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An exploration of the intrinsic connection between enterprise change and labour force employment in the digital era

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Abstract

Aim: In the digital era, enterprises are transitioning towards more efficient and adaptable models of production and service delivery, precipitating a shift in labour demands, which has engendered a reliance on technological solutions over human labour, resulting in the obsolescence of certain traditional roles and at the same time, the genesis of novel employment prospects. This study examined the fundamental nexus between enterprise evolution and workforce employment in the digital age, scrutinising the repercussions of such transitions on job opportunities and the requisite skill sets for workers.

Methodology: Utilising data from China's A-share listed companies spanning 2007-2022 and grounded in extant literature on digital enterprise transformation and labour employment, the research applied a benchmark regression model and regression analysis.

Results: The findings shows that digital transformation within enterprises exerts a profound influence on the magnitude and composition of labour force. There was a discernible employment generation effect for personnel with high, medium, technical, and service-oriented skills, whereas a substitution effect was observed for lower-skilled and production-centric roles. The impact of enterprise digital transformation on employment is manifested through various channels, including market size,

business domain, and production efficiency. Furthermore, the study revealed heterogeneity in employment effects across enterprises with differing scientific and technological characteristics and geographical locations, with digital transformation in high-tech sectors and central and western regions demonstrating a more pronounced facilitation of workforce employment.

Implications and recommendations: The insights gained from this research offer valuable implications for corporate governance and policy formulation. Managers are urged to anticipate changes and facilitate employee skill enhancement through training and re-education, thereby aligning with emergent occupational paradigms. A reevaluation and recalibration of human resource management strategies are imperative, alongside the establishment of incentive and welfare systems that attract and retain talent.

Originality/value: Policymakers should devise pertinent regulations and invest in digital education initiatives, thereby empowering citizens to elevate their digital competencies.

Keywords: digital era, business change, labour force employment, intrinsic connection

1. Introduction

The Digital China Construction Development Plan (henceforth the Plan) advocates for the fortification and refinement of the digital economy, bolstering the ascension of digital enterprises. The 14th Five-Year Plan and Vision 2035 (henceforth the 14th Five-Year Plan) underline the imperative of an employment-centric strategy, the enhancement of job quality, and the mitigation of structural employment discrepancies. Amidst the digital transformation era, corporate operational modalities and business processes are witnessing radical alterations, precipitating not only productivity enhancements and business model innovations but also exerting a profound influence on employment. Such transformations are redefining conventional job architectures and work paradigms, presenting the labour market with unparalleled challenges and prospects. This exploration into the intrinsic linkage between corporate evolution and workforce employment in the digital age yields insights of significant utility for both enterprises and policymakers. For enterprises, discerning the ramifications of digital transformation on workforce employment is instrumental in devising scientifically grounded human resource strategies, refining organizational structures and business workflows, and augmenting competitive edge and sustainability. For governmental bodies, comprehending the interplay between digital transformation and labour force employment is pivotal in crafting efficacious employment and industrial directives, fostering economic stability and societal advancement. This study not only offers pragmatic guidance for enterprises navigating the digital transformation landscape and optimising labour resources distribution, but also enriches the theoretical discourse on the interrelation between technological advancement and employment. The authors offer novel perspectives and methodologies for subsequent scholarly pursuits, thereby providing substantial theoretical and practical input for steering policy formulation in the digital era.

In the contemporary digital environment, the imperative for enterprises to undergo digital transformation was stressed by Gillespie and Hinson (2023), who asserted that addressing the challenges and requisites of businesses in the digital era through advanced technological integration streamlines management processes and also establishes a robust foundation for strategic decision-making. Ronteau et al. (2022) examined the ramifications of digital transformation within small and medium-sized enterprises, revealing through an analysis of data from numerous annual reports of listed companies, that such digital shifts positively influence operational costs and efficiency, thereby enhancing corporate performance and engendering multidimensional value. Martins et al. (2023) found that economic freedom, innovation and technology are the key factors that attract Chinese FDI, whilst Akbar et al. (2025) observed that trade openness and globalisation have a positive influence on environmental degradation.

The discourse on labour force employment was further enriched by Zakaluzhnaya (2023), who advocated a reconceptualisation of the employment landscape and legislative enhancements at statutory level, particularly considering the swift progression of artificial intelligence, which presents a spectrum of opportunities and challenges for workforce employment.

Investigating the interplay between enterprise digital transformation and labour employment, Su et al. (2023) explored the association between the digital economy and employment concerns, examining the influence of the Internet on the latent workforce and economy. The findings indicated that the burgeoning digital economy exerts both beneficial and adverse effects on employment. Liu et al (2024) explored through empirical modelling the intrinsic mechanisms of digital science and technology's empowerment in employment, concluding that digital innovation significantly empowers the workforce, advocating for the exploitation of the Internet and big data technologies to establish a shared platform for employment resources, thereby maximising the potential of these technologies in employment channels, skills development, and other domains. Zhao and Zhou (2024) highlighted the profound impact of digital transformation on employment, noting its emergence as its pivotal driver, capable of fostering employment through various facets of business scope, market expansion, and production efficacy, thus substantiating the intimate nexus between enterprise digital evolution and labour.

In synthesising the debate on the nexus between organizational transformation and employment amidst the digital era, it can be observed that despite a substantial body of research, opportunities for improvement persist. Predominantly, extant studies concentrated on the macroscopic repercussions of corporate digitalisation on the labour market, with scant attention to the granularity and architecture of employment metrics. The novelties of the present analysis are twofold: initially, it delves into the symbiotic relationship between organizational evolution and employment dynamics, offering a holistic and profound analytical schema, while subsequently, transcending conventional narrative reviews and theoretical disquisitions, the study employs an empirical investigatory approach to quantify the ramifications of digitalisation on employment, thereby describing the underlying mechanisms and furnishing policymakers and corporate strategists with granular, actionable insights.

2. Model design of the impact of enterprise change on employment in China in the digital era

2.1. Theoretical analysis

In the digital era the interplay between corporate metamorphosis and engagement of labour has undergone a discernible shift. Company requirements for employee competencies have markedly evolved, necessitating a continual skill refreshment by the workforce to align with the demands of the digital age. At the same time, digital technologies have catalysed a reconfiguration of organizational structures, endowing digitally adept employees with augmented promotional prospects. Furthermore, the advent of the digital era has spawned a plethora of novel employment modalities, thereby broadening the spectrum of vocational opportunities. Specifically, the ascendancy of the digital economy exerts a bifurcated influence on the job market, encapsulated by the employment displacement and generation effects.

2.1.1. Employment substitution effect

The phenomenon whereby automation and digital apparatus supplant traditional, monotonous occupations is encapsulated by the term 'employment substitution effect.' As demonstrated in Figure 1, an initial surge in productivity precipitates a contraction in demand for labour. Technological evolution engenders a diminution in occupational valuation, potentially curtailing labour demand, and

concomitantly, such technological progression fosters human capital enhancement, thereby diminishing corporate profits and the impetus for job creation. Furthermore, the proliferation of intelligent technology precipitates a precipitous decline in the cost of machinery, enabling equivalent human capital investments to procure an augmented quantity of equipment, culminating in the supplanting of labour by machines (cf. Chen, 2022). Lastly, industrial structure metamorphosis leads to occupational obsolescence. The relentless advancement of emergent technologies is correlated with an escalation in unemployment rates, as a multitude of conventional roles succumb to the burgeoning onslaught of new industries.

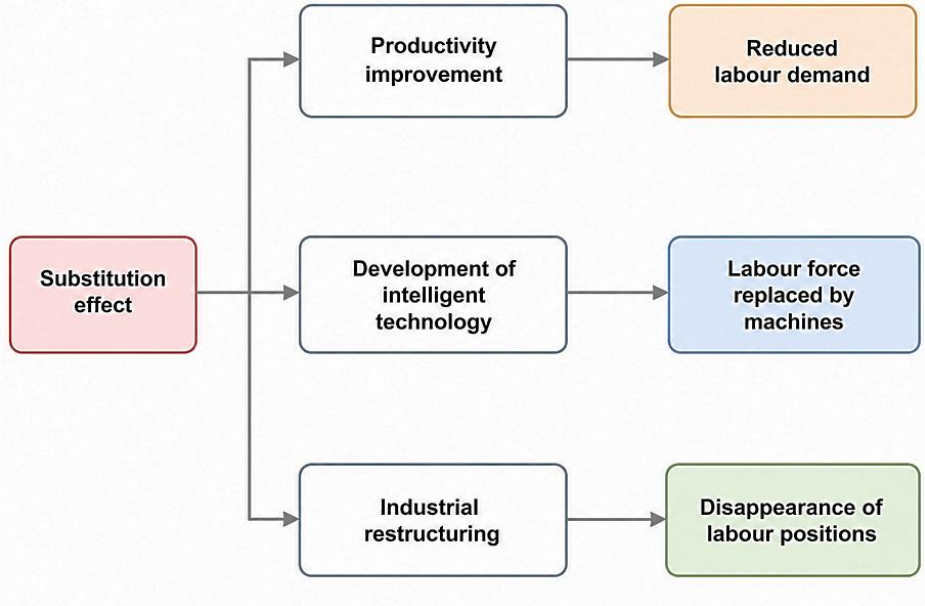

Fig. 1. Employment substitution effect

Source: authors' own compilation.

2.1.2. Employment creation effect

The term 'employment creation effect' encapsulates the emergence of new vocations and prospects engendered by technological innovation and industrial enhancement, thereby catalysing employment proliferation. As shown in Figure 2, a rise in productivity is observed to instigate an escalation in labour demand. The swift expansion of the digital economy is posited to bolster social productivity, which, in turn, precipitates a reduction in production costs, a subsequent diminishment in product prices, and an amplification in market demand. This sequence of events is theorised to broaden industrial magnitude and amplify labour requisition, where increased productivity is anticipated to enhance employee remuneration, invigorate labour demand, and expand production scope, with a resultant enlargement in workforce dimensions. Innovations within the industrial domain are purported to spawn new employment opportunities. The advent of novel technologies is projected to heighten the necessity for adept personnel, thereby engendering an abundance of new positions. The efficacious amalgamation of the digital and real economies is expected to give birth to innovative business paradigms, which then forge additional occupations. Lastly, the diffusion of technology is conjectured to facilitate employment transference. The digital evolution of enterprises is expected to diminish employment within some labour sectors while augmenting it in the emergent ones, thus fostering a workforce migration from traditional to pioneering sectors. The digital economy's integration is also presumed to be concomitant with the proliferation of other industries, thereby generating a multitude of associated jobs in both upstream and downstream sectors (cf. Pan & Xu, 2024).

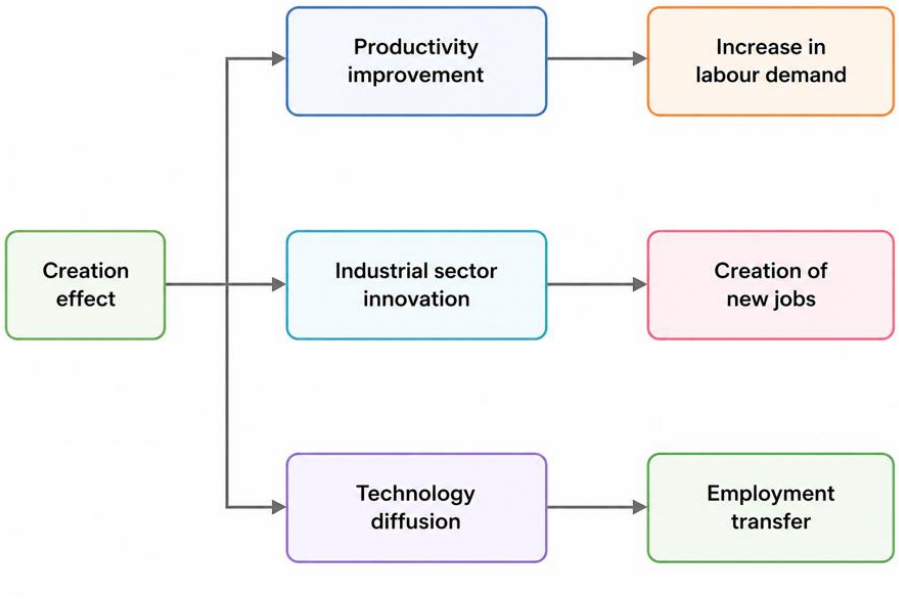

Fig. 2. Employment creation effect

Source: authors' own compilation.

2.2. Research hypotheses

Based on the above analysis, the following research hypotheses are proposed:

Digital transformation, while bringing new job opportunities by promoting the development of industries, such as e-commerce, data analytics, and cloud computing at a very fast pace, also means that these industries need to recruit a higher proportion of high-and medium-skilled workers to drive and scale their businesses. Meanwhile, digital transformation also reshapes the old patterns of work by bringing in automation and intelligent systems, which tend to replace low-skilled, manual roles. Additionally, as manufacturing and production processes are becoming more elaborate, enterprises require workers with modern skills and digital proficiency. Thus, there is a shift in labour demand toward more sophisticated occupations and service-oriented roles.

Hypothesis 1: Digital transformation is positively linked with the promotion of workforce skill composition, leading to a higher concentration of employment in more sophisticated and skilled occupations.

The effect of digital transformation on jobs is two-sided. Even though digital technologies have the potential to replace some jobs with automation, they also generate new employment opportunities in digital infrastructure, support industries, and innovation-based business sectors. With companies adopting digital tools, their transactional effectiveness increases, cost decreases, and market boundaries expand, all of which increase employment demand. Therefore, whenever the employment-creating effect of digital transformation outweighs the replacement effect, there is an overall rise in the level of employment, particularly in digitally adaptive sectors.

Hypothesis 2: Digital business transformation has a positive impact on overall levels of employment, demonstrating that the employment creation effect outweighs the employment substitution effect.

Digitalisation has substantially increased business productivity through the implementation of next-generation technologies and smart machinery, which lower the cost of production and enhance the efficiency of operations. Such aggregate factor productivity increases spur business expansion, resulting in the need for additional labour force in expanded or diversified operations. While automation may substitute some repetitive work, employment can continue to rise as businesses

expand and transform, particularly with the assistance of industrial upgrading and innovation. In this case, digital transformation boosts the productivity of production and stimulates employment growth.

Hypothesis 3: Digital transformation of enterprises improves production efficiency and encourages employment by increasing business operations and improving total productivity factor.

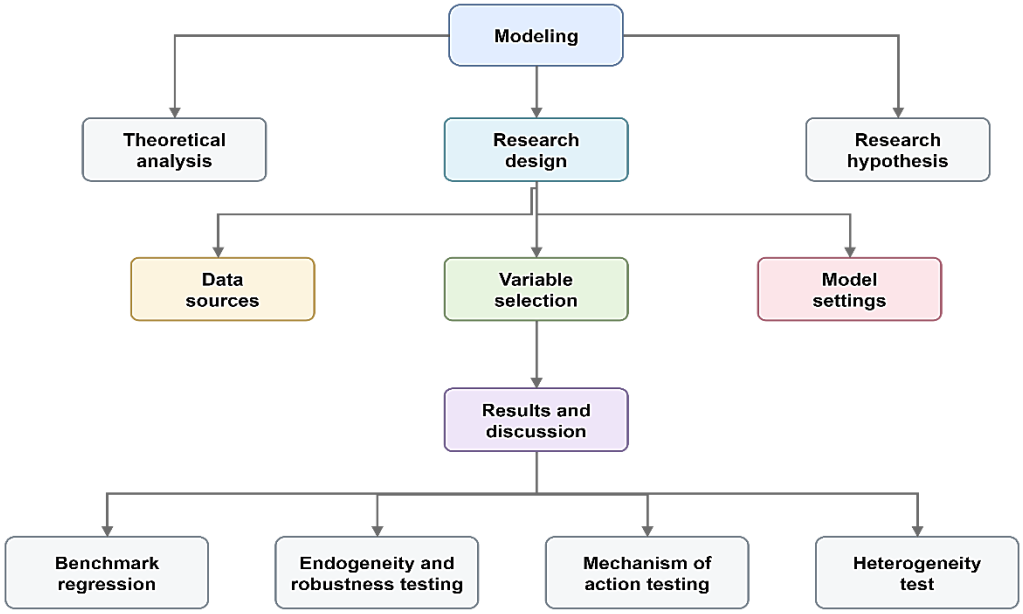

Fig. 3. Flowchart of the research idea

Source: authors' own compilation.

2.3. Research design

As shown in Figure 3, the flow chart of the research idea of this paper, this section mainly unfolds the model design through theoretical analysis and research hypotheses and discusses the results on this basis.

2.3.1. Variable selection

In the realm of enterprise digital transformation, a systematic approach is paramount. The study of this phenomenon was based on a textual analysis of annual reports from A-share listed companies spanning 2007 to 2022, serving as a pivotal indicator. This process entailed the utilisation of digital technology to extract data pertinent to digital transformation from relevant meetings and news sources, thereby constructing a textual database. Subsequent analysis enabled the quantification of digital transformation occurrences, which, upon incrementation by unity, undergo natural logarithmic transformation to yield the required indices.

Labour force employment, the dependent variable, is quantified by the annual terminal employee count within an enterprise. Employment structure bifurcates into positional and skill-based classifications. Educational attainment delineates employees into high, medium, and low skill groups, whilst occupational character classifies them into service, production, and technical categories, with proportional representation serving as the metric for employment positional structure. By aligning with variables like educational attainment and occupational structure, the authors drew conclusions as to how these factors shape labour market outcomes in the context of digital transformation.

The control variables encompass two domains: enterprise characteristics and financial attributes. The former employs the logarithm of enterprise inception duration as an age metric and asset logarithm as a size indicator. The latter leverages the net profit to total assets ratio and balance sheet proportionality to appraise profitability, while asset market value, expressed as a percentage of enterprise replacement cost, measures growth.

2.3.2. Modelling

The benchmark regression model is a common statistical model used to estimate the relationship between variables, usually used to control the effects of other variables in order to more accurately estimate the effects of the target variable. Based on the above theoretical analysis, the following benchmark regression model was set:

$$Labour_{it} = \beta_0 + \beta_1 DIGI_{it} + \sum_{j=1}^{K} \beta_j X_{jit} + \varepsilon_{it} + \lambda_c + \Phi_t, \quad (1)$$

where $Labour_{it}$ denotes the labour force employment of enterprise *i* in year *t*, β_0 is the regression constant, β_1 is the regression coefficient, $DIGI_{it}$ stands for the proxy variable of enterprise digital transformation, which refers to the degree of digital transformation of enterprise *i* in year *t*, X_{jit} denotes the control variable, ε_{it} – the random disturbance term, λ_c is the industry fixed effect, and Φ_t denotes the time fixed effect.

The fixed effects model, as a panel data analysis method, changes with individuals but not over time. It has n different intercepts corresponding to different individuals. The model was set up as follows:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \sum_{j=2}^{K} \beta_j X_{jit} + c_i + \varepsilon_{it}, \quad (2)$$

where β_0 and β_1 denotes the coefficients, and c_i represents the individual-specific fixed effect and ε_{it} denotes the idiosyncratic error term. The random effects model assumes that the explanatory variables in the model contain random factors that are correlated with the explanatory variables in the model, thus creating an endogeneity problem. The random effects model solves the endogeneity problem by controlling for these random factors in order to obtain unbiased parameter estimates. The model was set up by treating the fixed effects model regression coefficients as random variables and considering the intercept term and explanatory variables uncorrelated:

$$y_{it} = \alpha_i + \beta x_{it} + c_{it}, \quad (3)$$

where α_i is the individual random effect, x_{it} is the explanatory variable, and c_{it} is the composite error.

3. Results and discussion

3.1. Benchmark regression

Table 1 shows the regression outcomes elucidating the nexus between enterprise digital transformation and labour force employment magnitude in the digital era. It is clear that the core explanatory variable, enterprise digital transformation, manifests a coefficient of notable magnitude, affirming its significance. The employment size is incorporated as a control variable, bolstering the core explanatory variable's robust positive correlation at the 1% significance threshold, hence it is inferred that digital-era enterprise transformation is a potent catalyst for increasing the growth of employment. This finding supports hypothesis 2 which proposed that digital business transformation has a positive impact on the overall levels of employment, demonstrating that the employment creation effect outweighs the employment substitution effect.

Table 1. Benchmark regression results

	Enterprise digital transformation	Control variable	Industry effect	Year effect	Constant term	R^2
Employment scale（1）	0.16***	N	Y	Y	7.41***	0.85
Employment scale（2）	0.10***	Y	Y	Y	44.01***	0.75

Note: *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, and the same below.

Source: the data were analysed by using IBM SPSS Statistical software.

Table 2 presents the regression analysis concerning the interplay between enterprise digital transformation and the labor force employment structure in the digital era. The employment structure is dichotomised into skill-based and positional categories. The analysis revealed that the share of high-skilled and medium-skilled employees was significantly positive at the 1% level, suggesting that digital transformation within enterprises positively influences the demand for such labour. This finding supports hypothesis 1 that digital transformation is positively linked with the promotion of workforce skill composition, leading to a higher concentration of employment in more sophisticated and skilled occupations.

Table 2. Benchmark regression results

	Enterprise digital transformation	Control variable	Industry effect	Year effect	Constant term	R^2
High-skilled	1.32***	Y	Y	Y	4.90***	0.67
Medium-skilled	0.85***	Y	Y	Y	2.68***	0.82
Low-skilled	-1.73***	Y	Y	Y	2.58**	0.81
Technical	2.65***	Y	Y	Y	2.86**	0.81
Service oriented	1.97***	Y	Y	Y	2.19*	0.80
Production type	-3.23***	Y	Y	Y	2.30**	0.80

Source: benchmark regression results were analysed by using IBM SPSS Statistical software.

Conversely, the proportion of low-skilled employees is significantly negative at the same level, indicating a propensity for digital transformation to supplant low-skilled positions. Furthermore, the employment structure analysis indicated that skilled and service-oriented roles experience a significant positive impact at the 1% level, whereas production-oriented roles exhibit a significant negative effect, denoting that digital transformation engenders job creation for skilled and service-oriented labour while substituting employment for production-centred roles.

3.2. Endogeneity and robustness test

To address the model's inherent endogeneity, the Heckman two-step method, propensity score matching (PSM), and instrumental variable techniques were employed, mitigating the effects of bidirectional causality and omitted variables. The Heckman method resolves endogeneity arising from sample self-selection by leveraging the average digital transformation value of peer enterprises within the same locality to estimate digitalisation probability, thus deriving the Inverse Mills Ratio (IMR), subsequently incorporated as a control variable in the baseline regression. Thus PSM addressed selection bias by dividing samples based on the median digital transformation level, assigning values above the median to the experimental group and the remainder to the control group. Matching was carried out via the nearest neighbour, radius, and kernel methods. The instrumental variable approach introduced the exogenous variables, i.e. market size, business area, production efficiency unrelated to the error term yet correlated with endogenous variables, serving as unbiased estimators (Zhao et al., 2021).

Robustness checks involved substituting core explanatory variables to preclude indicator selection bias, and adjusting the data sample interval post-2015, following the State Council's "Internet Plus" initiative, which expedited enterprise digital transformation, and excluding external events influence, notably the 2015 stock market crash and the 2020 pandemic by omitting data from 2020 onwards and conducting a comprehensive robustness test excluding samples from 2015 to 2021. These measures ensured the benchmark regression's resilience.

3.3. Testing the mechanism of action

To further validate the impact of enterprise digital transformation on labour force employment from the three dimensions of market size, business field, and production efficiency, the following econometric model was set:

$$\begin{cases} Labour_{it} = \beta_0 + \beta_1 DIGI_{it} + \sum_{j=2}^{12} \beta_j X_{jit} + \varepsilon_{it} \\ M_{it} = \alpha_0 + \alpha_1 DIGI_{it} + \sum_{j=2}^{12} \alpha_j X_{jit} + \delta_{it} + \lambda_c + \Phi_t \\ Labour_{it} = \theta_0 + \theta_1 DIGI_{it} + \theta_2 M_{it} + \sum_{j=3}^{13} \theta_j X_{jit} + \varphi_{it} + \lambda_c + \Phi_t \end{cases} \quad (4)$$

where M_{it} denotes the mediating variable, and the remaining variables are defined as above. The summation in the third equation starts from j = 3 because θ_1 and θ_2 correspond to $DIGI_{it}$ and the mediating variable M_{it}, respectively.

3.3.1. Market size

Table 3. Testing the mechanism of market size effect

	DIGI	Ln_income	Marpow	Control variable	Industry effect	Year effect	Constant term	R^2
Employment scale（1）	0.416 ***			Y	Y	Y	5.710 ***	0.88
Employment scale（2）	0.173 ***	0.547 ***		Y	Y	Y	-4.344 ***	0.93
Employment scale（3）	0.391 ***		6.697 ***	Y	Y	Y	5.692 ***	0.89
Main business income	0.444 ***			Y	Y	Y	18.371 ***	0.90
Market share	0.004 ***			Y	Y	Y	0.003	0.93

Source: results were analysed by using IBM SPSS Statistics software.

As shown in Table 3, this is a test of the mechanism of market size effect. The index constructed by adopting the textual analysis method in the following section measures the market size of the enterprise with the two variables of the revenue of the main business (Ln_income) and the market share of the enterprise (Marpow). According to the table, the digital transformation of enterprises has effectively increased enterprise jobs under the market scale effect.

3.3.2. Operational areas

Table 4. Tests of the mechanism of action of business area effects

	DIGI	Prod_dum	Prod_scope	Control variable	Industry effect	Year effect	Constant term	R^2
Employment scale（1）	0.417 ***			Y	Y	Y	5.461 ***	0.89
Employment scale（2）	0.409 ***	0.096 ***		Y	Y	Y	5.434 ***	0.89
Employment scale（3）	0.404 ***		0.075 ***	Y	Y	Y	5.371 ***	0.89
Diversification	0.080 ***			Y	Y	Y	0.289 ***	0.67
Industry types	0.178 ***			Y	Y	Y	1.218	0.69

Source: results were analysed by using IBM SPSS Statistical software.

The digital transformation of enterprises has a positive effect on the expansion of business areas and can further promote employment. This paper adopted two indicators to measure whether the enterprise is diversified (Prod_dum) and the number of operating industries (Prod_scope), where Prod_dum takes the value of 1 if the enterprise's operating scope contains multiple industries, and 0 if it only concentrates on a certain field. As shown in Table 4, the effect of the business field was

significantly indicated as positive at the 1% level, which suggests that the expansion of the enterprise's business field has a positive contribution to the expansion of employment scale. The findings were consistent with (Zhao et al., 2024).

3.3.3. Productive efficiency

Table 5. Tests of the mechanism of action of the production efficiency effect

	DIGI	TFP_LP	TFP_OP	Control variable	Industry effect	Year effect	Constant term	R^2
Employment scale（1）	0.277 ***			Y	Y	Y	5.038 ***	0.91
Employment scale（2）	0.156 ***	0.519 ***		Y	Y	Y	2.033 ***	0.93
Employment scale（3）	0.274 ***		0.189 ***	Y	Y	Y	4.543 ***	0.91
TFP_LP	0.232 ***			Y	Y	Y	5.787 ***	0.91
TFP_OP	0.081 ***			Y	Y	Y	3.077 ***	0.88

Source: results were analysed by using IBM SPSS Statistical software.

Enterprise digital transformation is more favourable for the improvement of total factor productivity, measured by applying LP and OP to the total factor productivity of enterprises. As shown in Table 5, the results of the test of the mechanism of production efficiency effect, from which the corresponding DIGI values of LP and OP were significantly positive at the 1% level, indicates that the digital transformation of enterprises was effective in boosting total factor productivity while driving employment. This result supports the third and last hypothesis that digital transformation of enterprises improves production efficiency and concurrently encourages employment by increasing business operations and improving total factor productivity.

3.4. Heterogeneity test

Table 6. Heterogeneity test

	DIGI	DIGI_Teach	Teach	DIGI_East	East	Control variable	Industry effect	Year effect	Constant term	R^2
（1）	0.235 ***	0.366 ***	-0.792			Y	Y	Y	6.430 ***	0.88
（2）	0.575 ***			-0.222 ***	0.341	Y	Y	Y	5.568 ***	0.88

Source: results were analysed by using IBM SPSS Statistical software.

Table 6 presents the heterogeneity test outcomes. Initially, enterprises were stratified based on their scientific and technological attributes, specifically whether they were accredited as high-tech entities within the sampling timeframe and thus categorised as high-tech (Teach=1), or otherwise (Teach=0). The cross-multiplication term was markedly positive at the 1% significance level, denoting a pronounced advantage for high-tech firms. Next, enterprises were geographically segmented into East (East=1) and Midwest (East=0). Here, the cross-multiplication term was significantly negative at the 1% level, stressing that digital transformation is more conducive to employment expansion in the Midwest.

4. Conclusion

In the digital era, enterprise transformation has been identified as a pivotal influence on both corporate entities and the labour market. Utilising data from China's A-share listed corporations, the authors conducted an empirical examination of the nexus between enterprise evolution and workforce engagement in the digital age. It was found that the digital overhaul of enterprises emerged as a salient impetus for augmenting labour demand in present times, and such a transformation efficiently fosters employment across market dimensions, business sectors, and productive efficacy. Heterogeneity analysis revealed that high-tech companies and those situated in central and western regions showed more pronounced improvement in labour recruitment due to digital advancements. Investigating the impact of corporate shifts on employment structure and volume within the digital framework contributes to the expansion and refinement of the discourse on technological progress and its employment implications, thereby aiding corporations in devising empirically grounded and judicious talent strategies to pre-empt and mitigate labour contingencies.

Accordingly, the ensuing recommendations are posited for corporate governance and policy formulation:

(1) Companies ought to cultivate adaptable hiring stratagems, encompassing telecommuting, project-centric engagements, and diverse employment modalities, alongside revising remuneration structures and benefits to remain competitive. Organizational architecture should be reassessed for a flatter, decentralised configuration in order to align with digital era requisites, thereby enhancing decisional alacrity and adaptability, whilst also amplifying developmental prospects for personnel.
(2) The state structures are advised to escalate investments in digital proficiency cultivation, thereby facilitating labour force skill enhancement and alignment with digital era demands, including free-of-charge or subsidised digital skill courses and endorsing corporate-led training initiatives. Policy architecture should incentivise digital skills acquisition within the workforce, potentially through fiscal inducements and financial support for businesses, thereby stimulating investment in digitally-skilled human resources. Given the propensity of digital technology dissemination to intensify income disparities, governmental vigilance towards employment equality during digital transitions is imperative, with protective measures for the labour rights of marginalised cohorts, including employment aid and fortifying labour statutes. Entrepreneurial and innovation-centred enterprises should receive increased support, encouraging youth and entrepreneurs to venture into the digital economy, facilitated by starts-up funding, tax concessions, and procedural simplification.

5. Limitations of the study

The study's limitations are primarily manifested in the limited scope of sample selection, predominantly addressing the direct effects on employment scale and structure, with insufficient exploration of more profound impact mechanisms such as the labour market supply-demand dynamics and corporate organizational transformation. A singular methodological approach to heterogeneity analysis presents its own constraints, and future inquiries may explore the indirect repercussions and foundational mechanisms of digital transformation on workforce employment, incorporating varied classification of digitalisation levels to enrich the understanding of this multifaceted issue.

References

Ahmad, R., Sharif, F., Ahmad, S., Gul, A., & Abdirasulovna, Z. A. (2024). Does the digital economy improve female employment? A cross-country panel data analysis. *Heliyon*, *10*(13), e33535. https://doi.org/10.1016/j.heliyon.2024.e33535

Akbar, A., Gul, A., Haider, S. A., Ahmad, S., Chen, S., Tehseen, S., & Asif, M. (2025). China's Outward FDI and Globalization's Impact on CO2 Emissions: A Cross-Country Panel Data Analysis. *Journal of the Knowledge Economy*, *16*(6), 17546-17569. https://doi.org/10.1007/s13132-024-02404-y

Chen, L. (2022). The impact of digital economy development on the demand and supply of labor market. *BCP Business & Management*, *33*, 519-527. https://doi.org/10.54691/bcpbm.v33i.2835

Chunming, Z., Yuanhao, B., Hongbing, L., & Ye, L. (2023). Enterprise digital transformation and labor income share. *Journal of Finance and Economics*, *49*(06), 49-63.

Gillespie, C., & Hinson, C. (2023). Meeting the demands of change: A clear path to a better digital enterprise architecture. *Corporate Real Estate Journal*, *13*(1), 70-77. https://doi.org/10.69554/BALO8535

Li, M., & Du, W. (2022). The impact of environmental regulation on the employment of enterprises: an empirical analysis based on scale and structure effects. *Environmental Science and Pollution Research*, *29*(15), 21705-21716. https://doi.org/10.1007/s11356-021-17460-z

Liu, J., Fang, Y., Xia, Y., Zou, W., Chan, K.-L., Lam, J. F. I., & Chen, H. (2024). Can the digital economy promote sustainable improvement in the quality of employment for Chinese residents? Moderated mediation effect test based on innovation environments. *Sustainability*, *16*(14), 6071. https://doi.org/10.3390/su16146071

Lv, K., Zhao, Y., Zhu, S., & Zhu, L. (2024). Enterprise digital transformation and labor structure evolution: evidence from China. *Chinese Management Studies, 19*(3), 702-733. https://doi.org/10.1108/CMS-09-2023-0485

Martins, J. M., Gul, A., Mata, M. N., Haider, S. A., & Ahmad, S. (2023). Do Economic Freedom, Innovation, and Technology Enhance Chinese FDI? A Cross-country Panel Data Analysis. *Heliyon*, *9*(1), e16668. https://doi.org/10.1016/j.heliyon.2023.e16668

Pan, X., & Xu, G. (2024). Can regional innovation policies promote corporate digital transformation? Empirical evidence from China's national innovation demonstration zones. *Applied Economics*, *57*(39), 1-19. https://doi.org/10.1080/00036846.2024.2374460

Qiu, L., Duan, Y., Zhou, Y., Xu, F., Zheng, H., Cai, X., & Jiang, Z. (2024). Impact of digital empowerment on labor employment in manufacturing enterprises: Evidence from China. *Heliyon*, *10*(8), e29040. https://doi.org/10.1016/j.heliyon.2024.e29040

Ronteau, S., Muzellec, L., Saxena, D., & Trabucchi, D. (2022). *Digital business models: The new value creation and capture mechanisms of the 21st century* (p. 182). De Gruyter.

Su, J., Wei, Y., Wang, S., & Liu, Q. (2023). The impact of digital transformation on the total factor productivity of heavily polluting enterprises. *Scientific Reports*, *13*(1), 6386. https://doi.org/10.1038/s41598-023-33553-w

Tan, J. H., & Xiong, L. J. (2023). Research on the Development of High-Quality Employment of Students Under the Background of Digitalization of the Economy. In: *Digitalization and Management Innovation II* (pp. 331-338). IOS Press.

Wu, S., & Li, J. (2023, April). Prediction of Trend of Digital Talent Demand in China by BP Artificial Neural Network Model. In: *2023 IEEE 3rd International Conference on Electronic Communications, Internet of Things and Big Data (ICEIB)* (pp. 341-344). IEEE.

Zakalyuzhnaya, N. V. (2023). A New Concept of Employment and the Development of Labor Relations in the Digital Age. *Law. Journal of the Higher School of Economics*, *16*(2), 139-164. https://doi.org/10.17323/2072-8166.2023.2.139.164

Zhao, C., Deng, M., & Cao, X. (2021). Does haze pollution damage urban innovation? Empirical evidence from China. *Environmental Science and Pollution Research*, *28*(4), 1-16. https://doi.org/10.1007/s11356-020-11874-x

Zhao, C., & Zhou, P. (2024). Does dialect diversity improve enterprise employment? Evidence from Chinese listed companies. *International Review of Economics & Finance*, *92*, 1395-1404.

Zhao, Y., Said, R., Ismail, N. W., & Hamzah, H. Z. (2024). Impact of industrial robots on labour productivity: Empirical study based on industry panel data. *Innovation and Green Development*, *3*(2), 100148. https://doi.org/10.1016/j.igd.2024.100148

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