]. At the same time, efforts should be made to promote lightweight applications of AI technology, lower the barriers for enterprises to adopt technology, ensure that AI technology can be quickly implemented, and adapt to the development needs of local small and medium-sized enterprises. China already has a certain foundation in algorithms, computing power, and data. The "East Data, West Computing" project (a national strategic project in China aimed at optimizing the spatial layout of computing resources and promoting coordinated development of regional digital economies, providing low-cost computing support for local industrial AI applications) is progressing in an orderly manner, providing solid technical support for enabling AI in local industries.

Third is the talent support condition. AI-enabled industries require compound talents who possess both AI technical capabilities and industry practical experience. Local regions need to strengthen talent cultivation and introduction, improve talent incentive mechanisms, and address the shortage of talent to provide a talent guarantee for the integration of AI and industry. Currently, local industries generally face a shortage of high-end algorithm development talents and compound talents, making talent cultivation and introduction a key support for the implementation of AI empowerment.

Table 1. Basic Conditions for Enhancing Local Industrial Capabilities through AI Empowerment

Types of Basic Conditions	Core Requirements	Specific Implementation Directions
Policy Support Conditions	Improved top-level design, precise and effective support, and a sound institutional environment for the integration of AI and industries	Issue local special policies on "AI +", clarify the empowerment goals and key areas; establish special financial funds to provide enterprise subsidies and tax reductions/exemptions; release lists of application scenarios to guide the collaborative participation of enterprises and research institutions
Technological Basic Conditions	Complete computing power, network and equipment, and lightweight, easy-to-implement AI applications	Promote the construction of new infrastructure such as 5G, the Internet of Things, and data centers; rely on the "East Data West Computing" project to sink regional computing power resources; promote lightweight AI solutions to meet the technological needs of small and medium-sized enterprises
Talent Support Conditions	Gather compound talents with AI technology and industrial practice experience to solve the talent shortage	Cooperate between universities and localities to cultivate applied AI talents and carry out enterprise skill training; issue talent introduction policies to attract high-end algorithm and compound talents; improve the talent incentive and guarantee mechanism to stabilize the core talent team

3. Key Areas and Practical Paths for Enhancing Local Industrial Capabilities through AI Empowerment

Based on the resource endowments and actual development of local industries, enhancing the capabilities of local industries through AI should focus on three key sectors: agriculture, industry, and services. It is essential to address the pain points of each industry and formulate

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differentiated empowerment paths to ensure that AI technology precisely aligns with industry needs, achieving targeted improvements in industrial capabilities. The following sections, drawing on the practical experiences of various local "Artificial Intelligence" initiatives, elaborate in detail on the empowerment paths for each sector, presenting key content with charts to highlight practicality and operability.

3.1. AI Empowers the Improvement of Local Agricultural Capabilities

As a fundamental industry of regional economies, local agriculture generally faces developmental challenges such as extensive production methods, weak risk resistance, low added value of agricultural products, and disconnection between production and sales [10]. The application of AI technology can promote the transformation of agriculture towards precision, intelligence, and scale, improving agricultural production efficiency, product quality, and industry competitiveness. It is an important pathway for promoting rural revitalization and enhancing local agricultural capacity. Its core practical approaches mainly include three aspects, which can be clearly illustrated in Figure 2.

First, empowerment of precision agricultural production: by integrating AI technology with the Internet of Things and big data, precise control of agricultural production can be achieved. For example, in crop cultivation, AI image recognition technology can be used to monitor crop growth and pest conditions. Combined with soil moisture and meteorological data, intelligent algorithms can accurately recommend irrigation, fertilization, and pest control programs, reducing waste of water, fertilizers, and pesticides, and improving crop yield and quality. In livestock and poultry breeding, AI intelligent monitoring devices can track the health and growth environment of animals in real-time, enabling precise feeding and disease warning, reducing breeding costs, and enhancing breeding efficiency. For instance, the aquaculture base in Lianjiang, Fujian, uses an underwater intelligent multimodal system to monitor fish activity and water quality data in real time, significantly improving breeding efficiency [11], exemplifying AI-enabled local agriculture.

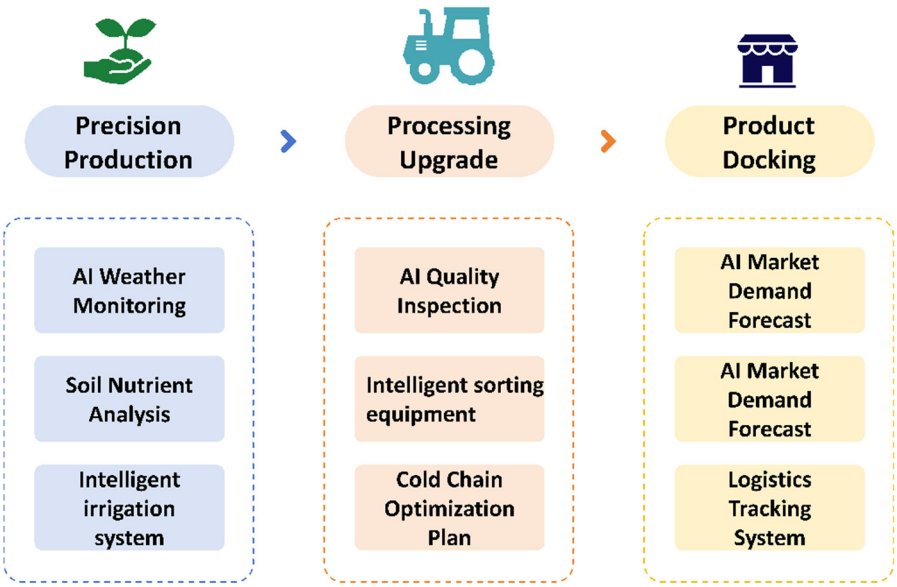

Figure 2. Practical Path Diagram for Enhancing Local Agricultural Capabilities with AI

Second, empowerment of agricultural product processing: AI technology can be used to optimize processing workflows, improving efficiency and the added value of products. For example, AI intelligent sorting equipment can automatically grade and sort agricultural products, selecting high-quality products and enhancing product quality; AI algorithms can

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optimize processing techniques to promote deep processing of agricultural products and develop high value-added products (such as pre-prepared dishes and health products), extending the agricultural industry chain and increasing industry profitability.

Third, empowerment of agricultural product production and sales: AI technology can establish intelligent production-sales matching platforms to achieve precise alignment of supply and demand. By analyzing market demand data with AI algorithms, market trends can be accurately forecasted, guiding farmers to arrange production reasonably and avoiding disconnection between production and sales. Using AI intelligent recommendation technology, local specialty agricultural products can be accurately delivered to target consumers, expanding sales channels and improving the visibility and market share of local agricultural products.

Practical AI applications in county-level agriculture in places such as Shouguang in Shandong and Lianjiang in Fujian demonstrate that lightweight AI technology can effectively adapt to the dispersed characteristics of agricultural production [12], providing a low-cost adaptation solution for the precision upgrading of agriculture in developing countries.

3.2. AI Empowers The Improvement of Local Agricultural Capabilities

Local industry is the core support of regional economies, and most local industries are dominated by small and medium-sized enterprises, which face development challenges such as low production efficiency, unstable product quality, insufficient innovation capabilities, and prominent safety risks [13]. The application of AI technology can promote the transformation of local industries toward intelligent production, refined management, and high-end innovation, breaking through industrial development bottlenecks and enhancing the overall capabilities of industrial sectors [14]. Its core practical paths mainly include four aspects, which can be clearly presented in Figure 3, with typical application cases summarized in Table 2.

First, empowering intelligent production involves promoting the deep integration of AI technology with industrial production processes to create smart production lines and intelligent workshops. By replacing traditional manual operations with AI intelligent equipment, the production process can be automated and intelligent, reducing human errors while improving production efficiency and product quality; AI algorithms can optimize production scheduling, allocate production resources efficiently, shorten production cycles, and lower production costs. For instance, the turbine blade production workshop in Sichuan implements an AI system to achieve precise process control, ensuring stable product quality and providing a practical reference for intelligent production in local industries; small and medium-sized shoe enterprises in Wenzhou, Zhejiang have introduced AI intelligent cutting equipment, increasing cutting efficiency by over 40%, significantly reducing labor costs, and effectively addressing the local SMEs' challenges of labor shortages and low efficiency. Furthermore, to address limited funding and weak technical foundations in local SMEs, lightweight AI production solutions can be promoted. These solutions do not require large-scale production line modifications, and by adding AI intelligent monitoring modules and optimizing production algorithms, production efficiency can be quickly improved, lowering the technical application threshold.

Second, empowering quality control involves using AI technology to achieve full-process quality traceability and precise detection of industrial products, addressing the problem of unstable product quality. By applying AI computer vision technology, products in the production process can be monitored in real-time to accurately identify surface defects, dimensional deviations, and other issues, with timely alerts fed back to the production stage, achieving ‘‘early detection and early correction’’ and improving product yield. An AI quality traceability system can be established to integrate data across the production, processing, and inspection processes, making product quality traceable, enhancing consumer trust, and providing data support for optimizing production processes. For example, a ceramic enterprise

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in Zibo, Shandong has introduced an AI visual inspection system to replace traditional manual inspection, raising detection accuracy to 99.8% [15], effectively solving the problem of low inspection efficiency and high misdetection rates in ceramic product defect detection, and helping to upgrade the quality of the local ceramic industry.

Third, empowering innovation and research & development: Relying on AI technology to enhance the technological innovation capabilities of local industrial enterprises, breaking the bottleneck of being locked in the low end of the industrial chain. Using AI algorithms to mine industry technical data and market demand data, accurately predict technological development trends, provide guidance for enterprise R&D, shorten development cycles, and reduce R&D costs; through AI virtual simulation technology, simulate product development and production processes, optimize product design plans, reduce trial-and-error costs during R&D, and improve R&D success rates. To address the issues of insufficient R&D investment and a lack of high-end R&D talent in local industrial enterprises, local research institutions can be encouraged to cooperate with enterprises to build AI shared R&D platforms, integrate regional R&D resources, provide AI-assisted R&D services for small and medium-sized enterprises, help enterprises overcome core technology bottlenecks, cultivate high-end products, and promote the industry to move up the value chain. For example, the county-level industrial cluster in Suzhou, Jiangsu built an AI shared R&D platform to provide local equipment manufacturing enterprises with product simulation and process optimization services, helping enterprises shorten the R&D cycle by more than 30% [17] and effectively improving the innovation capability of the local industry.

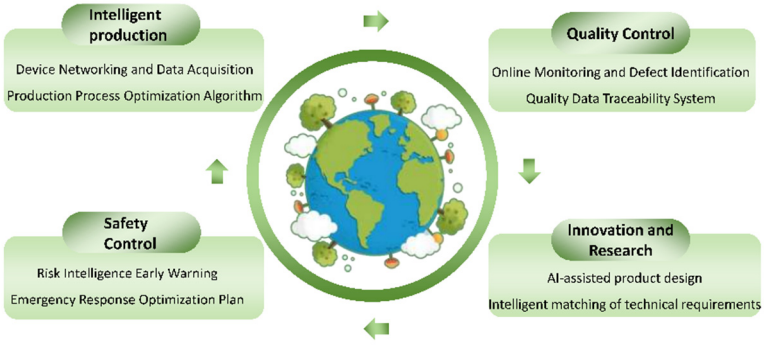

Figure 3. Practical Path Diagram for AI Empowering the Enhancement of Local Industrial Capabilities

Fourth, empowering safety management and control: Using AI technology to construct an intelligent industrial production safety protection system, addressing the prominent safety risks faced by local industrial enterprises. Through AI smart monitoring devices, the operational status of equipment, compliance with personnel operating procedures, and environmental safety indicators (such as temperature, humidity, and gas concentration) in production workshops are monitored in real-time to identify safety risks promptly, issue early warning signals, and even enable emergency shutdowns to prevent accidents; using AI algorithms to analyze historical safety accident data, uncover patterns in accident occurrences, provide reference for enterprises to formulate safety prevention measures, and improve safety management levels. For example, a non-ferrous metal enterprise in Luoyang, Henan introduced an AI safety monitoring system to monitor high-temperature and high-pressure equipment during the production process in real-time, achieving early warning of safety risks and reducing accident occurrence by 60% year-on-year, providing strong support for safe production in local industry.

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The AI empowerment models of small and medium-sized enterprises in Wenzhou, Zhejiang, and Suzhou, Jiangsu solve the digital transformation difficulties of SMEs with limited funds and weak technological bases, providing direct reference value for AI applications in global small and medium-sized manufacturing enterprises.

Table 2. Summary of Typical Cases of AI Empowering Local Industries

Region	Enterprise Type	AI Application Scenario	Implementation Measures	Empowerment Effects
Sichuan	Equipment Manufacturing	Intelligent Production	Introduce AI control system for precise process control and production flow optimization	Stable product quality, reduced human errors, and set a demonstration for local equipment manufacturers
Wenzhou, Zhejiang	Light Industry (Small & Medium Shoe Enterprises)	Intelligent Production (Cutting Process)	Adopt AI intelligent cutting equipment to adapt to SMEs without large-scale production line transformation	Cutting efficiency ↑40%, labor cost reduced, solving SMEs' recruitment and efficiency pain points
Zibo, Shandong	Traditional Manufacturing (Ceramics)	Quality Control (Defect Detection)	Use AI visual inspection system to replace manual real-time defect and dimension monitoring	Detection accuracy ↑99.8%, reduced missed detection, promoting ceramic industry quality upgrading
Luoyang, Henan	Heavy Industry (Non-ferrous Metals)	Safety Control (Equipment Monitoring)	Introduce AI safety monitoring system for high-temperature/high-pressure equipment with early warning	Potential hazards early warned, accident rate ↓60% YoY, improved safety management

3.3. AI Empowers the Enhancement of Local Service Industry Capabilities

Local service industries are important growth points of regional economies, covering multiple sectors such as cultural tourism, commerce and trade, logistics, government services, and healthcare. Currently, they generally face development challenges such as low service efficiency, uneven service quality, insufficient personalized services, and unreasonable resource allocation. The in-depth integration of AI technology can promote the transformation of local service industries toward intelligence, personalization, and efficiency, enhancing service quality and industrial competitiveness, while meeting the demand of local residents for high-quality services [177]. Its core practical pathways, combined with the actual conditions of local service industries, are developed across five key areas, with the specific pathways clearly illustrated in Figure 4.

First, AI empowers local cultural tourism services to address the pain points of severe homogenization, insufficient experiential quality, and inadequate promotion. By building AI-powered smart cultural tourism service platforms that integrate local cultural and tourism

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resources (scenic spots, cuisine, folk customs, etc.), tourists can enjoy one-stop services such as intelligent guides, route planning, ticket booking, and voice explanations, enhancing their experience. AI image generation and virtual simulation technologies can create virtual cultural tourism scenarios for 'online cloud tours,' broadening tourism promotion channels. Through AI algorithm analysis of tourists' consumption and preference data, cultural tourism products and services can be accurately targeted, achieving personalized marketing and enhancing the local tourism brand and attractiveness. For example, Huangshan Scenic Area in Anhui introduced an AI smart guide system that recommends routes and attractions based on visitors' locations and preferences [18]. Simultaneously, using AI virtual simulation technology, an 'online Huangshan' was created, allowing tourists to explore the area without leaving home, effectively improving both reception capacity and brand influence. In southeastern Guizhou, AI algorithms analyze tourism consumption data to accurately push Miao and Dong ethnic folk experience products, promoting differentiated development of the local cultural tourism industry.

Second, AI empowers local commerce and trade services, facilitating the transformation of traditional trade into smart commerce and addressing problems such as insufficient offline traffic and poor supply-demand matching. By building AI-powered smart commerce platforms for integrated online and offline development, AI recommendation technologies can precisely push products according to consumer habits, improving transaction rates. AI algorithm analysis of market demand data helps trade enterprises optimize product displays and adjust purchasing plans, reducing inventory backlog and enhancing operational efficiency. The introduction of AI intelligent customer service systems enables 24-hour responses to consumer inquiries and after-sales needs, improving service quality and lowering labor costs. For example, the Yiwu Small Commodities Market in Zhejiang introduced an AI smart commerce system that analyzes global buyers' demands to help merchants accurately match orders [19], while also establishing an AI intelligent customer service platform to resolve communication challenges between merchants and buyers, promoting quality and efficiency improvements in the local trade industry. In Weifang County, Shandong, county-level supermarkets adopted an AI inventory management system allowing intelligent monitoring and replenishment of goods. Inventory turnover increased by more than 25%, effectively reducing operational costs.

Third, AI empowers local logistics service industries by optimizing logistics resource allocation and addressing the pain points of local logistics such as "low efficiency, high costs, and inaccurate delivery." AI algorithms can be used to optimize logistics route planning by considering factors such as the quantity of goods, transportation distance, and traffic conditions to formulate the optimal delivery routes, shorten delivery time, and reduce transportation costs. An AI intelligent logistics scheduling platform can be established to achieve real-time monitoring and dispatch of logistics vehicles and goods, improving the utilization of logistics resources. Through AI image recognition technology, automatic sorting and barcode scanning for warehousing of goods can be realized, enhancing sorting efficiency and reducing human errors. For example, the county-level logistics park in Changsha, Hunan, introduced an AI intelligent scheduling system to optimize logistics delivery routes, increasing delivery efficiency by 30% and reducing transportation costs by 15%; logistics companies in Foshan, Guangdong, utilized AI automatic sorting equipment, enhancing sorting efficiency by more than 50% and effectively solving the problem of low local logistics sorting efficiency.

Fourth, AI empowers local government services by improving service efficiency and resolving the pain points of the public such as "difficulty in handling affairs and multiple trips." An AI intelligent government service platform can be established to integrate various government service items, achieving "one-stop online service" and "full online service." AI intelligent consultation systems can be introduced to answer public inquiries and guide citizens in handling affairs online through natural language processing technology. AI algorithms can optimize government service processes, simplify procedures, and shorten processing times,

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enhancing service convenience. For example, Quzhou in Zhejiang launched an AI intelligent government service robot that provides government consultation, preliminary material review, and business guidance, increasing citizen handling efficiency by more than 40% [20]; the county-level government service center in Chengdu, Sichuan, introduced an AI process optimization system, reducing the processing time for enterprise registration and social security matters by 50%, effectively improving the experience for citizens and businesses.

Fifth, AI empowers local healthcare services by optimizing medical resource allocation and addressing local challenges such as "difficulty in accessing medical care and a lack of high-quality medical resources." AI-assisted diagnostic technology helps doctors in primary healthcare institutions improve diagnostic accuracy, particularly for common and frequently occurring diseases, alleviating the pressure of insufficient medical personnel in grassroots facilities. An AI intelligent medical consultation platform can provide online consultations, health guidance, and medication reminders, allowing the public to obtain professional medical advice without leaving home. AI algorithms can analyze regional population health data to accurately predict disease trends, providing data support for local medical resource allocation and disease prevention. For example, primary healthcare institutions in Yancheng, Jiangsu, introduced an AI-assisted diagnostic system, increasing diagnostic accuracy among grassroots doctors by over 35% and effectively alleviating the difficulty in accessing healthcare; Jining, Shandong, launched an AI health management platform to provide personalized health monitoring and guidance services for the elderly, supporting the integration of local elderly care and medical industries.

The application of AI in the service industries of counties such as Quzhou in Zhejiang and Yancheng in Jiangsu has achieved an intelligent upgrade of public and livelihood services, providing a practical path for enhancing the public service capacity in emerging economy counties.

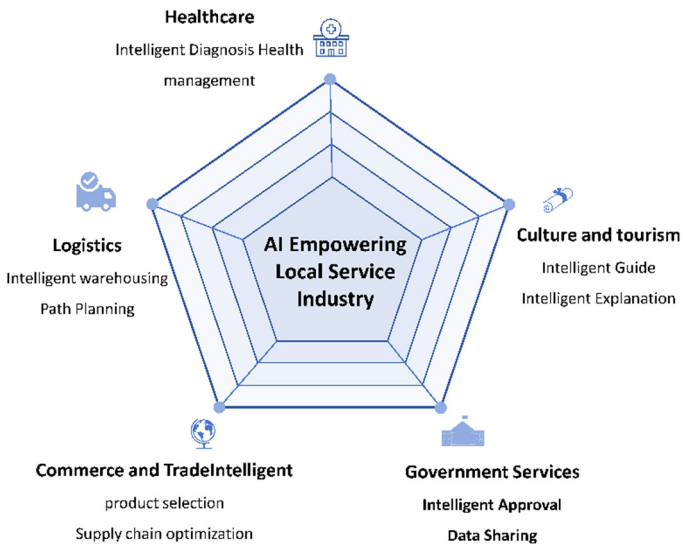

Figure 4. Practical Path Diagram for Enhancing Local Service Industry Capabilities through AI Empowerment

4. Development Strategies and Safeguard Measures for Enhancing Local Industrial Capabilities through AI Empowerment

Based on the actual development of local industries and the current state of AI empowerment practices, in order to promote deep integration of AI with local industries and achieve continuous enhancement of industrial capabilities, it is necessary to focus on four core areas: "policy guidance, technology implementation, talent support, and environmental optimization."

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Targeted development strategies and safeguard measures should be formulated to address issues such as imperfect policies, difficulties in technology implementation, talent shortages, and low enterprise engagement during the AI empowerment process, ensuring that AI empowerment pathways are effectively realized and contributing to the high-quality development of local industries. This section focuses on practical operability, avoiding theoretical expressions, and proposes specific measures based on local practical experience. A summary of related safeguard measures can be found in Table 3.

4.1. Optimize the Policy Support System and Strengthen Guidance and Support

As a guide for AI-enabled industries, local governments need to improve the policy support system, implement precise measures, and provide categorized guidance to create a favorable policy environment for the integration of AI and industry. First, formulate differentiated policies that combine local industrial resource endowments and target the characteristics of different sectors such as agriculture, industry, and services. Introduce targeted AI empowerment support policies, clarify development goals, key tasks, and support measures for each sector, and avoid a "one-size-fits-all" approach. For example, in the agricultural sector, focus on supporting AI applications in precision planting and livestock farming; in the industrial sector, prioritize supporting small and medium-sized enterprises in adopting lightweight AI solutions; in the service sector, focus on promoting the AI-driven upgrading of government services, cultural tourism, and other areas. Second, increase financial investment and establish special funds for AI-enabled industries (such as Huzhou, Zhejiang, setting up a 200 million yuan county-level AI industry empowerment fund) to support enterprises in AI technology transformation, AI application scenarios construction, talent cultivation and recruitment, while also introducing tax reductions, subsidies, and other preferential policies to lower the cost of AI technology application and stimulate enterprise participation. For example, Dongguan, Guangdong, established a special AI industry fund, providing a maximum subsidy of 5 million yuan for small and medium-sized enterprises adopting AI intelligent equipment; Ningbo, Zhejiang, offers tax reductions and exemptions for AI-enabled industry projects, effectively promoting local enterprises' participation in AI integration practices. Third, improve the policy implementation mechanism, establish a special assessment mechanism for AI-enabled industries, clarify the responsibilities of each department, strengthen supervision and evaluation of policy implementation, and promptly resolve issues arising during policy execution to ensure the policies take effect; meanwhile, build a policy publicity platform to promote AI-related policies to enterprises and research institutions, increasing policy awareness.

4.2. Strengthen Technical Support for Implementation and Reduce Application Barriers

The difficulty of technology implementation and the high threshold for application are key bottlenecks restricting the AI empowerment of local industries [21]. It is necessary to focus on the needs of local enterprises, especially small and medium-sized enterprises (SMEs), strengthen technical support, and promote the lightweight and scenario-based application of AI technology. First, promote the localized adaptation of AI technology by guiding research institutions and AI companies to cooperate with local industrial enterprises, addressing specific industry pain points, and developing lightweight AI solutions tailored to local industry needs, without requiring large-scale equipment modifications or significant financial investment, ensuring SMEs can afford and easily use them. For example, develop simple AI production scheduling systems to address low production efficiency in local SMEs, or develop low-cost AI pest and disease monitoring devices for agricultural challenges. Second, improve the technical service system by establishing AI technology service platforms to provide local enterprises with one-stop services including technical consultation, solution design, equipment installation, and

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operation and maintenance, solving technical problems encountered during AI application; at the same time, cultivate local AI technology service companies to enhance technical service capabilities and reduce enterprise service costs. For instance, Suzhou in Jiangsu Province has built an AI technology service platform to provide local SMEs with AI solution design and maintenance services, effectively addressing the issue of enterprises 'not knowing how to use or use poorly.' Third, strengthen infrastructure construction by accelerating the development of 5G, the Internet of Things, big data centers, and other new infrastructures, improving local network coverage, and providing solid infrastructure support for AI applications; leveraging the 'East Data, West Computing' project, promote the decentralization of computing resources to local areas, reduce computing costs for local enterprises, and facilitate the widespread application of AI technology in local industries.

4.3. Improve the Talent Cultivation and Introduction Mechanism to Solve the Talent Bottleneck

The shortage of talent is the core constraint on local industry AI empowerment, and it is necessary to build a 'cultivation, introduction, and incentive' integrated talent mechanism to provide talent support for the integration of AI with industries. First, strengthen the cultivation of local talent by promoting cooperation between local universities, vocational colleges, and enterprises, offering AI-related majors that combine local industry needs, and training compound talents with AI technical skills and industry practical experience; conduct AI skills training for existing employees and grassroots technical personnel to enhance the AI application capabilities of current talents and meet the needs of industry development. For example, vocational colleges in Weifang, Shandong, cooperate with local manufacturing enterprises to establish AI intelligent production-related majors, specifically cultivating compound technical talents; Hangzhou, Zhejiang, conducts AI skills training for small and medium-sized enterprises, having trained over ten thousand company employees, effectively improving their AI application capabilities. Second, strengthen talent introduction efforts by formulating targeted talent introduction policies, focusing on attracting high-end AI R&D talents and compound management talents, providing benefits such as relocation subsidies, salary subsidies, and children's education, to attract talent to settle; simultaneously, build platforms for talent exchange to facilitate the connection of AI talents with local enterprises, promoting the rational allocation of talent resources. For example, Hefei, Anhui, introduced AI talent policies, offering up to 10 million yuan in relocation subsidies to high-end AI talents, attracting a large number of AI talents and supporting local industry AI empowerment. Third, improve talent incentive mechanisms by establishing sound performance evaluation, professional title assessment, and salary distribution systems for AI talents, linking the results of AI technology applications with talents' compensation and promotion to stimulate work enthusiasm; encourage enterprises to sign long-term cooperation agreements with talents and provide rewards such as equity incentives to retain core talents.

4.4. Optimize the Industrial Development Environment and Stimulate Market Vitality

A good industrial environment is an important guarantee for promoting AI empowerment of local industries. It is necessary to focus on enterprise needs, optimize the development environment, and stimulate the vitality of market players. First, build a platform to showcase AI application scenarios, select typical cases of AI empowering local industries, carry out scenario displays and experience exchange activities, guide enterprises to learn and borrow ideas, and stimulate their enthusiasm for participating in AI integration; at the same time, hold AI-empowered industry competitions, innovation and entrepreneurship competitions, and other activities to discover outstanding AI application projects, provide support and rewards, and cultivate new formats and models empowered by AI. Second, strengthen collaboration

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among industry, academia, and research institutions, promote local governments, enterprises, research institutes, and universities to establish collaborative mechanisms, integrate resources from industry, academia, and research, and jointly carry out AI technology research and development, application scenario construction, talent training, and other work to enhance the overall level of AI-empowered industries. For example, Nanjing in Jiangsu Province has established an AI industry-academia-research collaborative platform that integrates resources from universities, research institutes, and enterprises, promoting the practical application of AI technology in local industries and achieving good results. Third, strengthen industry supervision and regulation, establish industry standards for AI technology applications, standardize the application of AI technology in industries, ensure data security and privacy protection, and prevent risks brought by AI technology applications; at the same time, strengthen market supervision, crack down on false AI empowerment projects, maintain market order, and create a fair and orderly development environment for the integration of AI and industries.

Table 3. Summary of Safeguards and Implementation Details for AI Empowering Local Industrial Capability Enhancement

Guarantee Type	Core Measures	Specific Implementation	Responsible Entities
Policy Guarantee	Optimize policy support and strengthen guidance	Differentiated policies; special funds, subsidies and tax incentives; supervision and policy promotion	Local governments, development and reform, industry and information technology, finance departments
Technology Guarantee	Strengthen technology implementation and lower thresholds	Lightweight AI solutions; one-stop service platform; new infrastructure construction	Science and technology departments, research institutions, AI enterprises, operators
Talent Guarantee	Improve talent training, introduction and incentive mechanisms	University-local cooperation; talent introduction policies; performance incentives	Human resources departments, universities, vocational colleges, local enterprises
Environment Guarantee	Optimize industrial ecology and stimulate market vitality	Scenario display; industry-university-research collaboration; industry standards and supervision	Government departments, industry associations, enterprises, research institutes

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5. Summary

As the core driving force of the digital economy era, AI technology has become an important path to break the bottleneck of local industrial development, enhance the core competitiveness of the industry, and promote the high-quality development of the local economy. Based on the actual development of local industries, this paper avoids experimental verification, dataset analysis and review writing modes, focuses on the practical level of AI-empowered local industry capacity improvement, clarifies the core logic and basic conditions of AI empowering local industries, elaborates on the practice path of the three key areas of agriculture, industry and service industry, and puts forward four major development strategies and safeguard measures of "policy guidance, technology implementation, talent support, and environmental optimization". It highlights practicality and operability, and can provide practical reference for local governments to formulate industrial policies and enterprises to promote technological upgrading.

At present, the improvement of AI-enabled local industrial capabilities is still in its infancy, and it is still facing problems such as imperfect policies, difficulty in technology implementation, talent shortage, and low enthusiasm for enterprise participation, especially in small and medium-sized cities and county industries, and the depth and breadth of AI empowerment still need to be further improved. In the future, with the continuous advancement of the digital economy and the continuous iteration of AI technology, the AI empowerment of local industries will show a development trend of "scenario-based, lightweight, and collaborative". Based on their own industrial advantages, local governments need to continue to optimize the policy system, strengthen technical support, improve the talent mechanism, optimize the development environment, and promote the full process and deep integration of AI technology and local industries. Enterprises need to take the initiative to actively introduce AI technology, optimize production and operation models, and enhance core competitiveness; Scientific research institutions need to focus on the pain points of local industries, carry out targeted technology research and development, and promote the localization and adaptation of AI technology.

Looking forward to the future, with the continuous popularization and application of AI technology, it will further solve the bottleneck of local industrial development, promote the transformation of local industries to intelligent, high-end and green, cultivate new industries, new formats and new models, enhance the comprehensive capabilities of local industries, and help the high-quality development of the regional economy. At the same time, the research of this paper still has certain limitations, and the follow-up can be combined with the practical progress of AI empowerment in local industries, further refine the empowerment paths in various fields, summarize more typical cases, and provide more targeted practical guidance for AI empowerment in local industries.

Global enlightenment: Digital technology empowering local industries needs to take into account the precise guidance of policies and the implementation of technology lightweight, pay attention to the application needs of small and medium-sized enterprises, and build an industrial ecology of collaborative collaboration between governments, enterprises and scientific research institutions.

Research Limitations: This paper only focuses on the AI empowerment practice of China's local industries, and does not compare and analyze the industrial digital transformation experience of other emerging economies.

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