Employment Effects of Digital Economy: The Role of SMEs in Bridging Skill Mismatch

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KEYWORDS

ABSTRACT

The digital economy has become the core driving force behind the transformation of China's job market. As the mainstay of employment absorption, the digital transformation process of small and medium-sized enterprises (SMEs) directly affects the growth of total employment and the optimization of employment structure. Based on data from authoritative institutions such as the Ministry of Industry and Information Technology, the China Academy of Industrial Internet, and the Tencent Research Institute, combined with academic research results, this paper systematically analyzes the current situation and mechanism of the digital economy's impact on SME employment, examines the prominent problems encountered in the transformation process, and puts forward targeted policy recommendations. The research finds that the digital economy has a significant employment creation effect on SMEs: for every 1% increase in digitalization level, employment demand rises by 13.7%. In the second quarter of 2025, the total number of industrial digitalization-related jobs nationwide reached 60.009 million, with SMEs and individual households contributing over 80%. However, only 3.2% of SMEs have achieved a high level of digitalization at present, 68% of enterprises face a shortage of digital talents, and structural contradictions such as the digital divide and skill mismatch are prominent. In the future, it is necessary to fully release the employment empowerment potential of the digital economy by improving the transformation support system and strengthening digital skills training.

INTRODUCTION

Employment is the foundation of people's livelihood, and high-quality and full employment is an important support for Chinese-style modernization.As the core component of China's market entities, small and medium-sized enterprises contribute over 80% of urban employment. The quality of their development is directly related to the stability of the job market. With the deep integration of digital technology and the real economy, the digital economy has become a key variable in reshaping industrial forms and optimizing employment structures. By 2024, the number of direct employees in China's digital industry will reach 20.6 million, and it is estimated that by 2030, the digital economy will drive 449 million jobs, among which the proportion of employment through industrial digitalization will exceed 60% [1].

Against this backdrop, the digital transformation of small and medium-sized enterprises is confronted with both the development opportunity of "cost reduction and efficiency improvement" and the realistic predicament of "not daring to transform, not wanting to transform, and not knowing how to transform" [2]. How exactly does the digital economy affect the employment demands and structure of small and medium-sized enterprises? What constraints exist during the transformation process? How can the coordinated development of digital technology and employment be achieved through policy guidance? Based on real data and academic consensus, this article conducts a systematic analysis of the above-mentioned issues, providing theoretical references and practical paths for promoting high-quality and full employment [3].

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2.Current Characteristics Of The Digital Economy's Impact On Sme Employment

2.1.High Participation But Insufficient Depth In Digital Transformation

The digital transformation of SMEs in China presents the prominent feature of "wide coverage but low depth". According to the 2024 Report on Digital Transformation of SMEs in China jointly released by Lenovo and 36Kr Research Institute, 98.8% of SMEs have launched digital transformation, yet 62.6% remain in the early stages. Among them, 32.4% are in the "single-point attempt stage" of basic informatization construction, 30.2% in the "partial construction stage" with digitalization in some businesses, and only 3.2% have reached the intelligent-driven stage [4]. A 2024 survey of 230,000 SMEs by the China Academy of Industrial Internet also confirms this trend: although the digital foundation, operation and management levels have steadily improved, the quality of transformation varies greatly. The digital investment intensity of specialized, refined, characteristic, and innovative (SRCI) enterprises is 3.7 times that of micro-enterprises, making them the backbone of transformation [5](fig.1).
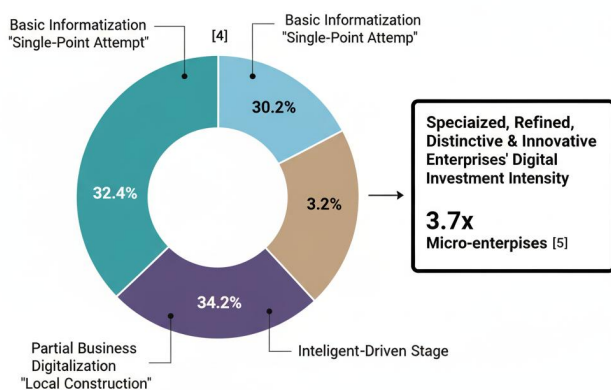

Fig.1.SME Digital Transformation Stages

2.2.Significant And Heterogeneous Employment Creation Effect

In the long run, the digital economy has a clear employment creation effect on SMEs. Research based on panel data of listed companies on the Shenzhen Main Board from 2012 to 2020 shows that for every 1% increase in the digitalization level of SMEs, employment demand increases significantly by 13.7% [6]. In terms of actual scale, the total number of industrial digitalization-related jobs nationwide reached 60.009 million in the second quarter of 2025, accounting for 8.2% of the national employment. Among these, enterprises created 20.831 million jobs and individual households 39.177 million jobs, with micro and small market entities contributing over 65% of digital employment positions.

This effect exhibits obvious heterogeneity across regions and industries: at the regional level, eastern coastal provinces hold prominent advantages. Enterprises in Guangdong, Jiangsu, and Zhejiang provinces created 3.311 million, 2.358 million, and 1.454 million digital jobs respectively, accounting for 34.6% of the national total digital jobs created by enterprises; at the industry level, the wholesale and retail industry has the largest volume of digital employment, with 25.138 million jobs in the second quarter of 2025, accounting for 41.1%. Although the manufacturing industry has a total employment of 5.685 million (a month-on-month increase of 12.3%), its penetration rate is only 4.6%, significantly lower than the 29.8% of the culture and entertainment industry and 19.3% of the catering and accommodation industry [7](fig.2.).
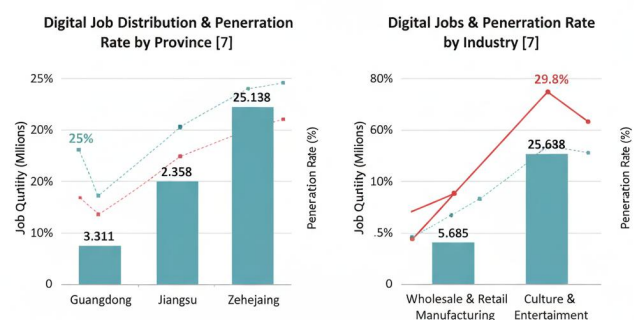

Fig.2. Heterogeneity Analysis of Industrial Digital Employment

2.3.Employment Structure Shifting Toward Digitalization and Skill Intensification

Digital technology is driving the transformation of SME employment structure from "quantity-oriented" to "quality-oriented". On one hand, digital transformation has spawned new types of jobs such as data analysts, platform operations, and digital marketing. Among the 158 new occupations added in China in 2022, digital employment accounted for 61.39%, and the demand growth rate of such jobs in SMEs is 2.3 times that of traditional jobs [8]. On the other hand, the digital skill requirements for traditional jobs have increased significantly. 42.1% of SMEs have improved operational efficiency through digital transformation, among which 79% require frontline employees to master basic

digital tool operation skills [9]. This structural transformation not only improves employment quality (the average salary of digital jobs is 18.7% higher than that of traditional jobs) but also exacerbates the contradiction of skill mismatch, becoming an important factor restricting the full release of employment effects [10].

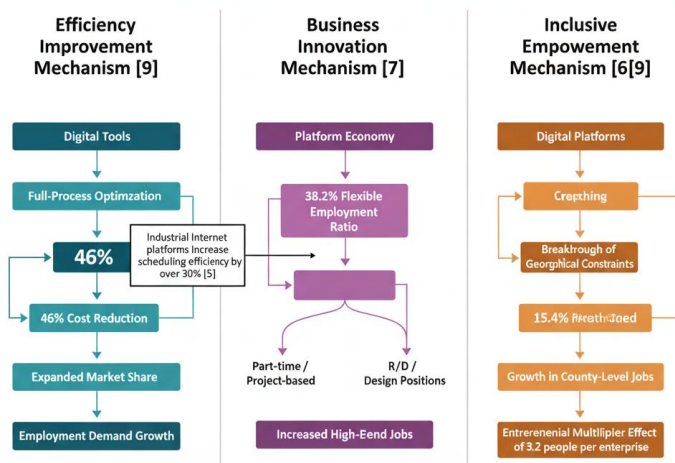# 3. Mechanisms of the Digital Economy Empowering SME Employment(fig.3)

Fig.3. Employment Empowerment Mechanisms by Digital Economy

3.1. Efficiency Improvement Mechanism: Cost Reduction and Efficiency Enhancement to Expand Employment Space

Digital transformation creates room for employment expansion for SMEs by optimizing internal operational efficiency. With digital tools, enterprises can realize the full-process optimization of production, management, and sales, reducing redundant links and labor costs—46% of SMEs have improved the competitiveness of their products and services through digital transformation, thereby expanding market share and driving the growth of employment demand [9]. For example, the application of industrial internet platforms has increased production scheduling efficiency by more than 30%, lowered the labor input threshold per unit of output, and indirectly promoted job expansion [5]. Meanwhile, the economies of scale brought by digitalization enable SMEs to break through production capacity constraints, further stimulating employment by expanding business scope, and the impact of this channel is greater than the pure efficiency improvement effect [11].

3.2. Business Format Innovation Mechanism: Spawning New Employment Forms

The "leading goose effect" of digital technology drives the innovation of SME business formats and creates diversified employment positions. On one hand, the development of platform economy and gig economy allows SMEs to access larger markets, spawning new employment models such as flexible employment and telecommuting. It particularly provides a "small, agile, fast, and precise" transformation path for micro-enterprises—40.7% of SMEs tend to choose one-stop digital solutions to quickly realize business onlineization, thereby absorbing flexible employees such as part-timers and project-based workers. Such flexible employment accounts for 38.2% of the total digital employment in SMEs [7]. On the other hand, the integration of product digitalization and operational digitalization promotes enterprises to transform into innovation-driven entities, increasing the demand for high-end positions such as R&D and design, and advancing the upgrading of employment structure.

3.3. Inclusive Empowerment Mechanism: Lowering the Threshold for Entrepreneurship and Employment

The "trickle-down effect" of digital technology makes SME employment opportunities more inclusive. With digital platforms, SMEs can break geographical limitations, access national and even global markets, reduce market access and operational costs, and create more employment opportunities in county and township areas. The number of digital employment positions in county-level SMEs increased by 15.4% year-on-year in the second quarter of 2025 [7]. Meanwhile, the popularization of digital entrepreneurship tools has lowered the threshold for entrepreneurship, spawning a large number of micro-entrepreneurial entities. The multiplier effect of entrepreneurship-driven employment is significant—each additional digital micro-enterprise drives an average of 3.2 jobs. In addition, the development of platform economy enables groups such as low-income people and rural surplus labor to easily access the job market, realizing the diffusion and inclusiveness of employment opportunities.

4.Prominent Problems in the Digital Economy Empowering SME Employment

4.1.Uneven Transformation Exacerbates the Digital Divide

The "level disparity" in the digital transformation of SMEs leads to uneven distribution of employment effects [13]. SMEs in first-tier cities, the manufacturing industry, and specialized, refined, characteristic, and innovative (SRCI) enterprises, relying on advantages in capital, technology, and talent, have achieved rapid transformation progress and significant employment gains, with a growth rate of digital jobs reaching 21.3%. In contrast, SMEs in central and western regions, the service industry, and micro-enterprises, constrained by fund shortages and insufficient technical reserves, over 60% remain in the early stage of transformation, with a growth rate of digital jobs only 4.8%. They struggle to enjoy the employment dividends of the digital economy, further widening the employment gap between regions and industries [7]. In terms of infrastructure, the broadband access speed of SMEs in rural areas is only 62% of that in urban areas, and the computing power support is insufficient, directly restricting the cultivation of local digital employment positions.

4.2.Skill Mismatch Restricts the Improvement of Employment Quality

The mismatch between digital skill supply and enterprise demand has become a core contradiction. Surveys show that 68% of SMEs report a "shortage of digital talents," with even larger gaps in the manufacturing industry (75%) and service industry (72%). Even when talents are recruited, the turnover rate is as high as 35% [9]. Specifically, SMEs have an urgent demand for interdisciplinary talents: 73% of enterprises need digital operation talents who understand both business and technology, but the supply of such talents can only meet 41% of the demand [7]. From the perspective of workers, only 32% of the existing labor force has basic digital literacy. Middle-aged and elderly groups, as well as low-educated groups, find it difficult to adapt to the requirements of digital jobs, leading to an increase in structural and technological unemployment. Although some enterprises carry out internal training, constrained by costs, only 19% of micro-enterprises have established a sound skill improvement system, exacerbating the mismatch problem
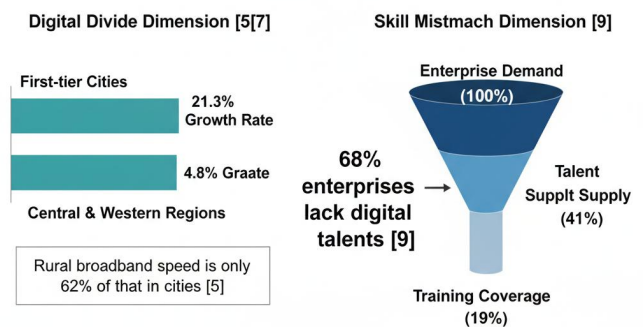
（fig.4）.

Fig.4. Digital Divide and Skill Mismatch

4.3.Imperfect Support System Affects Transformation Effectiveness

Institutional and service barriers faced by SMEs in digital transformation have weakened the employment empowerment effect [2]. Firstly, the precision of policy support is insufficient: the coverage of digital subsidies and tax incentives for micro-enterprises is only 27%, and the cost concerns of "daring not to transform" have not been fully eliminated [4]. Secondly, the regional imbalance of digital infrastructure—insufficient network coverage and computing power support in rural and remote areas—limits the transformation pace of local SMEs [5]. Thirdly, the digitalization level of employment services is lagging, resulting in low efficiency of talent-job matching. The average recruitment cycle for digital positions in SMEs reaches 45 days, 22 days longer than that in large enterprises, making it difficult to meet the urgent demand for digital skilled talents.

4.4.Inadequate Rights Protection Mechanisms Inhibit Employment Stability

The new employment forms spawned by the digital economy face shortcomings in rights protection [10]. The definition of labor relations between platform enterprises and flexible employees is ambiguous: only 28% of flexible employees in SMEs participate in urban employee endowment insurance, and traditional protection systems such as minimum wage standards and labor protection are difficult to cover [7]. To reduce costs, some SMEs avoid the skill training responsibilities for digital positions—only 23% of enterprises provide systematic training for employees in digital positions, restricting workers' career development

space and leading to insufficient employment stability. The annual turnover rate of employees in digital positions reaches 29%, 12 percentage points higher than that in traditional positions [9]. These problems not only affect workers' employment willingness but also restrict the sustainability of the digital economy's employment effects(fig.5).
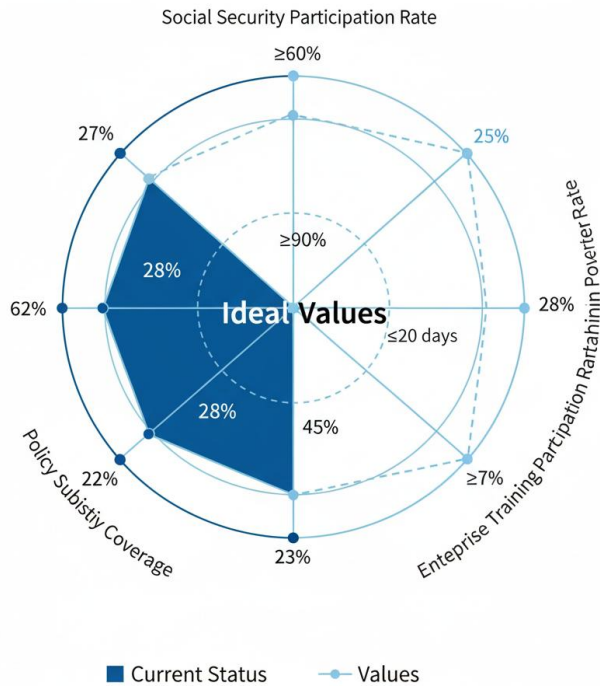

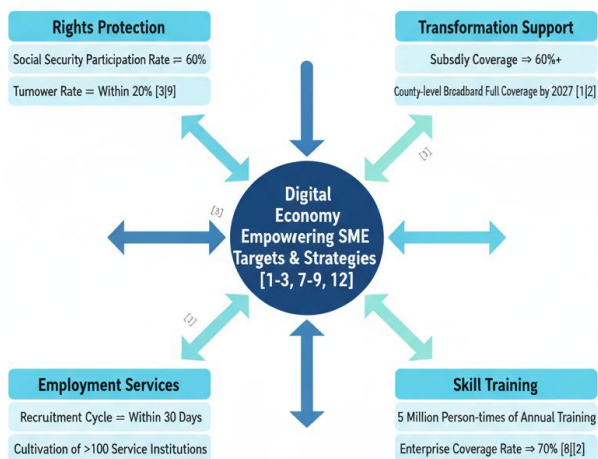**Fig.5.**Support System and Rights Protection

Fig.6. Four-in-One Policy Implementation Framework Chart

5.Policy Recommendations for Promoting the Digital Economy to Empower SME Employment(fig.6)

5.1.Improve the Transformation Support System and Narrow the Digital Divide

First, strengthen targeted policy support by launching inclusive policies such as "digital transformation subsidies" and "cloud service vouchers" for micro-enterprises, increasing the coverage of subsidies to over 60% to reduce transformation costs [2]. Second, promote the "chain-style transformation" model, with leading enterprises as the core to drive the coordinated transformation of SMEs in the industrial chain, sharing digital resources and market channels. It is expected to increase the digitalization rate of SMEs in the industrial chain by 40% [5]. Third, optimize the construction of digital infrastructure, focusing on rural and remote areas. Achieve full coverage of gigabit broadband for county-level SMEs by 2027, and ensure that computing power support reaches the same level as urban areas, creating conditions for SMEs to participate in the digital economy on an equal footing [1].

5.2.Strengthen Digital Skills Training and Resolve Structural Contradictions

Establish a collaborative skill training system involving "government-enterprises-educational institutions": At the government level, increase financial investment in digital skills training, and carry out free basic digital literacy training for low-skilled and middle-aged and elderly workers, with an annual training scale of no less than 5 million person-times [8]. At the enterprise level, implement the main responsibility for skill training, provide a 50% tax reduction on training expenses for SMEs conducting digital training, and promote the enterprise training coverage to 70% [2]. At the educational institution level, adjust the professional settings of vocational education, add practical majors such as digital marketing and industrial internet application, and cultivate skilled talents tailored to enterprise needs, with an annual output of 1 million people [5]. Meanwhile, promote the "on-the-job training with work-integrated learning" model, allowing workers to improve digital skills through practice and achieve precise talent-job matching.

5.3.Optimize the Employment Service Ecosystem and Improve Matching Efficiency

First, advance the digital transformation of employment services, establish a national unified database of SME employment demand and labor supply, and use big data algorithms to improve the accuracy of talent-job matching, shortening the recruitment cycle for digital positions to less than 30 days. Second, encourage third-party institutions to develop targeted employment services, provide one-stop solutions such as digital recruitment and flexible employment matching for SMEs, and cultivate more than 100 professional service institutions. Third, improve the digital employment statistics and monitoring system, timely grasp the changing trends of job demand, and provide data support for policy adjustments and training direction optimization.

5.4.Improve Rights Protection Mechanisms and Stabilize Employment Expectations

First, improve the legal system for new types of labor relations, clarify the rights and obligations of platform enterprises and flexible employees, establish a social insurance participation model adapting to the digital economy, promote the "platform + social security" agency payment service, and increase the participation rate of flexible employees in endowment insurance to 60%. Second, strengthen labor inspection and law enforcement, standardize standards such as salary payment and working hours for digital positions in SMEs, and protect the legitimate rights and interests of workers. Third, promote enterprises to establish career development channels for digital positions, clarify the correspondence between skill levels and salary promotion, and control the annual turnover rate of employees in digital positions within 20%, improving employment stability and attractiveness.

Conclusion

The digital economy has provided unprecedented opportunities for empowering SME employment. Through three core mechanisms—efficiency improvement, business format innovation, and inclusive empowerment—it has not only expanded the total employment volume (60.009 million industrial digitalization-related jobs in the second quarter of 2025) but also optimized the employment structure (the proportion of digital positions continues to rise), becoming a core engine for promoting high-quality and full employment. However, the current digital transformation of SMEs still faces prominent problems such as insufficient depth (only 3.2% have reached the intelligent-driven stage), skill mismatch (68% of enterprises face a shortage of digital talents), an imperfect support system, and lack of rights protection, which restrict the full release of employment effects.

In the future, it is necessary to adhere to a problem-oriented approach: narrow the digital divide by improving the transformation support system, resolve structural contradictions through strengthened skill training, improve matching efficiency by optimizing the employment service ecosystem, and stabilize employment expectations by improving rights protection mechanisms, promoting in-depth integration of the digital economy and SME employment. Only in this way can we give full play to the employment absorption role of SMEs, make the digital economy a sustainable driving force for high-quality and full employment, and lay a solid foundation for the high-quality development of the economy and society.

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